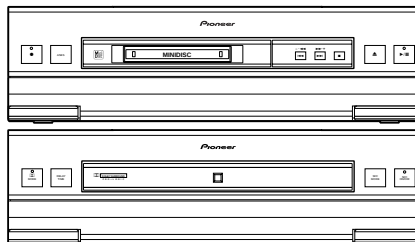


Service Manual

Pioneer



ORDER NO.
RRV1986

MINIDISC RECORDER

MJ-L5

SURROUND PROCESSOR

SP-L5

- This products is a system component. It combined the following components.

MINIDISC RECORDER MJ-L5

SURROUND PROCESSOR SP-L5

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model		Power Requirement	Remarks
	MJ-L5	SP-L5		
MYXK	○	○	AC220-230V	
NVXK	○	○	AC230V	

- This products is a system component.

For the system composition, refer to the service manual RRV1997 for XC-L5.

- This product does not operate normally by itself. Please connect it to the STEREO CD RECEIVER XC-L5, for adjustment and operation inspection. Otherwise damage may result.

CONTENTS

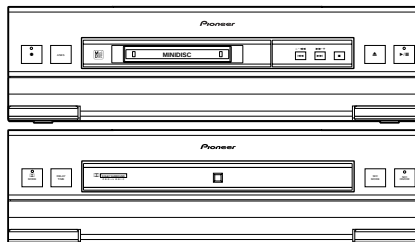
1. SAFETY INFORMATION	2	7. GENERAL INFORMATION	59
2. EXPLODED VIEWS AND PARTS LIST	3	7.1 IC	59
3. SCHEMATIC DIAGRAM	14	7.2 DIAGNOSIS	75
4. PCB CONNECTION DIAGRAM	32	7.3 DISASSEMBLY	77
5. PCB PARTS LIST	44	7.4 BLOCK DIAGRAM	82
6. ADJUSTMENT	49	8. PANEL FACILITIES AND SPECIFICATIONS	84

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS SERVICE, INC. P.O. Box 1760, Long Beach, CA 90801-1760, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 501 Orchard Road, #10-00 Wheelock Place, Singapore 238880
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Service Manual

Pioneer



ORDER NO.
RRV2087

MINIDISC RECORDER

MJ-L5

SURROUND PROCESSOR

SP-L5

- This products is a system component. It combined the following components.

MINIDISC RECORDER MJ-L5

SURROUND PROCESSOR SP-L5

THIS MANUAL IS APPLICABLE TO THE FOLLOWING MODEL(S) AND TYPE(S).

Type	Model		Power Requirement	Remarks
	MJ-L5	SP-L5		
KUXK/CA	O	O	AC120V	

- This products is a system component.
For the system composition, refer to the service manual RRV2080 for XC-L5.
- This product does not operate normally by itself. Please connect it to the STEREO CD RECEIVER XC-L5, for adjustment and operation inspection. Otherwise damage may result.

CONTENTS

1. SAFETY INFORMATION	2	7. GENERAL INFORMATION	59
2. EXPLODED VIEWS AND PARTS LIST	3	7.1 IC	59
3. SCHEMATIC DIAGRAM	14	7.2 DIAGNOSIS	75
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PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936
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1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.

IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

Health & Safety Code Section 25249.6 – Proposition 65

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 32 mw
WAVELENGTH: 785 nm

NOTICE

(FOR CANADIAN MODEL ONLY)

Fuse symbols  (fast operating fuse) and/or  (slow operating fuse) on PCB indicate that replacement parts must be of identical designation.

REMARQUE

(POUR MODÈLE CANADIEN SEULEMENT)

Les symboles de fusible  (fusible de type rapide) et/ou  (fusible de type lent) sur CCI indiquent que les pièces de remplacement doivent avoir la même désignation.

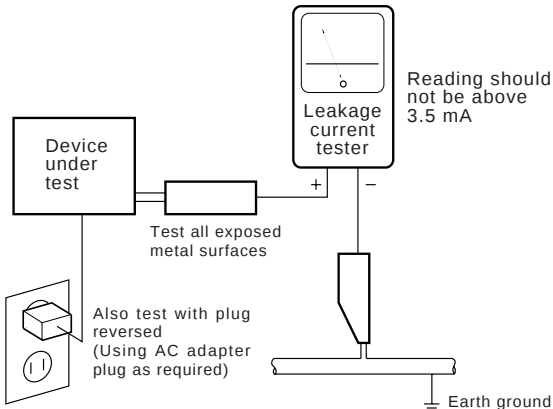
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60 Hz outlet and turn the AC power switch on. Any current measured must not exceed 3.5 mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage , etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a  on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

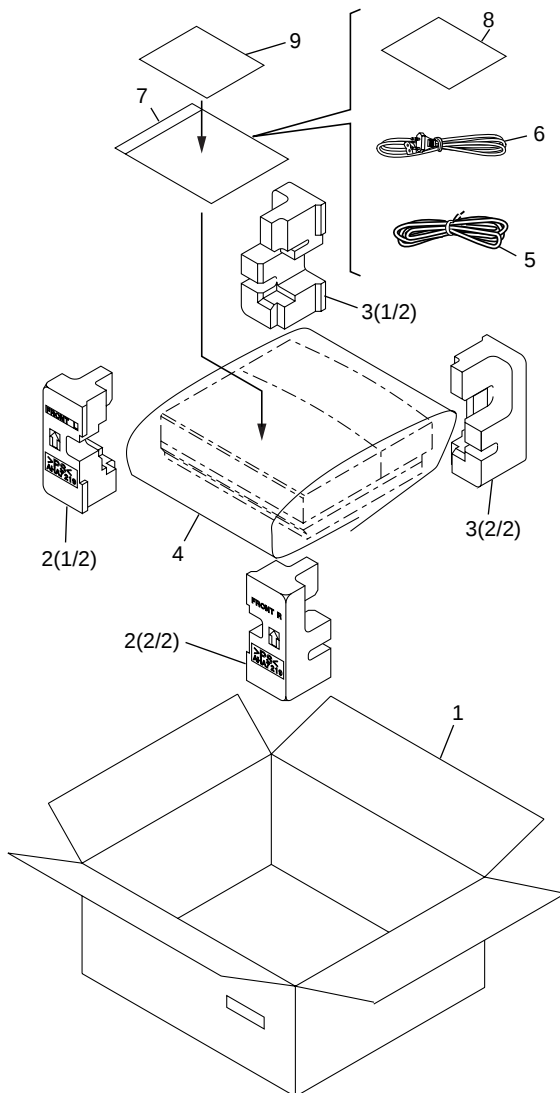
Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. EXPLODED VIEWS AND PARTS LIST

NOTES: ● Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
 ● The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
 ● Screws adjacent to $\blacktriangledown$ mark on the product are used for disassembly.

2.1 MINIDISC RECORDER (MJ-L5)

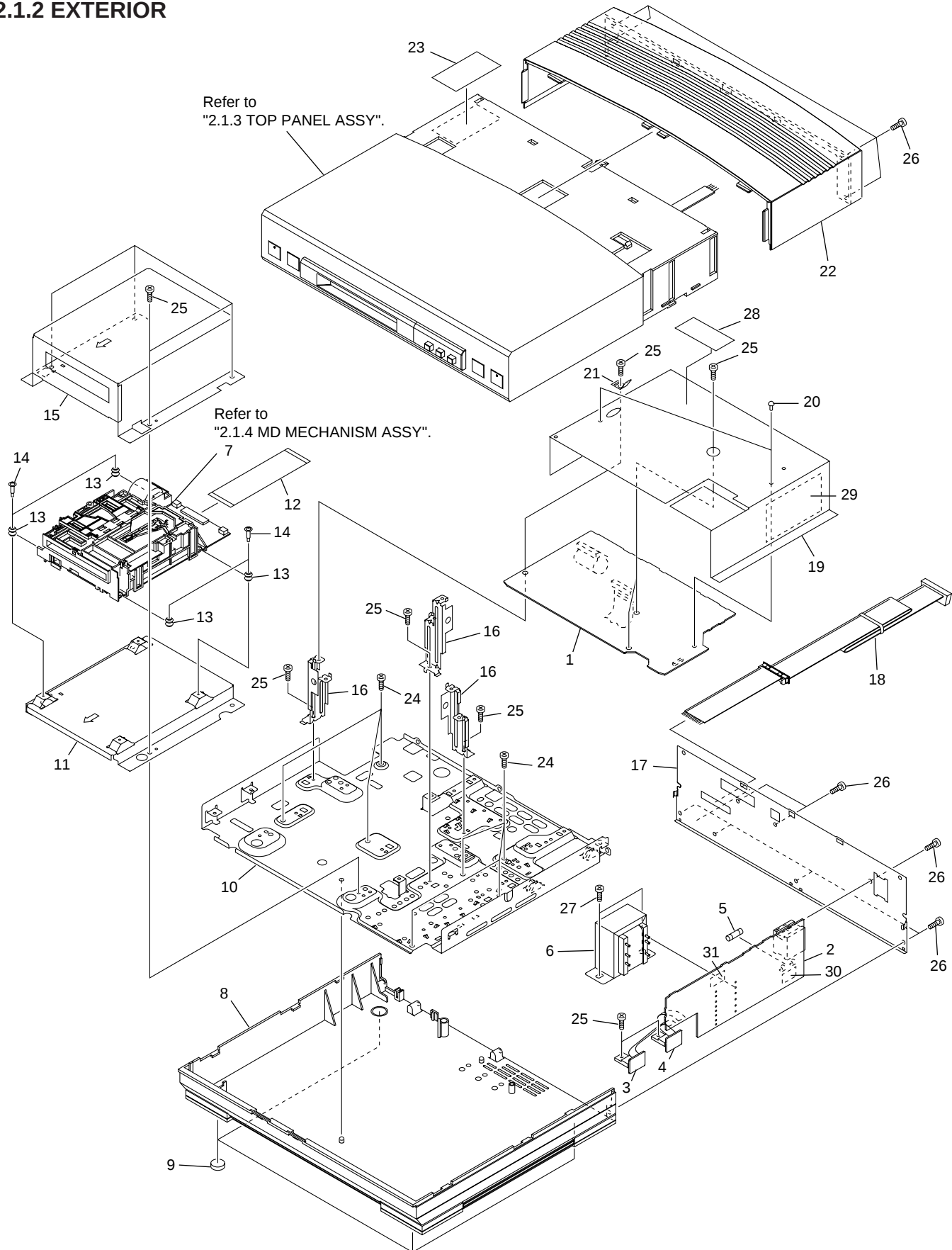
2.1.1 PACKING



PACKING PARTS LIST

Mark	No.	Description	Part No.
	1	Packing Case	AHD7735
	2	Pad F	AHA7219
	3	Pad R	AHA7220
	4	Sheet (750×600×0.5)	Z23-007
	5	Optical Fiber Cable	RKX1031
Δ	6	Power Cord	ADG7022
	7	Polyethylene Bag (0.03×230×340)	Z21-038
	8	Operating Instructions (English/French)	ARE7207
NSP	9	Warranty Card	ARY7023

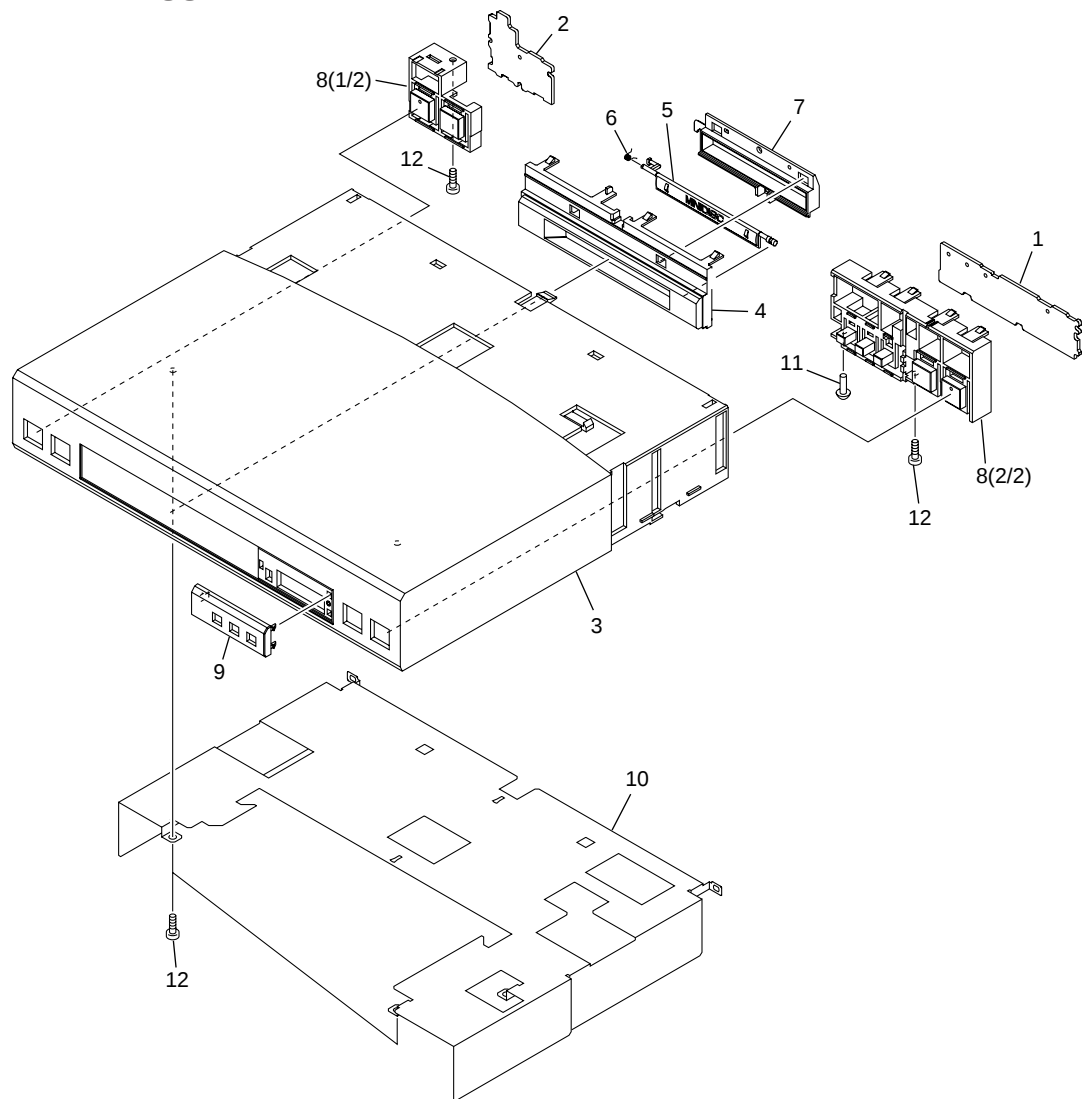
2.1.2 EXTERIOR



EXTERIOR PARTS LIST

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	MD MAIN Unit	AWU7125		16	Angle	ANG7189
	2	MD TRANS Unit	AWU7126		17	Rear Panel	ANC7802
	3	MD REG1 Unit	AWU7154	△	18	Cord With Plug (J1)	ADE7026
	4	MD REG2 Unit	AWU7155		19	Shield Barrier	AEC7164
△	5	Fuse (FU1 : 400mA/125V)	VEK1008		20	Rivet	VEC1178
△	6	Power Transformer (T1)	ATT7036		21	Earth Plate	ANG7168
NSP	7	MD MECHANISM Assy	AXA7069		22	Bonnet	AMA7007
	8	Bottom Base	AMA7006		23	*****	
	9	Leg	AEB7090		24	Screw	BPZ30P060FZK
NSP	10	Bottom Plate	ANF7010		25	Screw	BBZ30P060FMC
	11	MD Base	ANG7191		26	Screw	VPZ30P080FZK
	12	30P F•F•C/30V	ADD7097		27	Screw	BBZ40P060FMC
	13	Float Rubber	REB1328		28	65 Label	ARW7050
	14	Float Screw	RBA1133		29	Barrier MD	AEC7184
	15	MD Shield	ANG7192	NSP	30	Fuse Card	AAX7691
				NSP	31	Fuse Caution B	AAX7699

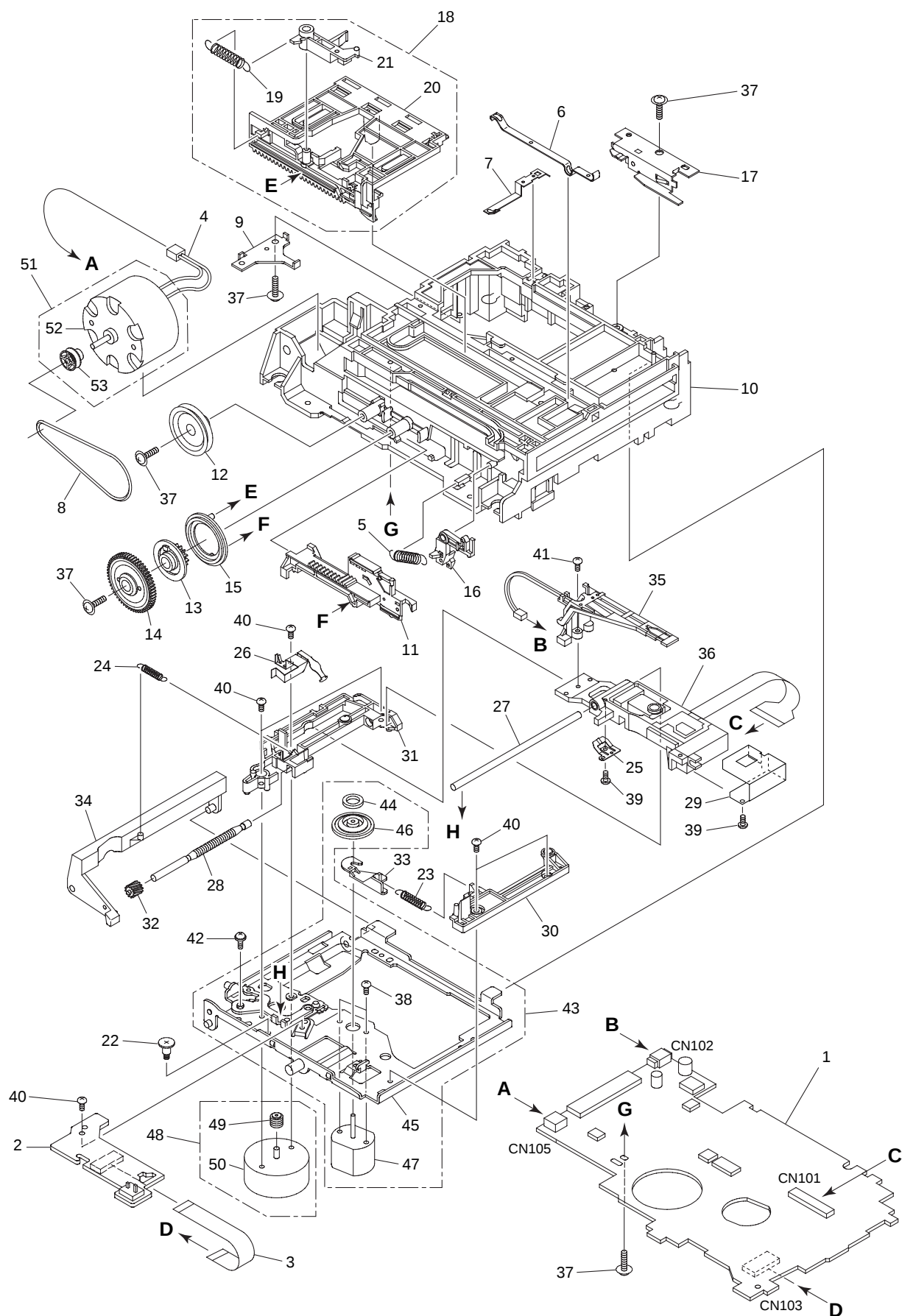
2.1.3 TOP PANEL ASSY



● TOP PANEL ASSY PARTS LIST

Mark	No.	Description	Part No.
NSP	1	MD KEYR Unit	AWU7108
	2	MD KEYL Unit	AWU7109
	3	Top Panel	AMB7515
	4	Sub Panel MD	AAP7049
	5	MD Flap	AAN7186
	6	MD Spring	ABH7154
	7	Flap Plate	AAT7003
	8	Button X Assy	AWL7034
	9	Sub Panel	AAP7058
	10	Top Plate	ANK7042
NSP	11	Rivet	VEC1178
	12	Screw	VPZ30P080FZK

2.1.4 MD MECHANISM ASSY

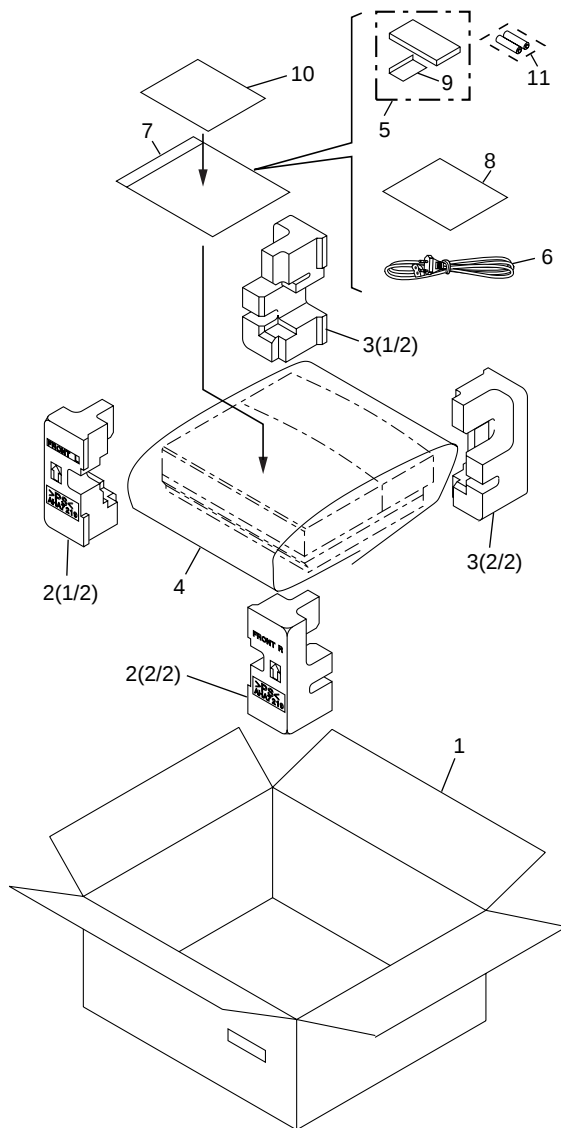


● MD MECHANISM ASSY PARTS LIST

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	MD CORE MAIN Unit	RWZ4326		31	S. Holder	RNK2307
	2	MD CORE SW Unit	RWZ4272		32	Worm Wheel	RNK2309
	3	Lead Card 7P	RDD1399		33	Hook	RNK2310
	4	Lead Wire	RKP1814		34	Head Lifter	RNK2311
	5	Lever Spring	RBH1463		35	MD Head	RPB1062
	6	Clamp Spring 1	RBK1074		36	MD Pickup	RWY1018
	7	Clamp Spring 2	RBK1075		37	Screw	IPZ20P080FMC
	8	Loading Belt	REB1329		38	Screw	JFZ17P020FZK
	9	Lock Plate	RNE1949		39	Screw	JGZ14P020FMC
	10	Loading Base	RNK2312		40	Screw	JGZ17P030FMC
	11	Under Slider	RNK2314		41	Screw	JGZ17P040FZK
	12	Gear Pulley	RNK2316		42	Screw	PMB20P040FMC
	13	Drive Gear	RNK2317		43	Servo Base Assy	REA1283
	14	Clutch Gear	RNK2318	NSP	44	Clamp Magnet	RMF1002
	15	Flip Disk	RNK2319	NSP	45	Servo Base	RNE1946
	16	SW Lever	RNK2320	NSP	46	Disc Table	RNK2305
	17	Shutter Assy	RXA1774	NSP	47	Spindle Motor	RXM1091
NSP	18	Upper Slider Assy	RXA1775		48	Carriage Motor Assy	REA1284
	19	Eject Spring	RBH1461		49	Worm	RNK2308
	20	Upper Slider	RNK2313	NSP	50	Carriage Motor	RXM1090
	21	Carrier	RNK2315		51	Loading Motor Assy	REA1285
	22	Screw	RBA1129		52	DC Motor /0.75W	PXM1010
	23	Spindle Spring	RBH1460		53	CA Pulley (1)	VNL1197
	24	Lifter SP	RBH1462				
	25	Screw Guide	RBK1072				
	26	S. H. Spring	RBK1073				
	27	Guide Shaft	RLA1312				
	28	Lead Screw	RLA1311				
	29	Shield Case	RNE1950				
	30	Reference Plate	RNK2306				

2.2 SURROUND PROCESSOR (SP-L5)

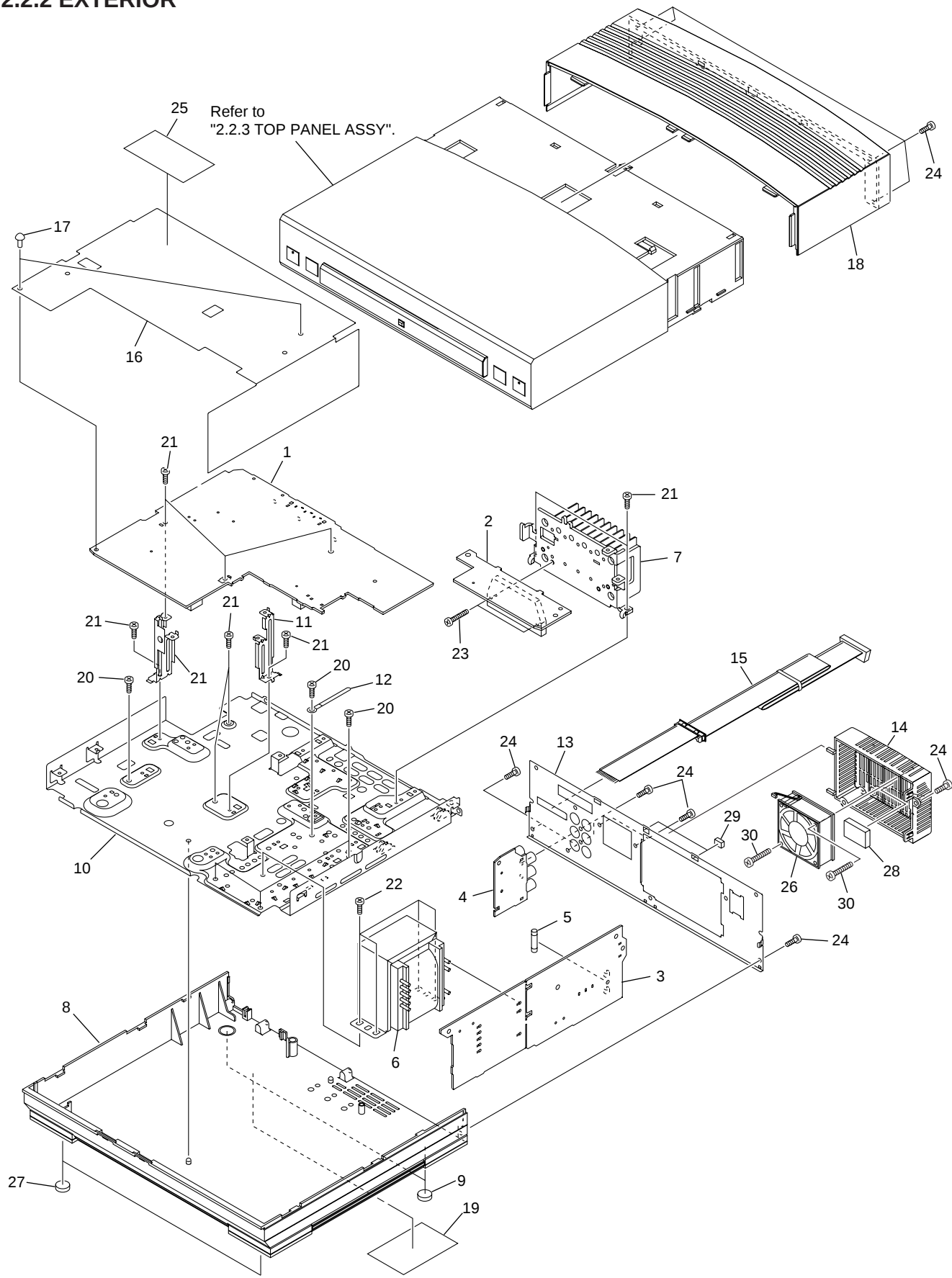
2.2.1 PACKING



PACKING PARTS LIST

Mark	No.	Description	Part No.
	1	Packing Case	AHD7736
	2	Pad F	AHA7219
	3	Pad R	AHA7220
	4	Sheet (750×600×0.5)	Z23-007
	5	Remote Control Unit (CU-SP005)	AXD7171
△	6	Power Cord	ADG7022
	7	Polyethylene Bag (0.03×230×340)	Z21-038
	8	Operating Instructions (English/French)	ARE7206
	9	Battery Cover	AZA7050
NSP	10	Warranty Card	ARY7023
NSP	11	Dry Cell Battery (R03,AAA)	VEM1018

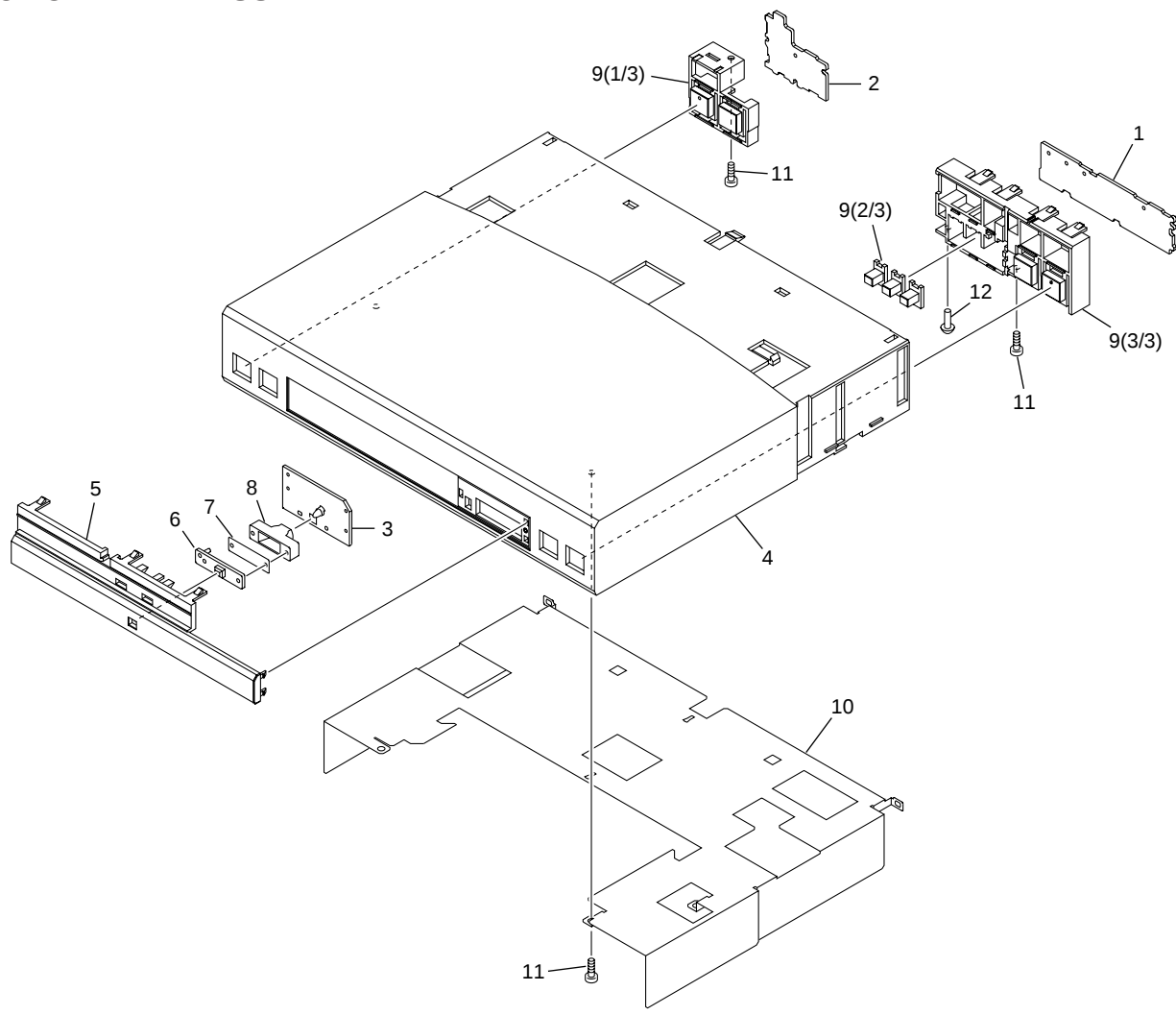
2.2.2 EXTERIOR



(1) EXTERIOR PARTS LIST

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	PRO MAIN Unit	AWU7122		16	Top Barrier	AEC7151
	2	PRO AMP Unit	AWU7102		17	Rivet	VEC1178
	3	PRO TRANS Unit	AWU7124		18	Bonnet	AMA7007
	4	PRO AUX Unit	AWU7146		19	Name Label	ARW7047
△	5	Fuse (FU1 : 1.6A/125V)	REK1077		20	Screw	BPZ30P060FZK
△	6	Power Transformer (T)	ATS7239		21	Screw	BBZ30P060FMC
NSP	7	Heat Sink	ANH7107		22	Screw	BBZ40P060FMC
	8	Bottom Base	AMA7009		23	Screw	BBZ30P140FMC
	9	Leg	AEB7090		24	Screw	VPZ30P080FZK
NSP	10	Bottom Plate	ANF7010		25	65 Label	ARW7050
	11	Angle	ANG7189		26	DC Fan Motor	AXM7003
	12	Cord Clamper	RNH-184		27	Front Leg	AEB7102
	13	Rear Panel	ANC7803		28	F Cushion	AEB7127
	14	Rear Case	AMR7207		29	Cussion Rubber	AEB7068
	15	Cord With Plug	ADE7026		30	Screw	BPZ30P300FMC

2.2.3 TOP PANEL ASSY



● TOP PANEL ASSY PARTS LIST

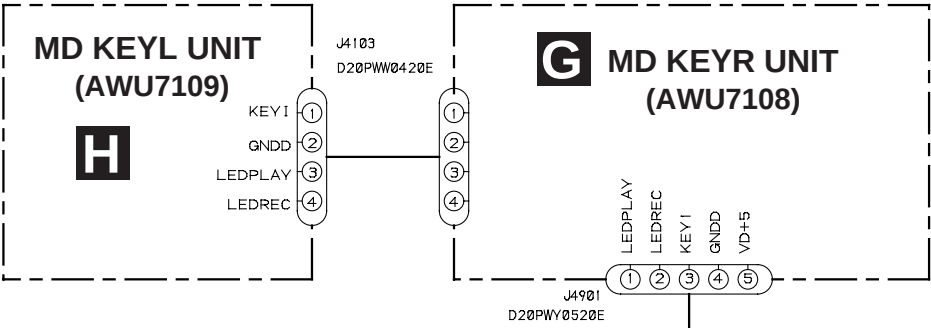
Mark	No.	Description	Part No.
NSP	1	PRO KEYR Unit	AWU7104
	2	PRO KEYL Unit	AWU7105
	3	PRO IND Unit	AWU7145
	4	Top Panel	AMB7516
	5	Sub Panel PR	AAP7050
	6	Lens D	AAX7640
	7	Illumination Filter	VEC1950
	8	Illumination Holder	VNK4098
	9	Button X Assy	AWL7035
	10	Top Plate	ANK7048
	11	Screw	VPZ30P080FZK
	12	Rivet	VEC1178

3. SCHEMATIC DIAGRAM

3.1 MINIDISC RECORDER (MJ-L5)

3.1.1 OVERALL CONNECTION DIAGRAM

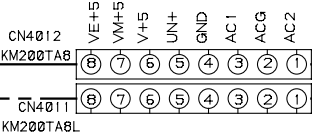
A



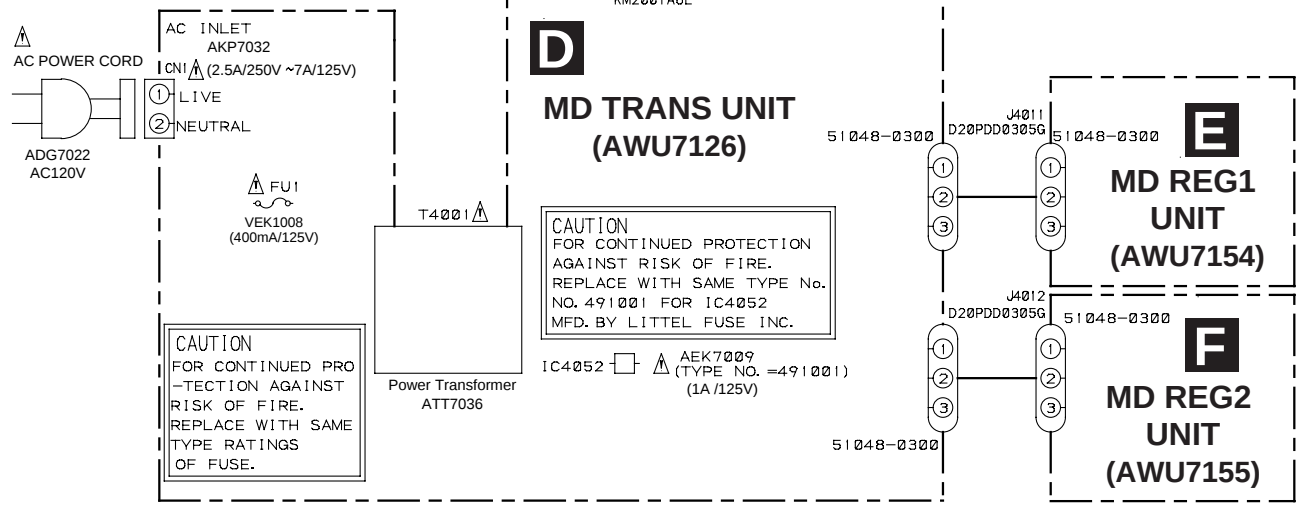
B



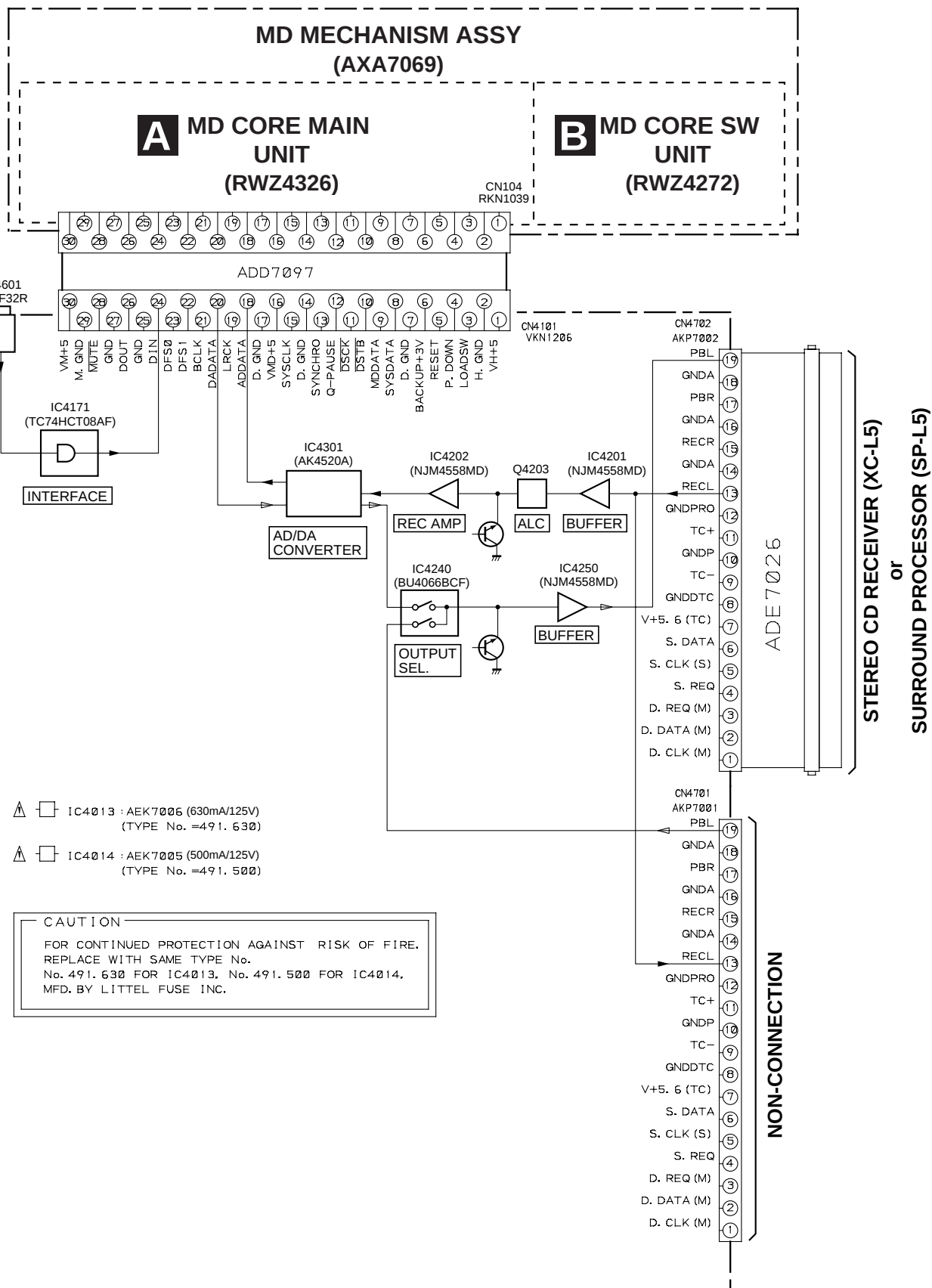
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D

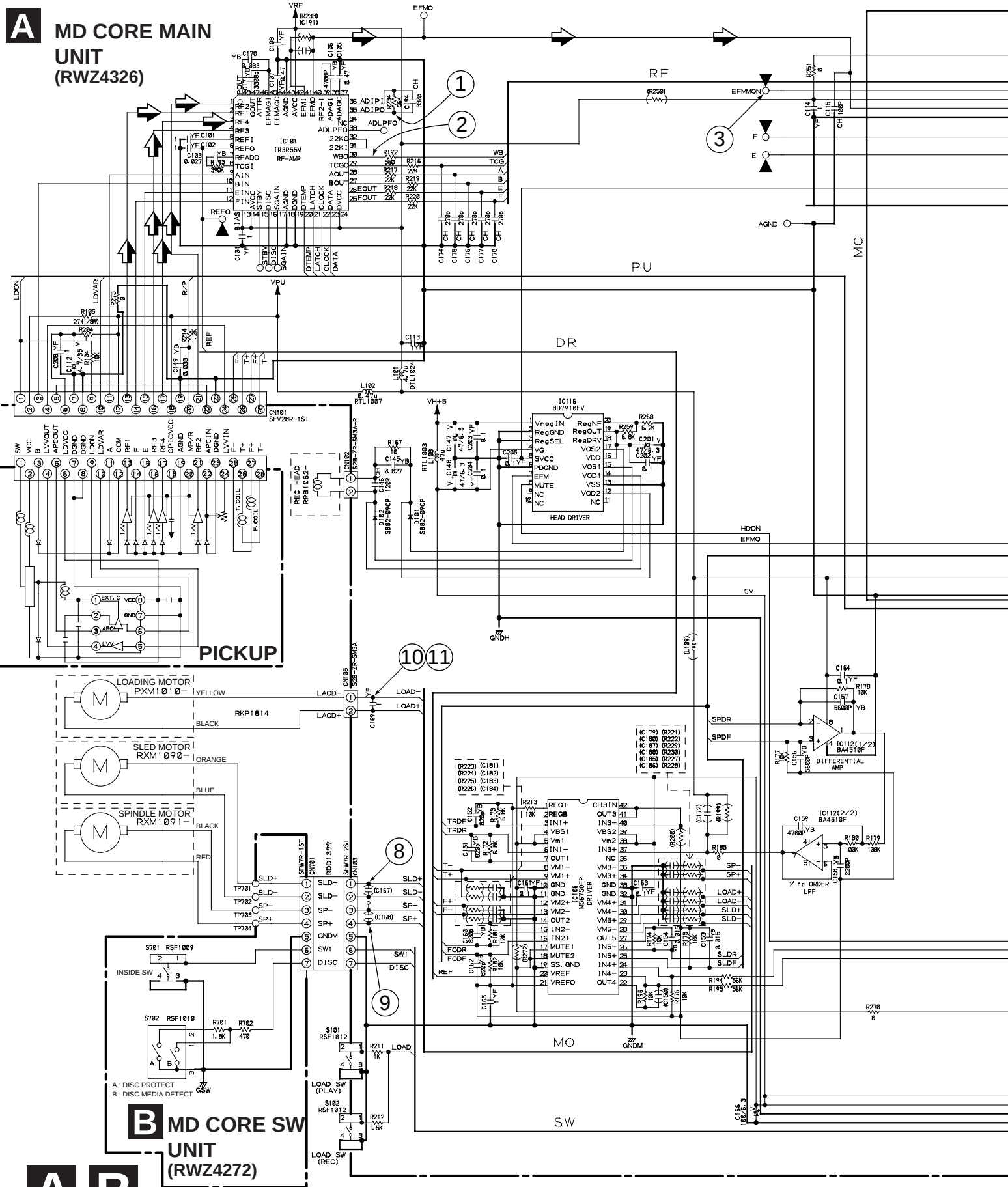


Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".



3.1.2 MD CORE MAIN and MD CORE SW UNITS

A MD CORE MAIN UNIT (RWZ4326)



B MD CORE SW UNIT (RWZ4272)

● ① – ⑪ are waveform numbers on pages 24 and 25.

SIGNAL ROUTE

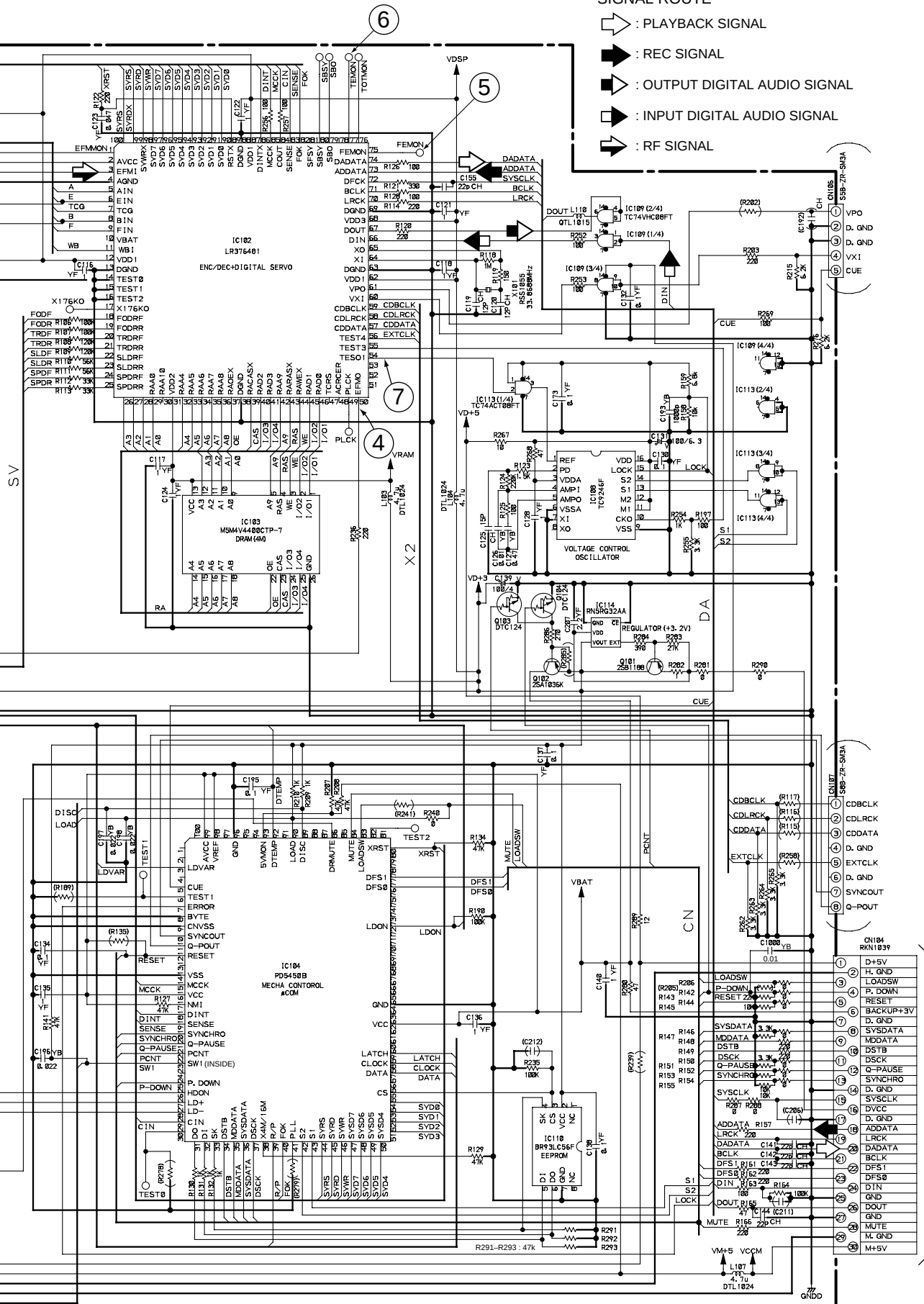
➡ : PLAYBACK SIGNAL

➡ : REC SIGNAL

➡ : OUTPUT DIGITAL AUDIO SIGNAL

➡ : INPUT DIGITAL AUDIO SIGNAL

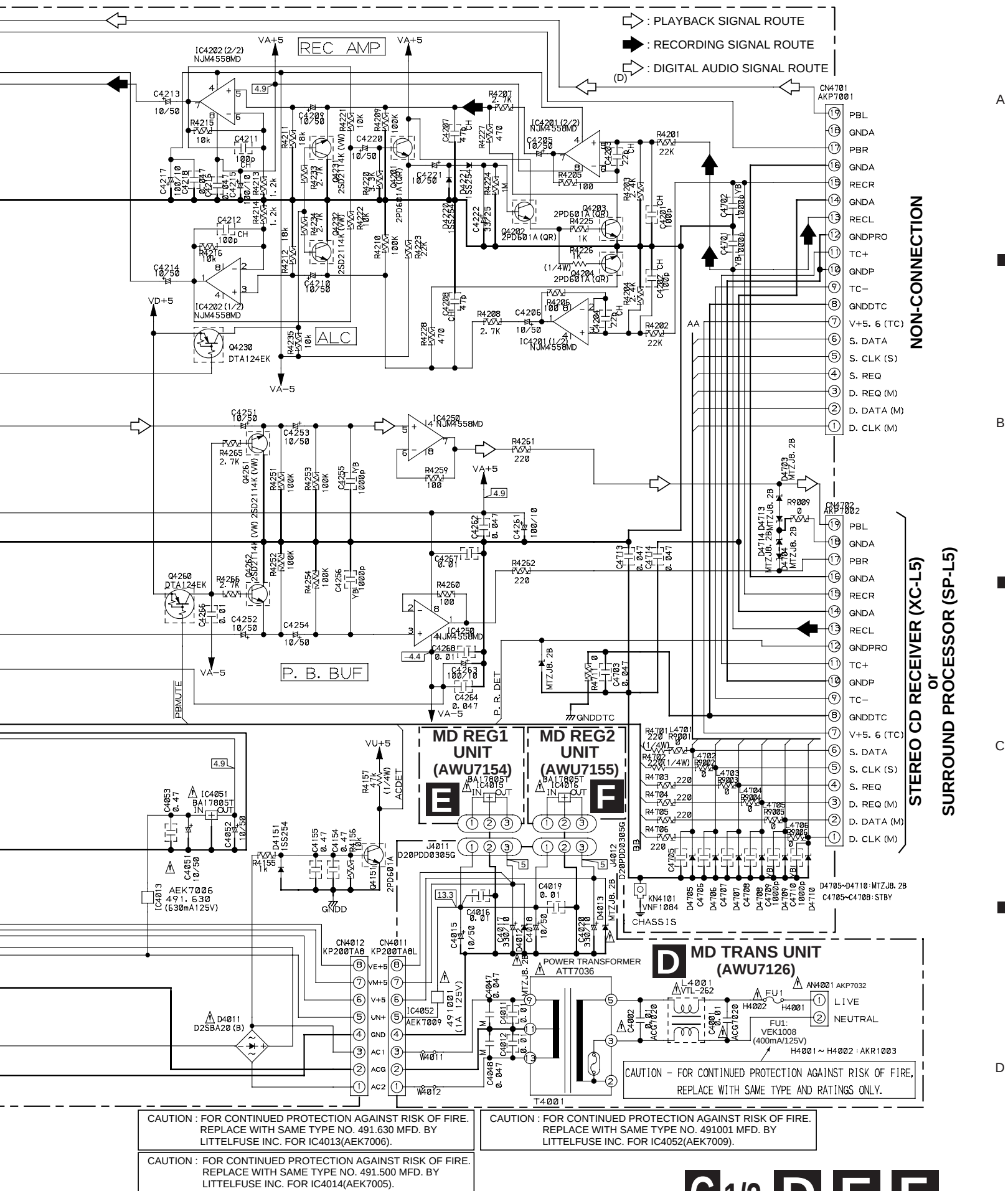
➡ : RF SIGNAL



C1/2 CN4101

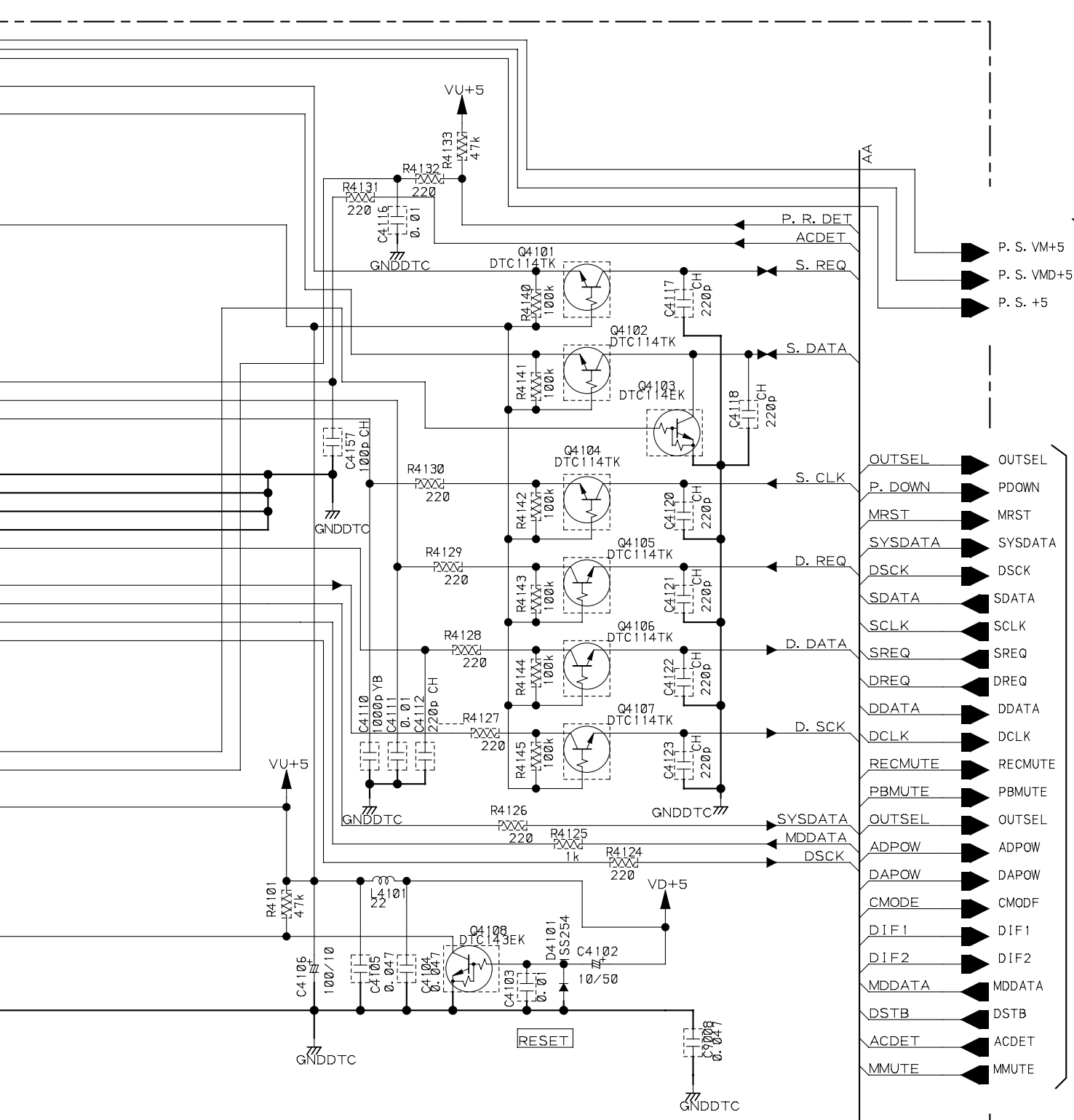
3.1.3 MD MAIN (1/2), MD TRANS, MD REG1 and MD REG2 UNITS





A





NOTES

ALL CAPACITORS ARE IN μF
UNLESS OTHERWISE SPECIFIED

TL : CFTLA M : CQVBA
HA : CQHA YB : CKCYB
SL : CCCSL
CH : CCSQCH YB : CKSQYB
SL : CCSQSL (OTHER: CKSQYF)
AL : CEAL ZA : CEZA
(OTHER: CEAT***M###)

ALL RESISTORS ARE IN Ω
XXX 1/10W (CHIP)
VV 1/4WPU
VM RD1/2VM

ALL INDUCTORS ARE IN μH
LAU

■ Voltages

A MD CORE MAIN UNIT

IC101	
PIN NO.	VOLTAGE
1	0.78V
2	0.73V
3	0.77V
4	0.75V
5	1.61V
6	1.61V
7	0.75V
8	1.61V
9	1.61V
10	1.61V
11	1.61V
12	1.61V
13	3.19V
14	3.19V
15	0V
16	0V
17	3.19V
18	0V
19	0V
20	1.5V
21	3.2V
22	0V
23	0V
24	3.19V
25	2.0V
26	0V
27	1.40V
28	1.42V
29	1.40V
30	1.63V
31	1.61V
32	1.61V
33	0V
34	0V
35	0V
36	1.62V
37	0.59V
38	1.61V
39	1.61V
40	1.61V
41	1.61V
42	3.19V
43	0V
44	1.08V
45	1.61V
46	1.61V
47	0V
48	0.74V

IC102			
PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
1	1.53V	51	1.59V
2	3.18V	52	0V
3	1.65V	53	0V
4	0V	54	1.59V
5	1.42V	55	1.8V
6	0V	56	0V
7	1.59V	57	0V
8	1.41V	58	0V
9	1.97V	59	0V
10	1.39V	60	0V
11	1.64V	61	0.56V
12	3.18V	62	3.18V
13	0V	63	0V
14	0V	64	1.5V
15	0V	65	1.5V
16	0V	66	3.2V
17	1.69V	67	1.6V
18	1.52V	68	3.2V
19	1.70V	69	0V
20	1.47V	70	1.6V
21	1.47V	71	1.6V
22	1.65V	72	1.48V
23	1.54V	73	0V
24	1.69V	74	0V
25	1.51V	75	1.68V
26	0.82V	76	1.82V
27	2.0V	77	1.59V
28	2.0V	78	0.35V
29	1.81V	79	0.02V
30	1.4V	80	3.2V
31	0.82V	81	3.2V
32	1.67V	82	0.02V
33	1.67V	83	0.03V
34	1.67V	84	1.9V
35	2.86V	85	1.56V
36	1.32V	86	3.1V
37	2.23V	87	3.2V
38	0V	88	0V
39	2.4V	89	3.19V
40	1.2V	90	0.5V
41	1.5V	91	0.5V
42	0V	92	0.5V
43	2.0V	93	0.5V
44	3.0V	94	0.9V
45	1.2V	95	0.5V
46	1.2V	96	0.5V
47	0.02V	97	0.5V
48	3.04V	98	0.8V
49	1.57V	99	3.18V
50	0.05V	100	0.06V

IC103	
PIN NO.	VOLTAGE
1	1.2V
2	1.2V
3	3.0V
4	2.0V
5	0V
9	2.23V
10	1.32V
11	2.86V
12	1.67V
13	3.18V
14	1.67V
15	1.67V
16	1.67V
17	2.86V
18	1.32V
22	2.23V
23	2.4V
24	1.2V
25	1.5V
26	0V

IC104			
PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
1	0V	51	0.54V
2	0V	52	0.6V
3	0.22V	53	0.6V
4	0.03V	54	0.6V
5	1.29V	55	0V
6	2.21V	56	0V
7	3.13V	57	0V
8	0V	58	0V
9	0V	59	3.2V
10	0V	60	0V
11	0V	61	0V
12	3.03V	62	3.2V
13	1.43V	63	0V
14	0V	64	0V
15	1.57V	65	3.2V
16	3.2V	66	0V
17	3.19V	67	0V
18	3.1V	68	0V
19	0.03V	69	0V
20	0V	70	0V
21	0V	71	0V
22	3.18V	72	3.1V
23	3.2V	73	3.2V
24	0V	74	0V
25	2.67V	75	0V
26	3.19V	76	3.2V
27	0V	77	0V
28	0V	78	0V
29	2.4V	79	0V
30	0.24V	80	3.2V
31	0V	81	0V
32	0.3V	82	3.19V
33	3.2V	83	0V
34	1.56V	84	3.19V
35	1.0V	85	0V
36	0V	86	3.18V
37	2.77V	87	3.2V
38	0V	88	0V
39	3.18V	89	1.03V
40	0.02V	90	1.6V
41	3.19V	91	0.56V
42	3.2V	92	1.49V
43	0V	93	1.49V
44	0.05V	94	0.68V
45	3.18V	95	0.61V
46	3.19V	96	0V
47	0.51V	97	0.53V
48	0.4V	98	3.2V
49	0.3V	99	3.2V
50	0.55V	100	0V

IC106	
PIN NO.	VOLTAGE
1	1.6V
2	0.49V
3	1.61V
4	4.99V
5	4.99V
6	1.61V
7	1.62V
8	2.46V
9	2.51V
10	0V
11	0V
12	2.54V
13	2.45V
14	1.62V
15	1.62V
16	1.61V
17	3.17V
18	0V
19	1.61V
20	1.61V
21	1.61V
22	1.61V
23	1.36V
24	1.36V
25	1.61V
26	1.61V
27	1.63V
28	2.41V
29	2.55V
30	2.47V
31	2.48V
32	0V
33	0V
34	2.79V
35	2.18V
36	0V
37	1.69V
38	5.0V
39	4.99V
40	1.67V
41	1.69V
42	1.69V

IC108	
PIN NO.	VOLTAGE
1	2.47V
2	2.63V
3	4.87V
4	2.63V
5	1.59V
6	0V
7	0V
8	4.87V
9	0V
10	2.25V
11	4.94V
12	4.94V
13	4.94V
14	4.94V
15	3.12V
16	4.94V

IC114	
PIN NO.	VOLTAGE
1	0V
2	4.19V
3	3.21V
4	2.81V
5	0V

IC109	
PIN NO.	VOLTAGE
1	2.77V
2	2.77V
3	3.2V
4	1.58V
5	1.58V
6	1.56V
7	0V
8	0V
9	0V
10	0V
11	0V
12	0V
13	0V
14	3.2V

IC116	
PIN NO.	VOLTAGE
1	4.98V
2	0V
3	0V
4	4.99V
5	3.2V
6	0V
7	0.03V
8	3.18V
9	0V
10	0V
11	0V
12	0.22V
13	0V
14	0.25V
15	0.25V
16	2.82V
17	0.16V
18	4.94V
19	2.82V
20	1.33V

IC110	
PIN NO.	VOLTAGE
1	0V
2	3.2V
3	0V
4	3.2V
5	0V
6	0.11V
7	0V
8	0V

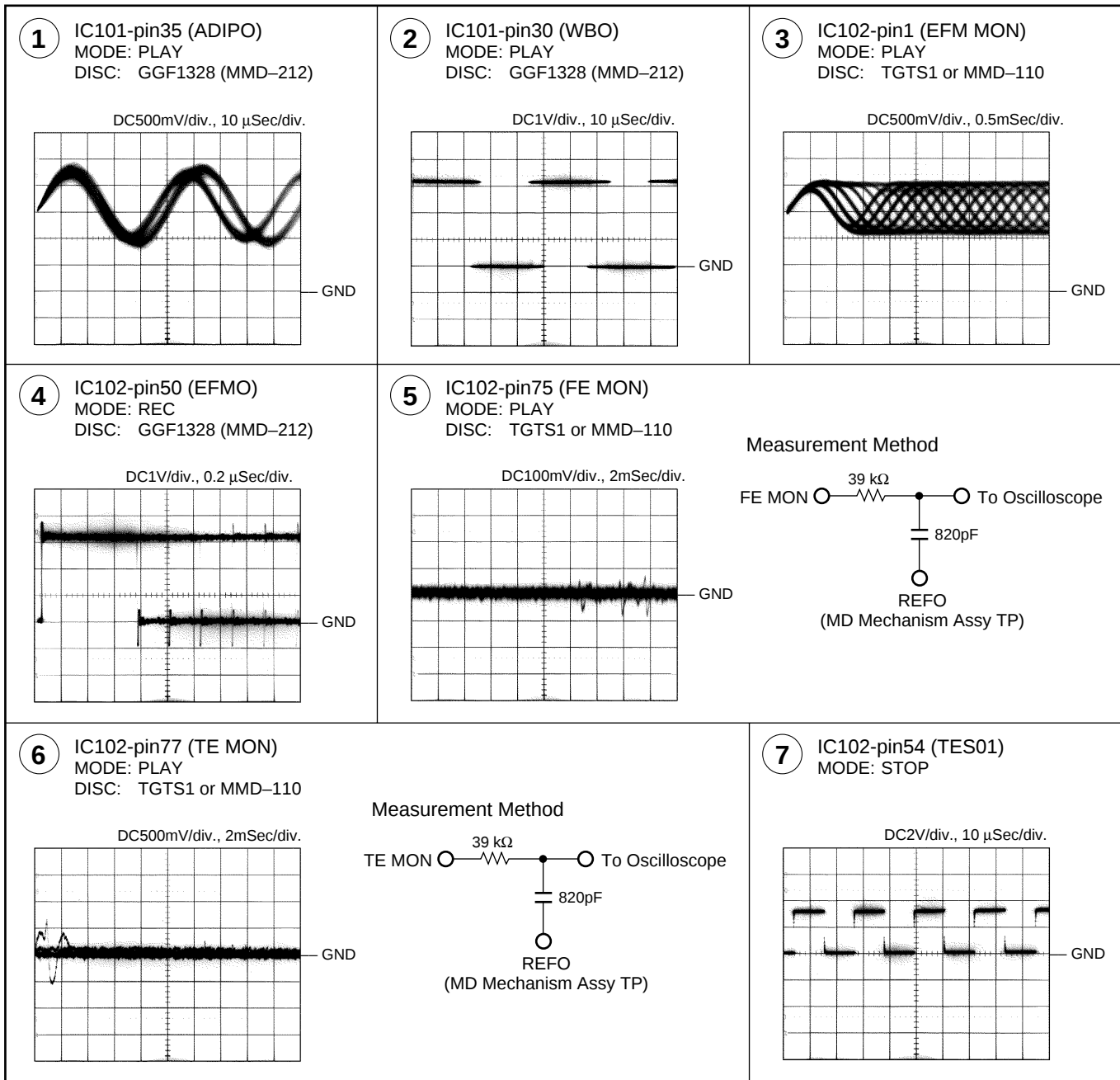
IC112	
PIN NO.	VOLTAGE
1	1.66V
2	1.62V
3	1.62V
4	0V
5	1.67V
6	1.67V
7	1.67V
8	3.19V

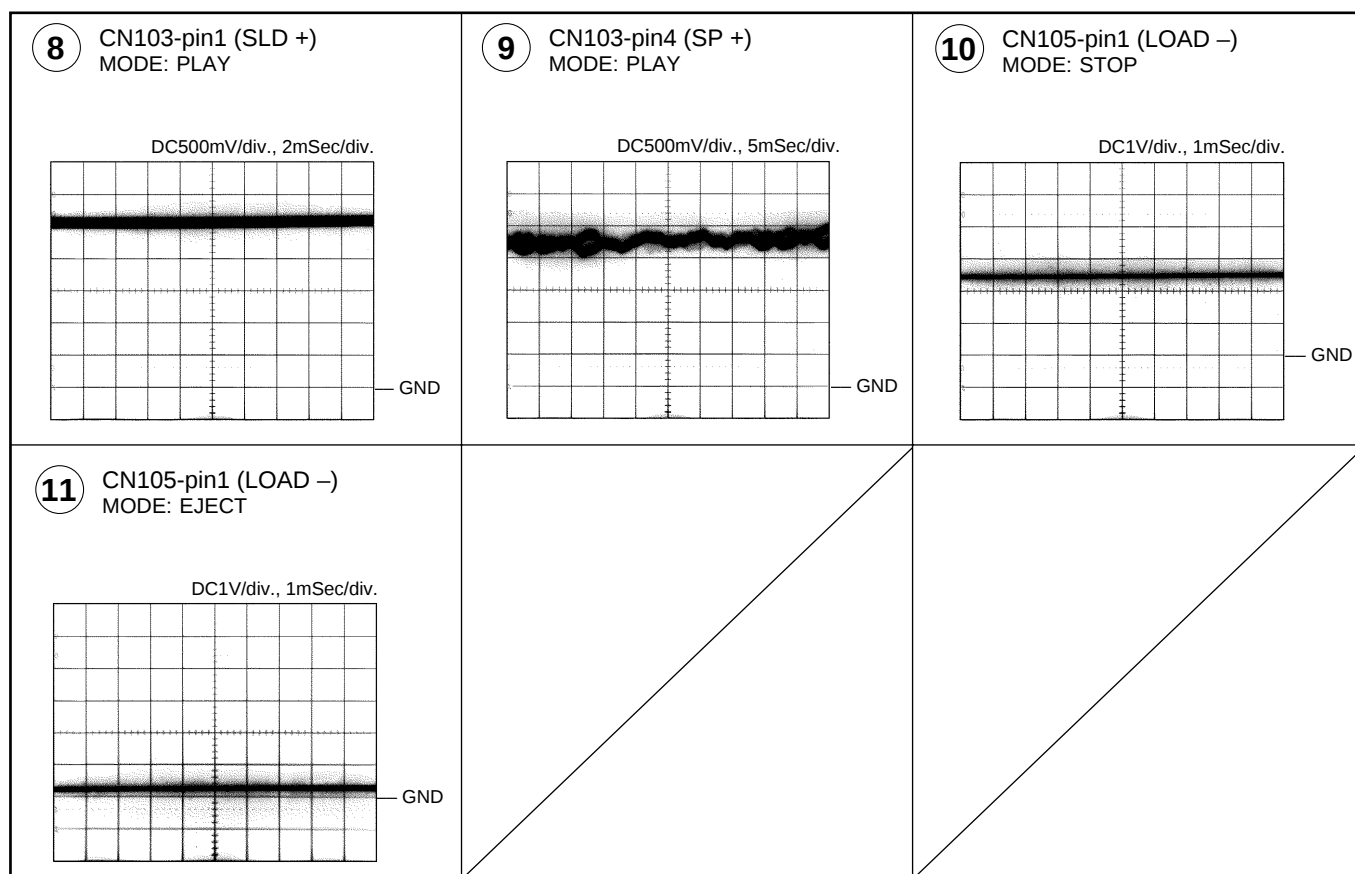
IC113	
PIN NO.	VOLTAGE
1	4.95V
2	3.96V
3	0V
4	0V
5	0V
6	0V
7	0V
8	0V
9	4.94V
10	4.12V
11	3.19V
12	0V
13	0V
14	4.94V

Waveforms

Note: The encircled numbers denote measuring point in the schematic diagram and the PCB connection diagram.

A MD CORE MAIN UNIT

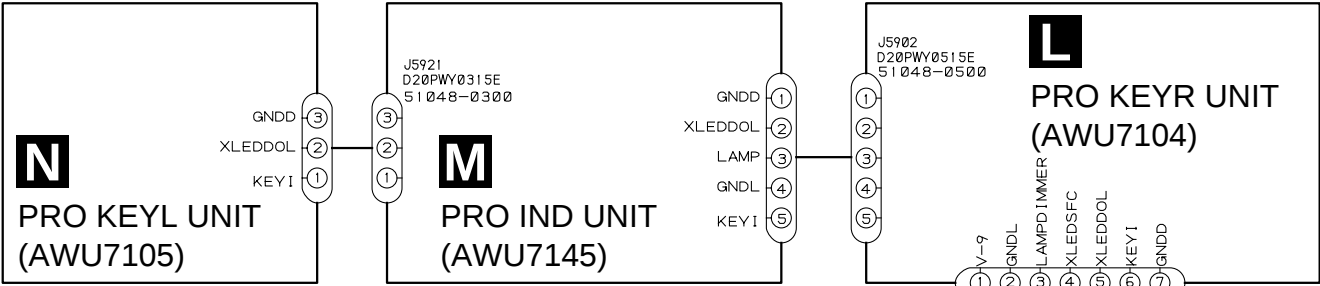




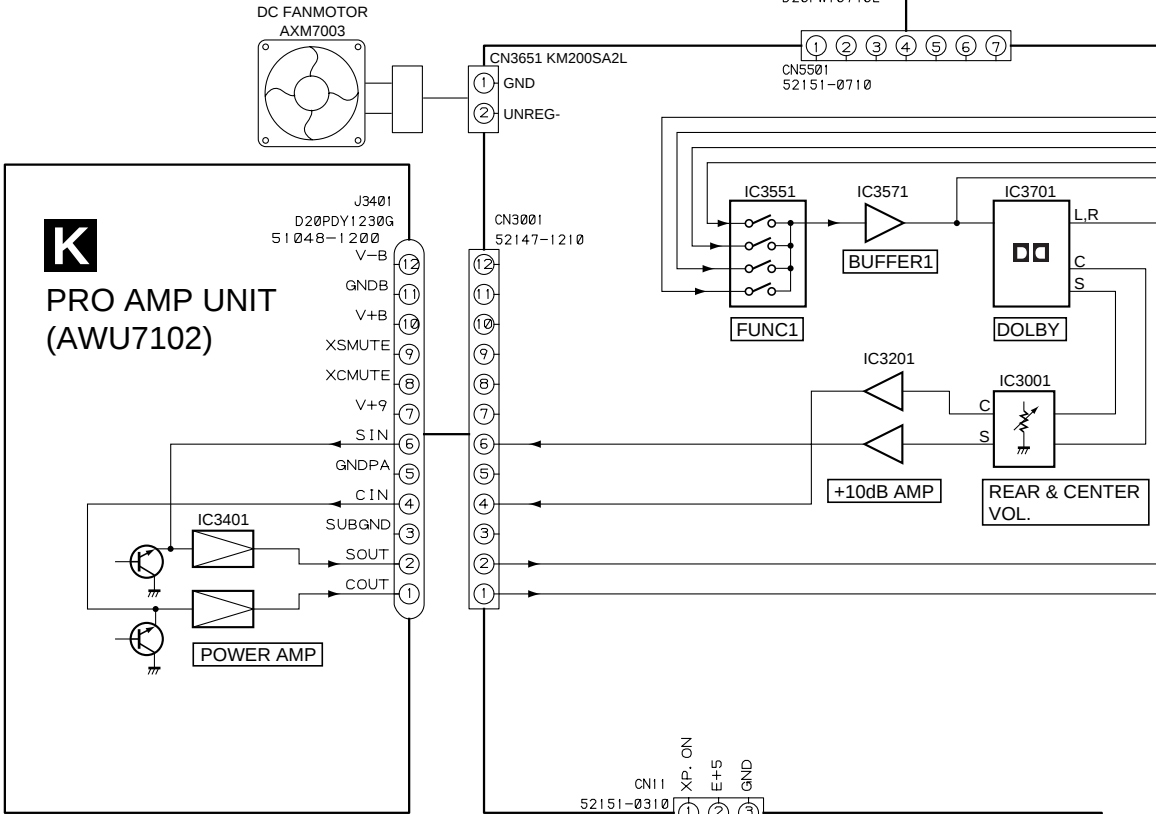
3.2 SURROUND PROCESSOR (SP-L5)

3.2.1 OVERALL CONNECTION DIAGRAM

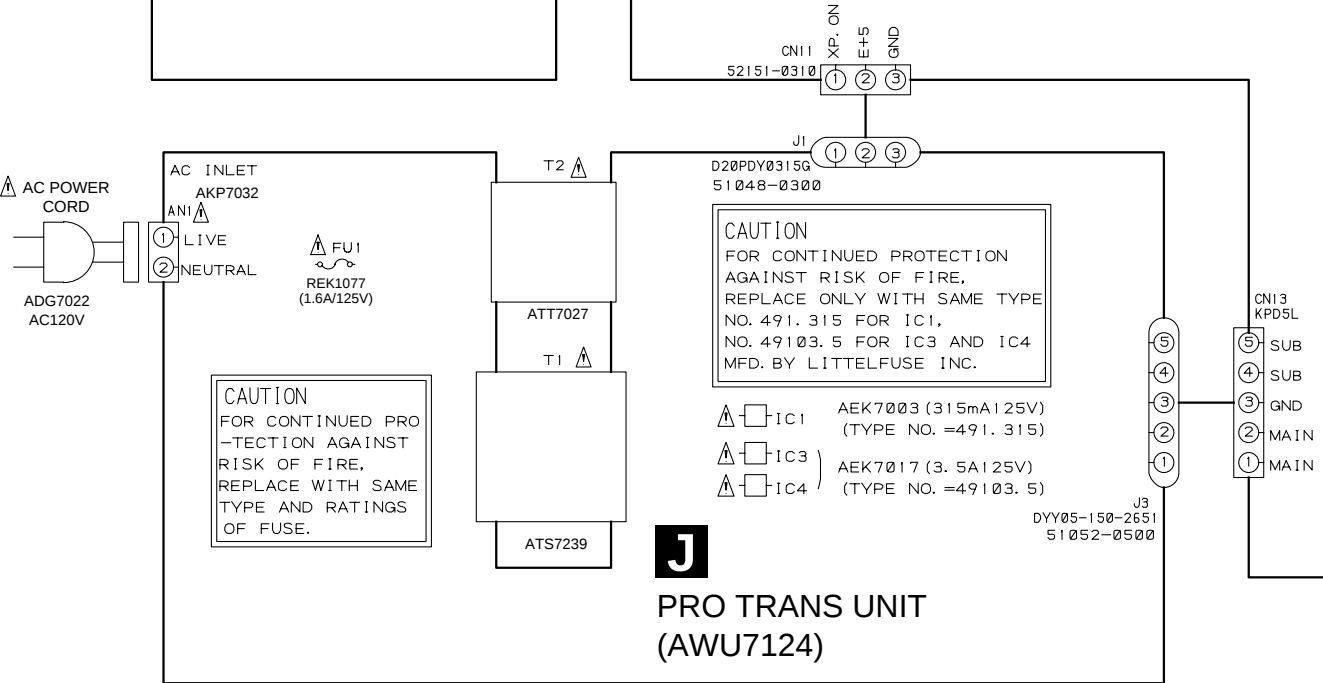
A



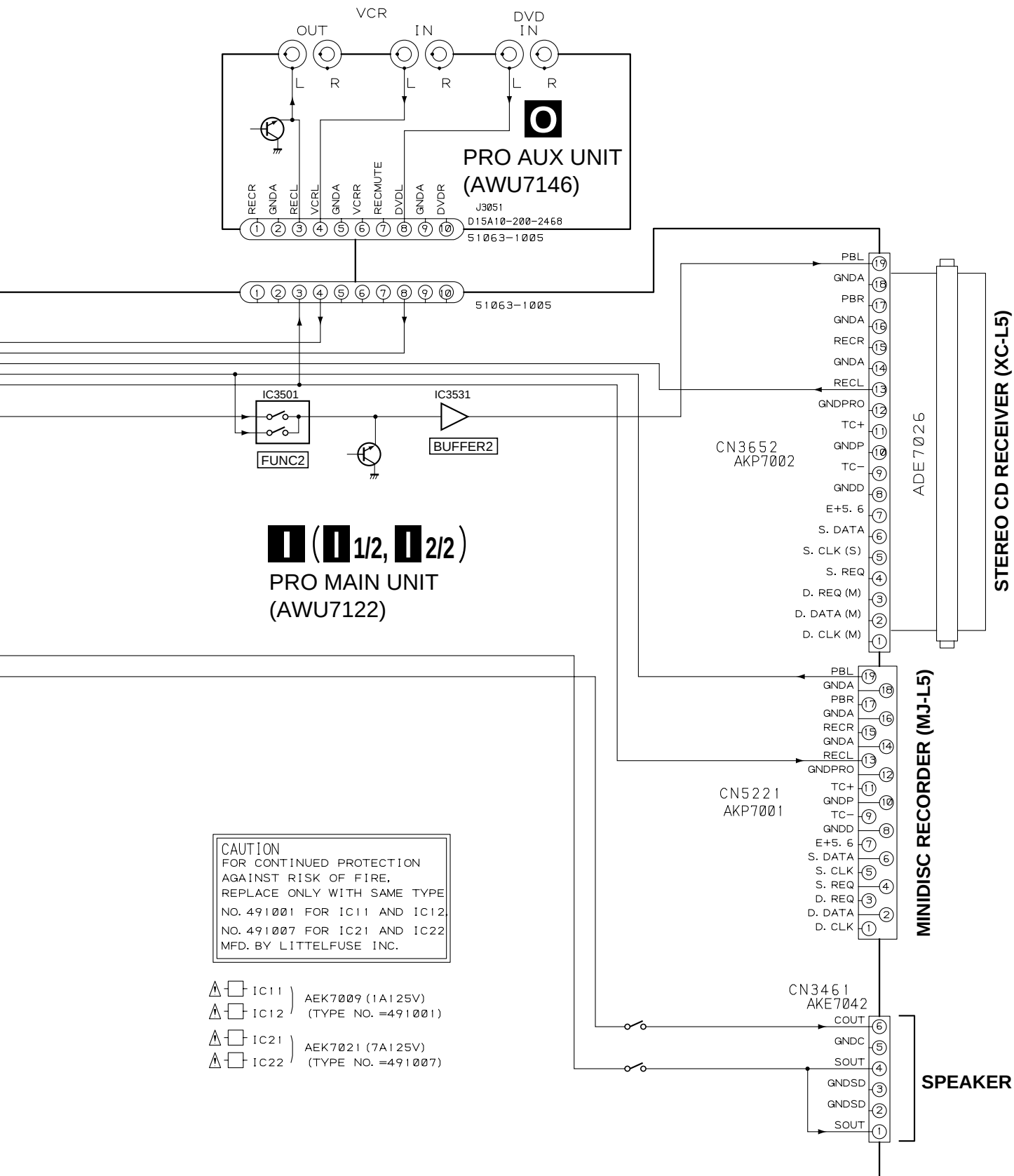
B



C



D



3.2.2 PRO MAIN (1/2), PRO TRANS and PRO AMP UNITS

A

NOTES

ALL CAPACITORS ARE IN μF
UNLESS OTHERWISE SPECIFIED

$\frac{1}{T}$ CKCYF

CH : CCSQCH
YB : CKSQYB
SL : CCSQSL
(OTHER : CKSQYF)

AL : CEAL
(OTHER : CEAT**M**H)

ALL RESISTORS ARE IN Ω

$\frac{1}{W}$ 1/10W (CHIP)

$\frac{1}{4W}$ 1/4WPU

$\frac{1}{F}$ (F) RFA1/4PS

$\frac{1}{LMF}$ FL RD1/4LMF

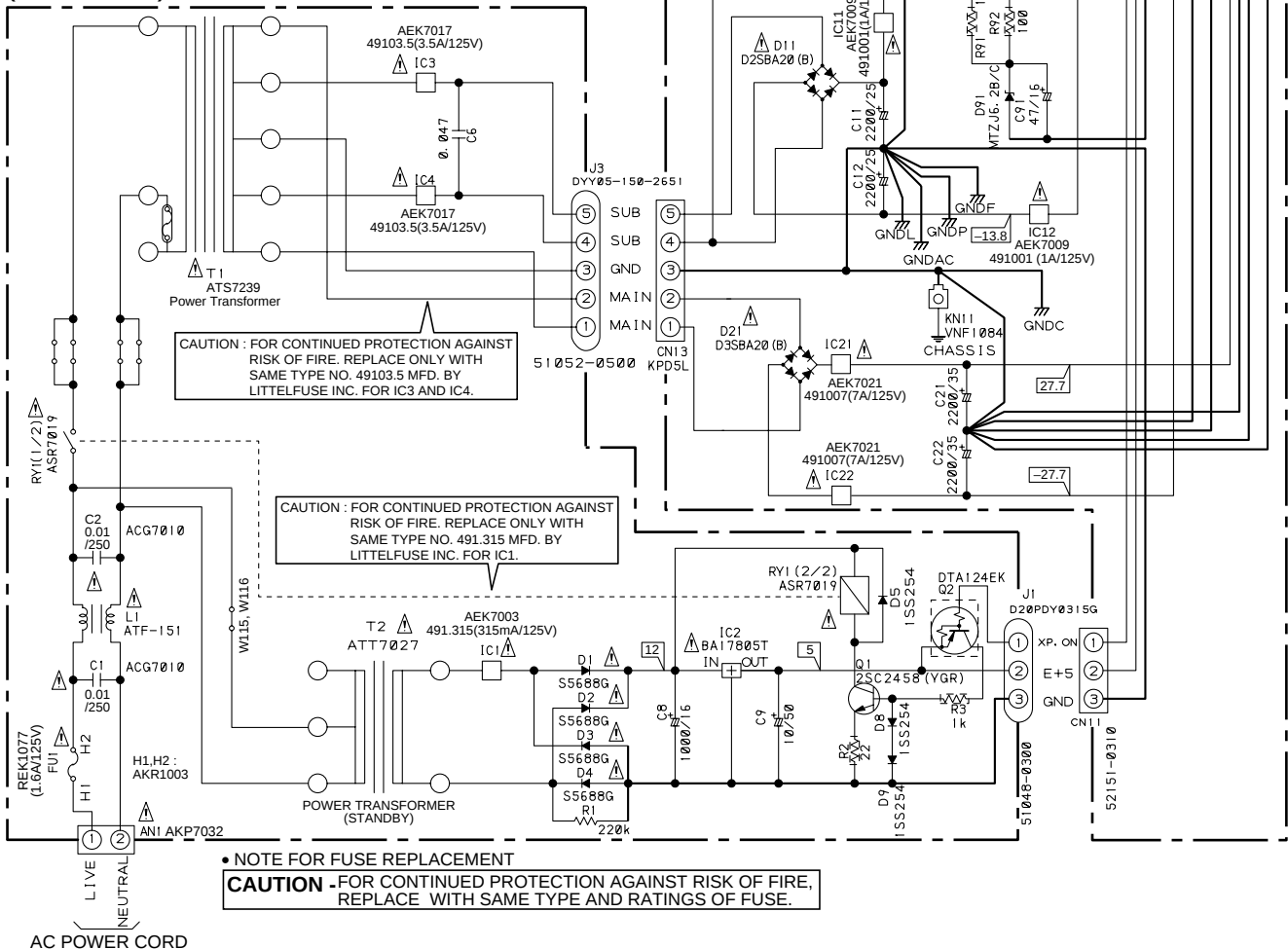
B

J

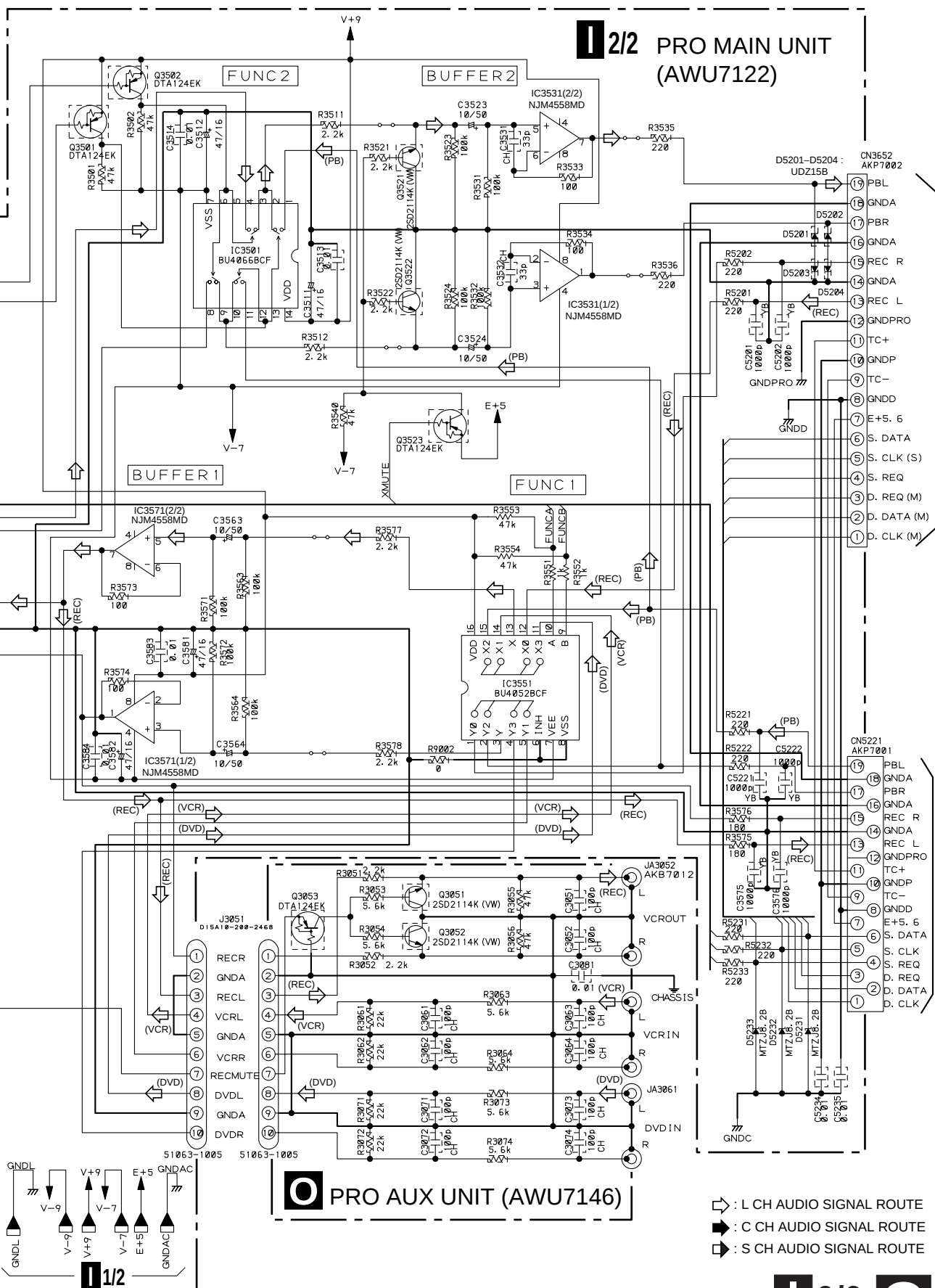
PRO TRANS UNIT (AWU7124)

C

D







A

B

C

D

STEREO CD RECEIVER (XC-L5)

MINIDISC RECORDER (MJ-L5)

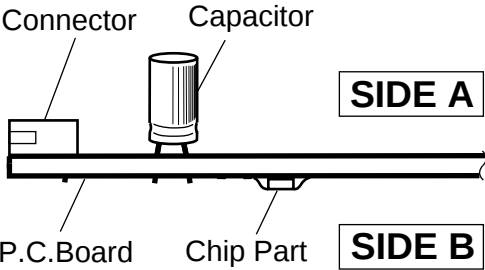
4. PCB CONNECTION DIAGRAM

NOTE FOR PCB DIAGRAMS :

- 1. Part numbers in PCB diagrams match those in the schematic diagrams.
- 2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol In PCB Diagrams	Symbol In Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

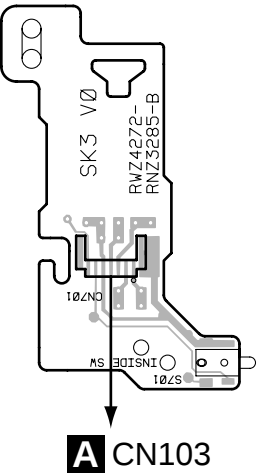
- 3. The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.
- 4. View point of PCB diagrams.



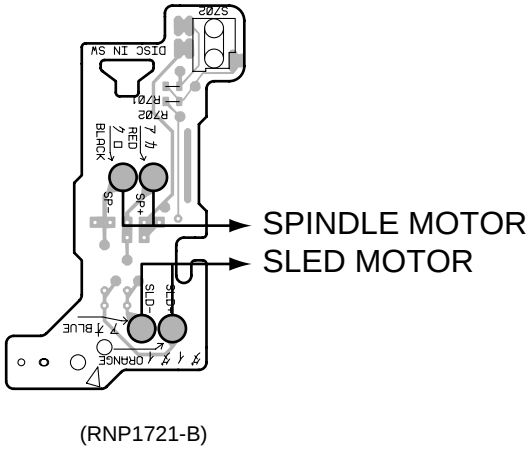
4.1 MINIDISC RECORDER (MJ-L5)

4.1.1 MD CORE SW UNIT

B MD CORE SW UNIT



SIDE A



SIDE B

4.1.3 MD MAIN UNIT

A

STEREO
CD RECEIVER
(XC-L5)
or
SURROUND
PROCESSOR
(SP-L5)

B

IC4183

C

IC4022
IC4025
IC4080
IC4024
Q4014
Q4012
IC4051
Q4020
IC4013
IC4014
Q4018

D

MD MAIN UNIT

SIDE A

(ANP7249-B)

ATTENTION - EN CAS DE
REMPLACEMENT DES FUSIBLES,
IC4013 N'UTILISER QUE
LA REFERENCE 491.630.
IC4014 N'UTILISER QUE LA
REFERENCE 491.500.
DE CHEZ
LITTELFUSE INC.

CN104

J4901

CN4011

Q4015
Q4017

Q4101
Q4104
Q4102
IC4101
Q4108
Q4103

Q4243
Q4022
IC4250

IC4171
Q4151
Q4260
Q4262

IC4240
Q4242
Q4241

IC4301

Q4021
Q4019
Q4040

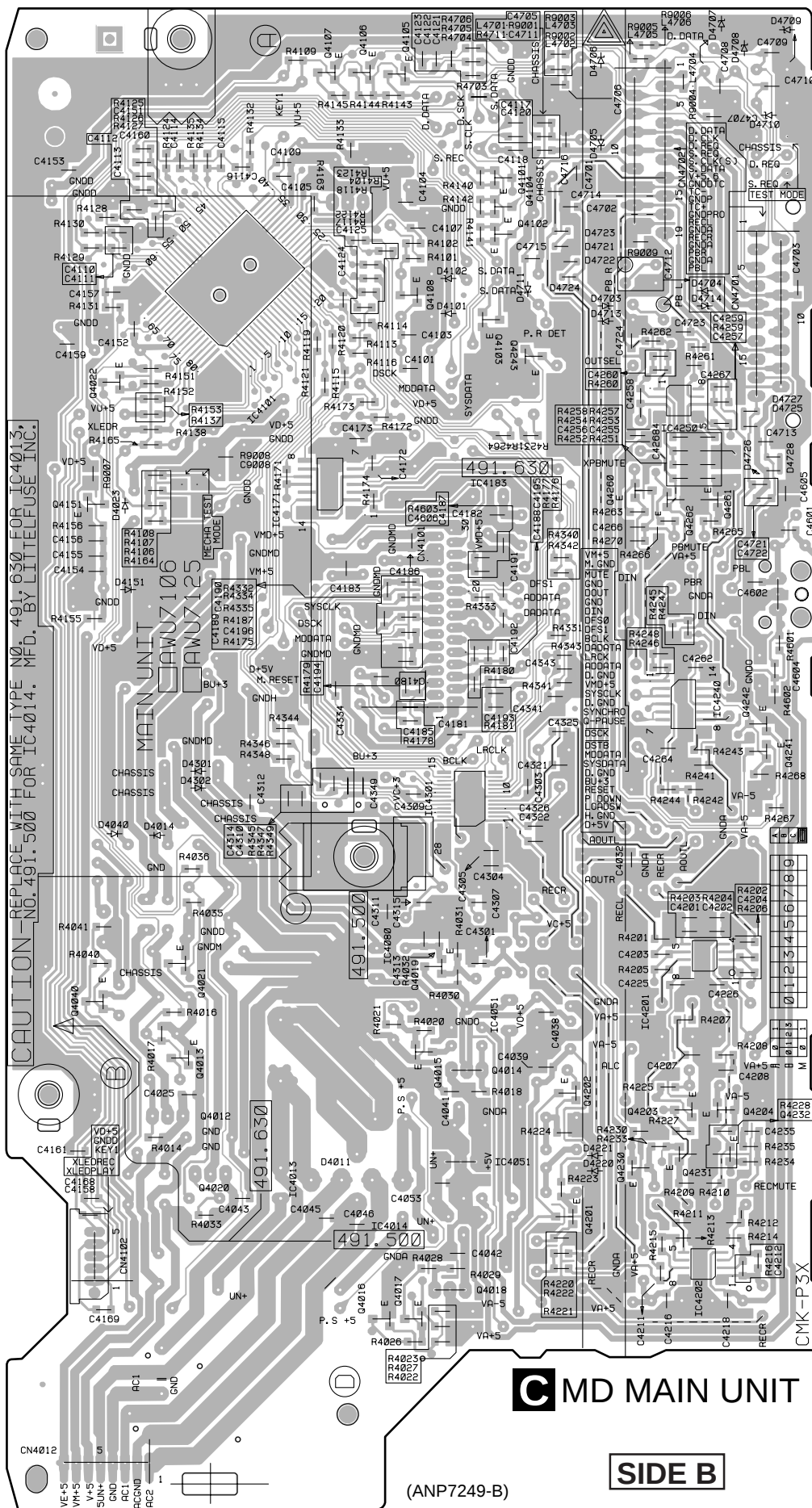
Q4015
Q4013

Q4202
Q4204
Q4230
Q4232

Q4201

IC4202

Q4016
Q4017



A

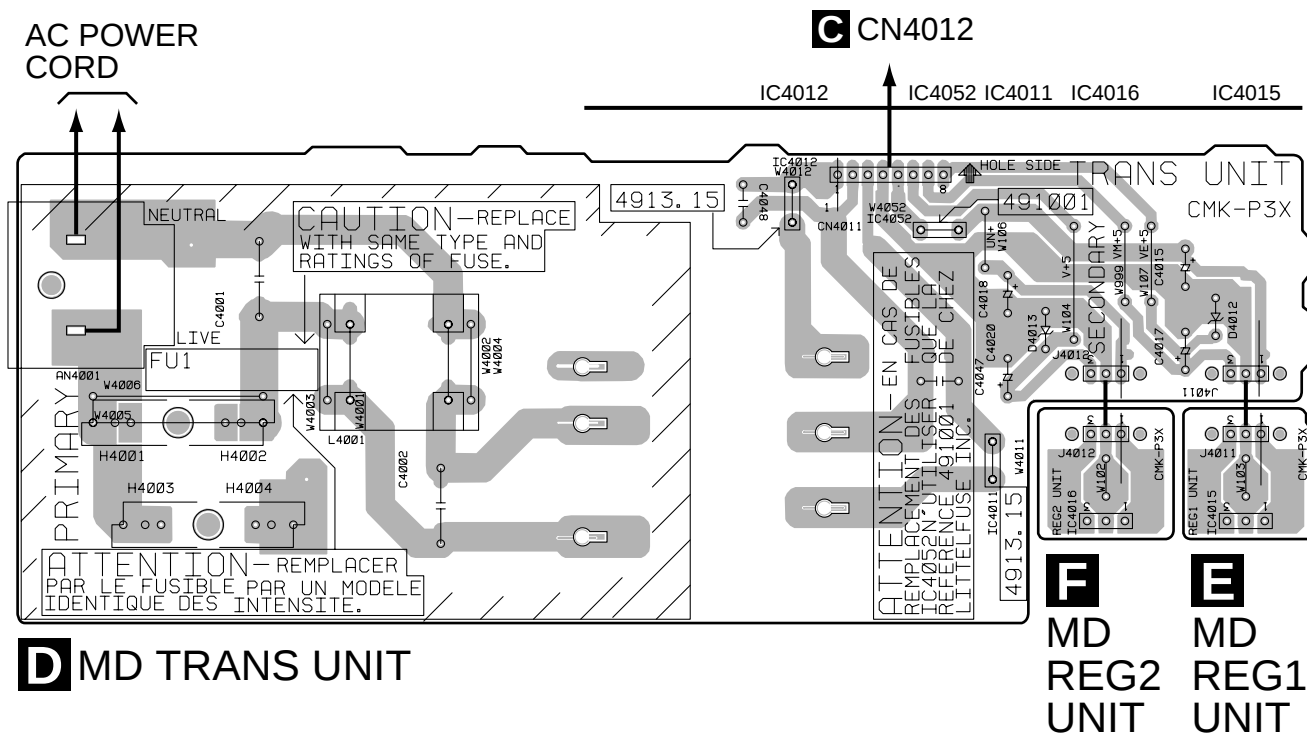
B

C

D

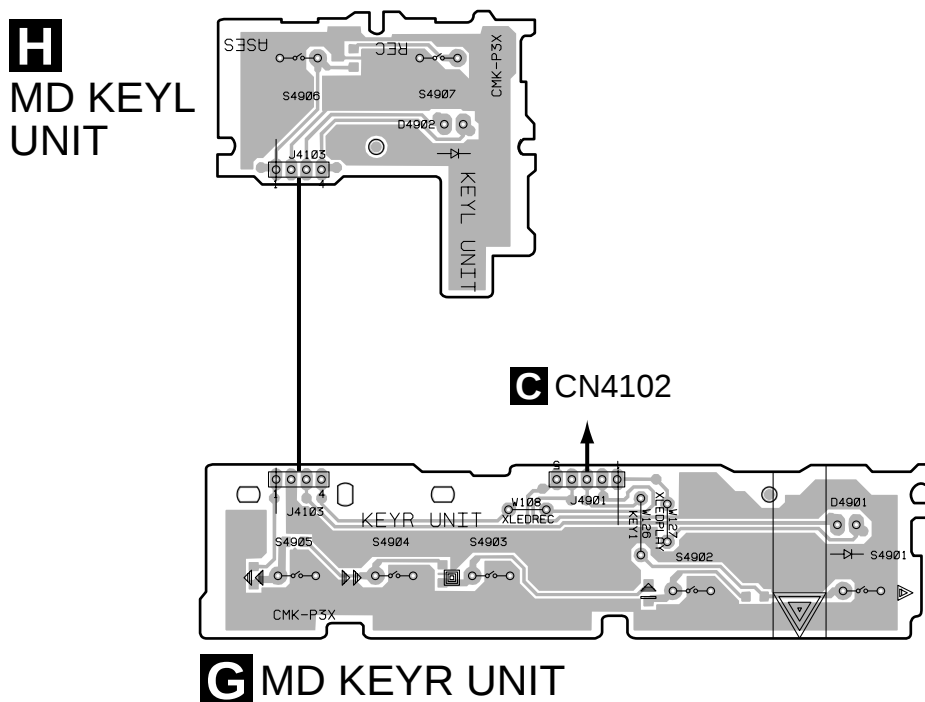
4.1.4 MD TRANS, MD REG1, MD REG2, MD KEYR and MD KEYL UNITS

A



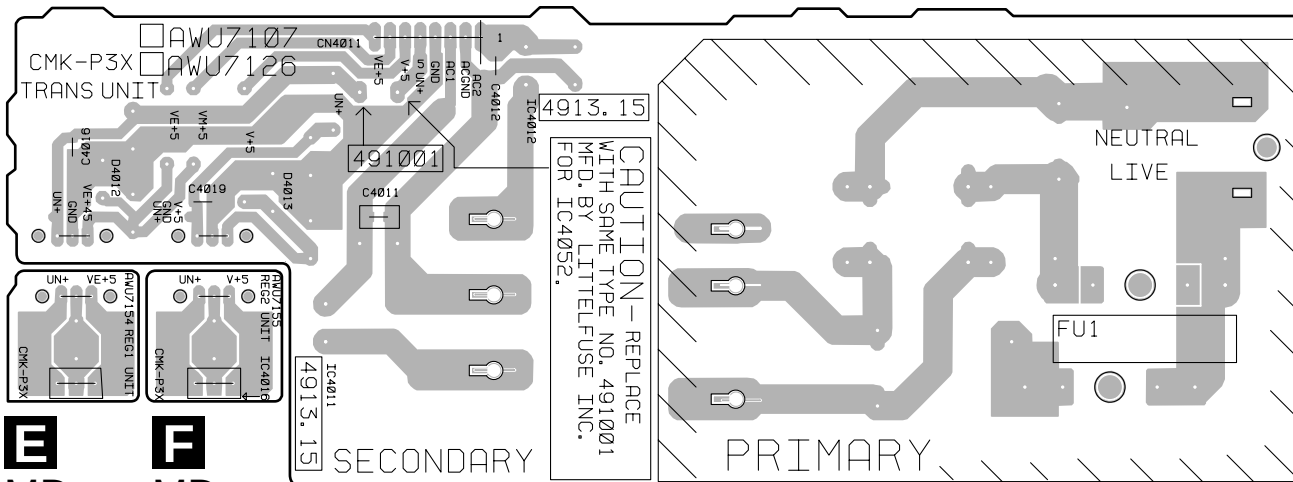
(ANP7249-B)

C



SIDE A

D MD TRANS UNIT

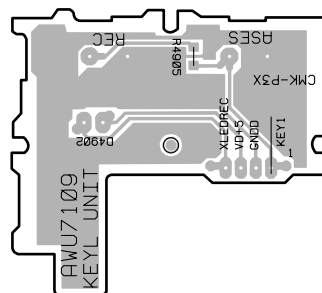


E MD REG1 UNIT

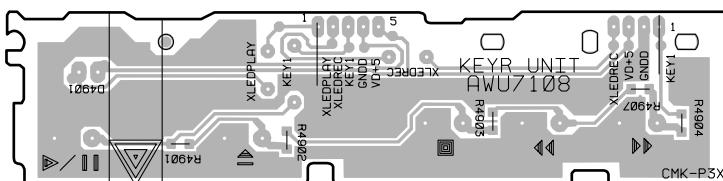
F MD REG2 UNIT

(ANP7249-B)

H MD KEYL UNIT

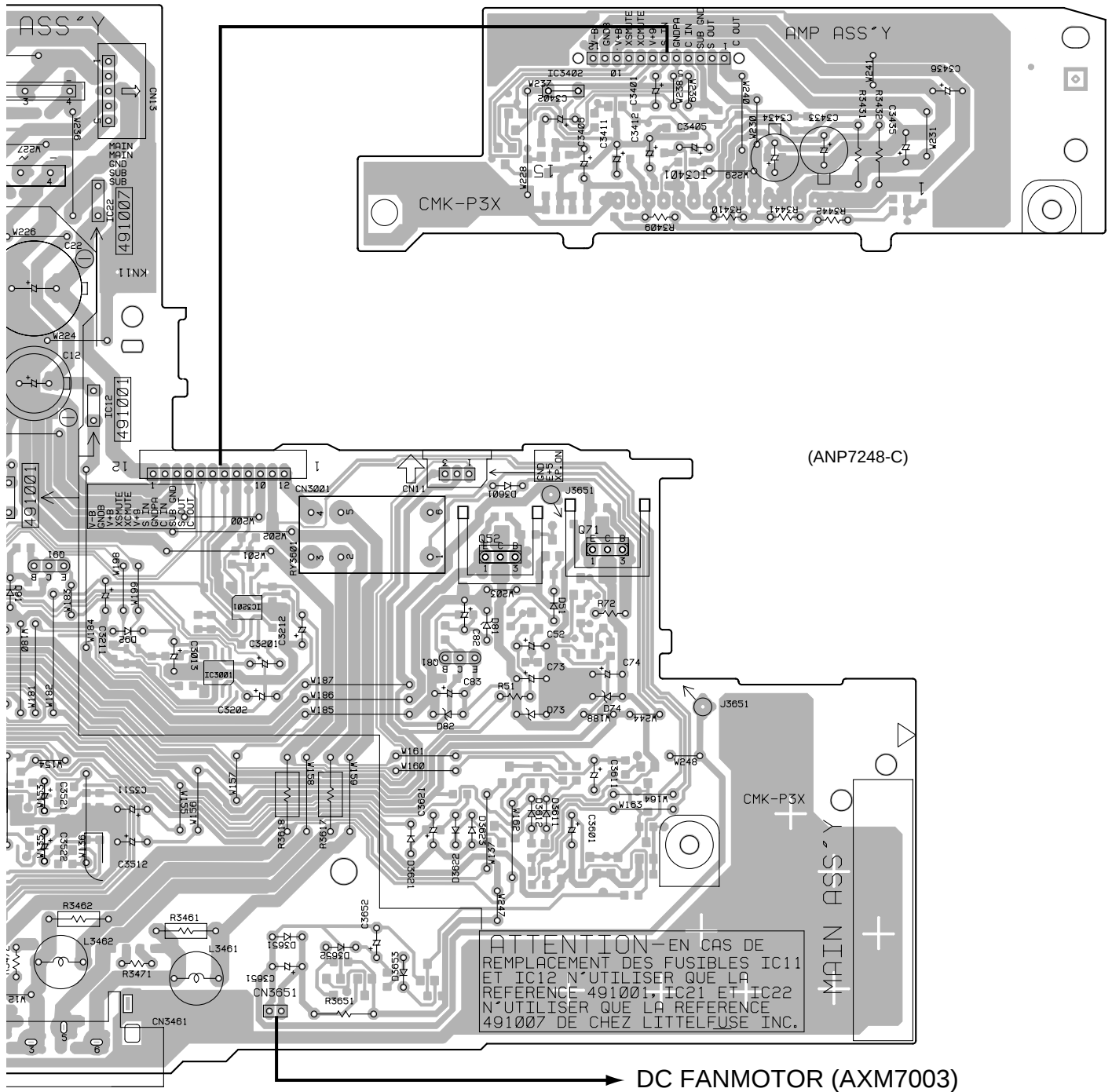


G MD KEYR UNIT



SIDE B

K PRO AMP UNIT

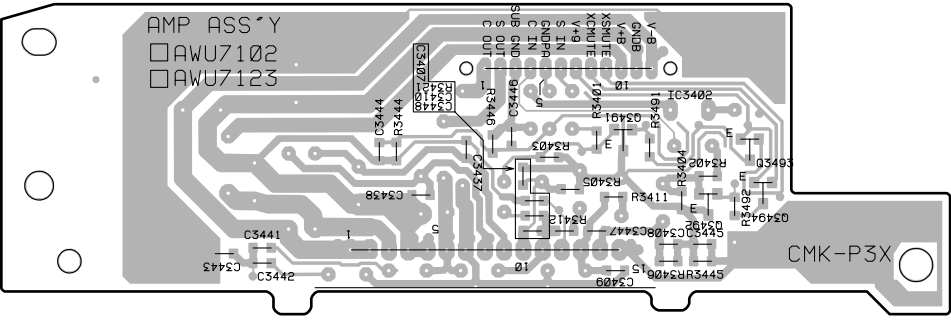


11 IC22
Q91 IC12
Q81 Q52 Q71

SIDE A

A

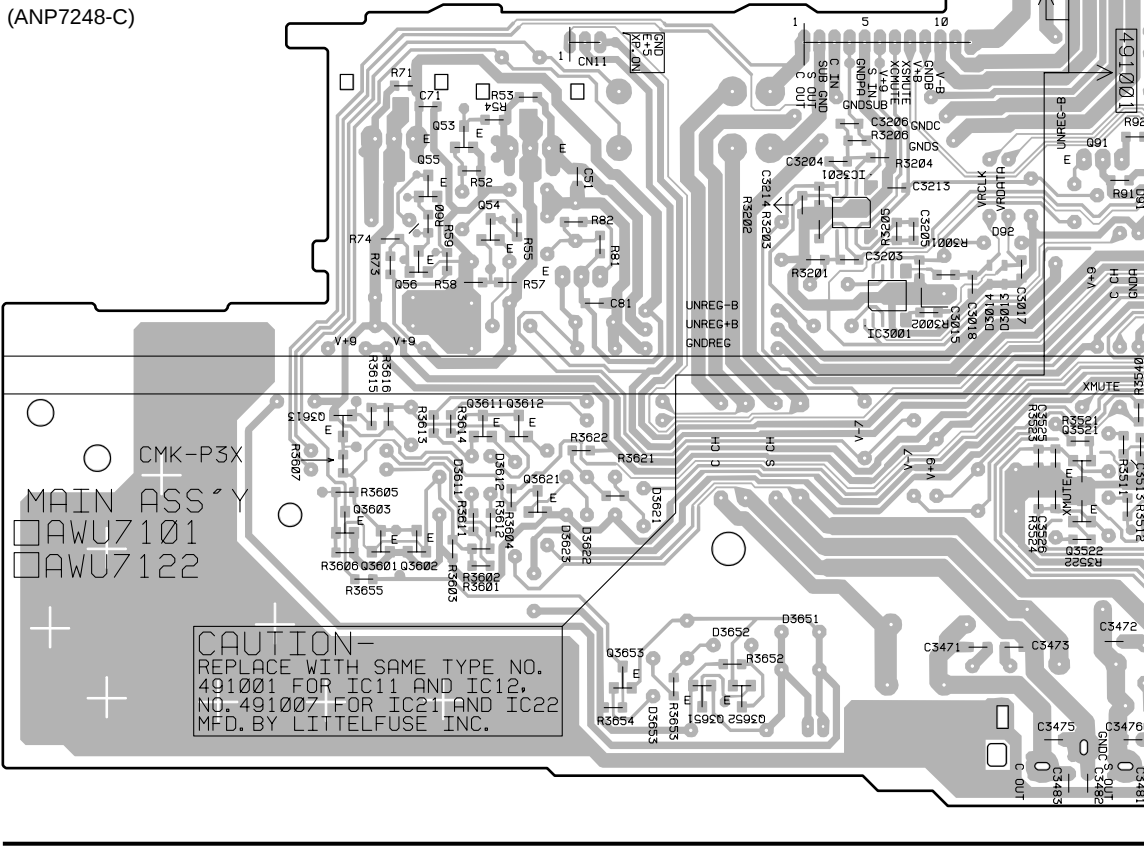
K PRO AMP UNIT



Q3491-Q3494

B

(ANP7248-C)

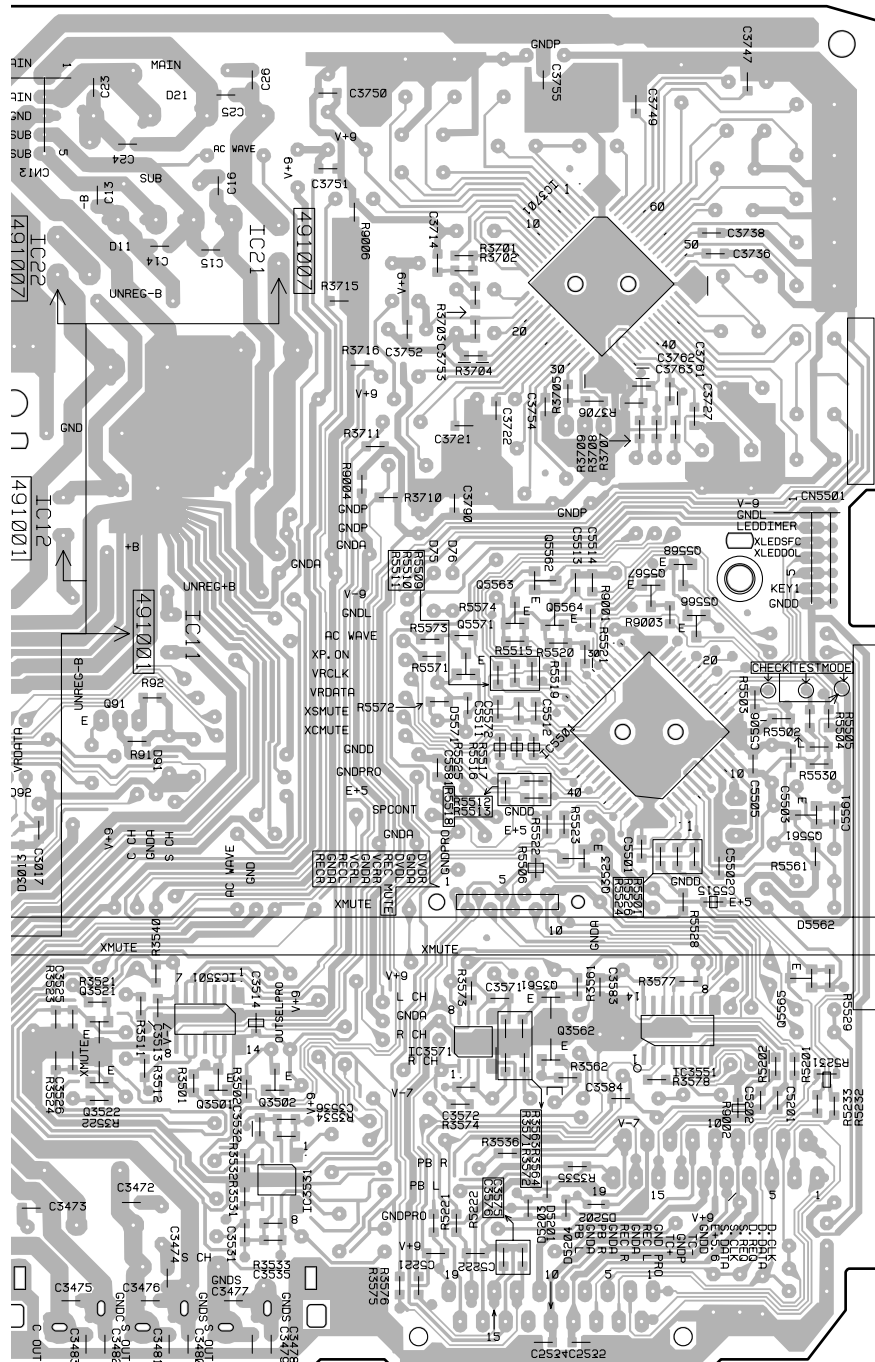


C

D

I PRO M

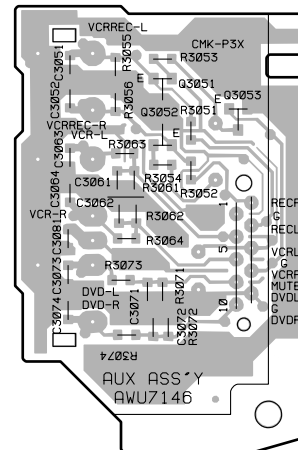
PRO MAIN UNIT



Q3521 IC3501 IC3571 Q3561 IC3551 Q5561
 Q3522 Q3501 Q3502 Q3562 Q5562 Q5563
 IC3531 Q3551 Q3556 Q3557 Q3558 Q3559 Q3560 Q3561 Q3562 Q3563 Q3564 Q3565 Q3566 Q3567 Q3568 Q3569 Q3570 Q3571 Q3572 Q3573 Q3574 Q3575 Q3576 Q3577 Q3578 Q3579 Q3580 Q3581 Q3582 Q3583 Q3584 Q3585 Q3586 Q3587 Q3588 Q3589 Q3590 Q3591 Q3592 Q3593 Q3594 Q3595 Q3596 Q3597 Q3598 Q3599 Q3600

SIDE B

PRO AUX UNIT

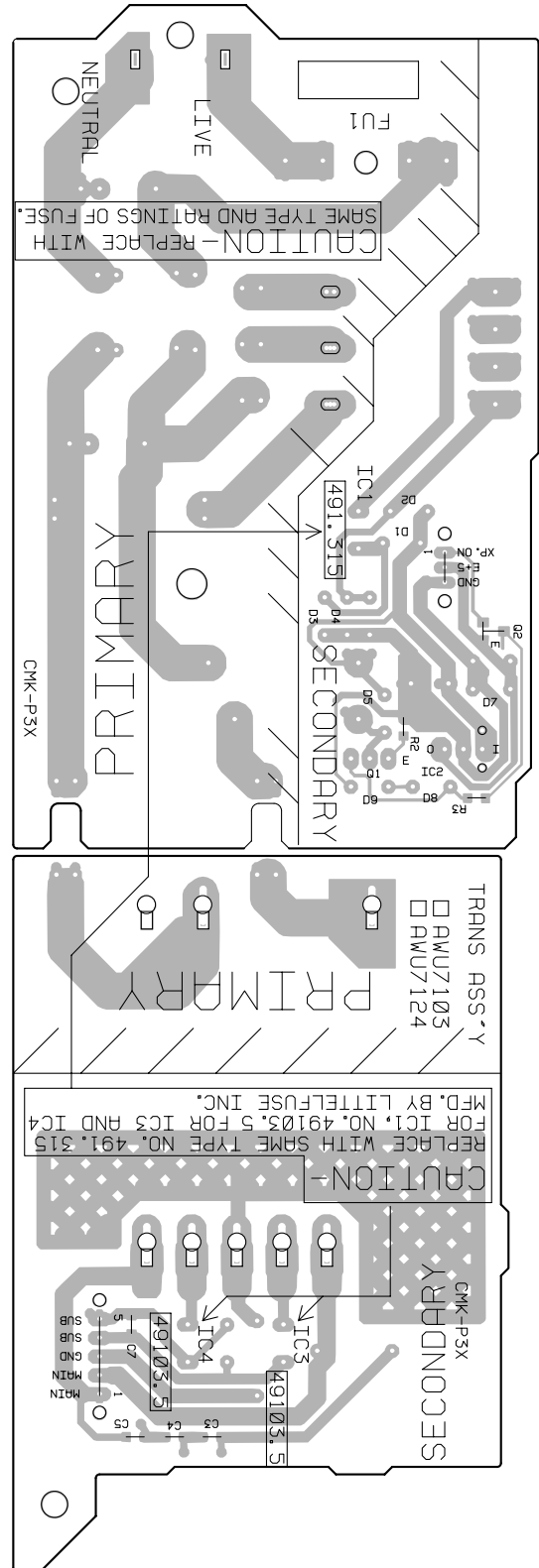


Q3051-Q3053

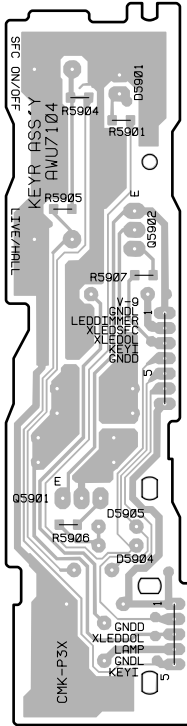
J PRO TRANS UNIT



J PRO TRANS UNIT

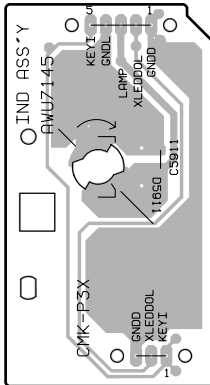


L PRO KEYR UNIT

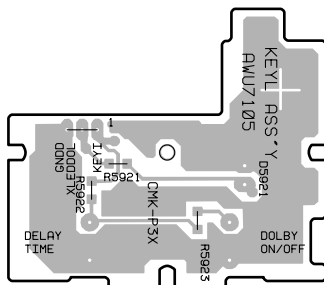


(ANP7248-C)

M PRO IND UNIT



N PRO KEYL UNIT



SIDE B

5. PCB PARTS LIST

NOTES: ●Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
●The Δ mark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.
●When ordering resistors, first convert resistance values into code form as shown in the following examples.
Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).
560 Ω → 56 × 10¹ → 561 RD1/4PU 5 6 1 J
47k Ω → 47 × 10³ → 473 RD1/4PU 4 7 3 J
0.5 Ω → R50 RN2H R 5 0 K
1 Ω → 1R0 RS1P 1 R 0 K
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62k Ω → 562 × 10¹ → 5621 RN1/4PC 5 6 2 1 F

Mark No. Description Part No.
5.1 MINIDISC RECORDER (MJ-L5)

LIST OF ASSEMBLIES

	MD CORE UNIT	RWM2055
	└ MD CORE MAIN UNIT	RWZ4326
	└ MD CORE SW UNIT	RWZ4272
NSP	MDCOMP ASSY	AWM7384
	└ MD MAIN UNIT	AWU7125
	└ MD TRANS UNIT	AWU7126
	└ MD KEYR UNIT	AWU7108
	└ MD KEYL UNIT	AWU7109
	└ MD REG1 UNIT	AWU7154
	└ MD REG2 UNIT	AWU7155

A MD CORE MAIN UNIT

SEMICONDUCTORS

	IC112	BA4510F
	IC116	BD7910FV
	IC110	BR93LC56F
	IC101	IR3R55M
	IC102	LR376481
	IC106	M56758FP
	IC103	M5M4V4400CTP-7
	IC104	PD5450B
Δ	IC114	RN5RG32AA
	IC113	TC74ACT08FT
	IC109	TC74VHC08FT
	IC108	TC9246F
	Q102	2SA1036K
	Q101	2SB1188
	Q103,Q104	DTC124EU
	D101,D102	SB02-09CP

COILS

	L101,L103,L104,L107 (4.7μH)	DTL1024
	L110	QTL1015
	L108 (47μH)	RTL1003
	L102 (0.47μH)	RTL1007

SWITCHES

	S101,S102	RSF1012
--	-----------	---------

Mark No. Description Part No.
CAPACITORS

	C115	CCSQCH101J50
	C119,C120	CCSQCH120J50
	C146	CCSQCH121J50
	C125	CCSQCH150J50
	C141-C144,C155	CCSQCH220J50
	C174-C178	CCSQCH271J50
	C194	CCSQCH331J50
	C139	CEV101M4
	C131,C166	CEV101M6R3
	C147,C148,C201	CEV470M6R3
	C112	CEV4R7M35
	C193	CKSQYB102K50
	C126,C1000	CKSQYB103K50
	C153,C154	CKSQYB153K50
	C158	CKSQYB222K50
	C196-C198	CKSQYB223K50
	C103,C145	CKSQYB273K50
	C171	CKSQYB332K50
	C149,C170	CKSQYB333K50
	C106,C159	CKSQYB472K50
	C127	CKSQYB474K16
	C156,C157	CKSQYB562K50
	C151,C152,C160,C162	CKSQYB821K50
	C130,C132,C134,C137,C138	CKSQYF104Z25
	C161,C163,C164,C173,C195	CKSQYF104Z25
	C202-C205	CKSQYF104Z25
	C101,C102,C104,C108	CKSQYF105Z16
	C113,C114,C116-C118	CKSQYF105Z16
	C121,C122,C124,C128	CKSQYF105Z16
	C135,C136,C140,C165,C169	CKSQYF105Z16
	C207,C208	CKSQYF105Z16
	C123	CKSQYF473Z25
	C105,C107	CKSQYF474Z16

RESISTORS

	R105	RS1/8S270J
	Other Resistors	RS1/10S□□□J

OTHERS

	CN104	30P CONNECTOR	RKN1039
	X101	(33.8688MHz)	RSS1055
	CN105	ZR CONNECTOR	S2B-ZR-SM3A
	CN102	2P CONNECTOR	S2B-ZR-SM3A-R
	CN101	CONNECTOR	SFV28R-1ST
	CN103	CONNECTOR	SFW7R-2ST

Mark	No.	Description	Part No.
B	MD CORE SW UNIT		
	SWITCHES		
	S701		RSF1009
	S702		RSF1010
	RESISTORS		
	All Resistors		RS1/10S□□□J
	OTHERS		
	CN701	CONNECTOR	SFW7R-1ST

C MD MAIN UNIT SEMICONDUCTORS

△	IC4014	AEK7005
△	IC4013	AEK7006
	IC4301	AK4520A
△	IC4051	BA17805T
	IC4240	BU4066BCF
	IC4201, IC4202, IC4250	NJM4558MD
	IC4101	PDG225A
	IC4171	TC74HCT08AF
	Q4017	2PB709A
	Q4013, Q4015, Q4016, Q4019, Q4021	2PD601A
	Q4040, Q4151, Q4201-Q4204	2PD601A
	Q4012, Q4014, Q4020	2SB1237X
	Q4018	2SD1858X
	Q4231, Q4232, Q4261, Q4262	2SD2114K
	Q4022, Q4230, Q4242, Q4260	DTA124EK
	Q4103	DTC114EK
	Q4101, Q4102, Q4104-Q4107	DTC114TK
	Q4241, Q4243	DTC124EK
	Q4108	DTC143EK
△	D4014	1SR139-400
	D4040, D4101, D4151, D4220, D4221	1SS254
△	D4011	D2SBA20(B)
	D4703-D4711, D4713, D4714	MTZJ8.2B

COILS

L4301, L4302, L4601	LAU100J
L4101, L4171	LAU220J

CAPACITORS

△	C4023 (0.047F/5.5V)	ACH1246
	C4013 (0.018F/25V)	ACH7099
	C4157, C4201, C4202, C4211, C4212	CCSQCH101J50
	C4314, C4709, C4710	CCSQCH101J50
	C4203, C4204	CCSQCH220J50
	C4112, C4117, C4118, C4120-C4123	CCSQCH221J50
	C4207, C4208	CCSQCH470J50
	C4054	CEAL1R0M50
	C4022, C4027-C4029, C4034, C4035	CEAT100M50
	C4052, C4102, C4205, C4206	CEAT100M50
	C4209, C4210, C4213, C4214	CEAT100M50
	C4220, C4221, C4241, C4242	CEAT100M50
	C4251-C4254	CEAT100M50
	C4106, C4215, C4217, C4261, C4263	CEAT101M10
	C4302, C4306, C4308, C4603	CEAT101M10

Mark	No.	Description	Part No.
	C4014		CEAT221M25
	C4222		CEAT330M25
	C4026, C4030, C4031, C4036, C4061		CEAT470M16
	C4171		CEAT470M16
	C4323, C4324		CEAT4R7M50
	C4110, C4114, C4255, C4256		CKSQYB102K50
	C4701, C4702		CKSQYB102K50
	C4325, C4326		CKSQYB104K25
	C4115, C4321, C4322		CKSQYB222K50
	C4604		CKSQYB332K50
	C4053, C4103, C4107, C4109, C4111		CKSQYF103Z50
	C4116, C4158, C4161, C4168, C4169		CKSQYF103Z50
	C4172, C4173, C4185, C4193		CKSQYF103Z50
	C4266-C4268, C4301, C4303, C4304		CKSQYF103Z50
	C4307, C4309, C4313, C4341, C4343		CKSQYF103Z50
	C4349, C4601, C4602		CKSQYF103Z50
	C4153, C4310, C4311		CKSQYF104Z25
	C4605		CKSQYF104Z50
	C4104, C4105, C4216, C4218, C4262		CKSQYF473Z50
	C4264, C4703, C4713, C4714, C9008		CKSQYF473Z50
	C4154, C4155		CKSQYF474Z16

RESISTORS

R4226	RD1/4PU102J
R4015, R4019, R4034	RD1/4PU151J
R4701, R4702	RD1/4PU221J
R4042	RD1/4PU470J
R4157	RD1/4PU473J
Other Resistors	RS1/10S□□□J

OTHERS

X4101	CERAMIC RESONATOR	ASS7016
CN4701	19P SOCKET	AKP7001
CN4702	19P CONNECTOR	AKP7002
JA4601	OPTICAL RECEIVER	GP1F32R
CN4012	8P PLUG	KM200TA8
CN4101	30P FFC CONNECTOR	VKN1206
KN4011, KN4101, KN4301	EARTH METAL FITTING	VNF1084

D MD TRANS UNIT SEMICONDUCTORS

△	IC4052 (1A)	AEK7009
	D4012, D4013	MTZJ8.2B

COIL

△	L4001	LINE FILTER	VTL-262
---	-------	-------------	---------

CAPACITORS

△	C4001, C4002 (10000pF/AC250V)	ACG7020
	C4015, C4018	CEAT100M50
	C4017, C4020	CEAT331M10
	C4011, C4012, C4016, C4019	CKSQYF103Z50
	C4047, C4048	CQMBA473J50

OTHERS

	3P CABLE HOLDER	51048-0300
	H4001, H4002 FUSE CLIP	AKR1003
△	AN4001 1P AC INLET	AKP7032
	J4011, J4012 JUMPER WIRE 3P	D20PDD0305G
	CN4011 8P SOCKET	KP200TA8L

MJ-L5, SP-L5

Mark	No.	Description	Part No.
------	-----	-------------	----------

E MD REG1 UNIT

SEMICONDUCTOR

△	IC4015	BA17805T
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OTHERS

3P CABLE HOLDER	51048-0300
-----------------	------------

F MD REG2 UNIT

SEMICONDUCTOR

△	IC4016	BA17805T
---	--------	----------

OTHERS

3P CABLE HOLDER	51048-0300
-----------------	------------

G MD KEYR UNIT

SEMICONDUCTOR

D4901	SLP3118C51H
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SWITCHES

S4901-S4905	RSG1031
-------------	---------

RESISTORS

All Resistors	RS1/10S□□□J
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OTHERS

J4103	JUMPER WIRE 4P	D20PWW0420E
J4901	JUMPER WIRE 5P	D20PWY0520E

H MD KEYL UNIT

SEMICONDUCTOR

D4902	SLP9118C51H
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SWITCHES

S4906,S4907	RSG1030
-------------	---------

RESISTORS

All Resistors	RS1/10S□□□J
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Mark	No.	Description	Part No.
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5.2 SURROUND PROCESSOR (SP-L5)

LIST OF ASSEMBLIES

NSP	PROCOMP ASSY	AWM7383
	├ PRO MAIN UNIT	AWU7122
	├ PRO AMP UNIT	AWU7102
	├ PRO TRANS UNIT	AWU7124
	├ PRO KEYR UNIT	AWU7104
	├ PRO KEYL UNIT	AWU7105
	├ PRO IND UNIT	AWU7145
	├ PRO AUX UNIT	AWU7146

I PRO MAIN UNIT

SEMICONDUCTORS

△	IC11,IC12	AEK7009
△	IC21,IC22	AEK7021
	IC3551	BU4052BCF
	IC3501	BU4066BCF
	IC3701	LV1035M
	IC3001	M62429FP
	IC3201,IC3531,IC3571	NJM4558MD
	IC5501	PDC046A
	Q3611,Q3612,Q54,Q55	2PB709A
	Q3601,Q3602,Q3613,Q53,Q5571	2PD601A
	Q56	2PD601A
△	Q81	2SB1237X
△	Q52	2SB1566
	Q91	2SD1858X
	Q3521,Q3522,Q3603,Q3653	2SD2114K
△	Q71	2SD2395
	Q3501,Q3502,Q3523,Q5566-Q5568	DTA124EK
	Q3651	DTA124TK
	Q5563-Q5565	DTC114TK
	Q3652, Q5562	DTC124EK
	Q5561	DTC143EK
	D3601,D3611,D3612,D-3651-D3653	1SS254
	D51,D5561	1SS254
	D5571	1SS355
△	D11	D2SBA20(B)
△	D21	D3SBA20(B)
△	D73,D74	MTZJ12B
	D91	MTZJ6.2B
	D81	MTZJ7.5B
	D5231-D5233	MTZJ8.2B
	D75	S5688G
	D5201-D5204	UDZ15B

COILS

L3461,L3462	AF CHOKE COIL	ATH-059
L3702,L5501		LAU100J

RELAY

RY3601	ASR7017
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CAPACITORS

C3203,C3204	CCSQCH100D50
C5572	CCSQCH101J50
C3761-C3763,C5501,C5513-C5515	CCSQCH221J50
C3531,C3532	CCSQCH330J50
C3205,C3206	CCSQCH471J50

Mark	No.	Description	Part No.
	C3727 C3652 C3741,C3744 C3737,C3739,C3746,C3748 C3523,C3524,C3563,C3564,C3611		CCSQSL681J50 CEAL101M6R3 CEANL3R3M50 CEANL4R7M25 CEAT100M50
	C3703-C3706,C3709,C3715 C3718-C3720,C3732,C3733,C52 C5562 C3013,C5504 C5571		CEAT100M50 CEAT100M50 CEAT100M50 CEAT101M10 CEAT1R0M50
	C3201,C3202 C3708,C3716 C3601,C3707,C3713,C3726 C11,C12 C21,C22		CEAT220M50 CEAT221M16 CEAT221M6R3 CEAT222M25 CEAT222M35
	C3717 C3211,C3212,C3511,C3512 C3581,C3582,C3731,C73,C74 C82,C83,C91 C3651		CEAT2R2M50 CEAT470M16 CEAT470M16 CEAT470M16 CEJA100M16
	C3740,C3742,C3743,C3745 C3730 C3475-C3478,C3481,C3483 C3575,C3576,C5201,C5202 C5221,C5222		CFTLA154J50 CFTLA474J50 CKSQYB102K50 CKSQYB102K50 CKSQYB102K50
	C51,C71,C81 C3714 C3721 C3722,C3736,C3738,C3747,C3749 C3015,C3213,C3214,C3479,C3480		CKSQYB103K50 CKSQYB182K50 CKSQYB334K16 CKSQYB474K16 CKSQYF103Z50
	C3482,C3513,C3514,C3583,C3584 C3750,C3752-C3754,C5234,C5235 C5502,C5503,C5505,C5506,C5561 C5581 C3471-C3474,C3755		CKSQYF103Z50 CKSQYF103Z50 CKSQYF103Z50 CKSQYF103Z50 CKSQYF473Z50
	C3701,C3702,C3734,C3735 C3729 C3724 C3728 C3723,C3725		CQMBA104J50 CQMBA223J50 CQMBA332J50 CQMBA473J50 CQMBA823J50

RESISTORS

△	R3617,R3618 (0.1Ω/1W)	ACN7032
△	R3461,R3462	RD1/4LMF101J
	R3551,R3552,R5562	RD1/4PU102J
	R51	RD1/4PU221J
	R72	RD1/4PU471J
	R3553,R3554	RD1/4PU473J
	R3471,R3472	RD1/4PU6R8J
	R3651	RFA1/4PS680J
	R3704	RN1/10SE3902D
	Other Resistors	RS1/10S□□□□

OTHERS

X3701	CERAMIC RESONATOR (8MHz)	DSS1053
X5501	CERAMIC RESONATOR (6MHz)	VSS1045
	CABLE HOLDER (10P)	51063-1005
CN3001	12P JUMPER CONNECTOR	52147-1210
CN11	3P JUMPER CONNECTOR	52151-0310

Mark	No.	Description	Part No.
	CN5501 CN3461 5221 CN3652 CN13	7P JUMPER CONNECTOR SPEAKER TERMINAL 6-P SOCKET (19P) CONNECTOR (19P) L-CONNECTOR (5P)	52151-0710 AKE7042 AKP7001 AKP7002 KPD5L
	CN3651 KN11 J3651	2P PLUG EARTH METAL FITTING BOARD IN WIRE	KM200SA2L VNF1084 DB007NT0

J PRO TRANS UNIT

SEMICONDUCTORS

△	IC1	AEK7003
△	IC3,IC4	AEK7017
△	IC2	BA17805T
	Q1	2SC2458
	Q2	DTA124EK
	D5,D8,D9	1SS254
△	D1-D4	S5688G

COIL

△	L1 LINE FILTER	ATF-151
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TRANSFORMER

△	T2	ATT7027
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RELAY

△	RY1	ASR7019
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CAPACITORS

△	C1,C2 (0.01μF/AC250V)	ACG7010
	C9	CEAT100M50
	C8	CEAT102M16
	C6	CKCYF473Z50

RESISTORS

R1	RD1/4PU224J
Other Resistors	RS1/10S□□□□

OTHERS

	CABLE HOLDER (3P)	51048-0300
	CABLE HOLDER (5P)	51052-0500
J3	FUSE CLIP	AKR1003
H1,H2	AC INLET 1P	AKP7032
AN1	JUMPER WIRE	D20PDY0315G
J1		

K PRO AMP UNIT

SEMICONDUCTORS

△	IC3401	STK407-040B
	Q3491,Q3492	2SD2114K
	Q3493,Q3494	DTA124EK

CAPACITORS

C3409,C3410,C3447,C3448	CCSQCH100D50
C3407,C3408	CCSQCH330J50
C3401,C3402,C3405,C3406	CEAT100M50
C3435,C3436	CEAT100M50
C3411,C3412	CEAT101M10

MJ-L5, SP-L5

Mark	No.	Description	Part No.
		C3433,C3434 C3444 C3441-C3443 C3437,C3438	CEAT101M35 CKSQYB102K50 CKSQYB473K50 CKSQYF103Z50
		RESISTORS	
		R3441,R3442 R3409,R3410 R3431,R3432 Other Resistors	RD1/4PU100J RD1/4PU563J RFA1/4PS101J RS1/10S□□□J
		OTHERS	
	3401	12P CABLE HOLDER	51048-1200
	J3401	JUMPER WIRE 12P	D20PDY1230G

L PRO KEYR UNIT

SEMICONDUCTORS

Q5901,Q5902 D5904,D5905 D5901	2SD1858X 1SS254 SLP3118C51H
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SWITCHES

S5901,S5902	RSG1031
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RESISTORS

R5902,R5909 R5903,R5908 Other Resistors	RD1/2PM121J RD1/2PM151J RS1/10S□□□J
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OTHERS

J5902	JUMPER WIRE 5P	D20PWY0515E
J5901	JUMPER WIRE 7P	D20PWY0740E

M PRO IND UNIT

SEMICONDUCTOR

D5911	1SS254
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OTHERS

5912	3P CABLE HOLDER	51048-0300
5911	5P CABLE HOLDER	51048-0500
J5921	JUMPER WIRE 3P	D20PWY0315E
PL5911	LAMP	VEL1022

N PRO KEYL UNIT

SEMICONDUCTOR

D5921	SLP3118C51H
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SWITCHES

S5921,S5922	RSG1030
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RESISTORS

All Resistors	RS1/10S□□□J
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Mark	No.	Description	Part No.
		PRO AUX UNIT	
		SEMICONDUCTORS	
		Q3051,Q3052 Q3053	2SD2114K DTA124EK
		CAPACITORS	
		C3051,C3052,C3061-C3064 C3071-C3074 C3081	CCSQCH101J50 CCSQCH101J50 CKSQYF103Z50
		RESISTORS	
		All Resistors	RS1/10S□□□J
		OTHERS	
	3051	10P CABLE HOLDER	51063-1005
	3052	6P PIN JACK	AKB7012
	J3051	JUMPER WIRE	D15A10-200-2468

6. ADJUSTMENT

6.1 MINIDISC RECORDER (MJ-L5)

■ JIGS AND MEASURING INSTRUMENTS

- | | |
|-----------------------|---|
| ● Thermometer | ● Test Disc |
| ● Oscilloscope | For servo system adjustment GGF1328 (MMD-212) |
| ● Optical Power Meter | For recording/playback inspection GGF1328 (MMD-212), GGF1277, |
| ● Jitter Meter | TGYS1 (or MMD-110), Commercial discs |

6.1.1 NECESSARY ADJUSTMENT POINTS

When		Adjustment points
Exchange PICKUP	➡	③, ④ → Pages 53 and 54
Exchange Servo Base Assy (SPINDLE MOTOR)	➡	③, ④ → Pages 53 and 54
Exchange MD CORE MAIN UNIT	➡	④ → Pages 53 and 54
Exchange MD HEAD	➡	_____
Exchange Loading Mechanism Assy	➡	_____
Exchange Servo Mechanism Assy	➡	③, ④ → Pages 53 and 54
Exchange MD Mechanism Assy (Loading Mechanism Assy + Servo Mechanism Assy)	➡	③, ④ → Pages 53 and 54

6.1.2 TEST MODE

(1) Test Mode Condition

The MJ-L5 can use the adjustment modes in the following three combinations.

- ① XC-L7 (CD receiver + Display unit) + MJ-L5 (MD)
- ② XC-L5 (CD receiver) + MJ-L5 (MD) + System remote control unit (CU-XC004, CU-XC005, or CU-SP005)
- ③ XC-L5 (CD receiver) + MJ-L5 (MD) + Service remote control unit (GGF1067)

SET and CANCEL keys (for remote control unit) used in the item of "6.1.3 MD Mechanism Assy Adjustment and Check" are performed in the combination ②.

In case of ① : Both SET and CANCEL key operate with the remote control unit or the DISPLAY unit.

In case of ③ : SET and CANCEL keys on the remote control unit are replaced with SEARCH and CLEAR keys of the service remote control unit.

Note:

Although the MJ-L5 and XC-L7 can be directly connected, unrelated characters may be displayed in the rightmost two digits as they differ in the number of digits for display. And they also differ in the power source, no playback sound is obtained from the receiver.

However, you can check the waveform at the pin 17 (PBR) and pin19 (PBL) of the system cable.

The service remote control cannot be used for the XC-L7.

(2) How to Start / Cancel Test Mode (Mechanism Assy Adjustment Mode)

TEST MODE : ON

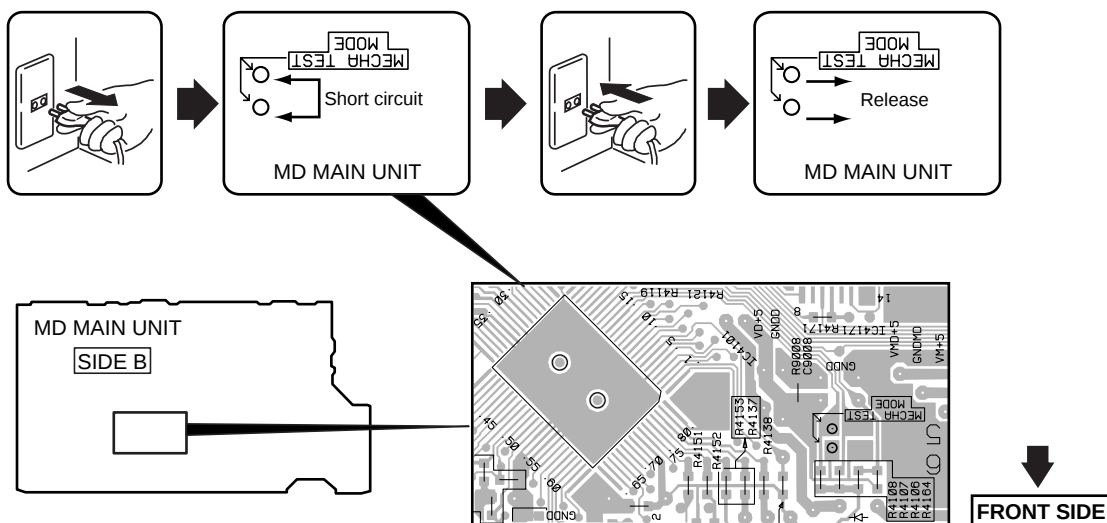
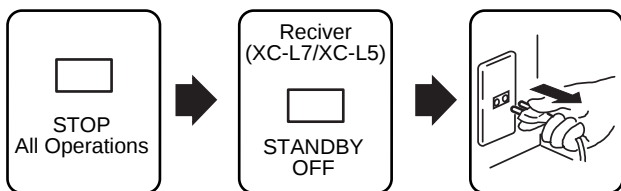


Fig.1

TEST MODE : STOP → CANCEL



(3) Independent operation mode (Aging mode)

- ① Short-circuit the jumper wires W205 and W4106 on the MD MAIN UNIT.
- ② Independent operation mode (Aging mode) can be initiated by short-circuiting the S. REQ connector (pin 4) of the system bus (MD MAIN UNIT : CN4702) with the GND connector (pin 14) for 3 seconds after AC power is applied.

In this mode, set the playback mode to All Repeat for aging. By setting the unit in All Repeat mode, the playback state can be maintained for a long period of time.

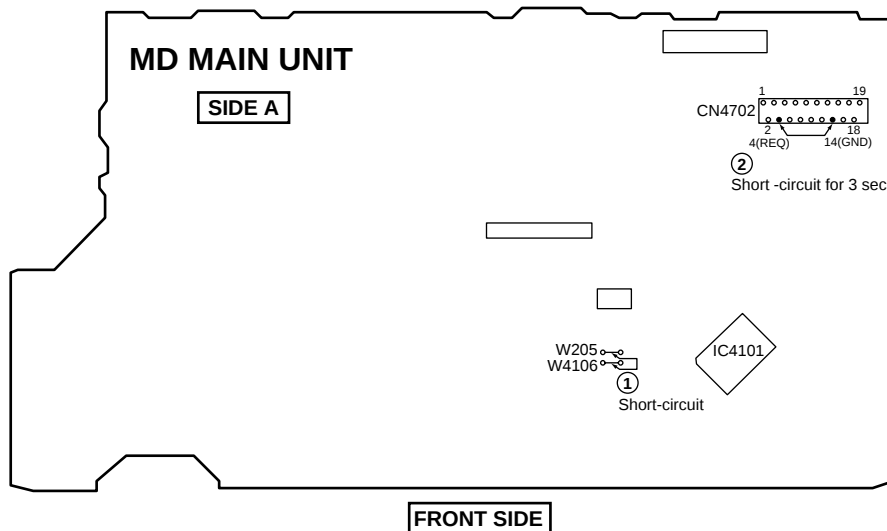


Fig.2

• Key operations in Independent operation mode (Keys on the main unit are used.)

[ASES]	Switches recording inputs (Digital/Analog)
[REC]	Executes recording.
[PLAY]	Executes playback.
[STOP]	Stops recording/playback.
[EJECT]	Ejects the disc.
[▶▶]	Advances the track or CUE.
[◀◀]	Reverses the track or REV.

Note: For aging, set the playback mode to All Repeat in Independent operation mode.

• Recording input switching

By pressing the ASES key in Recording pause mode, you can switch the recording inputs.

Each time you press the key, digital and analog are selected in turn.

The REC LED steadily lights when digital is selected, and it flashes when analog is selected. The flashing cycle is slower than that of the PLAY LED in Pause mode.

Note: If digital data cannot be locked when digital is selected, the REC LED flashes in the same cycle as that of the PLAY LED.

Note: The adjustment mode for the mechanism unit cannot be initiated from the Independent operation mode.

6.1.3 MD Mechanism Assy Adjustment and Check

① Temperature Check (Please perform this check soon after the power has been switched on.)

Note: When IC101 (RF-AMP) or IC104 (mechanical controller) has been exchanged or when a correction changing VD+3 has been made, be sure to correctly perform all steps up to step 7.

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks												
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode													
2	Press the REC key.	TEMP ○○□□	The microcomputer starts measuring.	○○: Measuring value												
3	When □□ is 80 or more at this time, the adjustment is OK (step 4 and following can be omitted).		End	□□: Set value												
When □□ is 80 (not passed)		TEMP ○○ 8 0	80 is the default value (unadjusted).													
4	Measure the ambient temperature T (°C) and check hat the measuring value (○○) is within the standard in regard to the microcomputer set value (□□). Note: When the indication of the measuring value (○○) is not stable, and the ambient temperature T (°C) is 25 °C or less, set to the lower value. When the ambient temperature is over 25 °C, set to the higher value.	TEMP ○○□□ μ-com Measuring value ↑ μ-com Set value ↑ <table><tr><th>Room Temperature [T (°C)]</th><th>hex= (○○-□□)</th></tr><tr><td>11.6 to 16.9</td><td>+1 to +3</td></tr><tr><td>17.0 to 22.3</td><td>0 to +2</td></tr><tr><td>22.4 to 27.6</td><td>-1 to +1</td></tr><tr><td>27.7 to 33.0</td><td>0 to -2</td></tr><tr><td>33.1 to 38.4</td><td>-1 to -3</td></tr></table> When the microcomputer value is 7B 79 ↑ - 7A 7C ↓ + 7D			Room Temperature [T (°C)]	hex= (○○-□□)	11.6 to 16.9	+1 to +3	17.0 to 22.3	0 to +2	22.4 to 27.6	-1 to +1	27.7 to 33.0	0 to -2	33.1 to 38.4	-1 to -3
Room Temperature [T (°C)]	hex= (○○-□□)															
11.6 to 16.9	+1 to +3															
17.0 to 22.3	0 to +2															
22.4 to 27.6	-1 to +1															
27.7 to 33.0	0 to -2															
33.1 to 38.4	-1 to -3															
5	Change □□ with the F. SKIP key (UP) and the R.SKIP key (DOWN).	TEMP 7B 7B														
6	Power OFF	EEPROMW	Writing to EEPROM is made and return is made automatically from test mode to normal mode.													

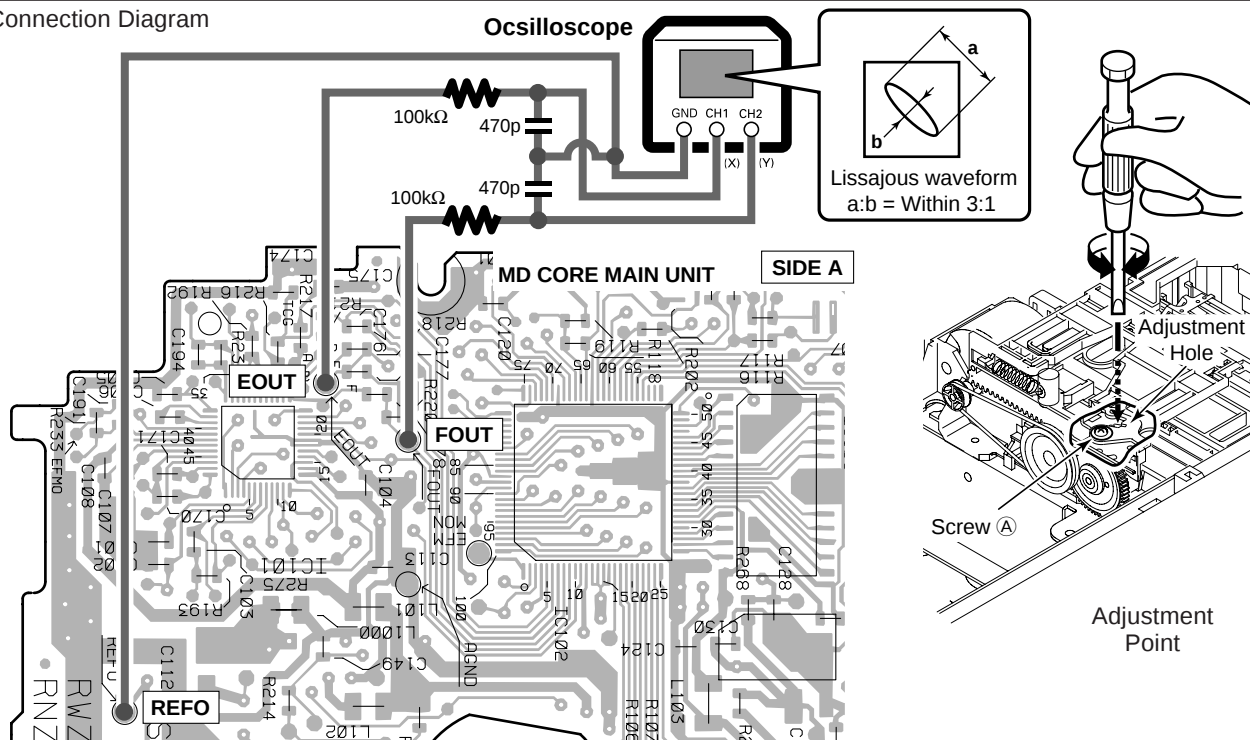
② Laser Power Check

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks								
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode	Laser Wavelength: 780 nm								
2	Press the SET key (Remote control unit)	ppw	PLAY power output status									
3	Measure the laser power with an optical power meter.	ppw										
4	At this time, check that the measuring value (PLAY power) meets the standard value of the table on the right. Note: When the standard value on the right is applied, the numerical value immediately after entry into test mode 2 shall be taken as the standard.	ppw	μ-com TEMP ○○□□ μ-com Measuring value ↑ ↑ Set value <table><tr><td>hex = (○○ – □□)</td><td>Standard Value (mW)</td></tr><tr><td>+02 to +04</td><td>0.69±0.12</td></tr><tr><td>–01 to +01</td><td>0.67±0.1</td></tr><tr><td>–02 to –04</td><td>0.63±0.1</td></tr></table>	hex = (○○ – □□)	Standard Value (mW)	+02 to +04	0.69±0.12	–01 to +01	0.67±0.1	–02 to –04	0.63±0.1	May be omitted.
hex = (○○ – □□)	Standard Value (mW)											
+02 to +04	0.69±0.12											
–01 to +01	0.67±0.1											
–02 to –04	0.63±0.1											
5	Press the SET or SEARCH key.	rpw	REC power output status									
6	At this time, check that the measuring value (REC power) meets the standard value of the table on the right.	rpw	<table><tr><td>hex = (○○ – □□)</td><td>Standard Value (mW)</td></tr><tr><td>+02 to +04</td><td>6.18±0.93</td></tr><tr><td>–01 to +01</td><td>5.79±0.87</td></tr><tr><td>–02 to –04</td><td>5.47±0.82</td></tr></table>	hex = (○○ – □□)	Standard Value (mW)	+02 to +04	6.18±0.93	–01 to +01	5.79±0.87	–02 to –04	5.47±0.82	
hex = (○○ – □□)	Standard Value (mW)											
+02 to +04	6.18±0.93											
–01 to +01	5.79±0.87											
–02 to –04	5.47±0.82											
7	Press the EJECT key.		The LD goes out.									

③ Grating Adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST	Grating adjustment status	
3	Press the PLAY key.	LON : LAG : GEG :	Playback is started in tracking open status. (The servo is closed only for focus and spindle.)	
4	Connect an oscilloscope according to the following connection diagram and loosen the screw (A) at the side of the adjustment hole. Turn the hole with a screwdriver until the Lissajous waveform becomes as shown in the figure, and then tighten the screw (A).	GRT AJST	Lissajous waveform a:b = Within 3:1	
5	Press the STOP key.		Adjustment end	

Connection Diagram



④ Preliminary Adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST		
3	Press the ASES key (until RST YOBI is displayed).	RST YOBI		
4	Press the PLAY key.		Preliminary adjustment result display mode	
5	Press the ASES key several times and display the GTG (GROOV TRACKING GAIN) value.	GTG : ☐		
6	Use the F.SKIP key (UP) and the R.SKIP key (DOWN) to adjust the value of ☐ to 4 or more.	GTG : 4		

④ Preliminary Adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
7	Press the STOP key.	RST YOBI	Return to menu display	
8	Press the ASES key (until AUT YOBI is displayed).	AUT YOBI	Preliminary adjustment mode	
9	Preliminary adjustment starts when the PLAY key is pressed.	HAo : LAG : PTG : Can't ADJ. COMPLETE	Defective adjustment (problem with the servo system) Adjustment end	
10	Press the STOP key.	AUT YOBI	Return to menu display	
11	Power OFF	EEPROM W GGF1328 (MMD-212)	Writing to the EEPROM	

Note: When this adjustment is performed after defocus adjustment has been performed, defocus is returned to the initial status, and defocus adjustment must be performed.

⑤ Normal adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST		
3	Press the ASES key (until AUTO AJST is displayed).	AUTO AJST	Normal adjustment mode	
4	Normal adjustment starts when the PLAY key is pressed.	PEG : HAG : Can't ADJ. COMPLETE	Defective adjustment (problem with the servo system) Adjustment end	
5	Press the STOP key.	AUTO AJST	Return to menu display	

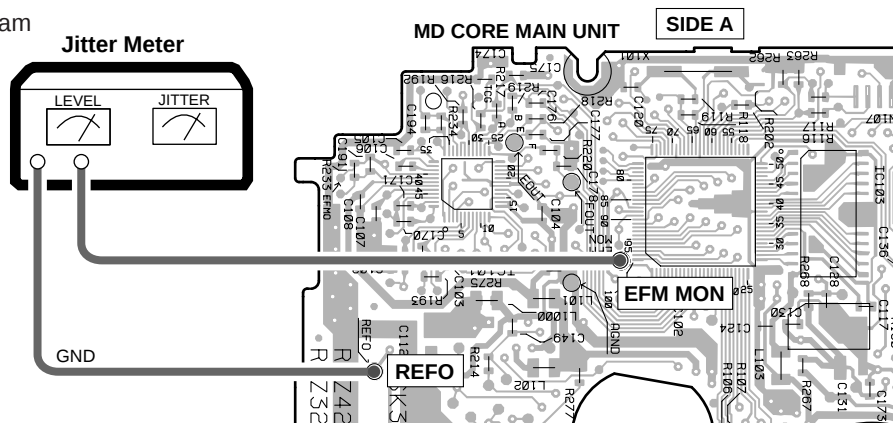
⑥ Defocus adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST		
3	Press the ASES key (until deFO AJST is displayed).	deFO AJST		
4	Press the PLAY key. of <u>○○○○</u> c <u>□□□□</u> Defocus Value ↑ C1 Error Value	PEG : FESpp : of000c0015	Defocus mode is entered, and after automatic execution of normal adjustment, the C1 error at the time of focus offset 0 is displayed.	
5	Check the jitter value and end the adjustment when the intermediate jitter value is 29 nsec or less.			
6	Press the REC key.	of+04 c0032	The C1 error with application of a focus offset of about 0.4 μm on the + side is displayed. The jitter value (J+) at this time is recorded.	

⑥ Defocus adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
7	Press the REC key.	of-04 c0020	The C1 error with application of a focus offset of about 0.4 μm on the – side is displayed. The jitter value (J–) at this time is recorded.	
8	When J+ is larger than J–, press the REC key and display the C1 error when the focus offset is applied up to +0.4 μm . (Do nothing when J– is larger than J+.)	of+04 c0032		
9	Change the value with F.SKIP/R.SKIP until the value becomes the same.	of+04 c0032 of+03 c0025 of+02 c0020	When the smaller offset of the jitter value has been corrected mistakenly, press the SET key (Remote control unit) and return to step 4.	
10	Press the PLAY key.	COMPLETE	The mean value of the changed set value and the offset of the other setting limit is written into the EEPROM as the compensation offset.	
11	Power OFF		Test mode is ended.	

Connection diagram

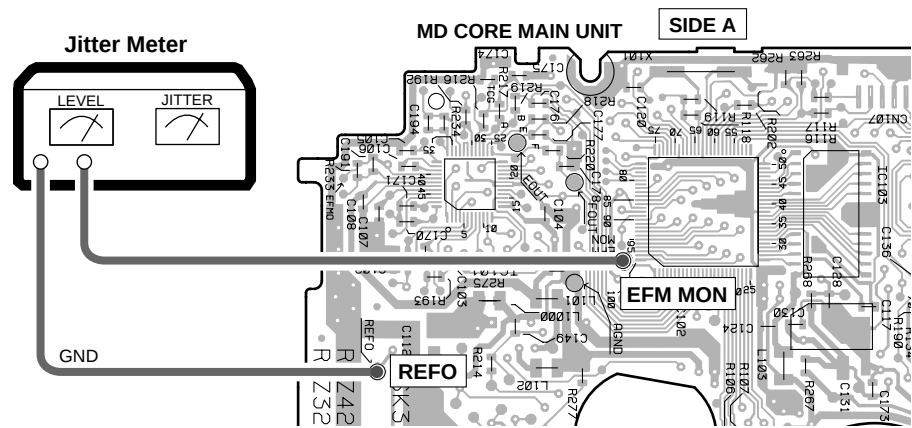


⑦ Jitter/C1 Error Check at the time of Playback

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks						
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode							
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST								
3	Perform “■ Normal Adjustment ” (step 3, step 4).	AUTO AJST								
4	Press the REC key.	TEST PLAY	TEST PLAY mode							
5	Press the SET (for Remote control unit) key and display the inner circumference address.	ADRES 0050								
6	Press the PLAY key and display the C1 error for the inner circumference.	a0050 c0015	Check that the jitter value meets the standard value of the following table. GGF1328 (MMD-212) jitter value <table><tr><td>Inner circumference</td><td>31 nsec or less</td></tr><tr><td>Intermediate circumference</td><td>29 nsec or less</td></tr><tr><td>Outer circumference</td><td>29 nsec or less</td></tr></table>	Inner circumference	31 nsec or less	Intermediate circumference	29 nsec or less	Outer circumference	29 nsec or less	
Inner circumference	31 nsec or less									
Intermediate circumference	29 nsec or less									
Outer circumference	29 nsec or less									
7	Press the CANCEL (for Remote control unit) key.	A0062 c0013 AVE. c0012	Seven data are acquired, the largest and the smallest value are discarded, and fixed display is made for the mean value of the remaining five data. Check that this value is 200 or less.							

⑦ Jitter/C1 Error Check at the time of Playback

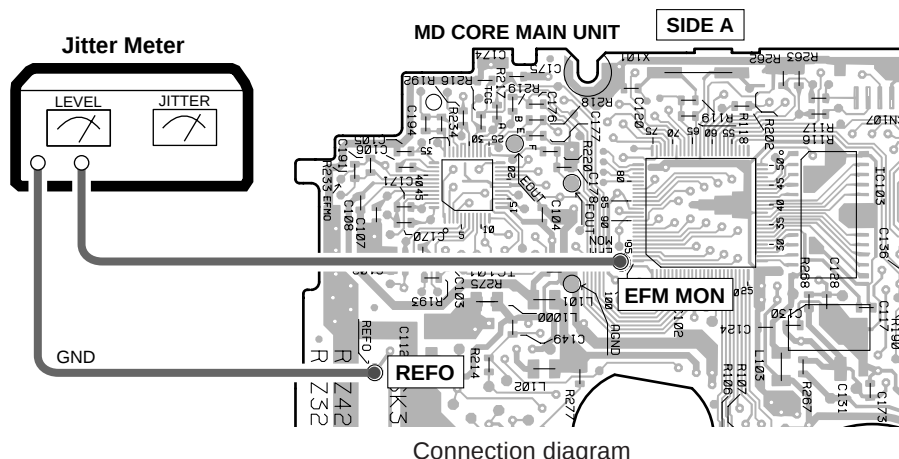
Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks						
8	Press the CANCEL (for Remote control unit) key.	a006F c0017	The fixed display of the C1 error is ended.							
9	Press the STOP key.	TEST PLAY								
10	Press the SET (for Remote control unit) key and display the inner circumference address.	ADRES 0050		Intermediate and outer circumference may be omitted.						
11	Press the REC key and display the intermediate circumference address. Perform steps 6 to 9 in this condition.	ADRES 03C0 a03C0 c0009 TEST PLAY								
12	Press the SET (for Remote control unit) key and display the inner circumference address.	ADRES 0050								
13	Press the REC key twice to display the outer circumference address. Perform steps 6 to 9 in this condition.	ADRES 0700 a0700 c0008 TEST PLAY								
14	Press the EJECT key, eject the test disc GGF1328 (MMD-212), and insert TGYS1 (or MMD-110.)	EJECT LOADING GRT AJST								
15	Perform steps 3 to 13 and check the jitter/C1 error with the test disc TGYS1 (or MMD-110).	a0062 c0009 a03d2 c0007 a0712 c0006	Check that the jitter value meets the standard value of the following table. TGYS1 (or MMD-110) jitter value <table><tr><td>Inner circumference</td><td>29 nsec or less</td></tr><tr><td>Intermediate circumference</td><td>27 nsec or less</td></tr><tr><td>Outer circumference</td><td>27 nsec or less</td></tr></table>	Inner circumference	29 nsec or less	Intermediate circumference	27 nsec or less	Outer circumference	27 nsec or less	
Inner circumference	29 nsec or less									
Intermediate circumference	27 nsec or less									
Outer circumference	27 nsec or less									
16	Press the EJECT key.	EJECT	The test disc TGYS1 (or MMD-110) is ejected.							
17	Power OFF		Test mode is ended.							



Connection diagram

■ Jitter/C1 Error Check at the time of Recording/Playback

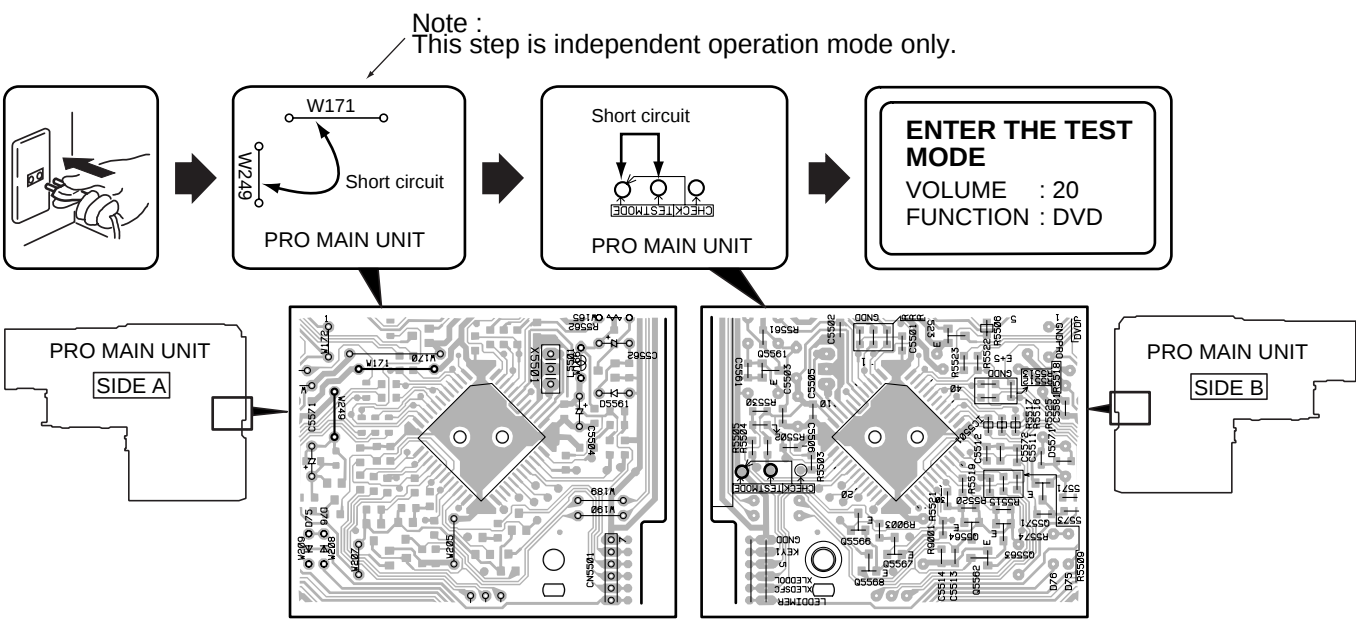
Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks						
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode							
2	Insert the test disc (GGF1277).	LOADING GRT AJST								
3	Perform “ ■ Normal Adjustment ” (step 3, step 4).	AUTO AJST								
4	Press the REC key twice.	TEST REC	TEST REC mode							
5	Press the SET (for Remote control unit) key and display the inner circumference address.	a0050 pw0D								
6	When the PLAY key is pressed, TEST REC starts, and when 25 addresses or more have been sent, stop by pressing the STOP key.	a0069 pw0D TEST REC	Note: When the initial address (0050) part of the inner circumference (or intermediate/ outer circumference) has been used 1000 times or more, press the F.SKIP key and shift the address by 10hex. (The address is shifted (up to 10 times) according to the use frequency of the disc.)	Intermediate and outer circumference may be omitted.						
7	Press the SET (for Remote control unit) key and display the inner circumference address.	a0050 pw0D								
8	Press the REC key and display the intermediate circumference.	a03C0 pw0D								
9	Perform step 6.	a03D9 pw0D TEST REC								
10	Press the SET (for Remote control unit) key and display the inner circumference address.	a0050 pw0D								
11	Press the REC key twice and display the outer circumference address.	a0700 pw0D								
12	Perform step 6.	a0719 pw0D TEST REC								
13	Press the REC key.	TEST PLAY	TEST PLAY mode							
14	Perform steps 5 to 13 of “ ■ Jitter/C1 Error Check at the time of Playback ”. At the time of self-recording, wait for seven addresses after TEST PLAY start, and then press the CANCEL key (Remote control unit) and enter into mean value mode. (Good recording may not be possible for several addresses at the beginning.)	a0069 c0009 a03D9 c0007 a0719 c0006	Check the jitter/C2 error at the inner/ intermediate/outer circumference of GGF1277, and check that the jitter value satisfies the standard value of the following table. GGF1277 jitter value <table><tr><td>Inner circumference</td><td>33 nsec or less</td></tr><tr><td>Intermediate circumference</td><td>31 nsec or less</td></tr><tr><td>Outer circumference</td><td>31 nsec or less</td></tr></table>	Inner circumference	33 nsec or less	Intermediate circumference	31 nsec or less	Outer circumference	31 nsec or less	
Inner circumference	33 nsec or less									
Intermediate circumference	31 nsec or less									
Outer circumference	31 nsec or less									
15	Press the EJECT key.	EJECT	The test disc (GGF1277) is ejected.							
16	Power OFF		Test mode is ended.							



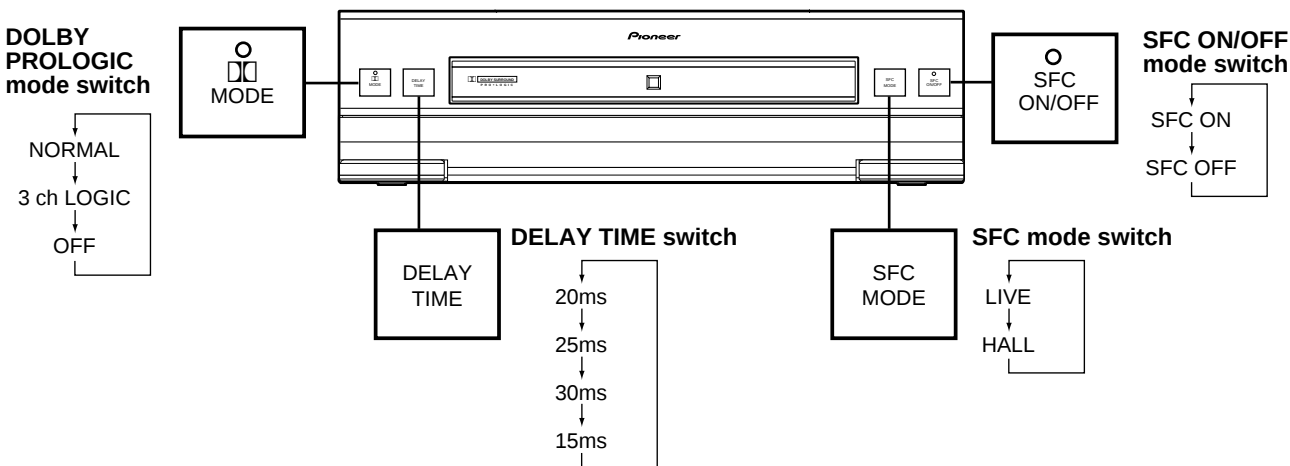
6.2 SURROUND PROCESSOR (SP-L5)

6.2.1 HOW TO ENTER / CANCEL TEST MODE

TEST MODE : ON



FUNCTION OF TEST MODE



TEST MODE CANCEL



7. GENERAL INFORMATION

7.1 IC

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

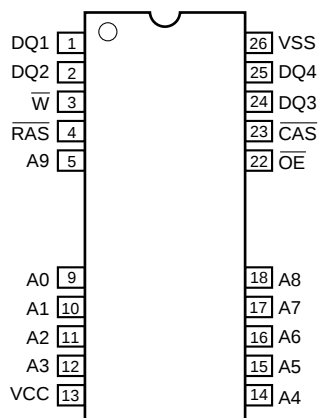
●List of IC

M5M4V4400CTP-7, M56758FP, PD5450A, LR376481, BD7910FV, BR93LC56F, IR3R55M, AK4520A, PDG225A, LV1035M, PDC046

■ M5M4V4400CTP-7 (MD CORE MAIN UNIT : IC103)

• DRAM

●Pin Assignment (Top View)

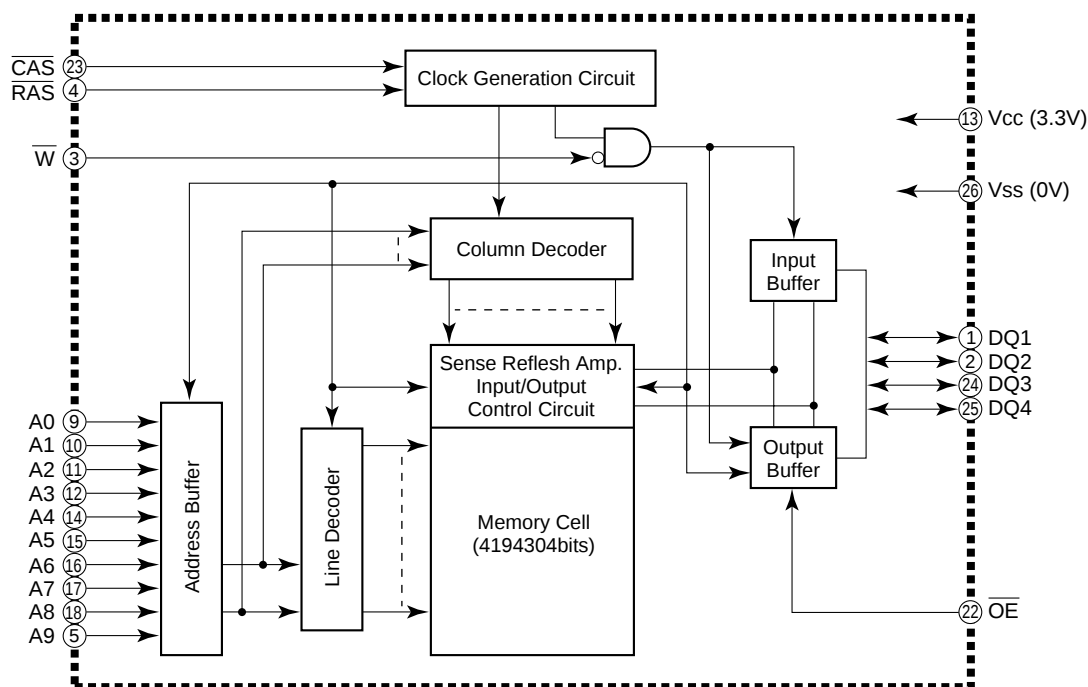


●Pin Function

No.	Name	Description
1	DQ1	Data Input/Output
2	DQ2	
3	$\overline{W}$	Write control input
4	$\overline{RAS}$	Line address strobe input
5	A9	Address input
6		
7		
8		
9	A0	Address input
12	A3	
13	Vcc	Power supply voltage (+3.3 V)

No.	Name	Description
14	A4	Address input
18	A8	
19		
20		
21		
22	$\overline{OE}$	Output-enable input
23	$\overline{CAS}$	Column address strobe input
24	DQ3	Data Input/Output
25	DQ4	
26	Vss	Ground (0 V)

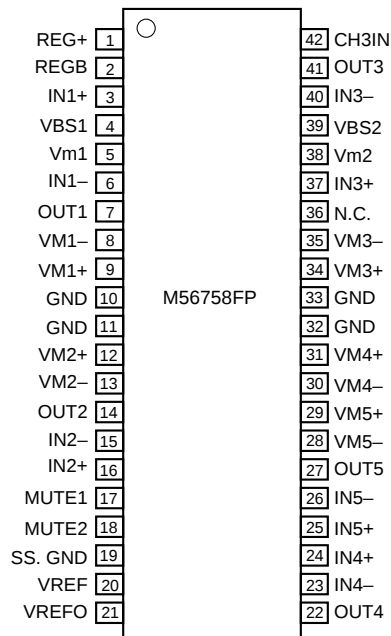
●Block Diagram



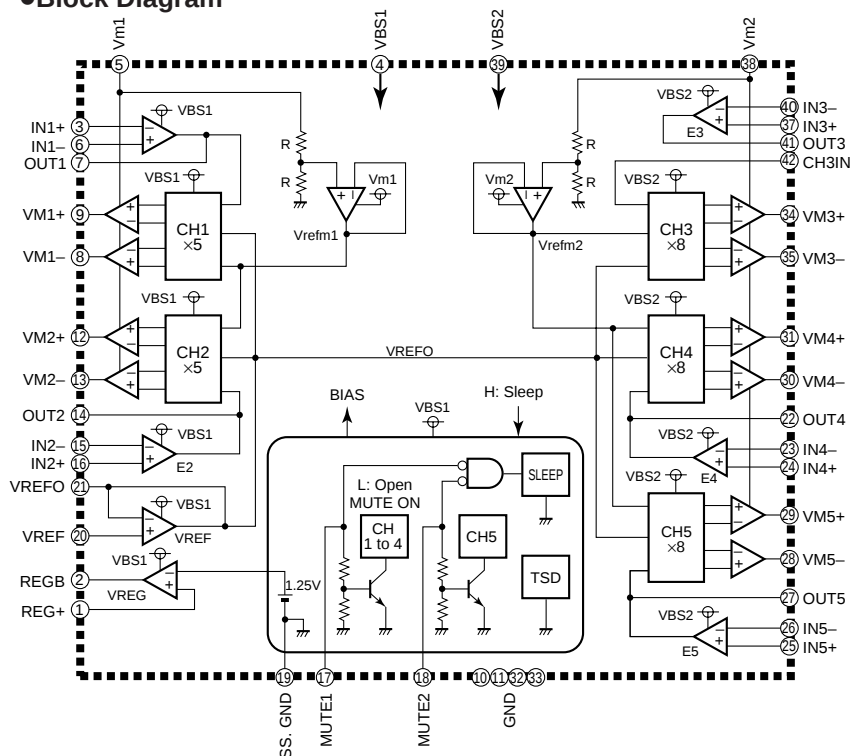
■ M56758FP (MD CORE MAIN UNIT : IC106)

• 5-channel Actuator Driver

●Pin Assignment (Top View)



●Block Diagram



●Pin Function

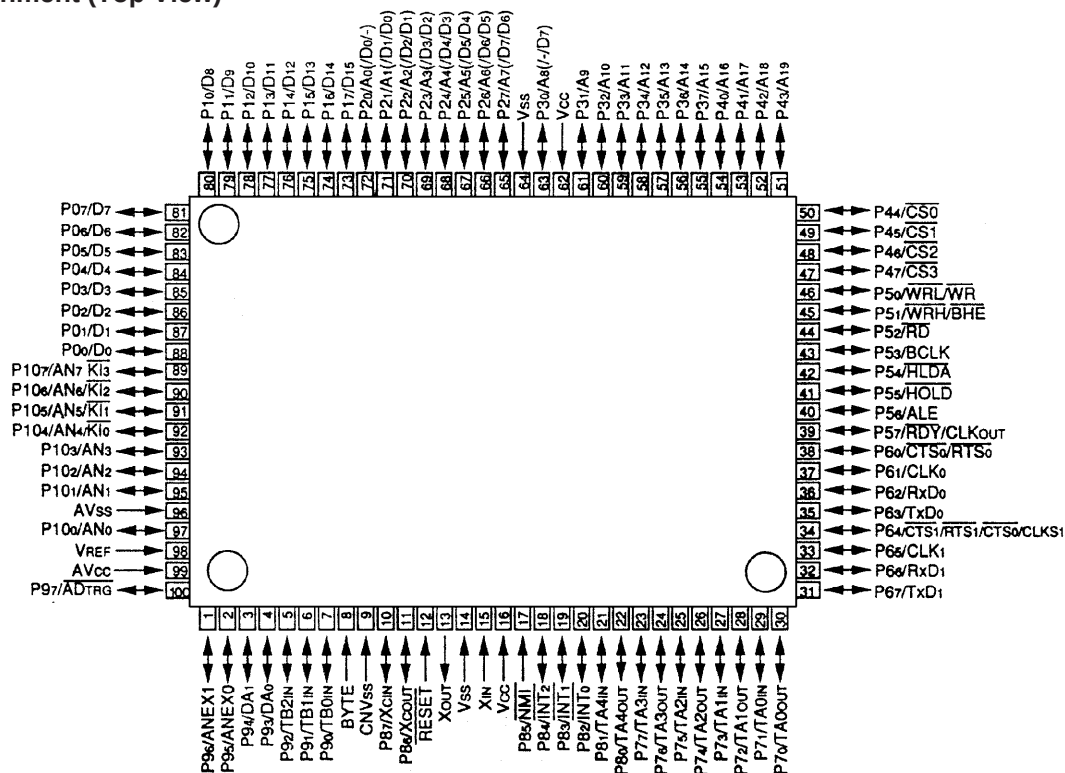
No.	Name	Description
1	REG+	Regulator voltage setting resistor connection terminal
2	REGB	Regulator PNP base connection terminal
3	IN1+	E1 amplifier nonreversed input terminal
4	VBS1	Bootstrap power supply terminal
5	Vm1	Motor power supply terminal
6	IN1-	E1 amplifier reversed input terminal
7	OUT1	E1 amplifier output terminal
8	VM1 (-)	CH1 reversed output terminal
9	VM1 (+)	CH1 nonreversed output terminal
10	GND	Motor GND
11		
12	VM2 (+)	CH2 nonreversed output terminal
13	VM2 (-)	CH2 reversed output terminal
14	OUT2	E2 amplifier output terminal
15	IN2-	E2 amplifier reversed input terminal
16	IN2+	E2 amplifier nonreversed input terminal
17	MUTE1	Mute terminal (CH1 to CH4)
18	MUTE2	Mute terminal (CH5)
19	SS. GND	Small-signal ground
20	VREF	Reference voltage input terminal
21	VREFO	Reference voltage output terminal

No.	Name	Description
22	OUT4	E4 amplifier output terminal
23	IN4-	E4 amplifier reversed input terminal
24	IN4+	E4 amplifier nonreversed input terminal
25	IN5+	E5 amplifier nonreversed input terminal
26	IN5-	E5 amplifier reversed input terminal
27	OUT5	E5 amplifier output terminal
28	VM5 (-)	CH5 reversed output terminal
29	VM5 (+)	CH5 nonreversed output terminal
30	VM4 (-)	CH4 reversed output terminal
31	VM4 (+)	CH4 nonreversed output terminal
32	GND	Motor GND
33		
34	VM3 (+)	CH3 nonreversed output terminal
35	VM3 (-)	CH3 reversed output terminal
36	N.C.	Not connected
37	IN3+	E3 amplifier nonreversed input terminal
38	Vm2	Motor power supply terminal
39	VBS2	Bootstrap power supply terminal
40	IN3-	E3 amplifier reversed input terminal
41	OUT3	E3 amplifier output terminal
42	CH3IN	E3 amplifier nonreversed input terminal

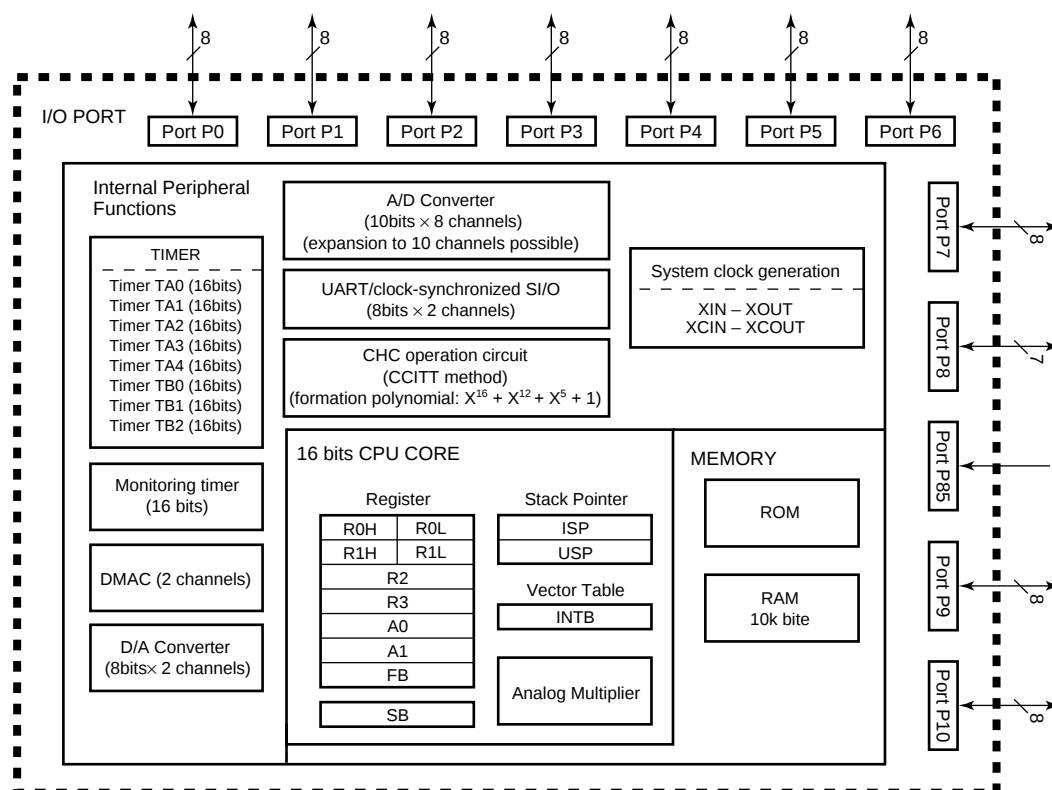
PD5450B (MD CORE MAIN UNIT : IC104)

• Mechanism Control microcomputer

Pin Assignment (Top View)



Block Diagram



●Pin Function

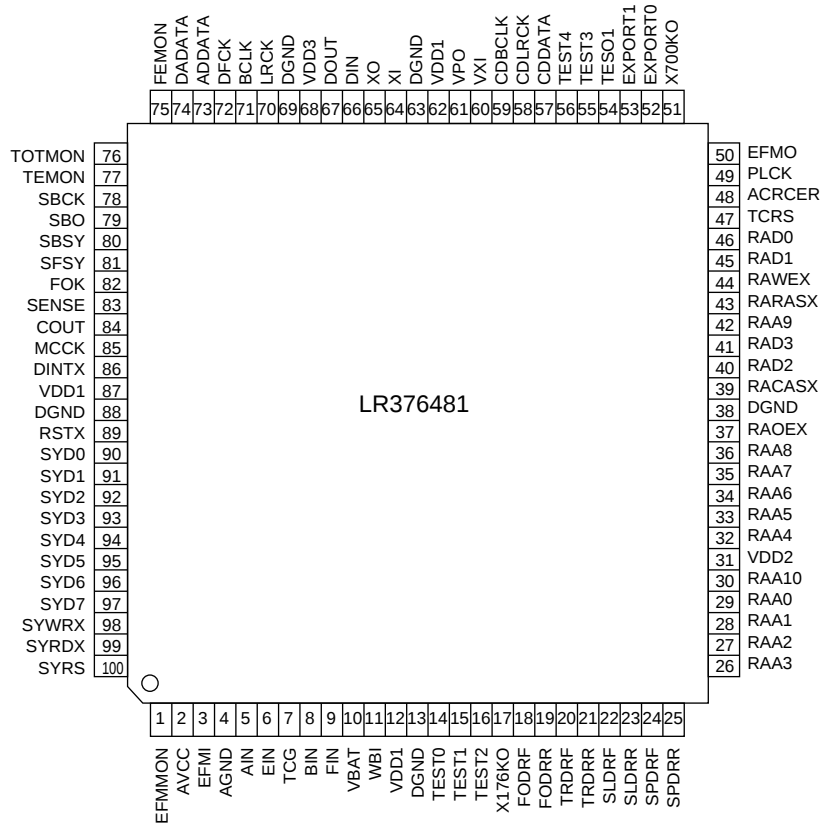
No.	Name	I/O	Description
1 to 7, 100	P96 to P90, P97	I/O	These are 8 bit I/O ports with the same functions as P0. By software selection, it functions as the input terminals for the timers B0 to B2, the output terminals for the D/A converter, the expansion input terminals of the A/D converter, or the A/D trigger input terminals.
8	BYTE	I	This is the terminal for switching the external data bus width. When the level of this terminal is "L", the width is 16 bits, and when it is "H", the width is 8 bits. Please fix it to one of these levels. At the time of single-chip mode, connect it to the Vss terminal.
9	CNVss	I	This is the terminal for processor mode switching. At the time of single-chip mode or at the time of memory expansion mode, connect it to the Vss terminal. At the time of microprocessor mode, connect it to the Vcc terminal.
10 11 17 18 to 22	P87 P86 P85 P84 to P80	I/O I/O I I/O	P80 to P84, P86, and P87 are I/O ports with the same functions as P0. By software selection, they function as the I/O terminals for the timer A4 or the input terminals for external interrupt. P86 and P87 function by software selection as the I/O terminals for the subclock oscillation circuit. In this case, connect a crystal oscillator between P86 (XCOUT terminal) and P87 (XCIN terminal). P85 is an input-only port serving also as $\overline{\text{NMI}}$. When the input of this terminal changes from "H" to "L", and $\overline{\text{NMI}}$ interrupt is generated. The $\overline{\text{NMI}}$ function can not be cancelled by software. A pullup resistance can not be set for this terminal.
12	$\overline{\text{RESET}}$	I	When the input to this terminal is "L", the microcomputer is reset.
13	XOUT	I	This are the I/O terminals of the main clock oscillation circuit. Connect a ceramic oscillator or a crystal oscillator between the terminals XIN and XOUT. In case of an externally generated clock, enter the clock from the XIN terminal and leave the XOUT terminal open.
15	XIN	O	
14	Vss	—	Impress 0 V.
16	Vcc	—	Impress 2.7 V to 5.5 V.
23 to 30	P77 to P70	I/O	These are 8 bit I/O ports with the same functions as P0. By software selection, they function as the I/O terminals for the timers A0 to A3.
31 to 38	P67 to P60	I/O	These are 8 bit I/O ports with the same functions as P0. By software selection, they function as the I/O terminals for the UART0 and UART1.
39 to 46	P57 to P50	I/O	These are 8 bit I/O ports with the same functions as P0. By software selection, they put out a clock with 1/8 or 1/32 of XIN or with the same cycle as XCIN from P57.
	$\overline{\text{WRL}}/\text{WR}$, $\overline{\text{WRH}}/\text{BHE}$, $\overline{\text{RD}}$, $\overline{\text{BCLK}}$, $\overline{\text{HLDA}}$, $\overline{\text{HOLD}}$, $\overline{\text{ALE}}$, $\overline{\text{RDY}}$	O O O O O I O I	$\overline{\text{WRL}}$, $\overline{\text{WRH}}$, ($\overline{\text{WR}}$, $\overline{\text{BHE}}$), $\overline{\text{RD}}$, $\overline{\text{BCLK}}$, $\overline{\text{HLDA}}$, and $\overline{\text{ALE}}$ signals are put out. Switching between $\overline{\text{WRL}}$ and $\overline{\text{WRH}}$ and between $\overline{\text{BHE}}$ and $\overline{\text{WR}}$ is possible by software. ■ At the time of $\overline{\text{WRL}}$, $\overline{\text{WRH}}$, $\overline{\text{RD}}$ selection When the external data bus width is 16 bits and the $\overline{\text{WRL}}$ signal is at "L" level, writing is done to an even address, and the $\overline{\text{WRH}}$ signal is at "L" level, writing is done to an odd address. Reading is performed when the $\overline{\text{RD}}$ signal is at "L" level. ■ At the time of $\overline{\text{WR}}$, $\overline{\text{BHE}}$, $\overline{\text{RD}}$ selection Writing is done when the $\overline{\text{WR}}$ signal is at "L" level. Reading is done when the $\overline{\text{RD}}$ signal is at "L" level. An odd address is accessed when the $\overline{\text{BHE}}$ signal is at "L" level. Please use this mode when the external data bus width is 8 bits. The microcomputer is in hold status while the input level to the $\overline{\text{HOLD}}$ terminal is "L". During hold status, the output from $\overline{\text{HLDA}}$ is at "L" level. $\overline{\text{ALE}}$ is the signal for address latching. The microcomputer is in ready status while the input to $\overline{\text{RDY}}$ is at "L" level. A clock with the same frequency as the internal clock ϕ is put out from the $\overline{\text{BCLK}}$ terminal.
47 to 54	P47 to P40	I/O	These are 8 bit I/O ports with the same functions as P0.
	$\overline{\text{CS3}}$ to $\overline{\text{CS0}}$, A19 to A16	O O	The A16 to A19 and $\overline{\text{CS0}}$ to $\overline{\text{CS3}}$ signals are put out. A16 to A19 are the upper 4 bits of the address. $\overline{\text{CS0}}$ to $\overline{\text{CS3}}$ are the chip select signals, and they are used for specification of the access space.

No.	Name	I/O	Description
55 to 61, 63	P37 to P31, P30	I/O	These are 8 bit I/O ports with the same functions as P0.
	A15 to A9, A8	O	The middle 8 bits (A8 to A15) of the address are put out.
	A15 to A9 A8/D7	I/O O	With an external data bus width of 16 bits and multiplex bus setting, time sharing is performed for data (D7) I/O and address (A8) output. Address (A9 to A15) output also is performed.
62	Vcc	—	Impress 2.7 V to 5.5 V.
64	Vss	—	Impress 0 V.
65 to 72	P27 to P20	I/O	These are 8 bit I/O ports with the same functions as P0.
	A7 to A0	O	Output of the lower 8 bits (A0 to A7) of the address is performed.
	A7/D7 to A0/D0	I/O	With an external data bus width of 16 bits and multiplex bus setting, time sharing is performed for data (D0 to D7) I/O and address lower 8 bits (A0 to A7) output.
	A0 A7/D6 to A1/D0	O I/O	With an external data bus width of 16 bits and multiplex bus setting, time sharing is performed for data (D0 to D6) I/O and address (A1 to A7) output. Address (A0) output also is performed.
73 to 80	P17 to P10	I/O	These are 8 bit I/O ports with the same functions as P0.
	D15 to D8	I/O	Data (D8 to D15) I/O is performed at the time of separate bus setting.
81 to 88	P07 to P00	I/O	These are CMOS 8 bit I/O ports. They have direction registers for I/O selection, and input or output port setting is possible individually for each terminal. For an input port, the existence or absence of a pull-up resistance can be set by software in 4 bit units.
	D7 to D0	I/O	Data (D0 to D7) I/O is performed at the time of separate bus setting.
89 to 95, 97	P107 to P101, P100	I/O	This are 8 bit I/O ports with the same functions as P0. By software selection, they function as input terminals of the A/D converter. P104 to P107 also function as input terminals for the key input interrupt function.
96	AVss	—	This is the A/D converter power supply input terminal. Please connect it to the Vss terminal.
98	VREF	I	This is the A/D converter reference voltage input terminal.
99	AVcc	—	This is the A/D converter power supply input terminal. Please connect it to the Vcc terminal.

■ LR376481 (MD CORE MAIN UNIT : IC102)

• Encode/Decode/Atrac

●Pin Assignment (Top View)



●Pin Function

No.	Name	I/O	Description
1*	EFMMON	O	EFM monitor output
2	AVCC	—	Analog power supply
3	EFMI	I	EFM signal input from RF amp
4	AGND	—	Analog GND
5	AIN	I	Focus error signal A
6	EIN	I	Tracking error signal E
7	TCG	I	Track cross signal
8	BIN	I	Focus error signal B
9	FIN	I	Tracking error signal F
10*	VBAT	I	Power-supply voltage detection signal for constant-voltage servo
11	WBI	I	ADIP wobble signal
12	VDD1	—	Digital power supply
13	DGND	—	Digital GND
14	TEST0	I	Test-use input; normally connected to GND when used.
15	TEST1	I	
16	TEST2	I	Test-use input; Encoder/Servo Mode and ATRAC Mode changeover

No.	Name	I/O	Description
17	X176KO	O	Clock output; f = 176.4kHz (4fs)
18	FODRF	O	Focus servo forward output; PWM
19	FODRR	O	Focus servo reverse output; PWM
20	TRDRF	O	Tracking servo forward output; PWM
21	TRDRR	O	Tracking servo reverse output; PWM
22	SLDRF	O	Slide servo forward output; PWM
23	SLDRR	O	Slide servo reverse output; PWM
24	SPDRF	O	Spindle servo forward output or spindle servo output; PWM
25	SPDRR	O	Spindle servo reverse output or spindle rotation forward/reverse changeover
26	RAA3	O	Address output to external D-RAM; ADR3
27	RAA2	O	Address output to external D-RAM; ADR2
28	RAA1	O	Address output to external D-RAM; ADR1
29	RAA0	O	Address output to external D-RAM; ADR0 (LSB)
30*	RAA10	O	Address output to external D-RAM; ADR10 (MSB)
31	VDD2	—	Power supply for DRAM interface

No.	Name	I/O	Description
32 36	RAA4 RAA8	O	Address output to external D-RAM; ADR4 Address output to external D-RAM; ADR8
37	RAOEX	O	Data output enable signal output to external D-RAM
38	DGND	–	Digital GND
39	RACASX	O	Column address strobe signal output to external D-RAM
40	RAD2	I/O	External D-RAM and data input/output; D2
41	RAD3	I/O	External D-RAM and data input/output; D3 (MSB)
42	RAA9	O	Address output to external D-RAM; ADR9
43	RARASX	O	Low address strobe signal output to external D-RAM
44	RAWEX	O	Data write enable signal output to external D-RAM
45	RAD1	I/O	External D-RAM and data input/output; D1
46	RAD0	I/O	External D-RAM and data input/output; D0 (LSB)
47*	TCRS	O	Track cross signal
48*	ACRCER	O	ADIP CRC error flag monitor output
49*	PLCK	O	EFM PLL clock output during Play
50	EFM0	O	EFM signal output during Record; C1F (C1 error flag) monitor output during Play.
51*	X700KO	O	Clock output; f = 705.6kHz; clock is not output when RSTX = 0.
52*	EXPORT0	O	Microcomputer extension output port 0
53*	EXPORT1	O	Microcomputer extension output port 1
54	TESO1	O	Microcomputer extension output port 2 during PLLR changeover
55	TEST3	I/O	Microcomputer extension output port 3 during PLLOSC changeover
56	TEST4	I/O	Microcomputer extension output port 4 during EXTCLK changeover
57	CDDATA	I/O	CD data input for high-speed dubbing; microcomputer extension port 5 during changeover
58	CDLRCK	I/O	CD LR clock input for high-speed dubbing; microcomputer extension port 6 during changeover
59	CDBCLK	I/O	CD bit clock input for high-speed dubbing; microcomputer extension port 7 during changeover
60	VXI	I	PLL clock input for varying pitch
61*	VPO	O	PLL phase error input for varying pitch
62	VDD1	–	Digital power supply
63	DGND	–	Digital GND
64	XI	I	Oscillation circuit input; 33.8688MHz
65	XO	O	

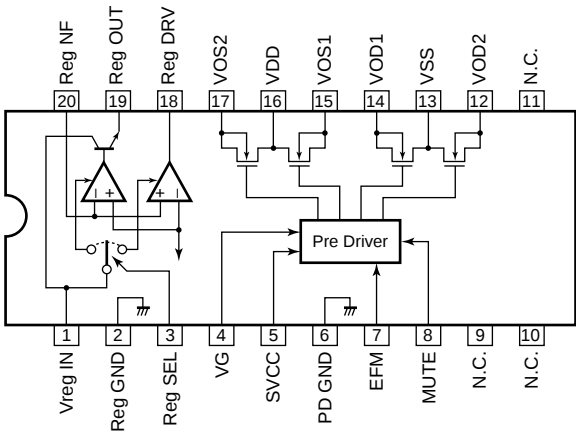
No.	Name	I/O	Description
66	DIN	I	Digital input signal
67	DOUT	O	Digital output signal
68	VDD3	–	Power supply for internal PLL
69	DGND	–	Digital GND
70	LRCK	O	Music data Lch/Rch changeover output
71	BCLK	O	Music data shift lock
72	DFCK	O	Clock for AD/DA converter digital filter; 256fs
73	ADDATA	I	Audio data input
74	DADATA	O	Audio data output
75*	FEMON	O	Focus error signal monitor output
76*	TOTMON	O	Total signal monitor output
77*	TEMON	O	Tracking error signal monitor output
78*	SBCK	I	DIN sub code readout clock; EIAJ CP-309 format
79*	SBO	O	DIN sub code serial data; EIAJ CP-309 format
80*	SBSY	O	DIN sub code block synchronization signal; EIAJ CP-309 format
81*	SFSY	O	DIN sub code frame synchronization signal; EIAJ CP-309 format
82	FOK	O	Focus OK detection signal; "0": Focus OK
83	SENSE	O	Servo status detection signal; "1": Auto Move/ Auto Jump/Auto Focus lead-in in progress
84	COUT	O	Track cross signal output
85	MCKK	O	Clock output for microcomputer; clock is output even when RSTX = 0.
86	DINTX	O	Interrupt Request output signal for system computer interface
87	VDD1	–	Digital power supply
88	DGND	–	Digital GND
89	RSTX	I	Tip reset input; reset with L (NOTE)
90	SYD0	I/O	System computer interface data bus terminal; (LSB)
91 96	SYD1 SYD6	I/O	System computer interface data bus terminal
97	SYD7	I/O	System computer interface data bus terminal; (MSB)
98	SYWRX	I	System computer interface register write pulse input
99	SYRDX	I	System computer interface register read pulse input
100	SYRS	I	System computer interface register select input

Terminals denoted with an asterisk (*) are (Open) terminals that are not externally connected.

(NOTE) Set RSTX to "L" when the power is being turned ON or after it has been turned ON.

BD7910FV (MD CORE MAIN UNIT : IC116)

- Head Driver
- Block Diagram



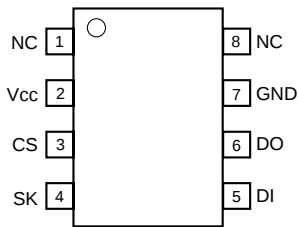
•Pin Function

No.	Name	Description
1	VregIN	Regulator input and regulator power supply
2	RegGND	Regulator GND
3	RegSEL	Regulator selection terminal
4	VG	Power MOS drive voltage input
5	SVCC	EFM high-level output voltage

No.	Name	Description
6	PDGND	Predrive GND
7	EFM	EFM signal input
8	MUTE	Mute control
9	N.C.	Not used
10	N.C.	
11	N.C.	
12	VOD2	Sink output (lower side power MOS drain)
13	VSS	H-bridge GND (lower side power MOS source)
14	VOD1	Sink output (lower side power MOS drain)
15	VOS1	Source output (upper side power MOS source)
16	VDD	H-bridge power supply (upper side power MOS drain)
17	VOS2	Source output (upper side power MOS source)
18	RegDRV	External PNP drive output for the regulator
19	RegOUT	Regulator output (emitter follower output)
20	RegNF	Regulator feedback terminal

BR93LC56F (MD CORE MAIN UNIT : IC110)

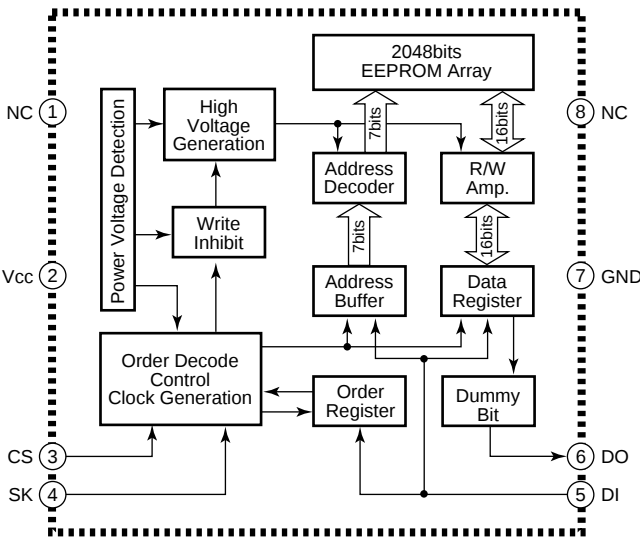
- EEPROM
- Pin Assignment (Top View)



•Pin Function

No.	Name	Description
1	NC	Not connected
2	Vcc	Power supply
3	CS	Chip selection input
4	SK	Serial clock input
5	DI	Start bit, operation code, address, and serial data input
6	DO	Serial data output, READY/BUSY internal status indication output
7	GND	Ground
8	NC	Not connected

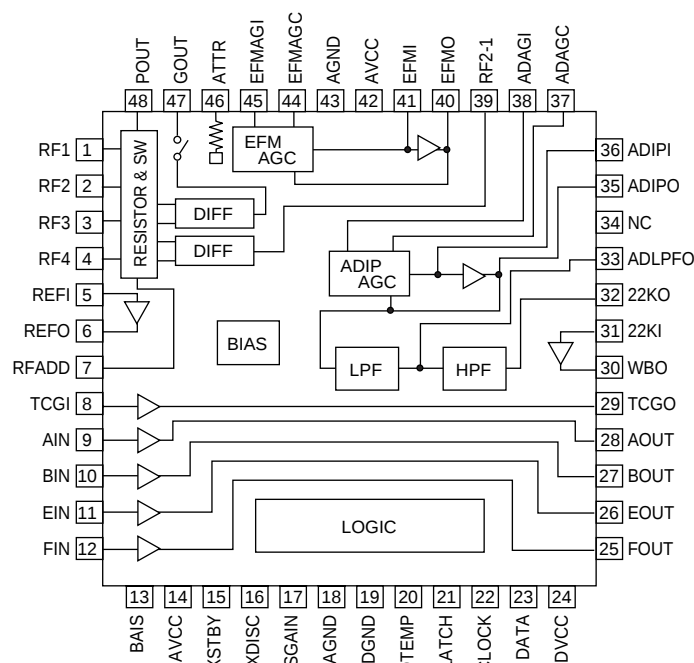
•Block Diagram



IR3R55M (MD CORE MAIN UNIT : IC101)

• RF Signal Processor

●Block Diagram



●Pin Function

No.	Name	Description
1	RF1	Inputs RF signal input terminal 1 pickup RF signal output.
2	RF2	Inputs RF signal input terminal 2 pickup RF signal output.
3	RF3	Inputs RF signal input terminal 3 pickup RF signal output.
4	RF4	Inputs RF signal input terminal 4 pickup RF signal output.
5	REFI	Standard voltage amp input terminal
6	REFO	Standard voltage amp output terminal
7	RFADD	RF1 – 4 resistance addition output terminal
8	TCGI	Track cross detection signal amp input terminal during groove input
9	AIN	Servo-use signal amp (Focus servo system) inversion input terminal
10	BIN	Servo-use signal amp (Focus servo system) inversion input terminal
11	EIN	Servo-use signal amp (Tracking servo system) inversion input terminal
12	FIN	Servo-use signal amp (Tracking servo system) inversion input terminal
13	BIAS	Bias input terminal
14	AVCC	Analog power terminal
15*	VSTBY	Logic signal output terminal (outputs STBY signal inversion signal)

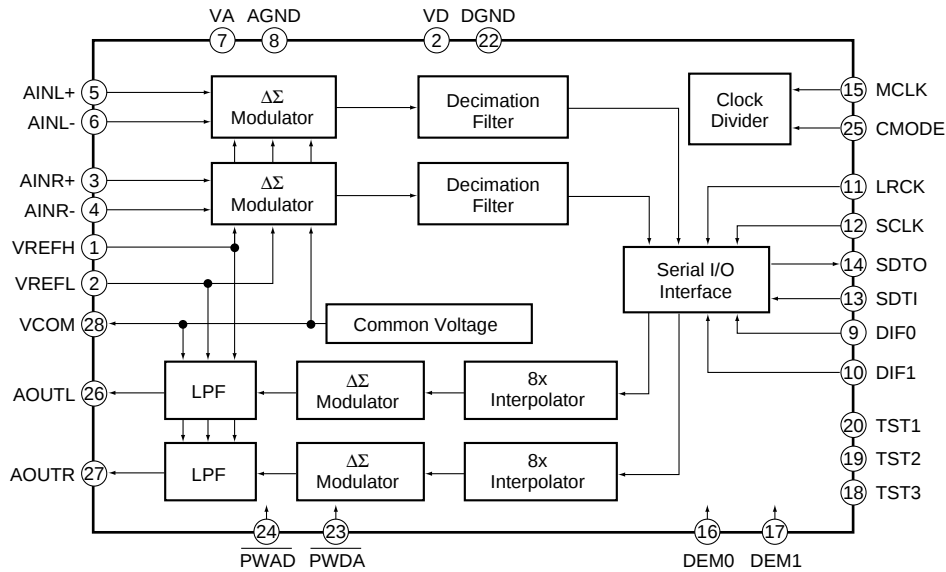
No.	Name	Description
16*	XDISC	Logic signal output terminal (outputs DISC signal inversion signal)
17*	XSGAIN	Logic signal output terminal (outputs SGAIN signal inversion signal)
18	AGND	Analog part GND terminal
19	DGND	Digital part GND terminal
20	DTEMP	Tip temperature detection terminal
21	LATCH	Latch signal input terminal
22	CLOCK	Clock signal input terminal
23	DATA	Serial data input terminal
24	DVCC	Digital part power terminal
25	FOUT	Servo-use signal amp (Tracking servo system) output terminal
26	EOUT	Servo-use signal amp (Tracking servo system) output terminal
27	BOUT	Servo-use signal amp (Focus servo system) output terminal
28	AOUT	Servo-use signal amp (Focus servo system) output terminal
29	TCGO	Track cross detection signal amp output terminal during groove output
30	WBO	Comparator output terminal for ADIP signal 2-value conversion
31	22KI	Comparator input terminal for ADIP signal 2-value conversion
32	22KO	ADIP signal HPF amp output terminal
33	ADLPFO	ADIP signal LPF amp output terminal
34*	NC	NC
35	ADIPO	ADIP signal preamp output terminal
36	ADIPI	ADIP signal AGC amp output terminal
37	ADAGC	Smoothing capacitor connection terminal for ADIP signal AGC
38	ADAGI	ADIP signal AGC amp input terminal
39	RF2-1	RF1, RF2 differential signal
40	EFMO	RF signal preamp output terminal
41*	EFMI	RF signal AGC amp output terminal
42	AVCC	Analog part power terminal
43	AGND	Analog part GND terminal
44	EFMAGC	Smoothing capacitor connection terminal for EFM signal AGC
45	EFMAGI	EFM signal AGC amp input terminal
46*	ATTR	Terminal for attenuating 47, 48 pin output signal
47	GOUT	Outputs RF1 + RF2 + RF3 – RF3 – RF4 signal during groove output
48	POUT	RF1 – 4 resistance addition output during pit output

Terminals denoted with an asterisk (*) are (Open) terminals that are not externally connected.

AK4520A (MD MAIN UNIT : IC4301)

• AD/DA Converter

•Block Diagram



•Pin Function

No.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
1	VREFH	I	Positive voltage reference input pin, VA	15	MCLK	I	Master clock input pin
2	VREFL	I	Negative voltage reference input pin, AGND	16	DEM0	I	De-emphasis frequency select pin
3	AINR+	I	R ch analog positive input pin	17	DEM1	I	De-emphasis frequency select pin
4	AINR-	I	R ch analog negative input pin	18	TST3	I/O	Test pins (Pull down pins) Open or connect to DGND.
5	AINL+	I	L ch analog positive input pin	19	TST2	I/O	
6	AINL-	I	L ch analog negative input pin	20	TST1	I	
7	VA	-	Analog power supply pin	21	VD	-	Digital power supply pin
8	AGND	-	Analog ground pin	22	DGND	-	Digital ground pin
9	DIF0	I	Audio data interface format pin	23	PWDA	I	DAC power-down mode pin
10	DIF1	I	Audio data interface format pin	24	PWAD	I	ADC power-down mode pin
11	LRCK	I	Input/Output channel clock pin	25	CMODE	I	Master clock select pin "H" : 384fs, "L" : 256fs
12	SCLK	I	Audio serial data clock pin	26	AOUTL	O	L ch analog output pin
13	SDTI	I	Audio serial data input pin	27	AOUTR	O	R ch analog output pin
14	SDTO	O	Audio serial data output pin	28	VCOM	O	Common voltage output pin, VA/2

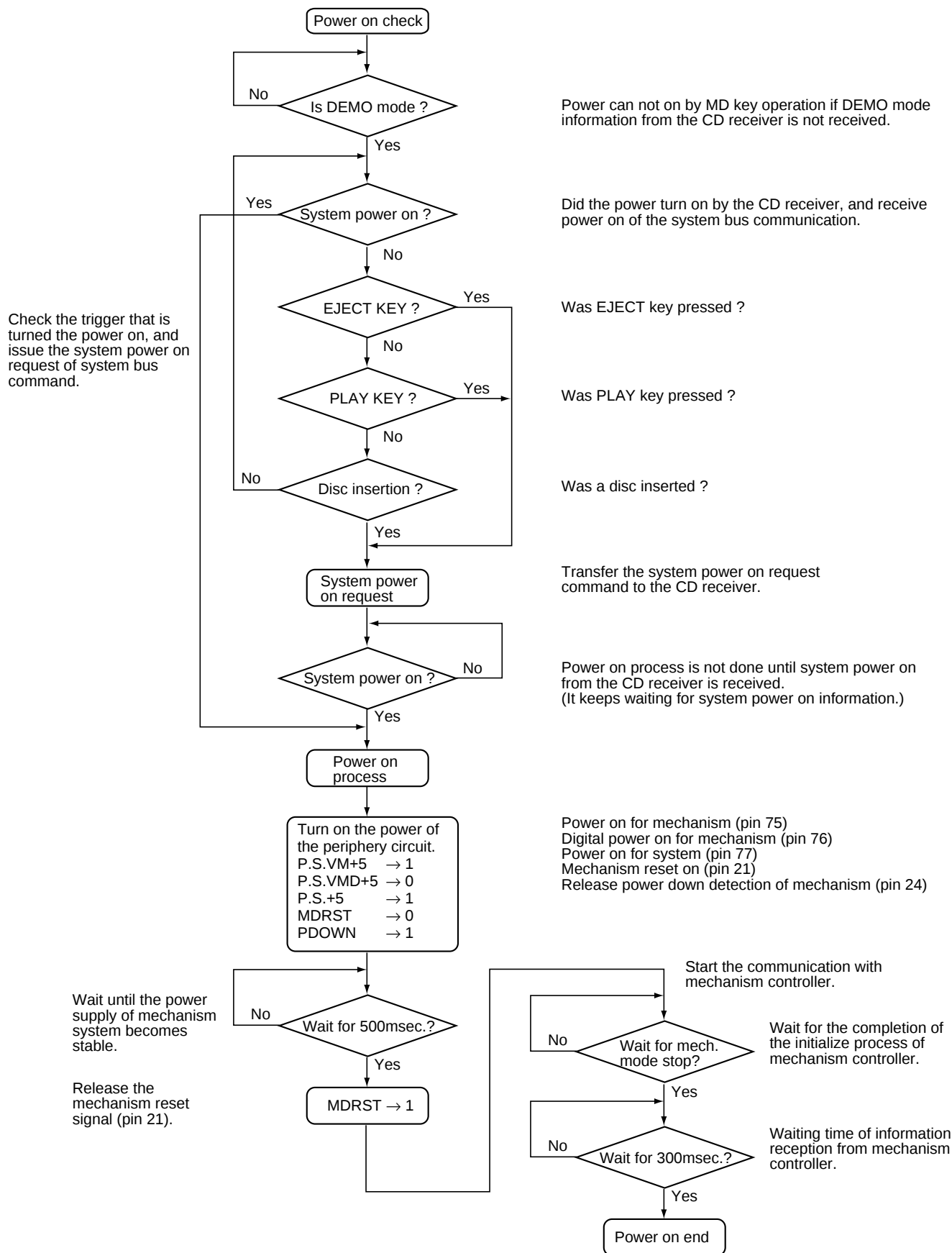
PDG225A (MD MAIN UNIT : IC4101)

• System Control IC

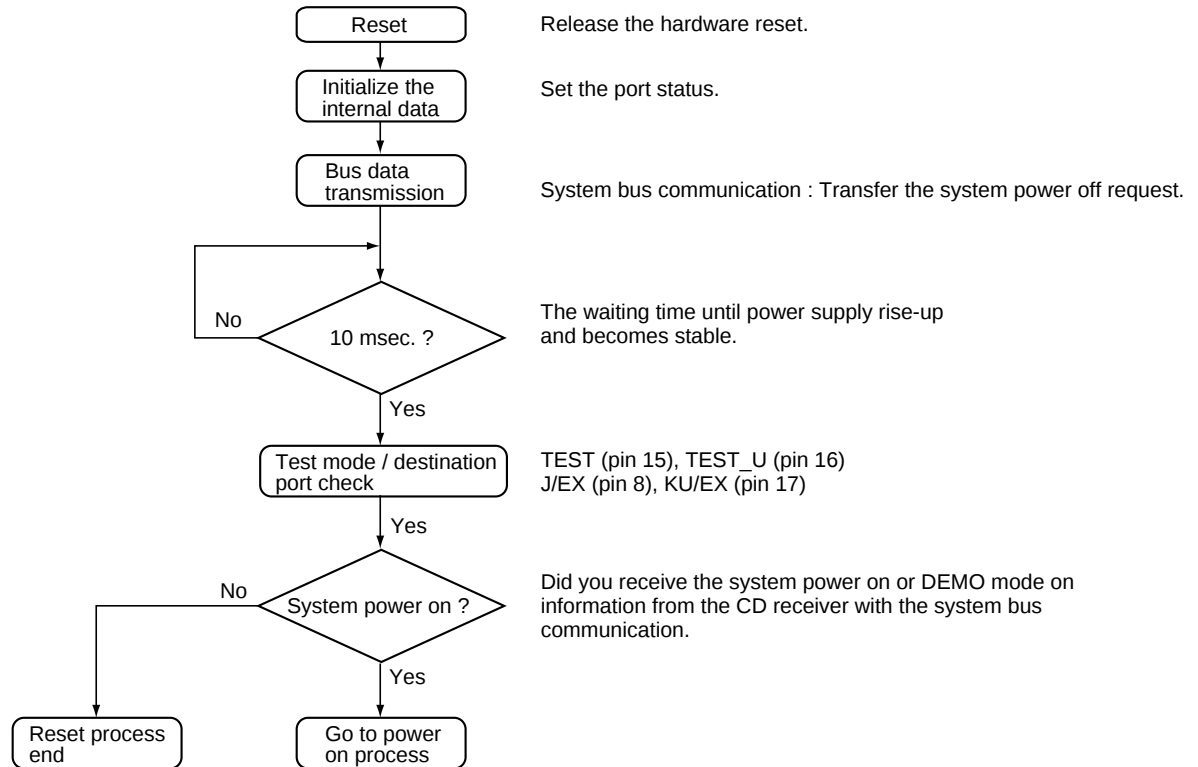
• Pin Function

No.	Mark	Pin Name	I/O	Function	No.	Mark	Pin Name	I/O	Function
1	PF3/SDA0	NC	O	Not used (open) (N ch open-drain)	41	PA3/AN3	PRODET	I	Connection recognition input of prologic processor
2	PF4/PWM0	NC	O	Not used (open)	42	PA4/AN4	SODATA	O	System bus data output
3	PF5/PWM1	NC			43	PA5/AN5	SIDATA	I	System bus data input
4	PF6/TxD	NC			44	PA6/AN6	S.REQ	I/O	System bus request input and output
5	PF7/RxD	NC	I	Connect to GND	45	PA7/AN7	NC	O	Not used (open)
6	PD0	NC	O	Not used	46	PB0/CINT	NC		
7	PD1	NC			47	PB1/CSO	NC		
8	PD2	J/EX	I	Destination recognition input (H : J, L : EX)	48	PB2/SCK0	MDSCK	O	Communication clock output of MD mech. controller
9	PD3	NC	O	Not used (open)	49	PB3/SI0	MDDATA	I	Communication data input of MD mech. controller
10	PD4	NC			50	PB4/SO0	SYSDATA	O	Communication data output of MD mech. controller
11	PD5	NC			51	PB5/SCK1	D.SCK	I/O	Communication clock output of MD display
12	PD6	NC			52	PB6/SI1	NC	O	Not used (open)
13	PD7	NC			53	PB7/SO1	D.DATA	O	Communication data output of MD display
14	PC0	NC			54	PE0/EC1	NC	I	Not used (Connect to GND)
15	PC1	TEST	I	Test mode input of MD mech. (L:ON)	55	PE1/EC1	NC		
16	PC2	TEST_U	I	Unit check mode input (L:ON)	56	PE2/RMC	NC		
17	PC3	KU/EX	I	Destination discrimination input (H : KU, L : EX)	57	PE3/NM1	NC	O	Not used (open)
18	PC4	CMODE	O	Master clock select output (L:256fs, H:384fs)	58	PE4	NC		
19	PC5	ADPOW	O	ADC power-down mode output (H:ON)	59	PE5/T0/ADJ	NC		
20	PC6	DAPOW	O	DAC power-down mode output (H:ON)	60	PI0/INT0	S.CLK	I	System bus clock input
21	PC7	MDRST	O	Reset output of MD mech. controller	61	PI1/INT1	D.REQ	I	Communication request input of MD display
22	PH0	MDMUTE	I	Request input of mech. controller mute	62	PI2/INT2	ACDET	I	Power down detection input of system controller
23	PH1	MDSTB	I	Communication request detection input of MD mech. controller	63	PI3/INT3	NC	O	Not used (open)
24	PH2	PDOWN	O	Power down detection output of MD mech. controller	64	PI4/INT4	NC		
25	PH3	DIF0	O	Audio data interface format 0 output	65	PI5/SCK2	NC		
26	PH4	DIF1	O	Audio data interface format 1 output	66	PI6/SI2	NC		
27	PH5	PBMUTE	O	MD PB mute output (L:MUTE ON)	67	PI7/SO2	NC		
28	PH6	RECMUTE	O	MD REC mute output (L:MUTE ON)	68	PG0	NC		
29	PH7	OUTSEL	O	PB SELECT output (L:MD, H:through)	69	PG1	NC		
30	RST	XRESET	I	Reset input	70	PG2	NC		
31	EXTAL	EXTAL	I	Connect to ceramic resonator	71	PG3	NC		
32	XTAL	XTAL	–		72	VDD	VDD	–	Connect to +5V
33	Vss	Vss	–	Connect to GND	73	NC	–		
34	TX	–	O	Not used (open)	74	PG4	NC	O	Not used (open)
35	TEX	–	I	Connect to GND	75	PG5	P.S.VM+5	O	+5V for mechanism (H:ON)
36	AVss	Vss	–	Connect to GND	76	PG6	P.S.VMD+5	O	Digital +5V for mechanism (L:ON)
37	AVref	AVref	–	A/D reference voltage input (Connect to +5V).	77	PG7	P.S.+5	O	+5V for system (H:ON)
38	PA0/AN0	KEYIN1	I	Key detection input 1 (A/D input)	78	PF0/SCL0	LEDREC	O	REC LED output (L:ON) (N ch open-drain)
39	PA1/AN1	NC	O	Not used (open)	79	PF1/SCL1	LEDPLAY	O	PLAY LED output (L:ON) (N ch open-drain)
40	PA2/AN2	NC			80	PF2/SDA0	NC	O	Not used (open) (N ch open-drain)

• Power on sequence of MD microcomputer



• Rise-up sequence after AC power is applied of MD microcomputer



* The power supply of MD mechanism is not being supplied to MD in the system power off condition. Therefore, nothing goes specially under the power off condition after the AC supplied.

PDC046 (PRO MAIN UNIT : IC5501)

• System Control IC

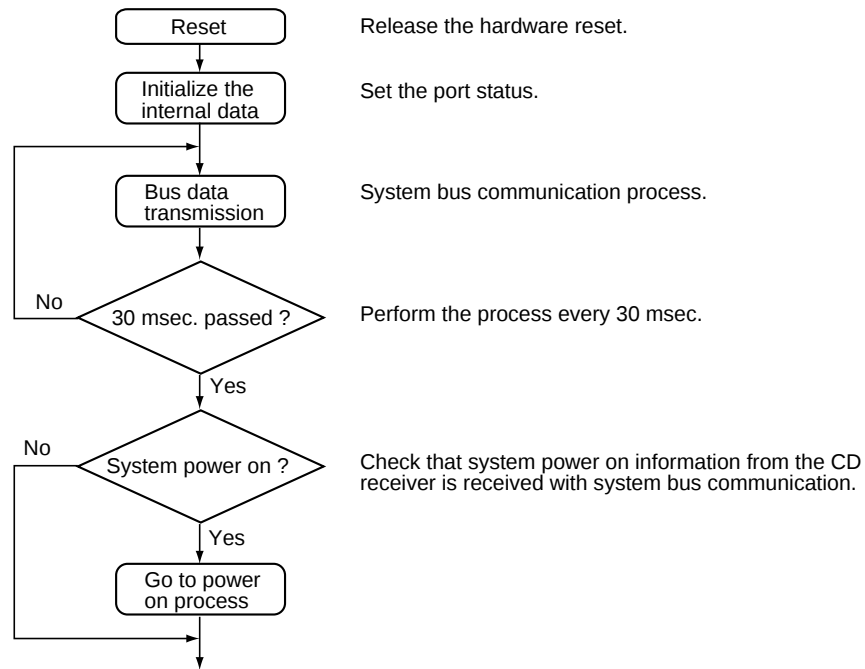
• Pin Function

No.	Mark	Pin Name	I/O	Function	No.	Mark	Pin Name	I/O	Function
1	P05	XMUTE	O	System mute H:OFF, L:ON	25	P73/INT3 /TOIN	NC	O	L
2	P06	FUNC B	O	(N ch SELECT) *	26	P30	XLED SFC	O	LED SFC ON/OFF (N ch SELECT) H: OFF, L: ON
3	P07	FUNC A	O	(N ch SELECT) *	27	P31	XLED DOLBY	O	LED DOLBY ON/OFF (N ch SELECT) H: OFF, L: ON
4	P70/INT0	S.CLK	I	Serial clock input of system bus communication	28	P32	XLAMP DIMMER	O	LAMP DIMMER ON/OFF (N ch SELECT) H: OFF, L: ON
5	RES	XRESET	I	CPU RESET input	29	NC	NC	—	—
6	XT1/P74	NC	I	Connect to VDD	30	P33	ACPULSE	I	AC pulse input
7	NC	NC	—	—	31	P34	S.REQ	I/O	Request input and output of system bus communication
8	XT2/P75	NC	I	Connect to VDD	32	P35	S.DATAO	O	Serial data output of system bus communication
9	VSS	D.GND	—	Ground	33	P36	S.DATAI	I	Serial data input of system bus communication
10	CF1	OSC	O	Connect a 6MHz ceramic resonator	34	P10/SO0	PRO ST	O	Strobe output of PRO LOGIC IC LV1035
11	CF2	OSC	I		35	P11/SI0 /SB0	PRO DATA	O	Serial data output of PRO LOGIC IC LV1035
12	VDD	+5V	—	Power supply voltage	36	P12/SCK0	PRO CLK	O	Serial clock output of PRO LOGIC IC LV1035
13	P80/AN0	KEYIN	I	Key input (AD)	37	P13/SO1	SPCONT	O	Speaker control H: ON, L: OFF
14	P81/AN1	UNITCHECK	I	Test mode input for checker H: OFF, L: ON	38	P14/SI1 /SB1	REC MUTE	O	REC MUTE H: ON, L: OFF
15	P82/AN2	TEST	I	Independent power on input H: OFF, L: ON	39	P15/SCK1	XPOWER ON	O	POWER ON/OFF H: OFF, L: ON
16	P83/AN3	NC	I	Pull-down	40	P16/BUZ	VR CLK	O	Clock output of VOLUME IC M62429
17	P84/AN4	NC	O	L	41	P17/PW-M0	VR DATA	O	Data output of VOLUME IC M62429
18	NC	NC	—	—	42	NC	NC	O	—
19	P85/AN5	NC	O	L	43	PO0	XSMUTE	O	Rear mute (N ch SELECT) H: OFF, L: ON
20	P86/AN6	NC	O	L	44	PO1	XCMUTE	O	Center mute (N ch SELECT) H: OFF, L: ON
21	P87/AN7	NC	O	L	45	PO2	NC	O	—
22	P71/INT1	NC	O	L	46	PO3	OUTSEL PRO	O	(N ch SELECT) *
23	P72/INT2 /TOIN	NC	O	L	47	PO4	OUTSEL PB	O	(N ch SELECT) *
24	NC	NC	—	—	48	NC	NC	—	—

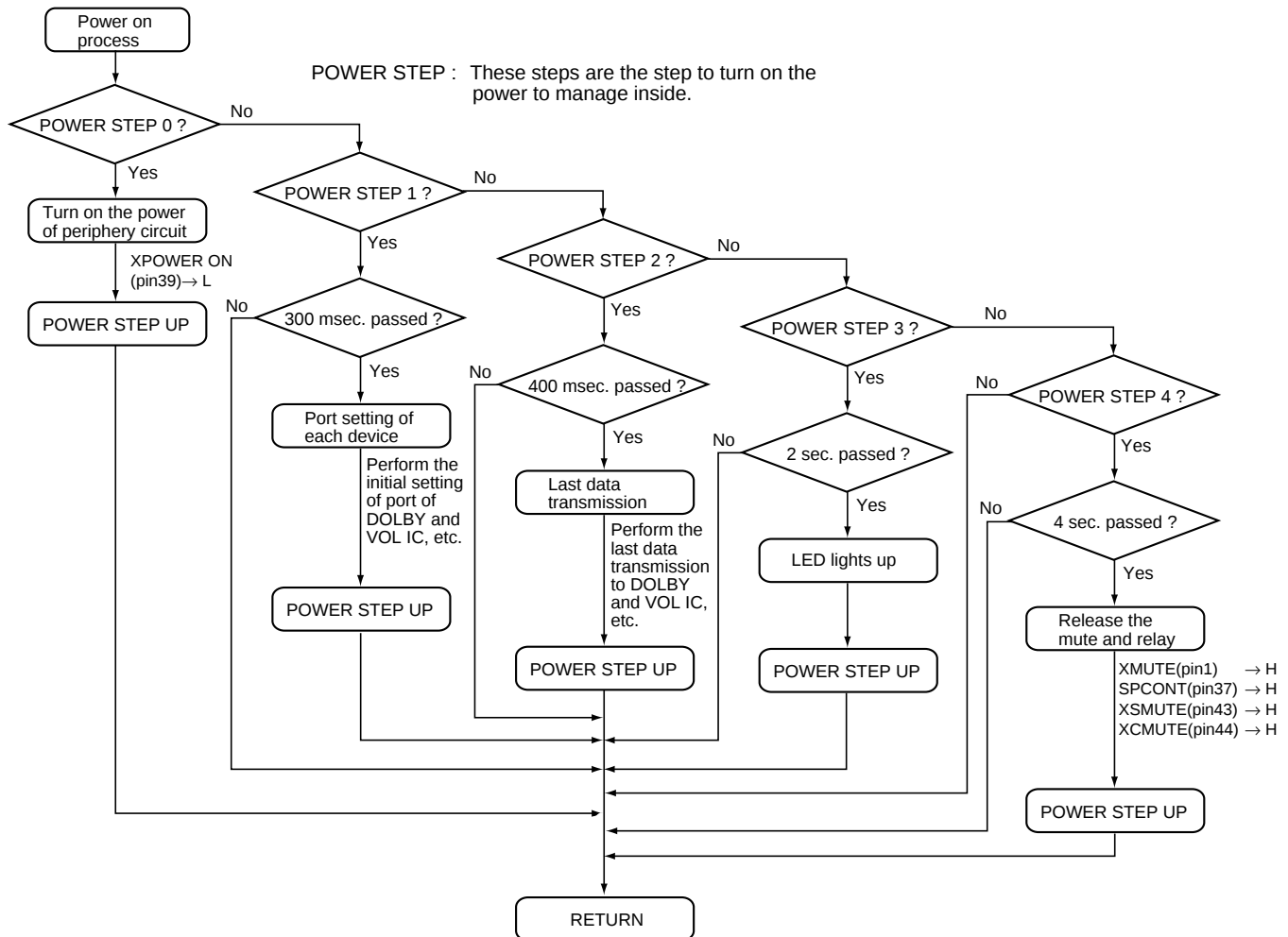
*(N ch SELECT)

Mode Port Name	CD/TX through	CD/TX PRO/SF	MD/TC through	MD/TC PRO/SF	DVD through	DVD PRO/SF	VCR through	VCR PRO/SF
FUNC A	L	L	L	L	H	H	H	H
FUNC B	L	L	H	H	H	H	L	L
OUTSEL PB	H	H	L	H	H	H	H	H
OUTSEL PRO	H	L	H	L	L	L	L	L

• Rise-up sequence after AC power applied of processor microcomputer



• Power on sequence of processor microcomputer



7.2 DIAGNOSIS

■ DETAILS OF ERROR DISPLAY

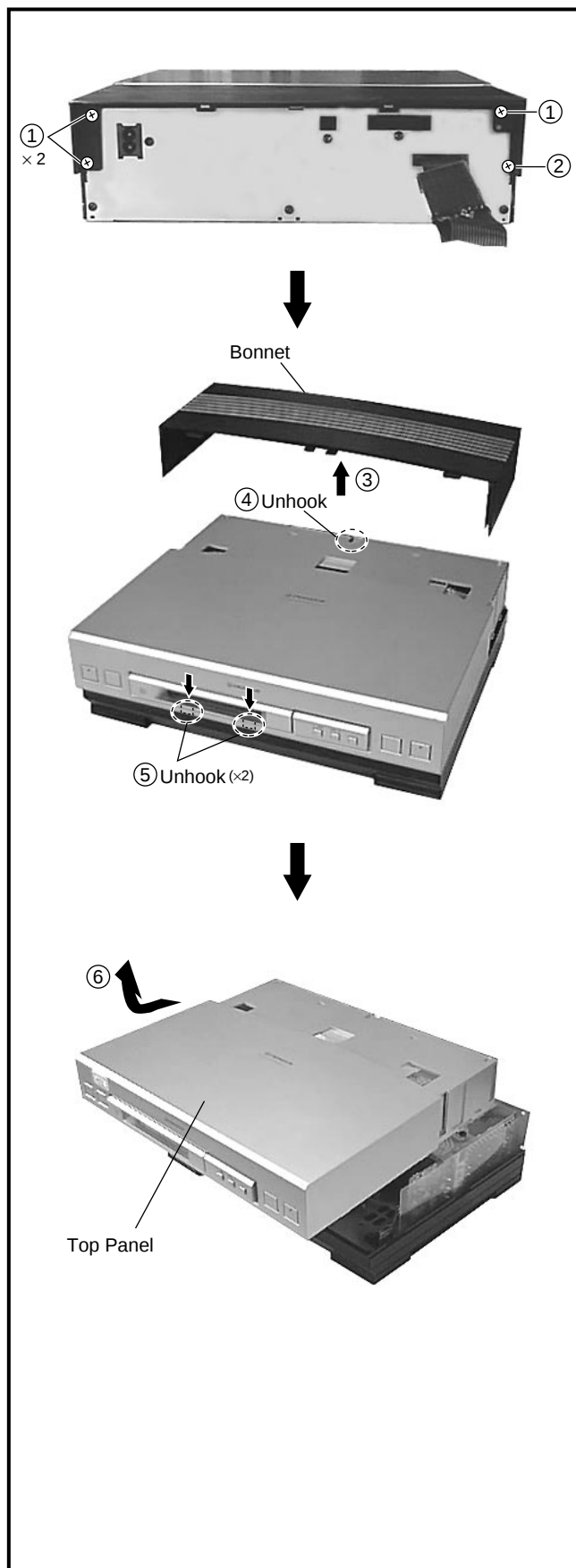
Error Display	Details of Error	Measure
Can't REC	● DEFECT occurred 10 times continuously during REC-PLAY. ● Recordable cluster became 0 since DEFECT occurred during REC-PLAY. ● Address is unreadable. REC state can not be set for 20 seconds even after try again.	● Check if there are scratches, dusts, fingerprints, or black spots on disc. Check if disc fluctuates eccentrically or moves up and down largely.
Can't COPY	● Determined as follows according to the channel status of the signals input from D-IN during REC-PAUSE or REC-PLAY. 1. Other than audio 2. Other than consumer use 3. Copy NG due to inversion of COPY bit of CD	● Check if CD is copy-proof. (Example: CD-R, etc.)
DIN UNLOCK	● The following occurred for digital signal input from D-IN during REC-PAUSE, REC-PLAY, or CD FUNC playback 1. Digital IN PLL unlocked. 2. Locked at other than FS = 32, 44.1 and 48 kHz.	● Check if D-IN signal line is normal.
TOC FULL	● No area for registering music number and character information during REC-PLAY (music name, disc number, etc.)	● Replace with recording/playback disc with space for registering UTOC.
UTOCER T S R	● FTNO > LTNO. ● FTNO ≠ 0 or 1. ● UTOC recorded on DISC could not be read.	● Replace with other discs to check if UTOC data is normal.
UTOCER A	● Start address > End address.	● Replace with other discs to check if UTOC data is normal.
UTOCER L 0 1 2 4	● Any one data of UTOC 0 to 4 has looped.	● Replace with other discs to check if UTOC data is normal.
NOT AUDIO	● Data not for audio is recorded for TNO track mode currently selected.	● Select other TNO or replace with other discs.
? DISC	● Data called MINI of system ID written in ASCII codes in TOC is incorrect. ● Disc type written in TOC is not pre-mastered MD, recording MD, or hybrid MD.	● Disc is outside specifications. Replace with different disc and check.
DISC FULL	● No recordable space when attempted to set REC-PAUSE.	● Replace with different disc with recording space.
Playback MD	● Disc only for playback was loaded when attempted to set REC-PAUSE or edit.	● Disc is for playback only. Replace with disc for recording.
PROTECTED	● Attempted to record or edit even through REC-proof knob of disc for recording was in the REC-proof state. ● Attempted to edit track with write-protect according to information on UTOC.	● Track attempted to be edited is write-protected. Try again with different track. ● Restore the REC-proof knob and try again.
Can't EDIT	● Editing conditions were not satisfied for each editing function.	● Operating method is wrong. Try again using correct method.
DISC ER [DISC ER R DISC ER S DISC ER W]	● Data read was incorrect or could not be read properly. ● Error occurred during music data recording and recording could not be performed correctly. ● Music data READ search time exceeded ● REC PAUSE shift abnormality (search time exceeded) ● SD WRITE (search time exceeded)	● Faulty TOC or UTOC data or scratch on disc. Replaced with other discs.

Error Display	Details of Error	Measure
? DISC	● TOC read was incorrect or could not be read properly.	● The TOC data recorded on the disc do not comply with MD Standards, so try using another disc. ● The disc may be scratched or damaged, so try using another disc.
UTOCER W	● Fault occurred during rewriting of UTOC rewriting, and rewriting could not be performed correctly.	● Scratch on disc. Replaced with other discs.
? DISC	● Inserted a disc but could not bring in FOCUS.	● Check if there are scratches, dusts, fingerprints, or black spots on disc. Check if disc fluctuates eccentrically or moves up and down largely.
MEM. FULL	● The DRAM has become filled with music data, but they can not be written (to the disc).	● Check if there are scratches, dusts, fingerprints, or black spots on disc. Check if disc fluctuates eccentrically or moves up and down largely.
BLANK DISC	● After reading UTOC, total number of TNO and NAME characters was 0.	● Record and check if disc is recordable.
DEFECT	● Focus execution error, etc. occurred due to shock during REC-PLAY.	● Check if there are scratches, dusts, fingerprints, or black spots on disc. Check if disc fluctuates eccentrically or moves up and down largely.
UTOCER W	● UTOC read was correct but could not be rewrite it.	● Check to see if the recording head contact is correct or if there are any disconnections between the board and the recording head.
EEPROM ER	● The EEPROM data are incorrect.	● Try doing a Preliminary Adjustment and a normal Adjustment. If the problem still persists, replace the EEPROM.
MECH ER 3E 3M 3L 3D 2E 2M 2L 2D 1E 1M 1L 1D	● Never completes EJECT. ● Never moves HEAD UP. ● Never moves HEAD DOWN. ● The set microcomputer and MD mechanism microcomputer are not communicating properly.	
SIO ERROR	● It can't communicate with system control IC and MD mechanism control IC.	● Check if communication line with the MD mechanism assy and connector is normal.

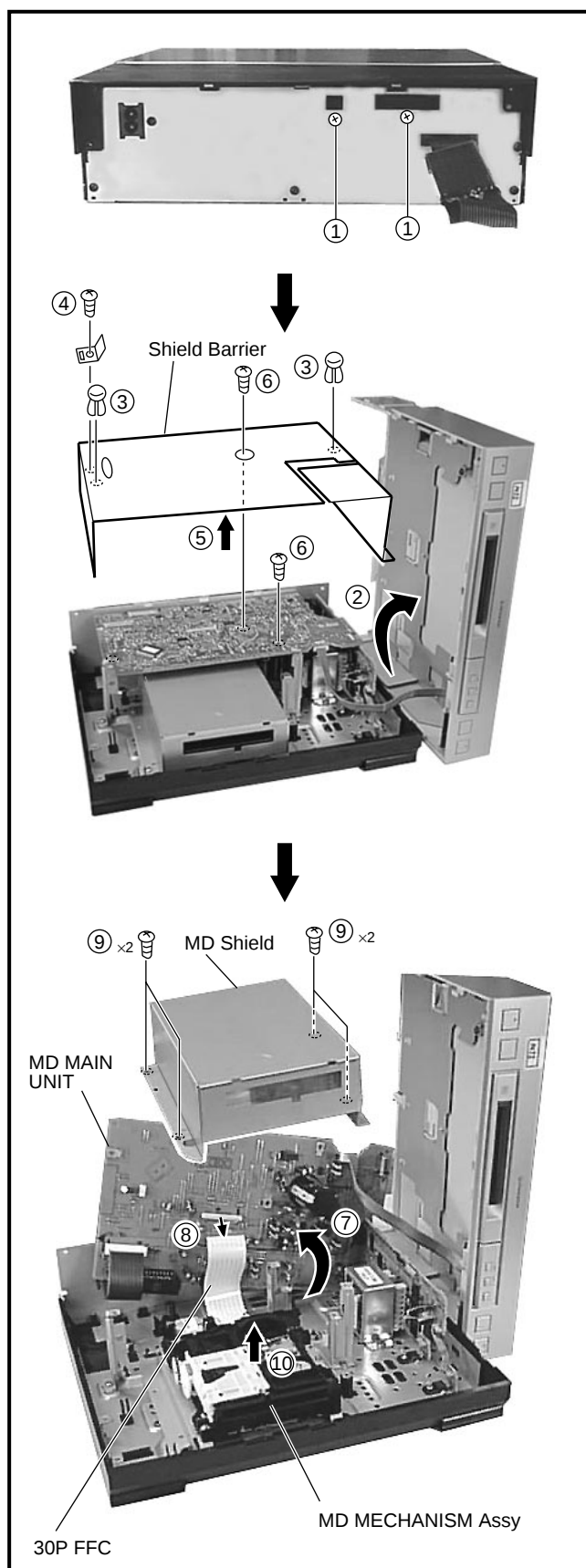
7.3 DISASSEMBLY

7.3.1 MINIDISC RECORDER (MJ-L5)

(1) Bonnet and Top Panel



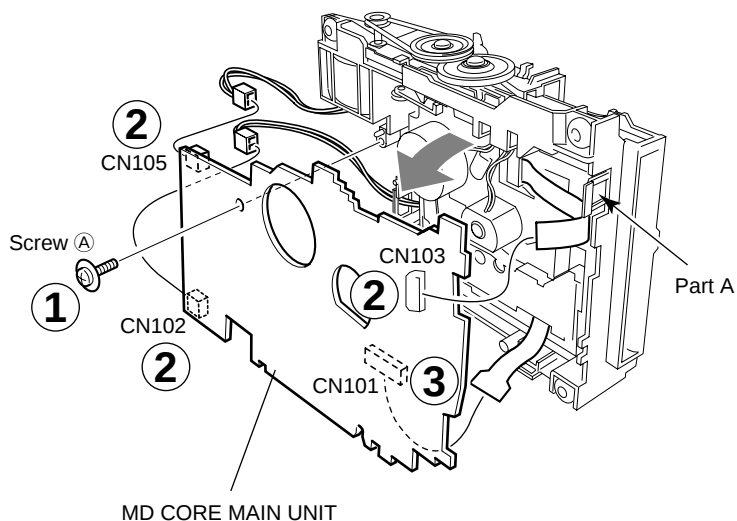
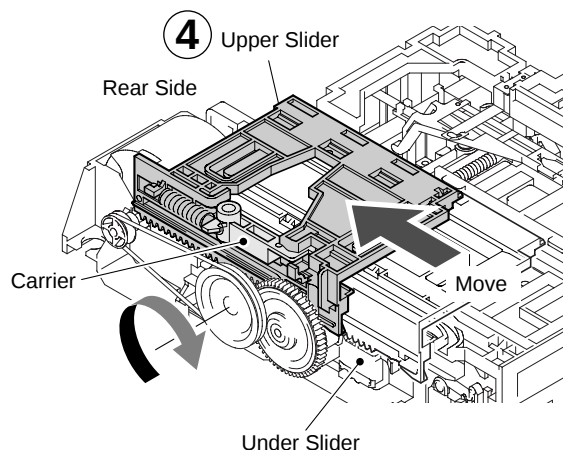
(2) MD MAIN UNIT and MD MECHANISM ASSY



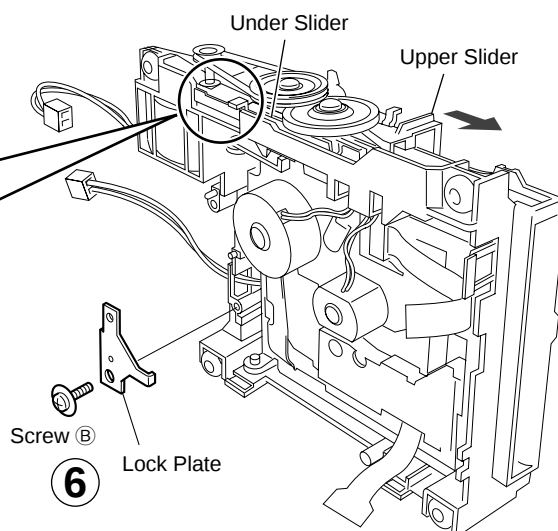
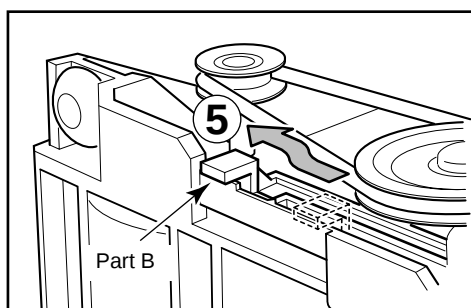
(3) MD MECHANISM ASSY

■ Removal of the Servo Mechanism Assy

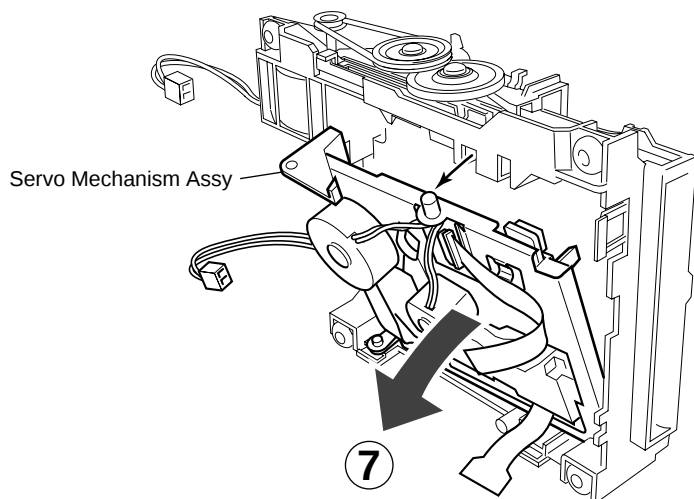
- ① Remove the screw (A).
- ② Disconnect the connectors (CN102, CN103, CN105), open the hook of part A, and tilt the upper side of the MD CORE MAIN UNIT to the front.
- ③ Disconnect the connector (CN101) at the rear of the MD CORE MAIN UNIT and remove the MD CORE MAIN UNIT.
- ④ After the Carrier has been pushed in, move the Upper Slider to the rear and stop it at the position where the Under Slider starts to move.



- ⑤ Shift part B to the position shown in the figure while raising the Under Slider. (At the same time, the Upper Slider moves to the front.)
- ⑥ Remove the Lock Plate. (One screw (B))



- ⑦ Remove the Servo Mechanism Assy.

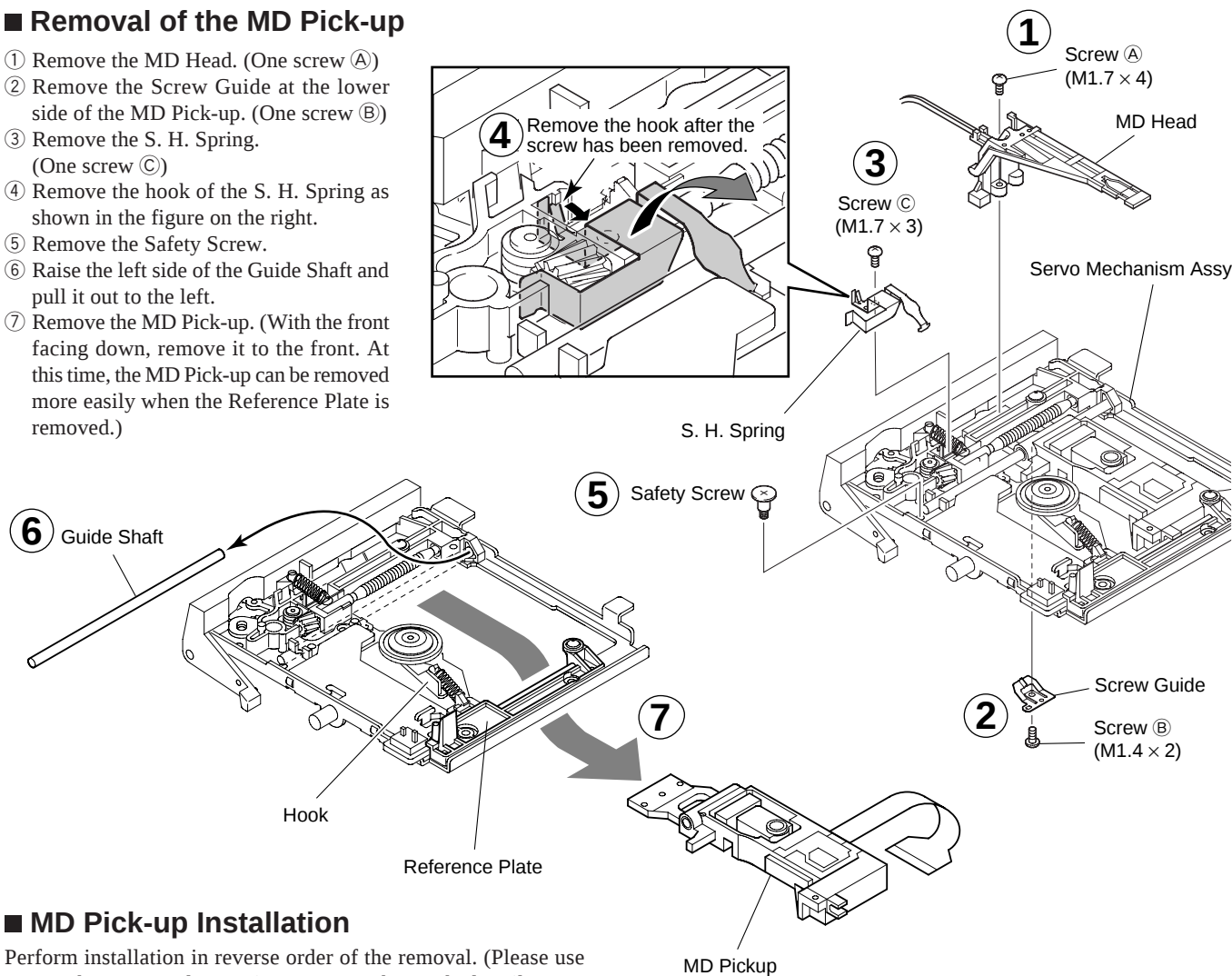


■ Caution for the time of installation of the servo mechanism assy

Move the MD Pick-up to the innermost circumference.
After installation of the servo mechanism assembly, shift the Upper Slider to the rear. (The Under Slider moves at the same time, and the servo mechanism assy is fixed. When the Under Slider is slide, this becomes the reason for switching ring catching.)

■ Removal of the MD Pick-up

- ① Remove the MD Head. (One screw (A))
- ② Remove the Screw Guide at the lower side of the MD Pick-up. (One screw (B))
- ③ Remove the S. H. Spring. (One screw (C))
- ④ Remove the hook of the S. H. Spring as shown in the figure on the right.
- ⑤ Remove the Safety Screw.
- ⑥ Raise the left side of the Guide Shaft and pull it out to the left.
- ⑦ Remove the MD Pick-up. (With the front facing down, remove it to the front. At this time, the MD Pick-up can be removed more easily when the Reference Plate is removed.)

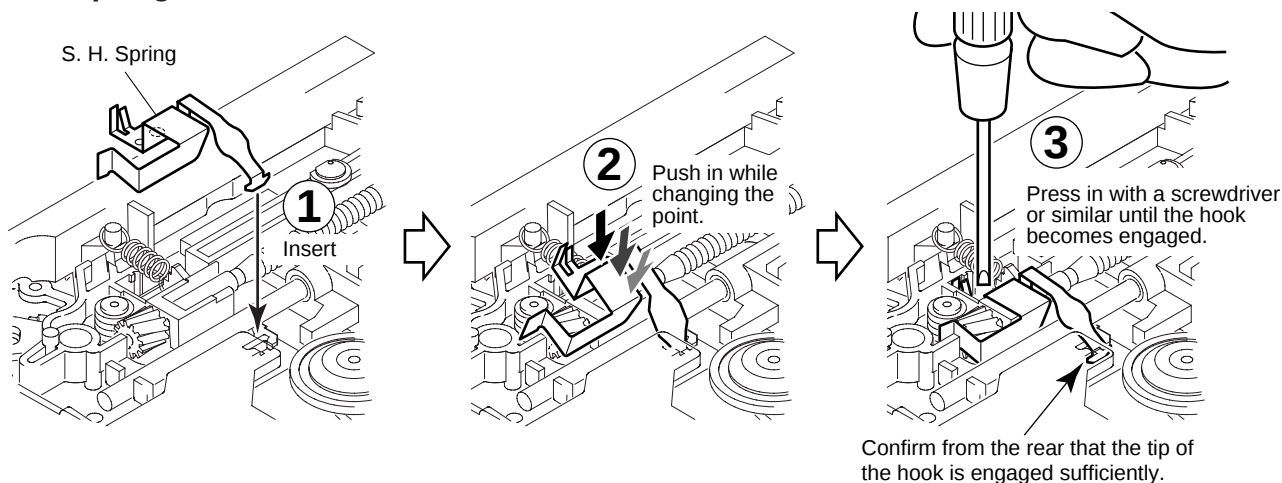


■ MD Pick-up Installation

Perform installation in reverse order of the removal. (Please use care as the MD Head mounting screw can be crushed easily.
MD Head mounting screw tightening torque: 0.8 kg • cm

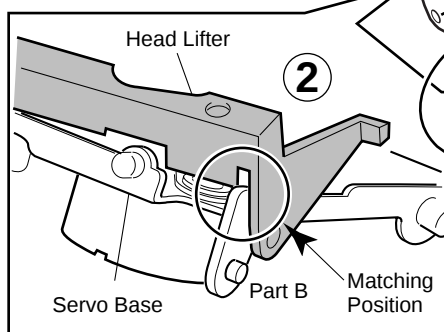
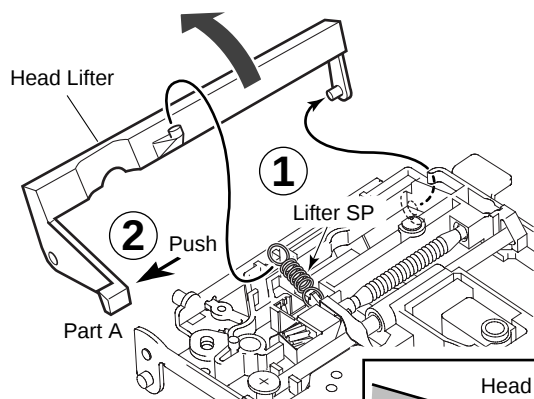
When the Reference Plate has been removed, confirm that the hook is engaged with the shaft of the spindle motor. (Take care that the mounting reference boss does not ride up.)

■ S. H. Spring Installation



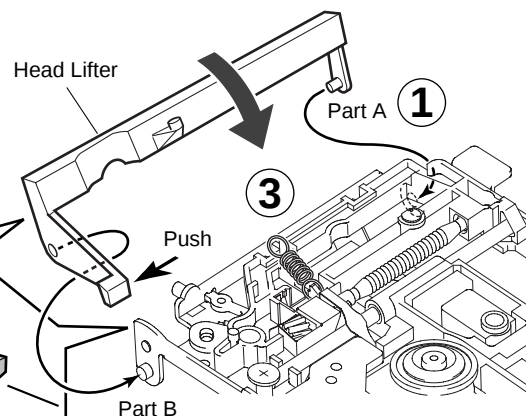
■ Removal of the Head Lifter

- ① Remove the Lifter SP.
- ② Tilt the Head Lifter to the rear and push part A to disengage it.



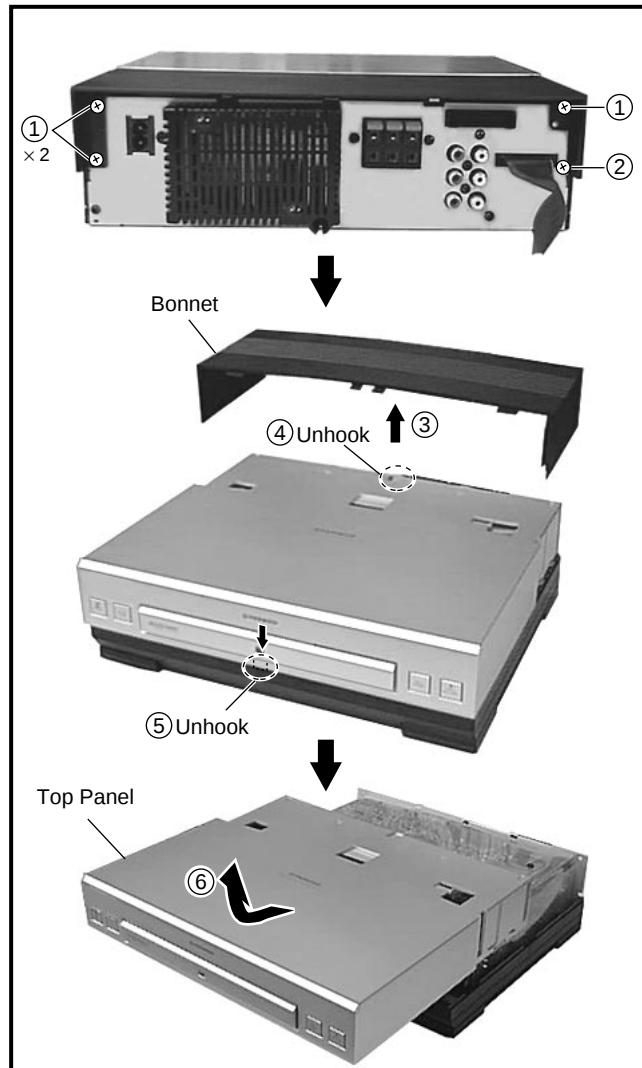
■ Head Lifter Installation

- ① Install part A in the Servo Base with the Head Lifter tilted to the back.
- ② Match the Head Lifter and the Servo Base as shown in the figure, and then engage part B.
- ③ While holding part B with your hand, tilt the Head Lifter to the front and install the Lifter SP.

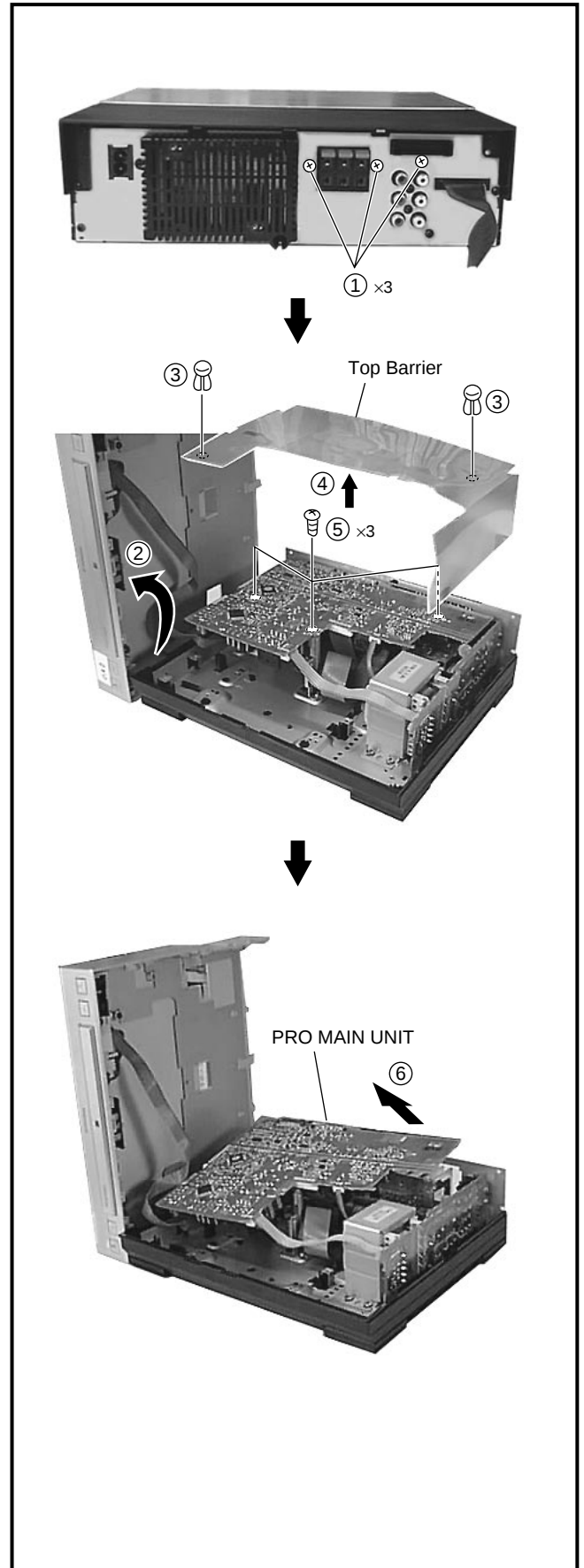


7.3.2 SURROUND PROCESSOR (SP-L5)

(1) Bonnet and Top Panel

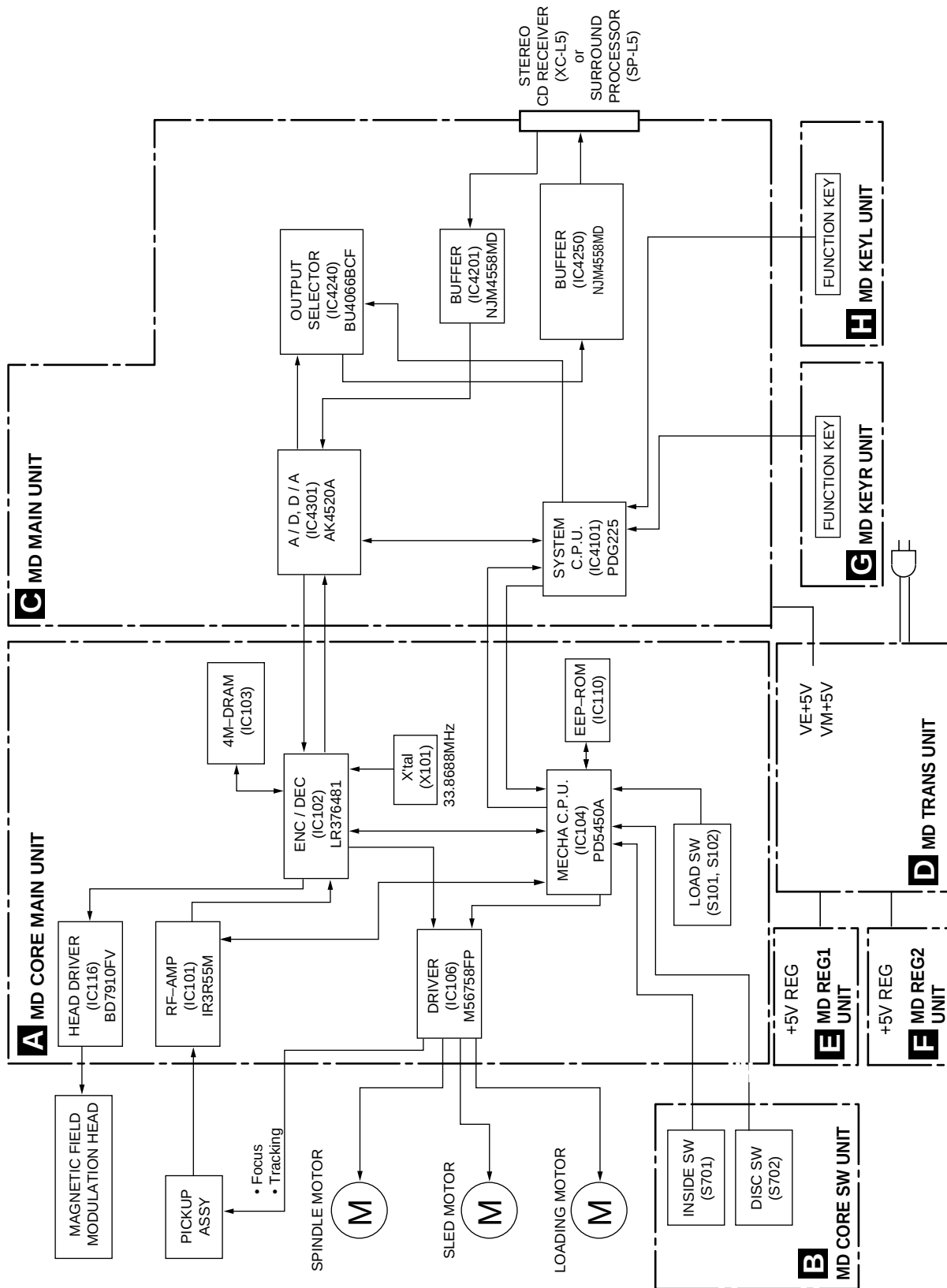


(2) PRO MAIN UNIT



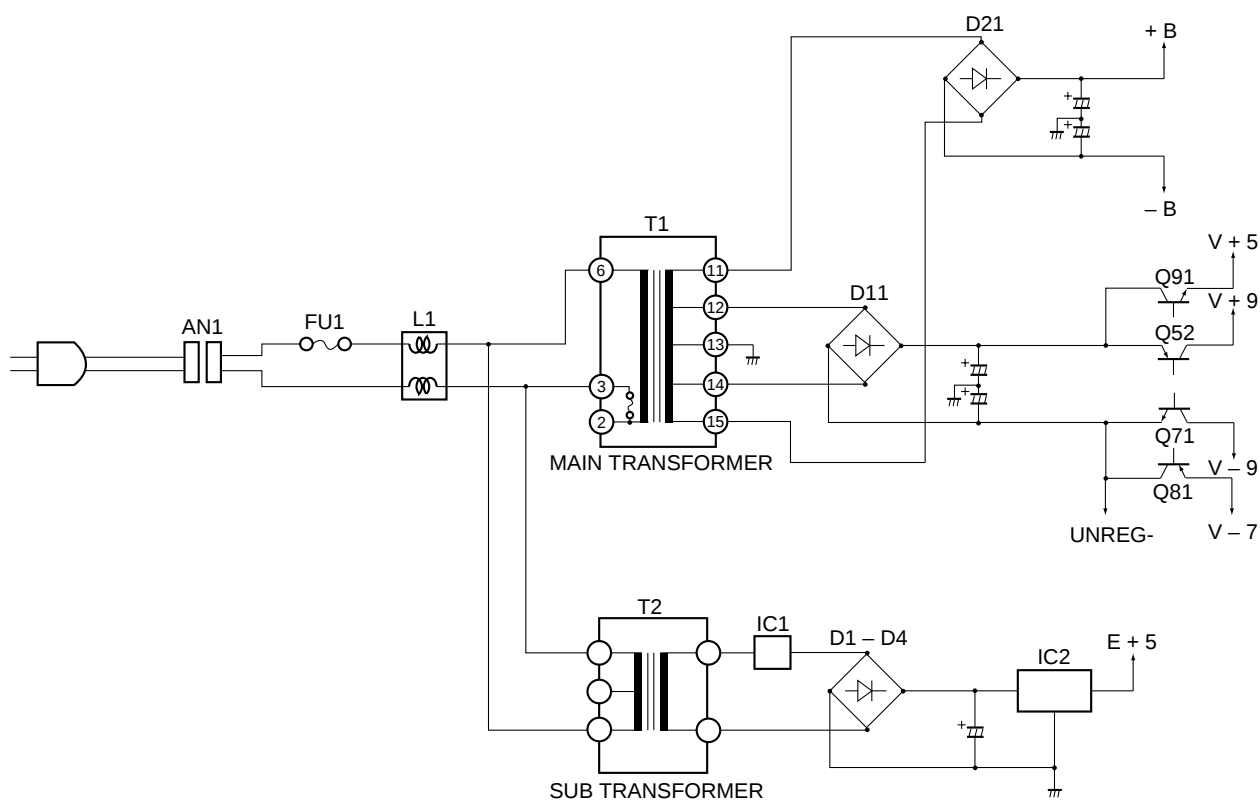
7.4 BLOCK DIAGRAM

7.4.1 MINIDISC RECORDER (MJ-L5)

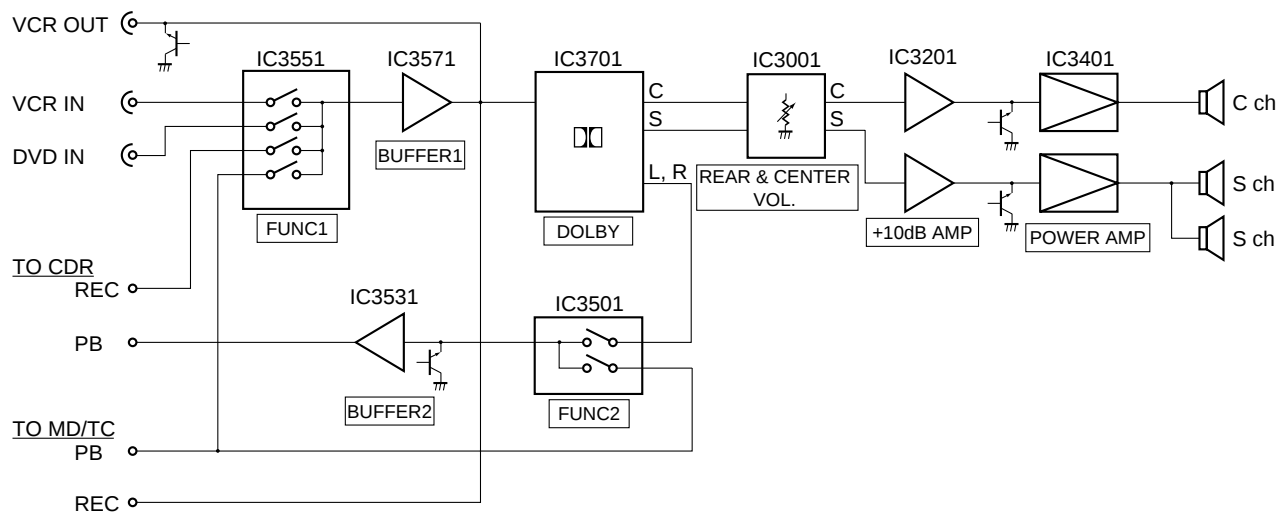


7.4.2 SURROUND PROCESSOR (SP-L5)

■ POWER SUPPLY BLOCK



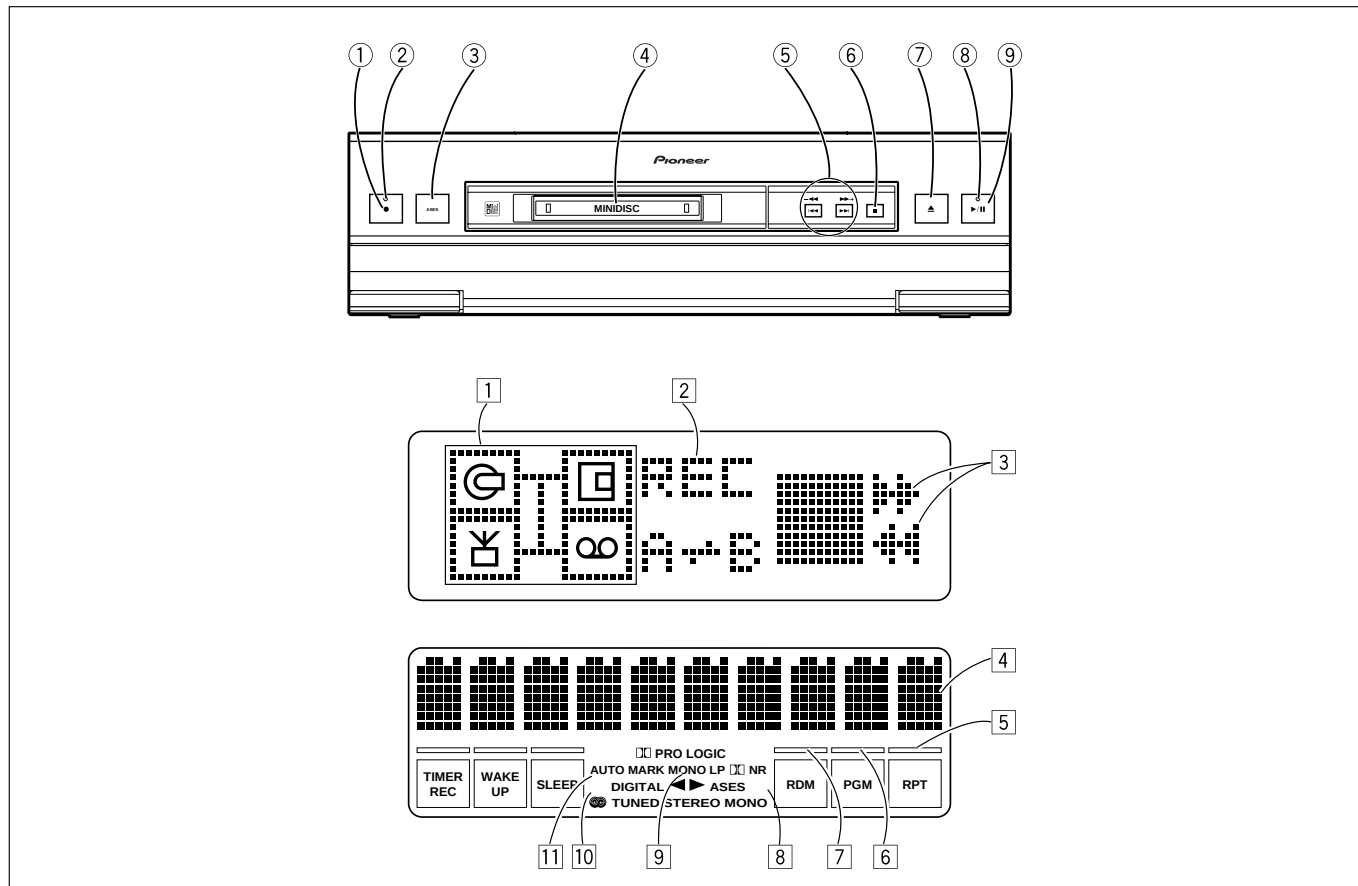
■ SIGNAL ROUTE BLOCK



8. PANEL FACILITIES AND SPECIFICATIONS

8.1 PANEL FACILITIES

8.1.1 MINIDISC RECORDER (MJ-L5)

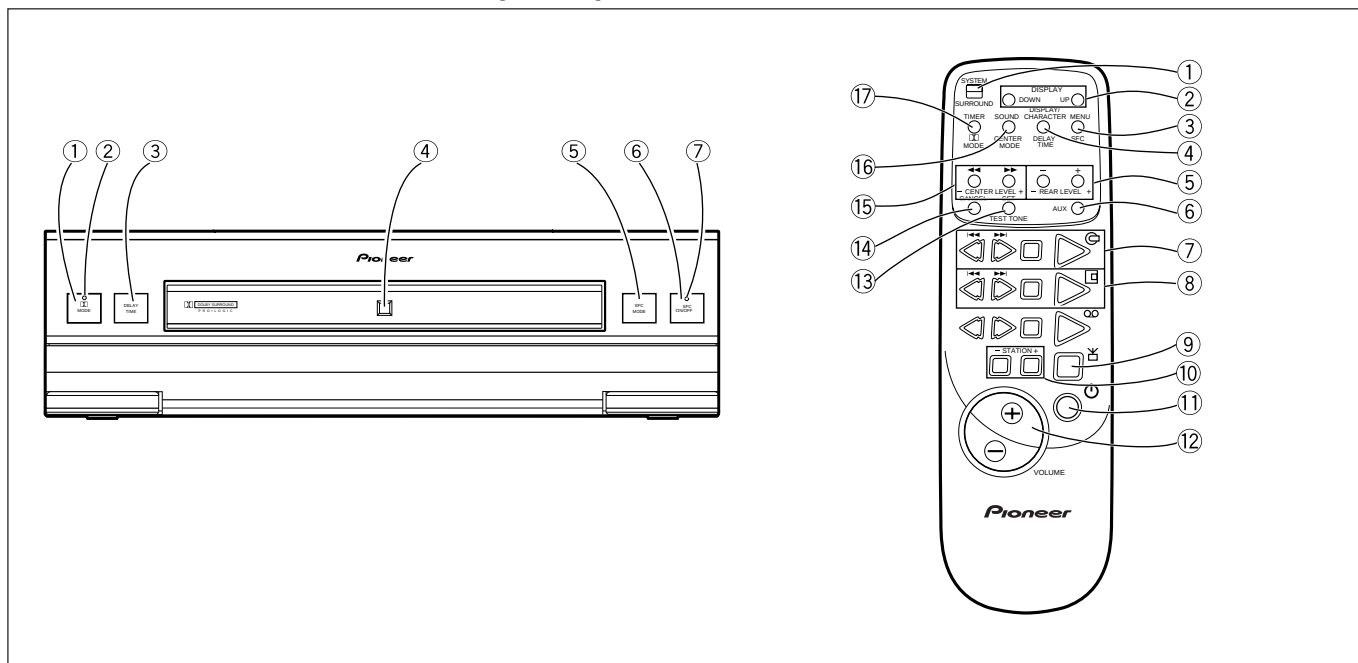


- ① **Recording button** (●)
- ② **Recording Indicator**
(lights when MD is Recording)
- ③ **ASES button**
- ④ **MINIDISC slot**
- ⑤ **Manual/track search buttons**
(◀◀/▶▶, ▶▶/▶▶)
- ⑥ **Stop button** (■)
- ⑦ **Disc Eject button** (▲)
- ⑧ **Play indicator**
- ⑨ **Play/Pause button** (▶/||)

This unit is not provided with its own display section; the following descriptions refer to the display shown on the optional CD stereo receiver XC-L5 when it is combined with the MiniDisc Recorder MJ-L5.

- ① **Function display:** CD (Ⓢ), Mini Disc (Ⓛ), Tuner (Ⓣ), Tape (∞).
(The us and Canadian models are not provided with tape functions.)
The selected function will appear emphasized in one of the following ways:
In DISP MODE 1: Slightly larger display typeface
In DISP MODE 2: Surrounded by frame
* Consult the CD receiver's Operating Instructions for details regarding switching the display mode.
- ② **Lights during recording.**
- ③ **Lights during Fast Forward (▶▶) or Reverse (◀◀)**
- ④ **Displays characters and numerals**
- ⑤ **Lights during repeat play**
- ⑥ **Lights during program setting and program play**
- ⑦ **Lights during random play**
- ⑧ **Lights during A.S.E.S setting and operation.**
- ⑨ **Lights to indicate monaural long-play mode.**
- ⑩ **Lights to indicate digital input to MiniDisc.**
- ⑪ **Lights to indicate Auto Mark function ON.**

8.1.2 SURROUND PROCESSOR (SP-L5)



① (Dolby) Mode button

② (Dolby) MODE indicator

③ Delay Time button

④ SURROUND indicator

Lights when (Dolby) mode is selected and when SFC is set to ON.

⑤ SFC MODE button

⑥ SFC ON/OFF button

⑦ SFC ON/OFF indicator

① **SYSTEM/SURROUND selector**

This selector is used to switch between system components (XC-L5 and MJ-L5) and main unit operations. When set to SYSTEM, the remote control unit can be used to operate the CD receiver and MiniDisc recorder. Consult the Operating Instructions for the CD receiver and MiniDisc recorder regarding operations for the respective component. When set to SURROUND, the remote control unit can be used to operate the main unit.

② **DISPLAY (UP/DOWN) buttons**

③ **SFC button**

*MENU button

④ **DELAY TIME button**

*DISPLAY/CHARACTER button

⑤ **REAR LEVEL (+/-) buttons**

*+/- buttons

⑥ **AUX button**

⑦ (CD) operation buttons

(Play/pause , Stop . Track search ,)

⑧ (MD) operation buttons

(Play/pause , Stop . Track search ,)

⑨ (FM/AM) button

⑩ **STATION (+/-) buttons**

⑪ **STANDBY/ON button**

⑫ **VOLUME (+/-) buttons**

⑬ **TEST TONE button**

*SET button

⑭ **CANCEL button**

⑮ **CENTER LEVEL (+/-) buttons**

* buttons

⑯ **CENTER MODE button**

*SOUND button

⑰ (Dolby) MODE button

*TIMER button

* Confirm that the SYSTEM/SURROUND selector is set to the SYSTEM side before pressing these buttons.

8.2 SPECIFICATIONS

8.2.1 MINIDISC RECORDER (MJ-L5)

Recording Method	Magnetic field modulation overwriting type
Playback Method	Non-contact optical type
Sampling Frequency	44.1 kHz, 32 kHz, 48 kHz
Frequency Response	20 Hz - 20 kHz
Signal-to-Noise Ratio	98 dB
Wow and Flutter	Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Power Requirements	AC 120V, 60Hz
Power Consumption	17 W
Dimensions	290 (W) x 86 (H) x 277 (D) mm 11-7/16 (W x 3-7/16 (H) x 10-15/16 (D) in.
Weight	2.6 kg (51 lb 12 oz)

Accessories

Operating Instructions	1
Optical fiber cable	1
Power cord	1
Warranty card	1

NOTE:
Specifications and design subject to possible modification without notice, due to improvement.

US and foreign patents licensed from Dolby Laboratories Licensing Corporation.

8.2.2 SURROUND PROCESSOR (SP-L5)

Amplifier Section	
Output for Center Speakers	
Continuous Power output (RMS)	30 W (1 kHz, THD 10%, 8 Ω)
Output for Rear Speaker	
Continuous Power output (RMS)	30 W (1 kHz, THD 10%, 8 Ω)

Power Requirements	AC 120 V, 60 Hz
Power Consumption	43 W
Dimensions	290 (W) x 86 (H) x 277 (D) mm 11-7/16 (W) x 3-7/16 (H) x 10-15/16 (D) in.
Weight	3.2 kg (7 lb 1 oz)

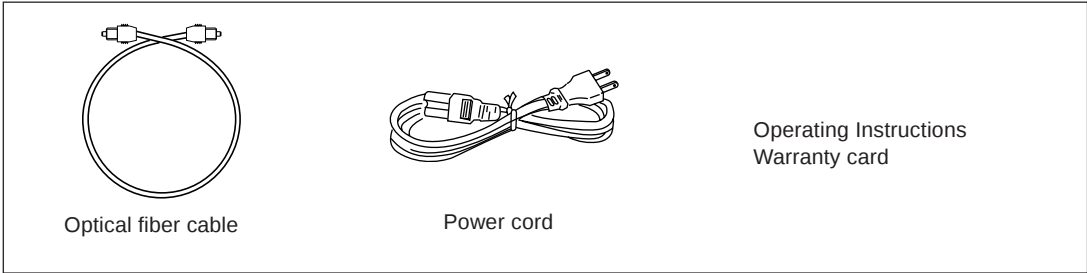
Accessories

Operating Instructions	1
Warranty Card	1
Remote control unit	1
AAA/R03 dry cell batteries	2
Power cord	1

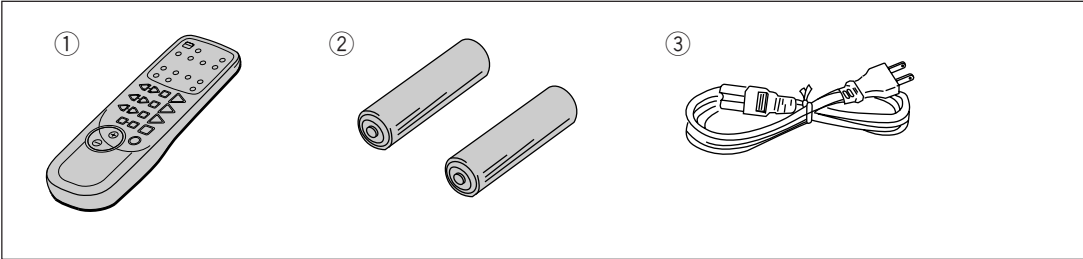
Manufactured under license from Dolby Laboratories Licensing Corporation.
"Dolby", "PRO LOGIC" and the double-D symbol are trade marks of Dolby Laboratories Licensing Corporation.

■ Accessories

MINIDISC RECORDER (MJ-L5)



SURROUND PROCESSOR (SP-L5)



- ① Remote control unit × 1
- ② AAA/R03 dry cell batteries × 2
- ③ Power cord × 1
- Operating Instructions × 1
- Warranty card × 1

1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.

Health & Safety Code Section 25249.6 – Proposition 65

— IMPORTANT —
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUTED PERSON.

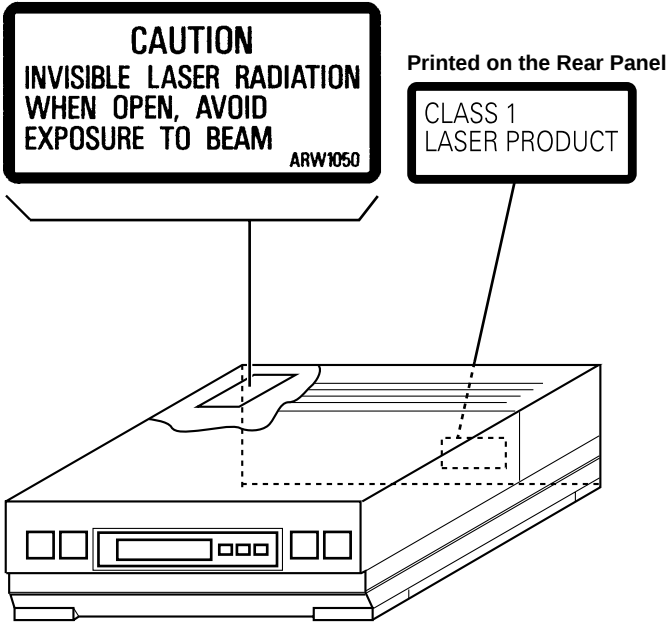
— LASER DIODE CHARACTERISTICS —
MAXIMUM OUTPUT POWER: 32 mw
WAVELENGTH: 785 nm

LABEL CHECK (for MJ-L5/MYXK and NVXK only)

MJ-L5/MYXK



MJ-L5/NVXK



Additional Laser Caution

Laser pickup assy
The output power at the objective lens of this assy is 0.73 mW.

Control method of the current through a laser diode.
The resistor R105 on the MD CORE MAIN UNIT (For MD mechanism assy) are for the limiting of current through a laser diode.

Control method of the laser output power
The laser pickup assy provide the photo-diodes and APC (Auto Power Control) circuit.
The photo-diode detect output of the laser diode then IC104 control the APC circuit according to the signal voltage of the photo-diode via IC101.
The Variable resistancer on the FPC in the Laser pickup assy can be adjusted the output level of Laser diode to fix the rated output level.

Laser Interlock Switch
The loading position detect switch S101 is set to " LOAD ON " (ON: low level, OFF: high level) position, IC104 get the " LOAD " signal, and hand the laser " LDON " signal to No. 9 terminal (LDON) of the Laser pickup assy.
Then a laser diode can be lighted expt when the level of signal "LOAD " is low.

* Refer to page 50.

2. EXPLODED VIEWS AND PARTS LIST

NOTES: ● Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.

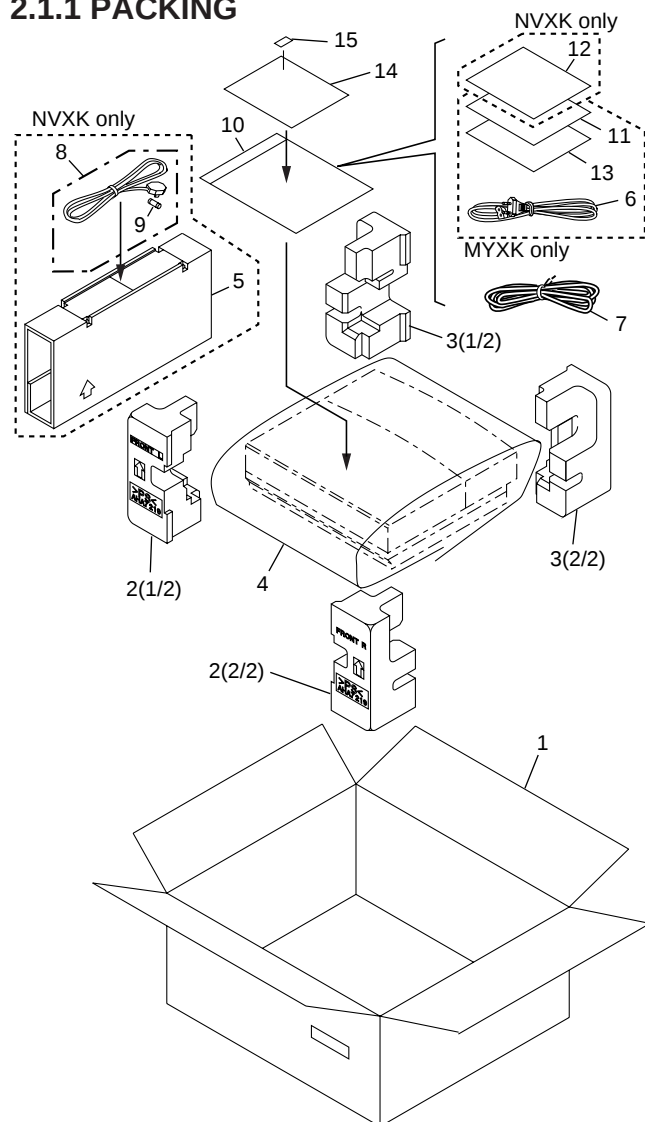
● The Δ mark found on some component parts indicates the importance of the safety factor of the part.

Therefore, when replacing, be sure to use parts of identical designation.

● Screws adjacent to ∇ mark on the product are used for disassembly.

2.1 MINIDISC RECORDER (MJ-L5)

2.1.1 PACKING



(1) PACKING PARTS LIST

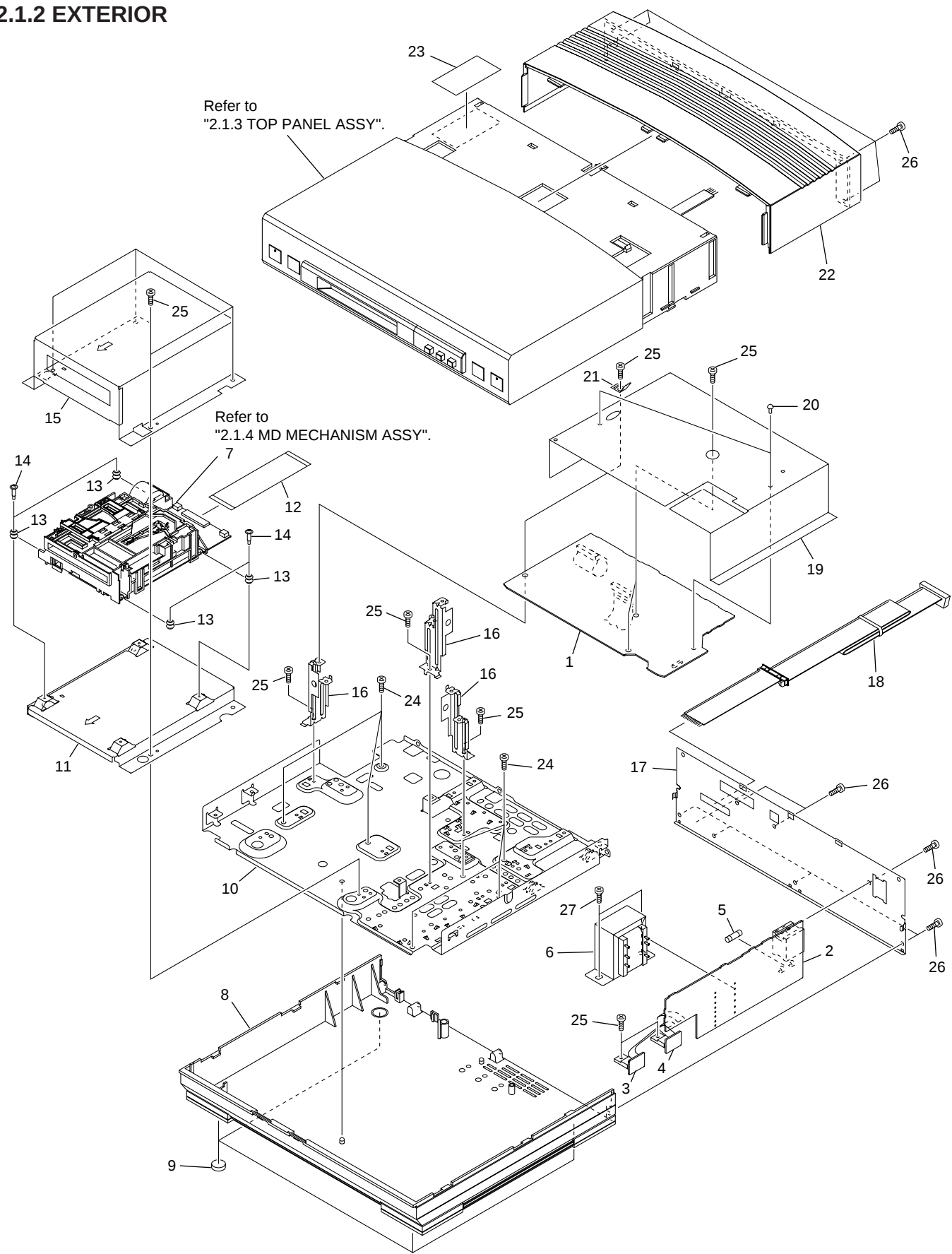
Mark	No.	Description	Part No.
	1	Packing Case	See Contrast table (2)
	2	Pad F	AHA7219
	3	Pad R	AHA7220
	4	Sheet (750×600×0.5)	Z23-007
	5	Sub Packing	See Contrast table (2)
Δ	6	Power Cord	See Contrast table (2)
Δ	7	Optical Fiber Cable	RKX1031
Δ	8	Power Cord	See Contrast table (2)
Δ	9	Fuse (T5A)	See Contrast table (2)
	10	Polyethylene Bag (0.03×230×340)	Z21-038
	11	Operating Instructions (English/French/German/Italian)	See Contrast table (2)
	12	Operating Instructions (English)	See Contrast table (2)
	13	Operating Instructions (Dutch/Swedish/Spanish/Portuguese)	See Contrast table (2)
NSP	14	Warranty Card	ARY7022
NSP	15	Serial Paper	RRW-168

(2) CONTRAST TABLE

MJ-L5/MYXK and MJ-L5/NVXK are constructed the same except for the following :

Mark	No.	Symbol and Description	Part No.		Remarks
			MJ-L5/MYXK	MJ-L5/NVXK	
Δ	1	Packing Case	AHD7630	AHD7631	
	5	Sub Packing	Not used	AHD7618	
	6	Power Cord	ADG7010	Not used	
	8	Power Cord	Not used	ADG7009	
	9	Fuse (T5A)	Not used	AEK7001	
	11	Operating Instructions (English/French/German/Italian)	ARE7173	Not used	
	12	Operating Instructions (English)	Not used	ARB7154	
	13	Operating Instructions (Dutch/Swedish/Spanish/Portuguese)	ARE7174	Not used	

2.1.2 EXTERIOR



(1) EXTERIOR PARTS LIST

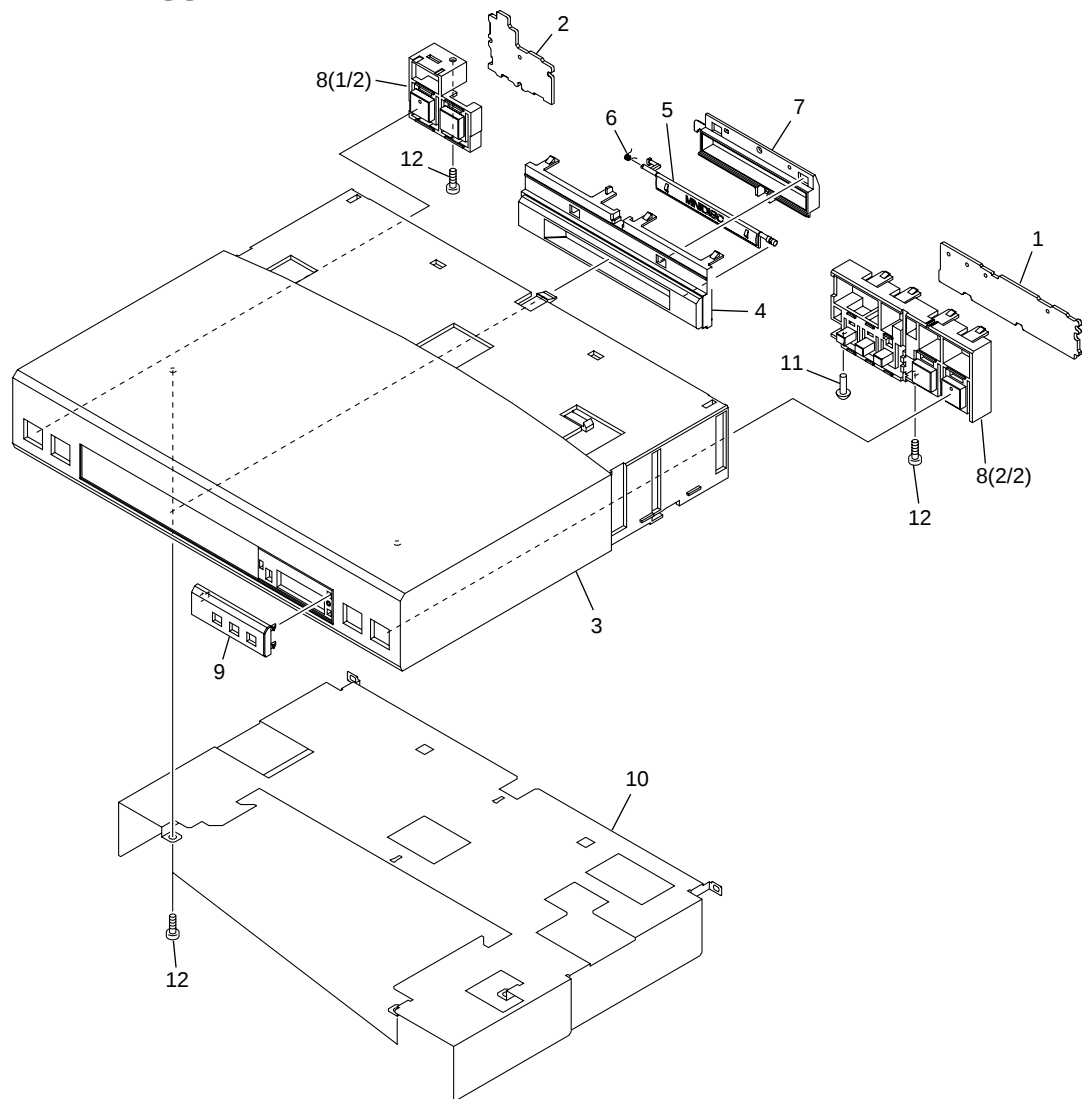
Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	MD MAIN Unit	AWU7106		16	Angle	ANG7189
	2	MD TRANS Unit	AWU7107		17	Rear Panel	See Contrast table (2)
	3	MD REG1 Unit	AWU7154	△	18	Cord With Plug (J1)	ADE7026
	4	MD REG2 Unit	AWU7155		19	Shield Barrier	AEC7164
△	5	Fuse (FU1 : T200mA/250V)	AEK1047		20	Rivet	VEC1178
△	6	Power Transformer (T1)	ATT7031		21	Earth Plate	ANG7168
NSP	7	MD MECHANISM Assy	AXA7069		22	Bonnet	AMA7007
	8	Bottom Base	AMA7006	NSP	23	Caution Label	See Contrast table (2)
	9	Leg	AEB7090		24	Screw	BPZ30P060FZK
NSP	10	Bottom Plate	ANF7010		25	Screw	BBZ30P060FMC
	11	MD Base	ANG7191		26	Screw	VPZ30P080FZK
	12	30P F•F•C/30V	ADD7097		27	Screw	BBZ40P060FMC
	13	Float Rubber	REB1328				
	14	Float Screw	RBA1133				
	15	MD Shield	ANG7192				

(2) CONTRAST TABLE

MJ-L5/MYXK and MJ-L5/NVXK are constructed the same except for the following :

Mark	No.	Symbol and Description	Part No.		Remarks
			MJ-L5/MYXK	MJ-L5/NVXK	
NSP	17	Rear Panel	ANC7675	ANC7676	
	23	Caution Label	ARW1047	ARW1050	

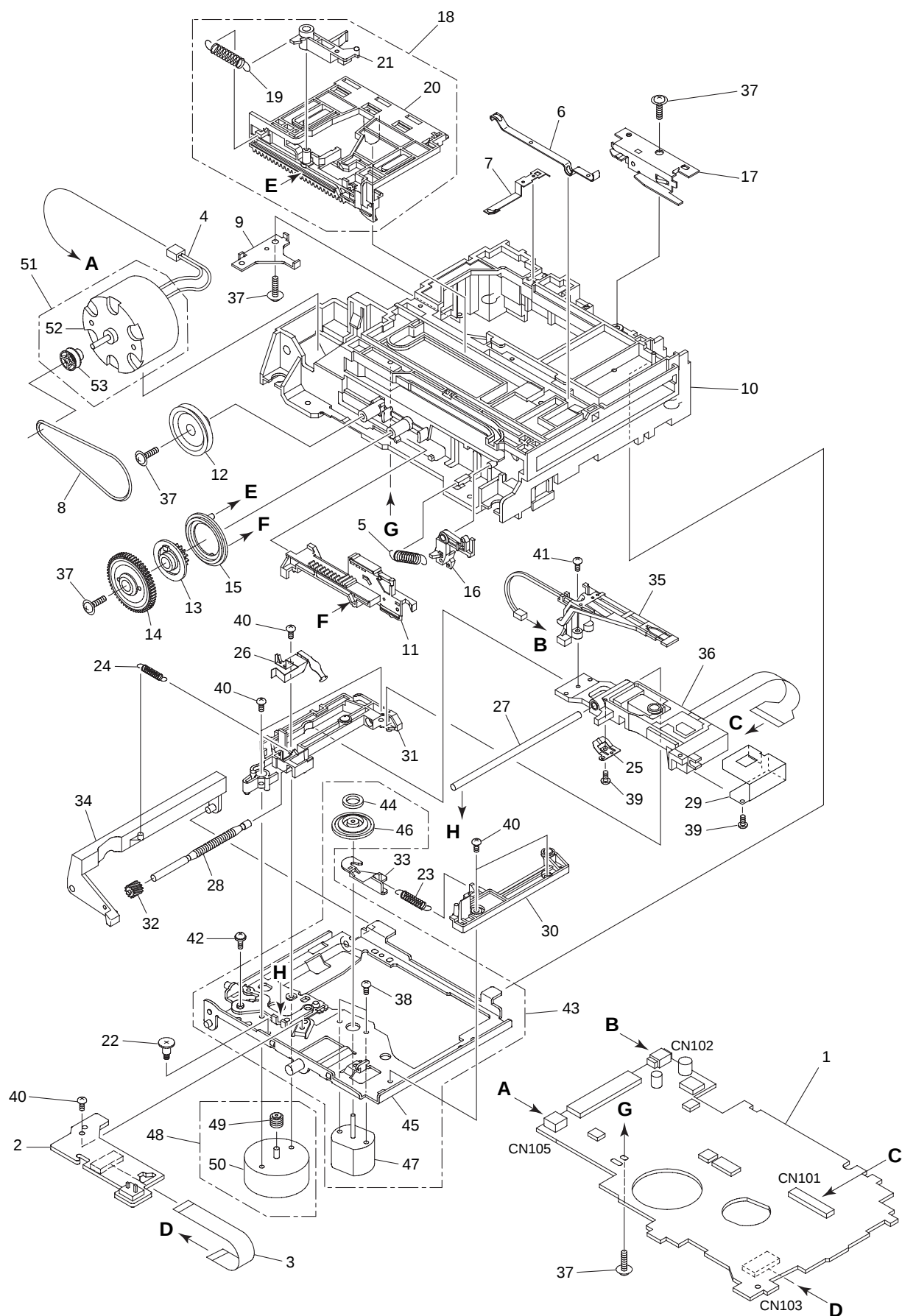
2.1.3 TOP PANEL ASSY



● TOP PANEL ASSY PARTS LIST

Mark	No.	Description	Part No.
NSP	1	MD KEYR Unit	AWU7108
	2	MD KEYL Unit	AWU7109
	3	Top Panel	AMB7515
	4	Sub Panel MD	AAP7049
	5	MD Flap	AAN7186
	6	MD Spring	ABH7154
	7	Flap Plate	AAT7003
	8	Button X Assy	AWL7034
	9	Sub Panel	AAP7048
	10	Top Plate	ANK7042
NSP	11	Rivet	VEC1178
	12	Screw	VPZ30P080FZK

2.1.4 MD MECHANISM ASSY

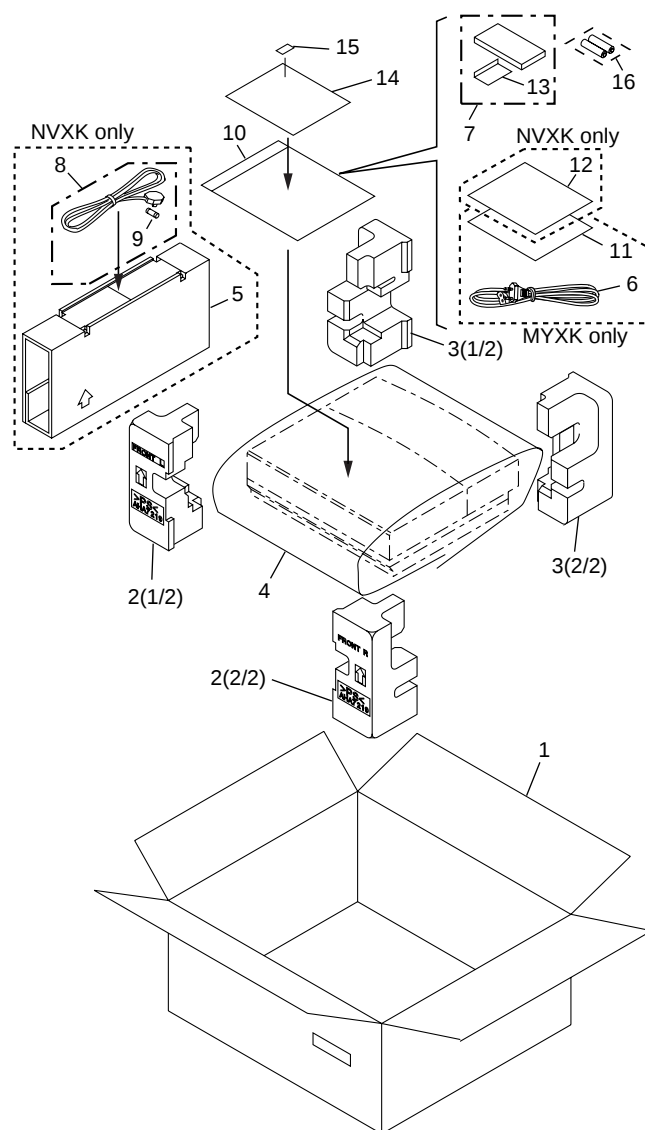


● MD MECHANISM ASSY PARTS LIST

Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	MD CORE MAIN Unit	RWZ4326		31	S. Holder	RNK2307
	2	MD CORE SW Unit	RWZ4272		32	Worm Wheel	RNK2309
	3	Lead Card 7P	RDD1399		33	Hook	RNK2310
	4	Lead Wire	RKP1814		34	Head Lifter	RNK2311
	5	Lever Spring	RBH1463		35	MD Head	RPB1062
	6	Clamp Spring 1	RBK1074		36	MD Pickup	RWY1018
	7	Clamp Spring 2	RBK1075		37	Screw	IPZ20P080FMC
	8	Loading Belt	REB1329		38	Screw	JFZ17P020FZK
	9	Lock Plate	RNE1949		39	Screw	JGZ14P020FMC
	10	Loading Base	RNK2312		40	Screw	JGZ17P030FMC
	11	Under Slider	RNK2314		41	Screw	JGZ17P040FZK
	12	Gear Pulley	RNK2316		42	Screw	PMB20P040FMC
	13	Drive Gear	RNK2317		43	Servo Base Assy	REA1283
	14	Clutch Gear	RNK2318	NSP	44	Clamp Magnet	RMF1002
	15	Flip Disk	RNK2319	NSP	45	Servo Base	RNE1946
	16	SW Lever	RNK2320	NSP	46	Disc Table	RNK2305
	17	Shutter Assy	RXA1774	NSP	47	Spindle Motor	RXM1091
NSP	18	Upper Slider Assy	RXA1775		48	Carriage Motor Assy	REA1284
	19	Eject Spring	RBH1461		49	Worm	RNK2308
	20	Upper Slider	RNK2313	NSP	50	Carriage Motor	RXM1090
	21	Carrier	RNK2315		51	Loading Motor Assy	REA1285
	22	Screw	RBA1129		52	DC Motor /0.75W	PXM1010
	23	Spindle Spring	RBH1460		53	CA Pulley (1)	VNL1197
	24	Lifter SP	RBH1462				
	25	Screw Guide	RBK1072				
	26	S. H. Spring	RBK1073				
	27	Guide Shaft	RLA1310				
	28	Lead Screw	RLA1311				
	29	Shield Case	RNE1950				
	30	Reference Plate	RNK2306				

2.2 SURROUND PROCESSOR (SP-L5)

2.2.1 PACKING



(1) PACKING PARTS LIST

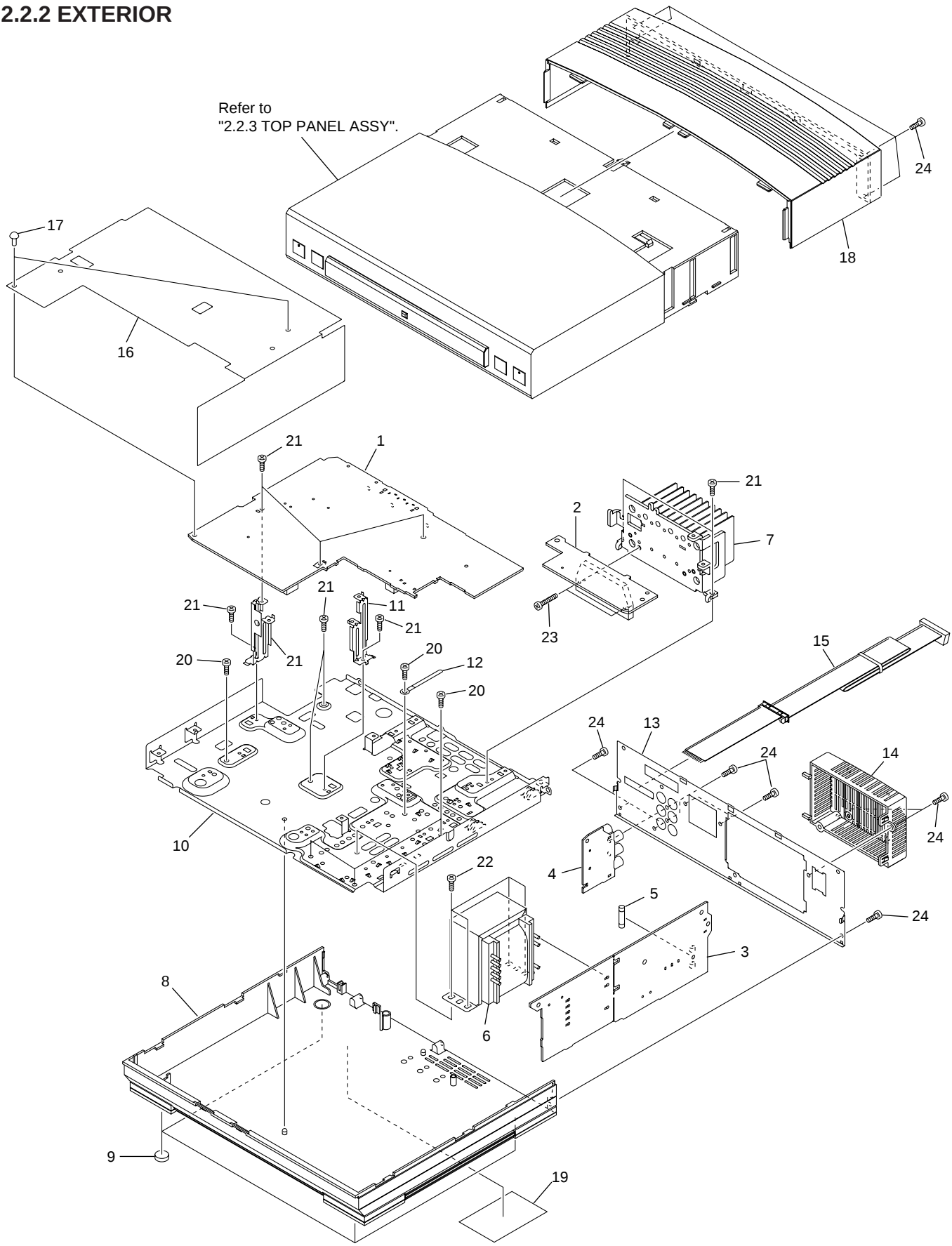
Mark	No.	Description	Part No.
	1	Packing Case	See Contrast table (2)
	2	Pad F	AHA7219
	3	Pad R	AHA7220
	4	Sheet (750×600×0.5)	Z23-007
	5	Sub Packing	See Contrast table (2)
△	6	Power Cord	See Contrast table (2)
	7	Remote Control Unit (CU-SP005)	AXD7171
△	8	Power Cord	See Contrast table (2)
△	9	Fuse (T5A)	See Contrast table (2)
	10	Polyethylene Bag (0.03×230×340)	Z21-038
	11	Operating Instructions (English/French/German/Italian/Dutch/Swedish/Spanish/Portuguese)	See Contrast table (2)
	12	Operating Instructions (English)	See Contrast table (2)
	13	Battery Cover	AZA7050
NSP	14	Warranty Card	ARY7022
NSP	15	Serial Paper	RRW-168
NSP	16	Dry Cell Battery (R03,AAA)	PEM1004

(2) CONTRAST TABLE

SP-L5/MYXK and SP-L5/NVXK are constructed the same except for the following :

Mark	No.	Symbol and Description	Part No.		Remarks
			SP-L5/MYXK	SP-L5/NVXK	
△	1	Packing Case	AHD7632	AHD7633	
	5	Sub Packing	Not used	AHD7618	
	6	Power Cord	ADG7010	Not used	
	8	Power Cord	Not used	ADG7009	
	9	Fuse (T5A)	Not used	AEK7001	
	11	Operating Instructions (English/French/German/Italian/Dutch/Swedish/Spanish/Portuguese)	ARE7175	Not used	
	12	Operating Instructions (English)	Not used	ARB7155	

2.2.2 EXTERIOR



(1) EXTERIOR PARTS LIST

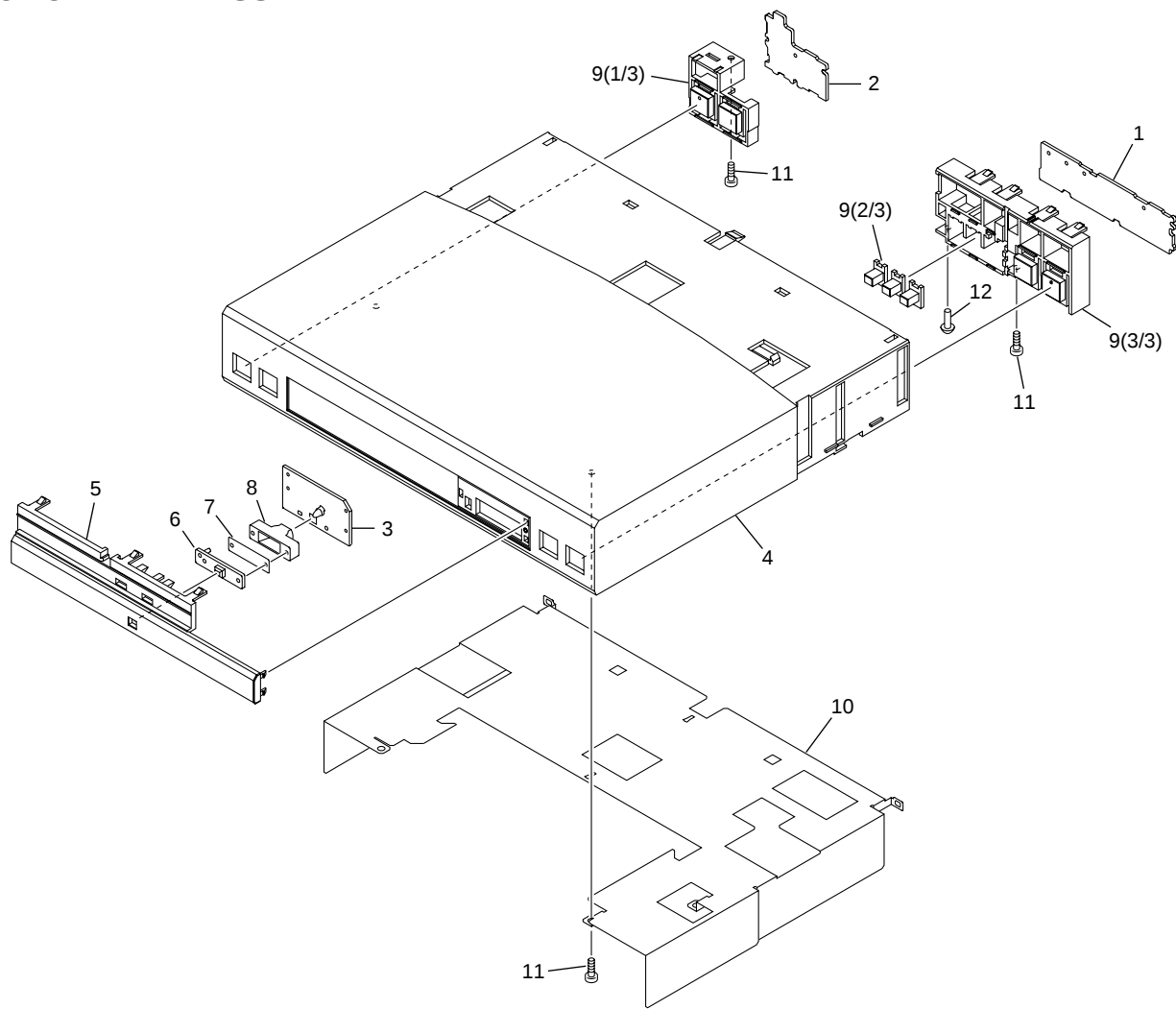
Mark	No.	Description	Part No.	Mark	No.	Description	Part No.
	1	PRO MAIN Unit	AWU7101		16	Top Barrier	AEC7151
	2	PRO AMP Unit	AWU7102		17	Rivet	VEC1178
	3	PRO TRANS Unit	AWU7103		18	Bonnet	AMA7007
	4	PRO AUX Unit	AWU7146		19	Name Label	ARW7043
△	5	Fuse (FU1 : T800mA/250V)	AEK1053		20	Screw	BPZ30P060FZK
△	6	Power Transformer (T)	ATS7220		21	Screw	BBZ30P060FMC
NSP	7	Heat Sink	ANH7089		22	Screw	BBZ40P060FMC
	8	Bottom Base	AMA7006		23	Screw	BBZ30P140FMC
	9	Leg	AEB7090		24	Screw	VPZ30P080FZK
NSP	10	Bottom Plate	ANF7010				
	11	Angle	ANG7189				
	12	Cord Clamper	RNH-184				
	13	Rear Panel	See Contrast table (2)				
	14	Rear Case	AMR7207				
	15	Cord With Plug (J)	ADE7026				

(2) CONTRAST TABLE

SP-L5/MYXK and SP-L5/NVXK are constructed the same except for the following :

Mark	No.	Symbol and Description	Part No.		Remarks
			SP-L5/MYXK	SP-L5/NVXK	
	13	Rear Panel	ANC7677	ANC7678	

2.2.3 TOP PANEL ASSY



● TOP PANEL ASSY PARTS LIST

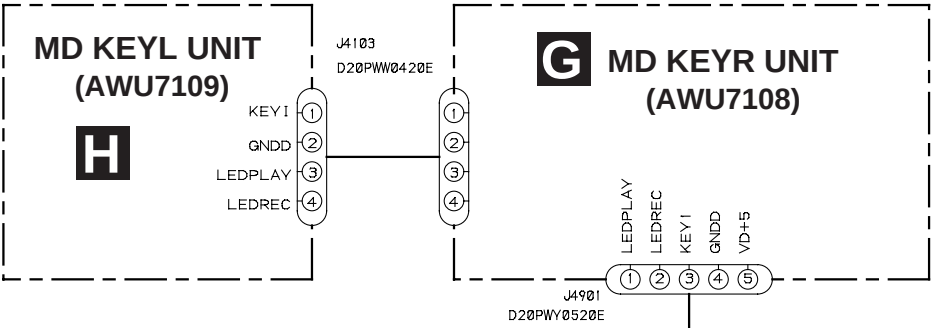
Mark	No.	Description	Part No.
NSP	1	PRO KEYR Unit	AWU7104
	2	PRO KEYL Unit	AWU7105
	3	PRO IND Unit	AWU7145
	4	Top Panel	AMB7516
	5	Sub Panel PR	AAP7050
	6	Lens D	AAX7640
	7	Illumination Filter	VEC1950
	8	Illumination Holder	VNK4098
	9	Button X Assy	AWL7035
	10	Top Plate	ANK7048
	11	Screw	VPZ30P080FZK
	12	Rivet	VEC1178

3. SCHEMATIC DIAGRAM

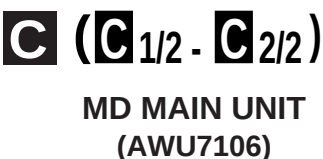
3.1 MINIDISC RECORDER (MJ-L5)

3.1.1 OVERALL CONNECTION DIAGRAM

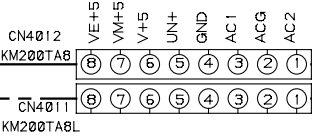
A



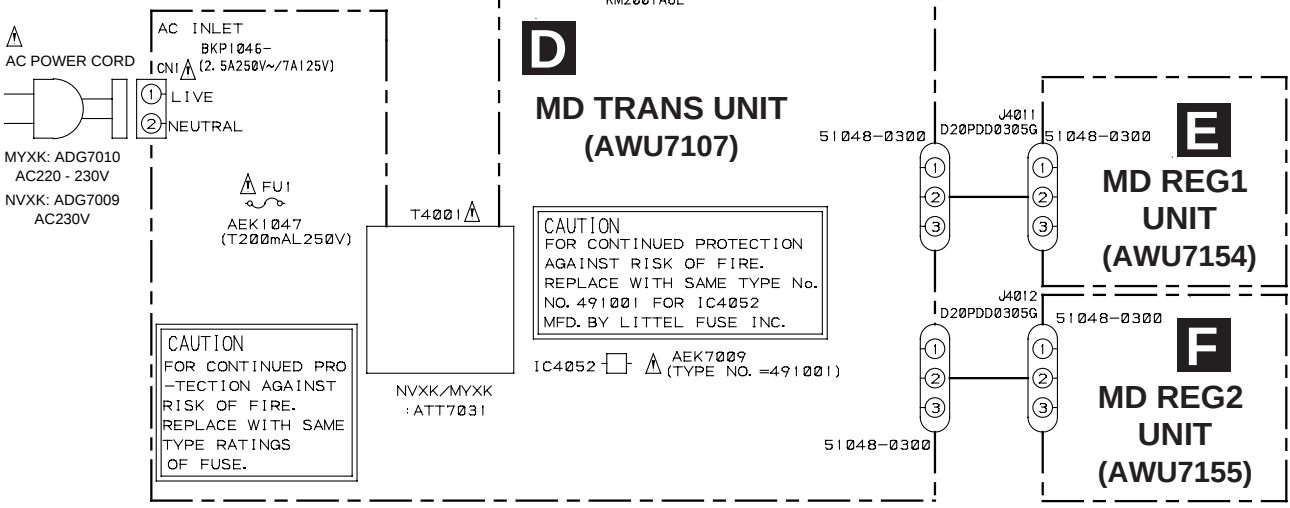
B



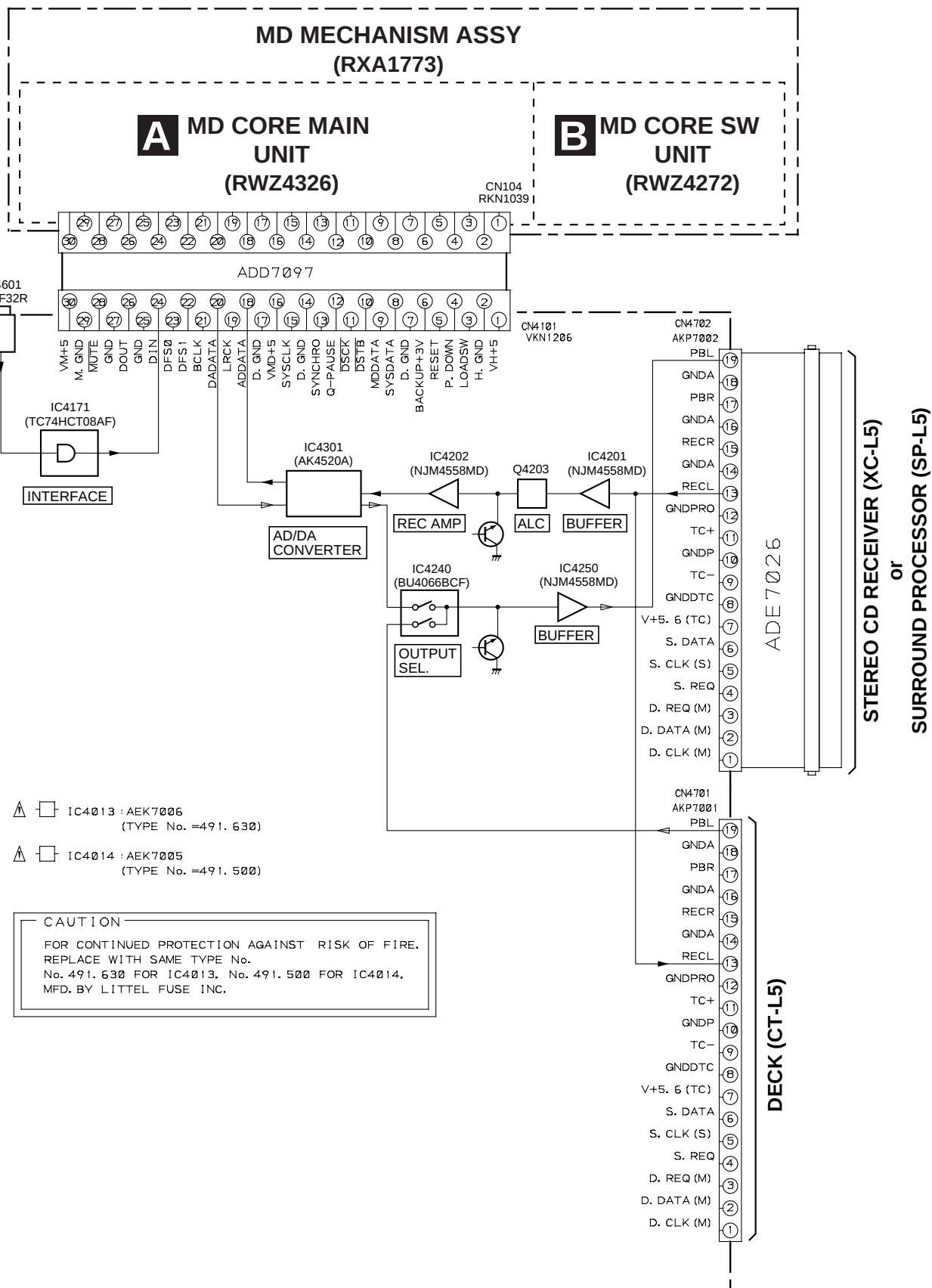
C



D



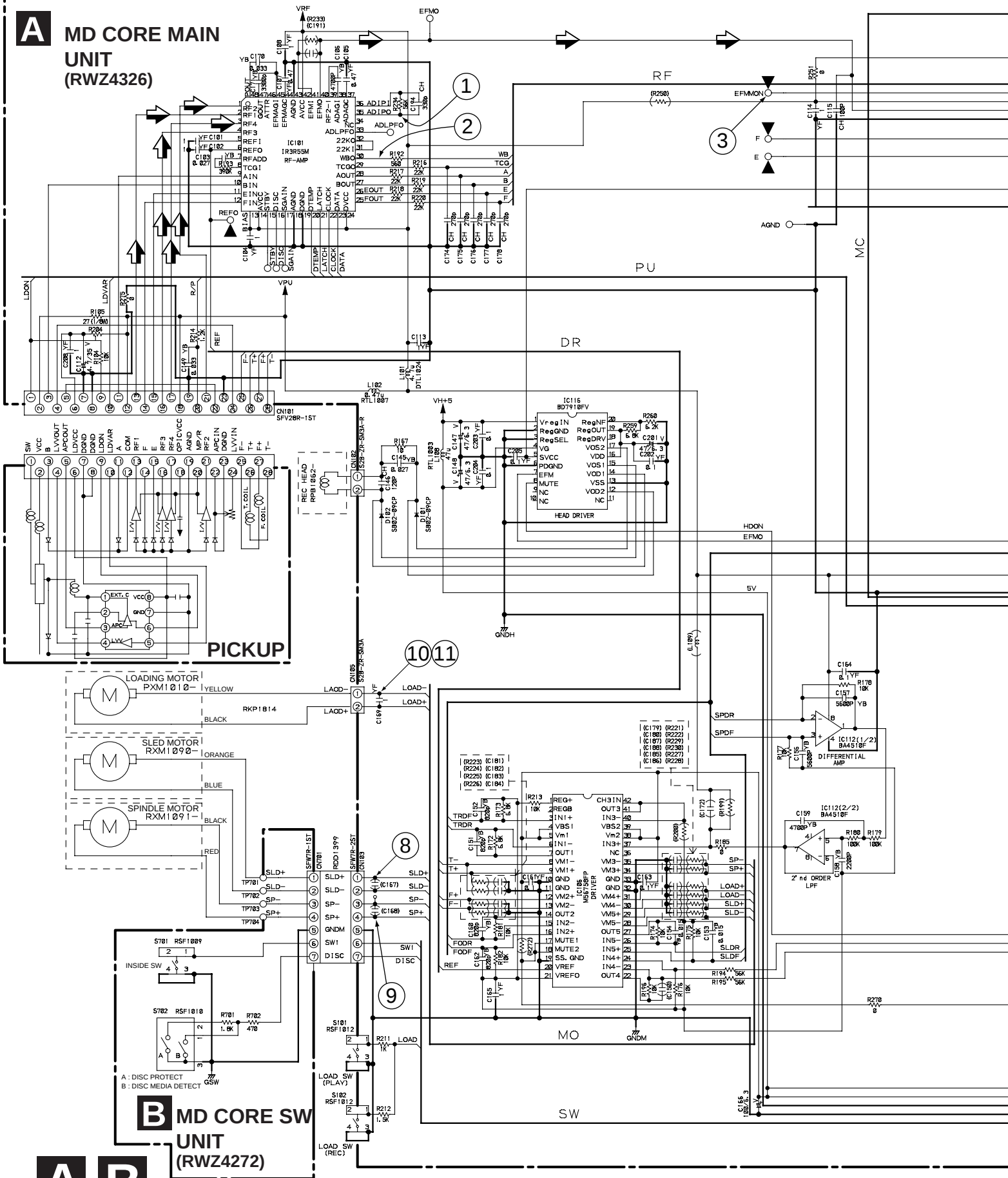
Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".



3.1.2 MD CORE MAIN and MD CORE SW UNITS

A

A MD CORE MAIN UNIT (RWZ4326)



B

C

D

● ① – ⑪ are waveform numbers on pages 24 and 25.

SIGNAL ROUTE

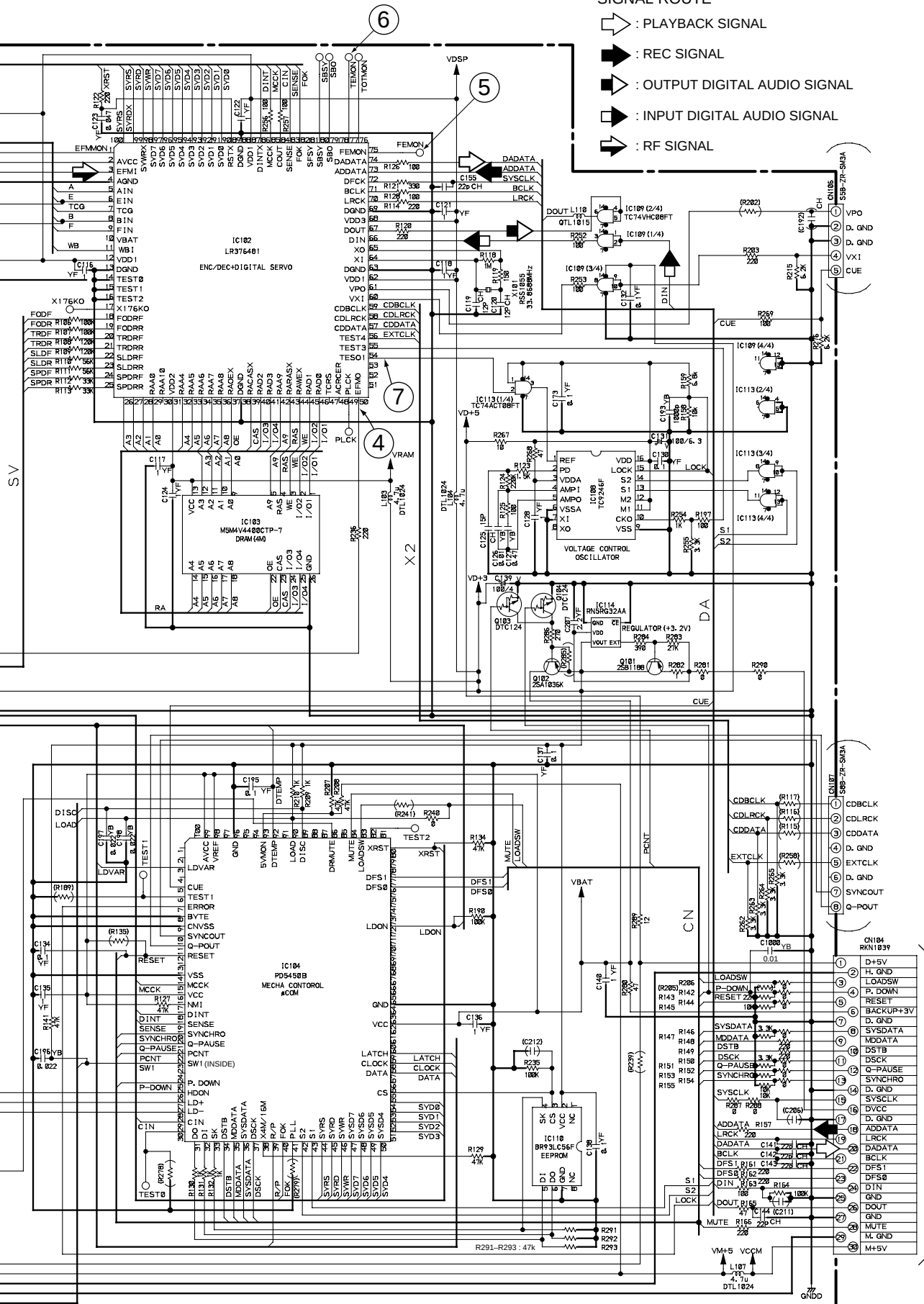
➡ : PLAYBACK SIGNAL

➡ : REC SIGNAL

➡ : OUTPUT DIGITAL AUDIO SIGNAL

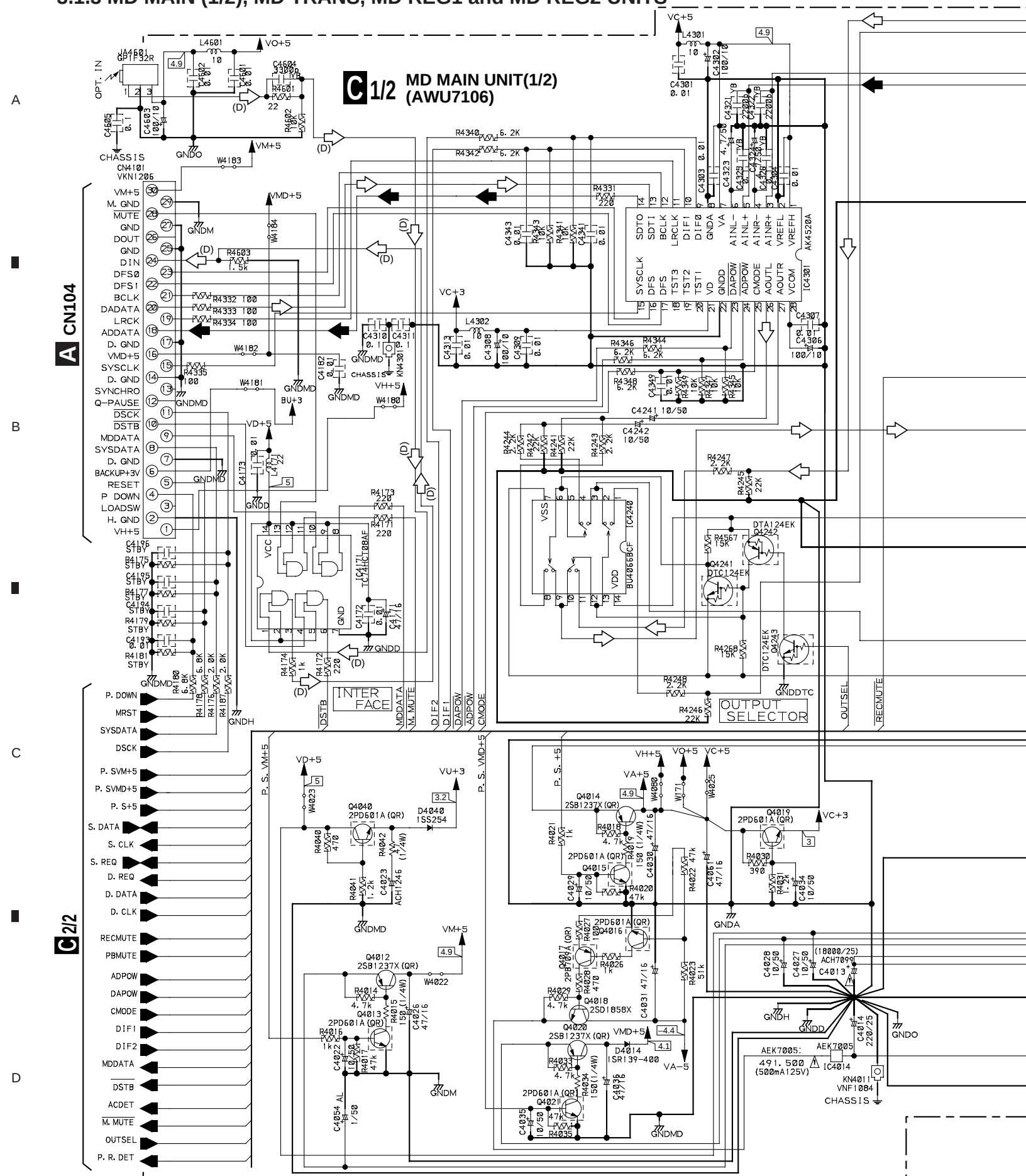
➡ : INPUT DIGITAL AUDIO SIGNAL

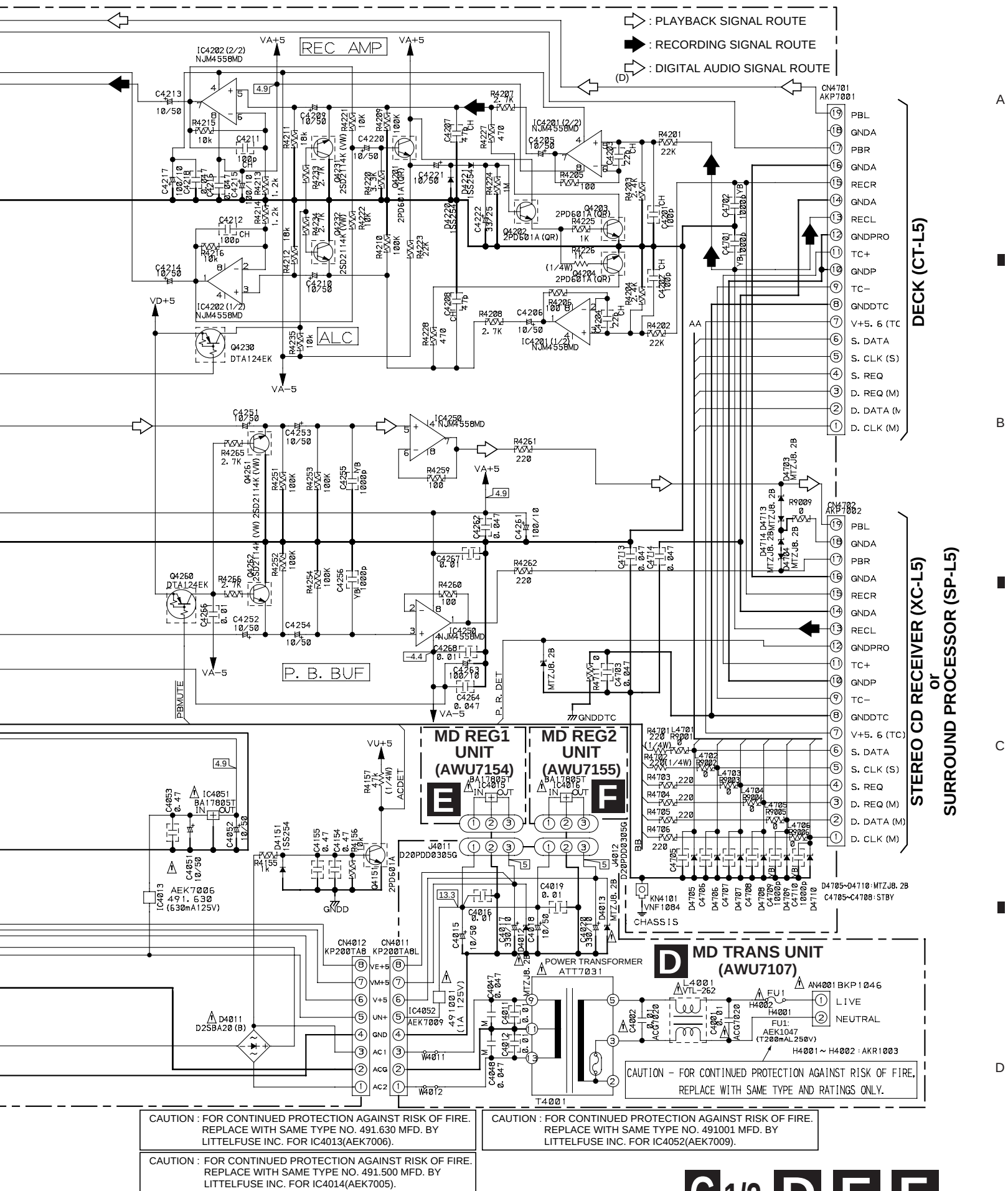
➡ : RF SIGNAL



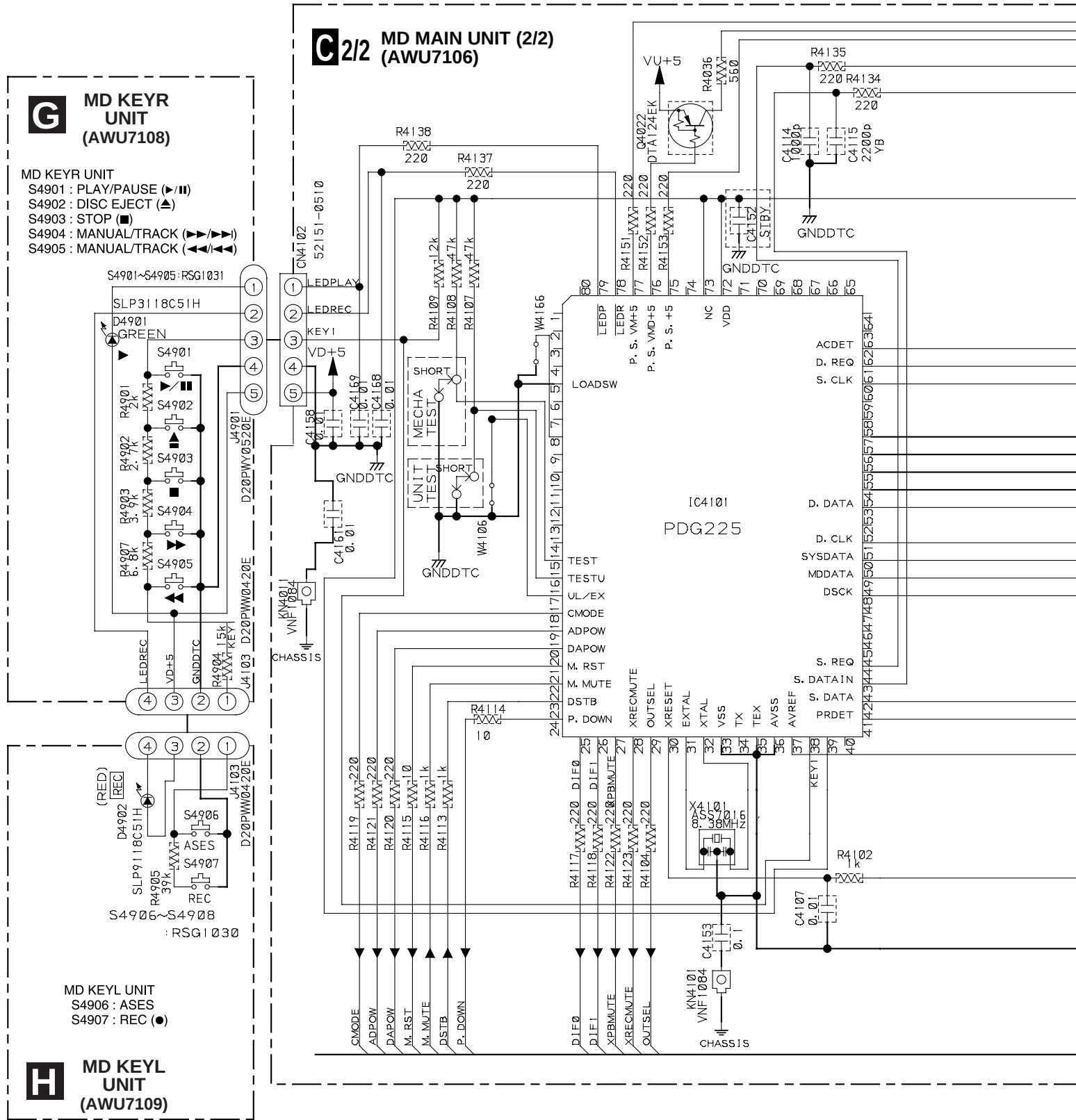
C1/2 CN4101

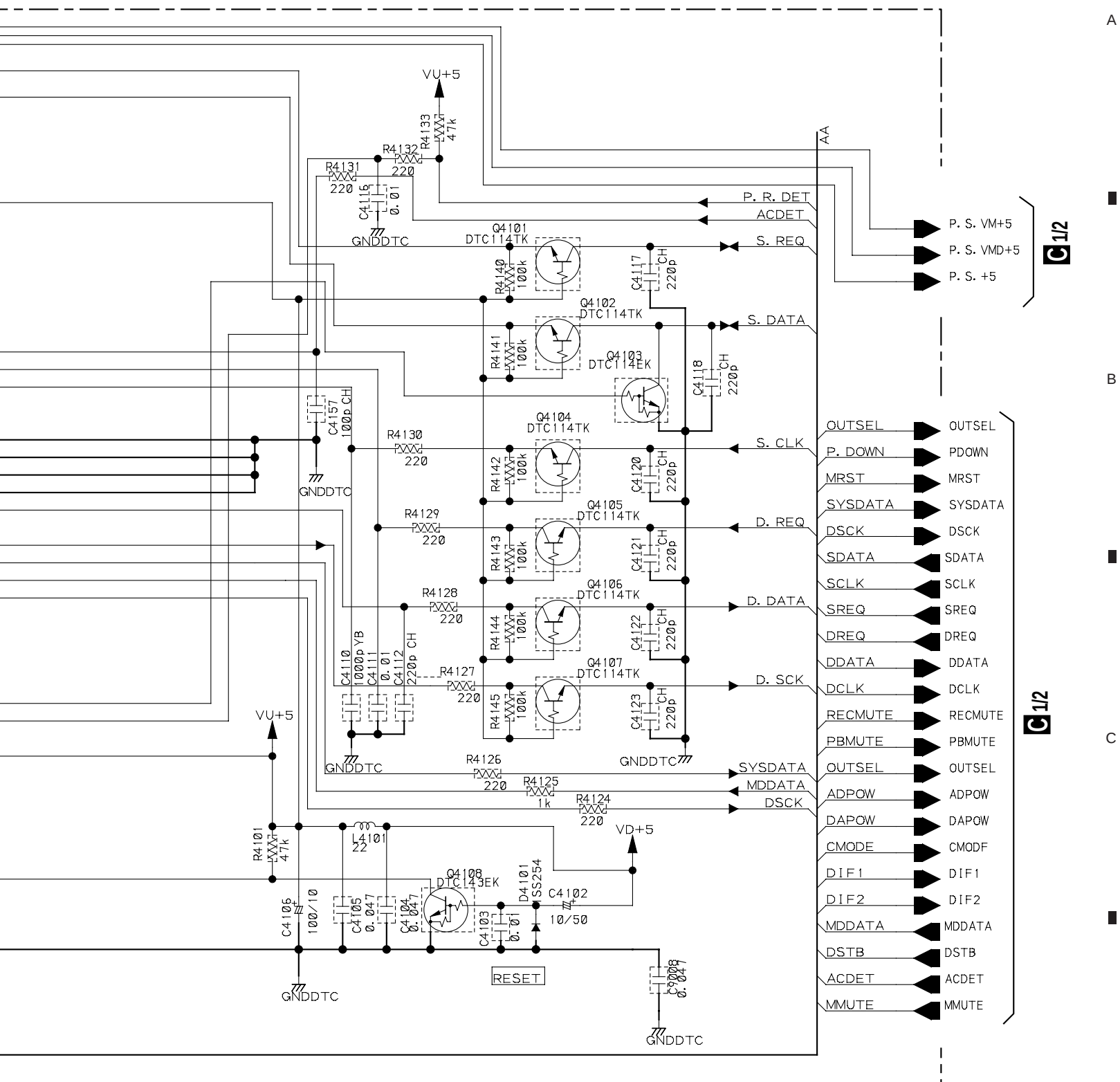
3.1.3 MD MAIN (1/2), MD TRANS, MD REG1 and MD REG2 UNITS





3.1.4 MD MAIN (2/2) , MD KEYR and MD KEYL UNITS





■ Voltages



MD CORE MAIN UNIT

IC101	
PIN NO.	VOLTAGE
1	0.78V
2	0.73V
3	0.77V
4	0.75V
5	1.61V
6	1.61V
7	0.75V
8	1.61V
9	1.61V
10	1.61V
11	1.61V
12	1.61V
13	3.19V
14	3.19V
15	0V
16	0V
17	3.19V
18	0V
19	0V
20	1.5V
21	3.2V
22	0V
23	0V
24	3.19V
25	2.0V
26	0V
27	1.40V
28	1.42V
29	1.40V
30	1.63V
31	1.61V
32	1.61V
33	0V
34	0V
35	0V
36	1.62V
37	0.59V
38	1.61V
39	1.61V
40	1.61V
41	1.61V
42	3.19V
43	0V
44	1.08V
45	1.61V
46	1.61V
47	0V
48	0.74V

IC102			
PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
1	1.53V	51	1.59V
2	3.18V	52	0V
3	1.65V	53	0V
4	0V	54	1.59V
5	1.42V	55	1.8V
6	0V	56	0V
7	1.59V	57	0V
8	1.41V	58	0V
9	1.97V	59	0V
10	1.39V	60	0V
11	1.64V	61	0.56V
12	3.18V	62	3.18V
13	0V	63	0V
14	0V	64	1.5V
15	0V	65	1.5V
16	0V	66	3.2V
17	1.69V	67	1.6V
18	1.52V	68	3.2V
19	1.70V	69	0V
20	1.47V	70	1.6V
21	1.47V	71	1.6V
22	1.65V	72	1.48V
23	1.54V	73	0V
24	1.69V	74	0V
25	1.51V	75	1.68V
26	0.82V	76	1.82V
27	2.0V	77	1.59V
28	2.0V	78	0.35V
29	1.81V	79	0.02V
30	1.4V	80	3.2V
31	0.82V	81	3.2V
32	1.67V	82	0.02V
33	1.67V	83	0.03V
34	1.67V	84	1.9V
35	2.86V	85	1.56V
36	1.32V	86	3.1V
37	2.23V	87	3.2V
38	0V	88	0V
39	2.4V	89	3.19V
40	1.2V	90	0.5V
41	1.5V	91	0.5V
42	0V	92	0.5V
43	2.0V	93	0.5V
44	3.0V	94	0.9V
45	1.2V	95	0.5V
46	1.2V	96	0.5V
47	0.02V	97	0.5V
48	3.04V	98	0.8V
49	1.57V	99	3.18V
50	0.05V	100	0.06V

IC103	
PIN NO.	VOLTAGE
1	1.2V
2	1.2V
3	3.0V
4	2.0V
5	0V
9	2.23V
10	1.32V
11	2.86V
12	1.67V
13	3.18V
14	1.67V
15	1.67V
16	1.67V
17	2.86V
18	1.32V
22	2.23V
23	2.4V
24	1.2V
25	1.5V
26	0V

IC104			
PIN NO.	VOLTAGE	PIN NO.	VOLTAGE
1	0V	51	0.54V
2	0V	52	0.6V
3	0.22V	53	0.6V
4	0.03V	54	0.6V
5	1.29V	55	0V
6	2.21V	56	0V
7	3.13V	57	0V
8	0V	58	0V
9	0V	59	3.2V
10	0V	60	0V
11	0V	61	0V
12	3.03V	62	3.2V
13	1.43V	63	0V
14	0V	64	0V
15	1.57V	65	3.2V
16	3.2V	66	0V
17	3.19V	67	0V
18	3.1V	68	0V
19	0.03V	69	0V
20	0V	70	0V
21	0V	71	0V
22	3.18V	72	3.1V
23	3.2V	73	3.2V
24	0V	74	0V
25	2.67V	75	0V
26	3.19V	76	3.2V
27	0V	77	0V
28	0V	78	0V
29	2.4V	79	0V
30	0.24V	80	3.2V
31	0V	81	0V
32	0.3V	82	3.19V
33	3.2V	83	0V
34	1.56V	84	3.19V
35	1.0V	85	0V
36	0V	86	3.18V
37	2.77V	87	3.2V
38	0V	88	0V
39	3.18V	89	1.03V
40	0.02V	90	1.6V
41	3.19V	91	0.56V
42	3.2V	92	1.49V
43	0V	93	1.49V
44	0.05V	94	0.68V
45	3.18V	95	0.61V
46	3.19V	96	0V
47	0.51V	97	0.53V
48	0.4V	98	3.2V
49	0.3V	99	3.2V
50	0.55V	100	0V

IC106	
PIN NO.	VOLTAGE
1	1.6V
2	0.49V
3	1.61V
4	4.99V
5	4.99V
6	1.61V
7	1.62V
8	2.46V
9	2.51V
10	0V
11	0V
12	2.54V
13	2.45V
14	1.62V
15	1.62V
16	1.61V
17	3.17V
18	0V
19	1.61V
20	1.61V
21	1.61V
22	1.61V
23	1.36V
24	1.36V
25	1.61V
26	1.61V
27	1.63V
28	2.41V
29	2.55V
30	2.47V
31	2.48V
32	0V
33	0V
34	2.79V
35	2.18V
36	0V
37	1.69V
38	5.0V
39	4.99V
40	1.67V
41	1.69V
42	1.69V

IC108	
PIN NO.	VOLTAGE
1	2.47V
2	2.63V
3	4.87V
4	2.63V
5	1.59V
6	0V
7	0V
8	4.87V
9	0V
10	2.25V
11	4.94V
12	4.94V
13	4.94V
14	4.94V
15	3.12V
16	4.94V

IC114	
PIN NO.	VOLTAGE
1	0V
2	4.19V
3	3.21V
4	2.81V
5	0V

IC109	
PIN NO.	VOLTAGE
1	2.77V
2	2.77V
3	3.2V
4	1.58V
5	1.58V
6	1.56V
7	0V
8	0V
9	0V
10	0V
11	0V
12	0V
13	0V
14	3.2V

IC116	
PIN NO.	VOLTAGE
1	4.98V
2	0V
3	0V
4	4.99V
5	3.2V
6	0V
7	0.03V
8	3.18V
9	0V
10	0V
11	0V
12	0.22V
13	0V
14	0.25V
15	0.25V
16	2.82V
17	0.16V
18	4.94V
19	2.82V
20	1.33V

IC110	
PIN NO.	VOLTAGE
1	0V
2	3.2V
3	0V
4	3.2V
5	0V
6	0.11V
7	0V
8	0V

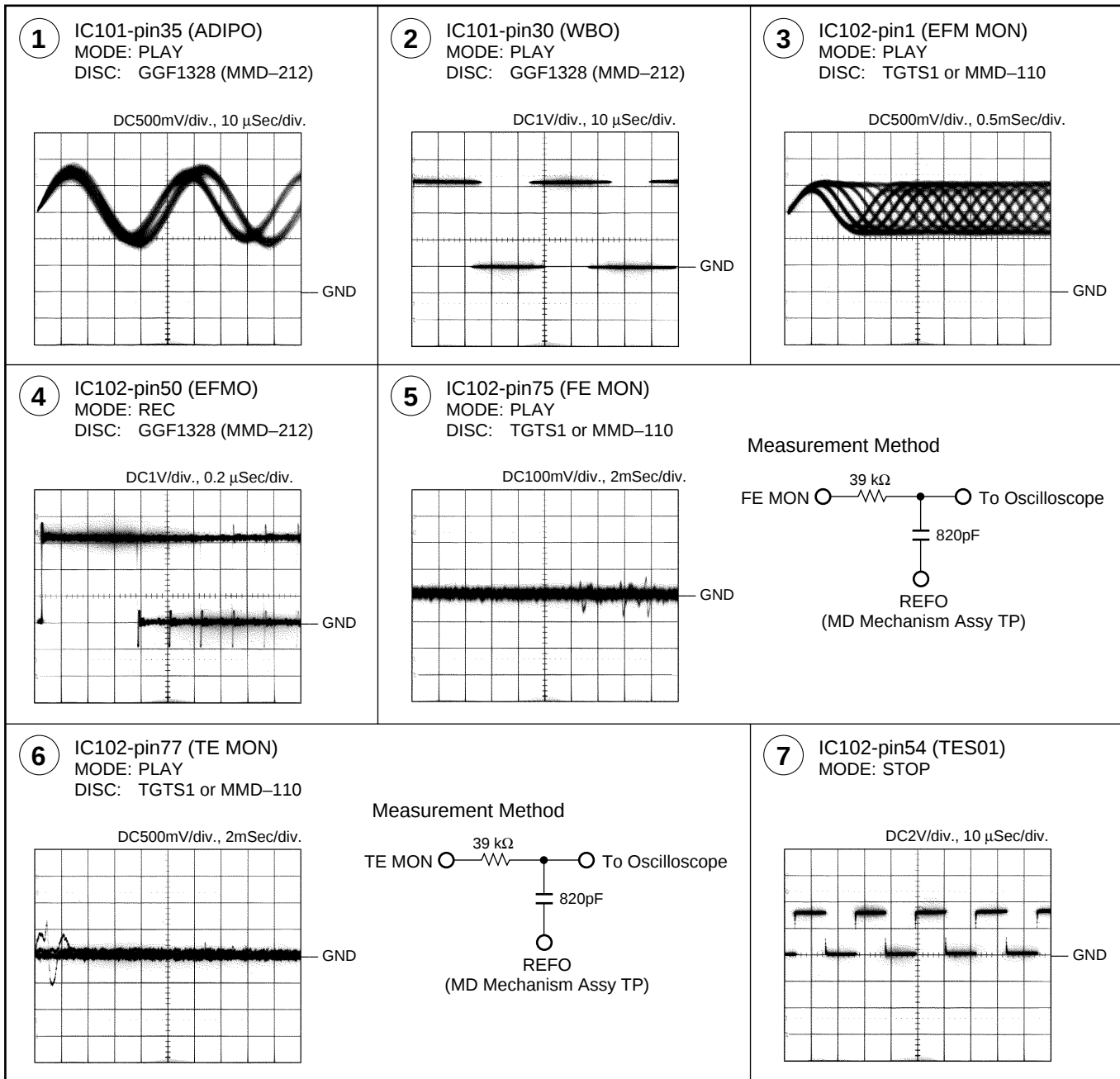
IC112	
PIN NO.	VOLTAGE
1	1.66V
2	1.62V
3	1.62V
4	0V
5	1.67V
6	1.67V
7	1.67V
8	3.19V

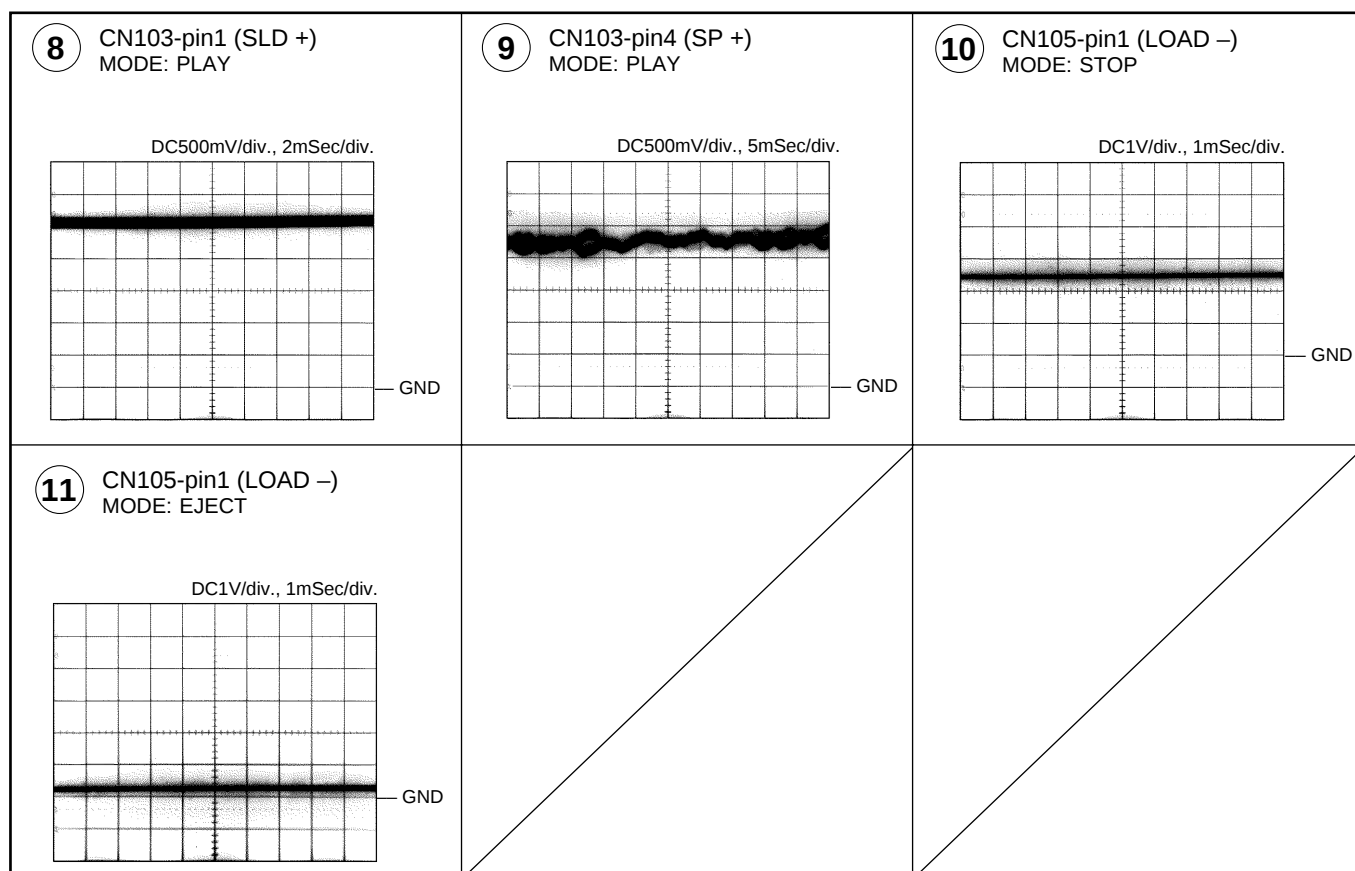
IC113	
PIN NO.	VOLTAGE
1	4.95V
2	3.96V
3	0V
4	0V
5	0V
6	0V
7	0V
8	0V
9	4.94V
10	4.12V
11	3.19V
12	0V
13	0V
14	4.94V

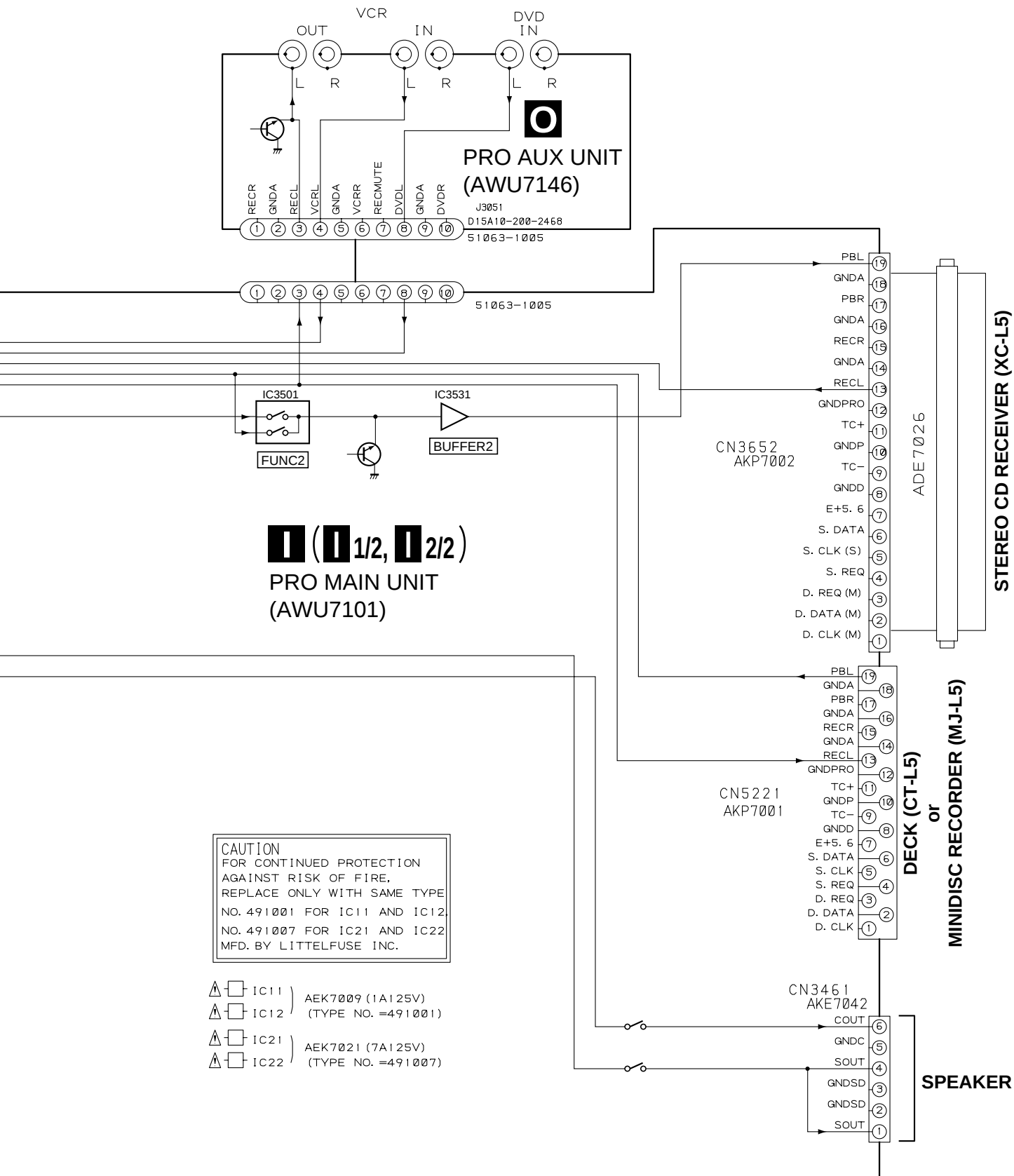
Waveforms

Note: The encircled numbers denote measuring point in the schematic diagram and the PCB connection diagram.

A MD CORE MAIN UNIT







3.2.2 PRO MAIN (1/2), PRO TRANS and PRO AMP UNITS

A

NOTES

ALL CAPACITORS ARE IN μ F
UNLESS OTHERWISE SPECIFIED

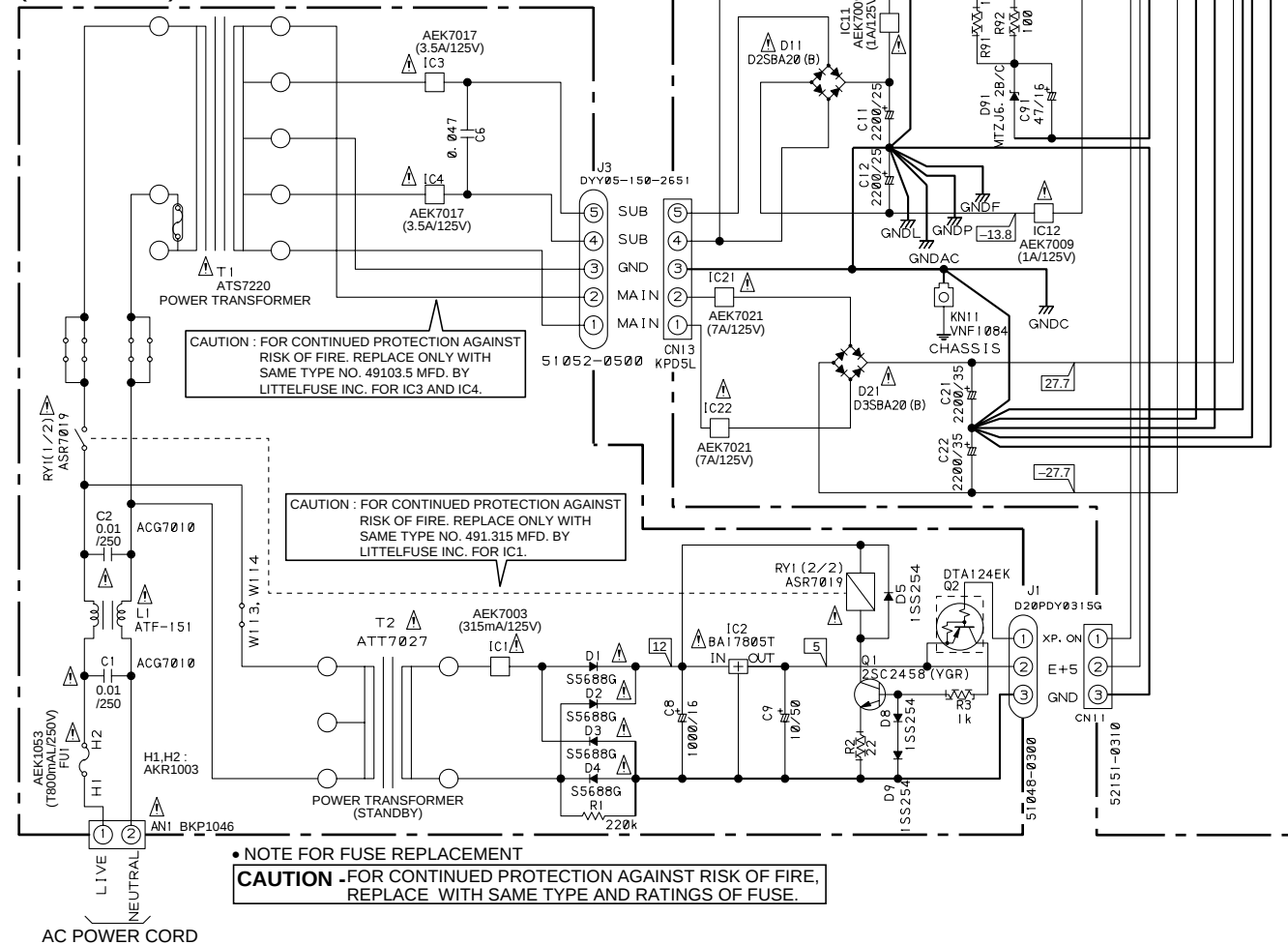
$\vdash$ CKCYF
 $\vdash$ CH : CCSQCH
 $\vdash$ YB : CKSQYB
 $\vdash$ SL : CCSQSL
 (OTHER : CKSQYF)
 $\vdash$ AL : CEAL
 (OTHER : CEAT**M##)
 ALL RESISTORS ARE IN Ω

$\sim$ 1/10W (CHIP)
 $\sim$ 1/4WPU
 $\sim$ (F) RFA1/4PS
 $\sim$ FL RD1/4LMF

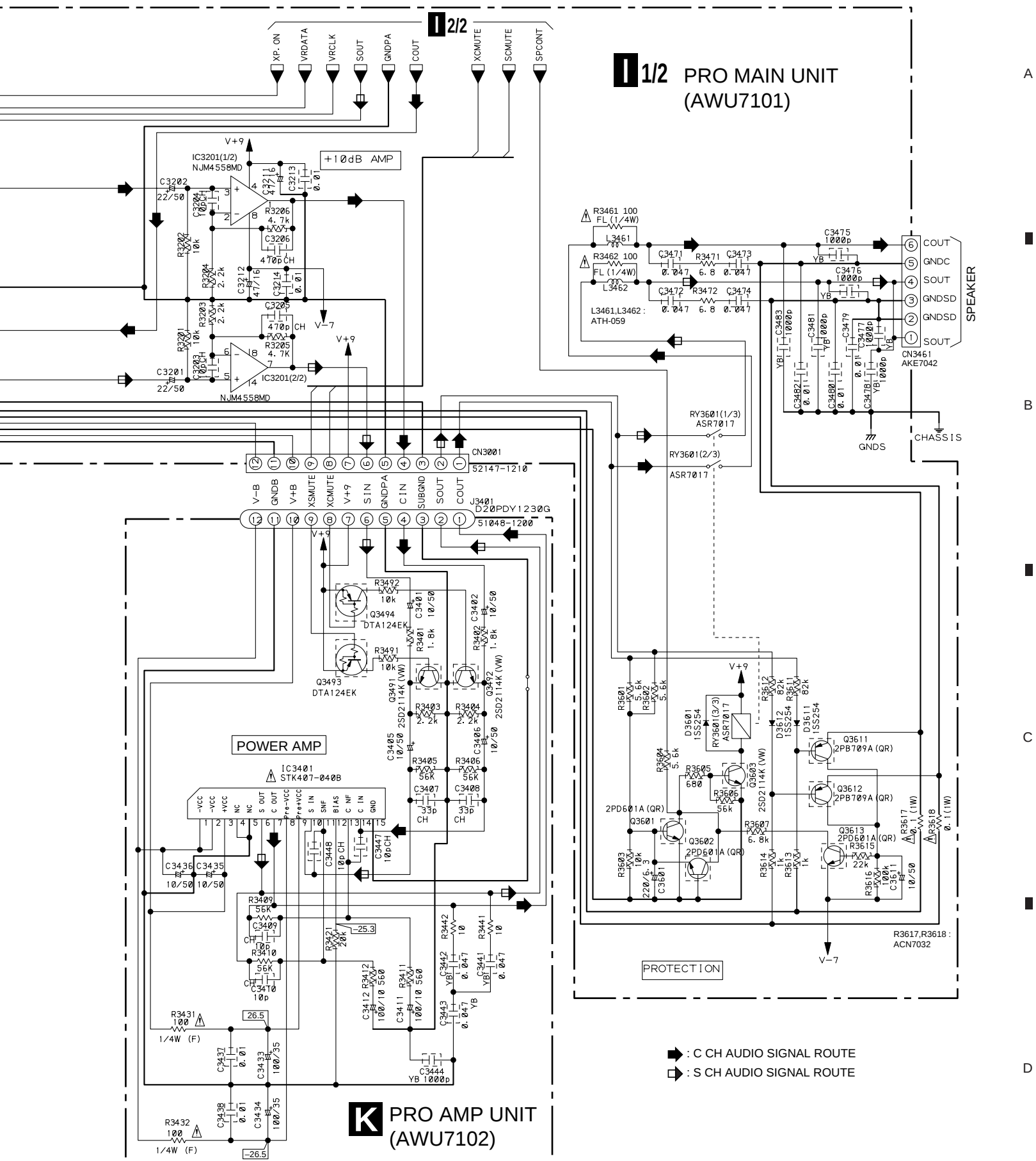
B

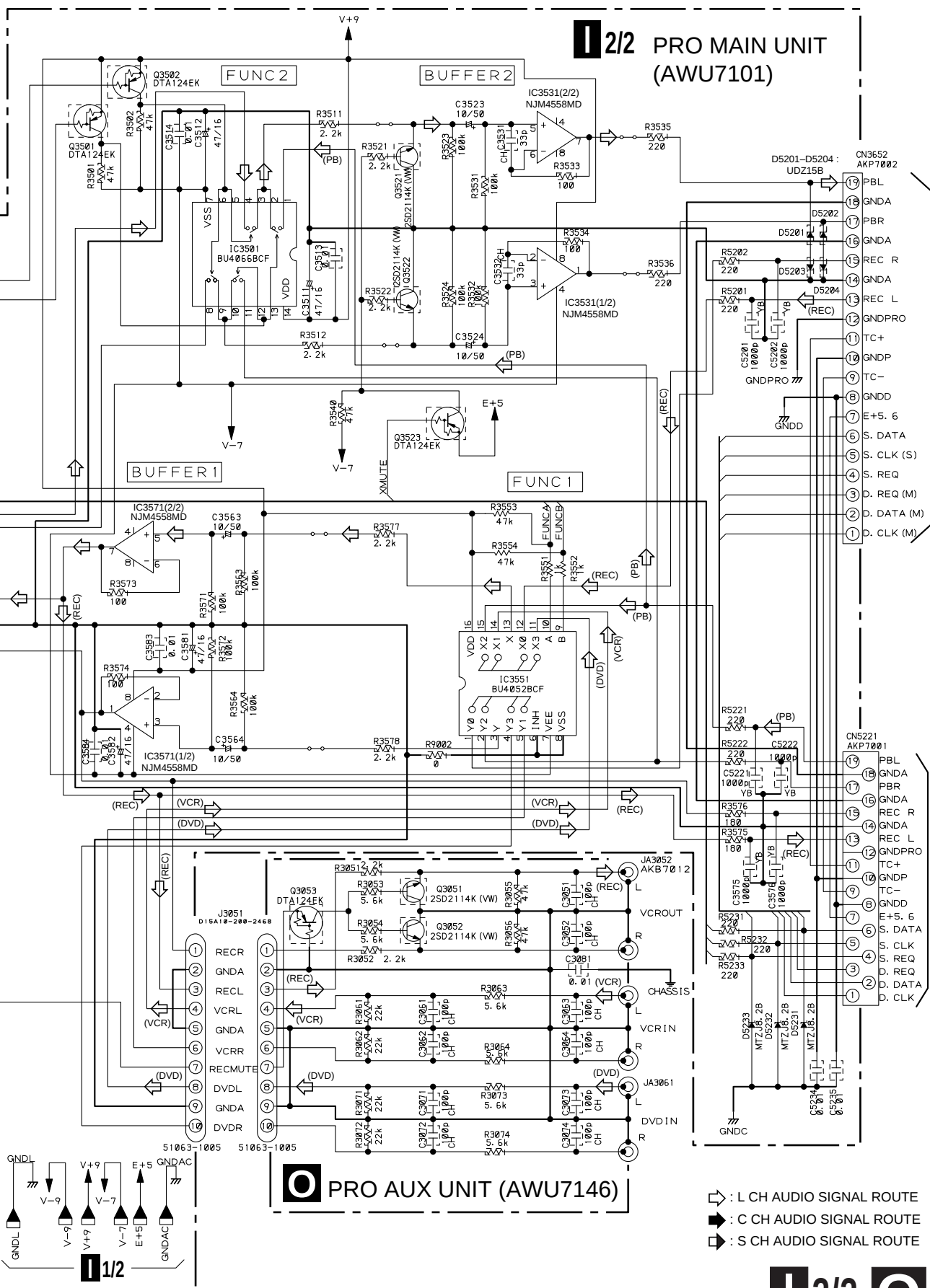
PRO TRANS UNIT
(AWU7103)

C



D





A

B

C

D

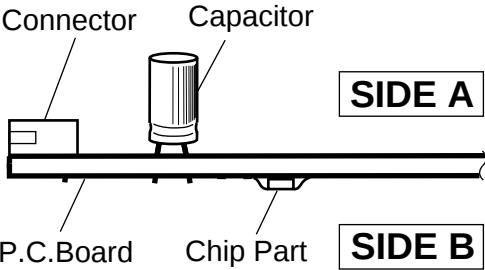
4. PCB CONNECTION DIAGRAM

NOTE FOR PCB DIAGRAMS :

- 1. Part numbers in PCB diagrams match those in the schematic diagrams.
- 2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol In PCB Diagrams	Symbol In Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

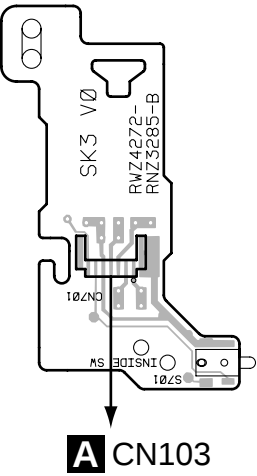
- 3. The parts mounted on this PCB include all necessary parts for several destinations.
For further information for respective destinations, be sure to check with the schematic diagram.
- 4. View point of PCB diagrams.



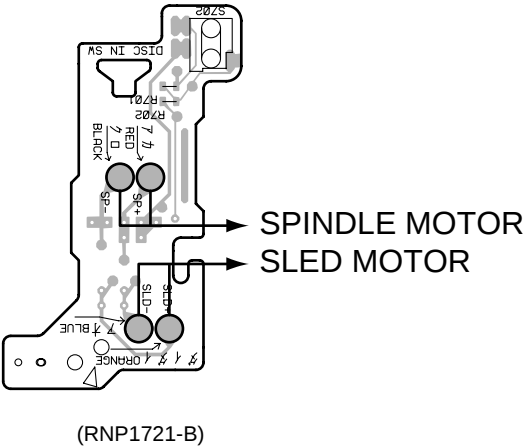
4.1 MINIDISC RECORDER (MJ-L5)

4.1.1 MD CORE SW UNIT

B MD CORE SW UNIT



SIDE A



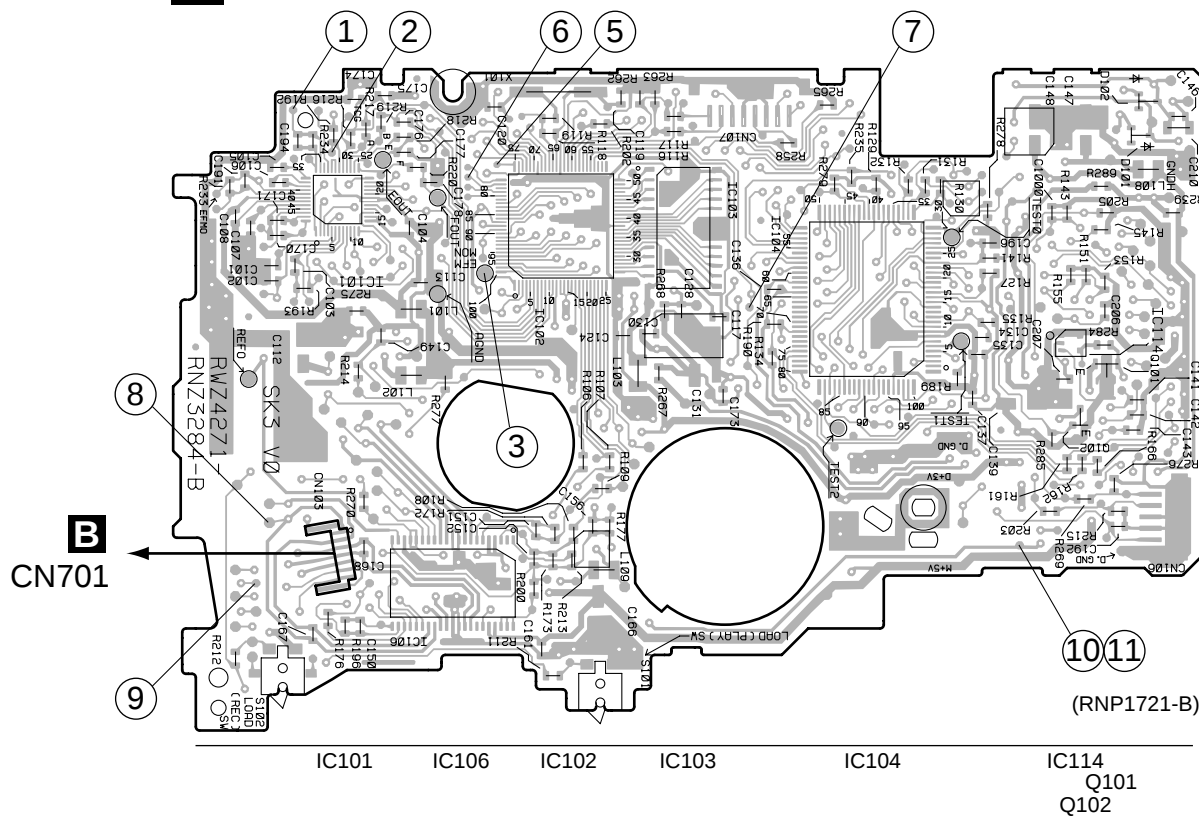
SIDE B

4.1.2 MD CORE MAIN UNIT

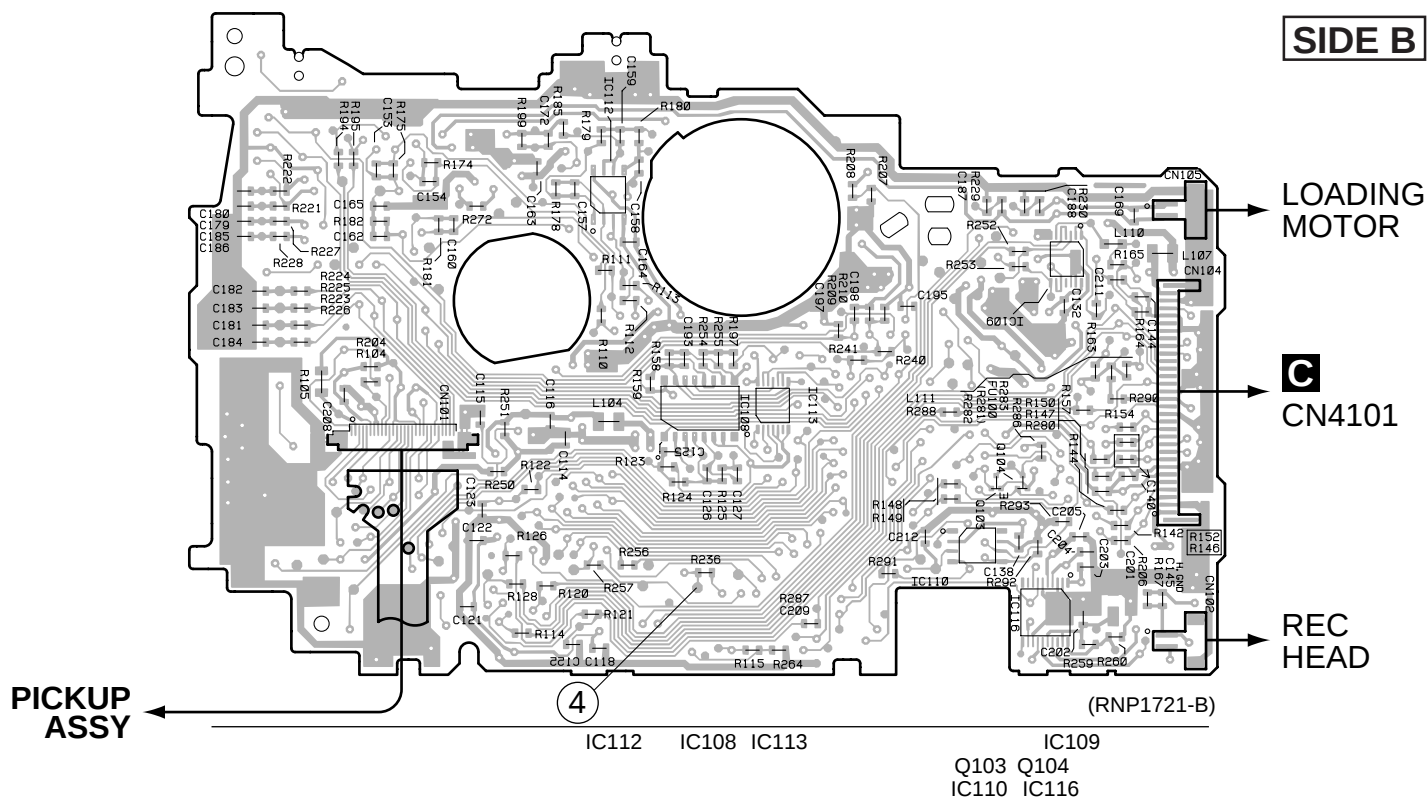
A MD CORE MAIN UNIT

● ① – ⑪ are waveform numbers on pages 24 and 25.

SIDE A



SIDE B



4.1.3 MD MAIN UNIT

A

STEREO
CD RECEIVER
(XC-L5)
or
SURROUND
PROCESSOR
(SP-L5)

DECK
(CT-L5)

B

IC4183

C

IC4022
IC4025
IC4080
IC4024
Q4014
Q4012
IC4051
Q4020
IC4013
IC4014
Q4018

D

A
CN104

G
J4901

D
CN4011

C MD MAIN UNIT

SIDE A

(ANP7249-B)

Q4015
Q4017

Q4101
Q4104
Q4102
IC4101
Q4108
Q4103

Q4243
Q4022
IC4250

IC4171
Q4151
Q4260
Q4262

IC4240
Q4242
Q4241

IC4301

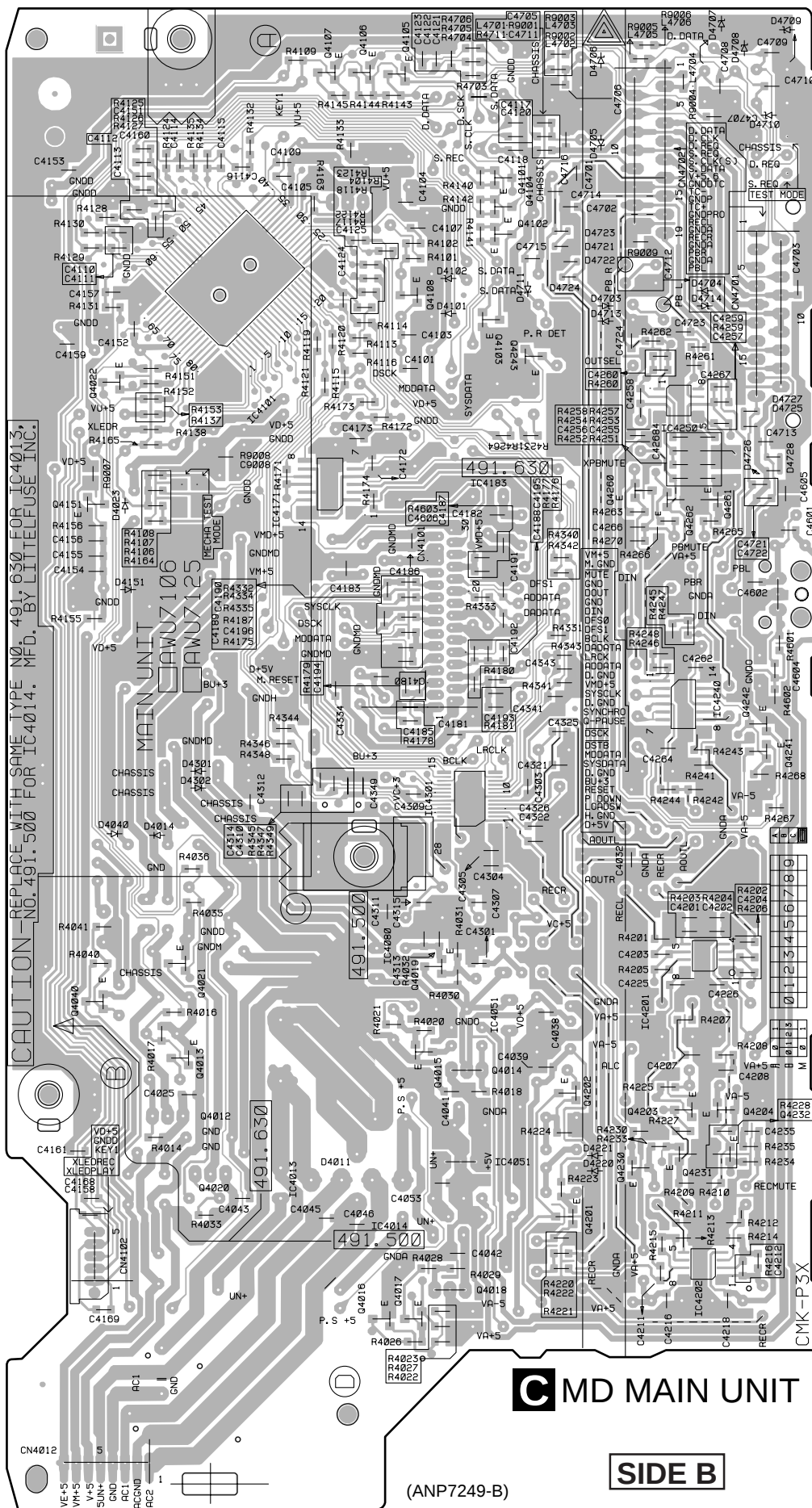
Q4021
Q4019
Q4040

Q4015
Q4013

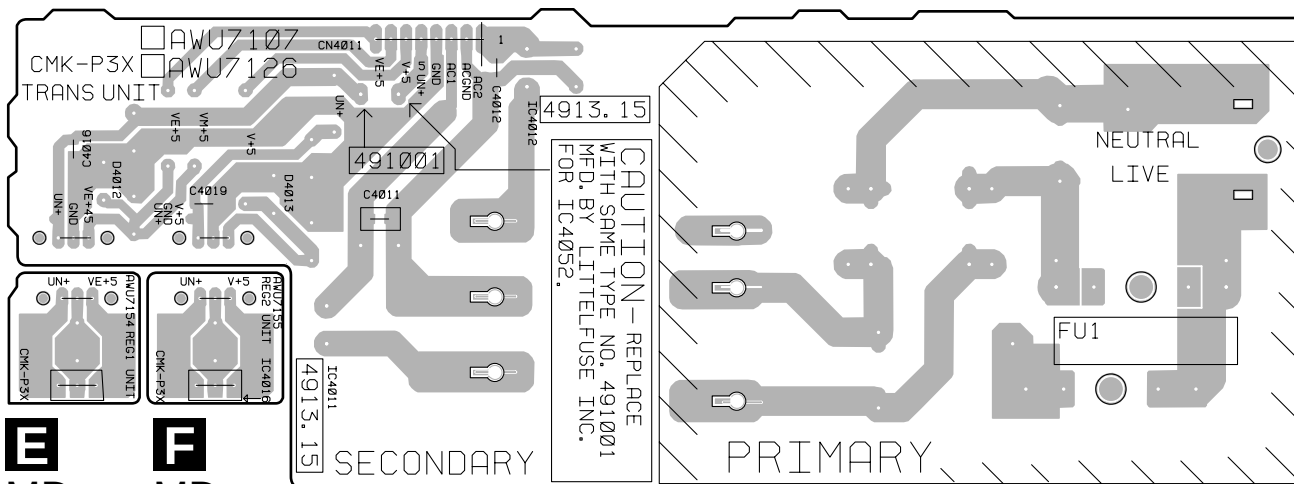
Q4202
Q4204
Q4230
Q4232

Q4201
IC4202

Q4016
Q4017



D MD TRANS UNIT

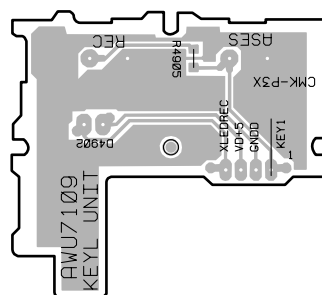


E MD REG1 UNIT

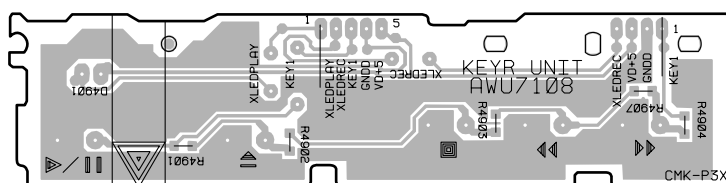
F MD REG2 UNIT

(ANP7249-B)

H MD KEYL UNIT



G MD KEYR UNIT



SIDE B

4.2.1 PRO MAIN, PRO AMP and PRO AUX UNITS

PRO MAIN UNIT



MINIDISC RECORDER (MJ-L5)
or
DECK (CT-L5)

SIDE A

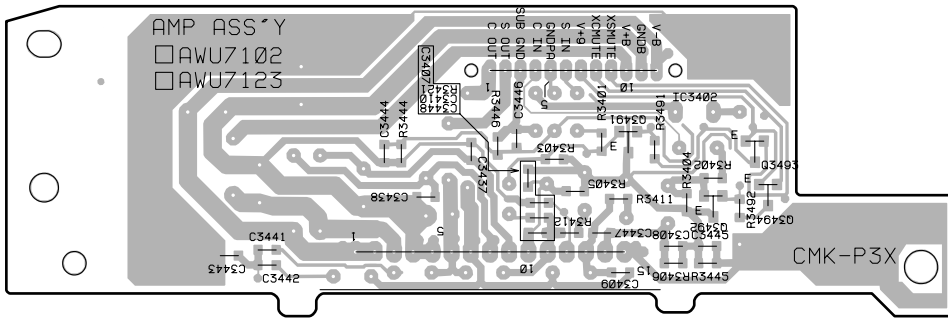
A



C

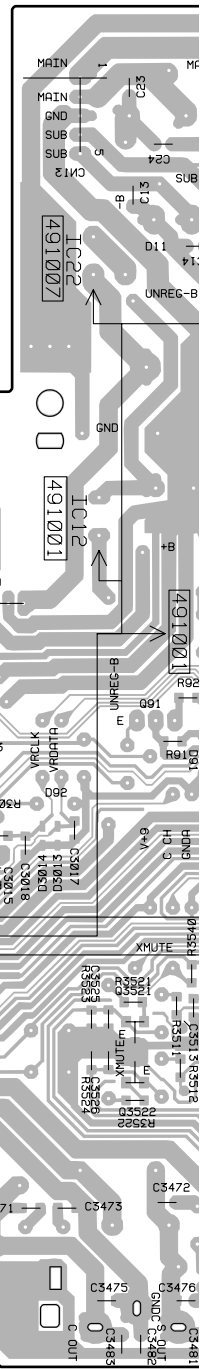
D

K PRO AMP UNIT



Q3491-Q3494

I PRO M



(ANP7248-B)

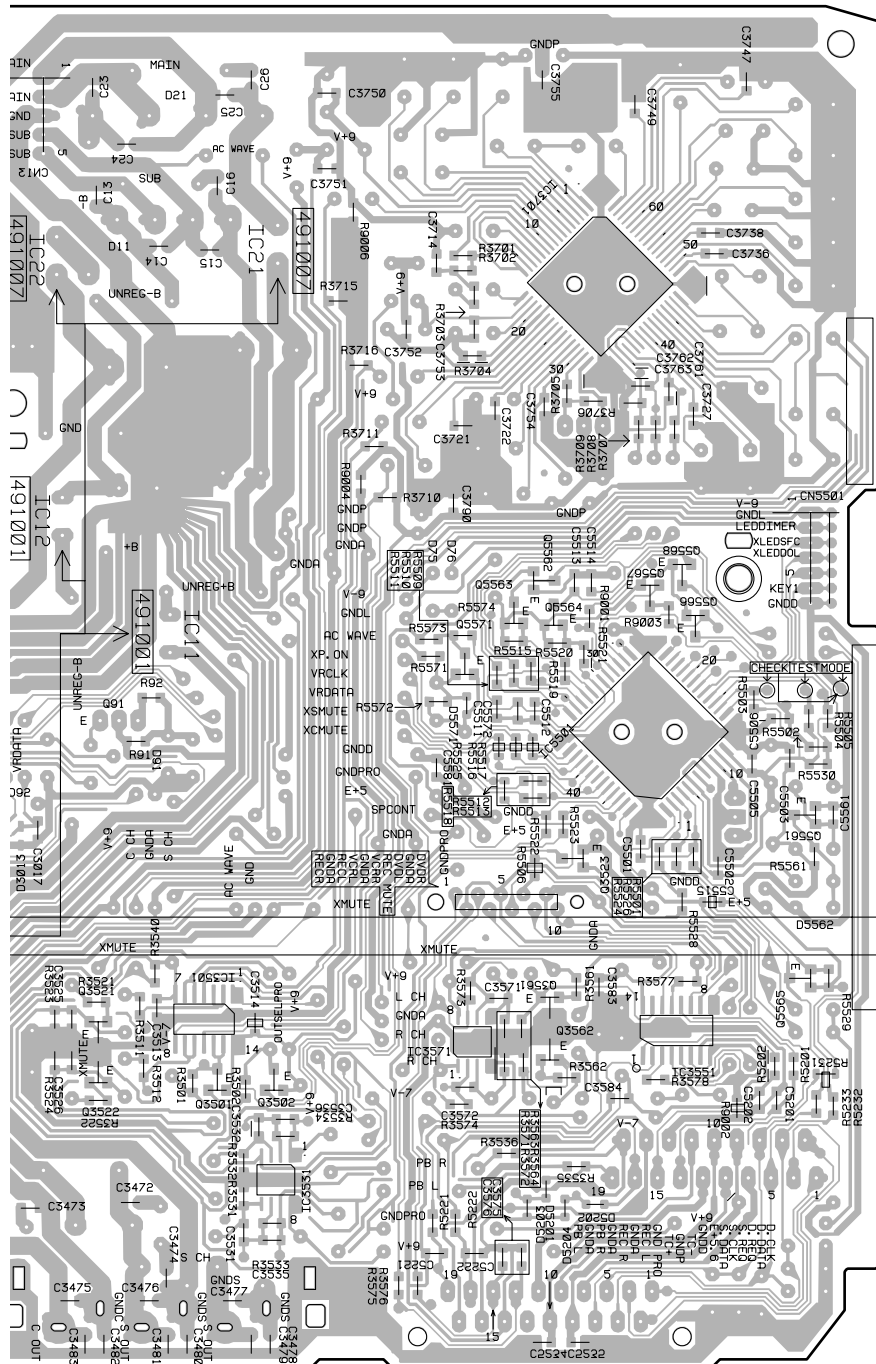
CMK-P3X
MAIN ASS'Y
AWU7101
AWU7122

CAUTION-
REPLACE WITH SAME TYPE NO.
491001 FOR IC11 AND IC12,
NO. 491007 FOR IC21 AND IC22
MFD. BY LITTELFUSE INC.

Q53-Q56
Q3611-Q3613
Q3601-Q3603
Q3621
Q3651-Q3653
IC3201
IC3001
Q3521
Q3522

SIDE B

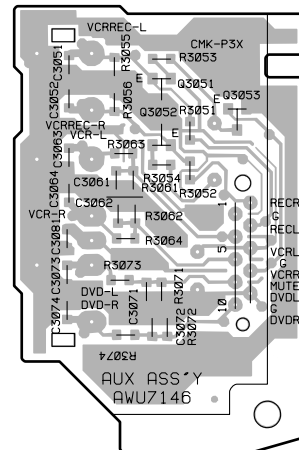
PRO MAIN UNIT



Q3521 IC3501 IC3571 Q3561 IC3551 Q5561
 Q3522 Q3501 Q3502 Q3562 Q5562 Q5563
 IC3531 Q3563 Q3564 Q3565 Q3566 Q3567 Q3568 Q3569 Q3570 Q3571 Q3572 Q3573 Q3574 Q3575 Q3576 Q3577 Q3578 Q3579 Q3580 Q3581 Q3582 Q3583 Q3584 Q3585 Q3586 Q3587 Q3588 Q3589 Q3590 Q3591 Q3592 Q3593 Q3594 Q3595 Q3596 Q3597 Q3598 Q3599 Q3600

SIDE B

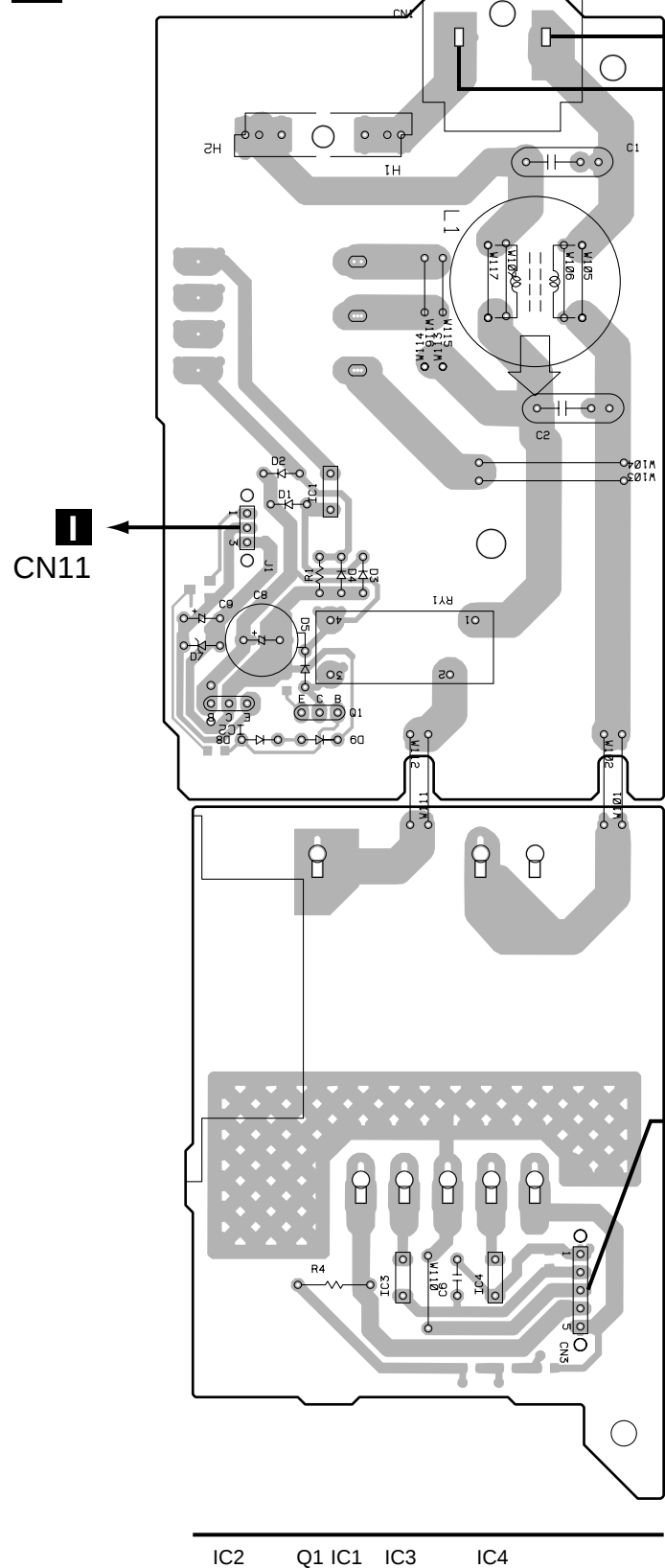
PRO AUX UNIT



Q3051-Q3053

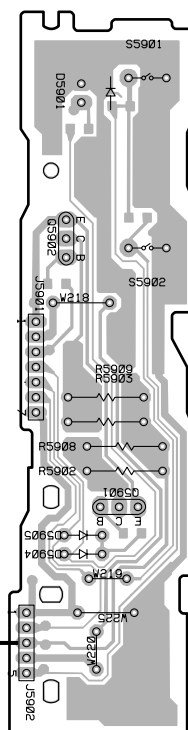
4.2.2 PRO TRANS, PRO KEYR, PRO IND and PRO KEYL UNITS

J PRO TRANS UNIT



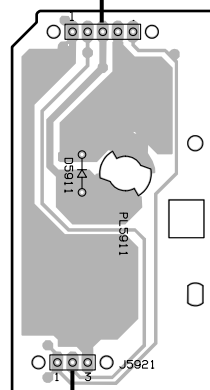
L PRO KEYR UNIT

(ANP7248-B)

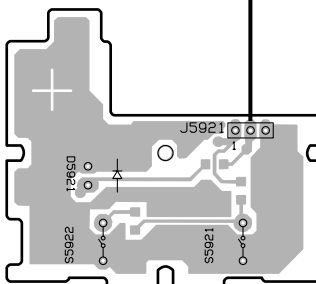


M PRO IND UNIT

CN13

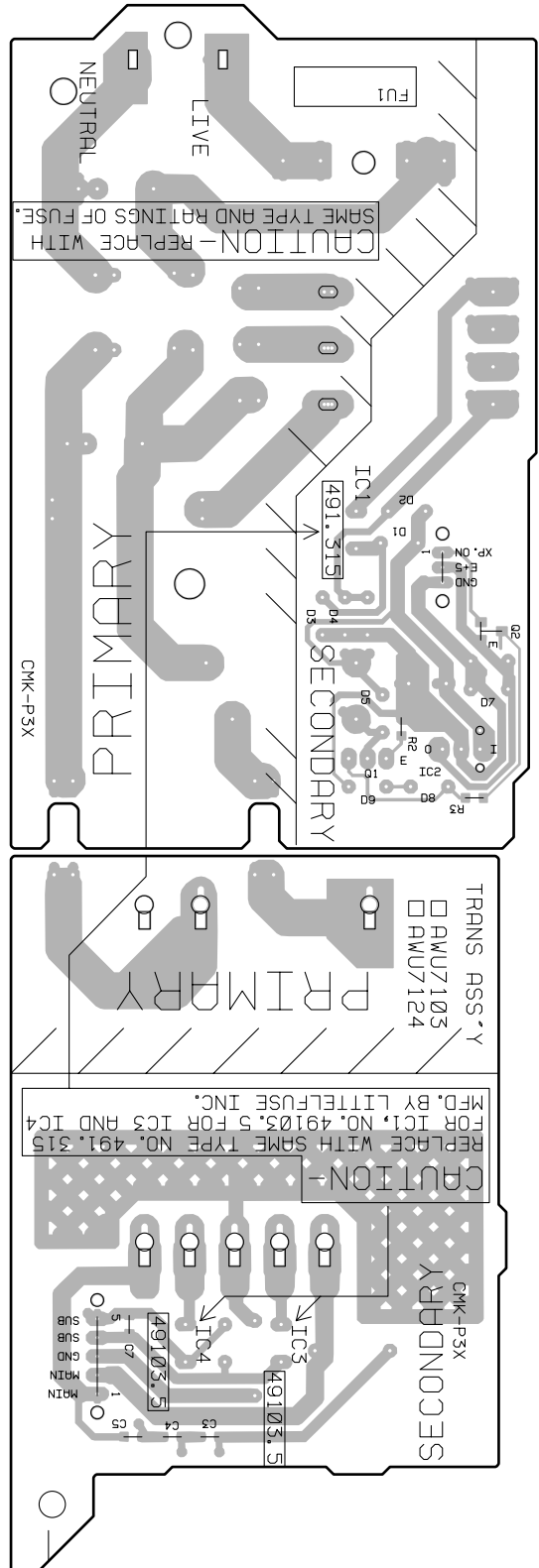


N PRO KEYL UNIT

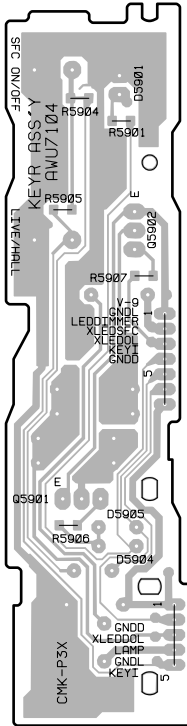


SIDE A

J PRO TRANS UNIT

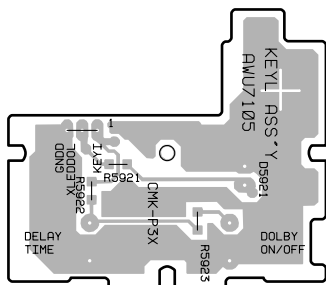
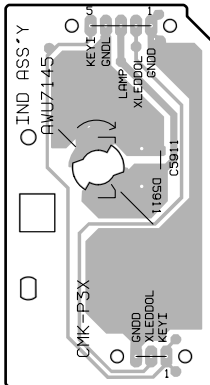


L PRO KEYR UNIT



(ANP7248-B)

M PRO IND UNIT



N PRO KEYL UNIT

SIDE B

5. PCB PARTS LIST

NOTES: ●Parts marked by "NSP" are generally unavailable because they are not in our Master Spare Parts List.
●The Δ mark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.
●When ordering resistors, first convert resistance values into code form as shown in the following examples.
Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).
560 Ω → 56 × 10¹ → 561 RD1/4PU 5 6 1 J
47k Ω → 47 × 10³ → 473 RD1/4PU 4 7 3 J
0.5 Ω → R50 RN2H R 5 0 K
1 Ω → 1R0 RS1P 1 R 0 K
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62k Ω → 562 × 10¹ → 5621 RN1/4PC 5 6 2 1 F

Mark No. Description Part No.
5.1 MINIDISC RECORDER (MJ-L5)

LIST OF ASSEMBLIES

MD CORE UNIT	RWM2055
└ MD CORE MAIN UNIT	RWZ4326
└ MD CORE SW UNIT	RWZ4272
MDCOMP ASSY	AWM7379
└ MD MAIN UNIT	AWU7106
└ MD TRANS UNIT	AWU7107
└ MD KEYR UNIT	AWU7108
└ MD KEYL UNIT	AWU7109
└ MD REG1 UNIT	AWU7154
└ MD REG2 UNIT	AWU7155

A MD CORE MAIN UNIT

SEMICONDUCTORS

IC112	BA4510F
IC116	BD7910FV
IC110	BR93LC56F
IC101	IR3R55M
IC102	LR376481
IC106	M56758FP
IC103	M5M4V4400CTP-7
IC104	PD5450B
Δ IC114	RN5RG32AA
IC113	TC74ACT08FT
IC109	TC74VHC08FT
IC108	TC9246F
Q102	2SA1036K
Q101	2SB1188
Q103,Q104	DTC124EU
D101,D102	SB02-09CP

COILS

L101,L103,L104,L107 (4.7μH)	DTL1024
L110	QTL1015
L108 (47μH)	RTL1003
L102 (0.47μH)	RTL1007

SWITCHES

S101,S102	RSF1012
-----------	---------

Mark No. Description Part No.
CAPACITORS

C115	CCSQCH101J50
C119,C120	CCSQCH120J50
C146	CCSQCH121J50
C125	CCSQCH150J50
C141-C144,C155	CCSQCH220J50
C174-C178	CCSQCH271J50
C194	CCSQCH331J50
C139	CEV101M4
C131,C166	CEV101M6R3
C147,C148,C201	CEV470M6R3
C112	CEV4R7M35
C193	CKSQYB102K50
C126,C1000	CKSQYB103K50
C153,C154	CKSQYB153K50
C158	CKSQYB222K50
C196-C198	CKSQYB223K50
C103,C145	CKSQYB273K50
C171	CKSQYB332K50
C149,C170	CKSQYB333K50
C106,C159	CKSQYB472K50
C127	CKSQYB474K16
C156,C157	CKSQYB562K50
C151,C152,C160,C162	CKSQYB821K50
C130,C132,C134,C137,C138	CKSQYF104Z25
C161,C163,C164,C173,C195	CKSQYF104Z25
C202-C205	CKSQYF104Z25
C101,C102,C104,C108	CKSQYF105Z16
C113,C114,C116-C118	CKSQYF105Z16
C121,C122,C124,C128	CKSQYF105Z16
C135,C136,C140,C165,C169	CKSQYF105Z16
C207,C208	CKSQYF105Z16
C123	CKSQYF473Z25
C105,C107	CKSQYF474Z16

RESISTORS

R105	RS1/8S270J
Other Resistors	RS1/10S□□□J

OTHERS

CN104	30P CONNECTOR	RKN1039
X101	(33.8688MHz)	RSS1055
CN105	ZR CONNECTOR	S2B-ZR-SM3A
CN102	2P CONNECTOR	S2B-ZR-SM3A-R
CN101	CONNECTOR	SFV28R-1ST
CN103	CONNECTOR	SFW7R-2ST

Mark	No.	Description	Part No.
B	MD CORE SW UNIT		
	SWITCHES		
	S701		RSF1009
	S702		RSF1010
	RESISTORS		
	All Resistors		RS1/10S□□□J
	OTHERS		
	CN701	CONNECTOR	SFW7R-1ST

C MD MAIN UNIT SEMICONDUCTORS

△	IC4014	AEK7005
△	IC4013	AEK7006
	IC4301	AK4520A
△	IC4051	BA17805T
	IC4240	BU4066BCF
	IC4201, IC4202, IC4250	NJM4558MD
	IC4101	PDG225A
	IC4171	TC74HCT08AF
	Q4017	2PB709A
	Q4013, Q4015, Q4016, Q4019, Q4021	2PD601A
	Q4040, Q4151, Q4201-Q4204	2PD601A
	Q4012, Q4014, Q4020	2SB1237X
	Q4018	2SD1858X
	Q4231, Q4232, Q4261, Q4262	2SD2114K
	Q4022, Q4230, Q4242, Q4260	DTA124EK
	Q4103	DTC114EK
	Q4101, Q4102, Q4104-Q4107	DTC114TK
	Q4241, Q4243	DTC124EK
	Q4108	DTC143EK
△	D4014	1SR139-400
	D4040, D4101, D4151, D4220, D4221	1SS254
△	D4011	D2SBA20(B)
	D4703-D4711, D4713, D4714	MTZJ8.2B

COILS

L4301, L4302, L4601	LAU100J
L4101, L4171	LAU220J

CAPACITORS

△	C4023	ACH1246
	C4013 (0.018F/25V)	ACH7099
	C4157, C4201, C4202, C4211, C4212	CCSQCH101J50
	C4314, C4709, C4710	CCSQCH101J50
	C4203, C4204	CCSQCH220J50
	C4112, C4117, C4118, C4120-C4123	CCSQCH221J50
	C4207, C4208	CCSQCH470J50
	C4054	CEAL1R0M50
	C4022, C4027-C4029, C4034, C4035	CEAT100M50
	C4052, C4102, C4205, C4206	CEAT100M50
	C4209, C4210, C4213, C4214	CEAT100M50
	C4220, C4221, C4241, C4242	CEAT100M50
	C4251-C4254	CEAT100M50
	C4106, C4215, C4217, C4261, C4263	CEAT101M10
	C4302, C4306, C4308, C4603	CEAT101M10

Mark	No.	Description	Part No.
	C4014		CEAT221M25
	C4222		CEAT330M25
	C4026, C4030, C4031, C4036, C4061		CEAT470M16
	C4171		CEAT470M16
	C4323, C4324		CEAT47R7M50
	C4110, C4114, C4255, C4256		CKSQYB102K50
	C4701, C4702		CKSQYB102K50
	C4325, C4326		CKSQYB104K25
	C4115, C4321, C4322		CKSQYB222K50
	C4604		CKSQYB332K50
	C4053, C4103, C4107, C4109, C4111		CKSQYF103Z50
	C4116, C4158, C4161, C4168, C4169		CKSQYF103Z50
	C4172, C4173, C4185, C4193		CKSQYF103Z50
	C4266-C4268, C4301, C4303, C4304		CKSQYF103Z50
	C4307, C4309, C4313, C4341, C4343		CKSQYF103Z50
	C4349, C4601, C4602		CKSQYF103Z50
	C4153, C4310, C4311		CKSQYF104Z25
	C4605		CKSQYF104Z50
	C4104, C4105, C4216, C4218, C4262		CKSQYF473Z50
	C4264, C4703, C4713, C4714, C9008		CKSQYF473Z50
	C4154, C4155		CKSQYF474Z16

RESISTORS

R4226	RD1/4PU102J
R4015, R4019, R4034	RD1/4PU151J
R4701, R4702	RD1/4PU221J
R4042	RD1/4PU470J
R4157	RD1/4PU473J
Other Resistors	RS1/10S□□□J

OTHERS

X4101	CERAMIC RESONATOR	ASS7016
4701	19P SOCKET	AKP7001
CN4702	19P CONNECTOR	AKP7002
JA4601	OPTICAL RECEIVER	GP1F32R
CN4012	8P PLUG	KM200TA8
CN4101	30P FFC CONNECTOR	VKN1206
KN4011, KN4101, KN4301	EARTH METAL FITTING	VNF1084

D MD TRANS UNIT SEMICONDUCTORS

△	IC4052 (1A)	AEK7009
	D4012, D4013	MTZJ8.2B

COIL

△	L4001	LINE FILTER	VTL-262
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CAPACITORS

△	C4001, C4002 (10000pF/AC250V)	ACG7020
	C4015, C4018	CEAT100M50
	C4017, C4020	CEAT331M10
	C4011, C4012, C4016, C4019	CKSQYF103Z50
	C4047, C4048	CQMBA473J50

OTHERS

	3P CABLE HOLDER	51048-0300
	H4001, H4002 FUSE CLIP	AKR1003
△	AN4001 1P AC INLET	BKP1046
	J4011, J4012 JUMPER WIRE 3P	D20PDD0305G
	CN4011 8P SOCKET	KP200TA8L

MJ-L5, SP-L5

Mark	No.	Description	Part No.
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E MD REG1 UNIT

SEMICONDUCTOR

△	IC4015	BA17805T
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OTHERS

3P CABLE HOLDER	51048-0300
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F MD REG2 UNIT

SEMICONDUCTOR

△	IC4016	BA17805T
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OTHERS

3P CABLE HOLDER	51048-0300
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G MD KEYR UNIT

SEMICONDUCTOR

D4901	SLP3118C51H
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SWITCHES

S4901-S4905	RSG1031
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RESISTORS

All Resistors	RS1/10S□□□J
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OTHERS

J4103	JUMPER WIRE 4P	D20PWW0420E
J4901	JUMPER WIRE 5P	D20PWY0520E

H MD KEYL UNIT

SEMICONDUCTOR

D4902	SLP9118C51H
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SWITCHES

S4906,S4907	RSG1030
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RESISTORS

All Resistors	RS1/10S□□□J
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Mark	No.	Description	Part No.
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5.2 SURROUND PROCESSOR (SP-L5)

LIST OF ASSEMBLIES

NSP	PROCOMP ASSY	AWM7378
	└ PRO MAIN UNIT	AWU7101
	└ PRO AMP UNIT	AWU7102
	└ PRO TRANS UNIT	AWU7103
	└ PRO KEYR UNIT	AWU7104
	└ PRO KEYL UNIT	AWU7105
	└ PRO IND UNIT	AWU7145
	└ PRO AUX UNIT	AWU7146

I PRO MAIN UNIT

SEMICONDUCTORS

△	IC11,IC12	AEK7009
△	IC21,IC22	AEK7021
	IC3551	BU4052BCF
	IC3501	BU4066BCF
	IC3701	LV1035M
	IC3001	M62429FP
	IC3201,IC3531,IC3571	NJM4558MD
	IC5501	PDC046A
	Q3611,Q3612,Q54,Q55	2PB709A
	Q3601,Q3602,Q3613,Q53,Q5571	2PD601A
	Q56	2PD601A
△	Q81	2SB1237X
△	Q52	2SB1566
	Q91	2SD1858X
	Q3521,Q3522,Q3603	2SD2114K
△	Q71	2SD2395
	Q3501,Q3502,Q3523,Q5566-Q5568	DTA124EK
	Q5563-Q5565	DTC114TK
	Q5562	DTC124EK
	Q5561	DTC143EK
	D3601,D3611,D3612,D51,D5561	1SS254
	D5571	1SS355
△	D11	D2SBA20(B)
△	D21	D3SBA20(B)
△	D73,D74	MTZJ12B
	D91	MTZJ6.2B
	D81	MTZJ7.5B
	D5231-D5233	MTZJ8.2B
	D75	S5688G
	D5201-D5204	UDZ15B

COILS

L3461,L3462	AF CHOKE COIL	ATH-059
L3702,L5501		LAU100J

RELAY

RY3601	ASR7017
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CAPACITORS

C3203,C3204	CCSQCH100D50
C5572	CCSQCH101J50
C3761-C3763,C5501,C5513-C5515	CCSQCH221J50
C3531,C3532	CCSQCH330J50
C3205,C3206	CCSQCH471J50

Mark	No.	Description	Part No.
	C3727		CCSQL681J50
	C3741,C3744		CEANL3R3M50
	C3737,C3739,C3746,C3748		CEANL4R7M25
	C3523,C3524,C3563,C3564,C3611		CEAT100M50
	C3703-C3706,C3709,C3715		CEAT100M50
	C3718-C3720,C3732,C3733,C52		CEAT100M50
	C5562		CEAT100M50
	C3013,C5504		CEAT101M10
	C5571		CEAT1R0M50
	C3201,C3202		CEAT220M50
	C3708,C3716		CEAT221M16
	C3601,C3707,C3713,C3726		CEAT221M6R3
	C11,C12		CEAT222M25
	C21,C22		CEAT222M35
	C3717		CEAT2R2M50
	C3211,C3212,C3511,C3512		CEAT470M16
	C3581,C3582,C3731,C73,C74		CEAT470M16
	C82,C83,C91		CEAT470M16
	C3740,C3742,C3743,C3745		CFTLA154J50
	C3730		CFTLA474J50
	C3475-C3478,C3481,C3483		CKSQYB102K50
	C3575,C3576,C5201,C5202		CKSQYB102K50
	C5221,C5222		CKSQYB102K50
	C51,C71,C81		CKSQYB103K50
	C3714		CKSQYB182K50
	C3721		CKSQYB334K16
	C3722,C3736,C3738,C3747,C3749		CKSQYB474K16
	C3015,C3213,C3214,C3479,C3480		CKSQYF103Z50
	C3482,C3513,C3514,C3583,C3584		CKSQYF103Z50
	C3750,C3752-C3754,C5234,C5235		CKSQYF103Z50
	C5502,C5503,C5505,C5506,C5561		CKSQYF103Z50
	C5581		CKSQYF103Z50
	C3471-C3474,C3755		CKSQYF473Z50
	C3701,C3702,C3734,C3735		CQMBA104J50
	C3729		CQMBA223J50
	C3724		CQMBA332J50
	C3728		CQMBA473J50
	C3723,C3725		CQMBA823J50

RESISTORS

△	R3617,R3618 (0.1Ω/1W)	ACN7032
△	R3461,R3462	RD1/4LMF101J
	R3551,R3552,R5562	RD1/4PU102J
	R51	RD1/4PU221J
	R72	RD1/4PU471J
	R3553,R3554	RD1/4PU473J
	R3471,R3472	RD1/4PU6R8J
	R3704	RN1/10SE3902D
	Other Resistors	RS1/10S□□□J

OTHERS

X3701	CERAMIC RESONATOR	DSS1053
X5501	CERAMIC RESONATOR	VSS1045
	CABLE HOLDER (10P)	51063-1005
CN3001	12P JUMPER CONNECTOR	52147-1210
CN11	3P JUMPER CONNECTOR	52151-0310
CN5501	7P JUMPER CONNECTOR	52151-0710
CN3461	SPEAKER TERMINAL 6-P	AKE7042
5221	SOCKET (19P)	AKP7001
CN3652	CONNECTOR (19P)	AKP7002
CN13	L-CONNECTOR (5P)	KPD5L
KN11	EARTH METAL FITTING	VNF1084

Mark	No.	Description	Part No.
J PRO TRANS UNIT			
SEMICONDUCTORS			
△	IC1		AEK7003
△	IC3,IC4		AEK7017
△	IC2		BA17805T
	Q1		2SC2458
	Q2		DTA124EK
	D5,D8,D9		1SS254
△	D1-D4		S5688G
COIL			
△	L1 LINE FILTER		ATF-151
TRANSFORMER			
△	T2		ATT7027
RELAY			
△	RY1		ASR7019
CAPACITORS			
△	C1,C2 (0.01μF/AC250V)		ACG7010
	C9		CEAT100M50
	C8		CEAT102M16
	C6		CKCYF473Z50
RESISTORS			
	R1		RD1/4PU224J
	Other Resistors		RS1/10S□□□J
OTHERS			
		CABLE HOLDER (3P)	51048-0300
	J3	CABLE HOLDER (5P)	51052-0500
	H1,H2	FUSE CLIP	AKR1003
△	AN1	AC INLET 1P	BKP1046
	J1	JUMPER WIRE	D20PDY0315G

K PRO AMP UNIT**SEMICONDUCTORS**

△	IC3401	STK407-040B
	Q3491,Q3492	2SD2114K
	Q3493,Q3494	DTA124EK

CAPACITORS

C3409,C3410,C3447,C3448	CCSQCH100D50
C3407,C3408	CCSQCH330J50
C3401,C3402,C3405,C3406	CEAT100M50
C3435,C3436	CEAT100M50
C3411,C3412	CEAT101M10
C3433,C3434	CEAT101M35
C3444	CKSQYB102K50
C3441-C3443	CKSQYB473K50
C3437,C3438	CKSQYF103Z50

RESISTORS

R3441,R3442	RD1/4PU100J
R3409,R3410	RD1/4PU563J
R3431,R3432	RFA1/4PS101J
Other Resistors	RS1/10S□□□J

MJ-L5, SP-L5

Mark	No.	Description	Part No.
OTHERS			
	3401	12P CABLE HOLDER	51048-1200
	J3401	JUMPER WIRE 12P	D20PDY1230G

L PRO KEYR UNIT

SEMICONDUCTORS

Q5901,Q5902	2SD1858X
D5904,D5905	1SS254
D5901	SLP3118C51H

SWITCHES

S5901,S5902	RSG1031
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RESISTORS

R5902,R5909	RD1/2PM121J
R5903,R5908	RD1/2PM151J
Other Resistors	RS1/10S□□□J

OTHERS

J5902	JUMPER WIRE 5P	D20PWY0515E
J5901	JUMPER WIRE 7P	D20PWY0740E

M PRO IND UNIT

SEMICONDUCTOR

D5911	1SS254
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OTHERS

5912	3P CABLE HOLDER	51048-0300
5911	5P CABLE HOLDER	51048-0500
J5921	JUMPER WIRE 3P	D20PWY0315E
PL5911	LAMP	VEL1022

N PRO KEYL UNIT

SEMICONDUCTOR

D5921	SLP3118C51H
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SWITCHES

S5921,S5922	RSG1030
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RESISTORS

All Resistors	RS1/10S□□□J
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O PRO AUX UNIT

SEMICONDUCTORS

Q3051,Q3052	2SD2114K
Q3053	DTA124EK

CAPACITORS

C3051,C3052,C3061-C3064	CCSQCH101J50
C3071-C3074	CCSQCH101J50
C3081	CKSQYF103Z50

Mark	No.	Description	Part No.
RESISTORS			
		All Resistors	RS1/10S□□□J

OTHERS

3051	10P CABLE HOLDER	51063-1005
3052	6P PIN JACK	AKB7012
J3051	JUMPER WIRE	D15A10-200-2468

6. ADJUSTMENT

6.1 MINIDISC RECORDER (MJ-L5)

■ JIGS AND MEASURING INSTRUMENTS

- | | |
|-----------------------|---|
| ● Thermometer | ● Test Disc |
| ● Oscilloscope | For servo system adjustment GGF1328 (MMD-212) |
| ● Optical Power Meter | For recording/playback inspection GGF1328 (MMD-212), GGF1277, |
| ● Jitter Meter | TGYS1 (or MMD-110), Commercial discs |

6.1.1 NECESSARY ADJUSTMENT POINTS

When		Adjustment points
Exchange PICKUP	➡	③, ④ → Pages 53 and 54
Exchange Servo Base Assy (SPINDLE MOTOR)	➡	③, ④ → Pages 53 and 54
Exchange MD CORE MAIN UNIT	➡	④ → Pages 53 and 54
Exchange MD HEAD	➡	_____
Exchange Loading Mechanism Assy	➡	_____
Exchange Servo Mechanism Assy	➡	③, ④ → Pages 53 and 54
Exchange MD Mechanism Assy (Loading Mechanism Assy + Servo Mechanism Assy)	➡	③, ④ → Pages 53 and 54

6.1.2 TEST MODE

(1) Test Mode Condition

The MJ-L5 can use the adjustment modes in the following three combinations.

- ① XC-L7 (CD receiver + Display unit) + MJ-L5 (MD)
- ② XC-L5 (CD receiver) + MJ-L5 (MD) + System remote control unit (CU-XC004, CU-XC005, or CU-SP005)
- ③ XC-L5 (CD receiver) + MJ-L5 (MD) + Service remote control unit (GGF1067)

SET and CANCEL keys (for remote control unit) used in the item of "6.1.3 MD Mechanism Assy Adjustment and Check" are performed in the combination ②.

In case of ① : Both SET and CANCEL key operate with the remote control unit or the DISPLAY unit.

In case of ③ : SET and CANCEL keys on the remote control unit are replaced with SEARCH and CLEAR keys of the service remote control unit.

Note:

Although the MJ-L5 and XC-L7 can be directly connected, unrelated characters may be displayed in the rightmost two digits as they differ in the number of digits for display. And they also differ in the power source, no playback sound is obtained from the receiver.

However, you can check the waveform at the pin 17 (PBR) and pin19 (PBL) of the system cable.

The service remote control cannot be used for the XC-L7.

(2) How to Start / Cancel Test Mode (Mechanism Assy Adjustment Mode)

TEST MODE : ON

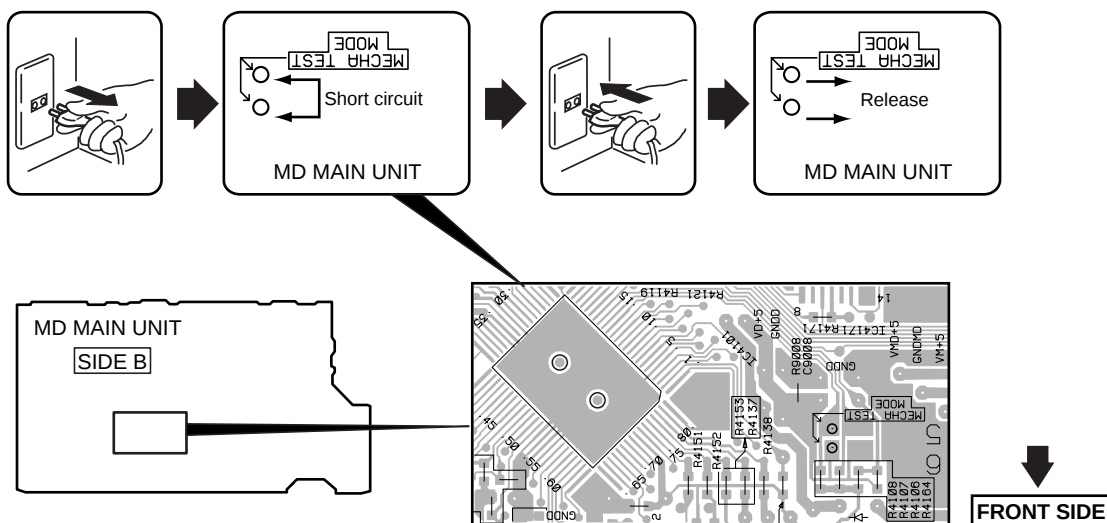
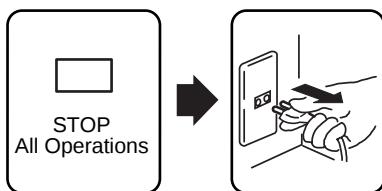


Fig.1

TEST MODE : STOP → CANCEL



(3) Independent operation mode (Aging mode)

- ① Short-circuit the jumper wires W205 and W4106 on the MD MAIN UNIT.
- ② Independent operation mode (Aging mode) can be initiated by short-circuiting the S. REQ connector (pin 4) of the system bus (MD MAIN UNIT : CN4702) with the GND connector (pin 14) for 3 seconds after AC power is applied.

In this mode, set the playback mode to All Repeat for aging. By setting the unit in All Repeat mode, the playback state can be maintained for a long period of time.

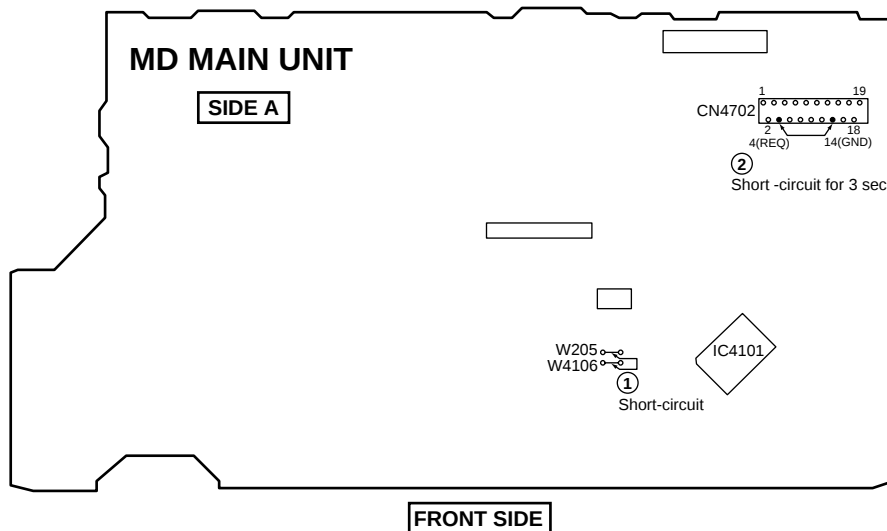


Fig.2

• Key operations in Independent operation mode (Keys on the main unit are used.)

[ASES]	Switches recording inputs (Digital/Analog)
[REC]	Executes recording.
[PLAY]	Executes playback.
[STOP]	Stops recording/playback.
[EJECT]	Ejects the disc.
[▶▶]	Advances the track or CUE.
[◀◀]	Reverses the track or REV.

Note: For aging, set the playback mode to All Repeat in Independent operation mode.

• Recording input switching

By pressing the ASES key in Recording pause mode, you can switch the recording inputs.

Each time you press the key, digital and analog are selected in turn.

The REC LED steadily lights when digital is selected, and it flashes when analog is selected. The flashing cycle is slower than that of the PLAY LED in Pause mode.

Note: If digital data cannot be locked when digital is selected, the REC LED flashes in the same cycle as that of the PLAY LED.

Note: The adjustment mode for the mechanism unit cannot be initiated from the Independent operation mode.

6.1.3 MD Mechanism Assy Adjustment and Check

① Temperature Check (Please perform this check soon after the power has been switched on.)

Note: When IC101 (RF-AMP) or IC104 (mechanical controller) has been exchanged or when a correction changing VD+3 has been made, be sure to correctly perform all steps up to step 7.

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks												
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode													
2	Press the REC key.	TEMP ○○□□	The microcomputer starts measuring.	○○: Measuring value												
3	When □□ is 80 or more at this time, the adjustment is OK (step 4 and following can be omitted).		End	□□: Set value												
When □□ is 80 (not passed)		TEMP ○○ 8 0	80 is the default value (unadjusted).													
4	Measure the ambient temperature T (°C) and check hat the measuring value (○○) is within the standard in regard to the microcomputer set value (□□). Note: When the indication of the measuring value (○○) is not stable, and the ambient temperature T (°C) is 25 °C or less, set to the lower value. When the ambient temperature is over 25 °C, set to the higher value.	TEMP ○○□□ μ-com Measuring value μ-com Set value <table><tr><th>Room Temperature [T (°C)]</th><th>hex= (○○-□□)</th></tr><tr><td>11.6 to 16.9</td><td>+1 to +3</td></tr><tr><td>17.0 to 22.3</td><td>0 to +2</td></tr><tr><td>22.4 to 27.6</td><td>-1 to +1</td></tr><tr><td>27.7 to 33.0</td><td>0 to -2</td></tr><tr><td>33.1 to 38.4</td><td>-1 to -3</td></tr></table> When the microcomputer value is 79 ↑ - 7A 7B 7C ↓ + 7D			Room Temperature [T (°C)]	hex= (○○-□□)	11.6 to 16.9	+1 to +3	17.0 to 22.3	0 to +2	22.4 to 27.6	-1 to +1	27.7 to 33.0	0 to -2	33.1 to 38.4	-1 to -3
Room Temperature [T (°C)]	hex= (○○-□□)															
11.6 to 16.9	+1 to +3															
17.0 to 22.3	0 to +2															
22.4 to 27.6	-1 to +1															
27.7 to 33.0	0 to -2															
33.1 to 38.4	-1 to -3															
5	Change □□ with the F. SKIP key (UP) and the R.SKIP key (DOWN).	TEMP 7B 7B														
6	Power OFF	EEPROMW	Writing to EEPROM is made and return is made automatically from test mode to normal mode.													

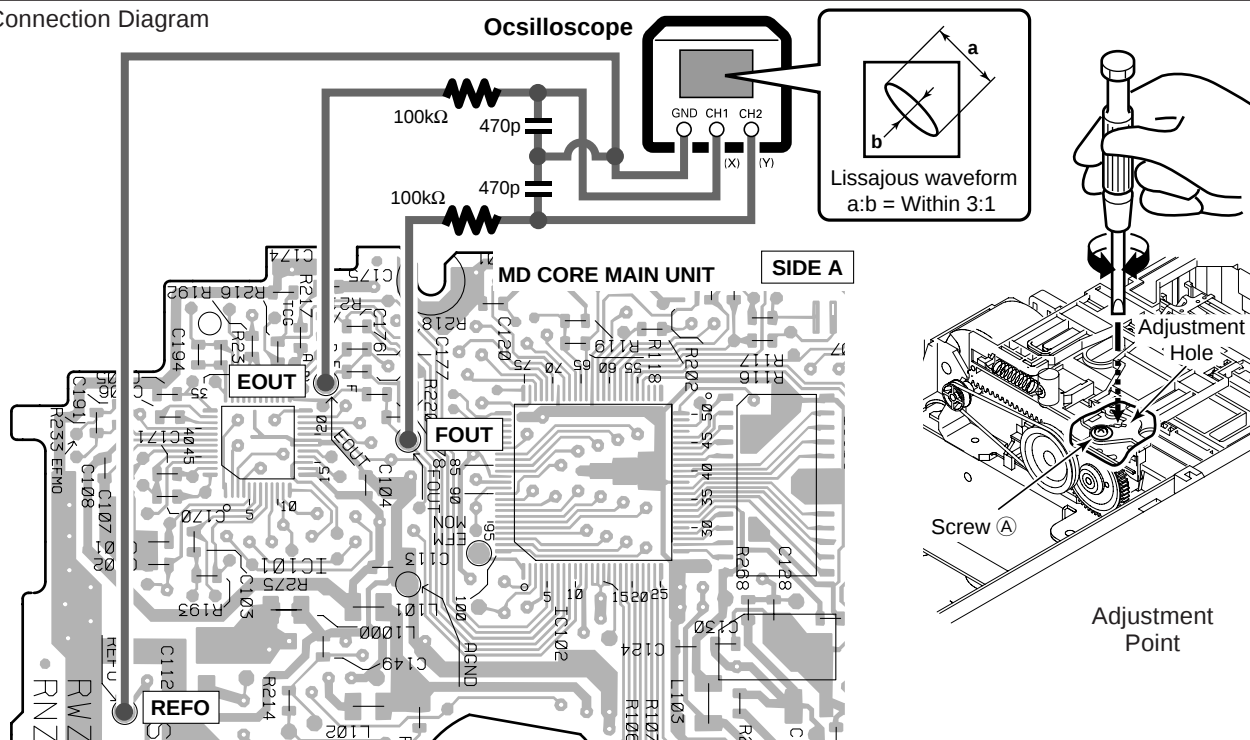
② Laser Power Check

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks								
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode	Laser Wavelength: 780 nm								
2	Press the SET key (Remote control unit)	ppw	PLAY power output status									
3	Measure the laser power with an optical power meter.	ppw										
4	At this time, check that the measuring value (PLAY power) meets the standard value of the table on the right. Note: When the standard value on the right is applied, the numerical value immediately after entry into test mode 2 shall be taken as the standard.	ppw	μ-com TEMP ○○□□ μ-com Measuring value ↑ ↑ Set value <table><tr><th>hex = (○○ – □□)</th><th>Standard Value (mW)</th></tr><tr><td>+02 to +04</td><td>0.69±0.12</td></tr><tr><td>–01 to +01</td><td>0.67±0.1</td></tr><tr><td>–02 to –04</td><td>0.63±0.1</td></tr></table>	hex = (○○ – □□)	Standard Value (mW)	+02 to +04	0.69±0.12	–01 to +01	0.67±0.1	–02 to –04	0.63±0.1	May be omitted.
hex = (○○ – □□)	Standard Value (mW)											
+02 to +04	0.69±0.12											
–01 to +01	0.67±0.1											
–02 to –04	0.63±0.1											
5	Press the SET or SEARCH key.	rpw	REC power output status									
6	At this time, check that the measuring value (REC power) meets the standard value of the table on the right.	rpw	<table><tr><th>hex = (○○ – □□)</th><th>Standard Value (mW)</th></tr><tr><td>+02 to +04</td><td>6.18±0.93</td></tr><tr><td>–01 to +01</td><td>5.79±0.87</td></tr><tr><td>–02 to –04</td><td>5.47±0.82</td></tr></table>	hex = (○○ – □□)	Standard Value (mW)	+02 to +04	6.18±0.93	–01 to +01	5.79±0.87	–02 to –04	5.47±0.82	
hex = (○○ – □□)	Standard Value (mW)											
+02 to +04	6.18±0.93											
–01 to +01	5.79±0.87											
–02 to –04	5.47±0.82											
7	Press the EJECT key.		The LD goes out.									

③ Grating Adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST	Grating adjustment status	
3	Press the PLAY key.	LON : LAG : GEG :	Playback is started in tracking open status. (The servo is closed only for focus and spindle.)	
4	Connect an oscilloscope according to the following connection diagram and loosen the screw (A) at the side of the adjustment hole. Turn the hole with a screwdriver until the Lissajous waveform becomes as shown in the figure, and then tighten the screw (A).	GRT AJST	Lissajous waveform a:b = Within 3:1	
5	Press the STOP key.		Adjustment end	

Connection Diagram



④ Preliminary Adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST		
3	Press the ASES key (until RST YOBI is displayed).	RST YOBI		
4	Press the PLAY key.		Preliminary adjustment result display mode	
5	Press the ASES key several times and display the GTG (GROOV TRACKING GAIN) value.	GTG : ☐		
6	Use the F.SKIP key (UP) and the R.SKIP key (DOWN) to adjust the value of ☐ to 4 or more.	GTG : 4		

④ Preliminary Adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
7	Press the STOP key.	RST YOBI	Return to menu display	
8	Press the ASES key (until AUT YOBI is displayed).	AUT YOBI	Preliminary adjustment mode	
9	Preliminary adjustment starts when the PLAY key is pressed.	HAo : LAG : PTG : Can't ADJ. COMPLETE	Defective adjustment (problem with the servo system) Adjustment end	
10	Press the STOP key.	AUT YOBI	Return to menu display	
11	Power OFF	EEPROM W GGF1328 (MMD-212)	Writing to the EEPROM	

Note: When this adjustment is performed after defocus adjustment has been performed, defocus is returned to the initial status, and defocus adjustment must be performed.

⑤ Normal adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST		
3	Press the ASES key (until AUTO AJST is displayed).	AUTO AJST	Normal adjustment mode	
4	Normal adjustment starts when the PLAY key is pressed.	PEG : HAG : Can't ADJ. COMPLETE	Defective adjustment (problem with the servo system) Adjustment end	
5	Press the STOP key.	AUTO AJST	Return to menu display	

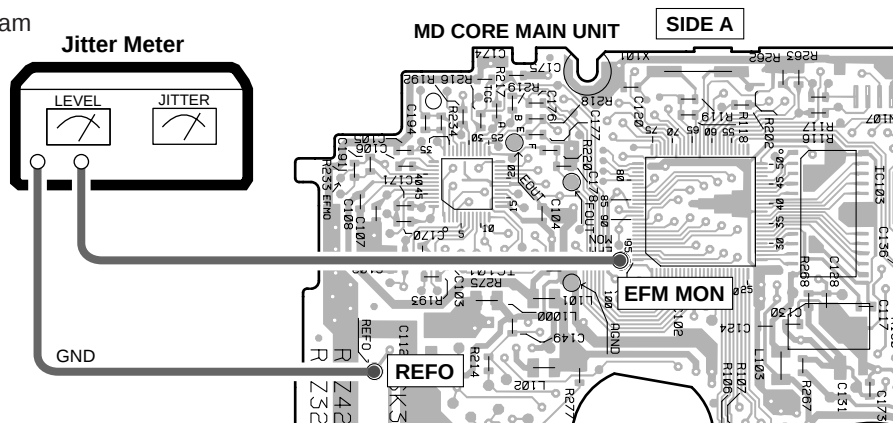
⑥ Defocus adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST		
3	Press the ASES key (until deFO AJST is displayed).	deFO AJST		
4	Press the PLAY key. of <u>○○○○</u> c <u>□□□□</u> Defocus Value ↑ C1 Error Value	PEG : FESpp : of000c0015	Defocus mode is entered, and after automatic execution of normal adjustment, the C1 error at the time of focus offset 0 is displayed.	
5	Check the jitter value and end the adjustment when the intermediate jitter value is 29 nsec or less.			
6	Press the REC key.	of+04 c0032	The C1 error with application of a focus offset of about 0.4 μm on the + side is displayed. The jitter value (J+) at this time is recorded.	

⑥ Defocus adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
7	Press the REC key.	of-04 c0020	The C1 error with application of a focus offset of about 0.4 μm on the – side is displayed. The jitter value (J–) at this time is recorded.	
8	When J+ is larger than J–, press the REC key and display the C1 error when the focus offset is applied up to +0.4 μm . (Do nothing when J– is larger than J+.)	of+04 c0032		
9	Change the value with F.SKIP/R.SKIP until the value becomes the same.	of+04 c0032 of+03 c0025 of+02 c0020	When the smaller offset of the jitter value has been corrected mistakenly, press the SET key (Remote control unit) and return to step 4.	
10	Press the PLAY key.	COMPLETE	The mean value of the changed set value and the offset of the other setting limit is written into the EEPROM as the compensation offset.	
11	Power OFF		Test mode is ended.	

Connection diagram

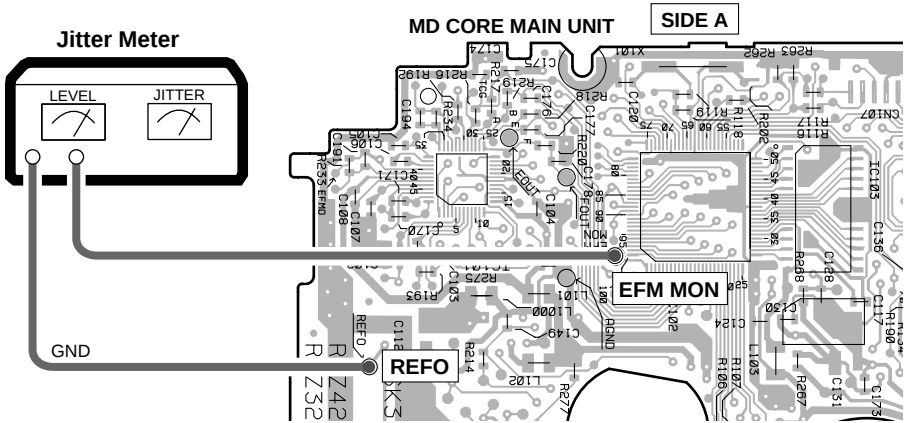


⑦ Jitter/C1 Error Check at the time of Playback

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks						
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode							
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST								
3	Perform “■ Normal Adjustment ” (step 3, step 4).	AUTO AJST								
4	Press the REC key.	TEST PLAY	TEST PLAY mode							
5	Press the SET (for Remote control unit) key and display the inner circumference address.	ADRES 0050								
6	Press the PLAY key and display the C1 error for the inner circumference.	a0050 c0015	Check that the jitter value meets the standard value of the following table. GGF1328 (MMD-212) jitter value <table><tr><td>Inner circumference</td><td>31 nsec or less</td></tr><tr><td>Intermediate circumference</td><td>29 nsec or less</td></tr><tr><td>Outer circumference</td><td>29 nsec or less</td></tr></table>	Inner circumference	31 nsec or less	Intermediate circumference	29 nsec or less	Outer circumference	29 nsec or less	
Inner circumference	31 nsec or less									
Intermediate circumference	29 nsec or less									
Outer circumference	29 nsec or less									
7	Press the CANCEL (for Remote control unit) key.	A0062 c0013 AVE. c0012	Seven data are acquired, the largest and the smallest value are discarded, and fixed display is made for the mean value of the remaining five data. Check that this value is 200 or less.							

⑦ Jitter/C1 Error Check at the time of Playback

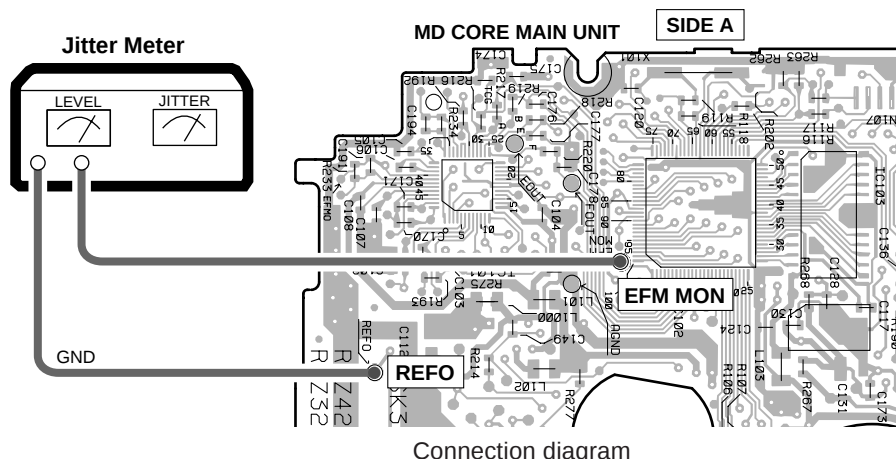
Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks						
8	Press the CANCEL (for Remote control unit) key.	a006F c0017	The fixed display of the C1 error is ended.							
9	Press the STOP key.	TEST PLAY								
10	Press the SET (for Remote control unit) key and display the inner circumference address.	ADRES 0050		Intermediate and outer circumference may be omitted.						
11	Press the REC key and display the intermediate circumference address. Perform steps 6 to 9 in this condition.	ADRES 03C0 a03C0 c0009 TEST PLAY								
12	Press the SET (for Remote control unit) key and display the inner circumference address.	ADRES 0050								
13	Press the REC key twice to display the outer circumference address. Perform steps 6 to 9 in this condition.	ADRES 0700 a0700 c0008 TEST PLAY								
14	Press the EJECT key, eject the test disc GGF1328 (MMD-212), and insert TGYS1 (or MMD-110.)	EJECT LOADING GRT AJST								
15	Perform steps 3 to 13 and check the jitter/C1 error with the test disc TGYS1 (or MMD-110).	a0062 c0009 a03d2 c0007 a0712 c0006	Check that the jitter value meets the standard value of the following table. TGYS1 (or MMD-110) jitter value <table><tr><td>Inner circumference</td><td>29 nsec or less</td></tr><tr><td>Intermediate circumference</td><td>27 nsec or less</td></tr><tr><td>Outer circumference</td><td>27 nsec or less</td></tr></table>	Inner circumference	29 nsec or less	Intermediate circumference	27 nsec or less	Outer circumference	27 nsec or less	
Inner circumference	29 nsec or less									
Intermediate circumference	27 nsec or less									
Outer circumference	27 nsec or less									
16	Press the EJECT key.	EJECT	The test disc TGYS1 (or MMD-110) is ejected.							
17	Power OFF		Test mode is ended.							



Connection diagram

■ Jitter/C1 Error Check at the time of Recording/Playback

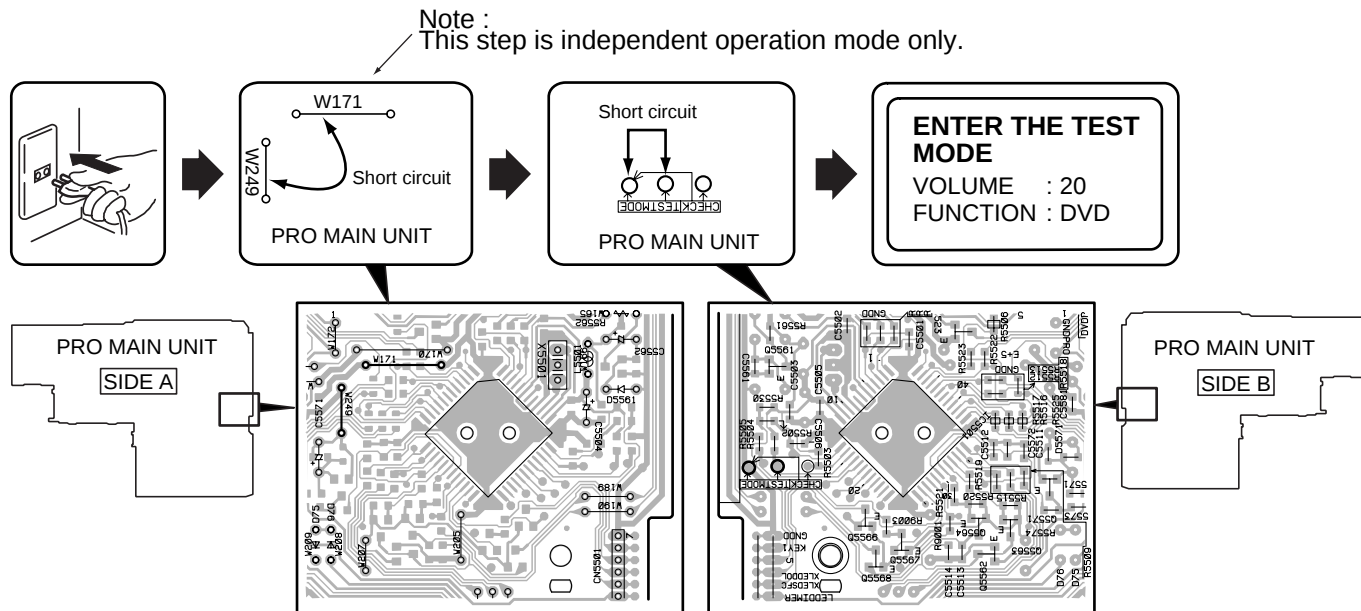
Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks						
1	Short circuit MECH TEST MODE during the power ON, or press the ESC key. (Service remote control unit)(Fig.1)	EJECT	Test mode							
2	Insert the test disc (GGF1277).	LOADING GRT AJST								
3	Perform “ ■ Normal Adjustment ” (step 3, step 4).	AUTO AJST								
4	Press the REC key twice.	TEST REC	TEST REC mode							
5	Press the SET (for Remote control unit) key and display the inner circumference address.	a0050 pw0D								
6	When the PLAY key is pressed, TEST REC starts, and when 25 addresses or more have been sent, stop by pressing the STOP key.	a0069 pw0D TEST REC	Note: When the initial address (0050) part of the inner circumference (or intermediate/ outer circumference) has been used 1000 times or more, press the F.SKIP key and shift the address by 10hex. (The address is shifted (up to 10 times) according to the use frequency of the disc.)	Intermediate and outer circumference may be omitted.						
7	Press the SET (for Remote control unit) key and display the inner circumference address.	a0050 pw0D								
8	Press the REC key and display the intermediate circumference.	a03C0 pw0D								
9	Perform step 6.	a03D9 pw0D TEST REC								
10	Press the SET (for Remote control unit) key and display the inner circumference address.	a0050 pw0D								
11	Press the REC key twice and display the outer circumference address.	a0700 pw0D								
12	Perform step 6.	a0719 pw0D TEST REC								
13	Press the REC key.	TEST PLAY	TEST PLAY mode							
14	Perform steps 5 to 13 of “ ■ Jitter/C1 Error Check at the time of Playback ”. At the time of self-recording, wait for seven addresses after TEST PLAY start, and then press the CANCEL key (Remote control unit) and enter into mean value mode. (Good recording may not be possible for several addresses at the beginning.)	a0069 c0009 a03D9 c0007 a0719 c0006	Check the jitter/C2 error at the inner/ intermediate/outer circumference of GGF1277, and check that the jitter value satisfies the standard value of the following table. GGF1277 jitter value <table><tr><td>Inner circumference</td><td>33 nsec or less</td></tr><tr><td>Intermediate circumference</td><td>31 nsec or less</td></tr><tr><td>Outer circumference</td><td>31 nsec or less</td></tr></table>	Inner circumference	33 nsec or less	Intermediate circumference	31 nsec or less	Outer circumference	31 nsec or less	
Inner circumference	33 nsec or less									
Intermediate circumference	31 nsec or less									
Outer circumference	31 nsec or less									
15	Press the EJECT key.	EJECT	The test disc (GGF1277) is ejected.							
16	Power OFF		Test mode is ended.							



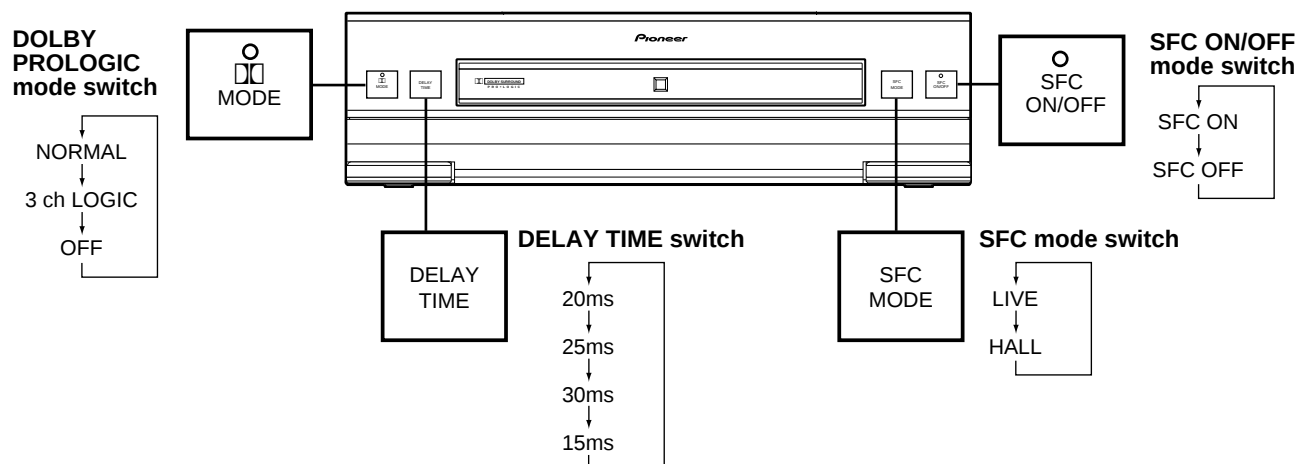
6.2 SURROUND PROCESSOR (SP-L5)

6.2.1 HOW TO ENTER / CANCEL TEST MODE

TEST MODE : ON



FUNCTION OF TEST MODE



TEST MODE CANCEL



7. GENERAL INFORMATION

7.1 IC

- The information shown in the list is basic information and may not correspond exactly to that shown in the schematic diagrams.

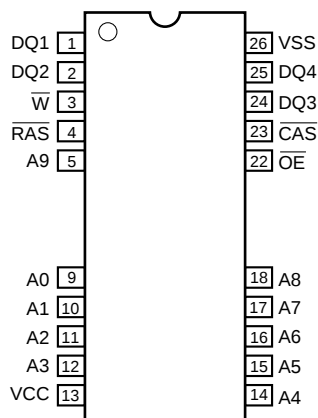
●List of IC

M5M4V4400CTP-7, M56758FP, PD5450A, LR376481, BD7910FV, BR93LC56F, IR3R55M, AK4520A, PDG225A, LV1035M, PDC046

■ M5M4V4400CTP-7 (MD CORE MAIN UNIT : IC103)

• DRAM

●Pin Assignment (Top View)

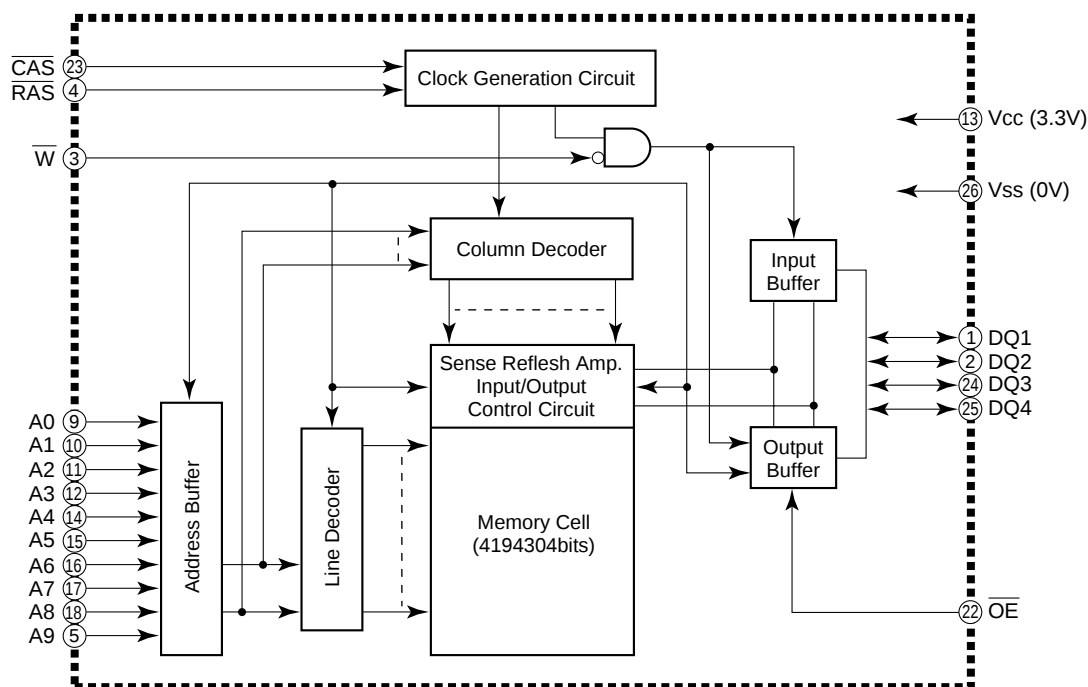


●Pin Function

No.	Name	Description
1	DQ1	Data Input/Output
2	DQ2	
3	$\overline{W}$	Write control input
4	$\overline{RAS}$	Line address strobe input
5	A9	Address input
6		
7		
8		
9	A0	Address input
12	A3	
13	Vcc	Power supply voltage (+3.3 V)

No.	Name	Description
14	A4	Address input
18	A8	
19		
20		
21		
22	$\overline{OE}$	Output-enable input
23	$\overline{CAS}$	Column address strobe input
24	DQ3	Data Input/Output
25	DQ4	
26	Vss	Ground (0 V)

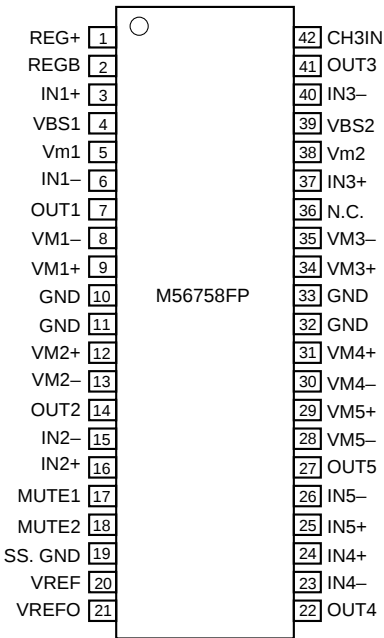
●Block Diagram



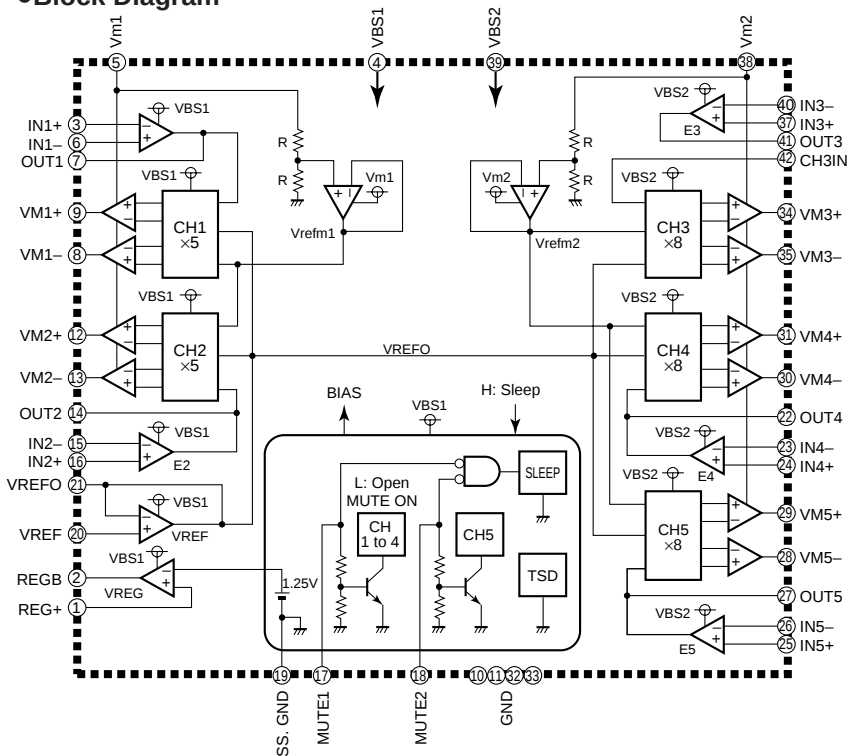
■ M56758FP (MD CORE MAIN UNIT : IC106)

• 5-channel Actuator Driver

●Pin Assignment (Top View)



●Block Diagram



●Pin Function

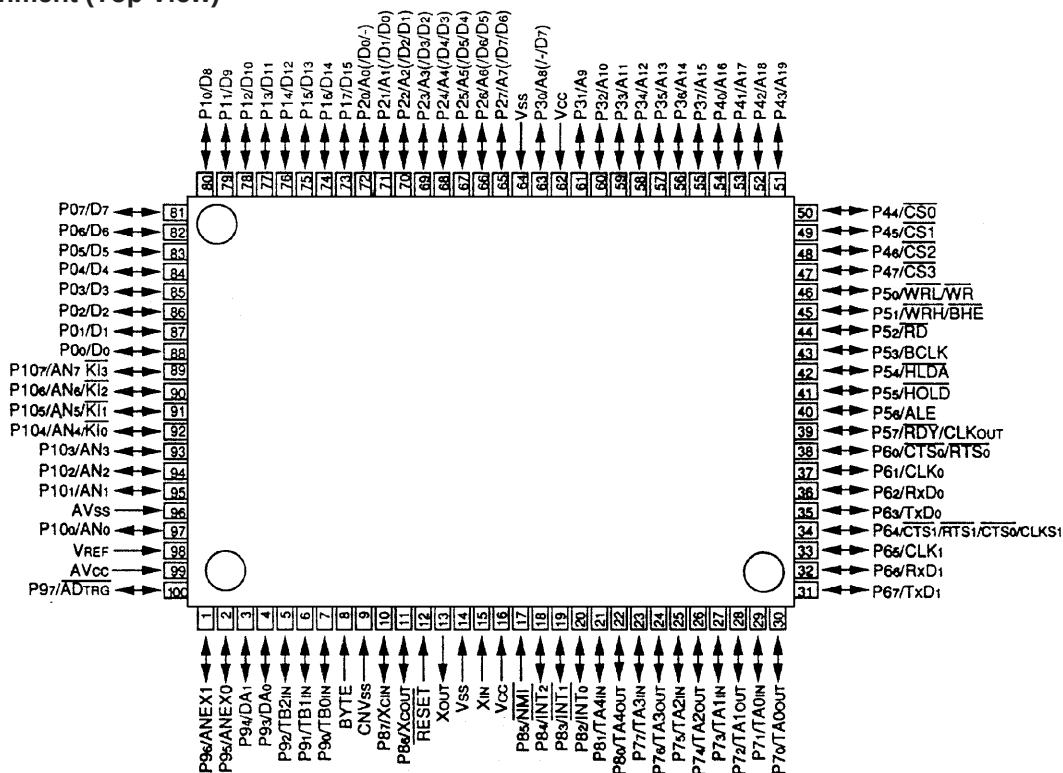
No.	Name	Description
1	REG+	Regulator voltage setting resistor connection terminal
2	REGB	Regulator PNP base connection terminal
3	IN1+	E1 amplifier nonreversed input terminal
4	VBS1	Bootstrap power supply terminal
5	Vm1	Motor power supply terminal
6	IN1-	E1 amplifier reversed input terminal
7	OUT1	E1 amplifier output terminal
8	VM1 (-)	CH1 reversed output terminal
9	VM1 (+)	CH1 nonreversed output terminal
10	GND	Motor GND
11		
12	VM2 (+)	CH2 nonreversed output terminal
13	VM2 (-)	CH2 reversed output terminal
14	OUT2	E2 amplifier output terminal
15	IN2-	E2 amplifier reversed input terminal
16	IN2+	E2 amplifier nonreversed input terminal
17	MUTE1	Mute terminal (CH1 to CH4)
18	MUTE2	Mute terminal (CH5)
19	SS. GND	Small-signal ground
20	VREF	Reference voltage input terminal
21	VREFO	Reference voltage output terminal

No.	Name	Description
22	OUT4	E4 amplifier output terminal
23	IN4-	E4 amplifier reversed input terminal
24	IN4+	E4 amplifier nonreversed input terminal
25	IN5+	E5 amplifier nonreversed input terminal
26	IN5-	E5 amplifier reversed input terminal
27	OUT5	E5 amplifier output terminal
28	VM5 (-)	CH5 reversed output terminal
29	VM5 (+)	CH5 nonreversed output terminal
30	VM4 (-)	CH4 reversed output terminal
31	VM4 (+)	CH4 nonreversed output terminal
32	GND	Motor GND
33		
34	VM3 (+)	CH3 nonreversed output terminal
35	VM3 (-)	CH3 reversed output terminal
36	N.C.	Not connected
37	IN3+	E3 amplifier nonreversed input terminal
38	Vm2	Motor power supply terminal
39	VBS2	Bootstrap power supply terminal
40	IN3-	E3 amplifier reversed input terminal
41	OUT3	E3 amplifier output terminal
42	CH3IN	E3 amplifier nonreversed input terminal

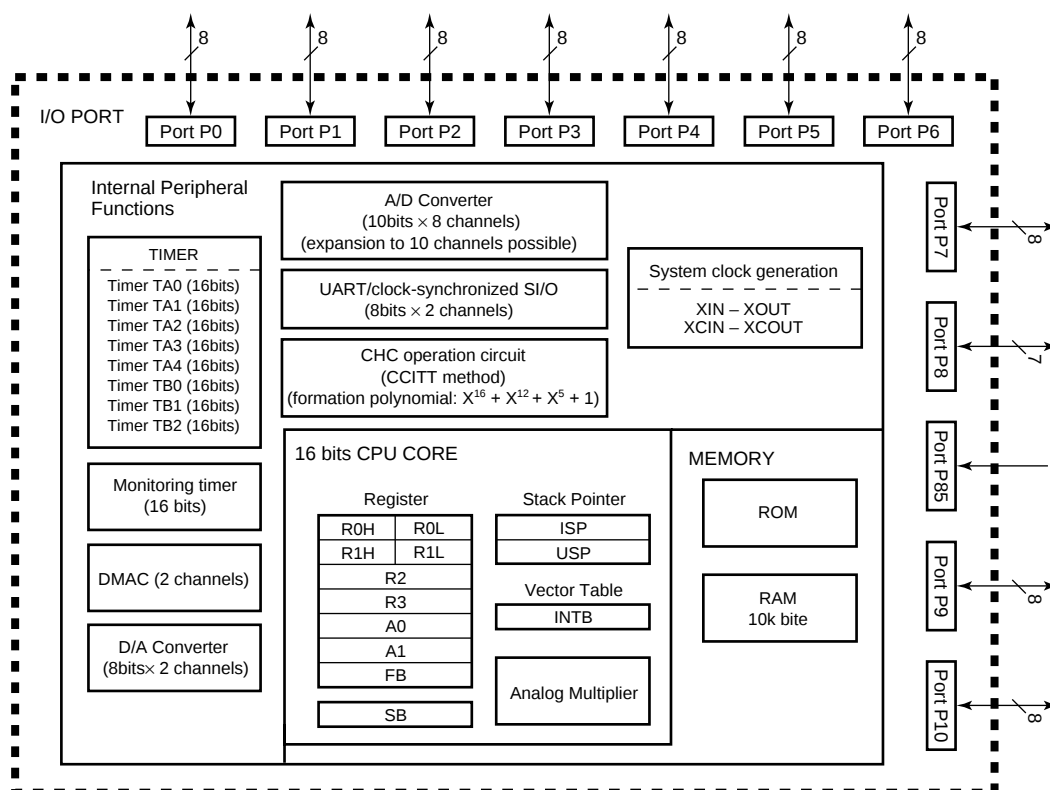
PD5450B (MD CORE MAIN UNIT : IC104)

• Mechanism Control microcomputer

•Pin Assignment (Top View)



•Block Diagram



●Pin Function

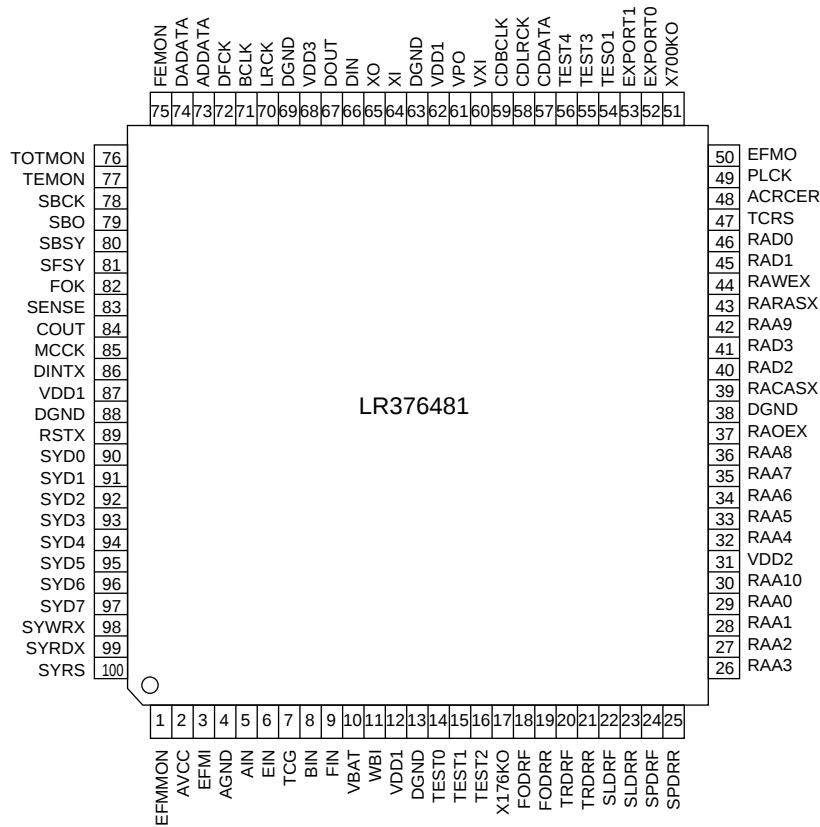
No.	Name	I/O	Description
1 to 7, 100	P96 to P90, P97	I/O	These are 8 bit I/O ports with the same functions as P0. By software selection, it functions as the input terminals for the timers B0 to B2, the output terminals for the D/A converter, the expansion input terminals of the A/D converter, or the A/D trigger input terminals.
8	BYTE	I	This is the terminal for switching the external data bus width. When the level of this terminal is "L", the width is 16 bits, and when it is "H", the width is 8 bits. Please fix it to one of these levels. At the time of single-chip mode, connect it to the Vss terminal.
9	CNVss	I	This is the terminal for processor mode switching. At the time of single-chip mode or at the time of memory expansion mode, connect it to the Vss terminal. At the time of microprocessor mode, connect it to the Vcc terminal.
10 11 17 18 to 22	P87 P86 P85 P84 to P80	I/O I/O I I/O	P80 to P84, P86, and P87 are I/O ports with the same functions as P0. By software selection, they function as the I/O terminals for the timer A4 or the input terminals for external interrupt. P86 and P87 function by software selection as the I/O terminals for the subclock oscillation circuit. In this case, connect a crystal oscillator between P86 (XCOUT terminal) and P87 (XCIN terminal). P85 is an input-only port serving also as $\overline{\text{NMI}}$. When the input of this terminal changes from "H" to "L", and $\overline{\text{NMI}}$ interrupt is generated. The $\overline{\text{NMI}}$ function can not be cancelled by software. A pullup resistance can not be set for this terminal.
12	$\overline{\text{RESET}}$	I	When the input to this terminal is "L", the microcomputer is reset.
13	XOUT	I	This are the I/O terminals of the main clock oscillation circuit. Connect a ceramic oscillator or a crystal oscillator between the terminals XIN and XOUT. In case of an externally generated clock, enter the clock from the XIN terminal and leave the XOUT terminal open.
15	XIN	O	
14	Vss	—	Impress 0 V.
16	Vcc	—	Impress 2.7 V to 5.5 V.
23 to 30	P77 to P70	I/O	These are 8 bit I/O ports with the same functions as P0. By software selection, they function as the I/O terminals for the timers A0 to A3.
31 to 38	P67 to P60	I/O	These are 8 bit I/O ports with the same functions as P0. By software selection, they function as the I/O terminals for the UART0 and UART1.
39 to 46	P57 to P50	I/O	These are 8 bit I/O ports with the same functions as P0. By software selection, they put out a clock with 1/8 or 1/32 of XIN or with the same cycle as XCIN from P57.
	$\overline{\text{WRL}}/\overline{\text{WRH}}$, $\overline{\text{WRH}}/\overline{\text{BHE}}$, $\overline{\text{RD}}$, $\overline{\text{BCLK}}$, $\overline{\text{HLDA}}$, $\overline{\text{HOLD}}$, $\overline{\text{ALE}}$, $\overline{\text{RDY}}$	O O O O O I O I	$\overline{\text{WRL}}$, $\overline{\text{WRH}}$, ($\overline{\text{WR}}$, $\overline{\text{BHE}}$), $\overline{\text{RD}}$, $\overline{\text{BCLK}}$, $\overline{\text{HLDA}}$, and $\overline{\text{ALE}}$ signals are put out. Switching between $\overline{\text{WRL}}$ and $\overline{\text{WRH}}$ and between $\overline{\text{BHE}}$ and $\overline{\text{WR}}$ is possible by software. ■ At the time of $\overline{\text{WRL}}$, $\overline{\text{WRH}}$, $\overline{\text{RD}}$ selection When the external data bus width is 16 bits and the $\overline{\text{WRL}}$ signal is at "L" level, writing is done to an even address, and the $\overline{\text{WRH}}$ signal is at "L" level, writing is done to an odd address. Reading is performed when the $\overline{\text{RD}}$ signal is at "L" level. ■ At the time of $\overline{\text{WR}}$, $\overline{\text{BHE}}$, $\overline{\text{RD}}$ selection Writing is done when the $\overline{\text{WR}}$ signal is at "L" level. Reading is done when the $\overline{\text{RD}}$ signal is at "L" level. An odd address is accessed when the $\overline{\text{BHE}}$ signal is at "L" level. Please use this mode when the external data bus width is 8 bits. The microcomputer is in hold status while the input level to the $\overline{\text{HOLD}}$ terminal is "L". During hold status, the output from $\overline{\text{HLDA}}$ is at "L" level. $\overline{\text{ALE}}$ is the signal for address latching. The microcomputer is in ready status while the input to $\overline{\text{RDY}}$ is at "L" level. A clock with the same frequency as the internal clock ϕ is put out from the $\overline{\text{BCLK}}$ terminal.
47 to 54	P47 to P40	I/O	These are 8 bit I/O ports with the same functions as P0.
	$\overline{\text{CS3}}$ to $\overline{\text{CS0}}$, A19 to A16	O O	The A16 to A19 and $\overline{\text{CS0}}$ to $\overline{\text{CS3}}$ signals are put out. A16 to A19 are the upper 4 bits of the address. $\overline{\text{CS0}}$ to $\overline{\text{CS3}}$ are the chip select signals, and they are used for specification of the access space.

No.	Name	I/O	Description
55 to 61, 63	P37 to P31, P30	I/O	These are 8 bit I/O ports with the same functions as P0.
	A15 to A9, A8	O	The middle 8 bits (A8 to A15) of the address are put out.
	A15 to A9 A8/D7	I/O O	With an external data bus width of 16 bits and multiplex bus setting, time sharing is performed for data (D7) I/O and address (A8) output. Address (A9 to A15) output also is performed.
62	Vcc	—	Impress 2.7 V to 5.5 V.
64	Vss	—	Impress 0 V.
65 to 72	P27 to P20	I/O	These are 8 bit I/O ports with the same functions as P0.
	A7 to A0	O	Output of the lower 8 bits (A0 to A7) of the address is performed.
	A7/D7 to A0/D0	I/O	With an external data bus width of 16 bits and multiplex bus setting, time sharing is performed for data (D0 to D7) I/O and address lower 8 bits (A0 to A7) output.
	A0 A7/D6 to A1/D0	O I/O	With an external data bus width of 16 bits and multiplex bus setting, time sharing is performed for data (D0 to D6) I/O and address (A1 to A7) output. Address (A0) output also is performed.
73 to 80	P17 to P10	I/O	These are 8 bit I/O ports with the same functions as P0.
	D15 to D8	I/O	Data (D8 to D15) I/O is performed at the time of separate bus setting.
81 to 88	P07 to P00	I/O	These are CMOS 8 bit I/O ports. They have direction registers for I/O selection, and input or output port setting is possible individually for each terminal. For an input port, the existence or absence of a pull-up resistance can be set by software in 4 bit units.
	D7 to D0	I/O	Data (D0 to D7) I/O is performed at the time of separate bus setting.
89 to 95, 97	P107 to P101, P100	I/O	This are 8 bit I/O ports with the same functions as P0. By software selection, they function as input terminals of the A/D converter. P104 to P107 also function as input terminals for the key input interrupt function.
96	AVss	—	This is the A/D converter power supply input terminal. Please connect it to the Vss terminal.
98	VREF	I	This is the A/D converter reference voltage input terminal.
99	AVcc	—	This is the A/D converter power supply input terminal. Please connect it to the Vcc terminal.

■ LR376481 (MD CORE MAIN UNIT : IC102)

• Encode/Decode/Atrac

●Pin Assignment (Top View)



●Pin Function

No.	Name	I/O	Description
1*	EFMMON	O	EFM monitor output
2	AVCC	–	Analog power supply
3	EFMI	I	EFM signal input from RF amp
4	AGND	–	Analog GND
5	AIN	I	Focus error signal A
6	EIN	I	Tracking error signal E
7	TCG	I	Track cross signal
8	BIN	I	Focus error signal B
9	FIN	I	Tracking error signal F
10*	VBAT	I	Power-supply voltage detection signal for constant-voltage servo
11	WBI	I	ADIP wobble signal
12	VDD1	–	Digital power supply
13	DGND	–	Digital GND
14	TEST0	I	Test-use input; normally connected to GND when used.
15	TEST1	I	
16	TEST2	I	Test-use input; Encoder/Servo Mode and ATRAC Mode changeover

No.	Name	I/O	Description
17	X176KO	O	Clock output; f = 176.4kHz (4fs)
18	FODRF	O	Focus servo forward output; PWM
19	FODRR	O	Focus servo reverse output; PWM
20	TRDRF	O	Tracking servo forward output; PWM
21	TRDRR	O	Tracking servo reverse output; PWM
22	SLDRF	O	Slide servo forward output; PWM
23	SLDRR	O	Slide servo reverse output; PWM
24	SPDRF	O	Spindle servo forward output or spindle servo output; PWM
25	SPDRR	O	Spindle servo reverse output or spindle rotation forward/reverse changeover
26	RAA3	O	Address output to external D-RAM; ADR3
27	RAA2	O	Address output to external D-RAM; ADR2
28	RAA1	O	Address output to external D-RAM; ADR1
29	RAA0	O	Address output to external D-RAM; ADR0 (LSB)
30*	RAA10	O	Address output to external D-RAM; ADR10 (MSB)
31	VDD2	–	Power supply for DRAM interface

No.	Name	I/O	Description
32 36	RAA4 RAA8	O	Address output to external D-RAM; ADR4 Address output to external D-RAM; ADR8
37	RAOEX	O	Data output enable signal output to external D-RAM
38	DGND	–	Digital GND
39	RACASX	O	Column address strobe signal output to external D-RAM
40	RAD2	I/O	External D-RAM and data input/output; D2
41	RAD3	I/O	External D-RAM and data input/output; D3 (MSB)
42	RAA9	O	Address output to external D-RAM; ADR9
43	RARASX	O	Low address strobe signal output to external D-RAM
44	RAWEX	O	Data write enable signal output to external D-RAM
45	RAD1	I/O	External D-RAM and data input/output; D1
46	RAD0	I/O	External D-RAM and data input/output; D0 (LSB)
47*	TCSR	O	Track cross signal
48*	ACRCER	O	ADIP CRC error flag monitor output
49*	PLCK	O	EFM PLL clock output during Play
50	EFM0	O	EFM signal output during Record; C1F (C1 error flag) monitor output during Play.
51*	X700KO	O	Clock output; f = 705.6kHz; clock is not output when RSTX = 0.
52*	EXPORT0	O	Microcomputer extension output port 0
53*	EXPORT1	O	Microcomputer extension output port 1
54	TESO1	O	Microcomputer extension output port 2 during PLLR changeover
55	TEST3	I/O	Microcomputer extension output port 3 during PLLOSC changeover
56	TEST4	I/O	Microcomputer extension output port 4 during EXTCLK changeover
57	CDDATA	I/O	CD data input for high-speed dubbing; microcomputer extension port 5 during changeover
58	CDLRCK	I/O	CD LR clock input for high-speed dubbing; microcomputer extension port 6 during changeover
59	CDBCLK	I/O	CD bit clock input for high-speed dubbing; microcomputer extension port 7 during changeover
60	VXI	I	PLL clock input for varying pitch
61*	VPO	O	PLL phase error input for varying pitch
62	VDD1	–	Digital power supply
63	DGND	–	Digital GND
64	XI	I	Oscillation circuit input; 33.8688MHz
65	XO	O	

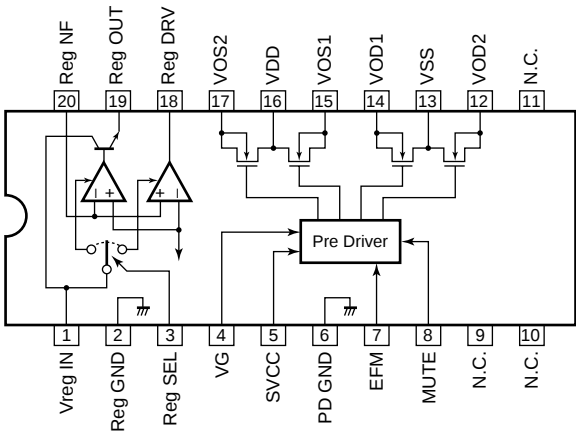
No.	Name	I/O	Description
66	DIN	I	Digital input signal
67	DOUT	O	Digital output signal
68	VDD3	–	Power supply for internal PLL
69	DGND	–	Digital GND
70	LRCK	O	Music data Lch/Rch changeover output
71	BCLK	O	Music data shift lock
72	DFCK	O	Clock for AD/DA converter digital filter; 256fs
73	ADDATA	I	Audio data input
74	DADATA	O	Audio data output
75*	FEMON	O	Focus error signal monitor output
76*	TOTMON	O	Total signal monitor output
77*	TEMON	O	Tracking error signal monitor output
78*	SBCK	I	DIN sub code readout clock; EIAJ CP-309 format
79*	SBO	O	DIN sub code serial data; EIAJ CP-309 format
80*	SBSY	O	DIN sub code block synchronization signal; EIAJ CP-309 format
81*	SFSY	O	DIN sub code frame synchronization signal; EIAJ CP-309 format
82	FOK	O	Focus OK detection signal; "0": Focus OK
83	SENSE	O	Servo status detection signal; "1": Auto Move/ Auto Jump/ Auto Focus lead-in in progress
84	COUT	O	Track cross signal output
85	MCKK	O	Clock output for microcomputer; clock is output even when RSTX = 0.
86	DINTX	O	Interrupt Request output signal for system computer interface
87	VDD1	–	Digital power supply
88	DGND	–	Digital GND
89	RSTX	I	Tip reset input; reset with L (NOTE)
90	SYD0	I/O	System computer interface data bus terminal; (LSB)
91 96	SYD1 SYD6	I/O	System computer interface data bus terminal
97	SYD7	I/O	System computer interface data bus terminal; (MSB)
98	SYWRX	I	System computer interface register write pulse input
99	SYRDX	I	System computer interface register read pulse input
100	SYRS	I	System computer interface register select input

Terminals denoted with an asterisk (*) are (Open) terminals that are not externally connected.

(NOTE) Set RSTX to "L" when the power is being turned ON or after it has been turned ON.

BD7910FV (MD CORE MAIN UNIT : IC116)

- Head Driver
- Block Diagram



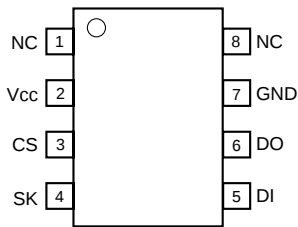
•Pin Function

No.	Name	Description
1	VregIN	Regulator input and regulator power supply
2	RegGND	Regulator GND
3	RegSEL	Regulator selection terminal
4	VG	Power MOS drive voltage input
5	SVCC	EFM high-level output voltage

No.	Name	Description
6	PDGND	Predrive GND
7	EFM	EFM signal input
8	MUTE	Mute control
9	N.C.	Not used
10	N.C.	
11	N.C.	
12	VOD2	Sink output (lower side power MOS drain)
13	VSS	H-bridge GND (lower side power MOS source)
14	VOD1	Sink output (lower side power MOS drain)
15	VOS1	Source output (upper side power MOS source)
16	VDD	H-bridge power supply (upper side power MOS drain)
17	VOS2	Source output (upper side power MOS source)
18	RegDRV	External PNP drive output for the regulator
19	RegOUT	Regulator output (emitter follower output)
20	RegNF	Regulator feedback terminal

BR93LC56F (MD CORE MAIN UNIT : IC110)

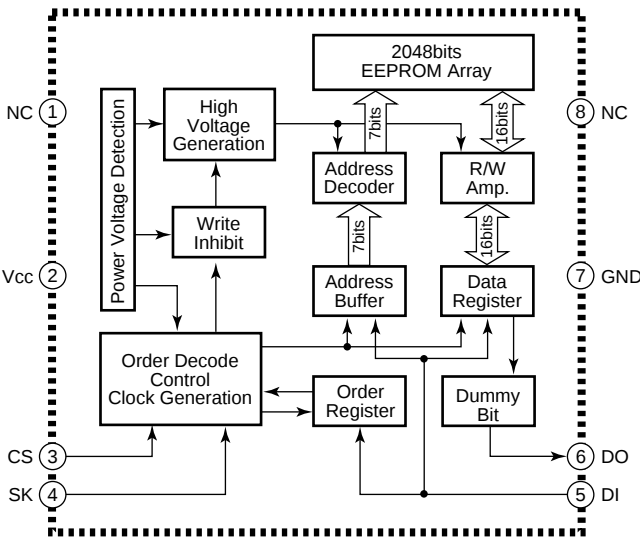
- EEPROM
- Pin Assignment (Top View)



•Pin Function

No.	Name	Description
1	NC	Not connected
2	Vcc	Power supply
3	CS	Chip selection input
4	SK	Serial clock input
5	DI	Start bit, operation code, address, and serial data input
6	DO	Serial data output, READY/BUSY internal status indication output
7	GND	Ground
8	NC	Not connected

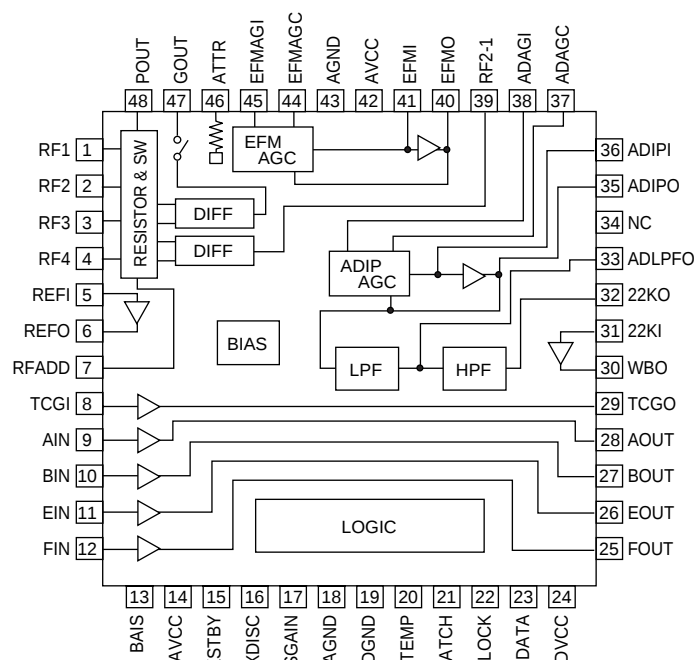
•Block Diagram



IR3R55M (MD CORE MAIN UNIT : IC101)

• RF Signal Processor

●Block Diagram



●Pin Function

No.	Name	Description
1	RF1	Inputs RF signal input terminal 1 pickup RF signal output.
2	RF2	Inputs RF signal input terminal 2 pickup RF signal output.
3	RF3	Inputs RF signal input terminal 3 pickup RF signal output.
4	RF4	Inputs RF signal input terminal 4 pickup RF signal output.
5	REFI	Standard voltage amp input terminal
6	REFO	Standard voltage amp output terminal
7	RFADD	RF1 – 4 resistance addition output terminal
8	TCGI	Track cross detection signal amp input terminal during groove input
9	AIN	Servo-use signal amp (Focus servo system) inversion input terminal
10	BIN	Servo-use signal amp (Focus servo system) inversion input terminal
11	EIN	Servo-use signal amp (Tracking servo system) inversion input terminal
12	FIN	Servo-use signal amp (Tracking servo system) inversion input terminal
13	BIAS	Bias input terminal
14	AVCC	Analog power terminal
15*	VSTBY	Logic signal output terminal (outputs STBY signal inversion signal)

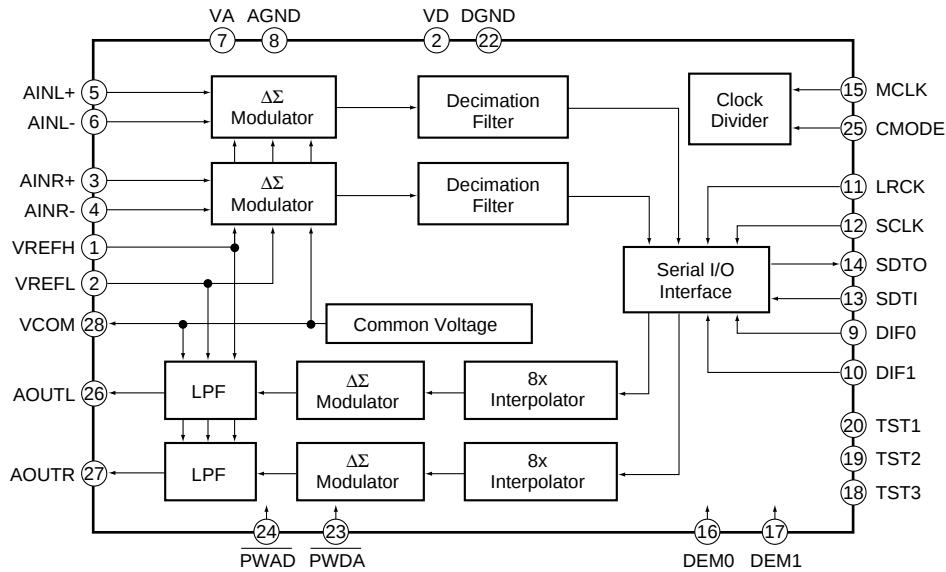
No.	Name	Description
16*	XDISC	Logic signal output terminal (outputs DISC signal inversion signal)
17*	XSGAIN	Logic signal output terminal (outputs SGAIN signal inversion signal)
18	AGND	Analog part GND terminal
19	DGND	Digital part GND terminal
20	DTEMP	Tip temperature detection terminal
21	LATCH	Latch signal input terminal
22	CLOCK	Clock signal input terminal
23	DATA	Serial data input terminal
24	DVCC	Digital part power terminal
25	FOUT	Servo-use signal amp (Tracking servo system) output terminal
26	EOUT	Servo-use signal amp (Tracking servo system) output terminal
27	BOUT	Servo-use signal amp (Focus servo system) output terminal
28	AOUT	Servo-use signal amp (Focus servo system) output terminal
29	TCGO	Track cross detection signal amp output terminal during groove output
30	WBO	Comparator output terminal for ADIP signal 2-value conversion
31	22KI	Comparator input terminal for ADIP signal 2-value conversion
32	22KO	ADIP signal HPF amp output terminal
33	ADLPFO	ADIP signal LPF amp output terminal
34*	NC	NC
35	ADIPO	ADIP signal preamp output terminal
36	ADIPI	ADIP signal AGC amp output terminal
37	ADAGC	Smoothing capacitor connection terminal for ADIP signal AGC
38	ADAGI	ADIP signal AGC amp input terminal
39	RF2-1	RF1, RF2 differential signal
40	EFMO	RF signal preamp output terminal
41*	EFMI	RF signal AGC amp output terminal
42	AVCC	Analog part power terminal
43	AGND	Analog part GND terminal
44	EFMAGC	Smoothing capacitor connection terminal for EFM signal AGC
45	EFMAGI	EFM signal AGC amp input terminal
46*	ATTR	Terminal for attenuating 47, 48 pin output signal
47	GOUT	Outputs RF1 + RF2 + RF3 – RF3 – RF4 signal during groove output
48	POUT	RF1 – 4 resistance addition output during pit output

Terminals denoted with an asterisk (*) are (Open) terminals that are not externally connected.

AK4520A (MD MAIN UNIT : IC4301)

• AD/DA Converter

•Block Diagram



•Pin Function

No.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
1	VREFH	I	Positive voltage reference input pin, VA	15	MCLK	I	Master clock input pin
2	VREFL	I	Negative voltage reference input pin, AGND	16	DEM0	I	De-emphasis frequency select pin
3	AINR+	I	R ch analog positive input pin	17	DEM1	I	De-emphasis frequency select pin
4	AINR-	I	R ch analog negative input pin	18	TST3	I/O	Test pins (Pull down pins) Open or connect to DGND.
5	AINL+	I	L ch analog positive input pin	19	TST2	I/O	
6	AINL-	I	L ch analog negative input pin	20	TST1	I	
7	VA	-	Analog power supply pin	21	VD	-	Digital power supply pin
8	AGND	-	Analog ground pin	22	DGND	-	Digital ground pin
9	DIF0	I	Audio data interface format pin	23	PWDA	I	DAC power-down mode pin
10	DIF1	I	Audio data interface format pin	24	PWAD	I	ADC power-down mode pin
11	LRCK	I	Input/Output channel clock pin	25	CMODE	I	Master clock select pin "H" : 384fs, "L" : 256fs
12	SCLK	I	Audio serial data clock pin	26	AOUTL	O	L ch analog output pin
13	SDTI	I	Audio serial data input pin	27	AOUTR	O	R ch analog output pin
14	SDTO	O	Audio serial data output pin	28	VCOM	O	Common voltage output pin, VA/2

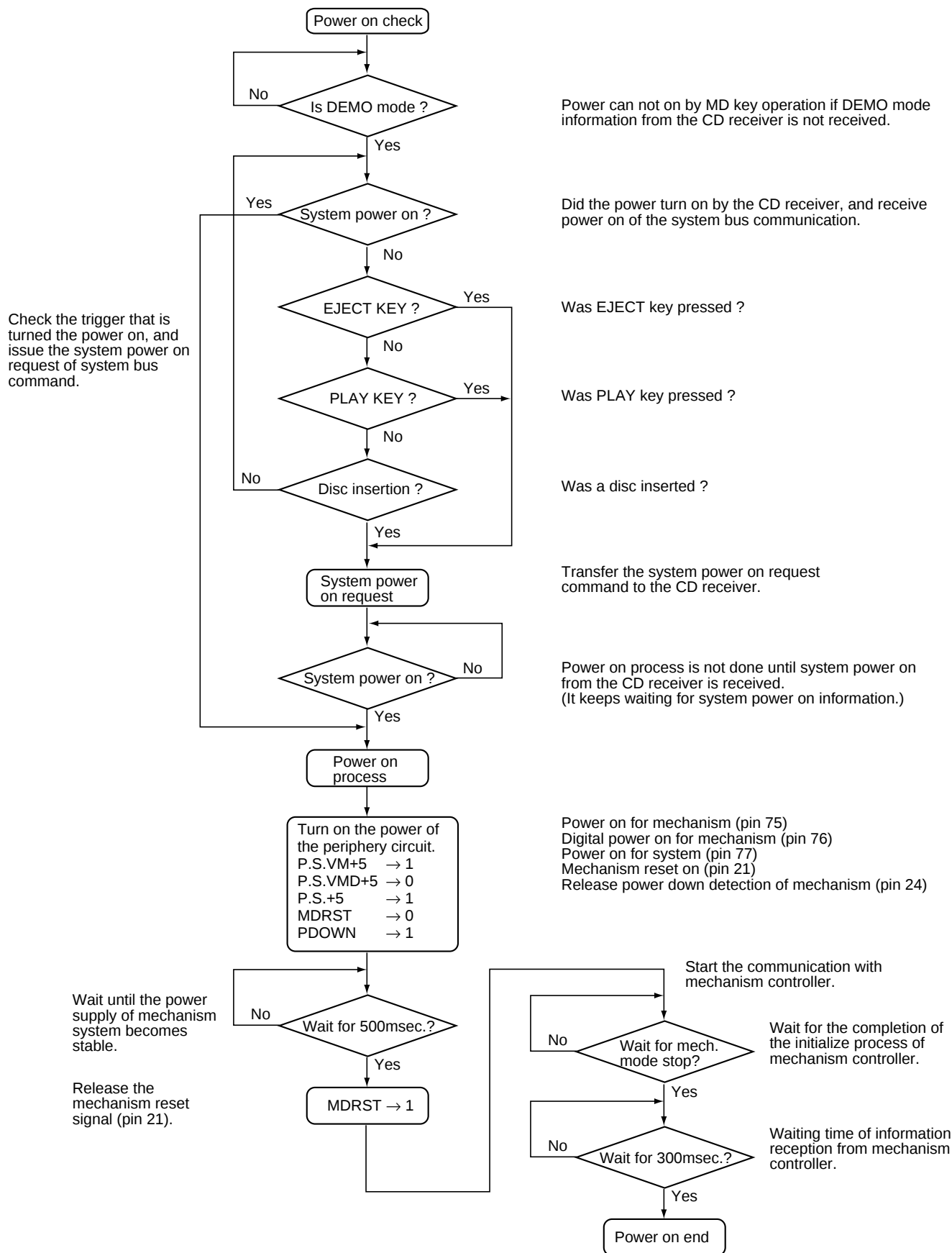
PDG225A (MD MAIN UNIT : IC4101)

• System Control IC

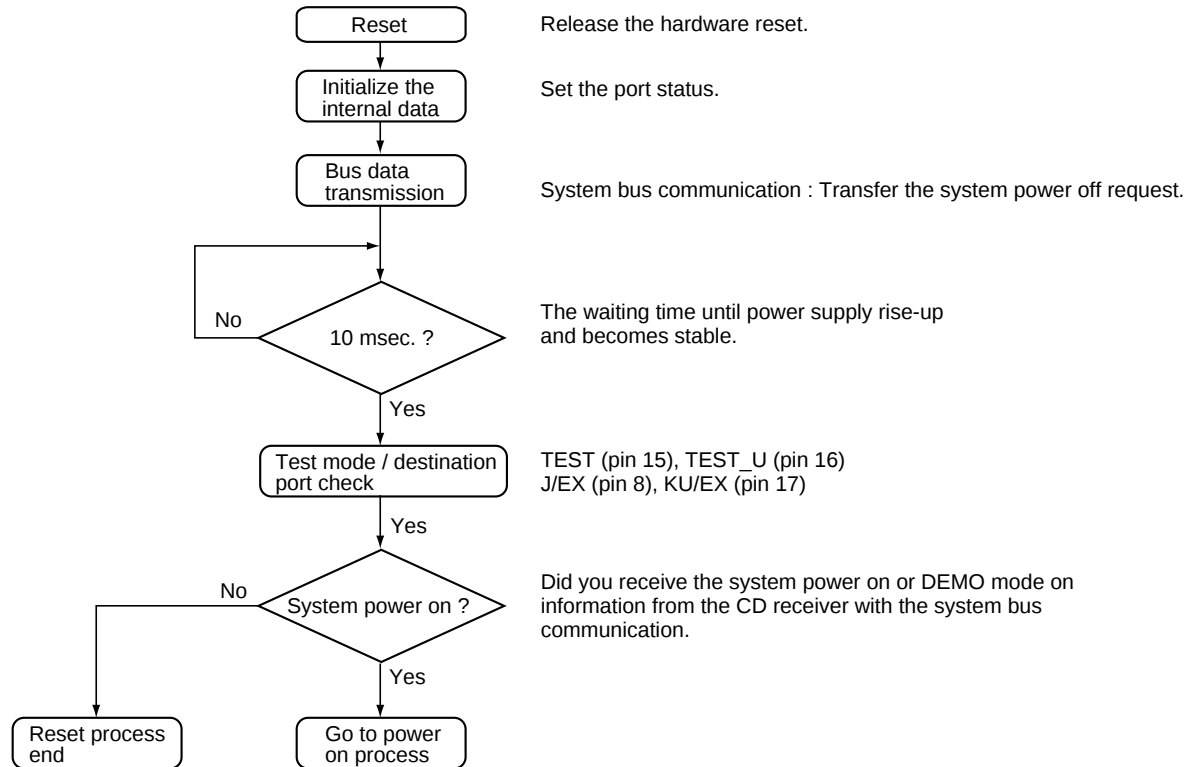
●Pin Function

No.	Mark	Pin Name	I/O	Function	No.	Mark	Pin Name	I/O	Function
1	PF3/SDA0	NC	O	Not used (open) (N ch open-drain)	41	PA3/AN3	PRODET	I	Connection recognition input of prologic processor
2	PF4/PWM0	NC	O	Not used (open)	42	PA4/AN4	SODATA	O	System bus data output
3	PF5/PWM1	NC			43	PA5/AN5	SIDATA	I	System bus data input
4	PF6/TxD	NC			44	PA6/AN6	S.REQ	I/O	System bus request input and output
5	PF7/RxD	NC	I	Connect to GND	45	PA7/AN7	NC	O	Not used (open)
6	PD0	NC	O	Not used	46	PB0/CINT	NC		
7	PD1	NC			47	PB1/CSO	NC		
8	PD2	J/EX	I	Destination recognition input (H : J, L : EX)	48	PB2/SCK0	MDSCK	O	Communication clock output of MD mech. controller
9	PD3	NC	O	Not used (open)	49	PB3/SI0	MDDATA	I	Communication data input of MD mech. controller
10	PD4	NC			50	PB4/SO0	SYSDATA	O	Communication data output of MD mech. controller
11	PD5	NC			51	PB5/SCK1	D.SCK	I/O	Communication clock output of MD display
12	PD6	NC			52	PB6/SI1	NC	O	Not used (open)
13	PD7	NC			53	PB7/SO1	D.DATA	O	Communication data output of MD display
14	PC0	NC			54	PE0/EC1	NC	I	Not used (Connect to GND)
15	PC1	TEST	I	Test mode input of MD mech. (L:ON)	55	PE1/EC1	NC		
16	PC2	TEST_U	I	Unit check mode input (L:ON)	56	PE2/RMC	NC		
17	PC3	KU/EX	I	Destination discrimination input (H : KU, L : EX)	57	PE3/NM1	NC	O	Not used (open)
18	PC4	CMODE	O	Master clock select output (L:256fs, H:384fs)	58	PE4	NC		
19	PC5	ADPOW	O	ADC power-down mode output (H:ON)	59	PE5/T0/ADJ	NC	I	System bus clock input
20	PC6	DAPOW	O	DAC power-down mode output (H:ON)	60	PI0/INT0	S.CLK		
21	PC7	MDRST	O	Reset output of MD mech. controller	61	PI1/INT1	D.REQ	I	Communication request input of MD display
22	PH0	MDMUTE	I	Request input of mech. controller mute	62	PI2/INT2	ACDET	I	Power down detection input of system controller
23	PH1	MDSTB	I	Communication request detection input of MD mech. controller	63	PI3/INT3	NC	O	Not used (open)
24	PH2	PDOWN	O	Power down detection output of MD mech. controller	64	PI4/INT4	NC		
25	PH3	DIF0	O	Audio data interface format 0 output	65	PI5/SCK2	NC		
26	PH4	DIF1	O	Audio data interface format 1 output	66	PI6/SI2	NC		
27	PH5	PBMUTE	O	MD PB mute output (L:MUTE ON)	67	PI7/SO2	NC		
28	PH6	RECMUTE	O	MD REC mute output (L:MUTE ON)	68	PG0	NC		
29	PH7	OUTSEL	O	PB SELECT output (L:MD, H:through)	69	PG1	NC		
30	RST	XRESET	I	Reset input	70	PG2	NC		
31	EXTAL	EXTAL	I	Connect to ceramic resonator	71	PG3	NC	-	Connect to +5V
32	XTAL	XTAL	-		72	VDD	VDD		
33	Vss	Vss	-	Connect to GND	73	NC	-	O	Not used (open)
34	TX	-	O	Not used (open)	74	PG4	NC		
35	TEX	-	I	Connect to GND	75	PG5	P.S.VM+5	O	+5V for mechanism (H:ON)
36	AVss	Vss	-	Connect to GND	76	PG6	P.S.VMD+5	O	Digital +5V for mechanism (L:ON)
37	AVref	AVref	-	A/D reference voltage input (Connect to +5V).	77	PG7	P.S.+5	O	+5V for system (H:ON)
38	PA0/AN0	KEYIN1	I	Key detection input 1 (A/D input)	78	PF0/SCL0	LEDREC	O	REC LED output (L:ON) (N ch open-drain)
39	PA1/AN1	NC	O	Not used (open)	79	PF1/SCL1	LEDPLAY	O	PLAY LED output (L:ON) (N ch open-drain)
40	PA2/AN2	NC			80	PF2/SDA0	NC	O	Not used (open) (N ch open-drain)

• Power on sequence of MD microcomputer



• Rise-up sequence after AC power is applied of MD microcomputer



* The power supply of MD mechanism is not being supplied to MD in the system power off condition. Therefore, nothing goes specially under the power off condition after the AC supplied.

PDC046 (PRO MAIN UNIT : IC5501)

• System Control IC

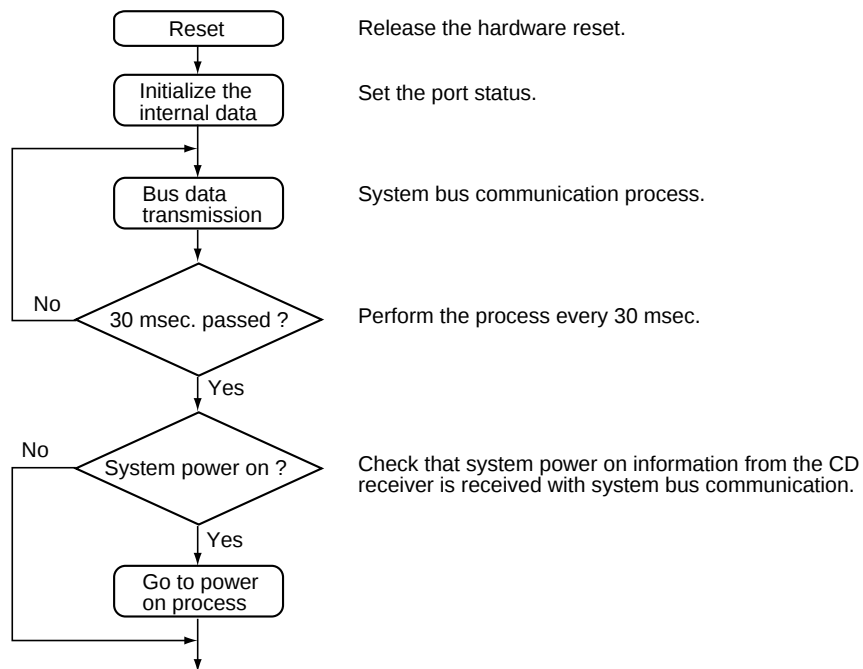
• Pin Function

No.	Mark	Pin Name	I/O	Function	No.	Mark	Pin Name	I/O	Function
1	P05	XMUTE	O	System mute H:OFF, L:ON	25	P73/INT3 /TOIN	NC	O	L
2	P06	FUNC B	O	(N ch SELECT) *	26	P30	XLED SFC	O	LED SFC ON/OFF (N ch SELECT) H: OFF, L: ON
3	P07	FUNC A	O	(N ch SELECT) *	27	P31	XLED DOLBY	O	LED DOLBY ON/OFF (N ch SELECT) H: OFF, L: ON
4	P70/INT0	S.CLK	I	Serial clock input of system bus communication	28	P32	XLAMP DIMMER	O	LAMP DIMMER ON/OFF (N ch SELECT) H: OFF, L: ON
5	RES	XRESET	I	CPU RESET input	29	NC	NC	—	—
6	XT1/P74	NC	I	Connect to VDD	30	P33	ACPULSE	I	AC pulse input
7	NC	NC	—	—	31	P34	S.REQ	I/O	Request input and output of system bus communication
8	XT2/P75	NC	I	Connect to VDD	32	P35	S.DATAO	O	Serial data output of system bus communication
9	VSS	D.GND	—	Ground	33	P36	S.DATAI	I	Serial data input of system bus communication
10	CF1	OSC	O	Connect a 6MHz ceramic resonator	34	P10/SO0	PRO ST	O	Strobe output of PRO LOGIC IC LV1035
11	CF2	OSC	I		35	P11/SI0 /SB0	PRO DATA	O	Serial data output of PRO LOGIC IC LV1035
12	VDD	+5V	—	Power supply voltage	36	P12/SCK0	PRO CLK	O	Serial clock output of PRO LOGIC IC LV1035
13	P80/AN0	KEYIN	I	Key input (AD)	37	P13/SO1	SPCONT	O	Speaker control H: ON, L: OFF
14	P81/AN1	UNITCHHECK	I	Test mode input for checker H: OFF, L: ON	38	P14/SI1 /SB1	REC MUTE	O	REC MUTE H: ON, L: OFF
15	P82/AN2	TEST	I	Independent power on input H: OFF, L: ON	39	P15/SCK1	XPOWER ON	O	POWER ON/OFF H: OFF, L: ON
16	P83/AN3	NC	I	Pull-down	40	P16/BUZ	VR CLK	O	Clock output of VOLUME IC M62429
17	P84/AN4	NC	O	L	41	P17/PW-M0	VR DATA	O	Data output of VOLUME IC M62429
18	NC	NC	—	—	42	NC	NC	O	—
19	P85/AN5	NC	O	L	43	PO0	XSMUTE	O	Rear mute (N ch SELECT) H: OFF, L: ON
20	P86/AN6	NC	O	L	44	PO1	XCMUTE	O	Center mute (N ch SELECT) H: OFF, L: ON
21	P87/AN7	NC	O	L	45	PO2	NC	O	—
22	P71/INT1	NC	O	L	46	PO3	OUTSEL PRO	O	(N ch SELECT) *
23	P72/INT2 /TOIN	NC	O	L	47	PO4	OUTSEL PB	O	(N ch SELECT) *
24	NC	NC	—	—	48	NC	NC	—	—

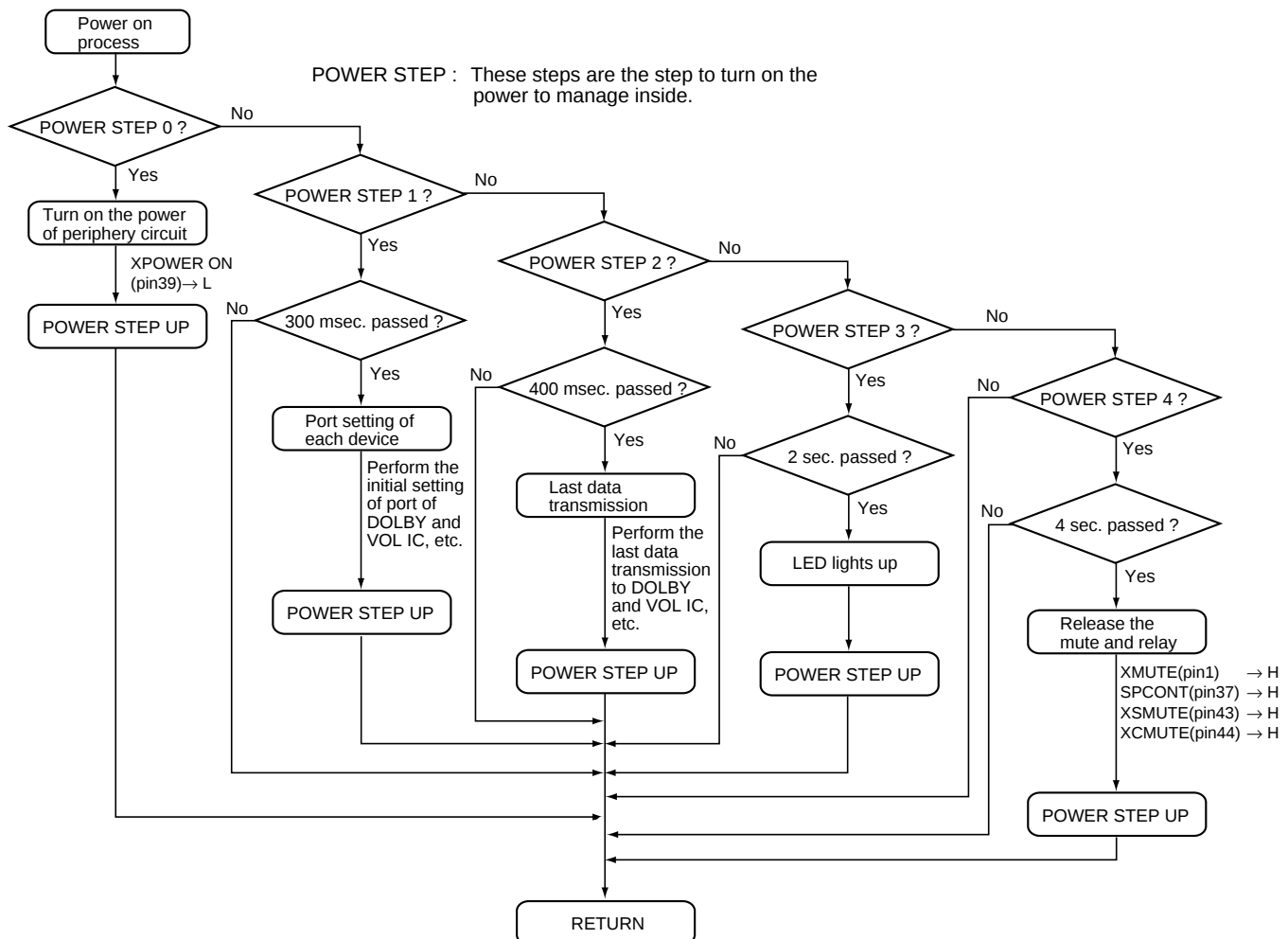
* (N ch SELECT)

Mode Port Name	CD/TX through	CD/TX PRO/SF	MD/TC through	MD/TC PRO/SF	DVD through	DVD PRO/SF	VCR through	VCR PRO/SF
FUNC A	L	L	L	L	H	H	H	H
FUNC B	L	L	H	H	H	H	L	L
OUTSEL PB	H	H	L	H	H	H	H	H
OUTSEL PRO	H	L	H	L	L	L	L	L

• Rise-up sequence after AC power applied of processor microcomputer



• Power on sequence of processor microcomputer



7.2 DIAGNOSIS

■ DETAILS OF ERROR DISPLAY

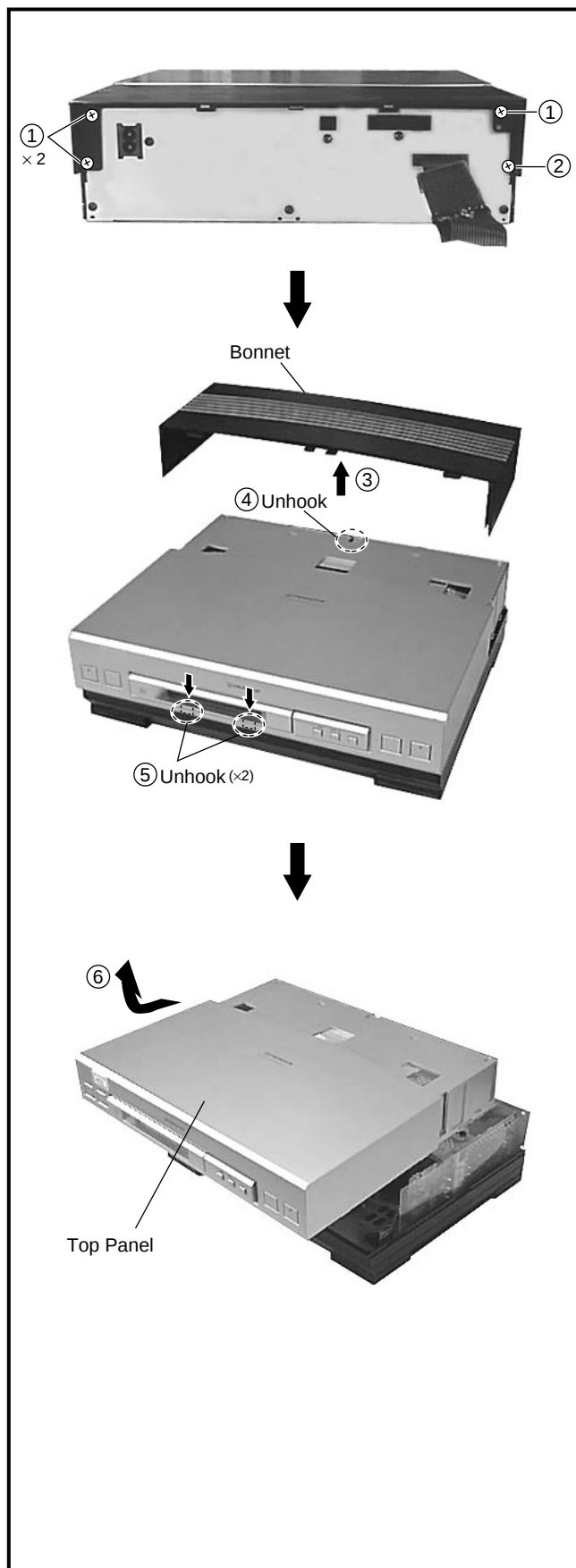
Error Display	Details of Error	Measure
Can't REC	● DEFECT occurred 10 times continuously during REC-PLAY. ● Recordable cluster became 0 since DEFECT occurred during REC-PLAY. ● Address is unreadable. REC state can not be set for 20 seconds even after try again.	● Check if there are scratches, dusts, fingerprints, or black spots on disc. Check if disc fluctuates eccentrically or moves up and down largely.
Can't COPY	● Determined as follows according to the channel status of the signals input from D-IN during REC-PAUSE or REC-PLAY. 1. Other than audio 2. Other than consumer use 3. Copy NG due to inversion of COPY bit of CD	● Check if CD is copy-proof. (Example: CD-R, etc.)
DIN UNLOCK	● The following occurred for digital signal input from D-IN during REC-PAUSE, REC-PLAY, or CD FUNC playback 1. Digital IN PLL unlocked. 2. Locked at other than FS = 32, 44.1 and 48 kHz.	● Check if D-IN signal line is normal.
TOC FULL	● No area for registering music number and character information during REC-PLAY (music name, disc number, etc.)	● Replace with recording/playback disc with space for registering UTOC.
UTOCER T S R	● FTNO > LTNO. ● FTNO ≠ 0 or 1. ● UTOC recorded on DISC could not be read.	● Replace with other discs to check if UTOC data is normal.
UTOCER A	● Start address > End address.	● Replace with other discs to check if UTOC data is normal.
UTOCER L 0 1 2 4	● Any one data of UTOC 0 to 4 has looped.	● Replace with other discs to check if UTOC data is normal.
NOT AUDIO	● Data not for audio is recorded for TNO track mode currently selected.	● Select other TNO or replace with other discs.
? DISC	● Data called MINI of system ID written in ASCII codes in TOC is incorrect. ● Disc type written in TOC is not pre-mastered MD, recording MD, or hybrid MD.	● Disc is outside specifications. Replace with different disc and check.
DISC FULL	● No recordable space when attempted to set REC-PAUSE.	● Replace with different disc with recording space.
Playback MD	● Disc only for playback was loaded when attempted to set REC-PAUSE or edit.	● Disc is for playback only. Replace with disc for recording.
PROTECTED	● Attempted to record or edit even through REC-proof knob of disc for recording was in the REC-proof state. ● Attempted to edit track with write-protect according to information on UTOC.	● Track attempted to be edited is write-protected. Try again with different track. ● Restore the REC-proof knob and try again.
Can't EDIT	● Editing conditions were not satisfied for each editing function.	● Operating method is wrong. Try again using correct method.
DISC ER [DISC ER R DISC ER S DISC ER W]	● Data read was incorrect or could not be read properly. ● Error occurred during music data recording and recording could not be performed correctly. ● Music data READ search time exceeded ● REC PAUSE shift abnormality (search time exceeded) ● SD WRITE (search time exceeded)	● Faulty TOC or UTOC data or scratch on disc. Replaced with other discs.

Error Display	Details of Error	Measure
? DISC	● TOC read was incorrect or could not be read properly.	● The TOC data recorded on the disc do not comply with MD Standards, so try using another disc. ● The disc may be scratched or damaged, so try using another disc.
UTOCER W	● Fault occurred during rewriting of UTOC rewriting, and rewriting could not be performed correctly.	● Scratch on disc. Replaced with other discs.
? DISC	● Inserted a disc but could not bring in FOCUS.	● Check if there are scratches, dusts, fingerprints, or black spots on disc. Check if disc fluctuates eccentrically or moves up and down largely.
MEM. FULL	● The DRAM has become filled with music data, but they can not be written (to the disc).	● Check if there are scratches, dusts, fingerprints, or black spots on disc. Check if disc fluctuates eccentrically or moves up and down largely.
BLANK DISC	● After reading UTOC, total number of TNO and NAME characters was 0.	● Record and check if disc is recordable.
DEFECT	● Focus execution error, etc. occurred due to shock during REC-PLAY.	● Check if there are scratches, dusts, fingerprints, or black spots on disc. Check if disc fluctuates eccentrically or moves up and down largely.
UTOCER W	● UTOC read was correct but could not be rewrite it.	● Check to see if the recording head contact is correct or if there are any disconnections between the board and the recording head.
EEPROM ER	● The EEPROM data are incorrect.	● Try doing a Preliminary Adjustment and a normal Adjustment. If the problem still persists, replace the EEPROM.
MECH ER 3E 3M 3L 3D 2E 2M 2L 2D 1E 1M 1L 1D	● Never completes EJECT. ● Never moves HEAD UP. ● Never moves HEAD DOWN. ● The set microcomputer and MD mechanism microcomputer are not communicating properly.	
SIO ERROR	● It can't communicate with system control IC and MD mechanism control IC.	● Check if communication line with the MD mechanism assy and connector is normal.

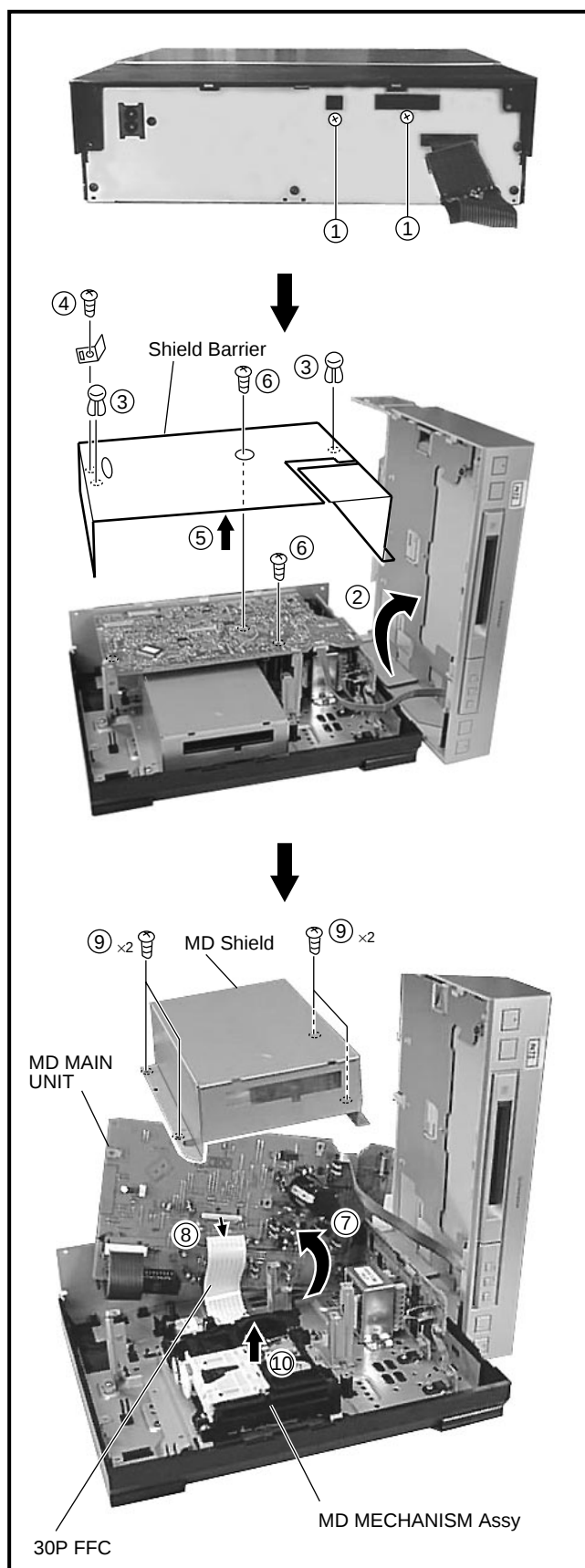
7.3 DISASSEMBLY

7.3.1 MINIDISC RECORDER (MJ-L5)

(1) Bonnet and Top Panel



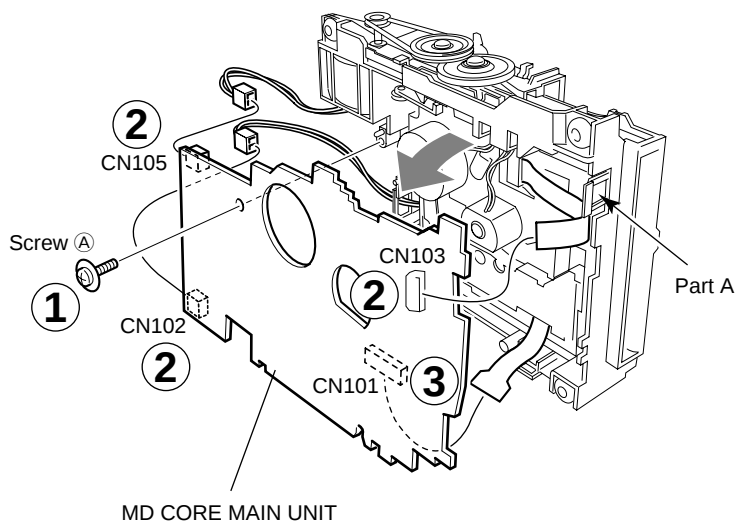
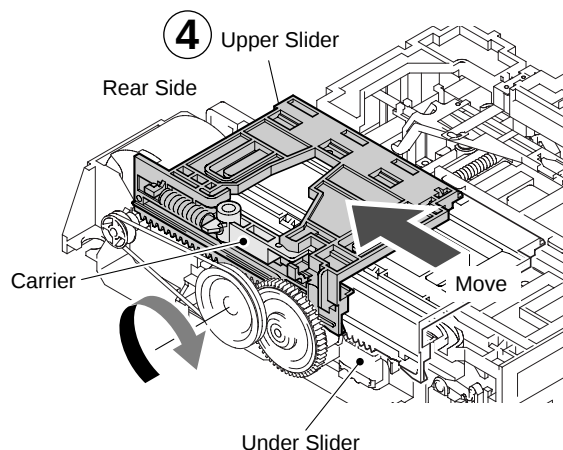
(2) MD MAIN UNIT and MD MECHANISM ASSY



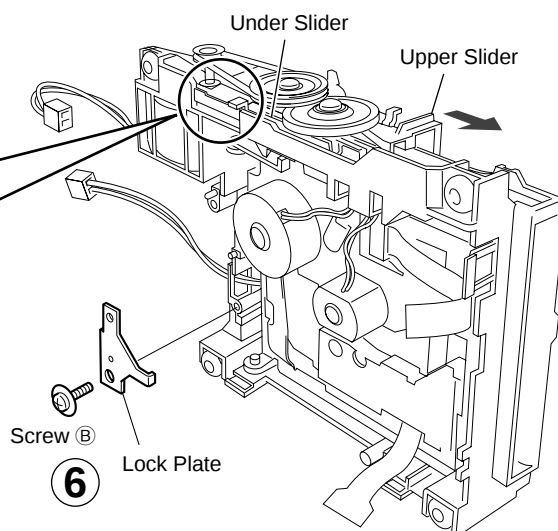
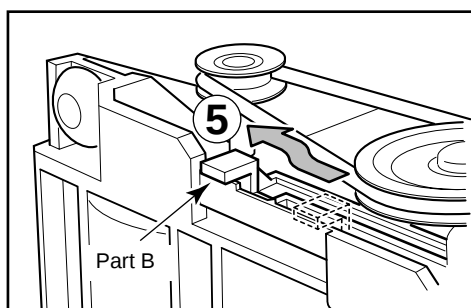
(3) MD MECHANISM ASSY

■ Removal of the Servo Mechanism Assy

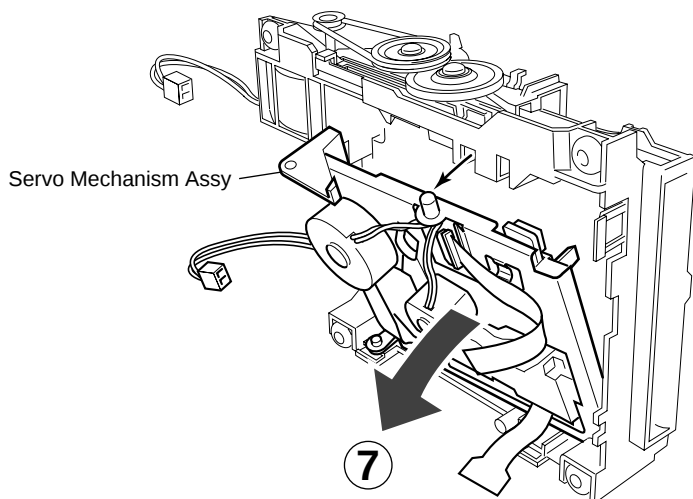
- ① Remove the screw (A).
- ② Disconnect the connectors (CN102, CN103, CN105), open the hook of part A, and tilt the upper side of the MD CORE MAIN UNIT to the front.
- ③ Disconnect the connector (CN101) at the rear of the MD CORE MAIN UNIT and remove the MD CORE MAIN UNIT.
- ④ After the Carrier has been pushed in, move the Upper Slider to the rear and stop it at the position where the Under Slider starts to move.



- ⑤ Shift part B to the position shown in the figure while raising the Under Slider. (At the same time, the Upper Slider moves to the front.)
- ⑥ Remove the Lock Plate. (One screw (B))



- ⑦ Remove the Servo Mechanism Assy.

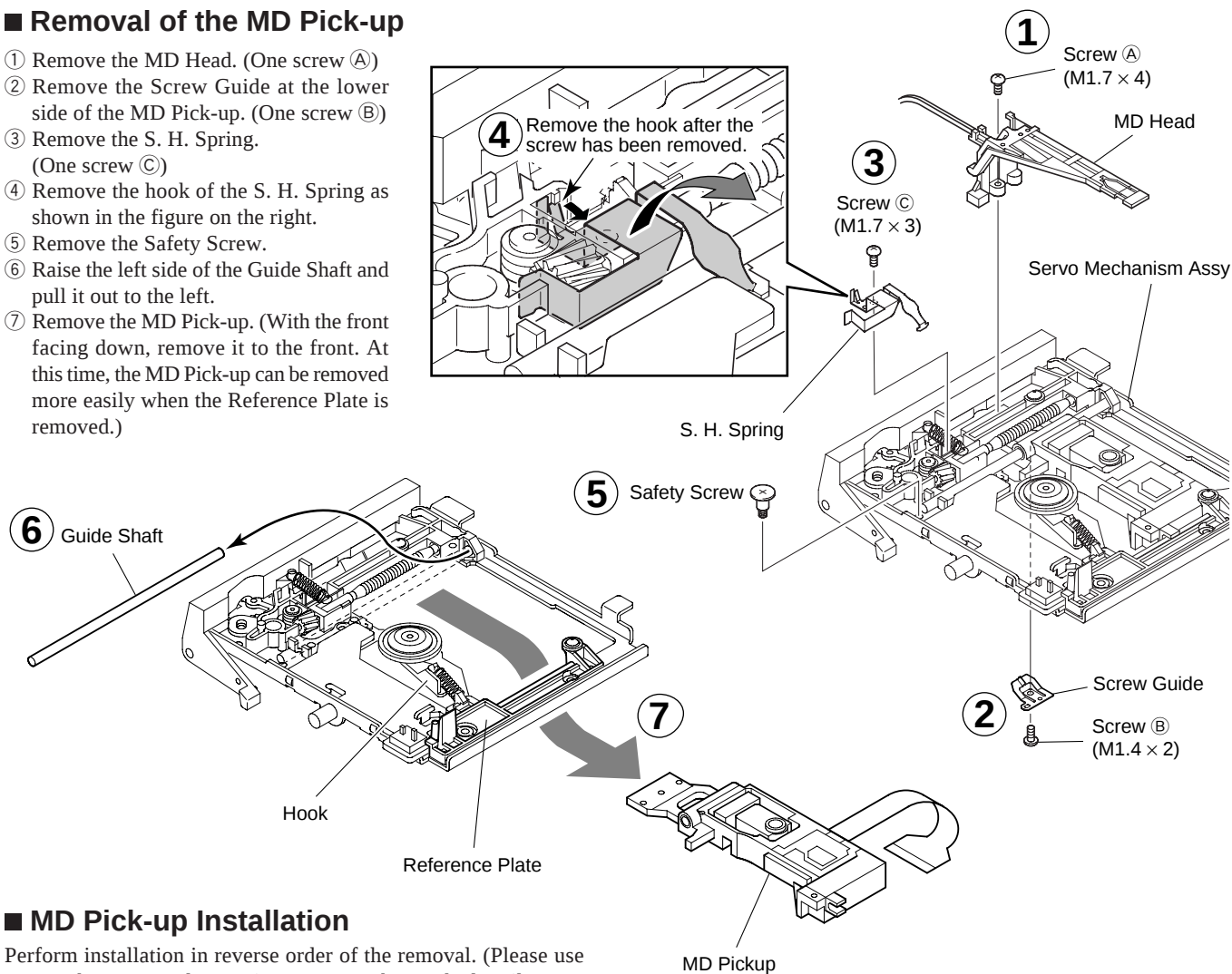


■ Caution for the time of installation of the servo mechanism assy

Move the MD Pick-up to the innermost circumference.
After installation of the servo mechanism assembly, shift the Upper Slider to the rear. (The Under Slider moves at the same time, and the servo mechanism assy is fixed. When the Under Slider is slide, this becomes the reason for switching ring catching.)

■ Removal of the MD Pick-up

- ① Remove the MD Head. (One screw (A))
- ② Remove the Screw Guide at the lower side of the MD Pick-up. (One screw (B))
- ③ Remove the S. H. Spring. (One screw (C))
- ④ Remove the hook of the S. H. Spring as shown in the figure on the right.
- ⑤ Remove the Safety Screw.
- ⑥ Raise the left side of the Guide Shaft and pull it out to the left.
- ⑦ Remove the MD Pick-up. (With the front facing down, remove it to the front. At this time, the MD Pick-up can be removed more easily when the Reference Plate is removed.)

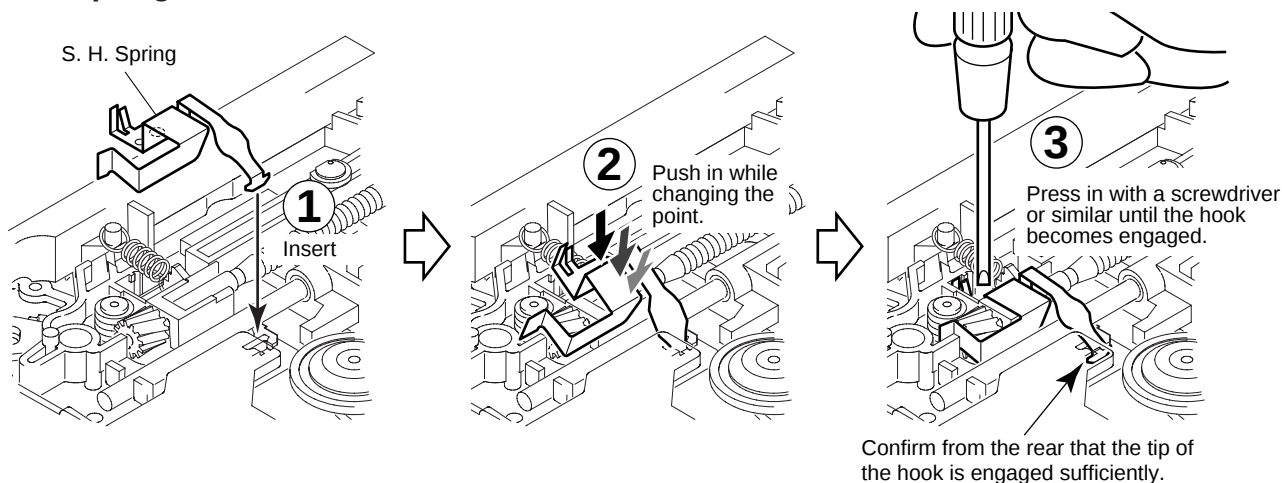


■ MD Pick-up Installation

Perform installation in reverse order of the removal. (Please use care as the MD Head mounting screw can be crushed easily.
MD Head mounting screw tightening torque: 0.8 kg • cm

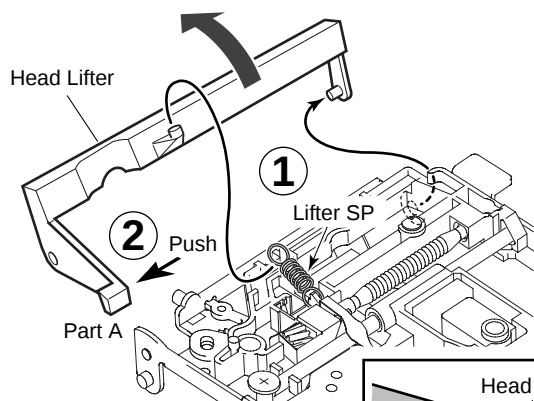
When the Reference Plate has been removed, confirm that the hook is engaged with the shaft of the spindle motor. (Take care that the mounting reference boss does not ride up.)

■ S. H. Spring Installation



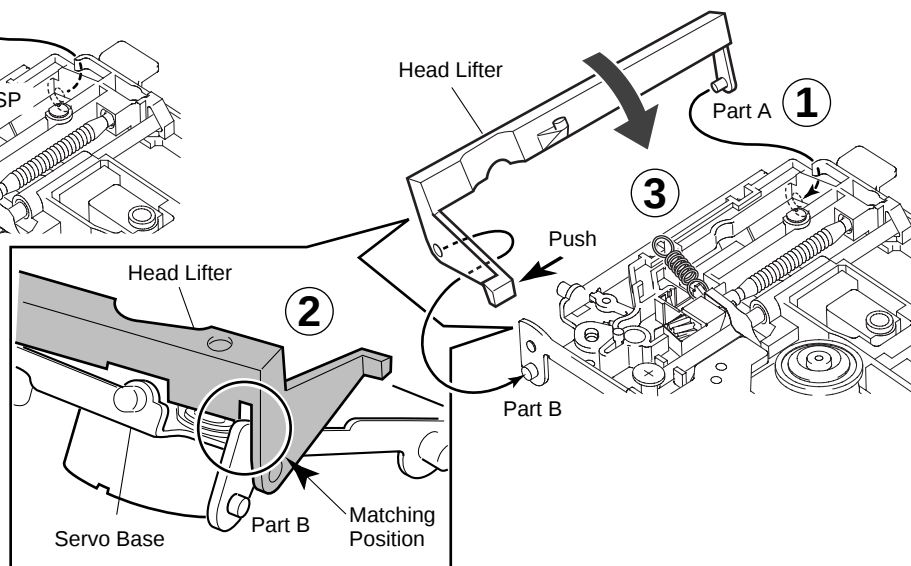
■ Removal of the Head Lifter

- ① Remove the Lifter SP.
- ② Tilt the Head Lifter to the rear and push part A to disengage it.



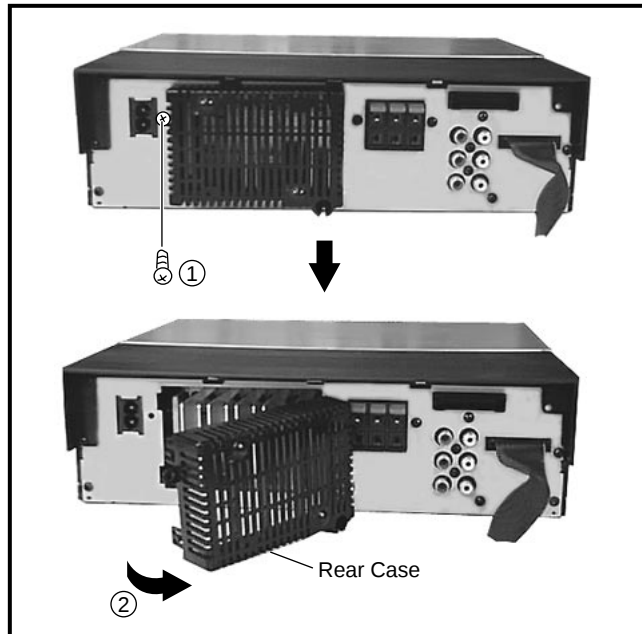
■ Head Lifter Installation

- ① Install part A in the Servo Base with the Head Lifter tilted to the back.
- ② Match the Head Lifter and the Servo Base as shown in the figure, and then engage part B.
- ③ While holding part B with your hand, tilt the Head Lifter to the front and install the Lifter SP.

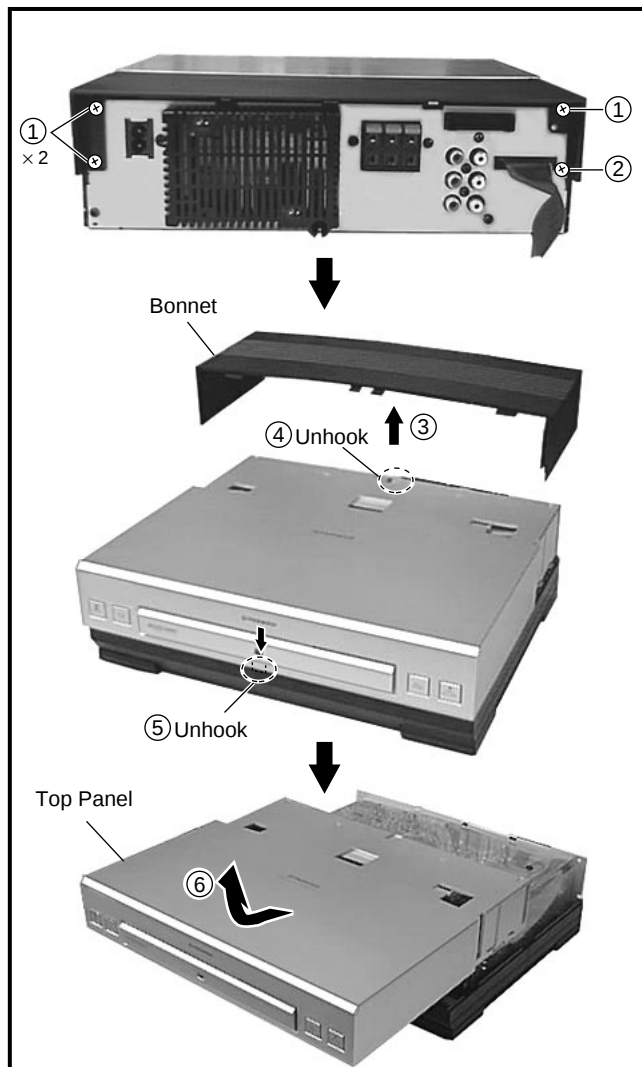


7.3.2 SURROUND PROCESSOR (SP-L5)

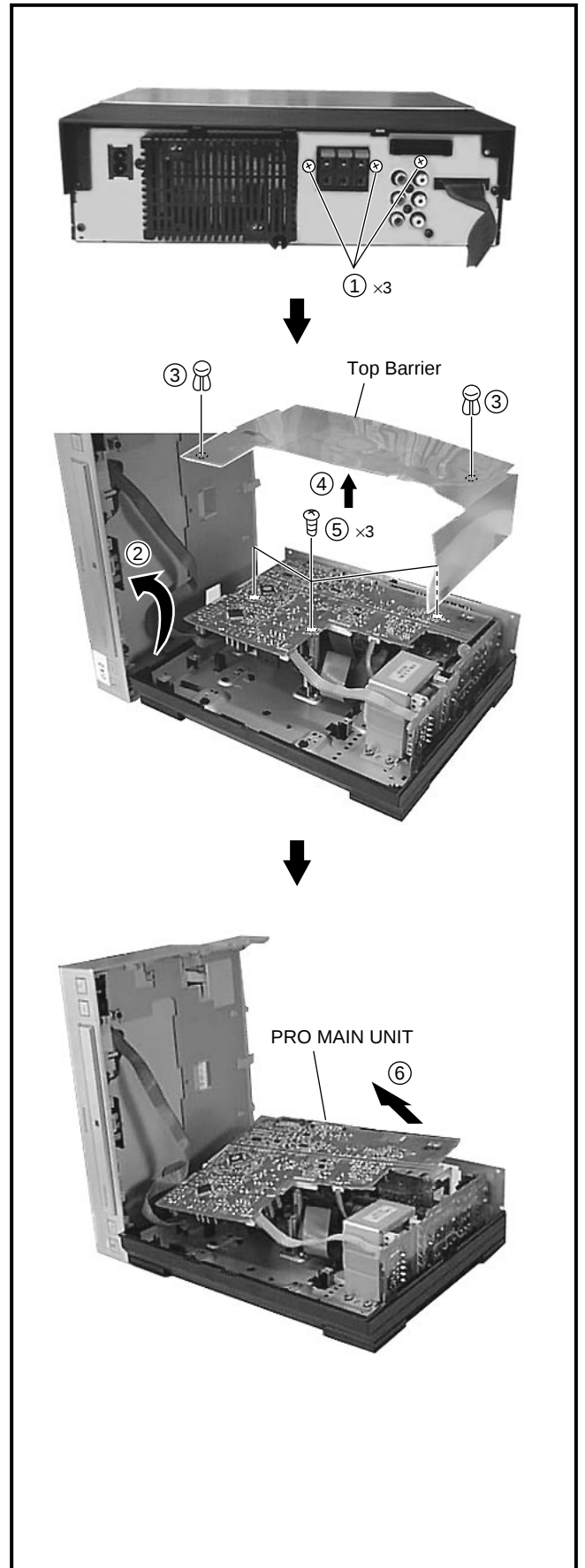
(1) Rear Case



(2) Bonnet and Top Panel

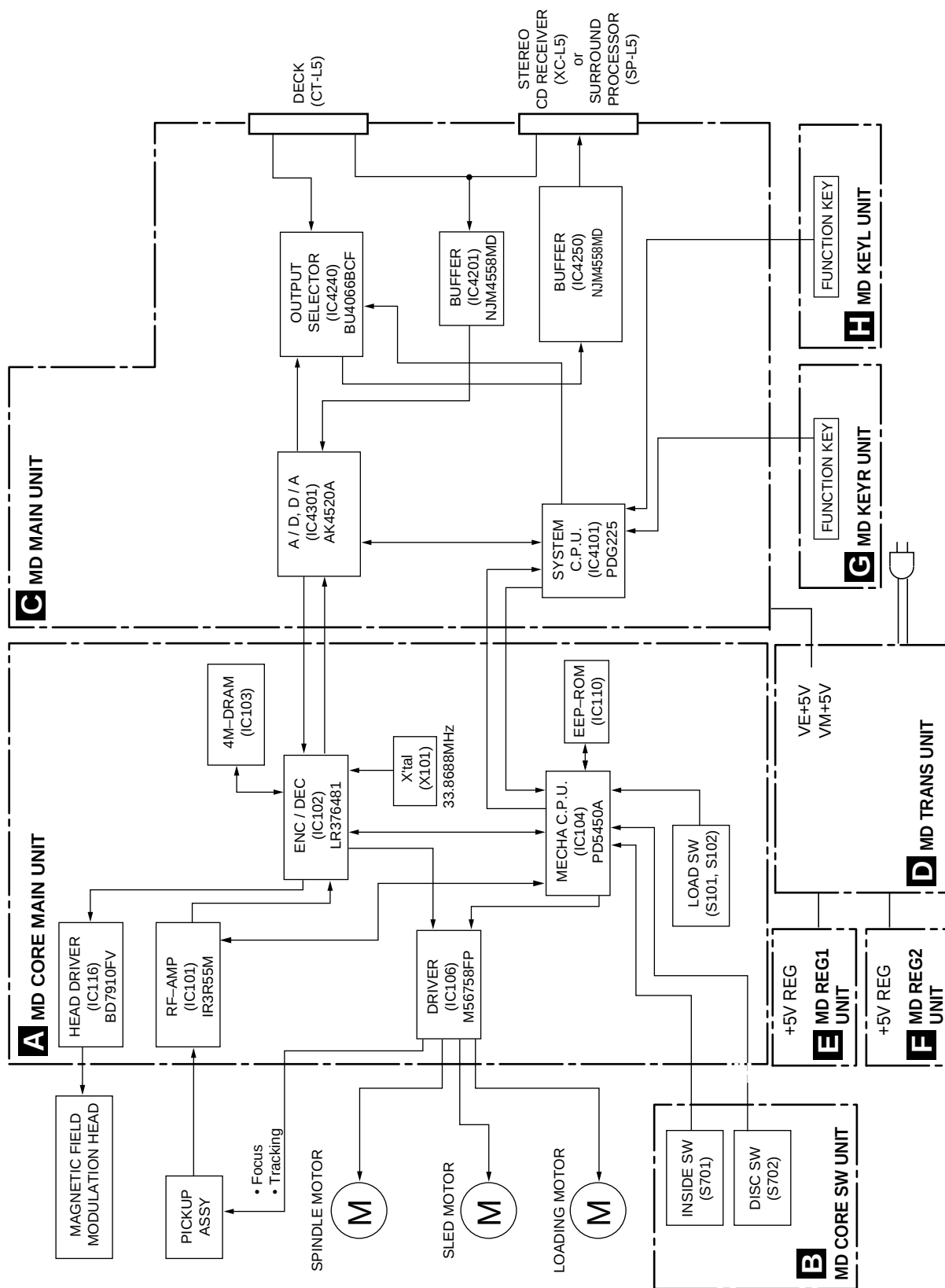


(3) PRO MAIN UNIT



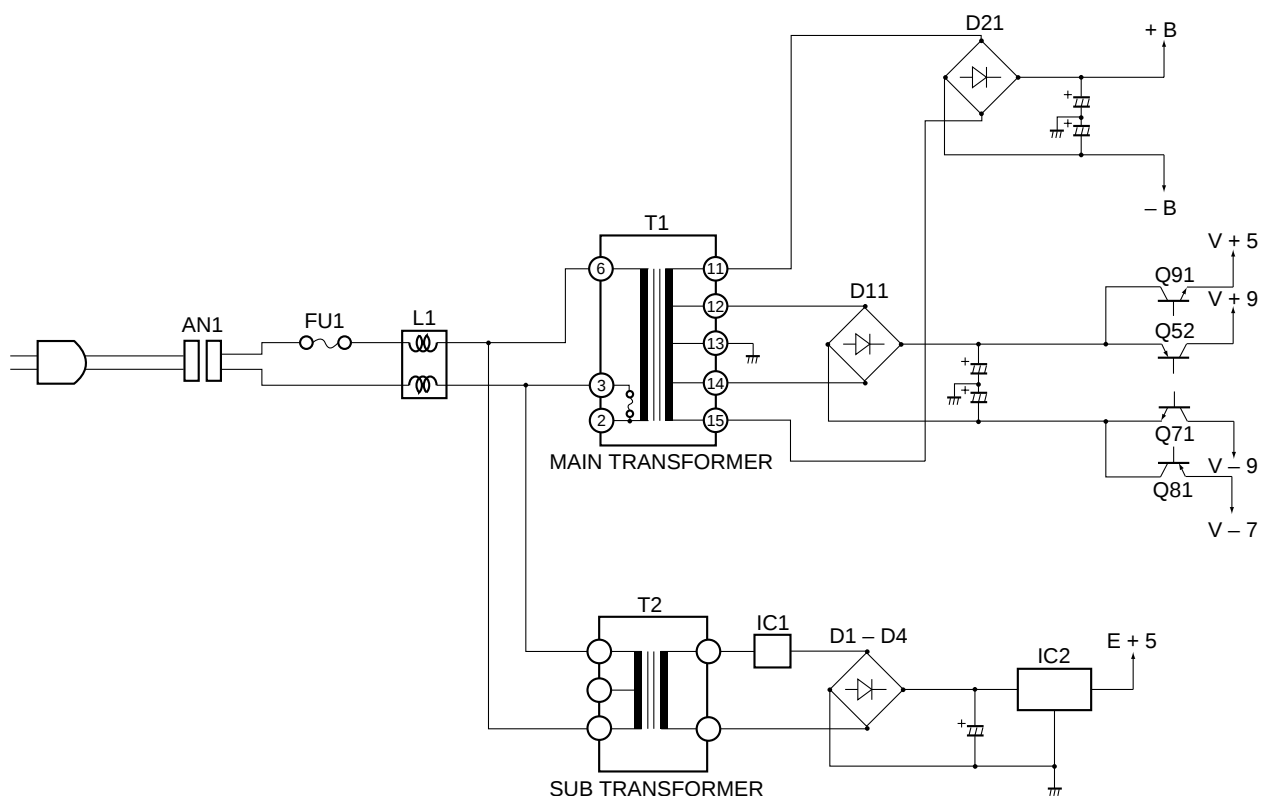
7.4 BLOCK DIAGRAM

7.4.1 MINIDISC RECORDER (MJ-L5)

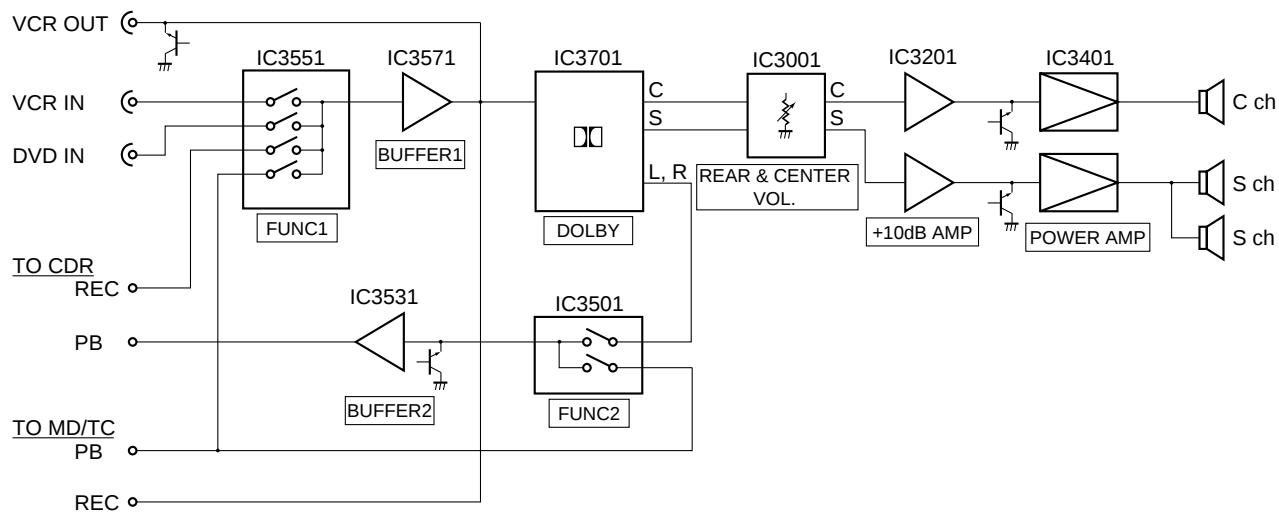


7.4.2 SURROUND PROCESSOR (SP-L5)

■ POWER SUPPLY BLOCK



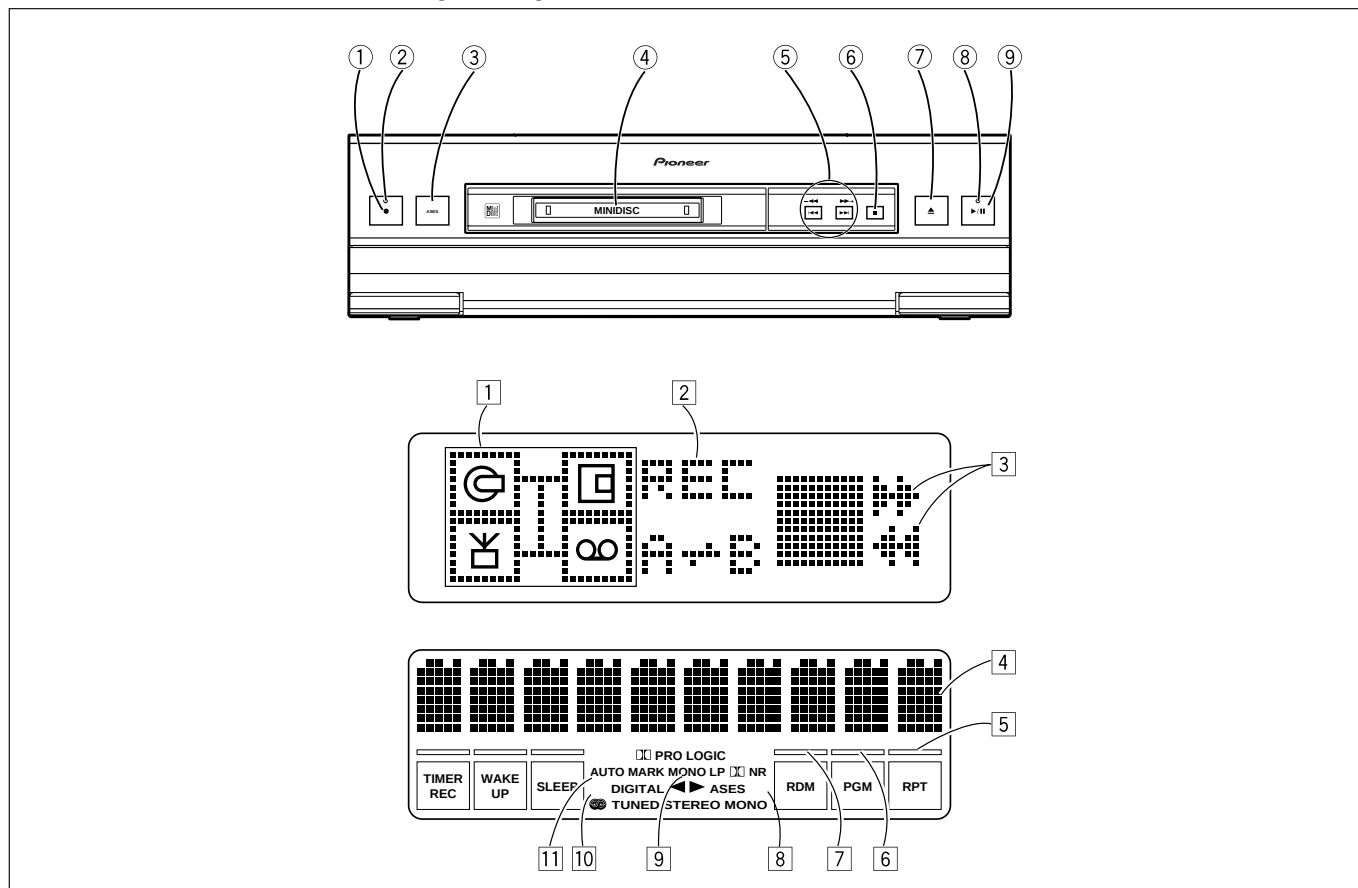
■ SIGNAL ROUTE BLOCK



8. PANEL FACILITIES AND SPECIFICATIONS

8.1 PANEL FACILITIES

8.1.1 MINIDISC RECORDER (MJ-L5)

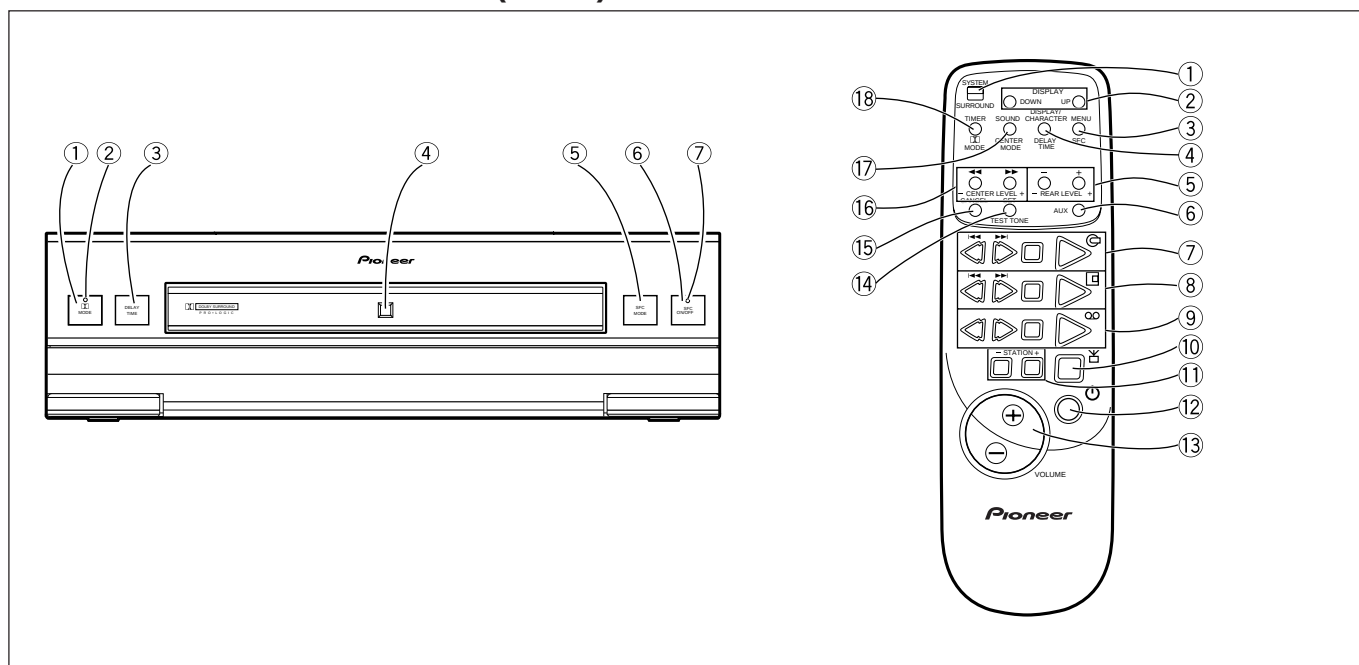


- ① **Recording button (●)**
- ② **Recording Indicator**
(lights when MD is Recording)
- ③ **ASES button**
- ④ **MINIDISC slot**
- ⑤ **Manual/track search buttons**
(◀◀/▶▶, ▶▶/▶▶)
- ⑥ **Stop button (■)**
- ⑦ **Disc Eject button (▲)**
- ⑧ **Play indicator**
- ⑨ **Play/Pause button (▶/||)**

This unit is not provided with its own display section; the following descriptions refer to the display shown on the optional CD stereo receiver XC-L5 when it is combined with the MiniDisc Recorder MJ-L5.

- ① **Function display:** CD (Ⓢ), Mini Disc (Ⓜ), Tuner (Ⓣ), Tape (Ⓣ). The selected function will appear emphasized in one of the following ways:
In DISP MODE 1: Slightly larger display typeface
In DISP MODE 2: Surrounded by frame
* Consult the CD receiver's Operating Instructions for details regarding switching the display mode.
- ② **Lights during recording.**
- ③ **Lights during Fast Forward (▶▶) or Reverse (◀◀)**
- ④ **Displays characters and numerals**
- ⑤ **Lights during repeat play**
- ⑥ **Lights during program setting and program play**
- ⑦ **Lights during random play**
- ⑧ **Lights during A.S.E.S setting and operation.**
- ⑨ **Lights to indicate monaural long-play mode.**
- ⑩ **Lights to indicate digital input to MiniDisc.**
- ⑪ **Lights to indicate Auto Mark function ON.**

8.1.2 SURROUND PROCESSOR (SP-L5)



① (Dolby) Mode button

② (Dolby) MODE indicator

③ Delay Time button

④ SURROUND indicator

Lights when (Dolby) mode is selected and when SFC is set to ON.

⑤ SFC MODE button

⑥ SFC ON/OFF button

⑦ SFC ON/OFF indicator

① **SYSTEM/SURROUND selector**

This selector is used to switch between system components (XC-L5, CT-L5, and MJ-L5) and main unit operations. When set to SYSTEM, the remote control unit can be used to operate the CD receiver, cassette deck, and MiniDisc recorder. Consult the Operating Instructions for the CD receiver and MiniDisc recorder regarding operations for the respective component. When set to SURROUND, the remote control unit can be used to operate the main unit.

② **DISPLAY (UP/DOWN) buttons**

③ **SFC button**

*MENU button

④ **DELAY TIME button**

*DISPLAY/CHARACTER button

⑤ **REAR LEVEL (+/-) buttons**

*+/- buttons

⑥ **AUX button**

⑦ (CD) operation buttons

(Play/pause , Stop . Track search ,)

⑧ (MD) operation buttons

(Play/pause , Stop . Track search ,)

⑨ (TAPE) operation buttons

(Play , Stop , Fast ,)

⑩ (FM/AM) button

⑪ **STATION (+/-) buttons**

⑫ **STANDBY/ON button**

⑬ **VOLUME (+/-) buttons**

⑭ **TEST TONE button**

*SET button

⑮ **CANCEL button**

⑯ **CENTER LEVEL (+/-) buttons**

* buttons

⑰ **CENTER MODE button**

*SOUND button

⑱ (Dolby) MODE button

*TIMER button

* Confirm that the SYSTEM/SURROUND selector is set to the SYSTEM side before pressing these buttons.

8.2 SPECIFICATIONS

8.2.1 MINIDISC RECORDER (MJ-L5)

Recording Method	Magnetic field modulation overwriting type
Playback Method	Non-contact optical type
Sampling Frequency	44.1 kHz, 32 kHz, 48 kHz
Frequency Response	20 Hz - 20 kHz
Signal-to-Noise Ratio	98 dB
Wow and Flutter	Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Power Requirements	AC 230V, 50/60 Hz
Power Consumption	20 W
Dimensions	290 (W) x 86 (H) x 277 (D) mm
Weight	2.6 kg

Accessories

Operating Instructions	1
Optical fiber cable	1
Power cord	1
Warranty card	1

NOTE:

Specifications and design subject to possible modification without notice, due to improvement.

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8.2.2 SURROUND PROCESSOR (SP-L5)

Continuous Power Center (RMS)	30 W (1 kHz, THD 10%, 8 Ω)
Continuous Power Rear (RMS)	30 W (1 kHz, THD 10%, 8 Ω)
Continuous Power Center (DIN)	24 W (1 kHz, THD 1%, 8 Ω)
Continuous Power Rear (DIN)	24 W (1 kHz, THD 1%, 8 Ω)
Music Power Center (DIN)	34 W (1 kHz, THD 1%, 8 Ω)
Music Power Rear (DIN)	34 W (1 kHz, THD 1%, 8 Ω)

● Above specifications are for when the power supply is 230 V.

Power Requirements	AC 230 V, 50/60 Hz
Power Consumption	53 W
Dimensions	290 (W) x 86 (H) x 277 (D) mm
Weight	3.2 kg

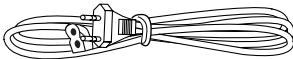
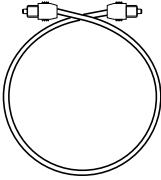
Accessories

Operating Instructions	1
Warranty Card	1
Remote control unit	1
AAA/R03 dry cell batteries	2
Power cord	1

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Accessories

MINIDISC RECORDER (MJ-L5)



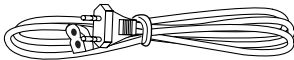
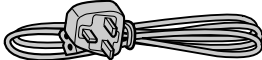
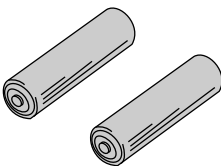
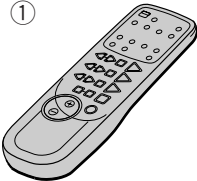
Operating Instructions
Warranty card

Optical fiber cable

Power cord (for NVXK Type)

Power cord (for MYXK Type)

SURROUND PROCESSOR (SP-L5)



① Remote control unit × 1

② AAA/R03 dry cell batteries × 2

③ Power cord × 1

● Operating Instructions × 1

● Warranty card × 1

Power cord (for NVXK Type)

Power cord (for MYXK Type)