marantz®

Service Manual Ver. 1

PRE-MAIN AMPLIFIER

PM-12 SE
PM-12 OSE

Click here!

On-line service parts list

PM-12 SE: https://dmedia.soundunited.com/documents/details/26617

PM-12 OSE: https://dmedia.soundunited.com/documents/details/26616

ONLINE PARTS LIST (P5)

WEB owner's manual

EU: http://manuals.marantz.com/PM12SE/EU/EN/index.php

JP: http://manuals.marantz.com/PM12OSE/JP/JA/index.php

Upload is planned for the time of a future press release.

- For purposes of improvement, specifications and design are subject to change without notice.
- Please use this service manual when referring to the operating instructions without fail.
- Some illustrations used in this service manual are slightly different from the actual product.

BEFORE SERVICING THIS UNIT

SAFETY PRECAUTIONS

NOTE FOR SCHEMATIC DIAGRAM

HANDLING THE SEMICONDUCTOR AND OPTICS

ONLINE PARTS LIST

SERIAL NUMBER

POST-SERVICE PRECAUTIONS

SAFETY PRECAUTIONS

The following items should be checked for continued protection of the customer and the service technician.

Leakage current check

Before returning the set to the customer, be sure to carry out either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 460 kohms, the set is defective.
Be sure to test for leakage current with the AC plug in both polarities, in addition, when the set's power is in each state (on, off and standby mode), if applicable.

CAUTION **Please heed the following cautions and instructions during servicing and inspection.**

◎ Heed the cautions!

Cautions which are delicate in particular for servicing are labeled on the cabinets, the parts and the chassis, etc. Be sure to heed these cautions and the cautions described in the handling instructions.

◎ Cautions concerning electric shock!

(1) An AC voltage is impressed on this set, so if you touch internal metal parts when the set is energized, you may get an electric shock. Avoid getting an electric shock, by using an isolating transformer and wearing gloves when servicing while the set is energized, or by unplugging the power cord when replacing parts, for example.
(2) There are high voltage parts inside. Handle with extra care when the set is energized.

◎ Caution concerning disassembly and assembly!

Through great care is taken when parts were manufactured from sheet metal, there may be burrs on the edges of parts. The burrs could cause injury if fingers are moved across them in some rare cases. Wear gloves to protect your hands.

◎ Use only designated parts!

The set's parts have specific safety properties (fire resistance, voltage resistance, etc.). Be sure to use parts which have the same properties for replacement. The burrs have the same properties. In particular, for the important safety parts that are indicated by the ⚠ mark on schematic diagrams and parts lists, be sure to use the designated parts.

◎ Be sure to mount parts and arrange the wires as they were originally placed!

For safety seasons, some parts use tapes, tubes or other insulating materials, and some parts are mounted away from the surface of printed circuit boards. Care should also be taken with the positions of the wires by arranging them and using clamps to keep them away from heating and high voltage parts, so be sure to set everything back as it was originally placed.

◎ Make a safety check after servicing!

Check that all screws, parts and wires removed or disconnected when servicing have been put back in their original positions, check that no serviced parts have deteriorated the area around. Then make an insulation check on the external metal connectors and between the blades of the power plug. And otherwise check that safety is ensured.
(Insulation check procedure)
Unplug the power cord from the power outlet, disconnect the antenna, plugs, etc., and on the power. Using a 500V insulation resistance tester, check that the insulation resistance value between the inplug and the externally exposed metal parts (antenna terminal, headphones terminal, input terminal, etc.) is 1M Ω or greater. If it is less, the set must be inspected and repaired.

CAUTION **Concerning important safety parts**

Many of the electric and the structural parts used in the set have special safety properties. In most cases these properties are difficult to distinguish by sight, and the use of replacement parts with higher ratings (rated power and withstand voltage) does not necessarily guarantee that safety performance will be preserved. Parts with safety properties are indicated as shown below on the wiring diagrams and the parts list in this service manual. Be sure to replace them with the parts which have the designated part number.

(1) Schematic diagrams Indicated by the ⚠ mark.
(2) Parts lists Indicated by the ⚠ mark.
The use of parts other than the designated parts could cause electric shocks, fires or other dangerous situations.

NOTE FOR SCHEMATIC DIAGRAM

WARNING:
Parts indicated by the ⚠ mark have critical characteristics. Use ONLY replacement parts recommended by the manufacturer.

CAUTION:
Before returning the set to the customer, be sure to carry out either (1) a leakage current check or (2) a line to chassis resistance check. If the leakage current exceeds 0.5 milliamps, or if the resistance from chassis to either side of the power cord is less than 460 kohms, the set is defective.

WARNING:
DO NOT return the set to the customer unless the problem is identified and remedied.

NOTICE:
(1) ALL RESISTANCE VALUES IN OHM. k=1,000 OHM / M=1,000,000 OHM
(2) ALL CAPACITANCE VALUES ARE EXPRESSED IN MICRO FARAD, UNLESS OTHERWISE INDICATED. P INDICATES MICRO-MICRO FARAD. N INDICATES NANO FARAD.
(3) EACH VOLTAGE AND CURRENT ARE MEASURED AT NO SIGNAL INPUT CONDITION.
(4) CIRCUIT AND PARTS ARE SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

HANDLING THE SEMICONDUCTOR AND OPTICS

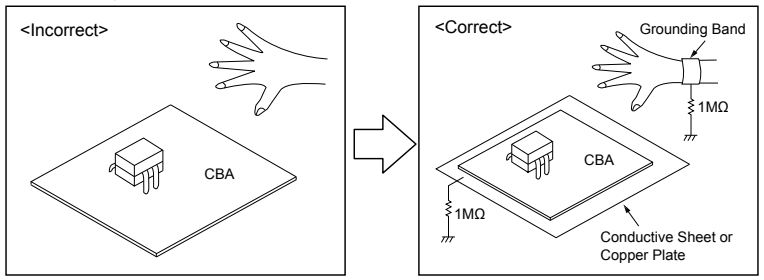
Electrostatic breakdown of the semi-conductors or optical pickup may occur due to a potential difference caused by electrostatic charge during unpacking or repair work.

1. Ground for Human Body

Be sure to wear a grounding band (1 M ohm) that is properly grounded to remove any static electricity that may be charged on the body.

2. Ground for Workbench

Be sure to place a conductive sheet or copper plate with proper grounding (1 M ohm) on the workbench or other surface, where the semi-conductors are to be placed. Because the static electricity charge on clothing will not escape through the body grounding band, be careful to avoid contacting semi-conductors with your clothing

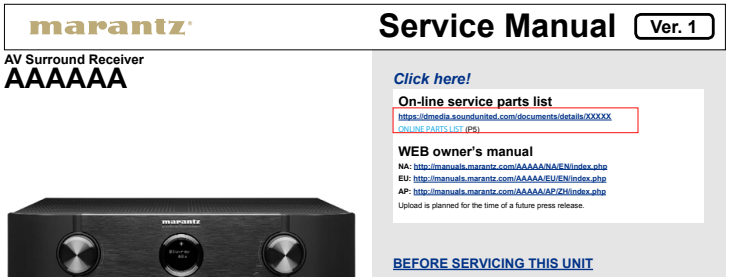


ONLINE PARTS LIST

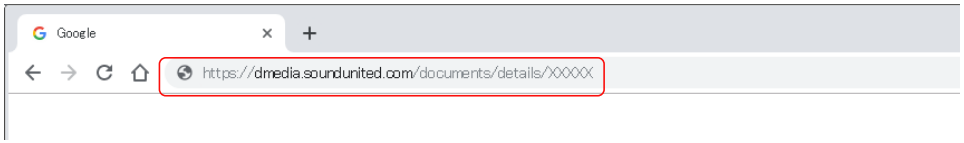
Accessing the Parts List

(1) Access from the Service Manual

・ Click the URL link on the cover of the service manual.
Examples of display



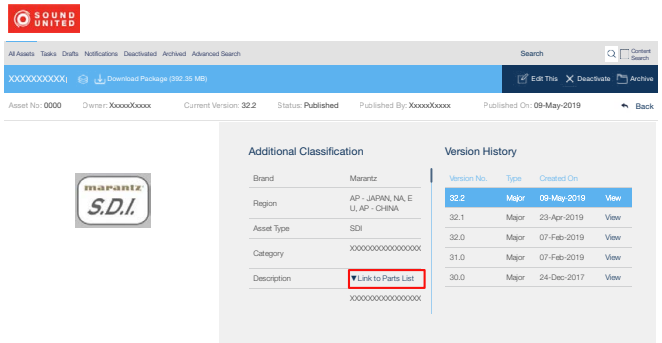
NOTE : If the web browser does not open automatically, copy the URL and paste it into the address bar of the web browser and then press Enter.



(2) Accessing the Part List from the Model Asset Screen.

・ Display Model Asset from New SDI.

・ Click the section displayed as ▼ Link to Part Lists under the model name.



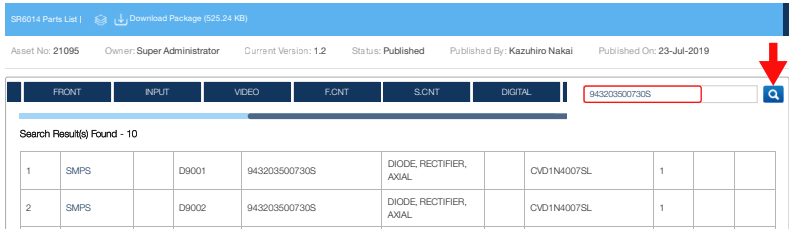
NOTE : If the ▼ Link to Parts List section is not displayed, download the parts table from the Asset list.

Searching Part Numbers or Ref. Numbers

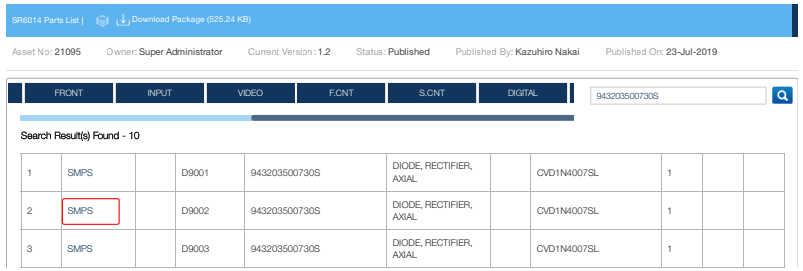
You can search a Parts List for part numbers or Ref. numbers.

(1) Enter the part number or Ref. number in the search window of the Parts List, and press the search button.

(2) The search results are displayed.
The name of the sheet in which the search part is used and the part's line are displayed.



(3) Next, click the "**Sheet**" section of the search results.



NOTE FOR PARTS LIST

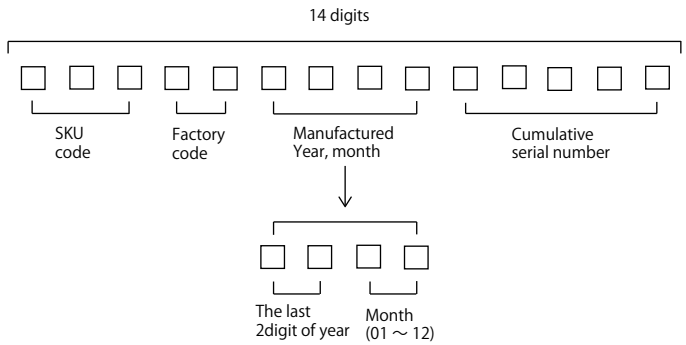
1. Parts indicated by "**nsp**" on this table cannot be supplied.
2. When ordering a part, make a clear distinction between "1" and "I" (i) to avoid mis-supplying.
3. A part ordered without specifying its part number can not be supplied.
4. Part indicated by "**@**" mark is not illustrated in the exploded and packaging view.

WARNING: Parts indicated by the ⚠ mark have critical characteristics. Use ONLY replacement parts recommended by the manufacturer.

SERIAL NUMBER

Serial Number Organization

The 14-digit serial number that contains the code of the manufacturing plant and the manufacturing date.



SKU Code of this Unit

Product SKU	SKU Code
PM12SE/N1B	BNJ
PM12SE/N1G	BNH
PM12OSE/FN	BND

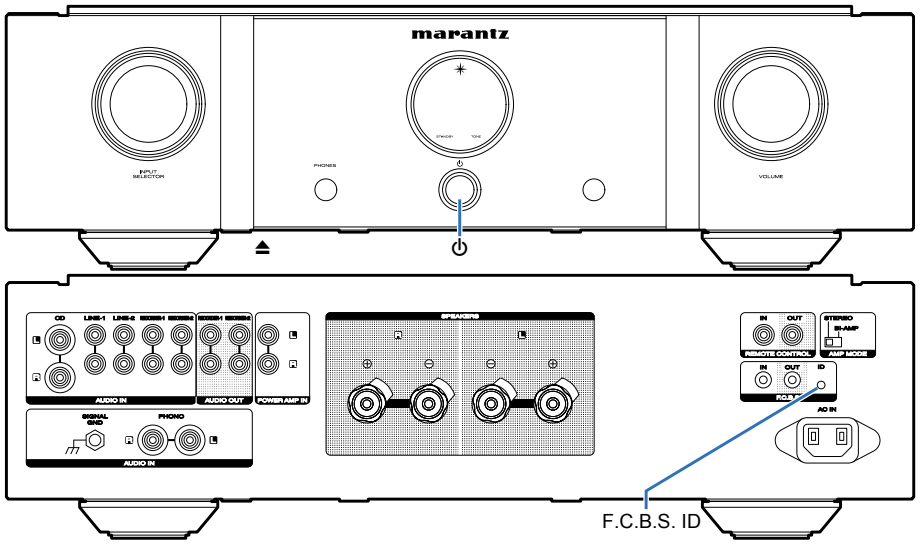
Initializing this Unit

Make sure to initialize this unit after replacing the microcomputer or any peripheral equipment, or the PCB.

1. Press the power button to turn off the power.
2. Turn on the power. When the ID appears in the display, press and hold button "**F.C.B.S. ID**" for 5 seconds or longer.
3. Check the set entered the service mode.
   The memory is cleared and the unit is initialized.

Turn the power back on to cancel this mode.

NOTE：
- If the unit fails to enter the service mode in step 3, repeat the procedure from step 1.
- Initializing the device restores the customized settings to the factory settings. Write down your settings in advance and reconfigure the settings after initialization.



The amplifier is designed taking consideration into the sound quality.

1. When screws and washers are removed, those parts must be reattached to the same places.
2. When wires are removed, the wires must be reinstalled in the same routes.
3. Do not hold side panel [T0010] when moving this unit while it is disassembled.

ELECTRICAL

SCHEMATIC DIAGRAMS

PRINTED CIRCUIT BOARDS

LEVEL DIAGRAM

BLOCK DIAGRAM

POWER DIAGRAM

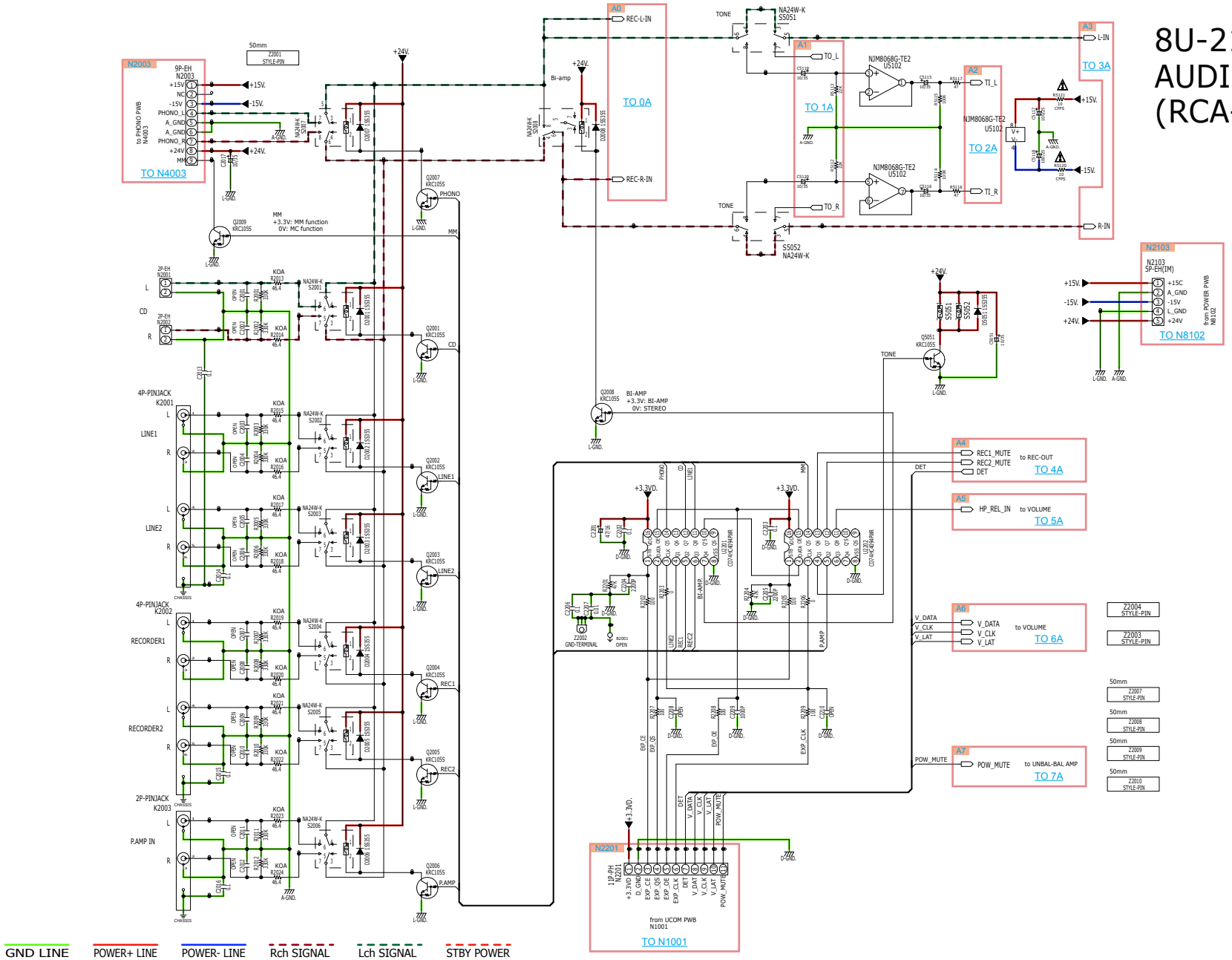
WIRING DIAGRAM

SEMICONDUCTORS

SCH01 AUDIO (RCA-IN)

All Ref.No. has been described in the parts list are four digits.
But there are less than four digits of printed Ref.No. on the PCB, and they have become four digits after the header by adding "0" in the parts list.

8U-210238-1
AUDIO
(RCA-IN)



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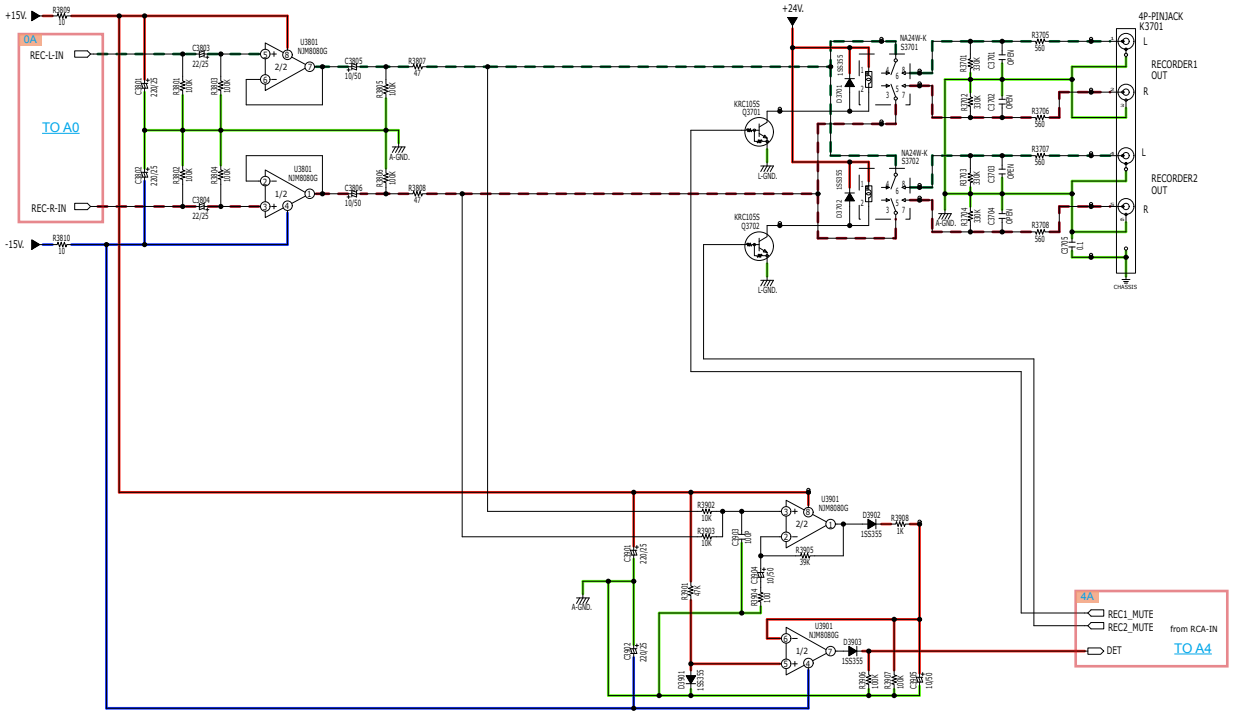
8U-210238-1
AUDIO
(RCA-OUT)



GND LINE POWER+ LINE POWER- LINE Rch SIGNAL Lch SIGNAL STBY POWER

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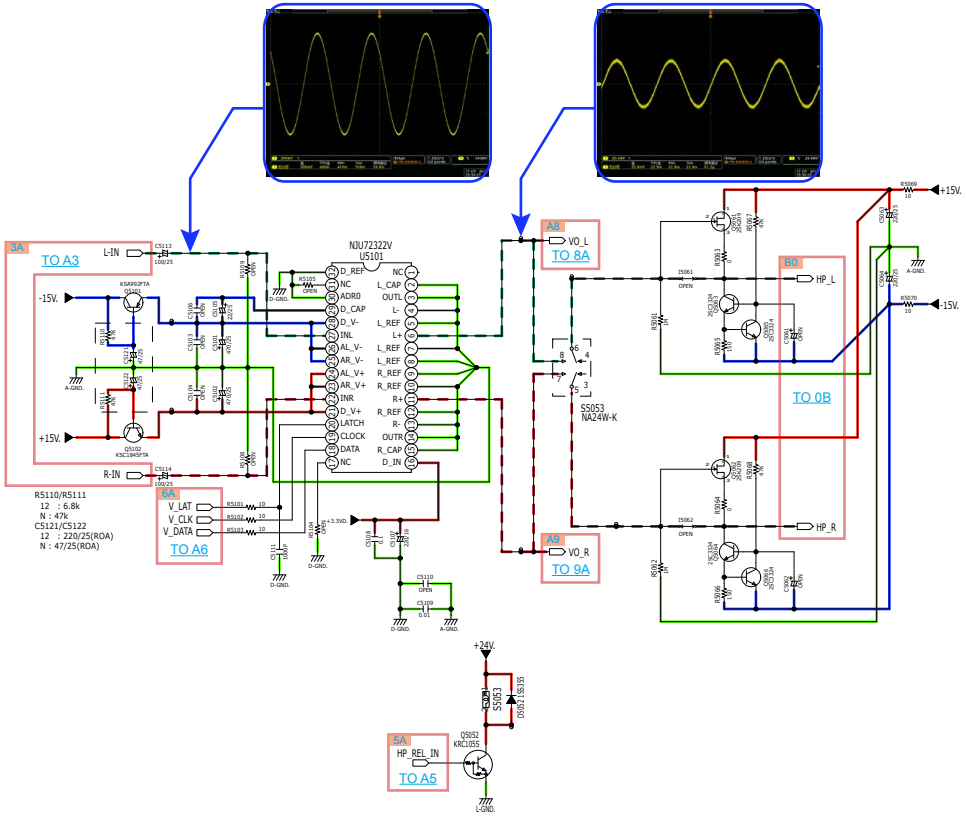
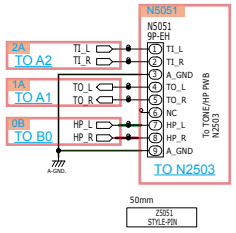
8U-210238-1
AUDIO
(VOLUME)





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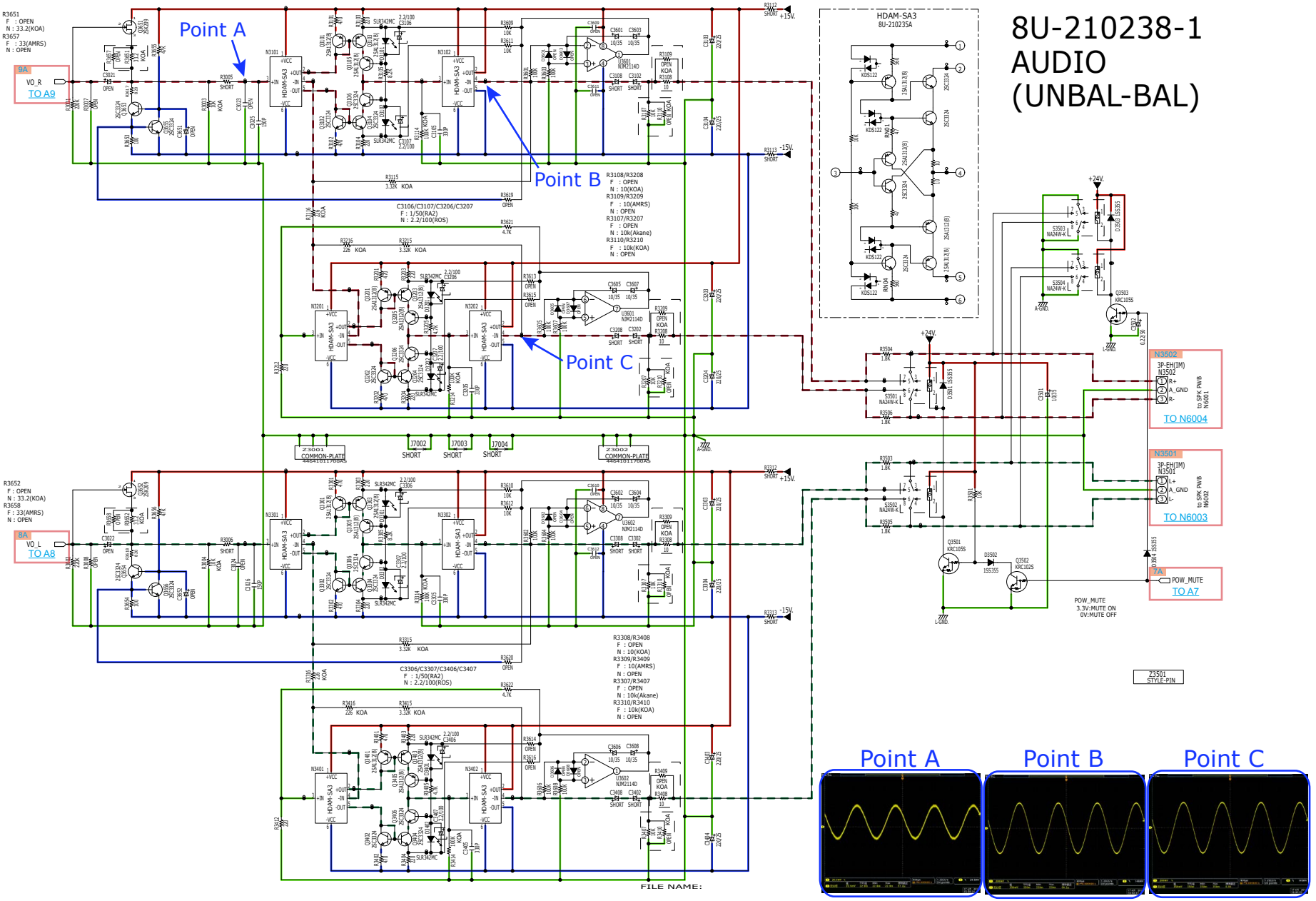

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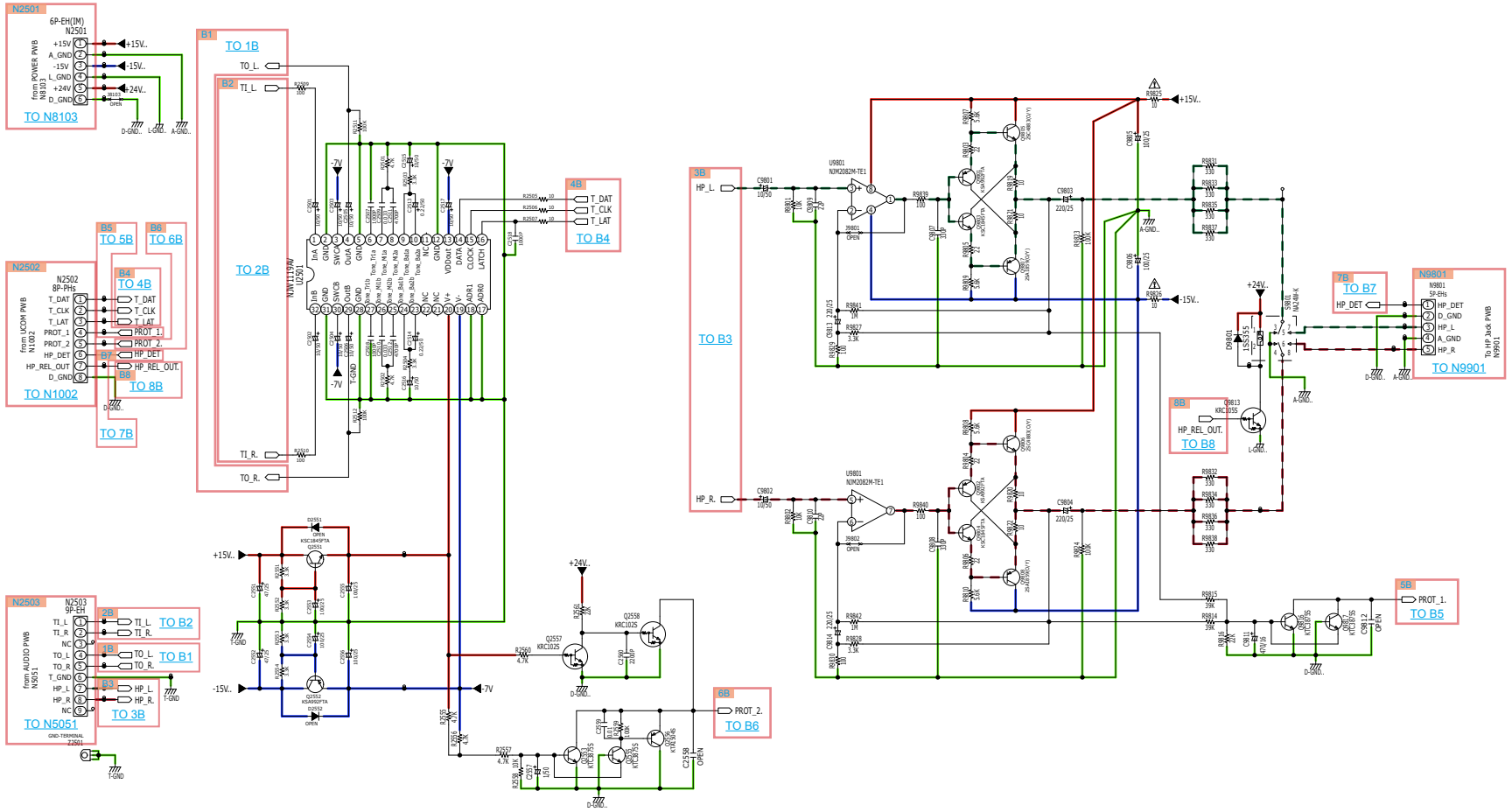
8U-210238-2
TONE/HP



GND LINE POWER+ LINE POWER- LINE Rch SIGNAL Lch SIGNAL STBY POWER

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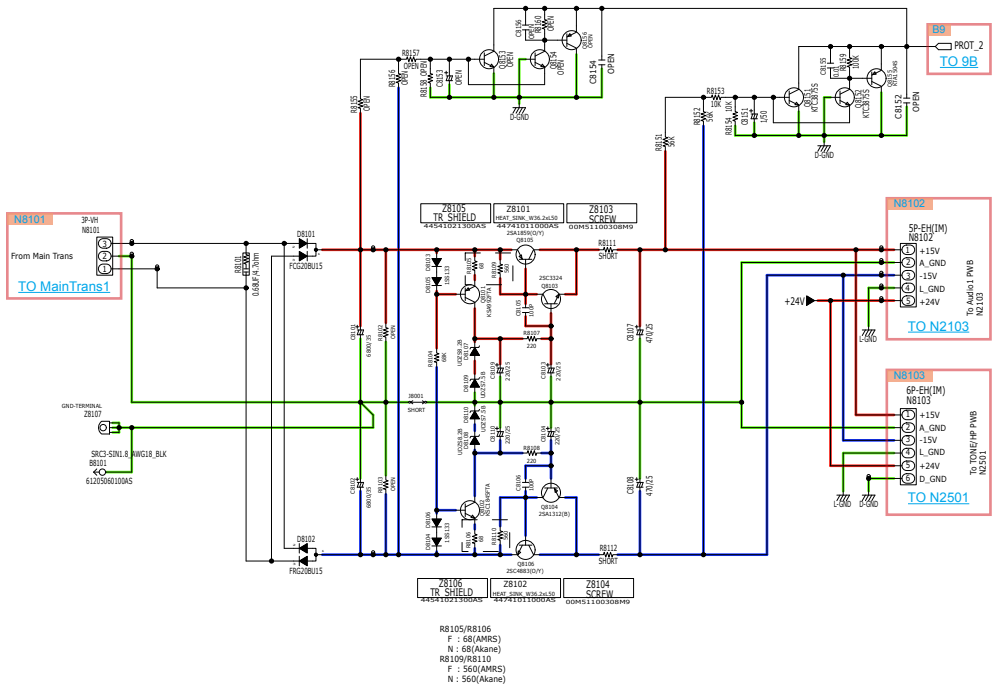
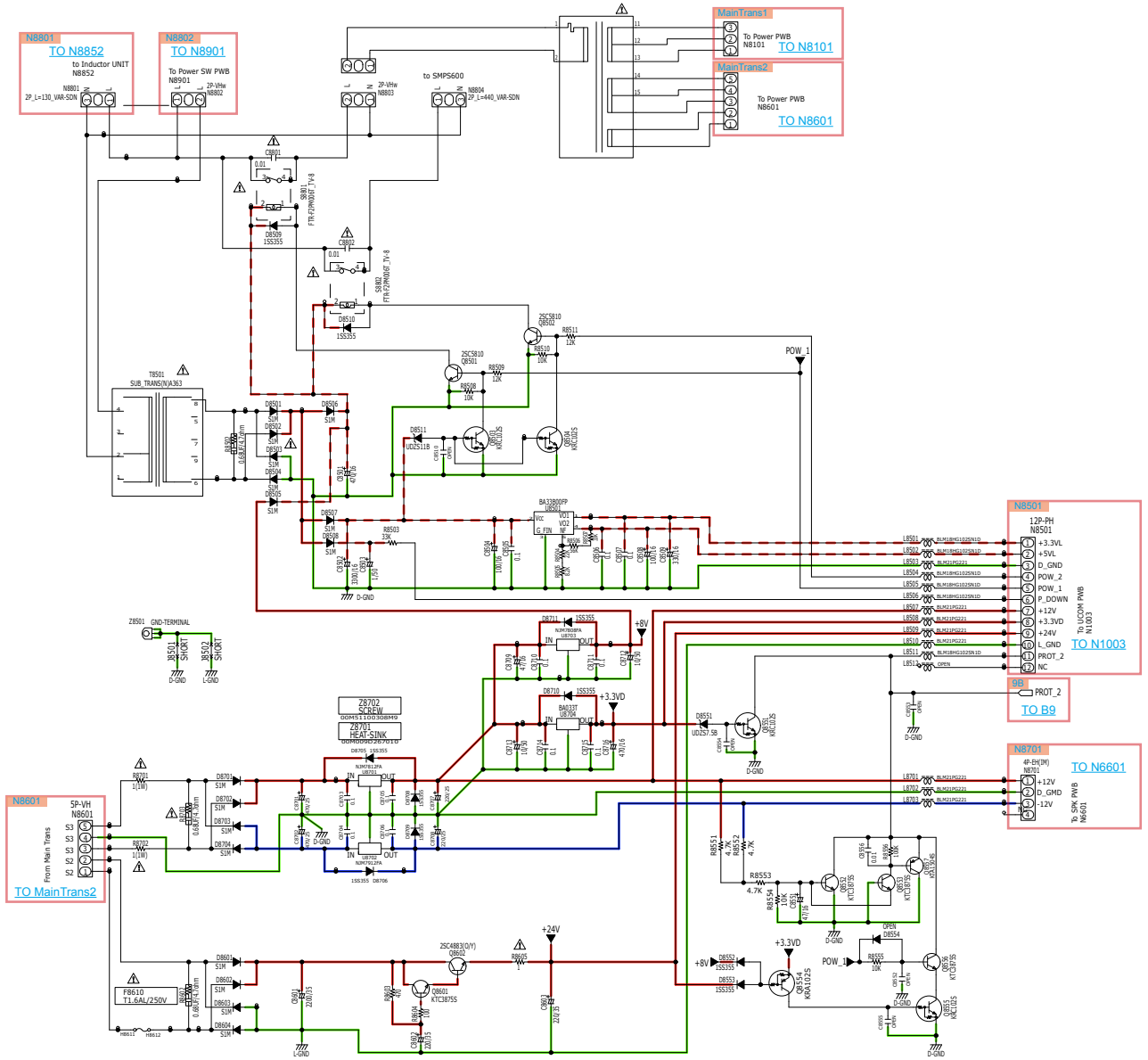
8U-210238-3
POWER



GND LINE POWER+ LINE POWER- LINE Rch SIGNAL Lch SIGNAL STBY POWER

All Ref.No. has been described in the parts list are four digits.
But there are less than four digits of printed Ref.No. on the PCB, and they have become four digits after the header by adding "0" in the parts list.

8U-210238-3
POWER



GND LINE | POWER+ LINE | POWER- LINE | Rch SIGNAL | Lch SIGNAL | STBY POWER

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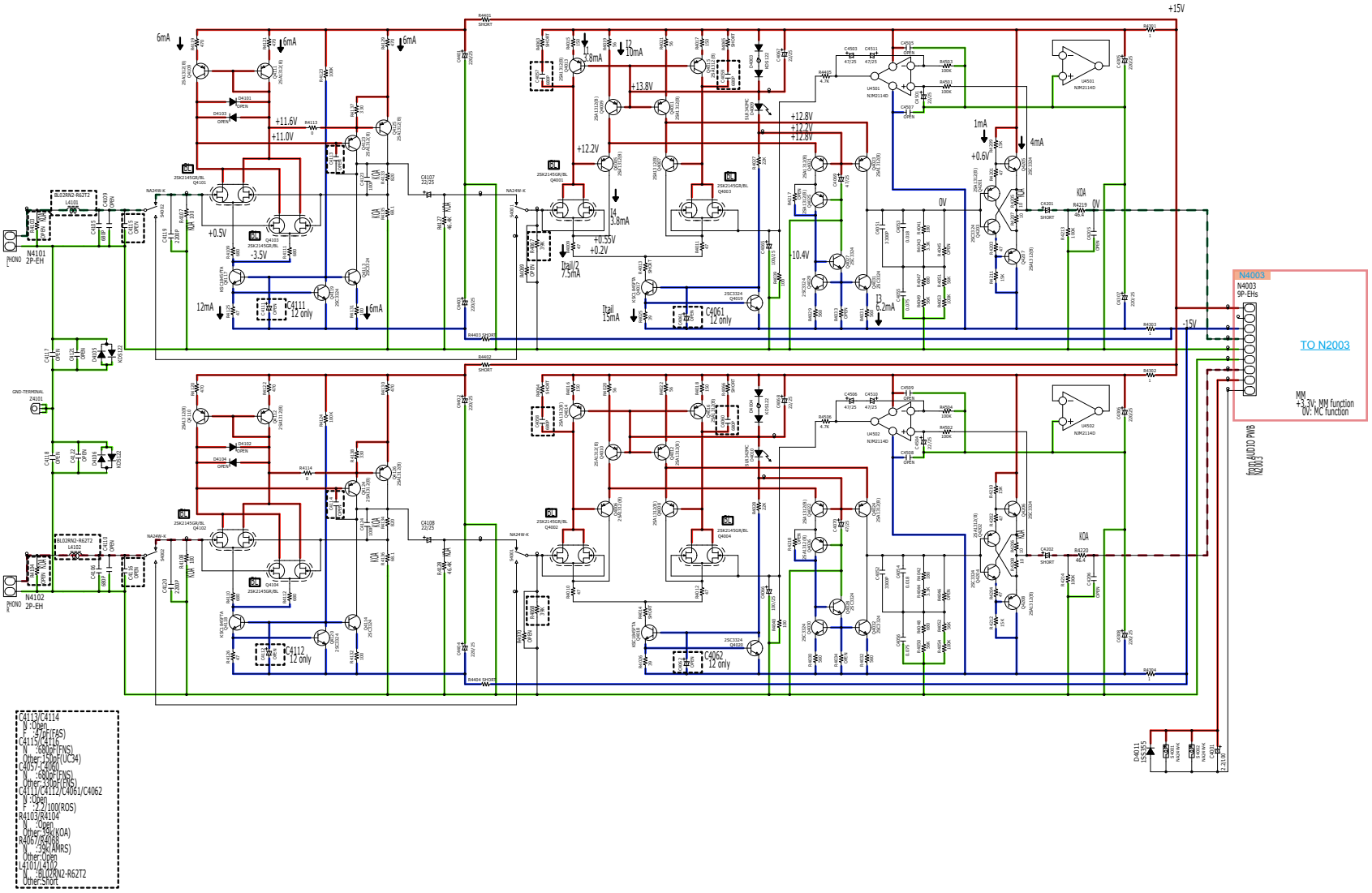

C4113/C4114
0 :Open
C :5pF(CH)
C4115/C4116
N :680pF(FNS)
Other:150pF(UC34)
C4057 - C4060
N :680pF(FNS)
Other:330pF(FNS)
C4111/C4112/C4061/C4062
0 :Open
C :12pF/100(ROS)
R4103/R4104
N :Open
Other:39k(KOA)
R4067/R4068
N :39k(AMRS)
Other:Open
L4101/L4102
N :BL02RN2-R62T2
Other:Short

8U-210239-1
PHONO

All Ref.No. has been described in the parts list are four digits.
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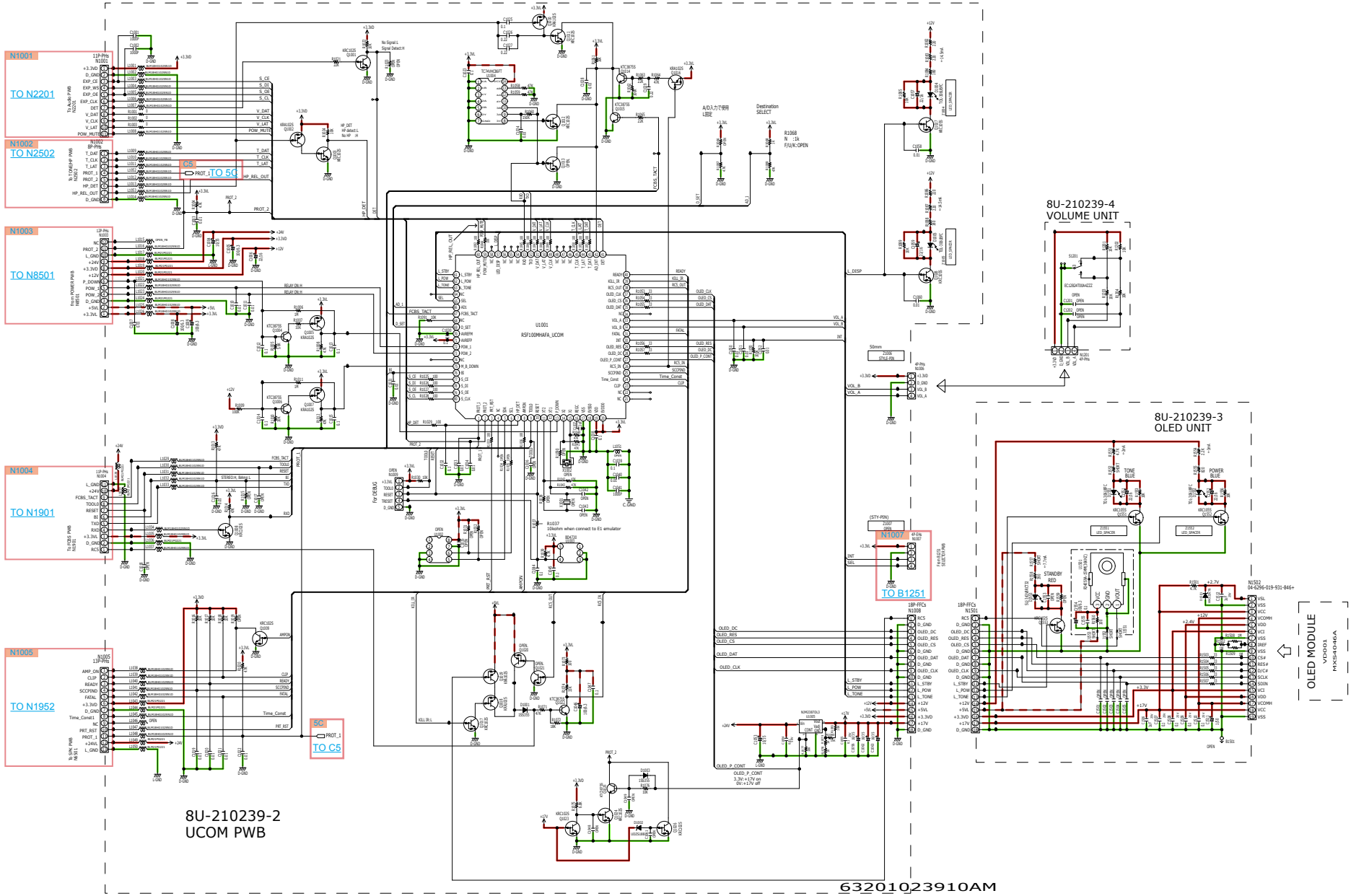

GND LINE POWER+ LINE POWER- LINE Rch SIGNAL Lch SIGNAL STBY POWER

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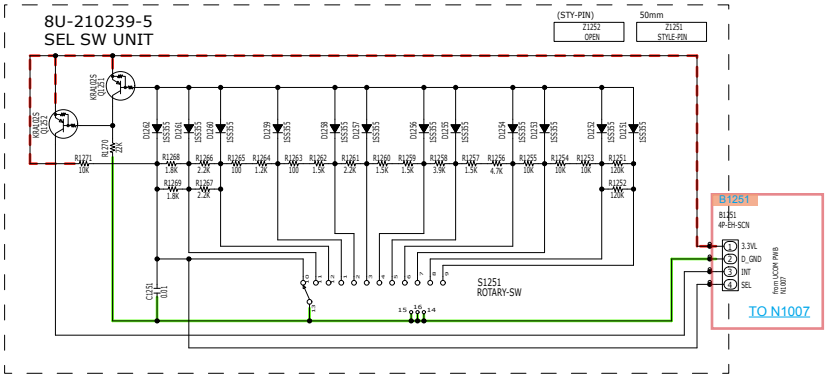
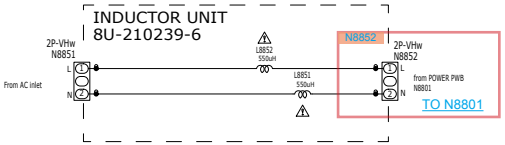
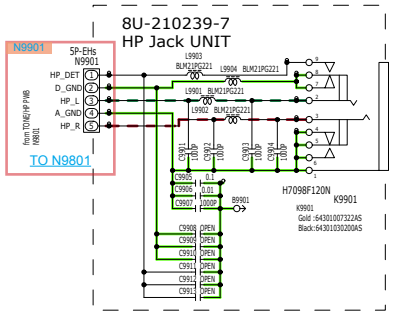
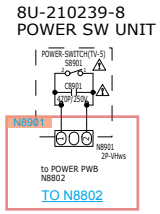






Headphone Output Impedance:83ohms



GND LINE POWER+ LINE POWER- LINE Rch SIGNAL Lch SIGNAL STBY POWER

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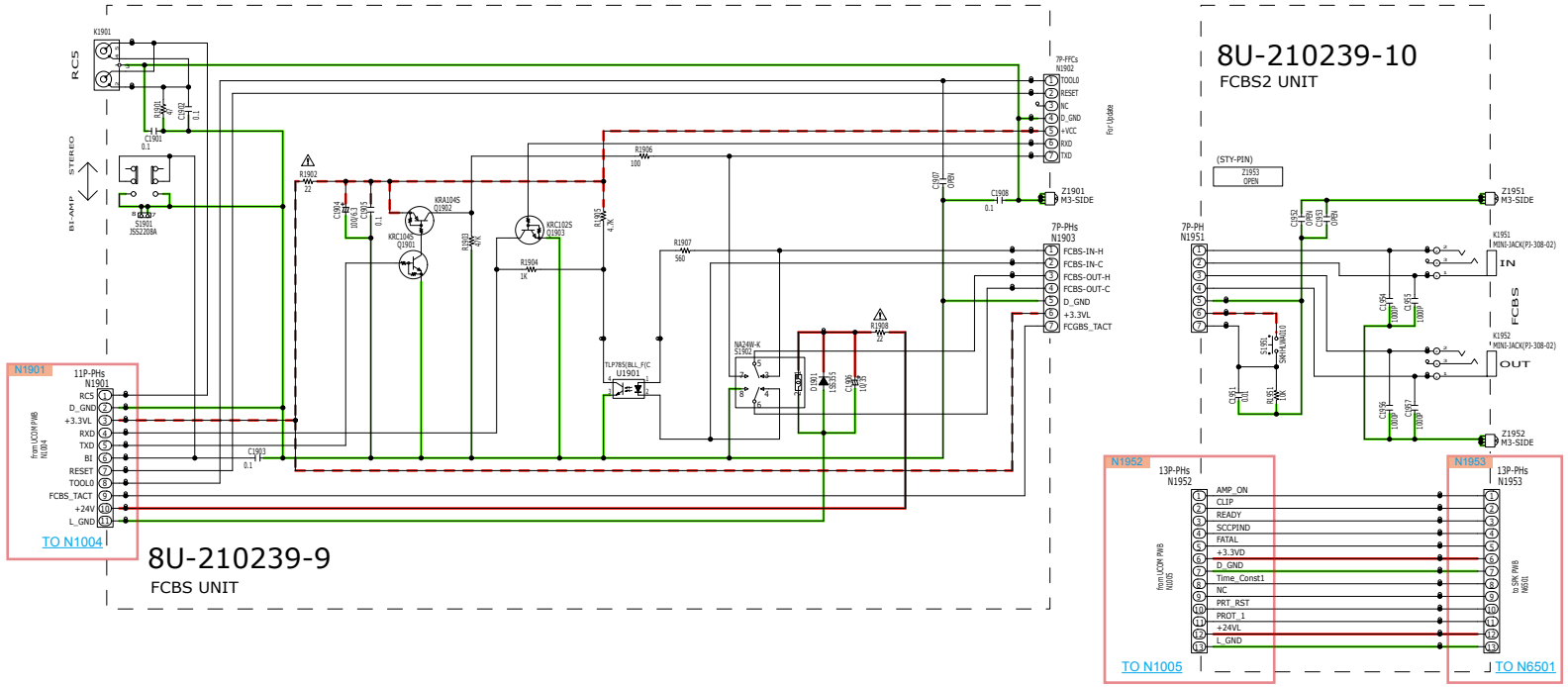

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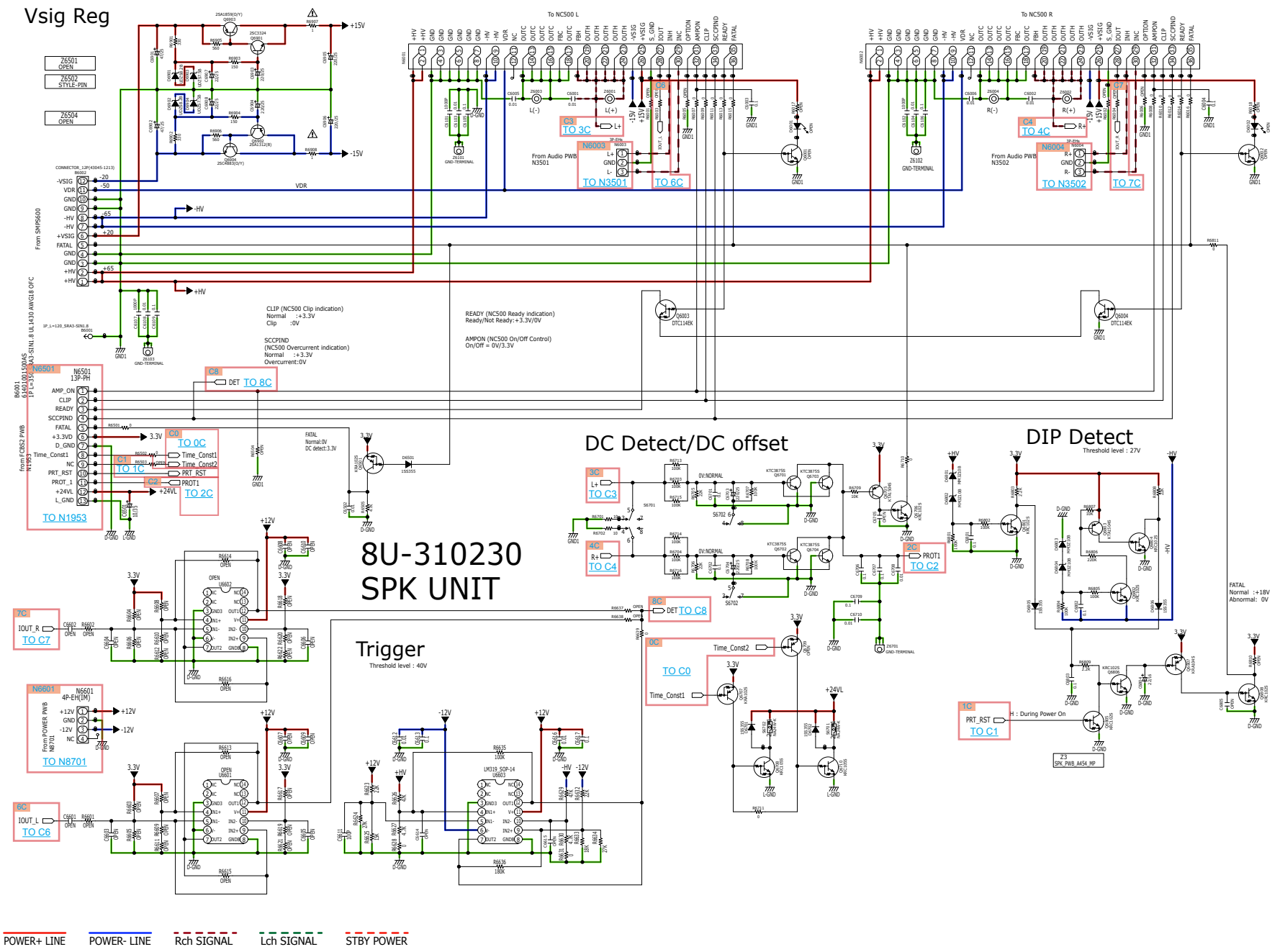

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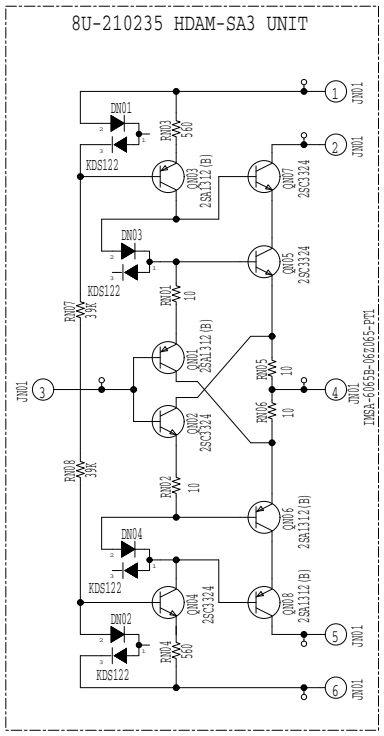
HDAM-SA3 PWB KIT
00MKH22AJ1030 --> 63201023500AM



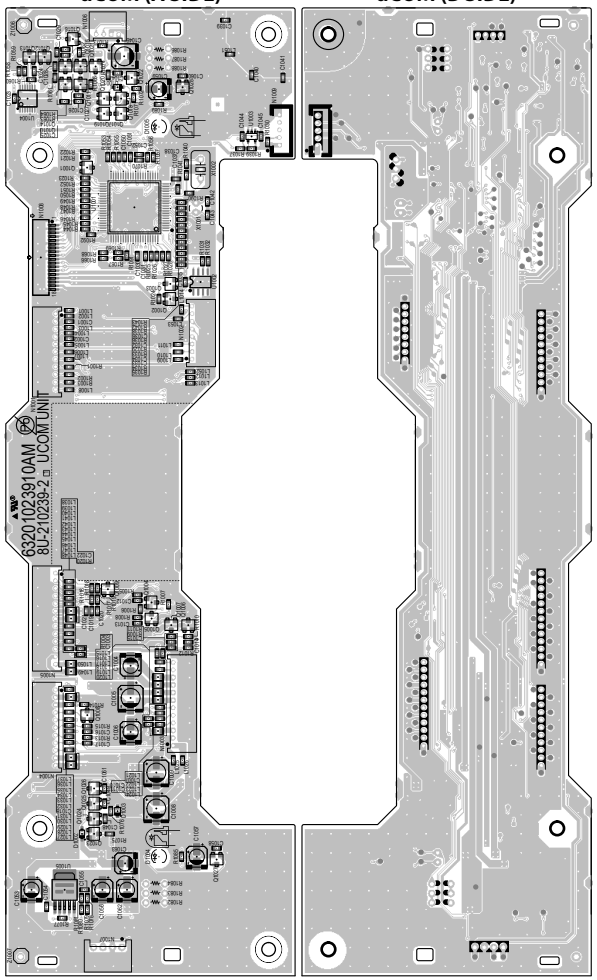
00MWG22AJ5000

GND LINE POWER+ LINE POWER- LINE Rch SIGNAL Lch SIGNAL STBY POWER

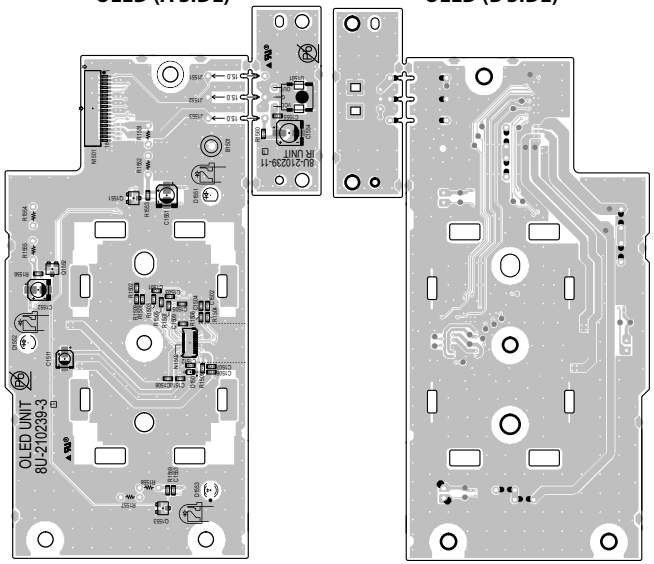
uCOM, OLED, HP, P.SW, SEL SW, VOLUME

Lead-free Solder
When soldering, use the Lead-free Solder (Sn-Ag-Cu).

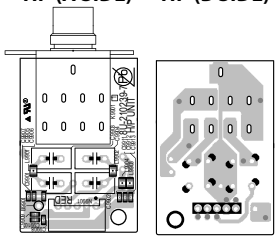
uCOM (A SIDE) uCOM (B SIDE)



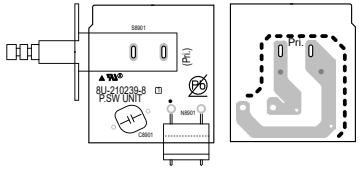
OLED (A SIDE) OLED (B SIDE)



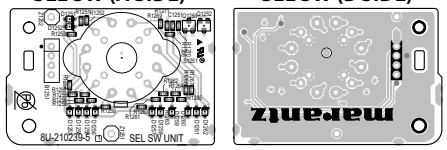
HP (A SIDE) HP (B SIDE)



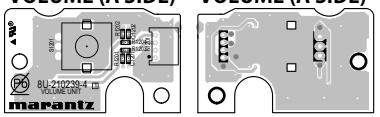
P.SW (A SIDE) P.SW (B SIDE)



SEL SW (A SIDE) SEL SW (B SIDE)

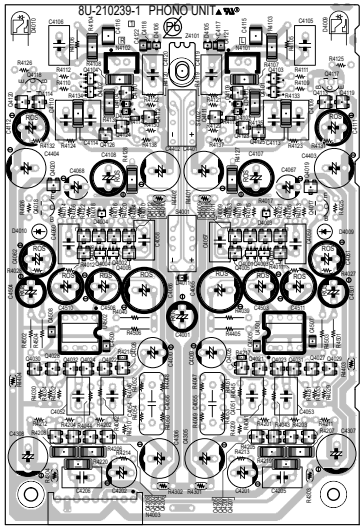


VOLUME (A SIDE) VOLUME (A SIDE)

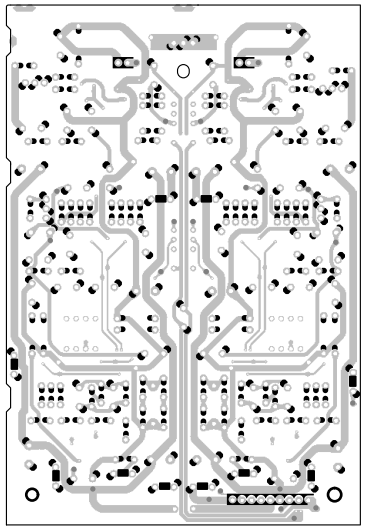


PHONO, INDUCTOR, FCBS1, FCBS2, SPK, HDAM SA3

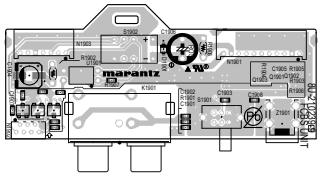
PHONO (A SIDE)



PHONO (B SIDE)



FCBS1 (A SIDE)



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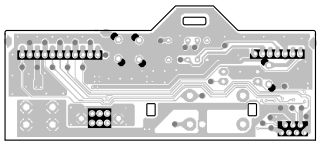

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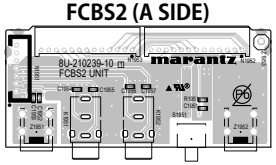

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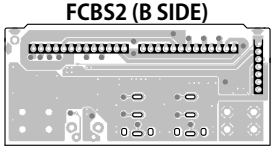
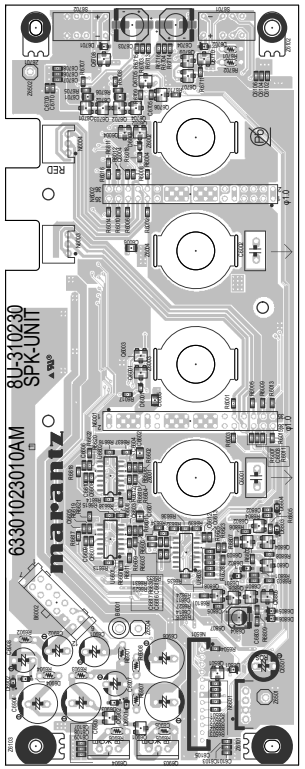
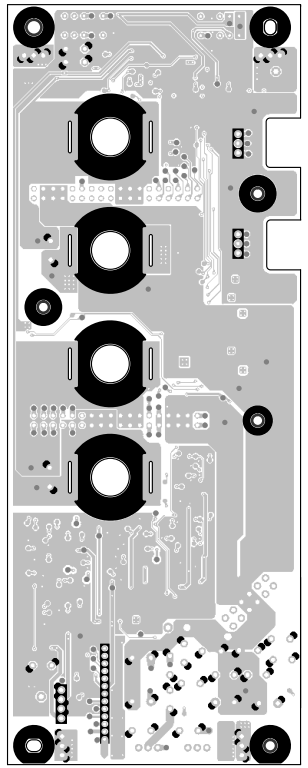


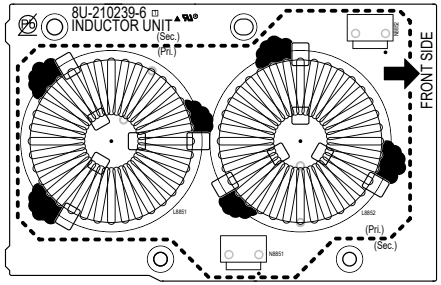
SPK (A SIDE)



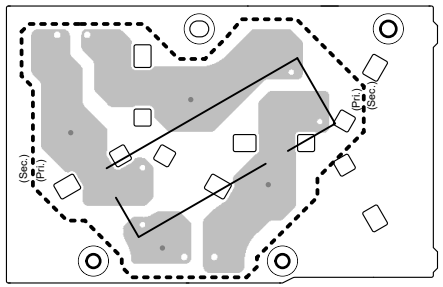
SPK (B SIDE)



INDUCTOR (A SIDE)



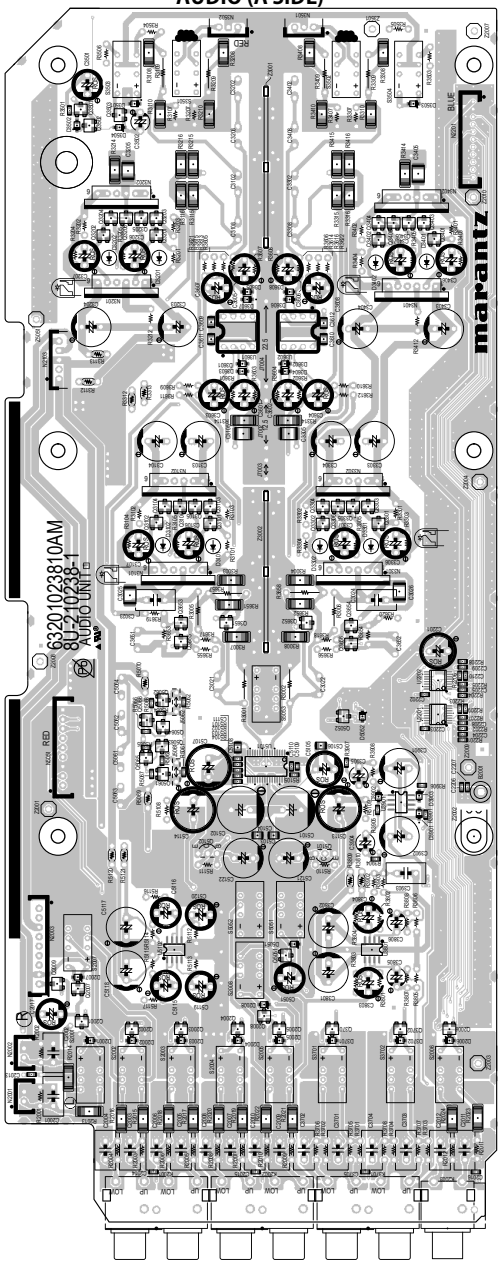
INDUCTOR (B SIDE)



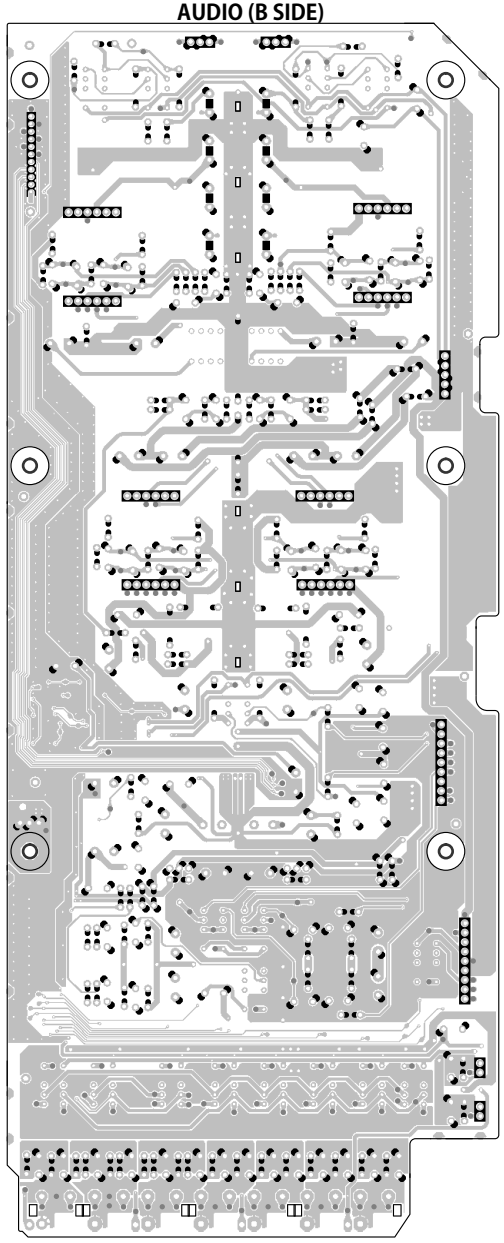
HDAM SA3 (A SIDE)

HDAM SA3 (B SIDE)

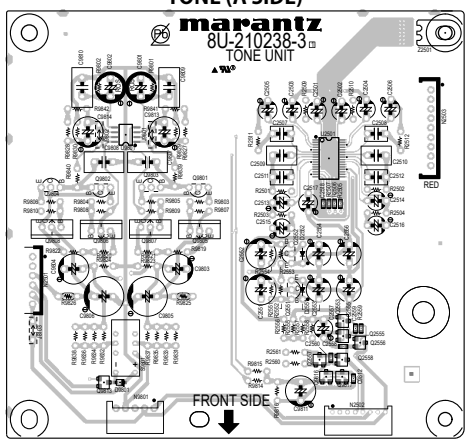
AUDIO (A SIDE)



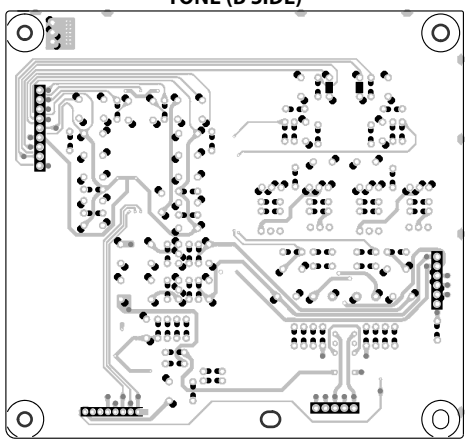
AUDIO (B SIDE)



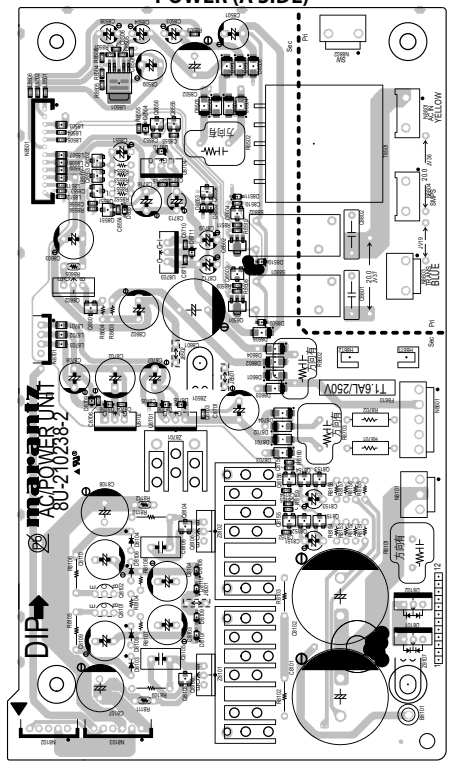
TONE (A SIDE)



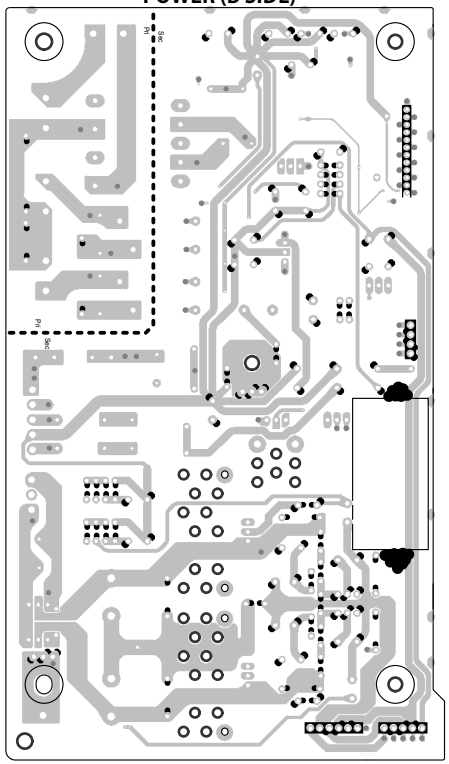
TONE (B SIDE)



POWER (A SIDE)

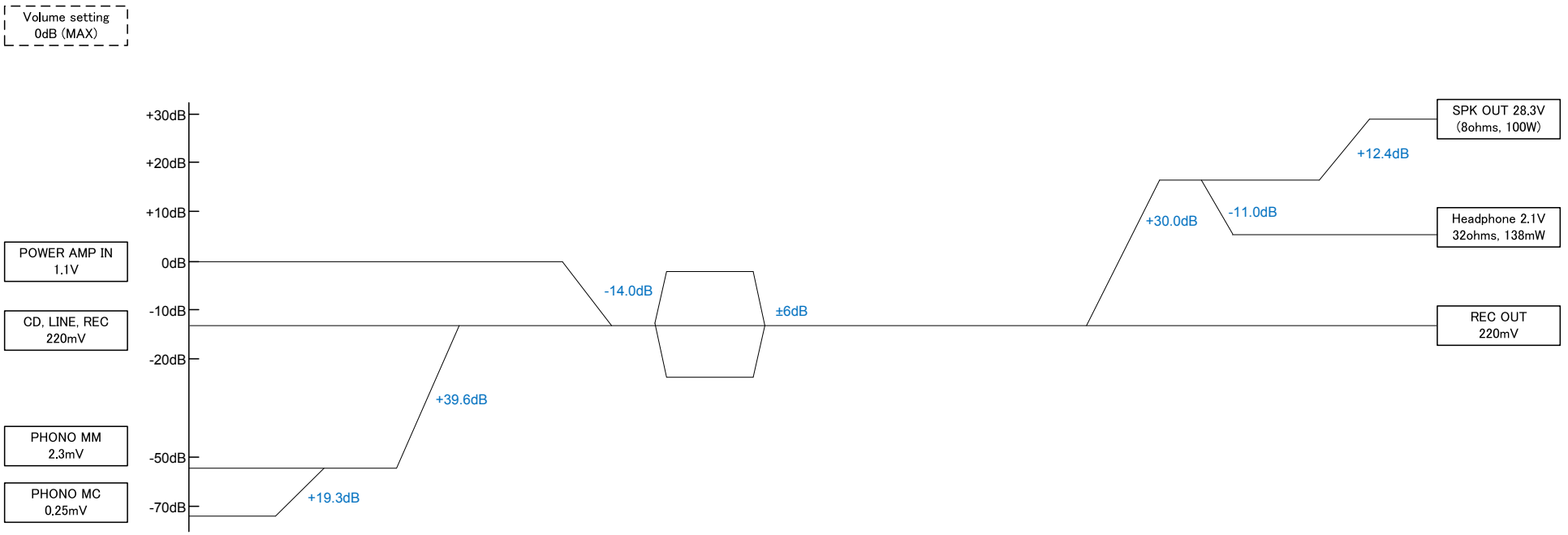


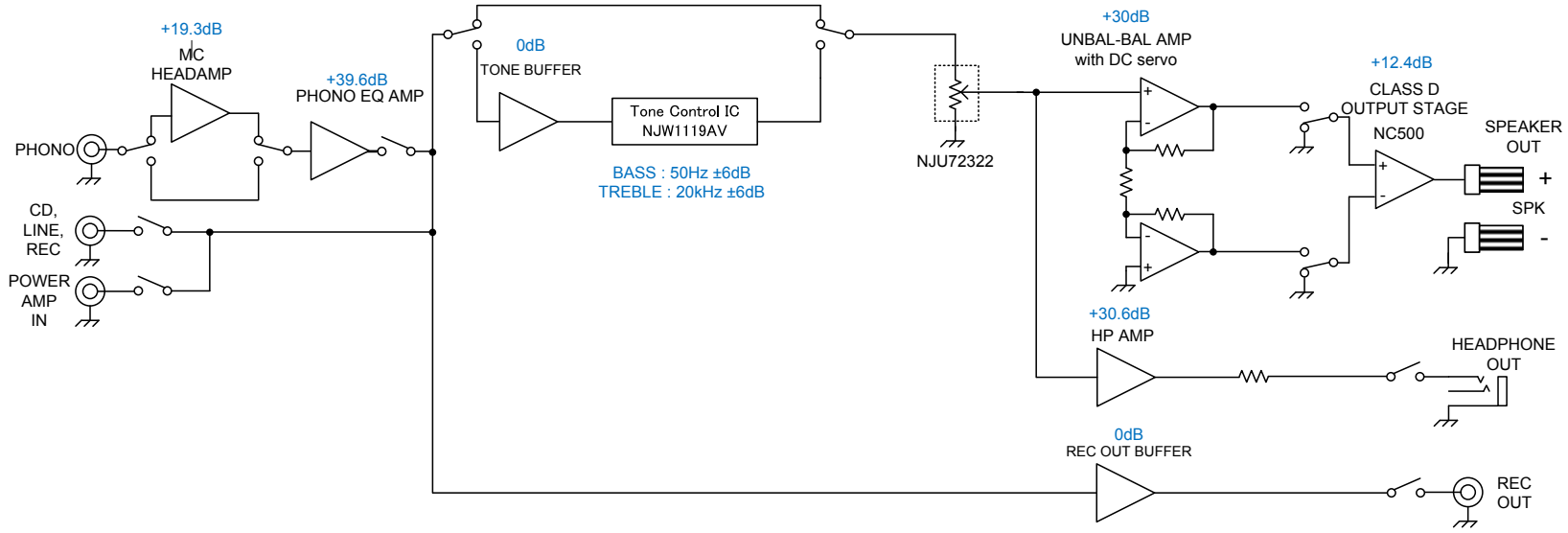
POWER (B SIDE)



PM-12 LEVEL DIAGRAM

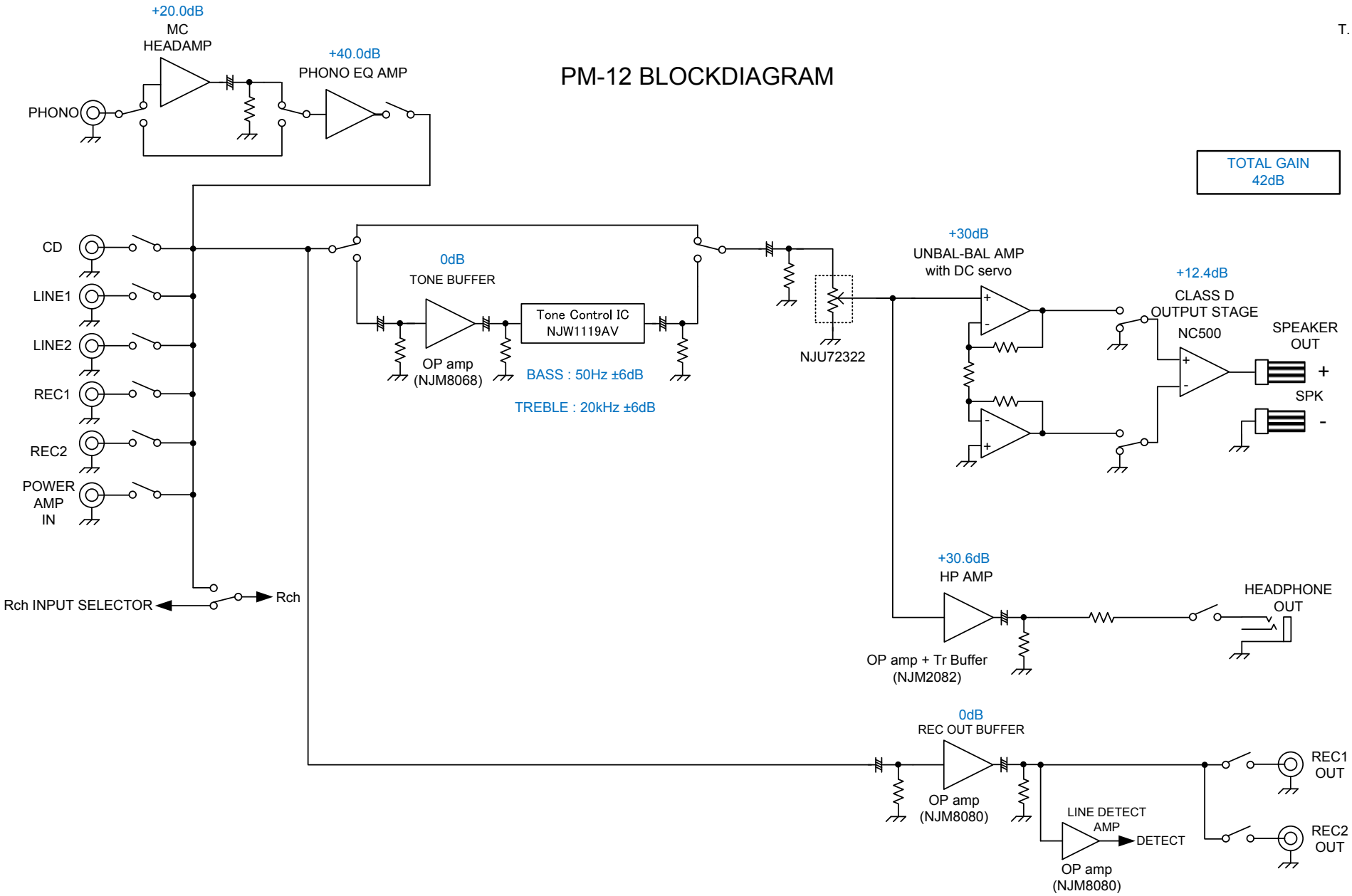
2018/4/11
T. Murayama

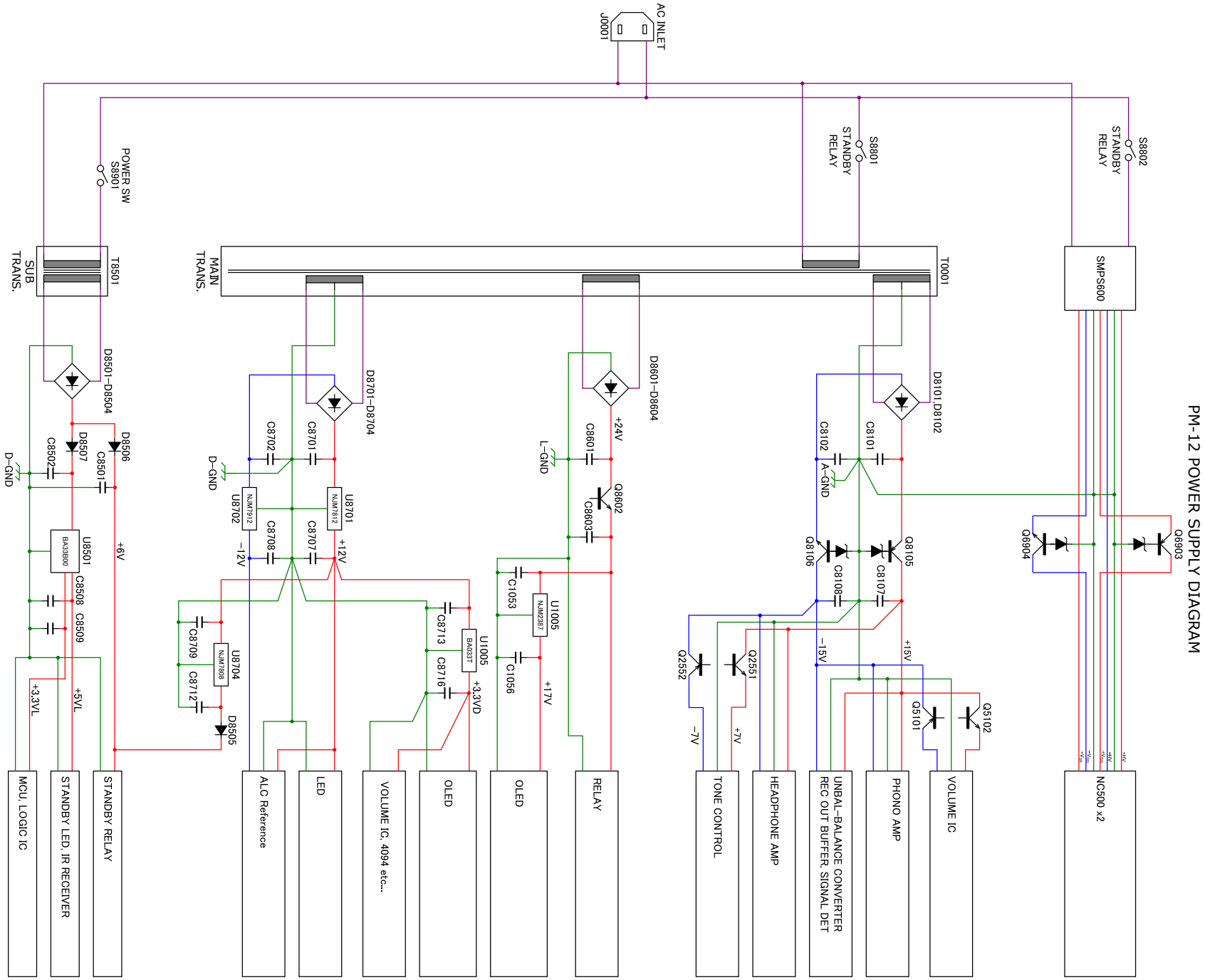




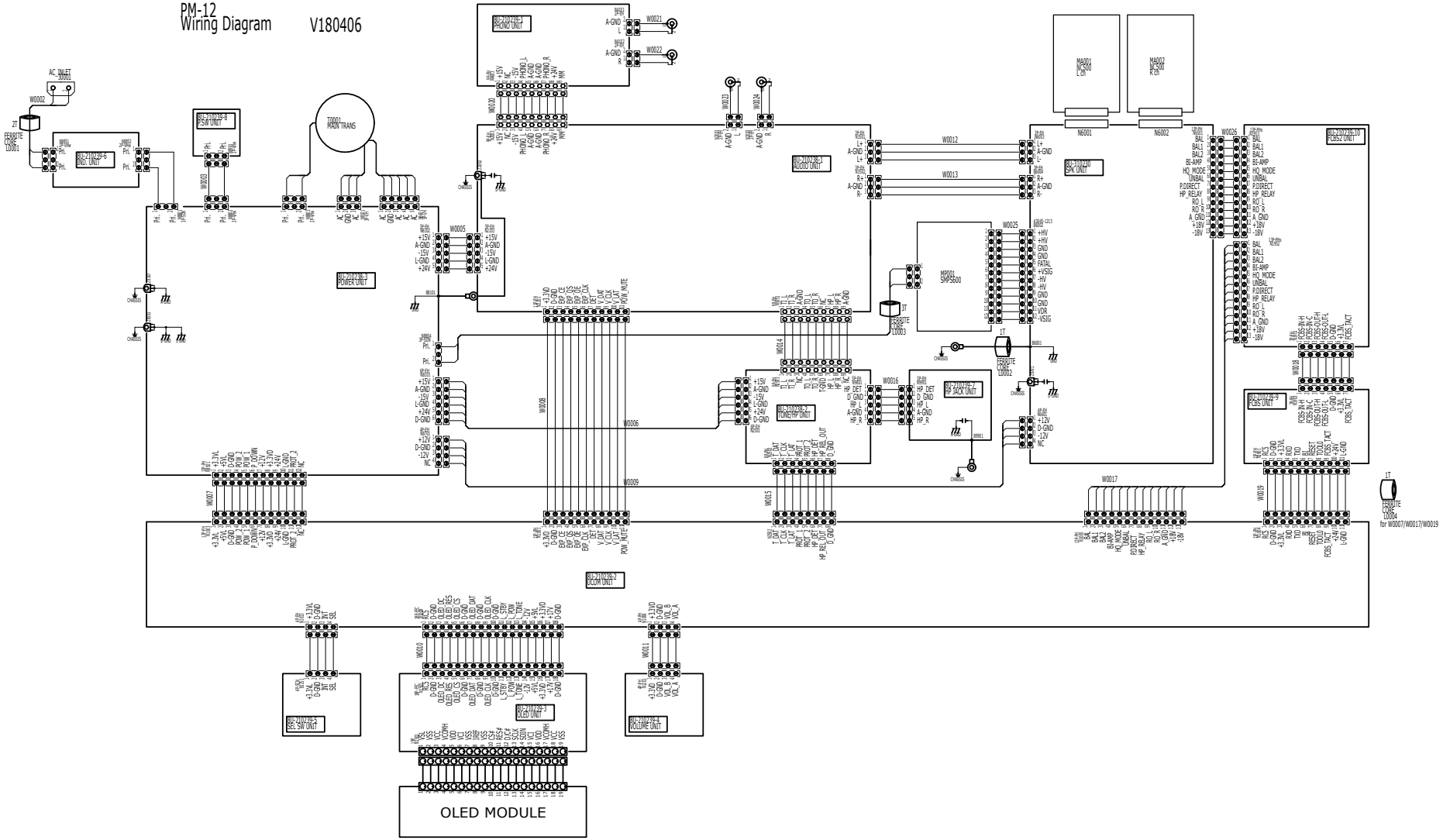
2018/3/8
T. Murayama

PM-12 BLOCKDIAGRAM




PM-12 POWER SUPPLY DIAGRAM
AC INLET
J0001
POWER SW
S8901
S8801
STANDBY
RELAY
S8802
STANDBY
RELAY
SUB
TRANS.
T8501
MAIN
TRANS.
T0001
SMPS600
NC600 x2
D8501-D8504
D8506
D8507
C8502
C8501
D-GND
U8501
BA33B00
C8508
C8509
+6V
+3.3VL
+5VL
MCU, LOGIC IC
STANDBY LED, IR RECEIVER
STANDBY RELAY
D8701-D8704
C8702
C8701
D-GND
U8702
NJM7912
U8701
NJM7812
C8708
C8707
-12V
+12V
C8709
C8712
U8704
NJM7809
D8505
ALC Reference
LED
D8601-D8604
+24V
C8601
L-GND
Q8602
C8603
C1053
U1005
NJM2387
C1056
+17V
C8713
C8716
U1005
BA033T
+3.3VD
VOLUME IC, 4094 etc...
OLED
OLED
RELAY
D8101,D8102
C8102
C8101
A-GND
Q8106
Q8105
C8108
C8107
-15V
+15V
Q2552
Q2551
-7V
+7V
Q5101
Q5102
TONE CONTROL
HEADPHONE AMP
UNBAL-BALANCE CONVERTER
REC OUT BUFFER, SIGNAL DET
PHONO AMP
VOLUME IC
Q6904
Q6903

WIRING DIAGRAM

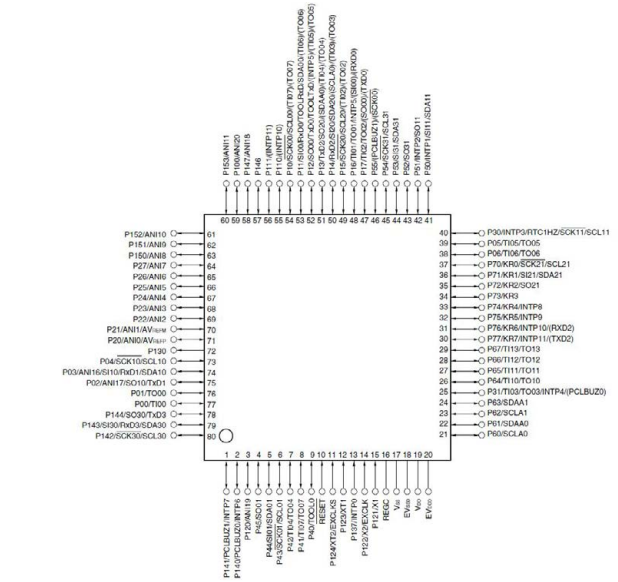


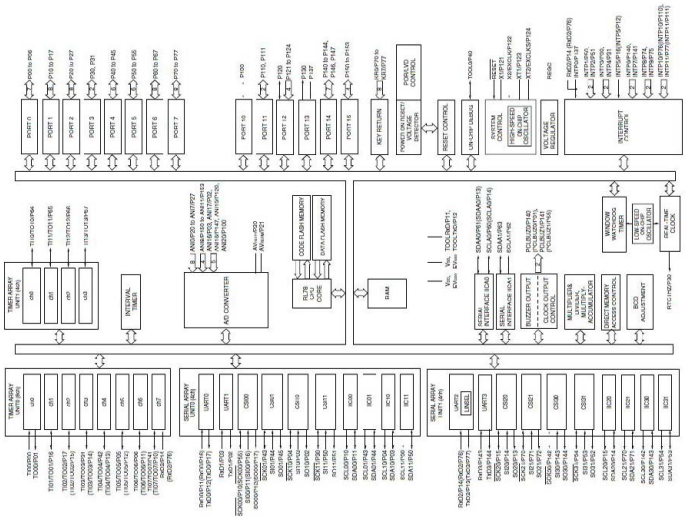
SEMICONDUCTORS

Only major semiconductors are shown, general semiconductors etc. are omitted to list.
The semiconductor which described a detailed drawing in a schematic diagram are omitted to list.

1. IC's

R5F100MHAFA (U1001)





PORT TABLE

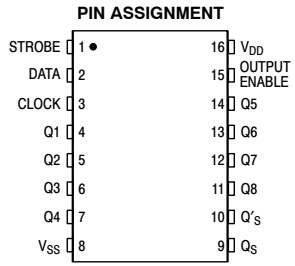
Pin	Port	I/O	use	Name	Port Setting			Note
					Act.	stby	Exit R	
1	P141/PCLBUZ1/INTP7	I/O	I	PROT_1	L	-	PU 47k	DC detection
2	P140/PCLBUZ0/INTP6	I/O	I	PROT_2	L	-	PU 47k	Power supply fault detection
3	P120/ANI19	I/O	O	PRT_ RST	L	L	PD 10K	Output H at startup, reset additional protection circuit
4	P45/SO01	I/O	O	NC	L	L	-	
5	P44/SI01/SDA01	I/O	O	SDA	L	L	-	E2PROM Serial Data Reserve
6	P43/SCK01/SCL01	I/O	O	SCL	L	L	-	E2PROM Serial Clock Reserve
7	P42/TI04/TO04	I/O	I	HP_DET	L	-	PU 10k	Headphone Detection (Detected : L)
8	P41/TI07/TO07	I/O	O	AMPON	H	L	PD 10k	NC500 ON/OFF (ON:H)
9	P40/TOOL0	I/O	I/O	TEST	H	-	PU 10k	L->H : PROGRAM MODE
10	RESET	I	I	RESET	L	-	PU 4.7k	Reset
11	P124/XT2/EXCLKS	I	I	XT2	-	-	PD 47k	Sub Clock (32.758kHz) Reserve
12	P123/XT1	I	I	XT1	-	-	PD 47k	Sub Clock (32.758kHz) Reserve
13	P137/INTP0	I	I	P_ DOWN	L	-	PD 47k	Detect Power Down (Power outage detection) (Primary power supplyON/OFF detection)Monitoring on power failure L=P_Down detection
14	P122/X2/EXCLK	I	I	X2	-	-	PD 47k	Main System Clock (8MHz) Reserve
15	P121/X1	I	I	X1	-	-	PD 47k	Main System Clock (8MHz) Reserve
16	REGC	-	-	REGC	-	-	-	Regulator Capacitance
17	VSS	-	-	VSS	-	-	-	GND
18	EVSS0	-	-	EVSS0	-	-	-	GND
19	VDD	-	-	VDD	-	-	-	3.3V
20	EVDD0	-	-	EVDD0	-	-	-	3.3V
21	P60/SCLA0	I/O	O	NC	L	L	-	
22	P61/SDAA0	I/O	O	NC	L	L	-	
23	P62/SCLA1	I/O	I	CLIP	L	-	PU 10k	NC500 Clip detection (H/L=Normal/Clip)
24	P63/SDAA1	I/O	O	Time_ Const	H	L	PU 10K	DC detection time constant switching H/L = Small time constant/Large time constant
25	P31/TI03/TO03/INTP4	I/O	I	SC-CPIND	L	-	PU 10k	NC500 Overcurrent detection (H/L=Normal/Trigger) ALC Trigger input
26	P64/TI10/TO10	I/O	I	RC5_IN	L	-	PU 33k	RC5 Capture input
27	P65/TI11/TO11	I/O	O	OLED_ P_CONT	H	L	PD 10k	OLED VCC ON/OFF (ON/OFF=H/L)
28	P66/TI12/TO12	I/O	O	OLED_ DC	-	L	-	OLED(MXS4046A) Data/Command SW
29	P67/TI13/TO13	I/O	O	OLED_ RES	L	L	-	OLED(MXS4046A) Reset
30	P77/KR7/INTP11	I/O	I	INT	H	-	PD 100k	Input Selector Interrupt
31	P76/KR6/INTP10	I/O	I	FATAL	H	-	PD 47k	NC500 DC detection (H/L=FATAL/Normal)
32	P75/KR5/INTP9	I/O	I	VOL_B	H	-	PU 10k	Volume Rotary Encorder

Pin	Port	I/O	use	Name	Port Setting			Note
					Act.	stby	Exit R	
33	P74/KR4/INTP8	I/O	I	VOL_A	H	-	PU 10k	Volume Rotary Encorder
34	P73/KR3	I/O	O	NC	L	L	-	
35	P72/KR2/SO21	I/O	O	OLED_ DAT	-	L	-	OLED(MXS4046A) Data
36	P71/KR1/SI21/SDA21	I/O	O	OLED_ CS	L	L	-	OLED(MXS4046A) CS
37	P70/KR0/SCK21/SCL21	I/O	O	OLED_ CLK	H	L	-	OLED(MXS4046A) Clock (fc=4MHz)
38	P06/TI06/TO06	I/O	O	RC5_ OUT	H	L	PD 10k	RC5 Output
39	P05/TI05/TO05	I/O	O	KILL_IR	L	H	PD 10k	RC5 Kill (Kill:L)
40	P30/INTP3/RTC1HZ/SCK11/SCL11	I/O	I	READY	H	-	PU 10k	NC500 Ready notification (Ready/Not Ready=H/L)
41	P50/INTP1/SI11/SDA11	I/O	I	DET	L	-	PU 10k	Signal Detect (No Signal:L)
42	P51/INTP2/SO11	I/O	I	AD_INT	L	-	PU 10k	Analog Key Detect (L:interrupt)
43	P52/SO31	I/O	O	T_DAT	-	L	-	Tone Control IC(NJW1119A) Data
44	P53/SI31/SDA31	I/O	O	T_LAT	L	L	-	Tone Control IC(NJW1119A) Latch
45	P54/SCK31/SCL31	I/O	O	T_CLK	L	L	-	Tone Control IC(NJW1119A) Clock (fc=100kHz)
46	P55	I/O	O	NC	L	L		
47	P17/TI02/TO02	I/O	O	NC	L	L	-	
48	P16/TI01/TO01/INTP5	I/O	O	NC	L	L	-	
49	P15/SCK20/SCL20	I/O	O	V_CLK	H	L	-	Volume IC(NJU72322) Clock
50	P14/RxD2/SI20/SDA20	I/O	O	V_LAT	L	L	-	Volume IC(NJU72322) Latch
51	P13/TxD2/SO20	I/O	O	V_DAT	-	L	-	Volume IC(NJU72322) Data (fc=500kHz)
52	P12/SO00/TxD0/TOOLTxD	I/O	O	TXD	-	L	PD 10k	System Control Bus Output/Update
53	P11/SI00/RxD0/TOOLRxD/SDA00	I/O	I	RXD	-	-	PU 47k	System Control Bus Input/Update
54	P10/SCK00/SCL00	I/O	O	NC	L	L		
55	P110	I/O	O	NC	L	L		
56	P111	I/O	O	NC	L	L		
57	P146	I/O	O	LED_ DISP	H	L	PD 10k	Illumination LED (H:LED ON)
58	P147/ANI18	I/O	O	NC	L	L		
59	P100/ANI20	I/O	O	POW_ MUTE	H	L	PD 10k	H/L=Mute ON/OFF
60	P153/ANI11	I/O	O	HP_ REL_ OUT	L	L	PD 47k	H/L=Mute OFF/ON
61	P152/ANI10	I/O	O	LED_ STBY	H	H	PD 10k	Standby LED (H:LED ON)
62	P151/ANI9	I/O	O	LED_ POWER	H	L	PD 10k	Power LED (H:LED ON)
63	P150/ANI8	I/O	O	LED_ TONE	H	L	PD 10K	Tone LED (H:LED ON)
64	P27/ANI7	I/O	O	NC	L	L		
65	P26/ANI6	I/O	I	SEL	-	-	-	Input Selector A/D Port
66	P25/ANI5	I/O	I	AD_1	-	-	-	Forwarding distinction port (N : H、F/U/K : L)
67	P24/ANI4	I/O	I	FCBS_ TACT	H	-	PD 10k	FCBS Tact SW (H:Tact on)
68	P23/ANI3	I/O	I	NC			PD 10k	
69	P22/ANI2	I/O	I	D_SET	-	-	PD 47k	LCD Driver Communication mode setting input H/L = Communication during communication / operation at 100 msec
70	P21/ANI1/AVREFM	I/O	-	AVREFM	-	-	-	GND
71	P20/ANI0/AVREFP	I/O	-	AVREFP	-	-	-	3.3V
72	P130	I/O	O	POW_1	H	L	PD 10k	Power Relay On (ON : H) (Main Transformer)
73	P04/SCK10/SCL10	I/O	O	POW_2	H	L	PD 10k	Power Relay On (ON : H) (SMPS)
74	P03/ANI16/SI10/RxD1/SDA10	I/O	O	NC	L	L		
75	P02/ANI17/SO10/TxD1	I/O	I	M_B_ DOWN	L	-	PD 47k	Detect Main Power On (L : Main B Down)
76	P01/TO00	I/O	I	BI	-	-	PU 47k	Stereo/Bi Amp SW (H/L)
77	P00/TI00	I/O	O	S_CE	L	L	PD 47k	Relay control 4094 CE
78	P144/SO30/TxD3	I/O	O	S_DI	H	L	-	Relay control 4094 Serial Data
79	P143/SI30/RxD3/SDA30	I/O	O	S_OE	H	L	-	Relay control 4094 OE
80	P142/SCK30/SCL30	I/O	O	S_CLK	H	L	-	Relay control 4094 Serial Clock (fc=100kHz)

Act: Active, Init: Initial, Stby: Standby, Ext R: External R

CD74HC4094PWR (U2201, U2202)

PIN ASSIGNMENT



TRUTH TABLE

CL ▲	Output Enable	Strobe	Data	Parallel Outputs		Serial Outputs	
				Q1	QN	QS*	Q' S
⌐	0	X	X	OC	OC	Q7	NC
¬	0	X	X	OC	OC	NC	Q7
⌐	1	0	X	NC	NC	Q7	NC
⌐	1	1	0	0	QN-1	Q7	NC
⌐	1	1	1	1	QN-1	Q7	NC
¬	1	1	1	NC	NC	NC	Q7

▲ = Level Change Logic 1 = High Logic 0 = Low
X = Don't Care NC = No Change OC = Open Circuit
* At the positive clock edge, information in the 7th shift register stage is transferred to the 8th register stage and the QS output.

U2201

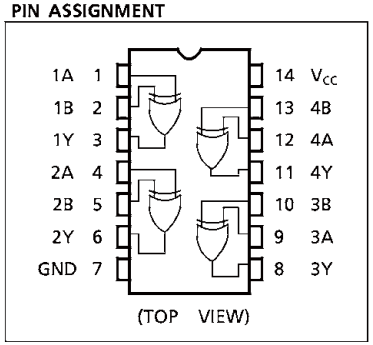
Pin	Port	I/O	use	Name	Port Setting			Note
					Act.	stby	Exit R	
1	STROBE	I	I	CE				Chip Enable
2	DATA	I	I	DATA				Serial Data (Direct controll from MPU)
3	CLOCK	I	I	CLK				Serial Clock
4	Q1	O	O	LINE2	H	L	PD 10k	LINE2 INPUT Relay ON (ON:H)
5	Q2	O	O	REC1	H	L	PD 10k	RECORDER1 INPUT Relay ON (ON:H)
6	Q3	O	O	REC2	H	L	PD 10k	RECORDER2 INPUT Relay ON (ON:H)
7	Q4	O	O	BI-AMP	H	L	PD 10k	Bi-Amp Relay Control (H/L = Bi-Amp/Stereo)
8	VSS	-	-	GND	-	-	-	GND
9	QS	O	O	QS				Open
10	Q'S	O	O	Q'S				To 4094-2
11	Q8	O	O	LINE1	H	L	PD 10k	LINE1 INPUT Relay ON (ON:H)
12	Q7	O	O	CD	H	L	PD 10k	CD INPUT Relay ON (ON:H)
13	Q6	O	O	open	L	L	-	Open
14	Q5	O	O	PHONO	H	L	PD 10k	PHONO INPUT Relay ON (H/L = PHONO/Other)
15	OE	I	I	OE				Output Enable
16	VDD	-	-	VCC	-	-	-	3.3V

U2202

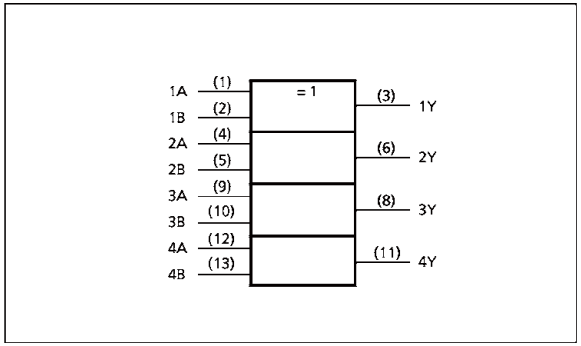
Pin	Port	I/O	use	Name	Port Setting			Note
					Act.	stby	Exit R	
1	STROBE	I	I	CE				Chip Enable
2	DATA	I	I	DATA				From 4094-1
3	CLOCK	I	I	CLK				Serial Clock
4	Q1	O	O	HQ_MODE	H	L	PD 10k	HQ Mode SW (ON:H)
5	Q2	O	O	P-DIRECT	H	L	PD 10k	Power Amp direct in Relay ON (ON:H)
6	Q3	O	O	open	L	L	-	Open
7	Q4	O	O	Open	L	L	-	Open
8	VSS	-	-	GND	-	-	-	GND
9	QS	O	O	QS				Open
10	Q'S	O	O	Q'S				Open
11	Q8	O	O	HP_RELAY_IN	H	L	PD 10k	HP input Relay Control (H/L=HP ON/OFF)
12	Q7	O	O	REC2_MUTE	H	L	PD 10k	RECORDER2 OUTPUT Relay ON (ON:H)
13	Q6	O	O	REC1_MUTE	H	L	PD 10k	RECORDER1 OUTPUT Relay ON (ON:H)
14	Q5	O	O	MM	H	L	PD 10k	PHONO MM/MC SW (H/L = MM/MC)
15	OE	I	I	OE				Output Enable
16	VDD	-	-	VCC	-	-	-	3.3V

TC74VHC86FT (U1004)

PIN ASSIGNMENT



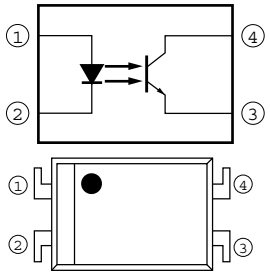
IEC LOGIC SYMBOL



TRUTH TABLE

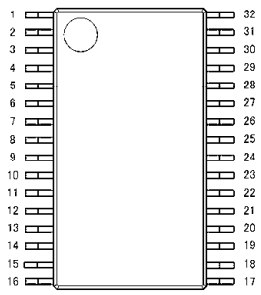
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

TLP785 (U1901)



① Anode
② Cathode
③ Emitter
④ Collector

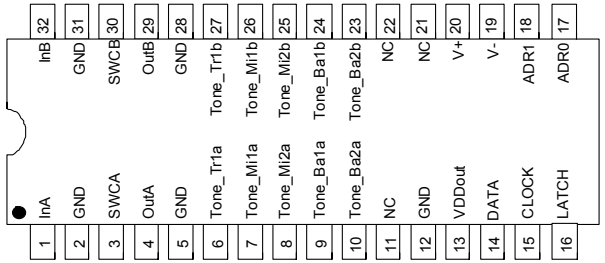
NJU72322V (U5101)



ピン配置

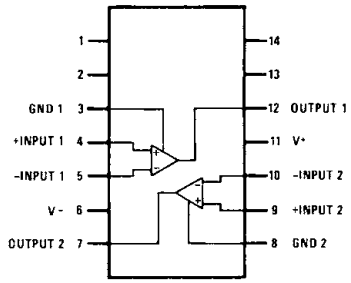
1. NC	17. NC
2. L_CAP	18. DATA
3. OUTL	19. CLOCK
4. L−	20. LATCH
5. L_REF	21. D_V+
6. L+	22. INR
7. L_REF	23. AR_V+
8. L_REF	24. AL_V+
9. R_REF	25. AR_V−
10. R_REF	26. AL_V−
11. R+	27. INL
12. R_REF	28. D_V−
13. R−	29. D_CAP
14. OUTR	30. ADR0
15. R_CAP	31. NC
16. D_IN	32. D_REF

NJW1119AV (U2501)



No.	Symbol	Function	No.	Symbol	Function
1	InA	Ach Input	17	ADR0	Chip address setting terminal 0
2	GND	GND Terminal	18	ADR1	Chip address setting terminal 1
3	SWCA	Ach Switching noise rejection capacitor	19	V-	Power Supply Terminal (-)
4	OutA	Ach Output	20	V+	Power Supply Terminal (+)
5	GND	GND Terminal	21	N.C.	No Connection
6	Tone_Tr1a	Ach Treble Filter Terminal 1	22	N.C.	No Connection
7	Tone_Mi1a	Ach Middle Filter Terminal 2	23	Tone_Ba2b	Bch Bass Filter Terminal 2
8	Tone_Mi2a	Ach Middle Filter Terminal 2	24	Tone_Ba1b	Bch Bass Filter Terminal 1
9	Tone_Ba1a	Ach Bass Filter Terminal 1	25	Tone_Mi2b	Bch Middle Filter Terminal 2
10	Tone_Ba2a	Ach Bass Filter Terminal 2	26	Tone_Mi1b	Bch Middle Filter Terminal 1
11	N.C.	No Connection	27	Tone_Tr1b	Bch Treble Filter Terminal 1
12	GND	GND Terminal	28	GND	GND Terminal
13	VDDout	Internal Digital Power Supply output	29	OutB	Bch Output
14	DATA	DATA (3 wire)	30	SWCB	Bch Switching noise rejection capacitor
15	CLOCK	CLOCK (3 wire)	31	GND	GND Terminal
16	LATCH	LATCH (3 wire)	32	InB	Bch Input

LM319 (U6603)

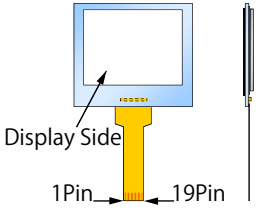


Pin Functions

PIN				I/O	DESCRIPTION
NAME	NO. (D, J, NFF 14)	NO. (LME 10)	NO. (NAD 10)		
OUTPUT 1	1	12	1	O	Comparator 1 output
GND 1	2	3	2	G	Comparator 1 ground connection
INPUT 1+	3	4	3	I	Comparator 1 input
INPUT 1-	4	5	4	I	Comparator 1 input
V-	5	6	5	P	Negative supply voltage
OUTPUT 2	6	7	6	O	Comparator 2 output
GND 2	7	8	7	G	Comparator 2 ground connection
INPUT 2+	8	9	8	I	Comparator 2 input
INPUT 2-	9	10	9	I	Comparator 2 input
V+	10	11	10	P	Positive supply voltage
NC	1,2,13,14				No connect. Do not connect to ground.

2. OLED DISPLAY

MXS4046



MXS4046 IO Interfaces

端子番号 Pin No.	端子名 Pin Name	入出力 IO	機能 Functions
1	VSL	P	陽極基準電位 Anode Reference Voltage
2	VSS	P	グランド GND
3	VCC	P	ドライバ系VCC電源 Drive System Power
4	VCOMH	P	陰極電源 Power Supply for Cathode Driver
5	VDD	P	内部ロジック系電源 Power supply for Core logic operation
6	VCI	P	ロジック系電源 Logic System Power Voltage
7	VSS	P	グランド GND
8	IREF	O	陽極出力基準電流設定端子 Reference current setting
9	VSS	P	グランド GND
10	CS#	I	チップセレクト入力(CS#=Lの時アクティブ) Chip Select(Active Low),
11	RES#	I	リセット端子 Reset
12	D/C#	I	データ/コマンド切り替え入力 Switch data or command
13	SCLK	I	シリアルクロック入力 Serial clock input
14	SDIN	I	シリアルデータ入力 Serial data input
15	VCI	P	ロジック系電源 Logic System Power Voltage
16	VDD	P	内部ロジック系電源 Power supply for Core logic operation
17	VCOMH	P	ドライバ系VCOMH電源 High voltage power supply for driving circuits
18	VCC	P	ドライバ系VCC電源 High voltage power supply for driving circuits
19	VSS	P	グランド GND

I: Input
O: Output
I/O: Inout
P: Power Supply

3. Remote Code Table

Remote Code List

Code
Pre-Main
CD Player

KEY No.	RC005PMSA	RC-5/RC-5 Ext. CD MODE (default *1) System	Command	Extension	AMP MODE System	Command	Extension
K1	⏻ CD POWER	20	12	- -	20	12	- -
K2	⏻ AMP POWER	16	12	- -	16	12	- -
K3	REMOTE MODE - CD *2						
K4							
K5	REMOTE MODE - AMP *3						
K6							
K7	▲ (Up)	20	80	- -	16	80	- -
K8							
K9	◀ (Left)	20	85	- -	16	85	- -
K10	ENTER	20	87	- -	16	87	- -
K11	▶ (Right)	20	86	- -	16	86	- -
K12							
K13	▼ (Down)	20	81	- -	16	81	- -
K14							
K15	DISPLAY	20	71	- -	16	15	- -
K16	MODE/TRIM	20	118	13	16	37	33
K17	SETUP	20	82	- -	16	82	- -
K18	⏸ (Pause)	20	48	- -	20	48	- -
K19	■ (Stop)	20	54	- -	20	54	- -
K20	⏮	20	33	- -	20	33	- -
K21	⏭	20	32	- -	20	32	- -
K22	▶ (Play)	20	53	- -	20	53	- -
K23	INFO	20	15	10	20	15	10
K24	DISC/INPUT	20	63	14	20	63	14
K25	OPEN/CLOSE	20	45	- -	20	45	- -
K26	INPUT ▲	16	00	13	16	00	13
K27	TONE	16	22	01	16	22	01
K28	VOLUME ▲	16	16	- -	16	16	- -
K29							
K30	[MUTE] *4	16	13	- -	16	13	- -
K31							
K32	INPUT ▼	16	00	14	16	00	14
K33	MUTE	16	13	- -	16	13	- -
K34	VOLUME ▼	16	17	- -	16	17	- -
K35	1	20	01	- -	20	01	- -
K36	2	20	02	- -	20	02	- -
K37	3	20	03	- -	20	03	- -
K38	4	20	04	- -	20	04	- -
K39	5	20	05	- -	20	05	- -
K40	6	20	06	- -	20	06	- -
K41	7	20	07	- -	20	07	- -
K42	8	20	08	- -	20	08	- -
K43	9	20	09	- -	20	09	- -
K44	+10	20	00	10	20	00	10
K45	0	20	00	- -	20	00	- -
K46	CLEAR	20	49	- -	20	49	- -
K47	RANDOM	20	28	- -	20	28	- -
K48	REPEAT	20	29	- -	20	29	- -
K49	PROGRAM	20	41	- -	20	41	- -
K50	FILTER	20	77	05	20	77	05
K51	SOUND MODE	20	66	- -	20	66	- -
K52	DIGITAL OUT	20	63	13	20	63	13

*1: The remote control returns to the default setting when the batteries are removed.
*2: REMOTE MODE is switched to CD. Remote code is not output.
*3: REMOTE MODE is switched to AMP. Remote code is not output.
*4: It is not used in RC005PMSA. (Common design with other models)

Extended Code: AMP
PM-12 SE/OSE must receive following codes.
These codes are not included in the RC005PMSA

No.	Key Name	RC-5/RC-5 Ext. System	Command	Extension
P1	Power On	16	12	01
P2	Power Off	16	12	02
P3	MUTE ON	16	13	00
P4	MUTE OFF	16	13	01
P5	SERVICE MODE	16	63	63
P6	CD	20	63	- -
P7	LINE-1 (TUNER)	17	63	- -
P8	TUNER (SYSTEM SELECT)	17	63	10
P9	LINE-2	16	00	10
P10	RECORDER-1	26	63	- -
P11	RECORDER-2	18	63	- -
P12	PHONO	21	63	- -
P13	POWER AMP DIRECT IN ON	16	01	30
P14	POWER AMP DIRECT IN OF	16	01	31
P15	EXIT	16	83	- -

Extended Code: CD
SA-12 SE/OSE must receive following codes.
These codes are not included in the RC005PMSA

No.	Key Name	RC-5/RC-5 Ext. System	Command	Extension
C1	Power On	20	12	01
C2	Power Off	20	12	02
C3	PLAY/PAUSE	20	53	10
C4	FF	20	52	- -
C5	FR	20	50	- -
C6	FOLDER MODE	20	118	14
C7	DISC	20	63	16
C8	USB	20	63	15
C9	COAX	20	63	21
C10	OPT	20	63	10
C11	USB DAC	20	63	22
C12	TIME	20	11	- -
C13	TEXT	20	88	- -
C14	DITHER	20	77	04
C15	NOISE SHAPER	20	77	06
C16	PHONES	20	118	10

MECHANICAL

DISASSEMBLY

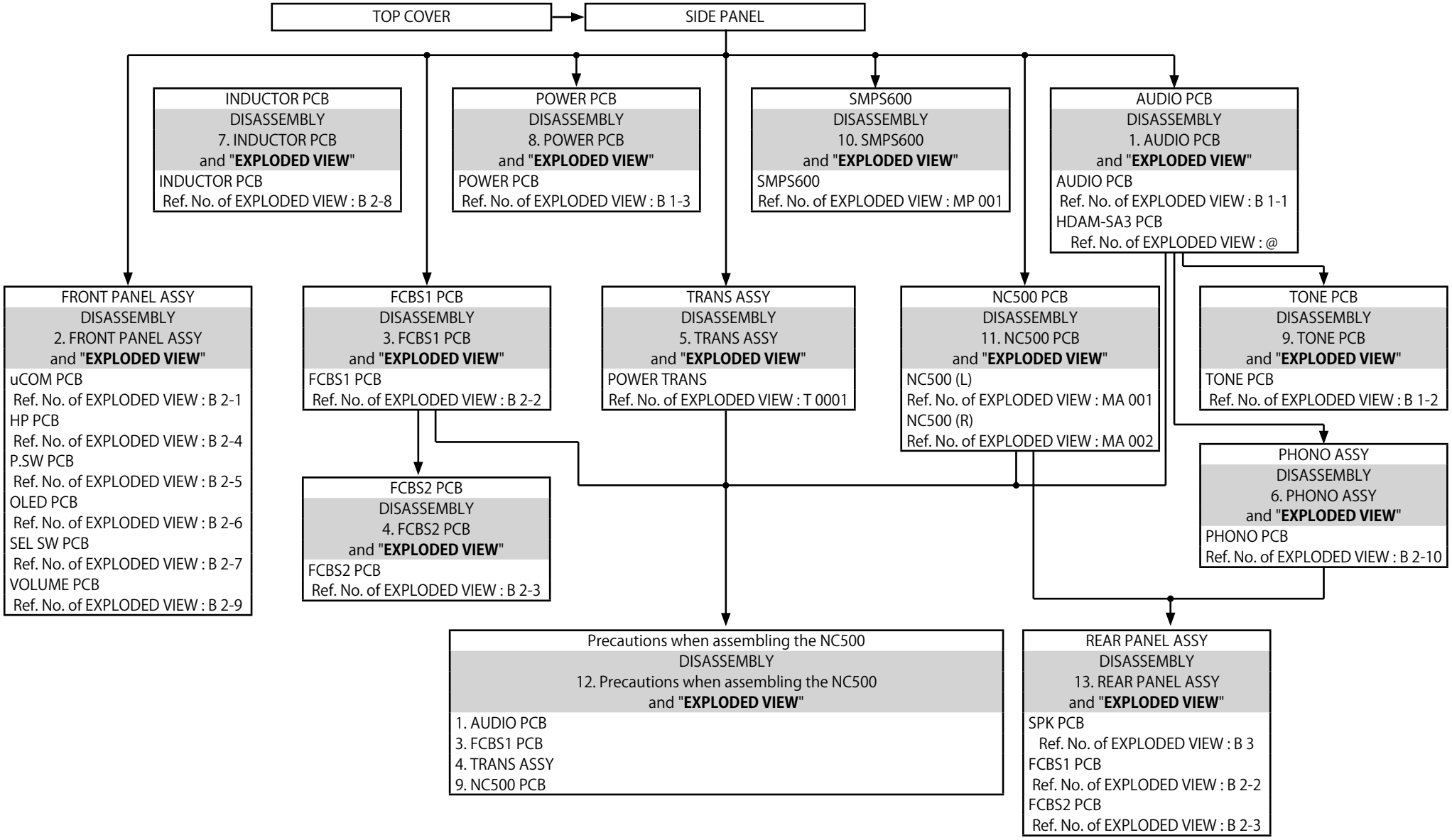
EXPLODED VIEW

PACKAGING VIEW

DISASSEMBLY

Flowchart

- Remove each part following the flow below.
- Reassemble the removed parts in the reverse order.
- Read "SAFETY PRECAUTIONS" before reassembling the removed parts.
- If wire bundles are removed or moved during adjustment or part replacement, reshape the wires after completing the work. Failure to shape the wires correctly may cause problems such as noise.
- See "EXPLODED VIEW"

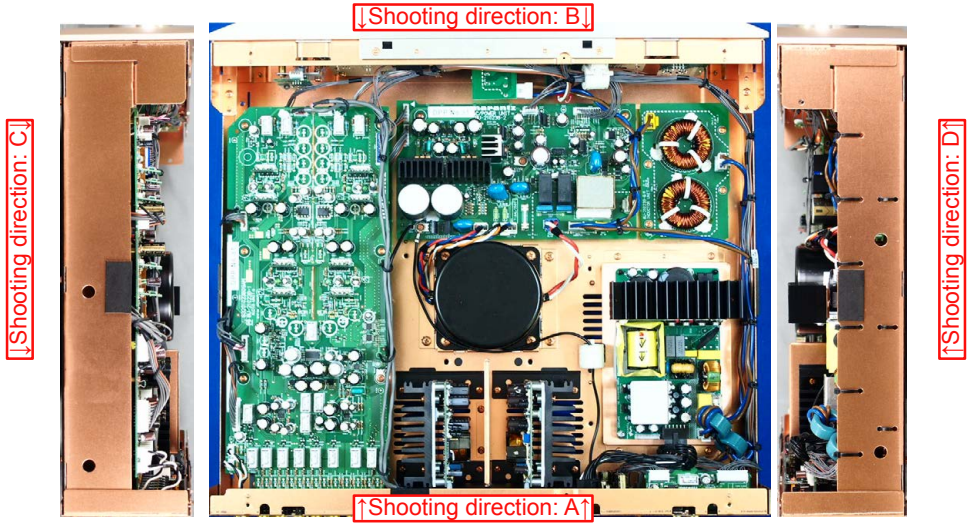


Explanatory Photos for DISASSEMBLY

- For the shooting direction of each photos used in this manual, see the photo below.
- **A, B, C and D** in the photo below indicate the shooting directions of photos.
- The photographs with no shooting direction indicated were taken from the top of the unit.
- Photos of PM-12 OSE F are used in this manual.

The viewpoint of each photograph

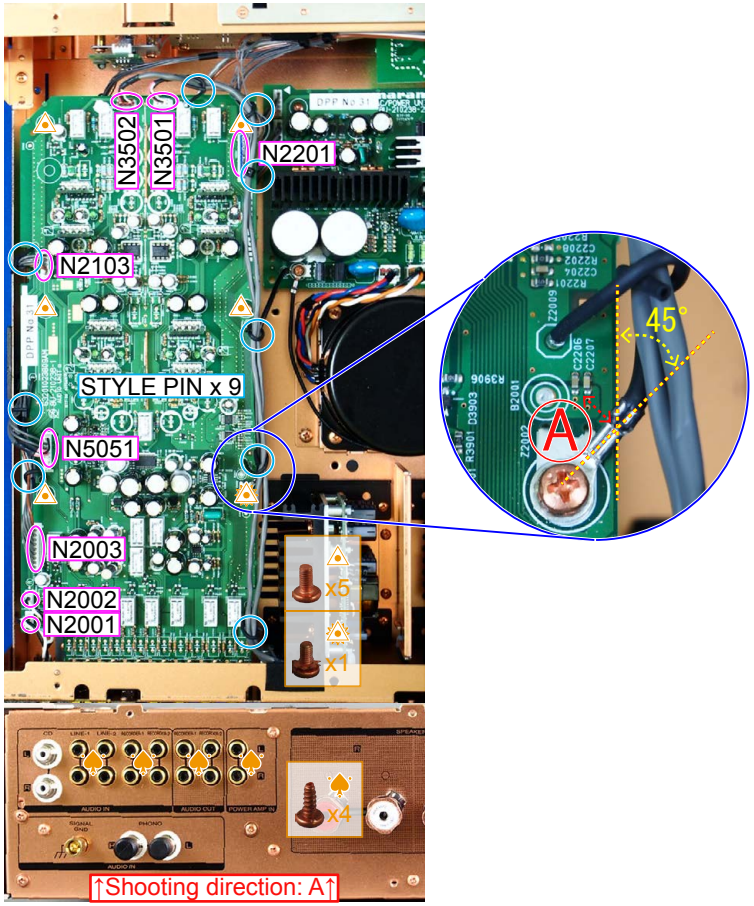
(Shooting direction : X) [View from the top]



1. AUDIO PCB

Proceeding : TOP COVER → SIDE PANEL → AUDIO PCB

(1) Remove the screws. Remove the connector. Remove the STYLE PIN.



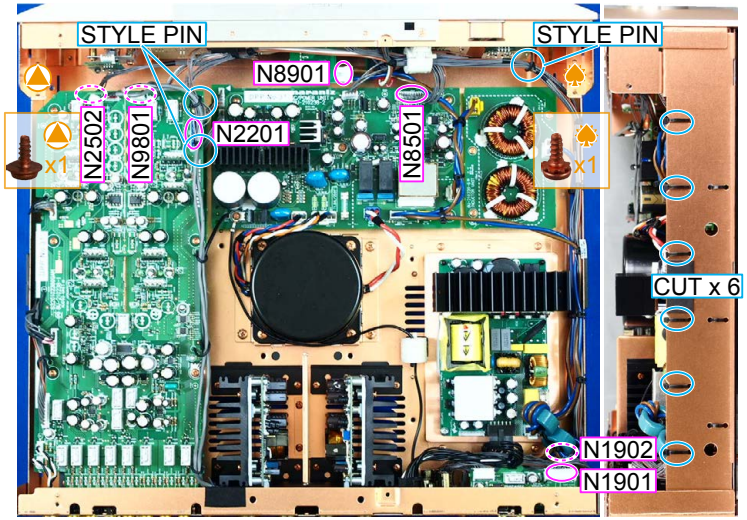
Attention :
Pay attention to the tip resistance of contact Ⓐ in the figure above during assembly.

2. FRONT PANEL ASSY

Proceeding : TOP COVER → SIDE PANEL → FRONT PANEL ASSY

(1) Remove the screws.

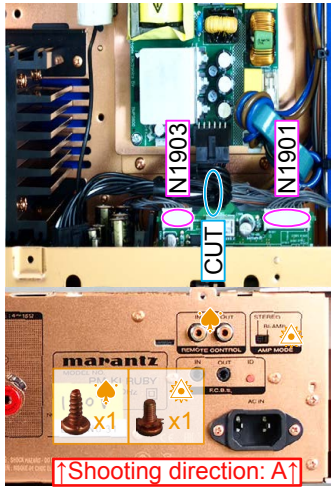
(1) Remove the screws. Remove the connector. Remove the STYLE PIN.
Cut the wire clamps.



3. FCBS1 PCB

Proceeding : TOP COVER → SIDE PANEL → FCBS1 PCB

(1) Remove the screws. Remove the connector. Cut the wire clamps.



4. FCBS2 PCB

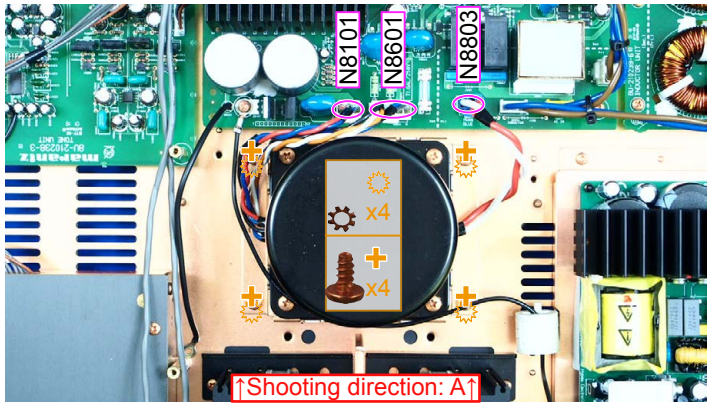
Proceeding : TOP COVER → SIDE PANEL → FCBS1 PCB → FCBS2 PCB

See "EXPLODED VIEW" for instructions on removing the FCBS2 PCB.

5. TRANS ASSY

Proceeding : TOP COVER → SIDE PANEL → TRANS ASSY

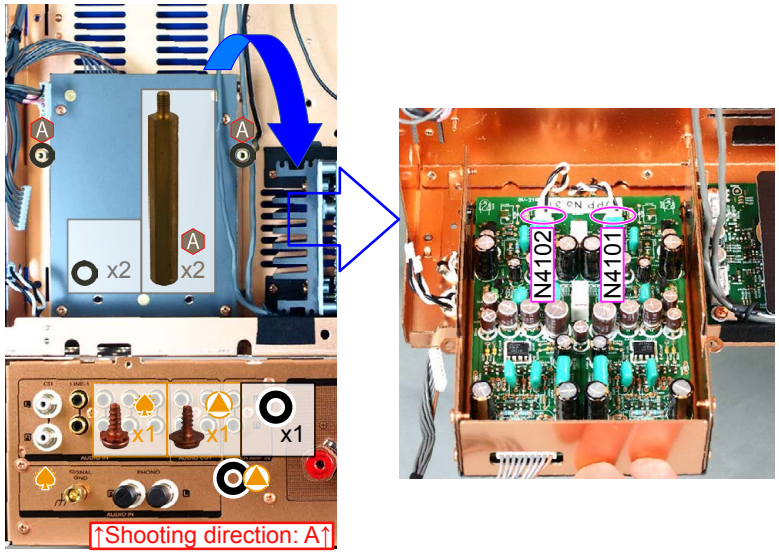
(1) Remove the screws. Remove the connector.



6. PHONO ASSY

Proceeding : TOP COVER → SIDE PANEL → AUDIO PCB → PHONO ASSY

(1) Remove the screws.
Lift the PHONO ASSY and remove the connector.



7. INDUCTOR PCB

Proceeding : TOP COVER → SIDE PANEL → INDUCTOR PCB

See "EXPLODED VIEW" for instructions on removing the INDUCTOR PCB.

8. POWER PCB

Proceeding : TOP COVER → SIDE PANEL → POWER PCB

See "EXPLODED VIEW" for instructions on removing the POWER PCB.

9. TONE PCB

Proceeding : TOP COVER → SIDE PANEL → AUDIO PCB → TONE PCB

See "EXPLODED VIEW" for instructions on removing the TONE PCB.

10. SMPS600

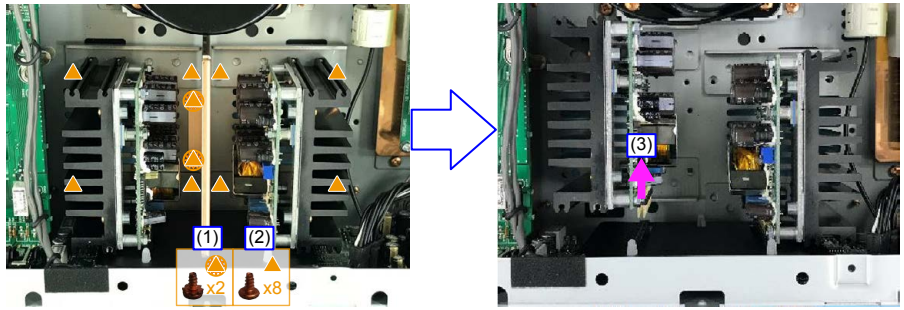
Proceeding : TOP COVER → SIDE PANEL → SMPS600

See "EXPLODED VIEW" for instructions on removing the SMPS600.

11. NC500 PCB

Proceeding : TOP COVER → SIDE PANEL → NC500 PCB

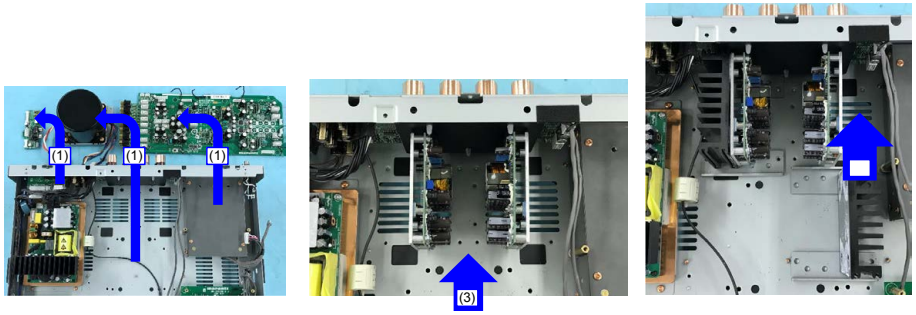
NOTE : There is an order in which to disassemble the NC500.
(1) Remove the SHIELD PLATE AMP .
(2) Remove the screws that secure the AMP block. (8 locations in total, left and right)
(3) Pull the AMP block forward, then remove the connector that connects the NC500 and SPK circuit board.



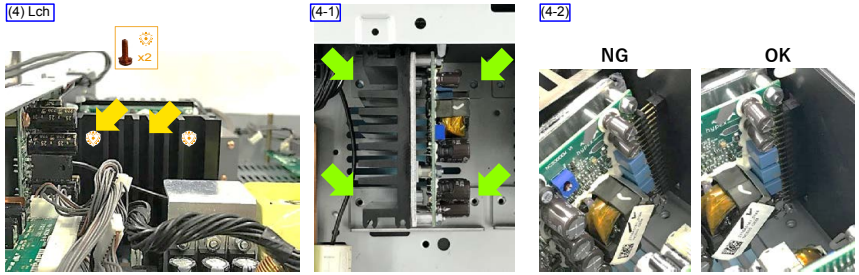
(4) Remove the AMP block from the body of the product.
(5) Remove the heat sink screws. (8 locations in total, left and right)
(6) Remove the NC500 from the heat sink.

12. Precautions when assembling the NC500

NOTE : There is an order in which to disassemble the NC500.
(1) First remove "**1. AUDIO PCB**", "**3. FCBS1 PCB**" and "**4. TRANS ASSY**".
(2) Apply silicone grease to the NC500.
(3) Install the SPK circuit board connector on the NC500.
※ The component side of the NC500 must be facing in.

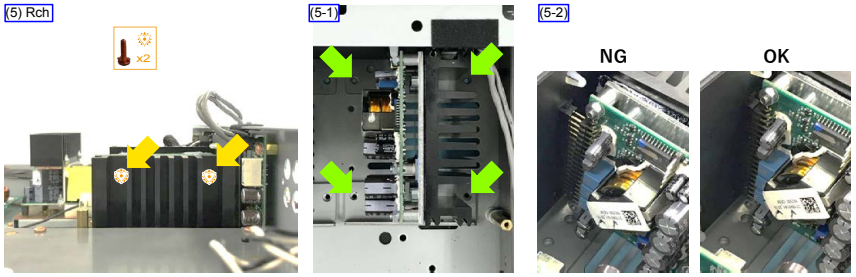


(4) Paying special attention to the cautions below, secure the NC500 of the left channel and the heat sink in two locations with screws.
Caution : (4-1) The heat sink and chassis holes must be properly aligned.
(4-2) The NC500 connecter must be completely connected. (connector must not be unplugged)

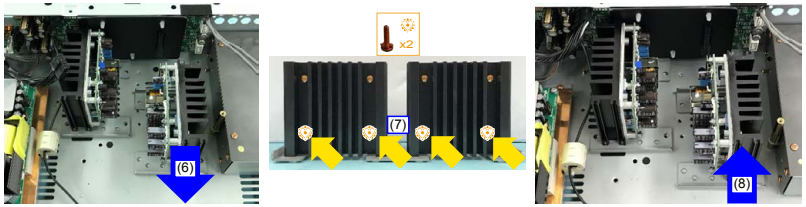


(5) Paying special attention to the cautions below, secure the NC500 of the right channel and the heat sink in two locations with screws.

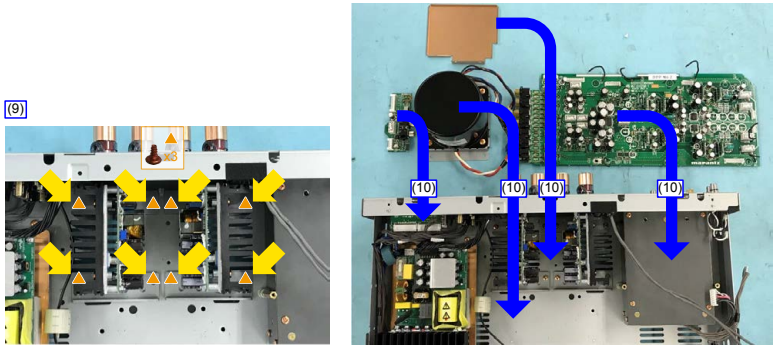
Caution : (5-1) The heat sink and chassis holes must be properly aligned.
(5-2) The NC500 connecter must be completely connected. (connector must not be unplugged)



(6) Pull the AMP block forward, then remove the connector that connects the NC500 and SPK PCB.
(7) Secure the NC500 and the heat sink with screws in 4 locations.
※ Any silicone grease that protrudes from the area around the NC500 must be wiped off.
Additionally, there must not be any silicone grease on any other surrounding components. (wipe off if there is any)
(8) Install the AMP block on the SPK circuit board connector.



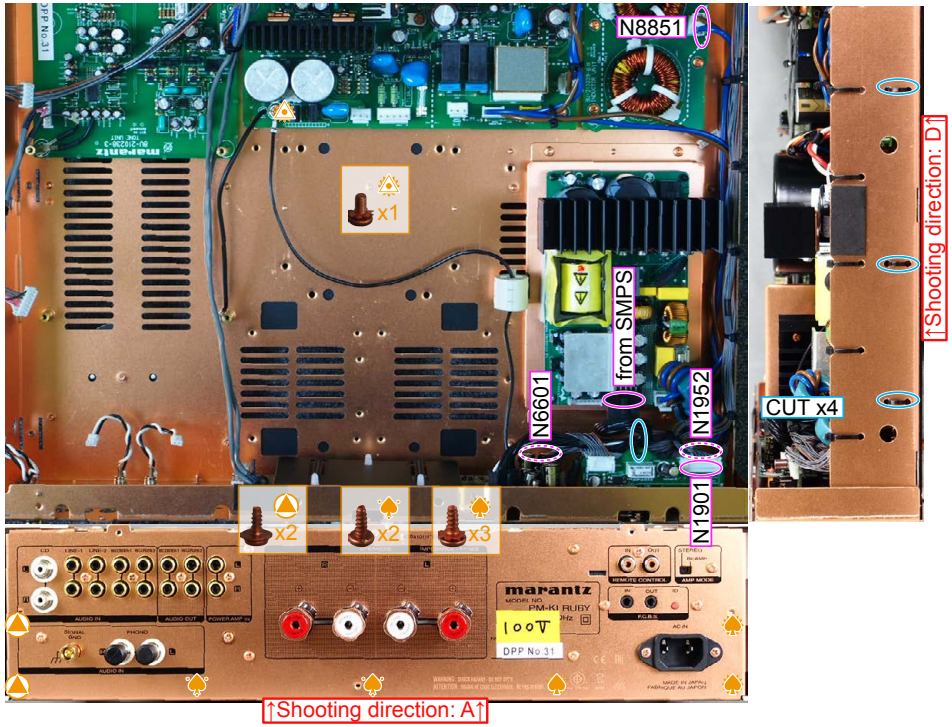
(9) Screw the AMP block into the chassis (8 locations total, left and right).
(10) Assemble the "**SHIELD PLATE AMP**", "**1. AUDIO PCB**", "**3. FCBS1 PCB**" and "**4. TRANS ASSY**".



13. REAR PANEL ASSY

Proceeding : TOP COVER → SIDE PANEL → AUDIO PCB → PHONO ASSY → NC500 PCB → REAR PANEL ASSY

(1) Remove the screws. Remove the connector. Cut the wire clamps.



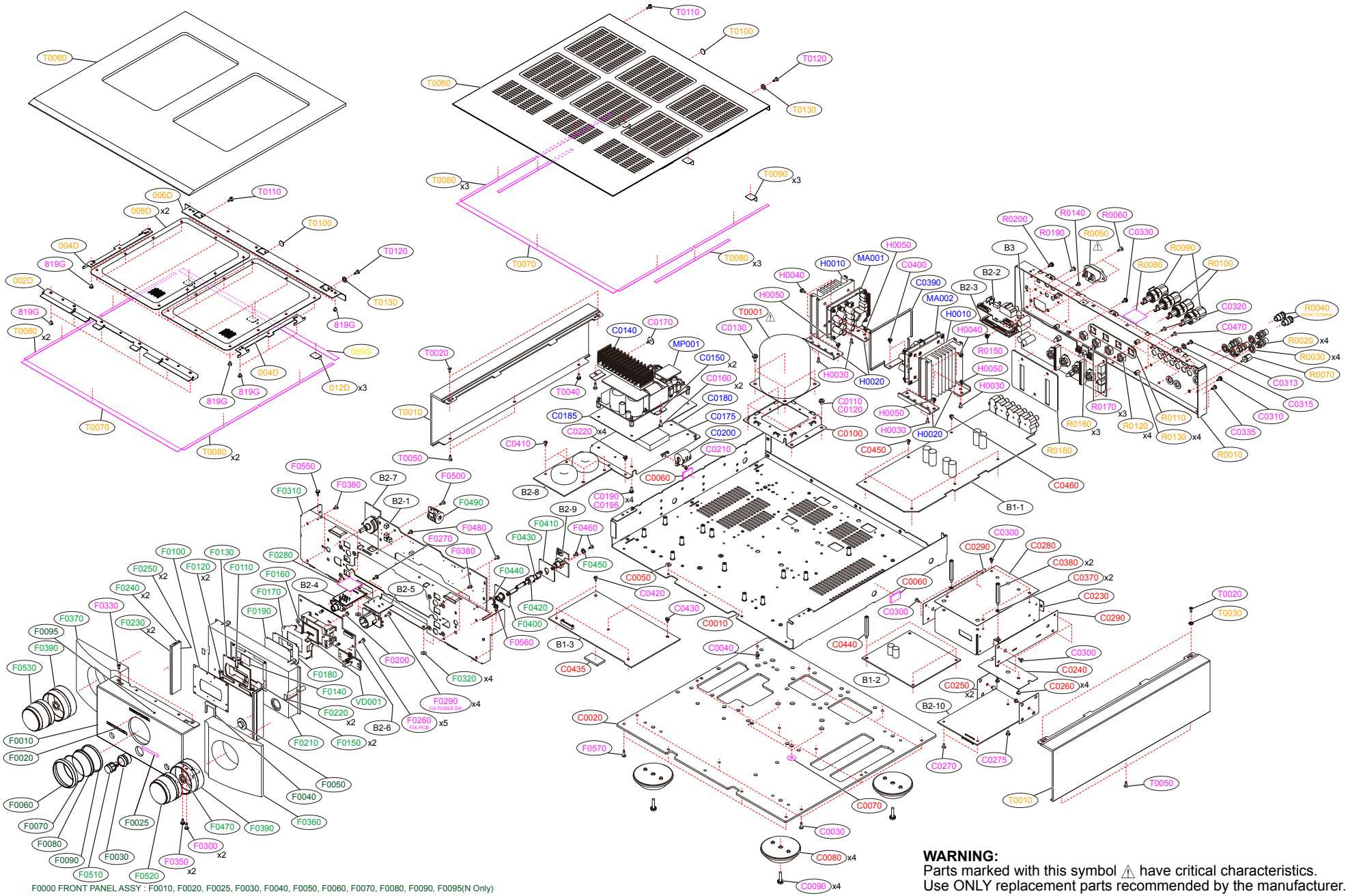
EXPLODED VIEW

PM-12 SE Parts List : https://dmedia.soundunited.com/documents/details/26617

PM-12 OSE Parts List : https://dmedia.soundunited.com/documents/details/26616

*TOP COVER (PM12OSE)

*TOP COVER (PM12SE)



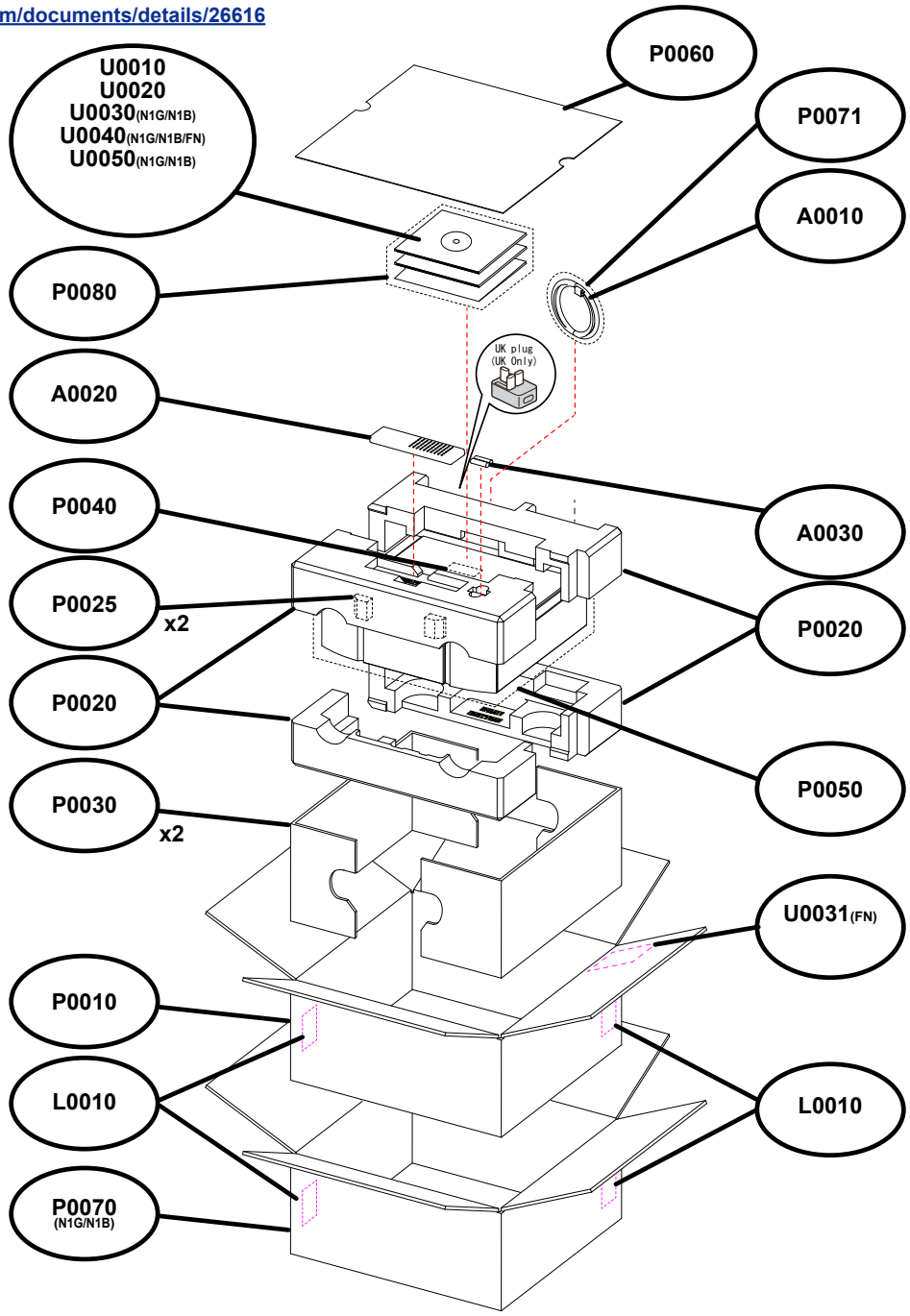
F0000 FRONT PANEL ASSY : F0010, F0020, F0025, F0030, F0040, F0050, F0060, F0070, F0080, F0090, F0095(N Only)

WARNING:
Parts marked with this symbol ⚠ have critical characteristics.
Use ONLY replacement parts recommended by the manufacturer.

PACKAGING VIEW

PM-12 SE Parts List : https://dmedia.soundunited.com/documents/details/26617

PM-12 OSE Parts List : https://dmedia.soundunited.com/documents/details/26616



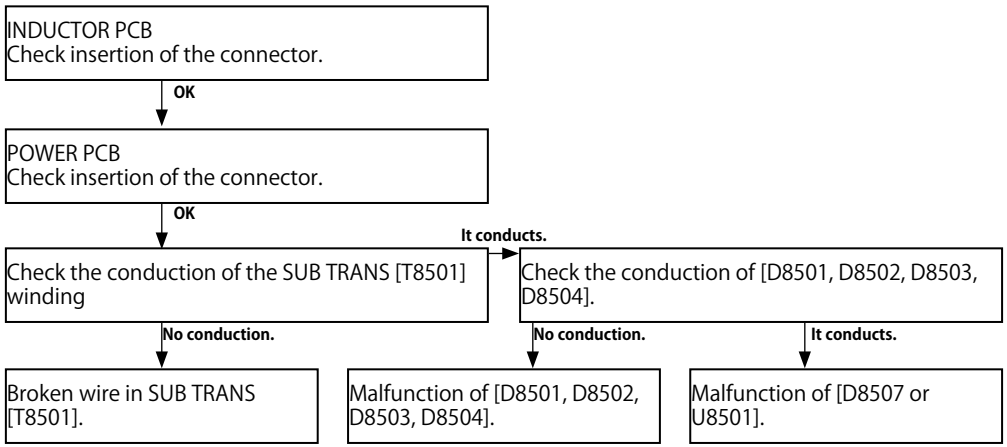
REPAIR INFORMATION

TROUBLE SHOOTING

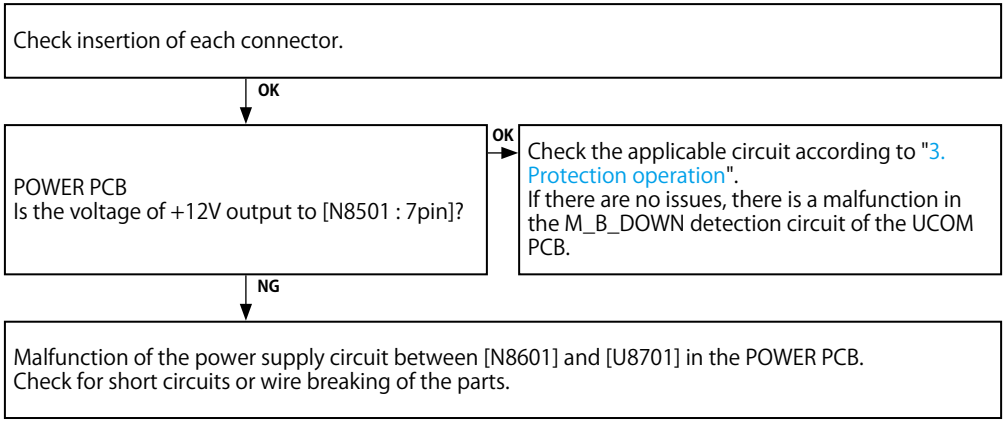
MEASURING METHOD AND WAVEFORMS

SPECIAL MODE

1. The power cannot be turned on (The standby LED does not light (standby mode))



2. The power cannot be turned on (STANDBY LED is lit → light flashes)



3. STANDBY LED flashes while using the unit (Protection circuit becomes activated)

Check insertion of each connector.
→ OK
See "2. The power cannot be turned on (STAND-BY LED is lit → light flashes)"

4. The power turns on but no sound is output

4.1. No sound is output from one channel.

Check insertion of each connector.
↓ OK
Is no sound output with other input sources?
→ NG
Check the input changeover relay [S2001-S2007] and the peripheral circuit.
↓ OK
AUDIO PCB
Is there sound from [N3501 : 1, 3pin and N3502 : 1, 3pin]?
→ NG
AUDIO PCB
Malfunction of amplifiers circuit.
↓ OK
Malfunction of [Power Amp module NC 500].

4.2. There is no sound from both channel.

Check insertion of each connector.
↓ OK
Do you hear the operation sound of the input changeover relay when rotating the Input Selector knob?
→ NG
AUDIO PCB
Malfunction of [U2201, U2202].
↓ OK
Do you hear the operation sound of the Mute relay in about 15 seconds after turning on the unit?
→ NG
AUDIO PCB
Malfunction of mute relay [S3501, S3502] or the driving circuit.
↓ OK
AUDIO PCB
Is power being supplied (± 15V, +3.3VD)?
→ NG
POWER PCB
Check the pre-amplifier power supply circuit.

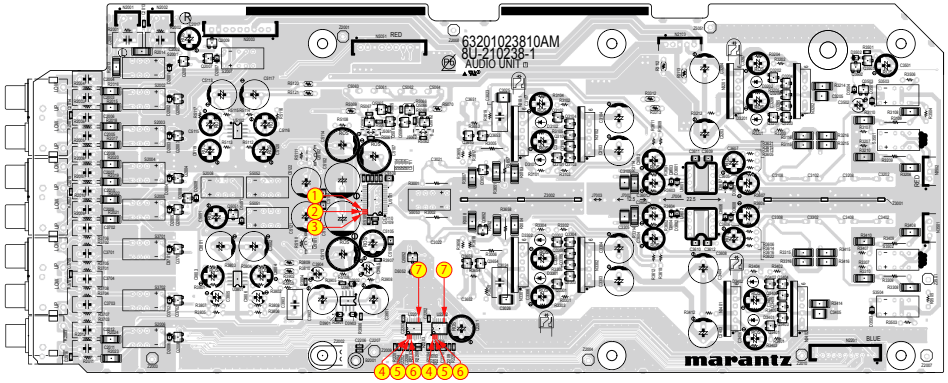
MEASURING METHOD AND WAVEFORMS

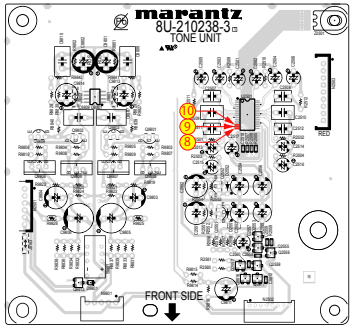
It is recommended to use extension wires between the probe and test points.

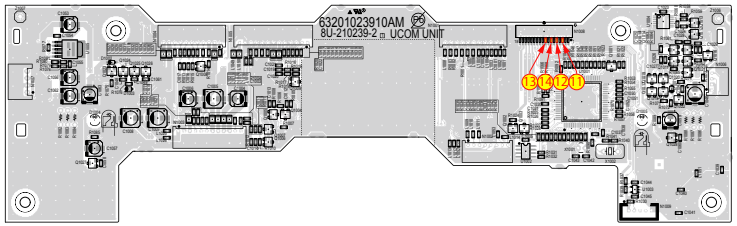
1. PCB test point

• For points ① to ⑪, take measurements at the points shown in the diagram below.

AUDIO PCB : U5101 [NJU72322V]							
①	LATCH : 20pin	②	CLOCK : 19pin	③	DATA : 18pin		
AUDIO PCB : U2201, U2202 [CD74HC4094PWR]							
④	STROBE : 1pin	⑤	DATA : 2pin	⑥	CLOCK : 3pin	⑦	OE : 15pin
TONE/HP PCB : U2501 [NJW1119AV]							
⑧	LATCH : 16pin	⑨	CLOCK : 15pin	⑩	DATA : 14pin		
UCOM PCB : VD001 LCD[N1009]							
⑪	DC : 3pin	⑫	CS : 5pin	⑬	CLOCK : 9pin	⑭	DATA : 7pin





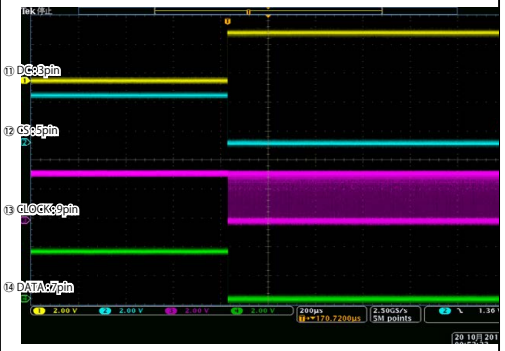


AUDIO PCB : U5101 [NJU72322V]

AUDIO PCB : U2201, U2202 [CD74HC4094PWR]

TONE/HP PCB : U2501 [NJW1119AV]

UCOM PCB : VD001 [MXS4046A]

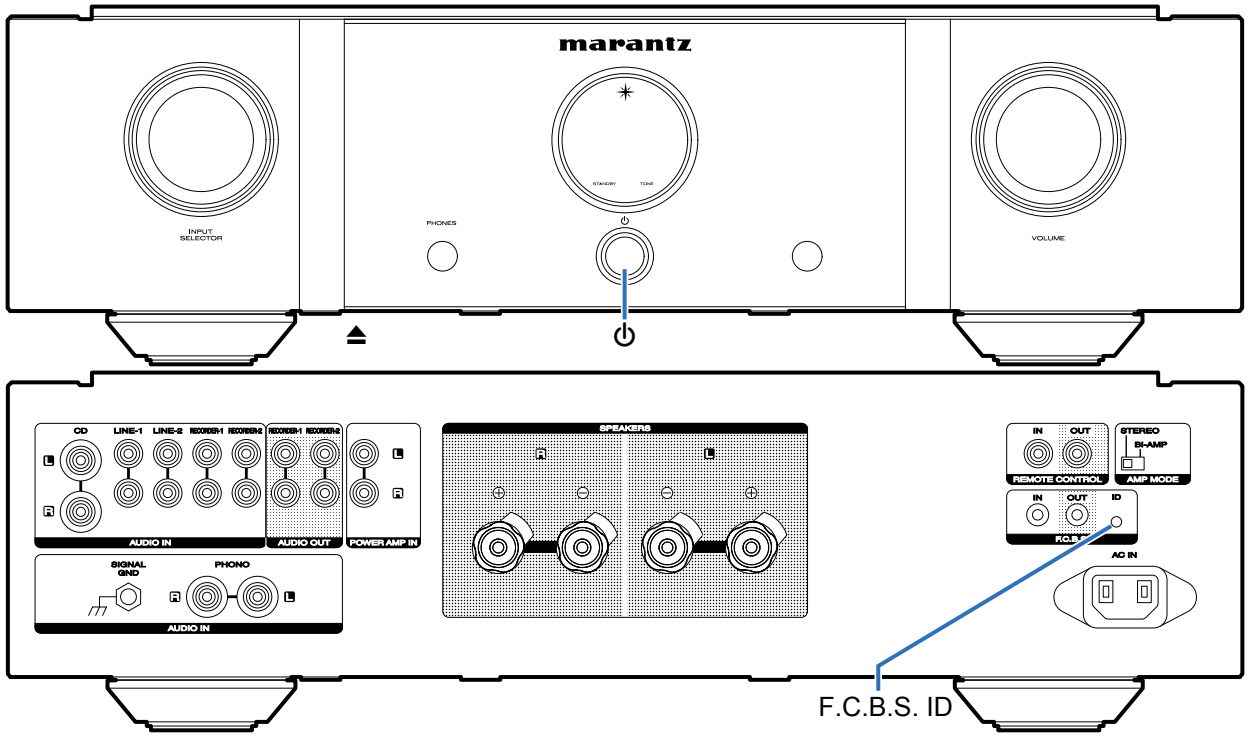


SPECIAL MODE

Special mode setting button

※ No. 1 : Turn on the power. When the ID appears in the display, press and hold button "**A**" for 5 seconds or longer.

No.	Mode	Button A	Button B	Descriptions
1	Service mode	F.C.B.S. ID	-	The firmware version, display check, communication test of BUS, protection detection count and serial number display appear in the display. The memory is cleared and the unit is initialized. (See 1. Service mode)
2	ERROR MESSAGES	-	-	Table of Error Message. (See 2. ERROR MESSAGES)
3	Protection operation	-	-	Displayed when an error occurs. (See 3. Protection operation)



1. Service mode

1.1. Actions

The firmware version, display check, communication test of BUS, protection detection count and serial number display appear in the display.
The memory is cleared and the unit is initialized.
＊ Initializes when the power supply is turned OFF.
•Settings return to default.
•Protection history is not initialized.

1.2. Starting up

Turn on the power. When the ID appears in the display, press and hold "**F.C.B.S. ID**" button for 5 seconds or longer.
Turn the "**INPUT SELECTOR**" knob to the right after this to show the information from item "**1.3.**" in the display.
Turning the "**INPUT SELECTOR**" knob to the left has no effect.

1.3. Display Order

① System version → ② Flashing of the display → ③ All off → ④ Communication test of BUS → ⑤ Detection count for PROTECTION1 and 2 → ⑥ Detection count for PROTECTION3 and 4 → ⑦ Detection count for PROTECTION5 and 6 → ⑧ Serial number display ·····
Turn the power back on to cancel this mode.

①System Version

L1	[VERSION]
L2	PM-12 ⟋
L3	U******

⟍ : Region (U, N, K, F)

② Lighting of the display

L1	■■■■■■■■■■
L2	■■■■■■■■■■
L3	■■■■■■■■■■

③ All off

L1	
L2	
L3	

④ Communication test of BUS

L1	[BUS TEST]
L2	BUS OK
L3	

• "BUS_OK" or "BUS_NG"

⑤ Detection count for PROTECTION 1 and 2

L1	[PROTECT]
L2	PROT-1: ＊
L3	PROT-2: ＊

⑥ Detection count for PROTECTION 3(SCCPIND) and 4(FATAL)

L1	[PROTECT]
L2	PROT-3: ＊
L3	PROT-4: ＊

⑦ Detection count for PROTECTION 5(READY) and 6(MB_DOWN)

L1	[PROTECT]
L2	PROT-5: ＊
L3	PROT-6: ＊

⑧ Serial number display

L1	[SERIAL]
L2	*********
L3	*****

1.4. Clear PROTECTION History

(1) Display the protection detection number to clear protection history.

L1	[PROTECT]
L2	PROT-＊: ＊
L3	PROT-＊: ＊

(2) Press and hold the "**F.C.B.S. ID**" button for more than 5 second.

(3) "**CLEARED**" is shown on the display for 3 seconds.

L1	[PROTECT]
L2	CLEARED
L3	

(4) All history for PROTECTION 1 to 6 is cleared.

1.5. Initialization item

No	Items	Default
1	INPUT SELECTOR	CD
2	VOLUME	- ∞
3	LEVEL TRIM	0.0(L/R)
4	ATT	- ∞
5	ATT (MUTE)	OFF
6	PHONO	MM
7	ID No.	0
8	SIDE ILLUMINATION	ON
9	AUTO STANDBY MODE	N : ON F/U/K : OFF
10	POWER ON/STANDBY	ON

2. ERROR MESSAGES

Displayed when an error occurs.

No.	Error cord	Error content	Remedies
1	E01	ID=1(Master)	-
2	E02	Two or more amplifiers set as ID=2 (Slave) were detected.	Assign different ID numbers to the amplifiers.
3	E03	Two or more amplifiers set as ID=3 (Slave) were detected.	
4	E04	Two or more amplifiers set as ID=4 (Slave) were detected.	
5	E11	ID=2, 3, 4(Slave) are powered on and communication with the Master could not be completed within the prescribed time. The error is canceled when communication with the Master is completed.	•If the ID No.1 amplifier is not on, turn it ON. •Check that the remote cable is properly connected.
6	E12	Bus connection error (including duplication of Master) Two or more amplifiers set as ID=1 (Master) were detected. An amplifier set as ID=0 was connected to the amplifier set as ID=1 (Master).	•If multiple amplifiers take ID No. 1, set ID numbers properly. •If the ID No.1 amplifier is connected to the ID No.0 amplifier, set the ID numbers properly. •Check that the remote cable is properly connected.

ID Duplication Errors

An ID error command is issued to the Master when the Slave receives the device check command if the same ID as this unit is already set.
The Master then issues an ID error for all devices and an ID duplication error is indicated on the applicable device and the Master.
Return condition : Turn off all devices, set the correct ID and start the devices again.
(The IDs for each device are only identified when the devices are powered on)

Master Not Detected Errors

A Master Not Detected error is displayed if the Master cannot be recognized after the start process of the Slave is completed (within 3 seconds) or when a power off command is received from the master.
Return condition: When the Master is recognized.

Bus connection error

A bus connection error is displayed if a command issued by the master or a response message to that command cannot be detected.
Return condition: Turn off all devices, check that they are connected correctly and then start the devices again.

3. Protection operation

Explanation of UCOM (U1001) [PROT_1 : pin1, PROT_2 : pin2, PROT_4 : FATAL, pin31, PROT_5 : READY, pin40, PROT_6 : M_B_DOWN, pin75]

[A] The PROT_1(pin1) is the port to detect the following abnormalities of the amplifiers circuit

(1) Detection of an abnormality in the DC offset voltage from the Speaker Output terminal.
If the voltage from the Speaker Output terminal exceeds approximately 1.5V (DC),[**Q6701, Q6702, Q6703 or Q6704**] will turn on, then the signal from the "**PROT_1**" will change to "**Hi → Lo**".

(2) Detects abnormal voltage in the DC offset voltage of the headphone amplifier circuit output.
When the headphone amplifier circuit output exceeds around 1.7V, [**Q9816 or Q9817**] turn on and "**PROT_1**" changes from "**Hi → Lo**".

When "**PROT_1**" changes from "**Hi → Lo**" due to abnormality detected in either (1) or (2), the protection circuit engages, "**POW_1 : pin72**" and "**POW_2 : pin73**" changes from "**Hi → Lo**", the power supply relay [**S8801-S8802**] immediately turns off and shuts the unit down.
The STANDBY indicator flickers to inform that an error has occurred.
This protection operation is intended for when a failure occurs in the amplifiers circuit and immediately turns the power off to avoid the risk of any damage.

To check whether the amplifier is broken, turn off the unit, then wait for about 1 minute and turn it on again.
This action will deactivate the protection operation.
If the "**PROT_1**" remains in the "**Lo**" abnormal state, which constitutes an abnormality, the unit shuts down approximately 8 seconds later and the STANDBY indicator starts flickering.
If the protection operation is not deactivated even after the power is turned on again, the amplifiers circuit may be broken.

[B] The PROT_2 (pin2) is the port to detect abnormalities of the power supply circuit

(1) Detection of an abnormality in the pre-amplifier power supply circuit.
This port monitors the midpoint voltage between +15V and -15V. If the voltage at the connection point of [**R8151, R8152**] exceeds DC ± 1.2V, [**Q8151 or Q8152**] will turn on to change the signal from the "**PROT_2**" to "**Hi → Lo**".

(2) Detects abnormalities in the power supply circuit of the TONE circuit.
Monitors TONE circuit power supply midpoint voltage between +7V and -7V, and if the [**R2555, R2556**] or [**R8151, R8152**] connection point voltage exceeds around ± 0.9V (DC), the [**Q2553 or Q2555**] turns on and "**PROT_2**" changes from "**Hi → Lo**".

(3) Detects abnormalities in the power supply circuit within the POWER PCB.
① Detects over-voltage (+9V or more) in +3.3VD of the DIGITAL circuit power supply, then [**Q8551**] turns on and "**PROT_2**" changes from "**Hi → Lo**".
② Monitors DIGITAL circuit power supply midpoint voltage between +12V and -12V, and if the [**R8551, R8552**] connection point voltage exceeds 0.9V, [**Q8552 or Q8553**] turns on and "**PROT_2**" changes from "**Hi → Lo**".
③ Detects short circuits in +24V or +8V of the relay power supply, then [**Q8554**] turns on and "**PROT_2**" changes from "**Hi → Lo**".

(4) Detects abnormalities in the OLED power supply circuit
① Detects short circuits in +17V of the OLED power supply, then [**Q1024**] turns on and "**PROT_2**" changes from "**Hi → Lo**".
② Detects over-voltage in +17V of the OLED power supply, then [**Q1026**] turns on and "**PROT_2**" changes from "**Hi → Lo**".

When the abnormality mentioned in (1) or (4) is detected, "**POW_1 : pin72**" and "**POW_2 : pin73**" change from "**Hi → Lo**" and power relay [**S8801, S8802**] immediately turns off and shuts down.
The STANDBY indicator flickers to inform that an error has occurred.
This protection operation is intended for when a breakdown of the power supply circuit occurs and immediately shuts off the power in order to avoid the risk of damage.

To check whether the power supply circuit is broken, turn off the unit, then wait for about 1 minute and turn it on again.
This action will deactivate the protection operation.
If the "**PROT_2**" remains in the "**Lo**" abnormal state, which constitutes an abnormality, the unit shuts down approximately 5 seconds later and the STANDBY indicator starts flickering.
If the protection operation is not deactivated even after the power is turned on again, the power supply circuit may be broken.

[C] PROT_4(FATAL,pin31) is the port for detecting a power amplifier abnormality or SMPS abnormality

(1) Detection of an abnormality in the DC offset voltage from the Speaker Output terminal.
If the voltage from the Speaker Output terminal exceeds approximately 1.7V (DC), [**Q6501, Q96705, Q6706**] will turn on, then the signal from the "**PROT_4**" will change to "**Lo → Hi**".

(2) Detects sudden SMPS voltage drops.
If SMPS ± HV falls below ± 27V, [**Q6501, Q6808**] turns on and "**PROT_4**" changes from "**Lo → Hi**".

When the abnormality mentioned in (1) or (2) is detected, "**POW_1 : pin72**" and "**POW_2 : pin73**" change from "**Hi → Lo**" and power relay [**S8801, S8802**] immediately turns off and shuts down.
The STANDBY indicator flickers to inform that an error has occurred.
This protection operation is intended for when a breakdown of the Amplifiers circuit or the SMPS occurs and immediately shuts off the power in order to avoid the risk of damage.

To check whether the amplifiers circuit or the SMPS is broken, turn off the unit, then wait for about 1 minute and turn it on again.
This action will deactivate the protection operation.
If the "**PROT_4**" remains in the "**Hi**"abnormal state, which constitutes an abnormality, the unit shuts down approximately 4 seconds later and the STANDBY indicator starts flickering.
If the protection operation is not deactivated even after the power is turned on again, the amplifiers circuit or the SMPS may be broken.

[D] PROT_5(READY,pin40) is the port for detecting abnormalities in the SMPS and power amplifier

(1) Detection of an abnormality in the power amplifiers power supply circuit (± HV).
If undervoltage (around 30V) or overvoltage (around 101V) is detected for the ± HV of the power amplifier power supply (SMPS), [**Q6003, Q6004**] turns off and "**PROT_5**" changes from "**Lo → Hi**".

(2) Detection of an abnormality in the power amplifiers power supply circuit (VDR).
If undervoltage (around 13.5V) or overvoltage (around 19V) is detected for the VDR of the power amplifier power supply (SMPS), [**Q6003, Q6004**] turns off and "**PROT_5**" changes from "**Lo → Hi**".

(3) Detection of abnormal temperature increase in the power amplifier.
If an abnormal temperature increase (around 90° C or higher) is detected near the thermistor of the power amplifier, [**Q6003, Q6004**] turns off and "**PROT_5**" changes from "**Lo → Hi**".

(4) Detection of overcurrent in the power amplifier.
When an overcurrent (around 26A or higher) is detected in the power amplifier, [**Q6003, Q6004**] turns off and "**PROT_5**" changes from "**Lo → Hi**".

When the abnormality mentioned in (1) or (4) is detected, "**POW_1 : pin72**" and "**POW_2 : pin73**" change from "**Hi → Lo**" and power relay [**S8801, S8802**] immediately turns off and shuts down.
The STANDBY indicator flickers to inform that an error has occurred.
This protection operation is intended for when a breakdown of the Amplifiers circuit or the SMPS occurs and immediately shuts off the power in order to avoid the risk of damage.

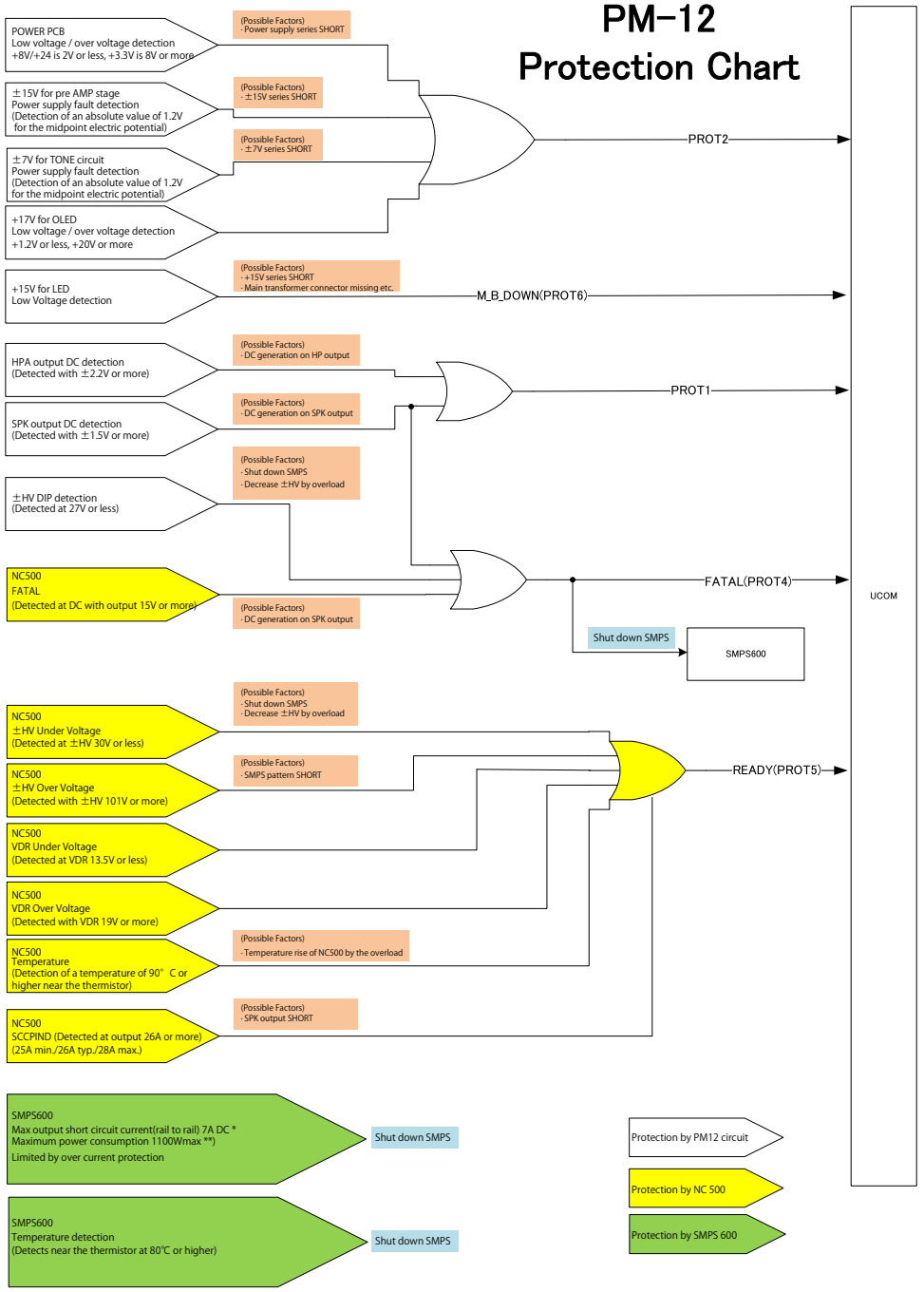
To check whether the amplifiers circuit or the SMPS is broken, turn off the unit, then wait for about 1 minute and turn it on again.
This action will deactivate the protection operation.
If the "**PROT_5**" remains in the "**Hi**"abnormal state, which constitutes an abnormality, the unit shuts down approximately 4 seconds later and the STANDBY indicator starts flickering.
If the protection operation is not deactivated even after the power is turned on again, the amplifiers circuit or the SMPS may be broken.

[E] The PROT_6(M_B_DOWN, pin75) is the port to detect abnormalities of the power supply circuit

(1) Detects abnormalities in the power supply circuit of the DIGITAL circuit.
Detects voltage reduction (about 6.6V) in +12V of the DIGITAL circuit power supply, then [**Q1006, Q1007**] turns off and "**PROT_6**" changes from "**Hi → Lo**".

If "**PROT_6**" changes from "**Hi → Lo**" when the above abnormality is detected, the protection circuit activates. "**POW_1 : pin72**" and "**POW_2 : pin73**" change from "**Hi → Lo**" and power relay [**S8801, S8802**] immediately turns off and shuts down.
The STANDBY indicator flickers to inform that an error has occurred.
This protection operation is intended for when a breakdown of the power supply circuit occurs and immediately shuts off the power in order to avoid the risk of damage.

To check whether the power supply circuit is broken, turn off the unit, then wait for about 1 minute and turn it on again.
This action will deactivate the protection operation.
If the "**PROT_6**" remains in the "**Lo**" abnormal state, which constitutes an abnormality, the unit shuts down approximately 3 seconds later and the STANDBY indicator starts flickering.
If the protection operation is not deactivated even after the power is turned on again, the power supply circuit or main transformer may be broken.



PROCEDURE AFTER REPLACING THE U-COM, ETC.

PROCEDURE AFTER REPLACING THE U-COM, ETC.

The procedure after replacing the u-COM (microprocessor), flash ROM, etc. is as follows.

PCB Name	Ref. No.	Description	Procedure after Re-placement	Remark
UCOM	U1001	R5F100MHAFA	A	SOFTWARE : System

Procedure after Replacement

A : The software has been written. The software is not written at the time of replacement.

B : The software has been written. The software may need to be rewritten by version updates. Check the version.

C : The software has not been written. The software needs to be written after replacement.

D : The software has been written. Be sure to rewrite with the latest software for your service region.

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