Service Manual

ORDER NO.
RRV2201

MINIDISC RECORDER

MJ-L77

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

Type	Model	Power Requirement	Remarks
	MJ-L77		
MYXK	◯	AC220-230V	
NVXK	◯	AC230V	

- **These products are component of systems. This product does not operate normally by itself.**
  Please connect it to the STEREO CD RECEIVER XC-L77 and the DISPLAY UNIT DU-L77, an accessory of the XC-L77, for adjustment and operation inspection.

Component	Model			Service manual	Remarks
STEREO CD RECEIVER	XC-L77			RRV2187	
SPEAKER SYSTEM	S-L9-LRW	—	—	RRV2176	
	—	S-L9-A-LRW	—	RRV2176	
	—	—	S-L8-LRW	RRV2178	
STEREO CASSETTE DECK	CT-L77			RRV2199	
MINIDISC RECORDER	MJ-L77			RRV2201	This manual.

CONTENTS

1. SAFETY INFORMATION ····· 2
2. EXPLODED VIEWS AND PARTS LIST ····· 3
3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM ····· 8
4. PCB CONNECTION DIAGRAM ····· 22
5. PCB PARTS LIST ····· 29
6. ADJUSTMENT ····· 32
7. GENERAL INFORMATION ····· 43
   7.1 DIAGNOSIS ····· 43
      7.1.1 TROUBLESHOOTING ····· 43
      7.1.2 DISASSEMBLY ····· 46
   7.2 IC ····· 49
8. PANEL FACILITIES AND SPECIFICATIONS ····· 59

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PIONEER ELECTRONIC (EUROPE) N.V. Haven 1087, Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE. LTD. 253 Alexandra Road, #04-01, Singapore 159936

T – ZZE AUG. 1999 Printed in Japan

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.

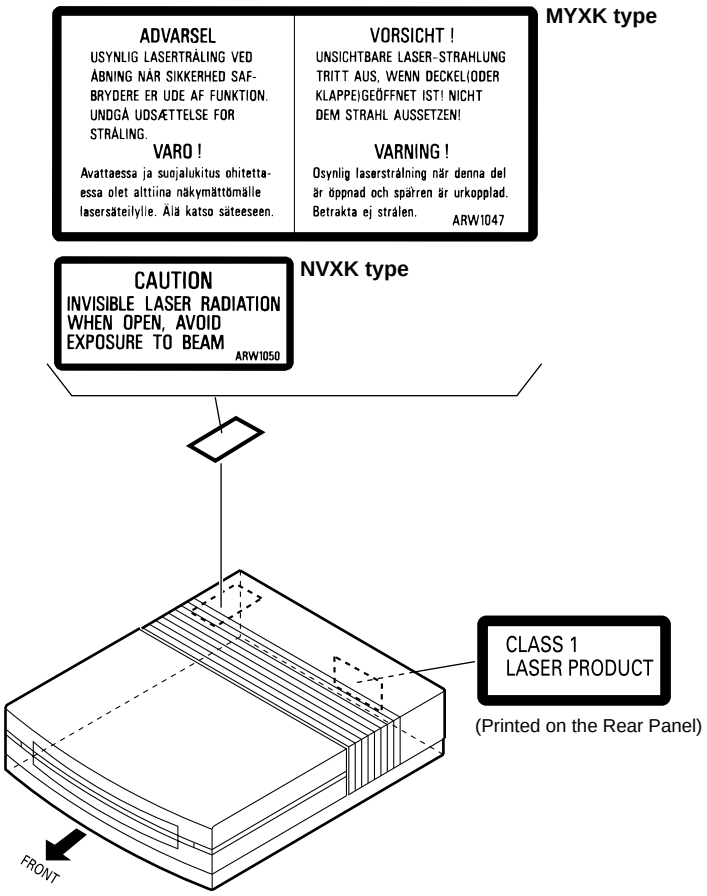
WARNING
This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.

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



Additional Laser Caution

Control method of the current through a laser diode.
The resistor R105 on the CORE MAIN UNIT ASSY (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.

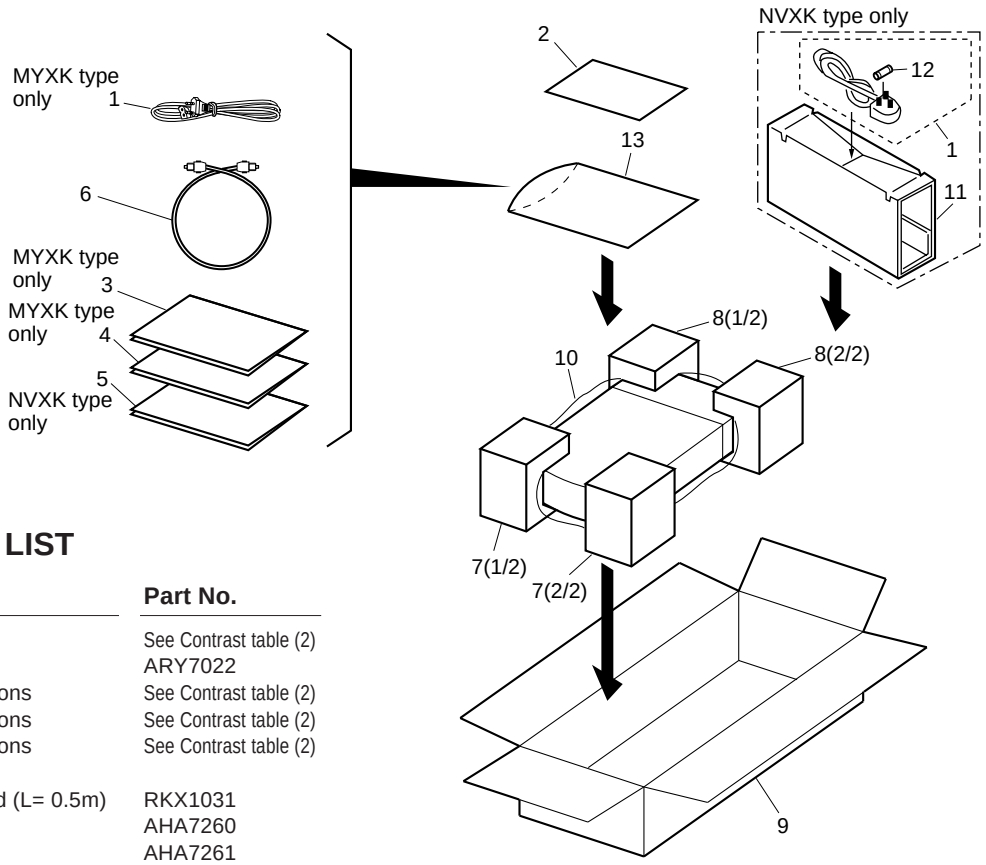
Laser Interlock Switch
The loading position detect switch S101 is set to " LOAD ON " (ON: low level, OFF: high level) position, IC104 get the " LOAD " signal, and hand the laser " LDON " signal to No. 9 terminal (LDON) of the Laser pickup assy.
Then a laser diode can be lighted exept when the level of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

∗ Refer to page 33.

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 ⚠ 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.*
● *Screw adjacent to ▼ mark on the product are used for disassembly.*

2.1 PACKING



(1) PACKING PARTS LIST

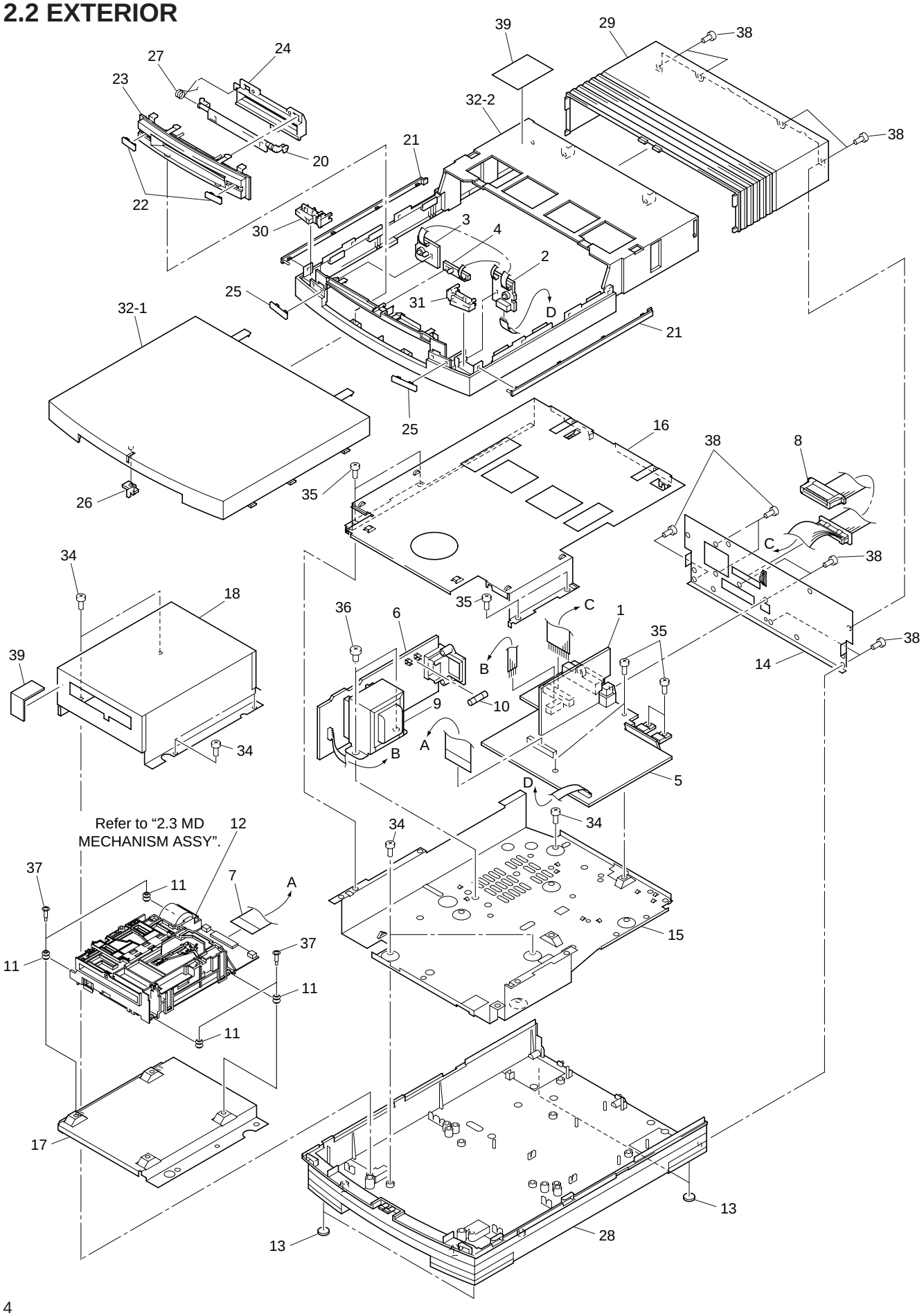
Mark	No.	Description	Part No.
⚠	1	Power Cord	See Contrast table (2)
NSP	2	Warranty Card	ARY7022
	3	Operating Instructions	See Contrast table (2)
	4	Operating Instructions	See Contrast table (2)
	5	Operating Instructions	See Contrast table (2)
	6	Optical Digital Cord (L= 0.5m)	RKX1031
	7	Pad Front	AHA7260
	8	Pad Rear	AHA7261
	9	Packing Case	See Contrast table (2)
	10	Sheet (750 × 600 × 0.5)	Z23–007
	11	Sub Packing	See Contrast table (2)
⚠	12	Fuse (5A)	See Contrast table (2)
	13	Polyethylene Bag (0.03 × 230 × 340)	Z21–038

(2) CONTRAST TABLE

MJ-L77/MYXK and NVXK are constructed the same except for the following:

Mark	No.	Symbol and Description	Part No.		Remarks
			MYXK type	NVXK type	
⚠	1	Power Cord	ADG7010	ADG7009	
	3	Operating Instructions (Swedish/Dutch/Portuguese/Spanish)	ARC7251	Not used	
	4	Operating Instructions (French/English/Italian/German)	ARE7222	Not used	
	5	Operating Instructions (English)	Not used	ARB7196	
	9	Packing Case	AHD7769	AHD7801	
	11	Sub Packing	Not used	AHD7770	
⚠	12	Fuse (5A)	Not used	AEK7001	

2.2 EXTERIOR


39
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D
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A
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5
D
Refer to “2.3 MD MECHANISM ASSY”.
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(1) EXTERIOR PARTS LIST

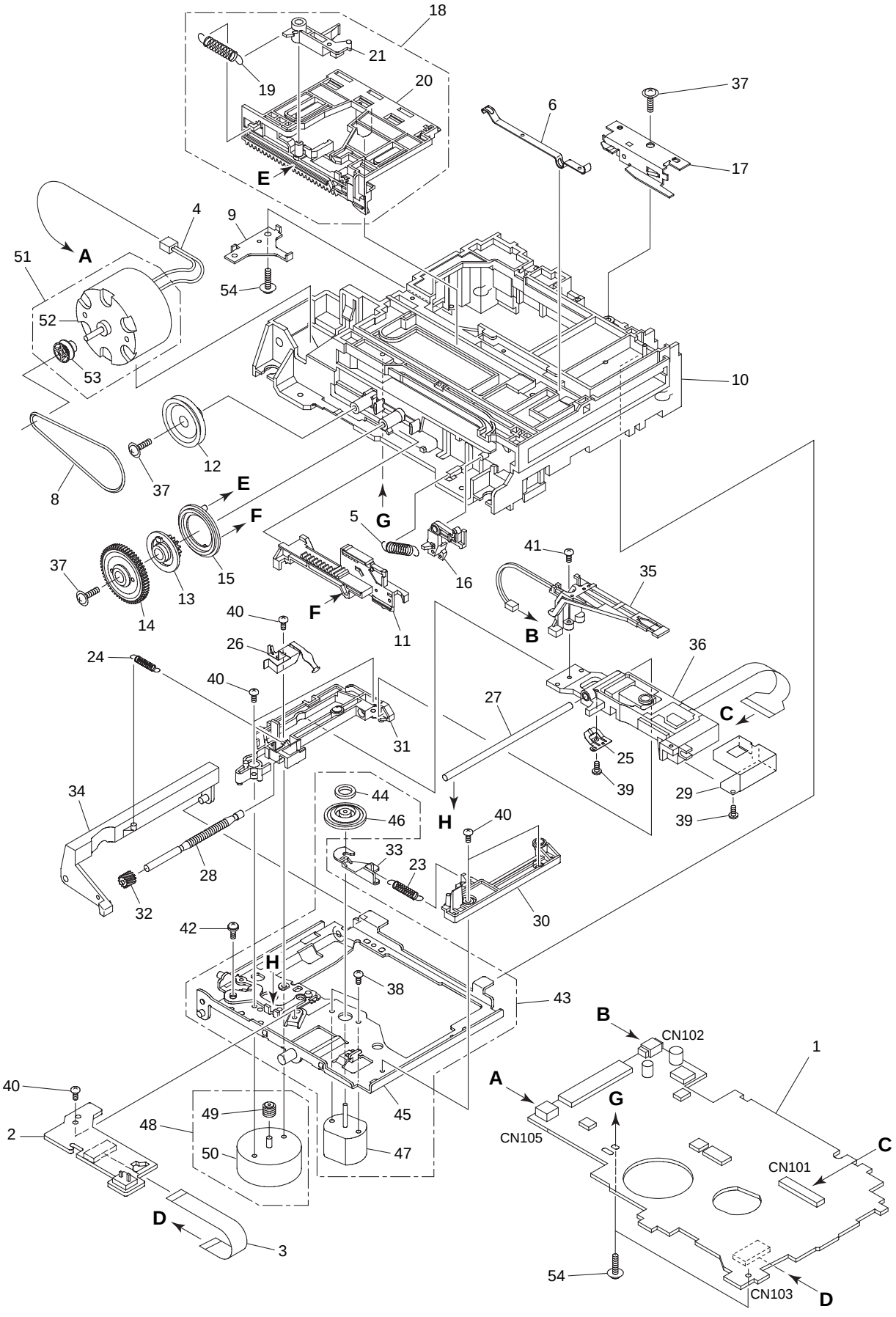
Mark	No.	Description	Part No.
	1	AF UNIT ASSY	AWU7397
	2	KEYR UNIT ASSY	AWU7398
	3	KEYL UNIT ASSY	AWU7399
	4	BLUE IND. UNIT ASSY	AWU7400
	5	MAIN UNIT ASSY	AWU7395
	6	TRANS. UNIT ASSY	AWU7396
	7	30P FFC/30V	ADD7097
	8	Cord with Plug	ADE7043
⚠	9	Power Transformer	ATT7054
⚠	10	Fuse (T200mA)	AEK1047
	11	Float Rubber	REB1328
NSP	12	MD Mechanism Assy	RXA1777
	13	Leg	AEB7090
	14	Rear Panel	See Contrast table (2)
NSP	15	Bottom Plate	ANF7016
NSP	16	Top Plate	ANF7017
	17	MD Base	ANG7191
	18	MD Shield	ANG7192
	19	• • • • • • • •	
	20	MD Flap	AAN7190
	21	Main Line	AAP7058
	22	Sub Line	AAP7060
	23	Sub Panel	AAP7061
	24	Flap Plate	AAP7062
	25	Front Line	AAP7066
	26	CL Lens	AAX7704
	27	MD Spring	ABH7154
	28	Bottom Base	AMA7014
	29	Bonnet	AMA7015
	30	Button Assy A	AWL7044
	31	Button Assy B	AWL7045
	32	Top Panel Assy	AWL7052
NSP	32-1	├ Top Panel 1	AMB7645
NSP	32-2	└ Top Panel 2	AMB7646
	33	• • • • • • • •	
	34	Screw	BBT30P060FZK
	35	Screw	BBZ30P060FMC
	36	Screw	BBZ40P060FMC
	37	Float Screw	RBA1133
	38	Screw	VPZ30P080FZK
	39	MD Spacer	AEB7181
NSP	40	Caution Label	See Contrast table (2)

(2) CONTRAST TABLE

MJ-L77/MYXK and NVXK are constructed the same except for the following:

Mark	No.	Symbol and Description	Part No.		Remarks
			MYXK type	NVXK type	
	14	Rear Panel	ANC7828	ANC7830	
NSP	40	Caution Label	ARW1047	ARW1050	

2.3 MD MECHANISM ASSY

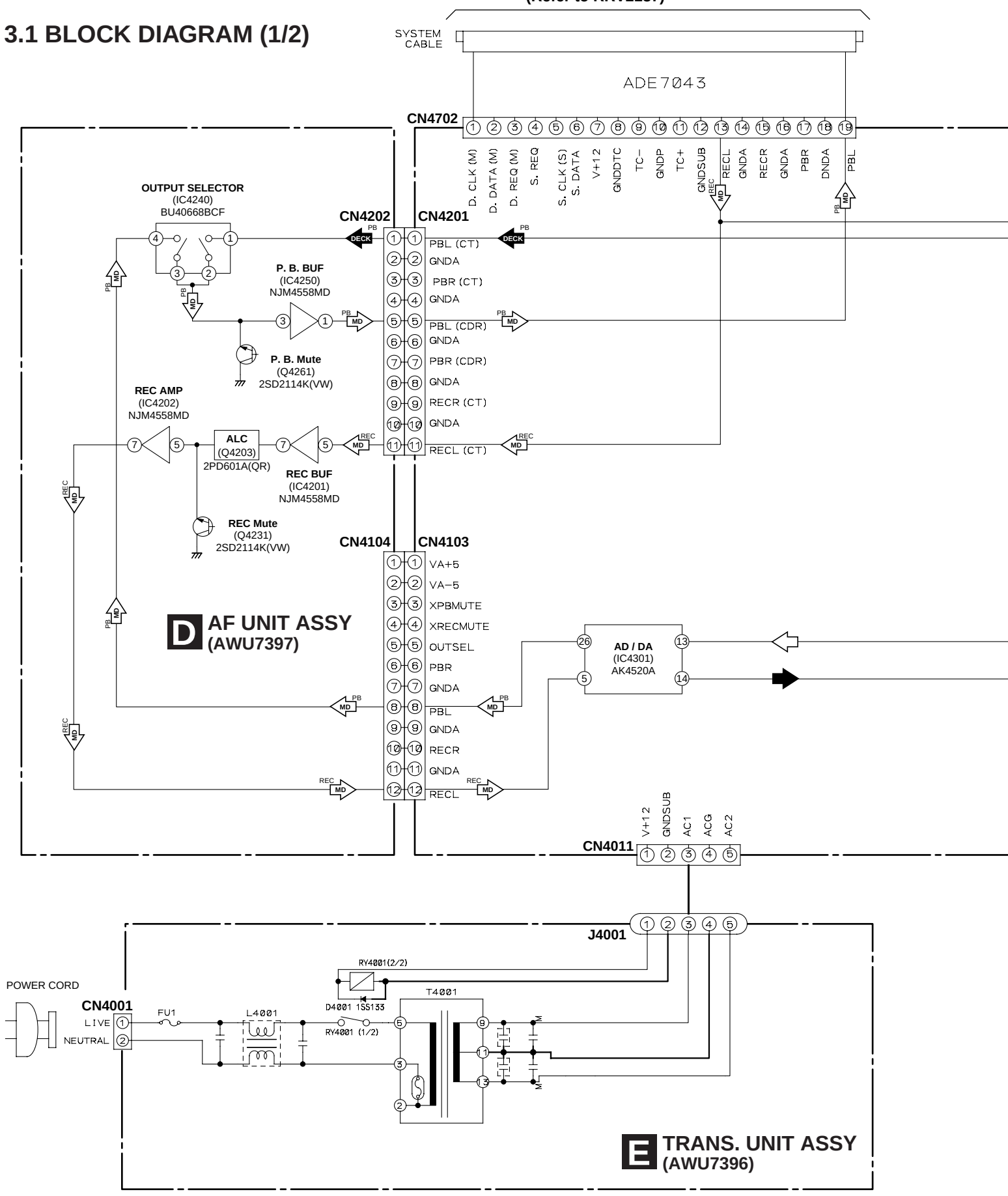


■ MD MECHANISM ASSY PARTS LIST

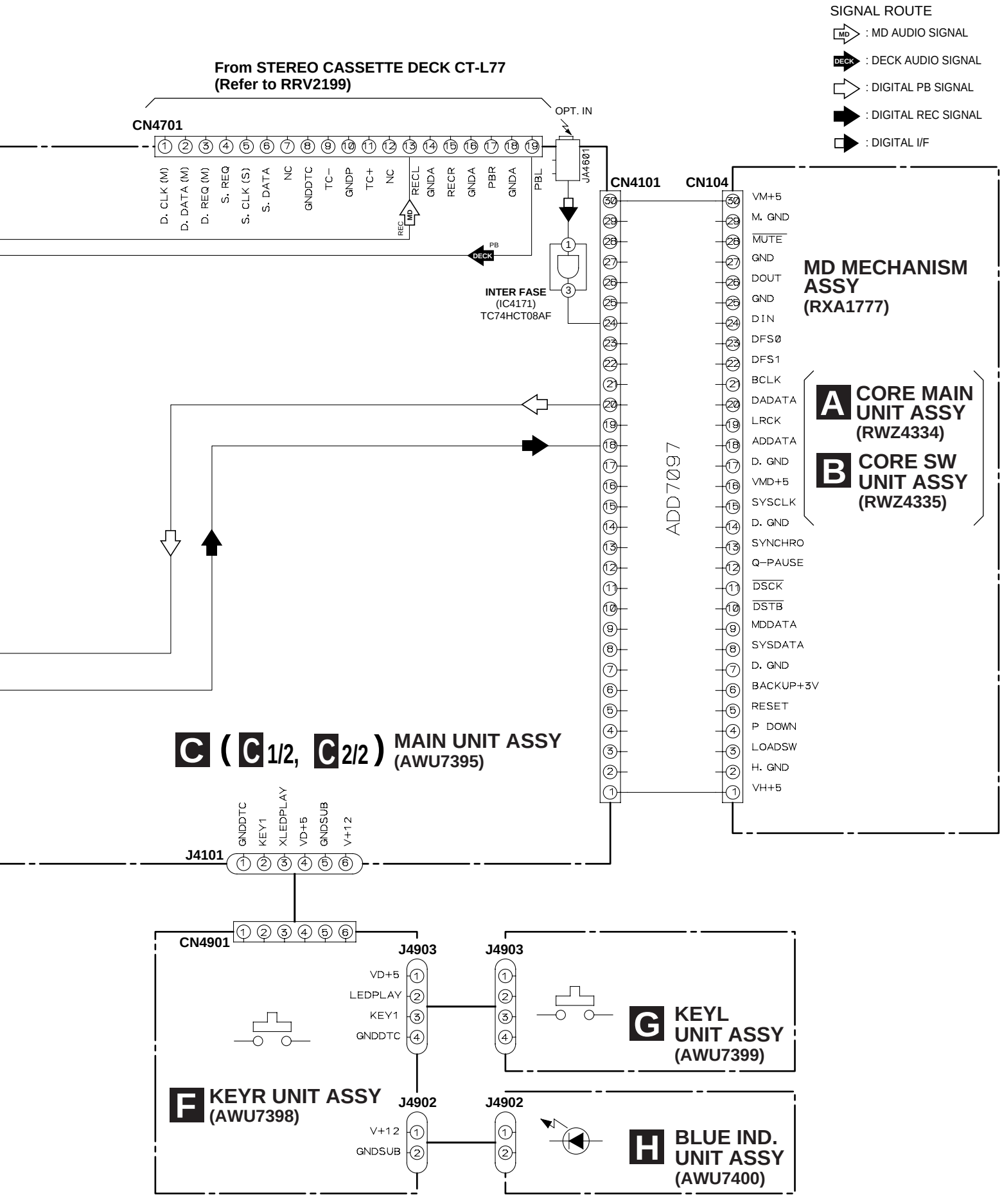
Mark	No.	Description	Part No.
	1	CORE MAIN UNIT ASSY	RWZ4334
NSP	2	CORE SW UNIT ASSY	RWZ4335
	3	Lead Card 7P	RDD1403
	4	Lead Wire	RKP1814
	5	Lever Spring	RBH1463
	6	Clamp Spring 1	RBK1074
	7	• • • • • • • •	
	8	Loading Belt	REB1329
	9	Lock Plate	RNE1949
	10	Loading Base	RNK2323
	11	Under Slider	RNK2314
	12	Gear Pulley	RNK2316
	13	Drive Gear	RNK2317
	14	Clutch Gear	RNK2318
	15	Flip Disk	RNK2319
	16	SW Lever	RNK2320
	17	Shutter Assy	RXA1774
NSP	18	Upper Slider Assy	RXA1782
	19	Eject Spring	RBH1461
	20	Upper Slider	RNK2324
	21	Carrier	RNK2315
	22	• • • • • • • •	
	23	Spindle Spring	RBH1460
	24	Lifter Spring	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
	31	S. Holder	RNK2307
	32	Worm Wheel	RNK2309
	33	Hook	RNK2310
	34	Head Lifter	RNK2311
	35	MD Head	RPB1063
	36	MD Pick-up	RWY1019
	37	Screw	Z39-019
	38	Screw	JFZ17P020FZK
	39	Screw	JGZ14P020FMC
	40	Screw	JGZ17P028FMC
	41	Screw	JGZ17P040FMC
	42	Screw	PMB20P040FMC
	43	Servo Base Assy	REA1283
NSP	44	Clamp Magnet	RMF1002
NSP	45	Servo Base	RNE1946
NSP	46	Disc Table	RNK2305
NSP	47	Spindle Motor	RXM1091
	48	Carriage Motor Assy	REA1284
	49	Worm	RNK2308
NSP	50	Carriage Motor	RXM1090
	51	Loading Motor Assy	REA1290
	52	DC Motor /0.75W	PXM1010
	53	CA Pulley	RNK2322
	54	Screw	BPZ20P080FMC

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

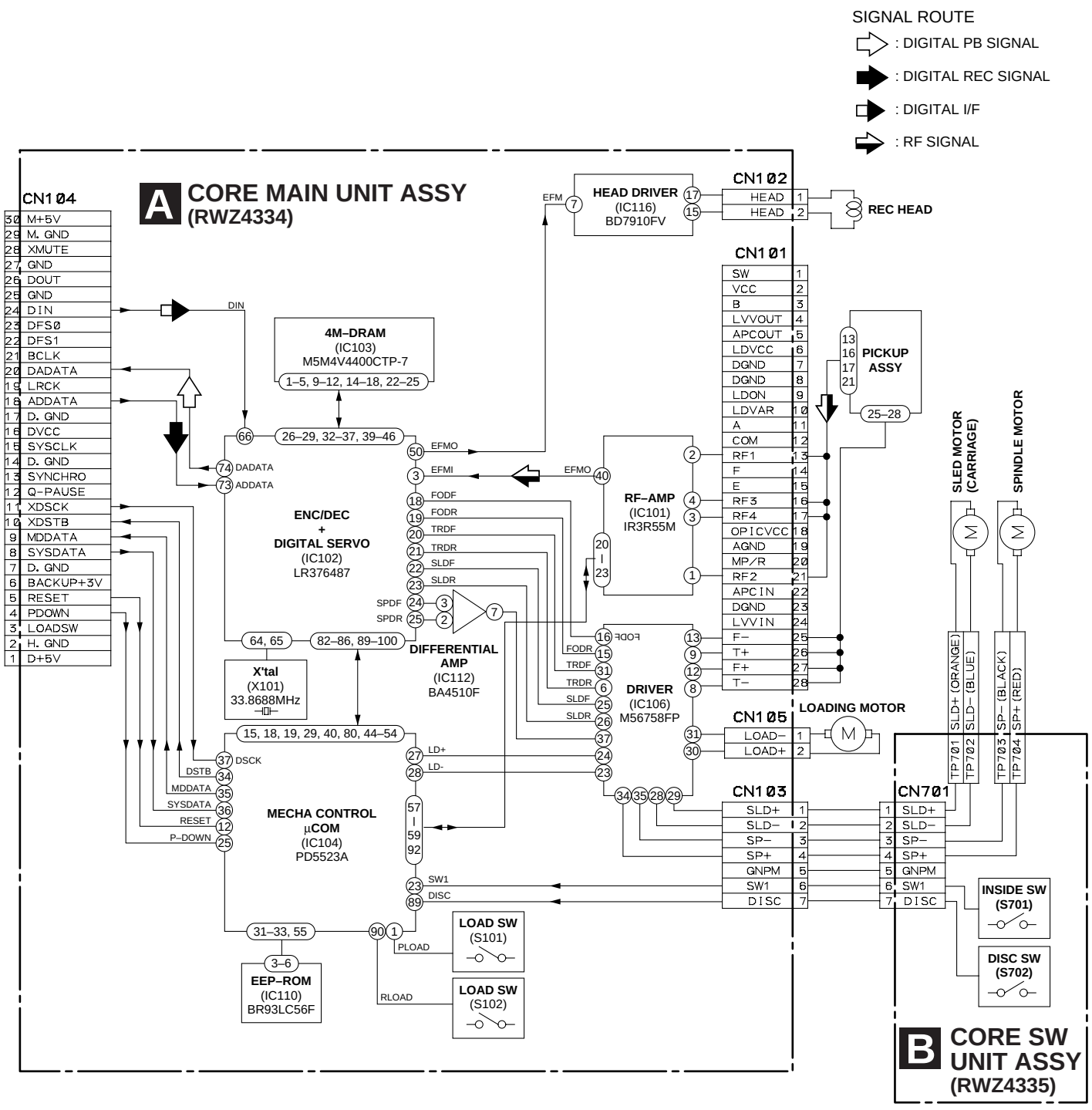
3.1 BLOCK DIAGRAM (1/2)



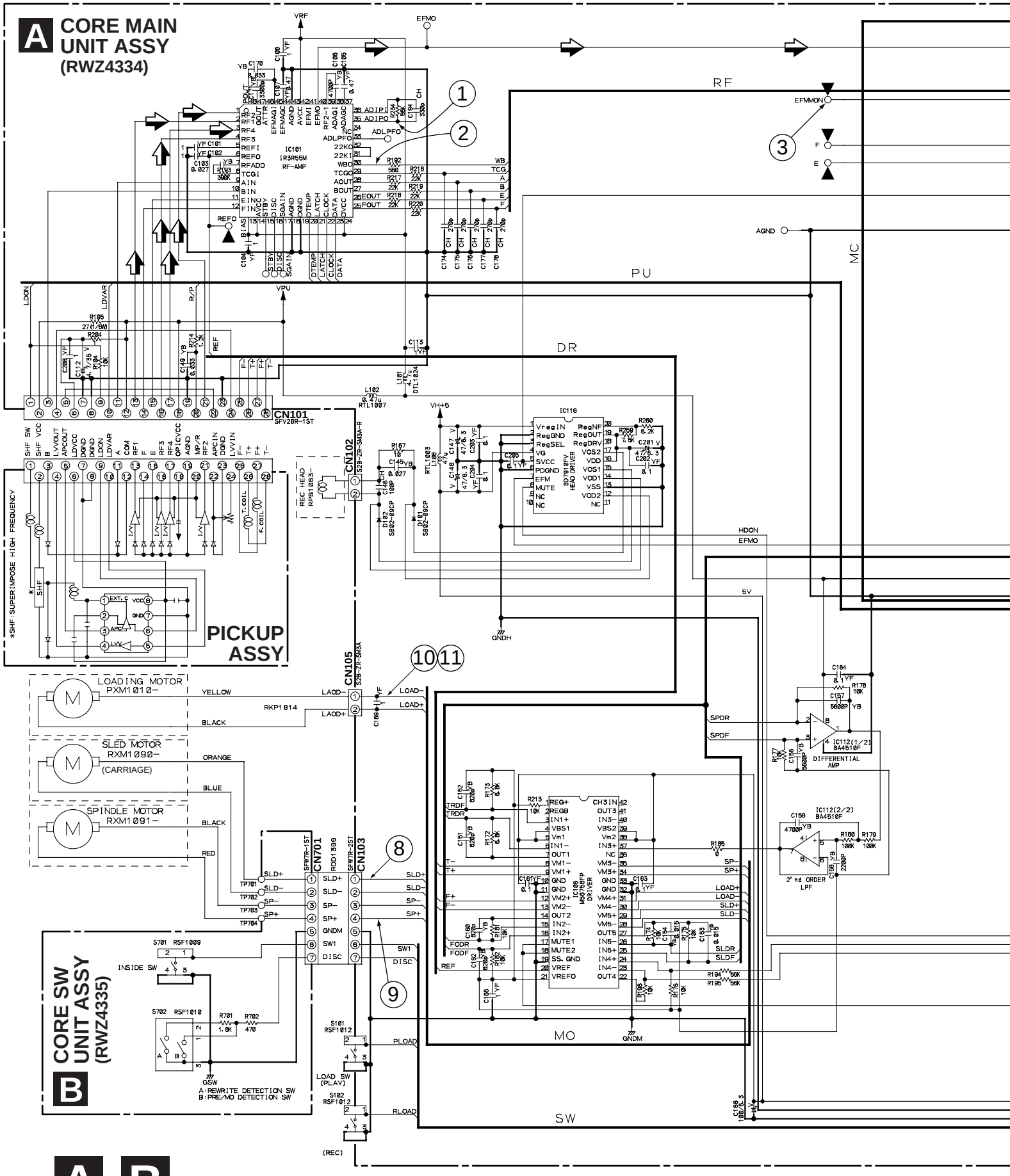
Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".



3.2 BLOCK DIAGRAM (2/2)

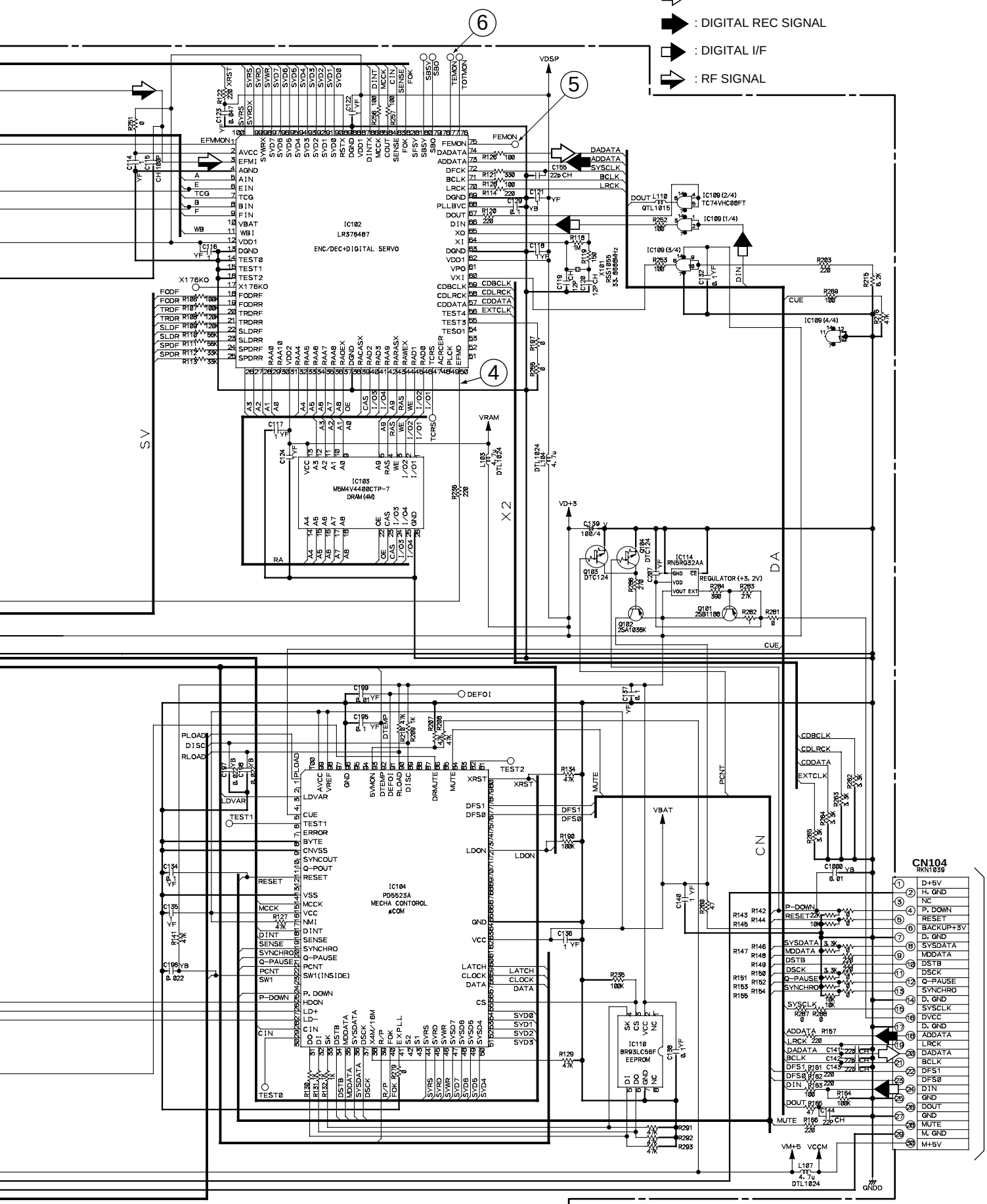


3.3 CORE MAIN UNIT and CORE SW UNIT ASSYS



● ① – ⑪ are waveform numbers on pages 16 and 17.

SIGNAL ROUTE
: DIGITAL PB SIGNAL
: DIGITAL REC SIGNAL
: DIGITAL I/F
: RF SIGNAL



C 2/2
CN401

■ Voltages of CORE MAIN UNIT ASSY

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	0V
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	0V
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	1.4V
41	1.5V	91	1.4V
42	0V	92	1.4V
43	2.0V	93	0.8V
44	3.0V	94	1.5V
45	1.2V	95	1.4V
46	1.2V	96	1.5V
47	0.02V	97	1.3V
48	3.04V	98	3.2V
49	1.57V	99	3.2V
50	0.05V	100	0V

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	3.2V	51	0.8V
2	0V	52	1.4V
3	0V	53	1.4V
4	0V	54	1.4V
5	0V	55	0V
6	0V	56	0V
7	0V	57	0V
8	0V	58	0V
9	0V	59	3.2V
10	0V	60	0V
11	0V	61	0V
12	3.1V	62	3.2V
13	1.5V	63	0V
14	0V	64	0V
15	1.5V	65	3.2V
16	3.2V	66	0V
17	3.2V	67	0V
18	3.1V	68	0V
19	0V	69	0V
20	0V	70	0V
21	0V	71	0V
22	3.2V	72	3.1V
23	3.2V	73	3.2V
24	0V	74	0V
25	3.2V	75	0V
26	3.2V	76	3.2V
27	0V	77	0V
28	0V	78	0V
29	2.4V	79	0V
30	0V	80	3.2V
31	0V	81	0V
32	0V	82	0V
33	0V	83	0V
34	1.6V	84	3.19V
35	1.0V	85	0V
36	0V	86	3.18V
37	2.8V	87	3.2V
38	0V	88	0V
39	0V	89	2.2V
40	0V	90	1.2V
41	3.19V	91	0.56V
42	3.2V	92	1.49V
43	0V	93	2.5V
44	0V	94	0.88V
45	3.2V	95	0.90V
46	3.2V	96	0V
47	1.3V	97	0.87V
48	1.5V	98	3.2V
49	1.4V	99	3.2V
50	1.5V	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

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

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

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

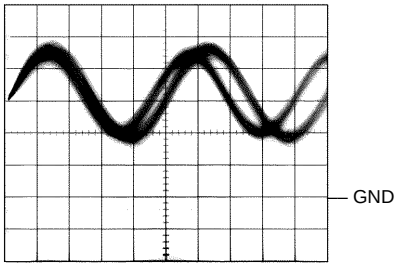
IC116	
PIN NO.	VOLTAGE
1	4.98V
2	0V
3	0V
4	4.99V
5	3.2V
6	0V
7	0.03V
8	3.18V
9	0V
10	0V
11	0V
12	0.22V
13	0V
14	0.25V
15	0.25V
16	2.82V
17	0.16V
18	4.94V
19	2.82V
20	1.33V

Waveforms

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

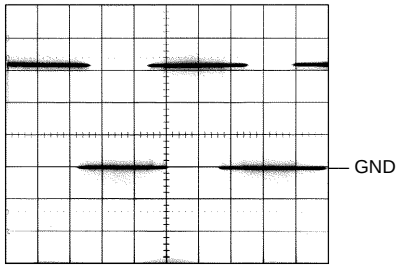
1 IC101-pin35 (ADIPO)
(CORE MAIN UNIT ASSY)
MODE: PLAY
DISC: GGF1328 (MMD–212)

DC500mV/div., 10 µSec/div.



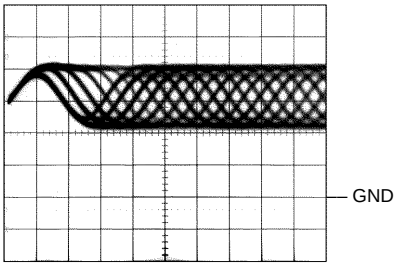
2 IC101-pin30 (WBO)
(CORE MAIN UNIT ASSY)
MODE: PLAY
DISC: GGF1328 (MMD–212)

DC1V/div., 10 µSec/div.



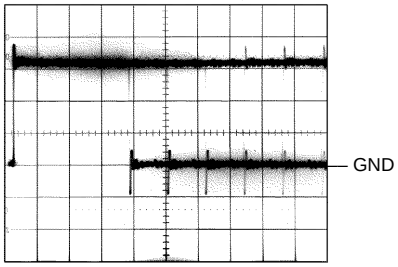
3 IC102-pin1 (EFM MON)
(CORE MAIN UNIT ASSY)
MODE: PLAY
DISC: TGTS1 or MMD–110

DC500mV/div., 0.5mSec/div.



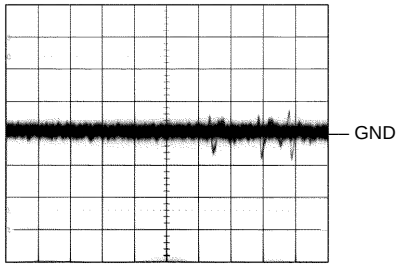
4 IC102-pin50 (EFMO)
(CORE MAIN UNIT ASSY)
MODE: REC
DISC: GGF1328 (MMD–212)

DC1V/div., 0.2 µSec/div.

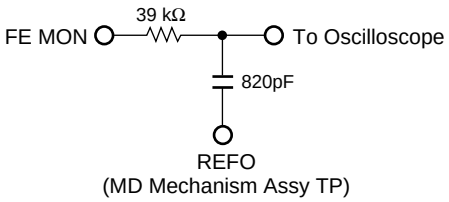


5 IC102-pin75 (FE MON)
(CORE MAIN UNIT ASSY)
MODE: PLAY
DISC: TGTS1 or MMD–110

DC100mV/div., 2mSec/div.

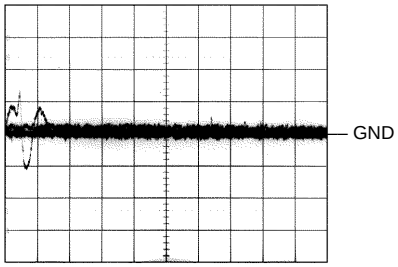


Measurement Method

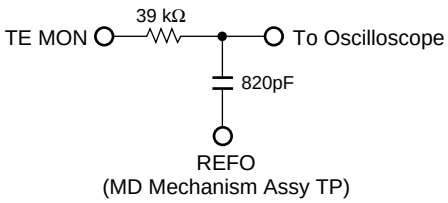


6 IC102-pin77 (TE MON)
(CORE MAIN UNIT ASSY)
MODE: PLAY
DISC: TGTS1 or MMD–110

DC500mV/div., 2mSec/div.

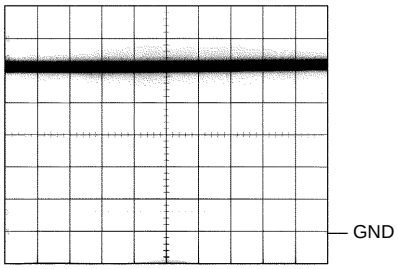


Measurement Method



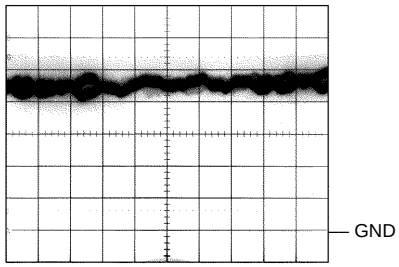
8 CN103-pin1 (SLD +)
(CORE MAIN UNIT ASSY)
MODE: PLAY

DC500mV/div., 2mSec/div.



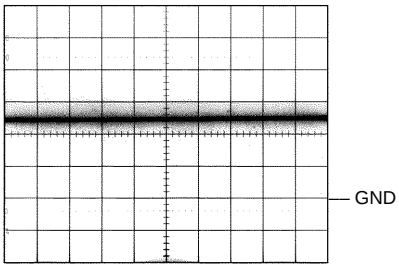
9 CN103-pin4 (SP +)
(CORE MAIN UNIT ASSY)
MODE: PLAY

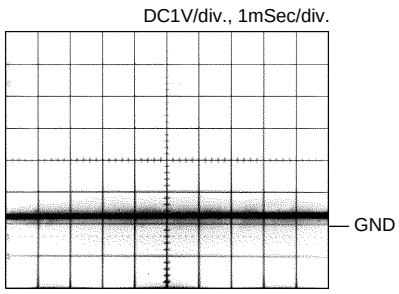
DC500mV/div., 5mSec/div.



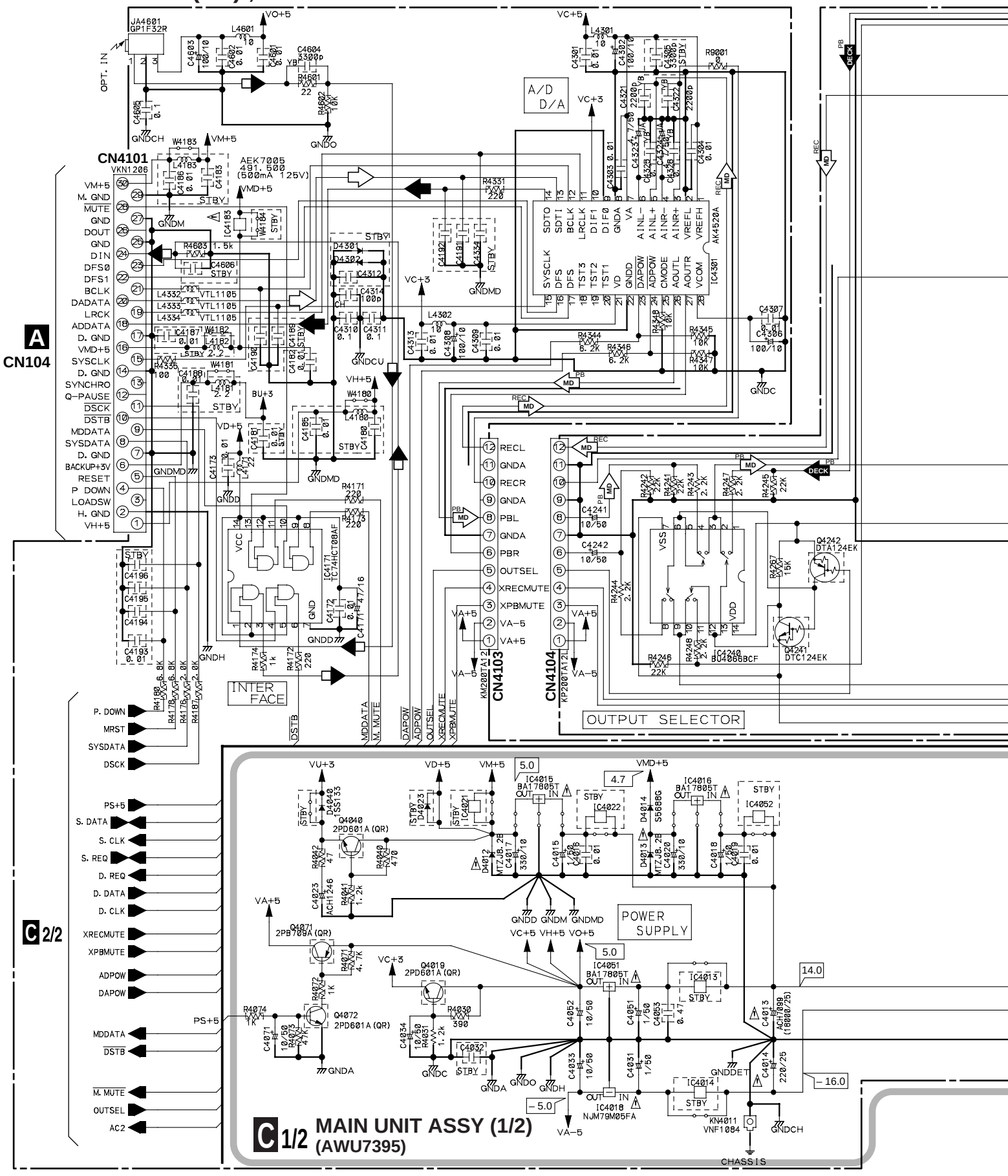
10 CN105-pin1 (LOAD –)
(CORE MAIN UNIT ASSY)
MODE: STOP

DC1V/div., 1mSec/div.

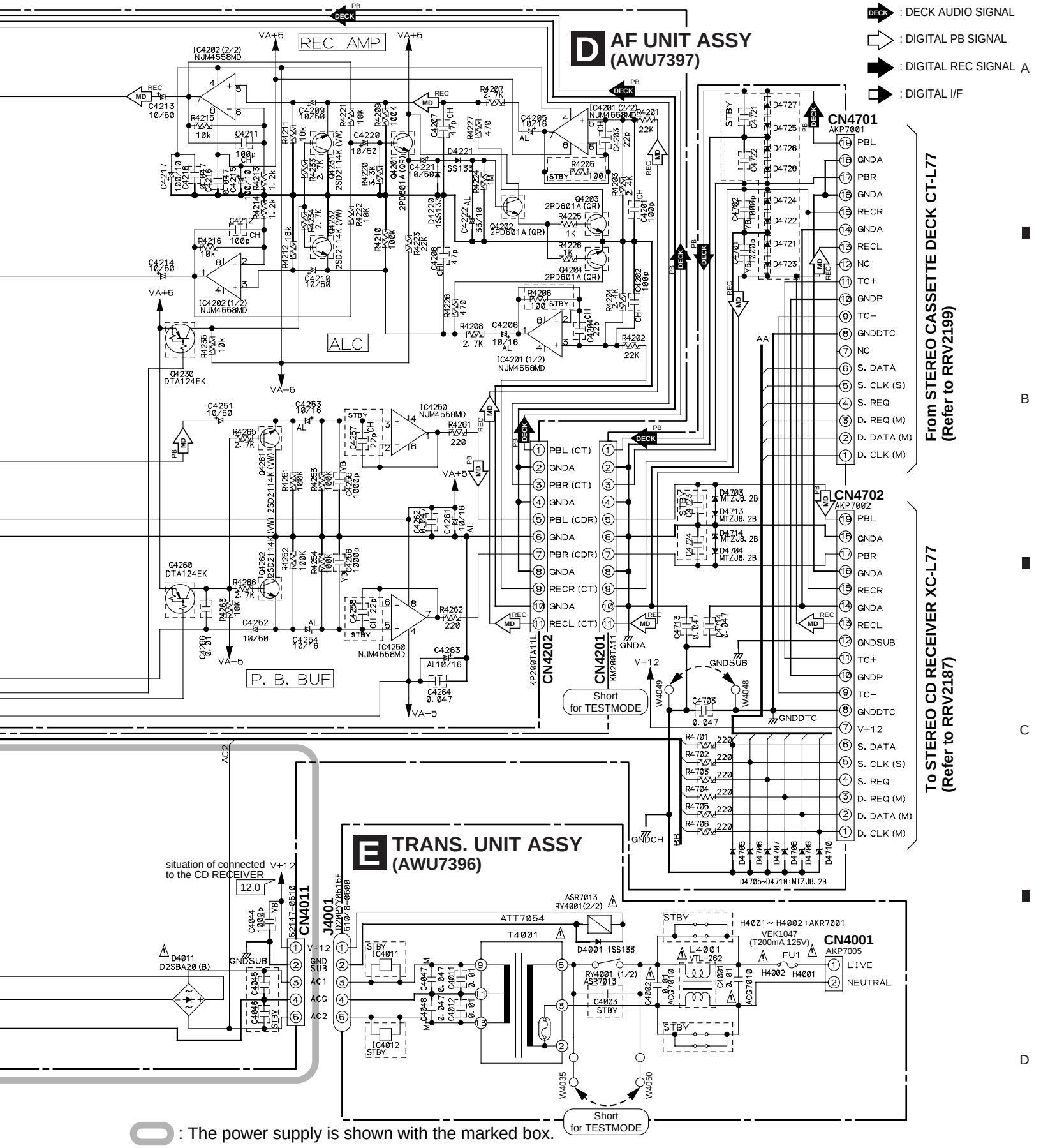


11 CN105-pin1 (LOAD –) (CORE MAIN UNIT ASSY) MODE: EJECT 		

3.4 MAIN UNIT (1/2) , AF UNIT and TRANS. UNIT ASSYS



SIGNAL ROUTE
: MD AUDIO SIGNAL
: DECK AUDIO SIGNAL
: DIGITAL PB SIGNAL
: DIGITAL REC SIGNAL
: DIGITAL I/F



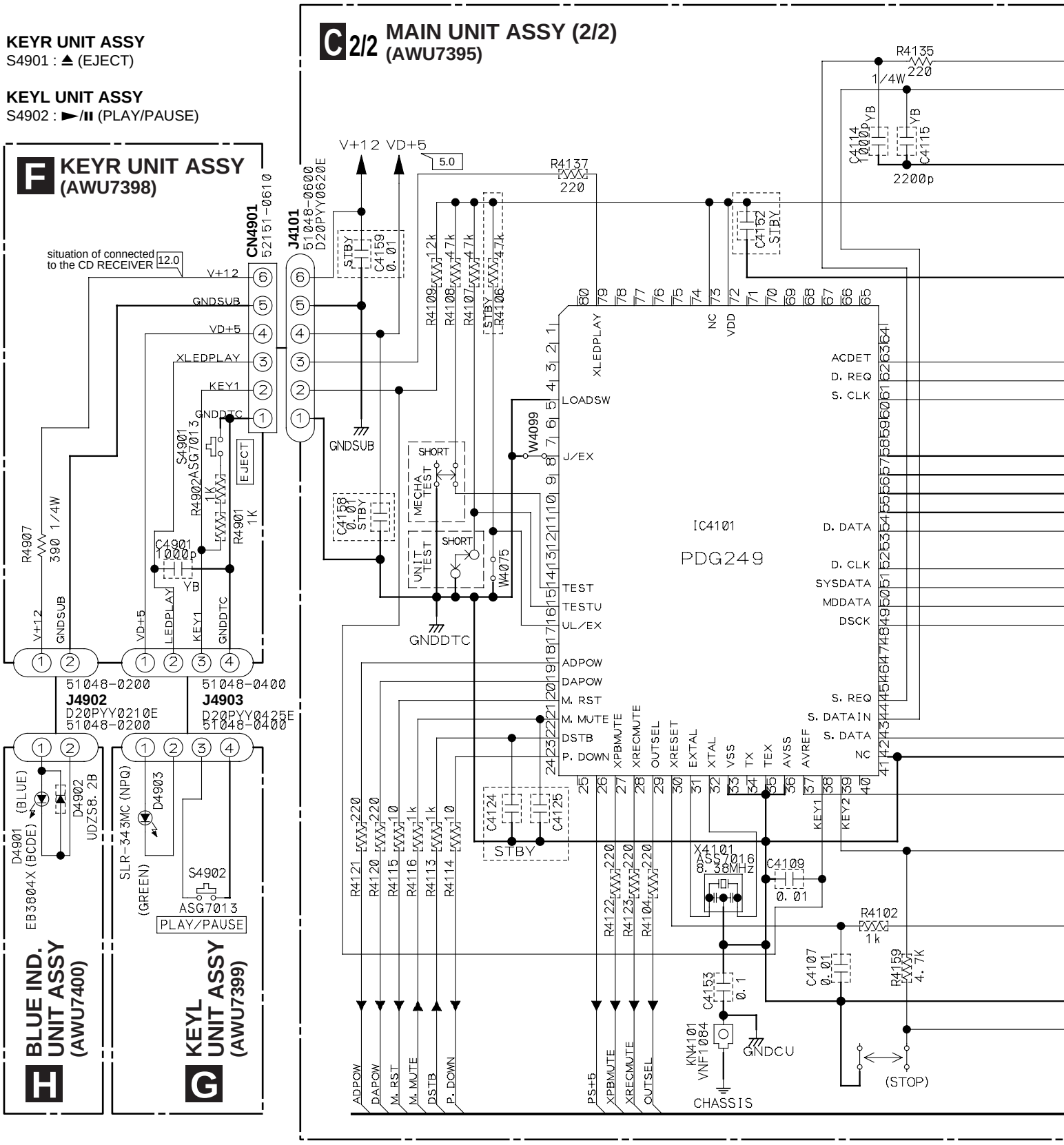
: The power supply is shown with the marked box.

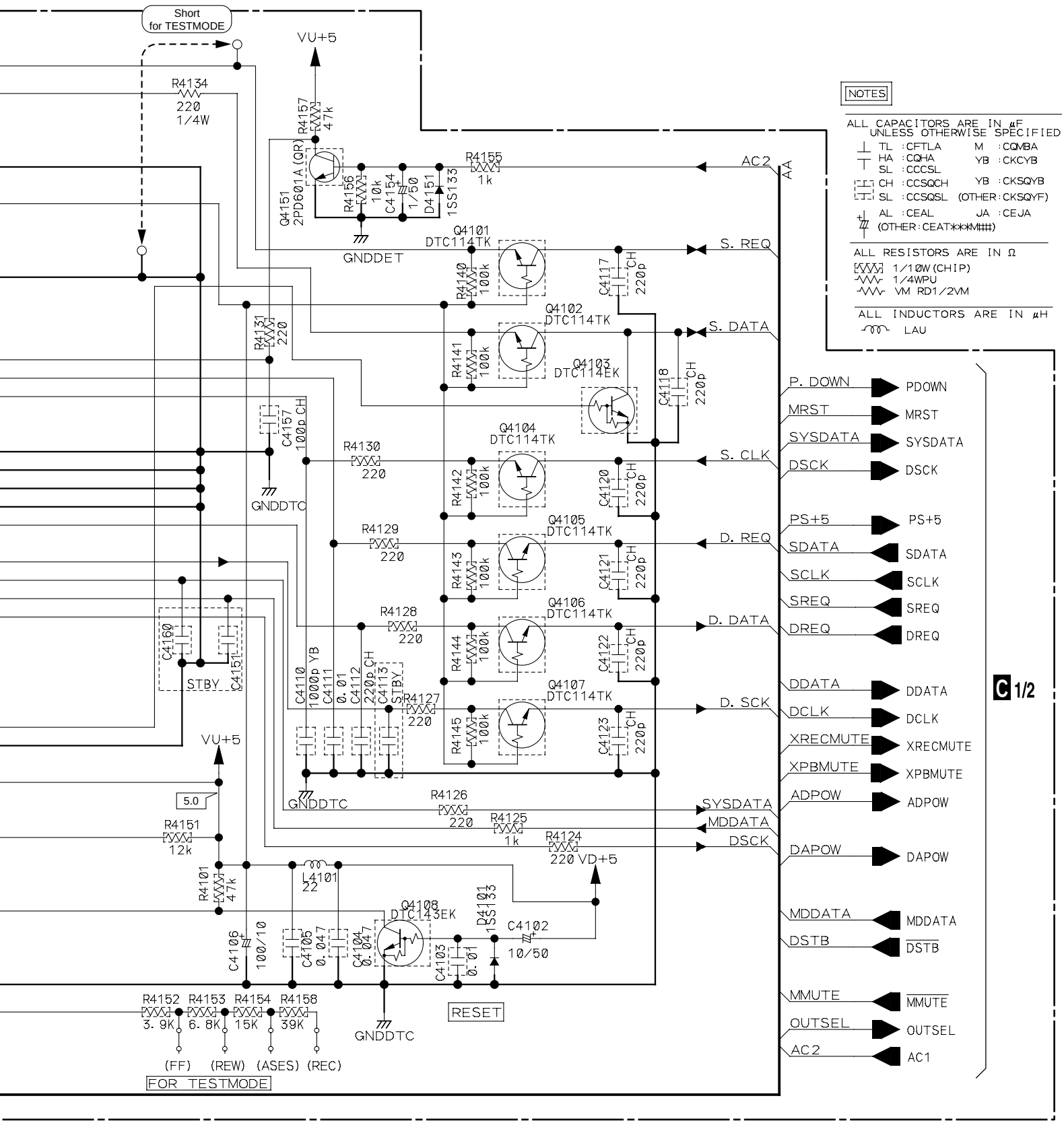
C1/2 D E

3.5 MAIN UNIT (2/2), KEYR UNIT, KEYL UNIT and BLUE IND. UNIT ASSYS

KEYR UNIT ASSY
S4901 : ▲ (EJECT)

KEYL UNIT ASSY
S4902 : ►/II (PLAY/PAUSE)




Short for TESTMODE
VU+5
R4134 220 1/4W
R4157 47k
Q4151 2PD601A(QR)
R4156 10k
C4154 1/50
D4151 1SS133
R4155 1k
GNDDET
AC2
AA
Q4101 DTC114TK
S. REQ
R4140 100k
C4117 CH 220p
Q4102 DTC114TK
S. DATA
R4131 220
R4141 100k
Q4103 DTC114EK
C4118 CH 220p
C4157 100p CH
GNDDTC
Q4104 DTC114TK
R4130 220
S. CLK
R4142 100k
C4120 CH 220p
Q4105 DTC114TK
R4129 220
D. REQ
R4143 100k
C4121 CH 220p
Q4106 DTC114TK
R4128 220
D. DATA
R4144 100k
C4122 CH 220p
C4160
C4151
STBY
C4110 10000p YB
C4111 0.01
C4112 220p CH
C4113 STBY
Q4107 DTC114TK
R4127 220
D. SCK
R4145 100k
C4123 CH 220p
VU+5
5.0
GNDDTC
R4126 220
SYSDATA
R4125 1k
MDDATA
R4124 220
DSCK
VD+5
R4151 12k
R4101 47k
L4101 22
Q4108 DTC143EK
D4101 1SS133
C4102 10/50
C4106 100/10
C4105 0.047
C4104 0.047
C4103 0.01
R4152 3.9K
R4153 6.8K
R4154 15K
R4158 39K
RESET
GNDDTC
(FF) (REW) (ASES) (REC)
FOR TESTMODE
P. DOWN
MRST
SYSDATA
DSCK
PS+5
SDATA
SCLK
SREQ
DREQ
DDATA
DCLK
XRECMUTE
XPBMUTE
ADPOW
DAPOW
MDDATA
DSTB
MMUTE
OUTSEL
AC2
PDOWN
MRST
SYSDATA
DSCK
PS+5
SDATA
SCLK
SREQ
DREQ
DDATA
DCLK
XRECMUTE
XPBMUTE
ADPOW
DAPOW
MDDATA
DSTB
MMUTE
OUTSEL
AC1
C 1/2
NOTES
ALL CAPACITORS ARE IN μF UNLESS OTHERWISE SPECIFIED
TL : CFTLA M : CQMBA
HA : CQHA YB : CKCYB
SL : CCCSL
CH : CCSQCH YB : CKSQYB
SL : CCSQSL (OTHER : CKSQYF)
AL : CEAL JA : CEJA
(OTHER : CEAT***M###)
ALL RESISTORS ARE IN Ω
1/10W (CHIP)
1/4WPU
VM RD1/2VM
ALL INDUCTORS ARE IN μH
LAU

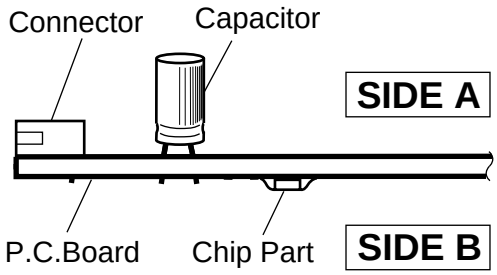
4. PCB CONNECTION DIAGRAM

NOTE FOR PCB DIAGRAMS :

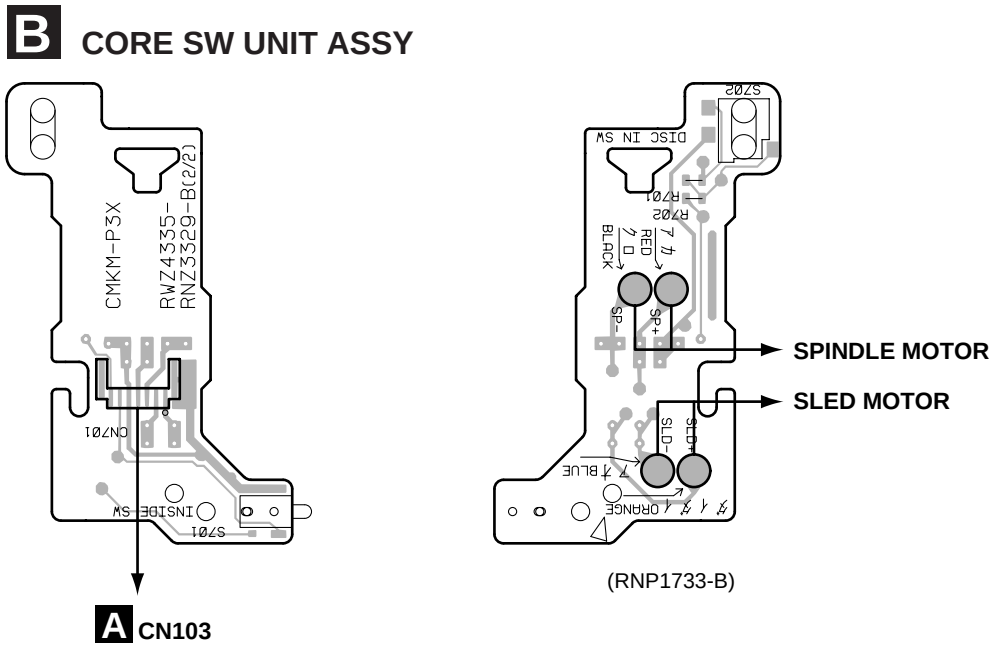
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

Symbol In PCB Diagrams	Symbol In Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	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.



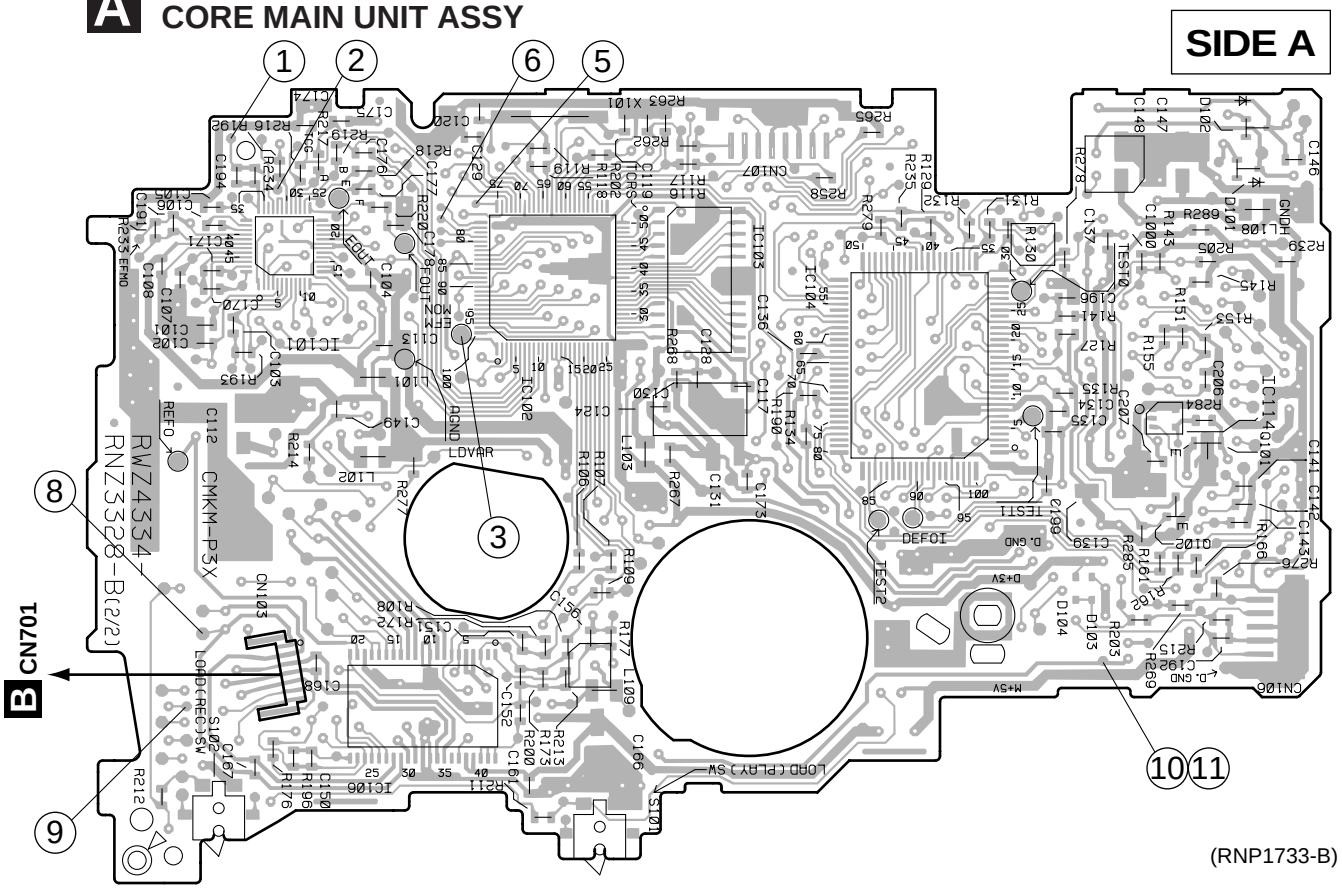
4.1 CORE SW UNIT ASSY

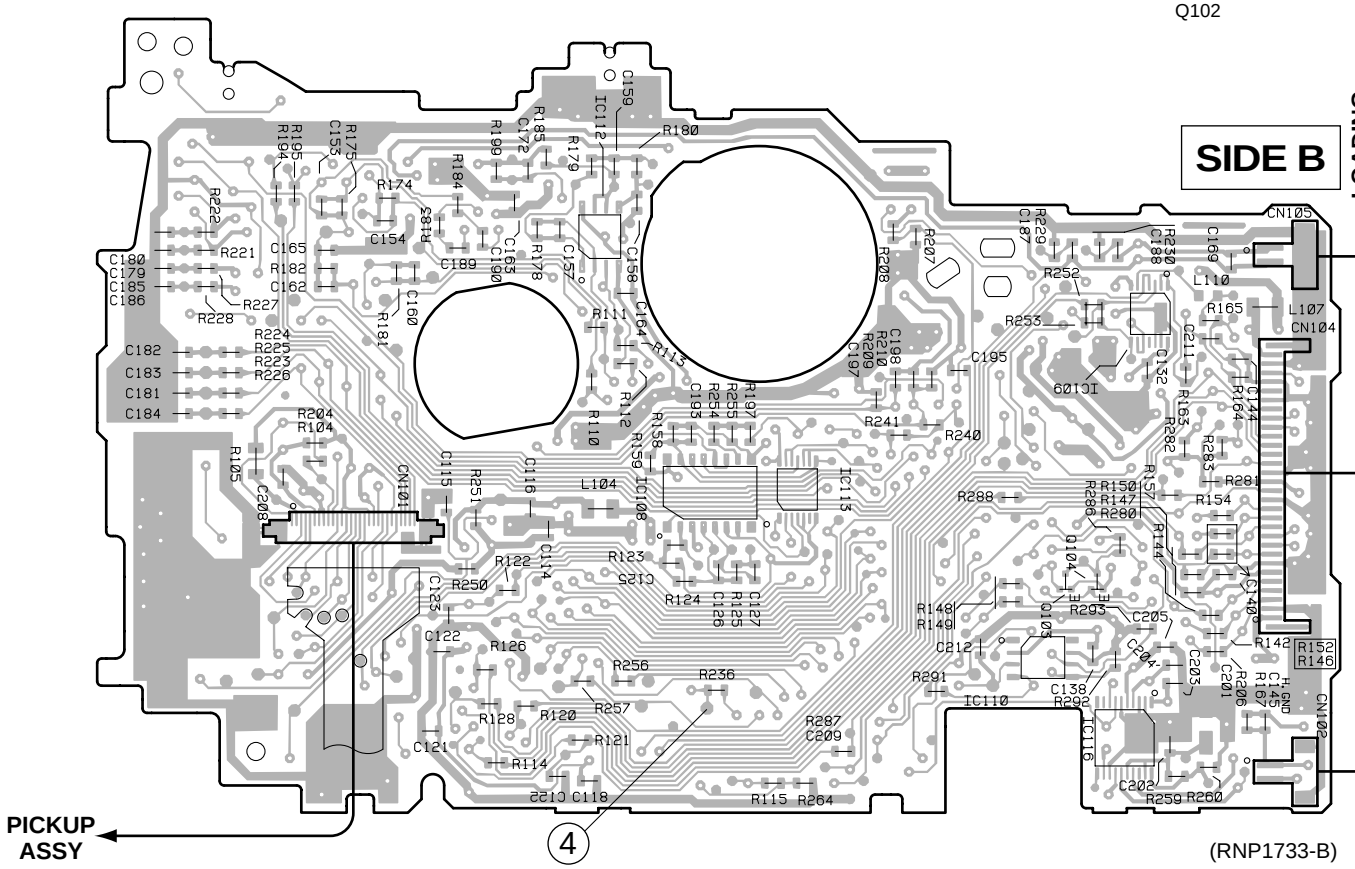


4.2 CORE MAIN UNIT ASSY

● ① – ⑪ are waveform numbers on pages 16 and 17.

A CORE MAIN UNIT ASSY





4.3 MAIN UNIT ASSY

SIDE A

C MAIN UNIT ASSY

STEREO CD RECIEVER
XC-L77

E J4001

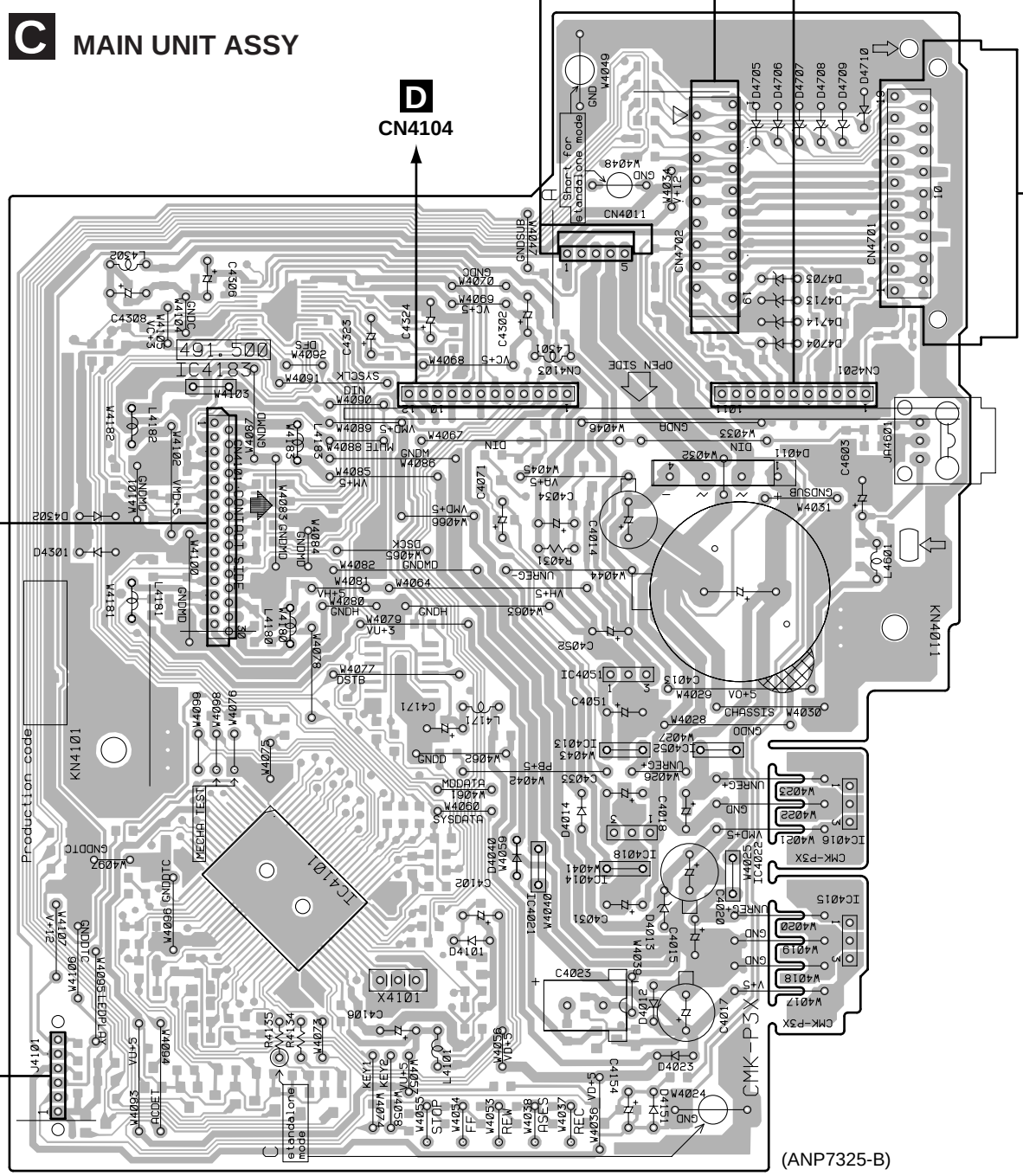
D CN4202

D CN4104

STEREO CASSETTE DECK
CT-L77

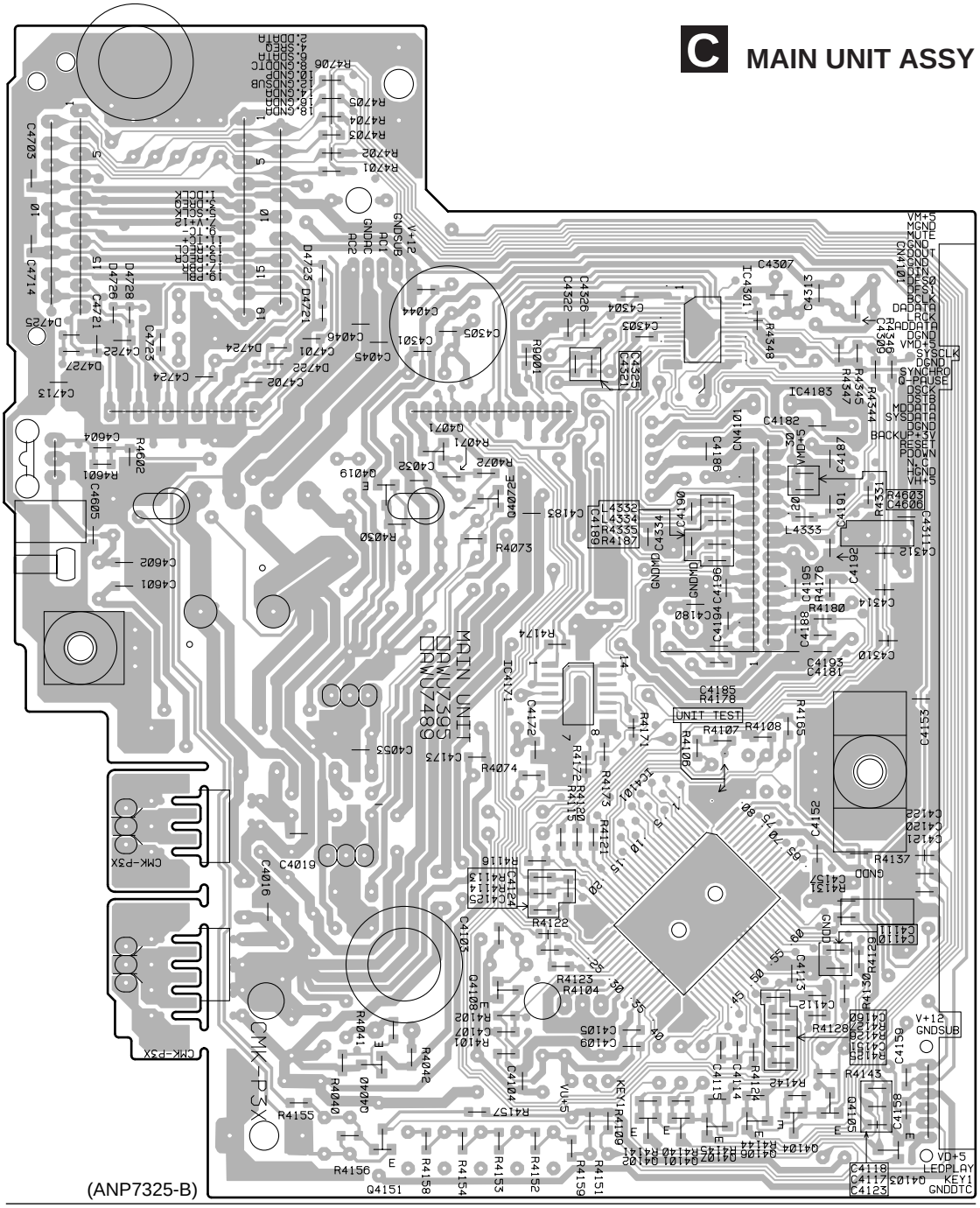
A CN104

F CN4901



SIDE B

C MAIN UNIT ASSY

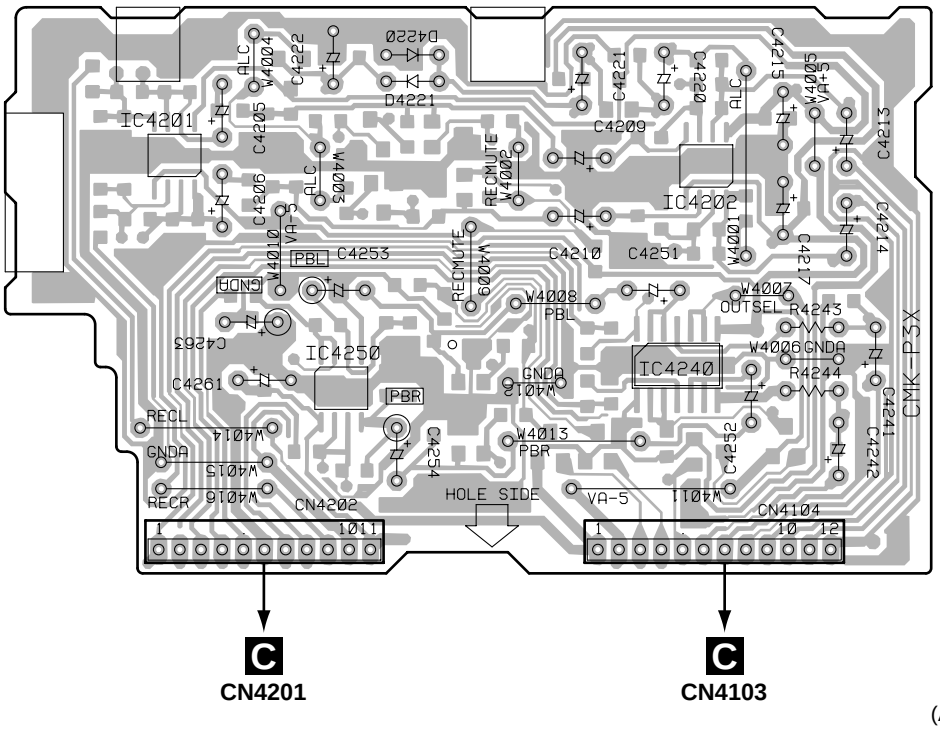


Q4019 Q4071 Q4072 IC4171 IC4301
Q4040 Q4108 IC4101
Q4151 Q4101——————Q4107

4.4 AF UNIT and TRANS. UNIT ASSYS

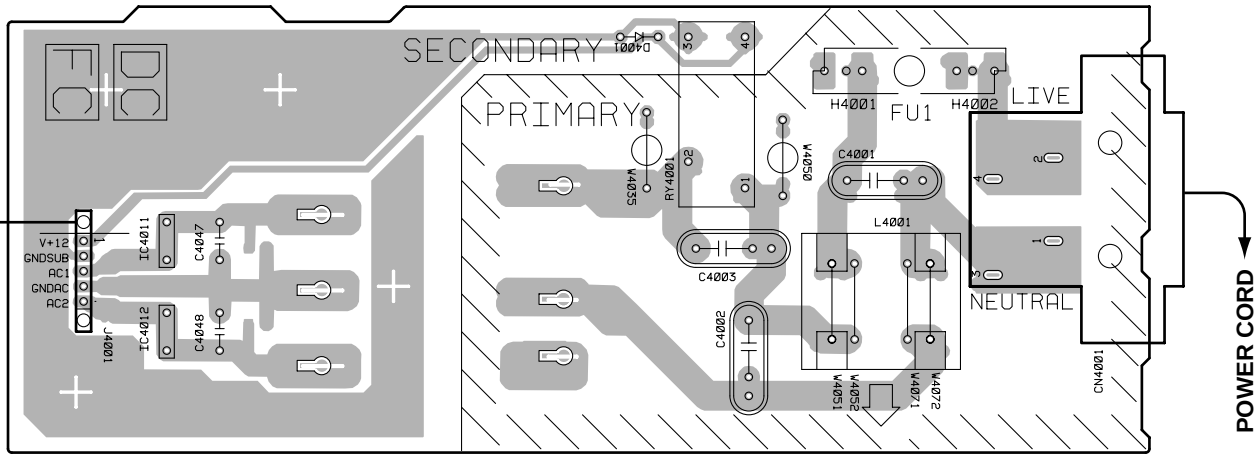
SIDE A

D AF UNIT ASSY



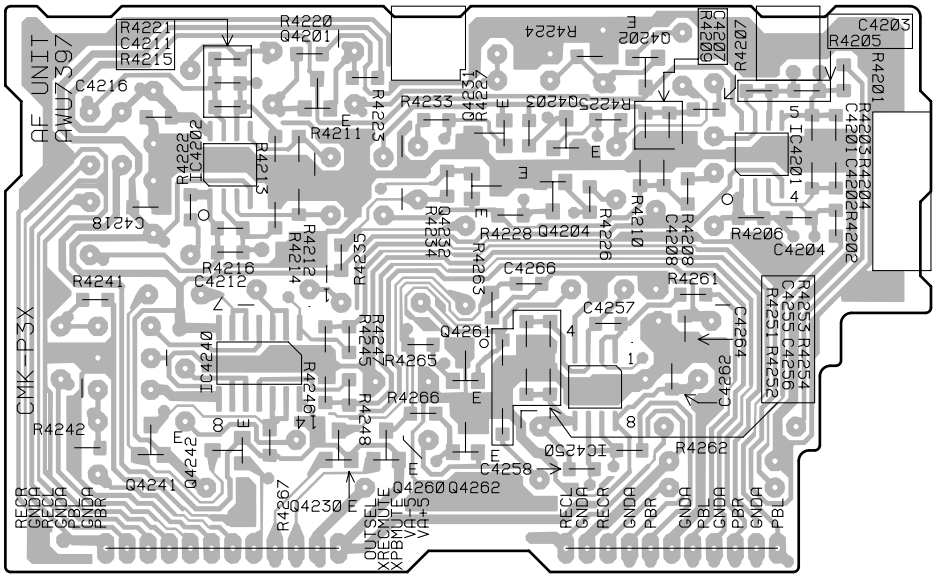
(ANP7325-B)

E TRANS. UNIT ASSY



SIDE B

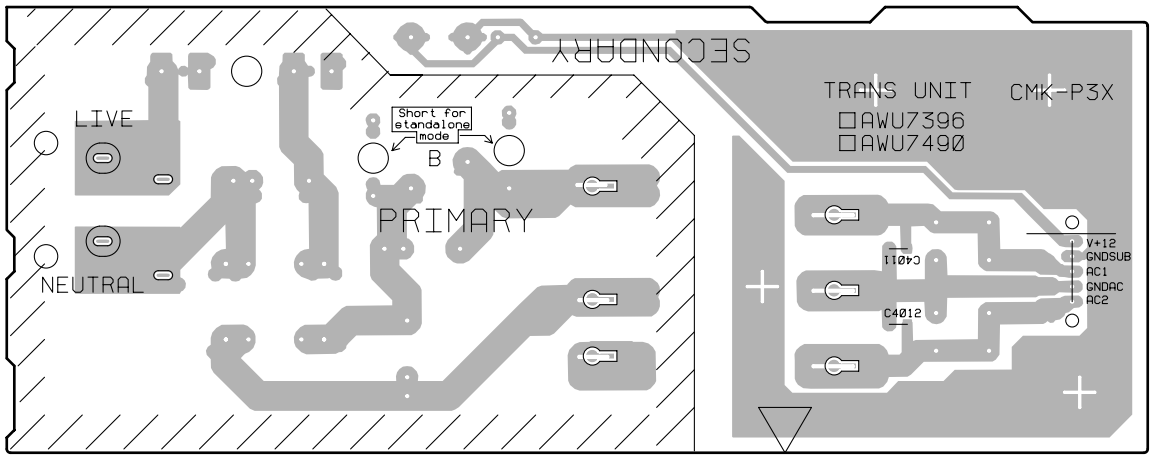
D AF UNIT ASSY



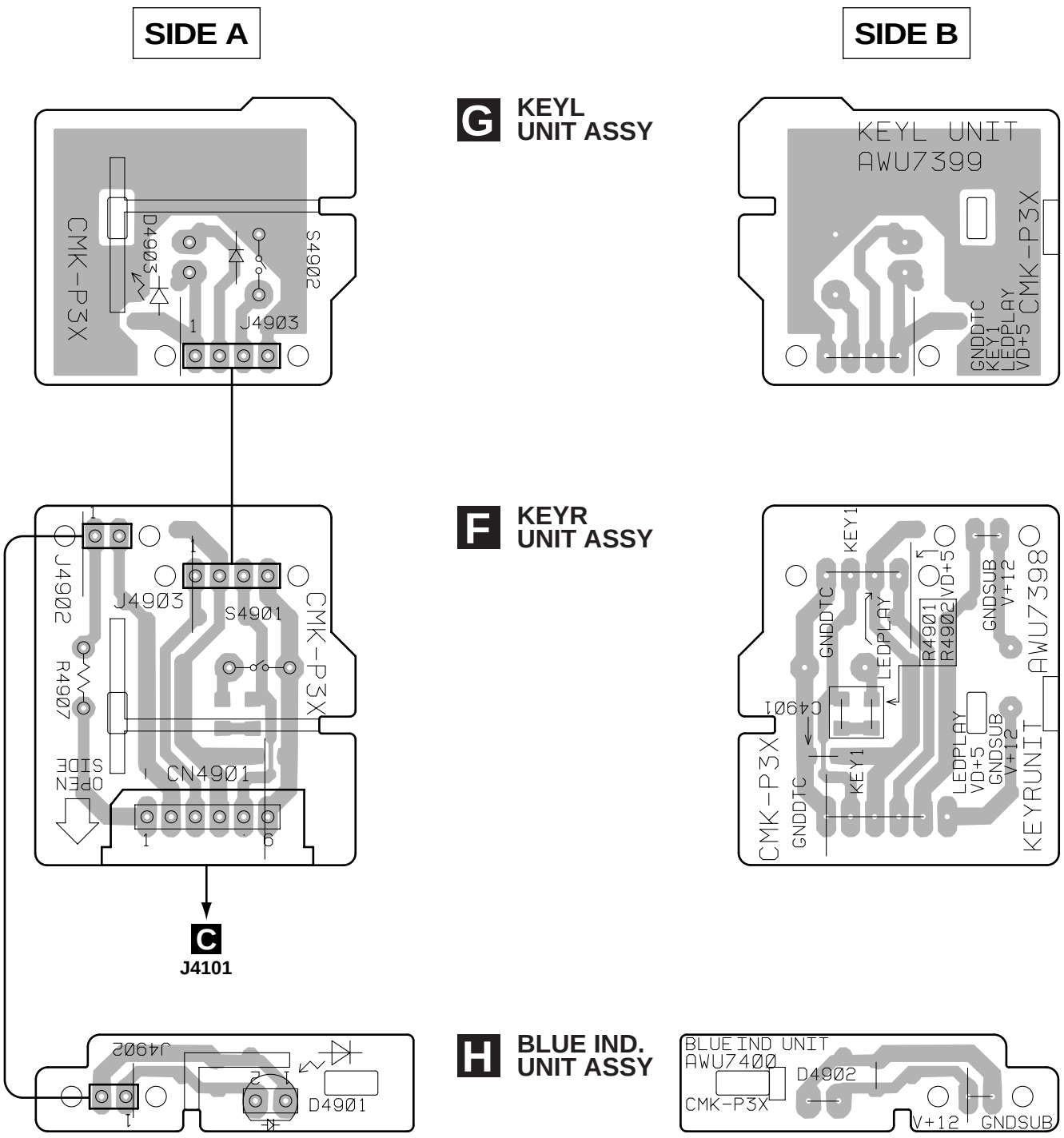
Q4201 IC4202 IC4240 Q4242 | Q4201 Q4230 | Q4260 | Q4231 Q4232 Q4261 Q4262 | Q4203 Q4204 IC4250 | Q4202 | IC4201

(ANP7325-B)

E TRANS. UNIT ASSY



4.5 KEYR UNIT, KEYL UNIT and BLUE IND. UNIT ASSYS



(ANP7325-B)

5. PCB PARTS LIST

NOTES :
- *Parts marked by "* NSP *" are generally unavailable because they are not in our Master Spare Parts List.*
- *The ⚠ 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 × 10 [1] → 561 ..... RD1/4PU 5 6 1 J
47k Ω → 47 × 10 [3] → 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 × 10 [1] → 5621 ..... RN1/4PC 5 6 2 1 F

LIST OF WHOLE PCB ASSEMBLIES

Mark	No.	Description	Part No.
NSP		MD MECHANISM ASSY	RXA1777
		└CORE UNIT ASSY	RWM2058
		├CORE MAIN UNIT ASSY	RWZ4334
NSP		└CORE SW UNIT ASSY	RWZ4335
NSP		MDCOMP ASSY	AWM7449
		├MAIN UNIT ASSY	AWU7395
		├TRANS. UNIT ASSY	AWU7396
		├AF UNIT ASSY	AWU7397
		├KEYR UNIT ASSY	AWU7398
		├KEYL UNIT ASSY	AWU7399
		└BLUE IND. UNIT ASSY	AWU7400

A CORE MAIN UNIT ASSY

SEMICONDUCTORS

Mark	No.	Part No.
	IC112	BA4510F
	IC116	BD7910FV
	IC110	BR93LC56F
	IC101	IR3R55M
	IC102	LR376487
	IC106	M56758FP
	IC103	M5M4V4400CTP-7
	IC104	PD5523A
⚠	IC114	RN5RG32AA
	IC109	TC74VHC08FT
	Q102	2SA1036K
	Q101	2SB1188
	Q103, Q104	DTC124EU
	D101, D102	SB02-09CP

COILS AND FILTERS

No.	Part No.
L101, L103, L104, L107 (4.7µH)	DTL1024
L110 CHIP SOLID INDUCTOR	QTL1015
L108 (47µH)	RTL1003
L102 (0.47µH)	RTL1007

SWITCHES AND RELAYS

No.	Part No.
S101, S102	RSF1012

CAPACITORS

No.	Part No.
C115, C146	CCSQCH101J50
C119, C120	CCSQCH120J50
C141–C144, C155	CCSQCH220J50
C174–C178	CCSQCH271J50
C194	CCSQCH331J50
C139	CEV101M4
C166	CEV101M6R3
C147, C148, C201	CEV470M6R3
C112	CEV4R7M35
C1000, C199	CKSQYB103K50
C129	CKSQYB122K50
C153, C154	CKSQYB153K50
C158	CKSQYB222K50
C196–C198	CKSQYB223K50
C103, C145	CKSQYB273K50
C171	CKSQYB332K50
C149, C170	CKSQYB333K50
C106, C159	CKSQYB472K50
C156, C157	CKSQYB562K50
C151, C152, C160, C162	CKSQYB821K50
C132, C134, C137, C138, C161	CKSQYF104Z25
C163, C164, C195, C202–C205	CKSQYF104Z25
C101, C102, C104, C108	CKSQYF105Z16
C113, C114, C116–C118	CKSQYF105Z16
C121, C122, C124, C135, C136	CKSQYF105Z16
C140, C165, C169, C207, C208	CKSQYF105Z16
C123	CKSQYF473Z25
C105, C107	CKSQYF474Z16

RESISTORS

No.	Part No.
R105	RS1/8S270J
Other Resistors	RS1/10S□□□J

OTHERS

No.	Part No.
CN104 30P CONNECTOR	RKN1039
X101 (33.8688MHz)	RSS1055
CN105 CONNECTOR	S2B-ZR-SM3A
CN102 CONNECTOR	S2B-ZR-SM3A-R
CN101 CONNECTOR	SFV28R-1ST
CN103 CONNECTOR	SFW7R-2ST

Mark	No.	Description	Part No.

B CORE SW UNIT ASSY

SWITCHES AND RELAYS

	S701	RSF1009
	S702	RSF1010

RESISTORS

	All Resistors	RS1/10S□□□J

OTHERS

	CN701 CONNECTOR	SFW7R-1ST

C MAIN UNIT ASSY

SEMICONDUCTORS

⚠	IC4183	AEK7005
	IC4301	AK4520A
⚠	IC4015,IC4016,IC4051	BA17805T
⚠	IC4018	NJM79M05FA
	IC4101	PDG249A
	IC4171	TC74HCT08AF
	Q4071	2PB709A
	Q4019, Q4040, Q4072, Q4151	2PD601A
	Q4103	DTC114EK
	Q4101, Q4102, Q4104–Q4107	DTC114TK
	Q4108	DTC143EK
	D4040, D4101, D4151	1SS133
⚠	D4011	D2SBA20(B)
	D4012, D4013, D4703–D4710	MTZJ8.2B
	D4713, D4714	MTZJ8.2B
⚠	D4014	S5688G

COILS AND FILTERS

	L4301, L4302, L4601	LAU100J
	L4101, L4171	LAU220J
	L4332–L4334 CHIP BEADS	VTL1105

CAPACITORS

	C4023	ACH1246
⚠	C4013 (18000μF/25V)	ACH7099
	C4157, C4314	CCSQCH101J50
	C4112, C4117, C4118, C4120–C4123	CCSQCH221J50
	C4033, C4034, C4052, C4071, C4102	CEAT100M50
	C4106, C4302, C4306, C4308, C4603	CEAT101M10
	C4015, C4018, C4031, C4051, C4154	CEAT1R0M50
	C4014	CEAT221M25
	C4017, C4020	CEAT331M10
	C4171	CEAT470M16
	C4323, C4324	CEJA4R7M50
	C4044, C4110, C4114, C4701, C4702	CKSQYB102K50
	C4325, C4326	CKSQYB104K25
	C4115, C4321, C4322	CKSQYB222K50
	C4604	CKSQYB332K50
	C4016, C4019, C4103, C4107, C4109	CKSQYF103Z50
	C4111, C4172, C4173, C4182, C4301	CKSQYF103Z50
	C4303, C4304, C4307, C4309, C4313	CKSQYF103Z50
	C4601, C4602	CKSQYF103Z50
	C4153, C4310, C4311	CKSQYF104Z25
	C4605	CKSQYF104Z50
	C4104, C4105, C4703, C4713, C4714	CKSQYF473Z50
	C4053	CKSQYF474Z16

RESISTORS

	R4031	RD1/4PU122J
	R4134, R4135	RD1/4PU221J
	Other Resistors	RS1/10S□□□J

OTHERS

	6P CABLE HOLDER	51048-0600
	CN4011 5P JUMPER CONNECTOR	52147-0510
	4701 SOCKET(19P)	AKP7001
	CN4702 CONNECTOR(19P)	AKP7002
	J4101 JUMPER WIRE	D20PYY0620E
	JA4601 OPTICAL RECEIV MOD.	GP1F32R
	CN4201 11P PLUG	KM200TA11
	CN4103 12P PLUG	KM200TA12
	CN4101 30P CONNECTOR	VKN1206
	KN4011,KN4101 EARTH METAL FITTING	VNF1084
	X4101 (8.389MHz)	ASS7016

D AF UNIT ASSY

SEMICONDUCTORS

	IC4240	BU4066BCF
	IC4201,IC4202,IC4250	NJM4558MD
	Q4201–Q4204	2PD601A
	Q4231, Q4232, Q4261, Q4262	2SD2114K
	Q4230, Q4242, Q4260	DTA124EK
	Q4241	DTC124EK
	D4220, D4221	1SS133

CAPACITORS

	C4201, C4202, C4211, C4212	CCSQCH101J50
	C4203, C4204	CCSQCH220J50
	C4207, C4208	CCSQCH470J50
	C4205, C4206, C4253, C4254, C4261	CEAL100M16
	C4263	CEAL100M16
	C4222	CEAL330M10
	C4209, C4210, C4213, C4214	CEAT100M50
	C4220, C4221, C4241, C4242	CEAT100M50
	C4251, C4252	CEAT100M50
	C4215, C4217	CEAT101M10
	C4255, C4256	CKSQYB102K50
	C4266	CKSQYF103Z50
	C4216, C4218, C4262, C4264	CKSQYF473Z50

RESISTORS

	R4243, R4244	RD1/4PU222J
	Other Resistors	RS1/10S□□□J

OTHERS

	CN4202 11P SOCKET	KP200TA11L
	CN4104 12P SOCKET	KP200TA12L

Mark	No.	Description	Part No.

E TRANS. UNIT ASSY

SEMICONDUCTORS

	D4001		1SS133

COILS AND FILTERS

⚠	L4001	FILTER	VTL-262

SWITCHES AND RELAYS

⚠	RY4001		ASR7013

CAPACITORS

⚠	C4001, C4002	(0.01µF/AC250V)	ACG7010
	C4011, C4012		CKSQYF103Z50
	C4047, C4048		CQMBA473J50

OTHERS

		5P CABLE HOLDER	51048-0500
⚠	CN4001	AC INLET	AKP7005
	J4001	JUMPER WIRE	D20PYY0515E
	H4001, H4002	HOLDER	AKR7001

F KEYR UNIT ASSY

SWITCHES AND RELAYS

	S4901		ASG7013

CAPACITORS

	C4901		CKSQYB102K50

RESISTORS

	R4907		RD1/4PU391J
	Other Resistors		RS1/10S□□□J

OTHERS

		4P CABLE HOLDER	51048-0400
	CN4901	6P JUMPER CONNECTOR	52151-0610

G KEYL UNIT ASSY

SEMICONDUCTORS

	D4903		SLR-343MC(NPQ)

SWITCHES AND RELAYS

	S4902		ASG7013

OTHERS

		4P CABLE HOLDER	51048-0400
	J4903	JUMPER WIRE	D20PYY0425E

Mark	No.	Description	Part No.

H BLUE IND. UNIT ASSY

SEMICONDUCTORS

	D4901		EB3804X(BCDE)
	D4902		UDZS8.2B

OTHERS

	J4902	JUMPER WIRE	D20PYY0210E

6. ADJUSTMENT

■ JIGS AND MEASURING INSTRUMENTS

- **Thermometer**
- **Oscilloscope**
- **Optical Power Meter**
- **Jitter Meter**
- **XC-L77, DU-L77,**
  Remote control supplied with XC-L77

(● CLD service remote control GGF1067)

- **Test Disc**

For servo system adjustment GGF1328 (MMD-212)
For recording/playback inspection ..... GGF1328 (MMD-212), GGF1277, TGYS1 (or MMD-110), Commercial discs

6.1 NECESSARY ADJUSTMENT POINTS

When	Adjustment points
Exchange PICKUP	②–⑧ → Page 36–42
Exchange Servo Base Assy (SPINDLE MOTOR)	②–⑧ → Page 36–42
Exchange CORE MAIN UNIT ASSY	①,④–⑧ → Page 36–42
Exchange MD HEAD	⑧ → Page 41, 42
Exchange Loading Mechanism Assy	———
Exchange Servo Mechanism Assy	③–⑧ → Page 37–42
Exchange MD Mechanism Assy (Loading Mechanism Assy + Servo Mechanism Assy)	③–⑧ → Page 37–42

6.2 Test modes

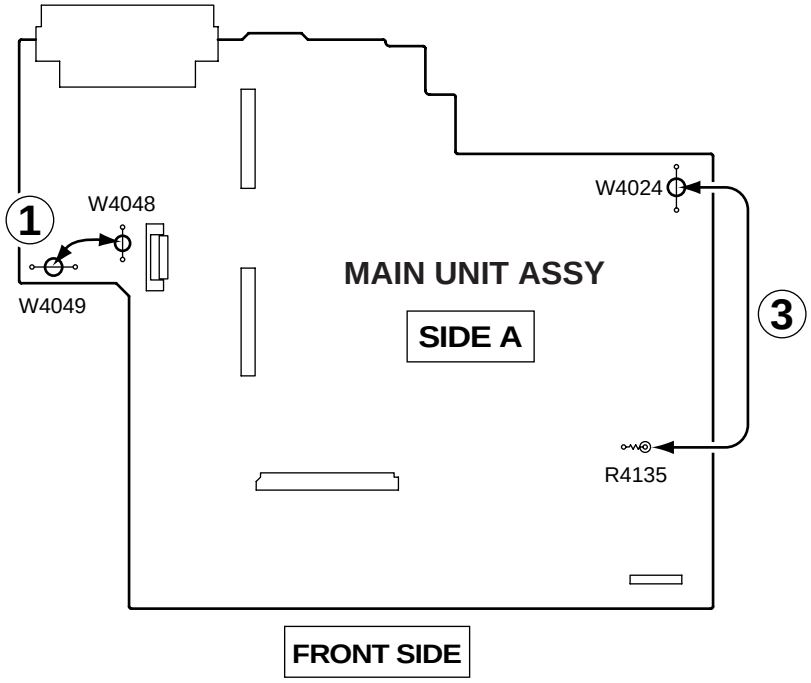
In the test modes, there are the Single operation mode and MD mech adjustment mode.

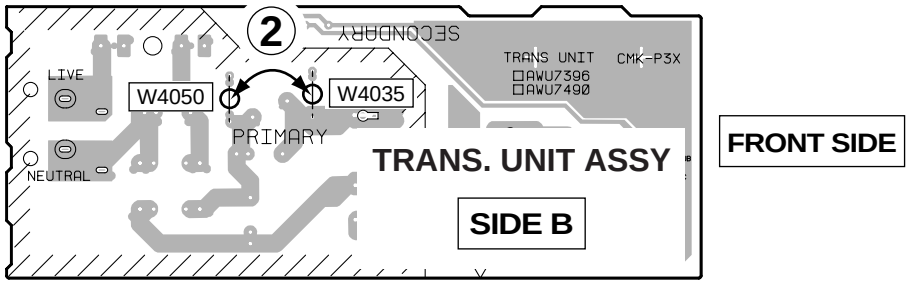
6.2.1 Single operation mode

- In this mode, when the play button is pressed, all repeat mode is selected automatically.
- For aging, you can select this single operation mode and keep the unit in the play mode for a long period of time.

■ How to enter the single operation mode

1) Short the jumper wires numbered as ① and ② on the MAIN UNIT ASSY and TRANS. UNIT ASSY respectively. (See below.)
   Jumper wires ① : To make the GND of the microcomputer and that of the body common.
   Jumper wires ② : To turn on the relay for the primary windings.
2) Turn on the power of the product (MJ-J77).
3) Short the jumper wires numbered as ③ between the S.REQ terminal of the system bus line (R4135) and the GND terminal (W4024) on TRANS. UNIT ASSY for 3 seconds or more. (See below.) Then, remove this short-circuit.





Caution on the shorting point ②

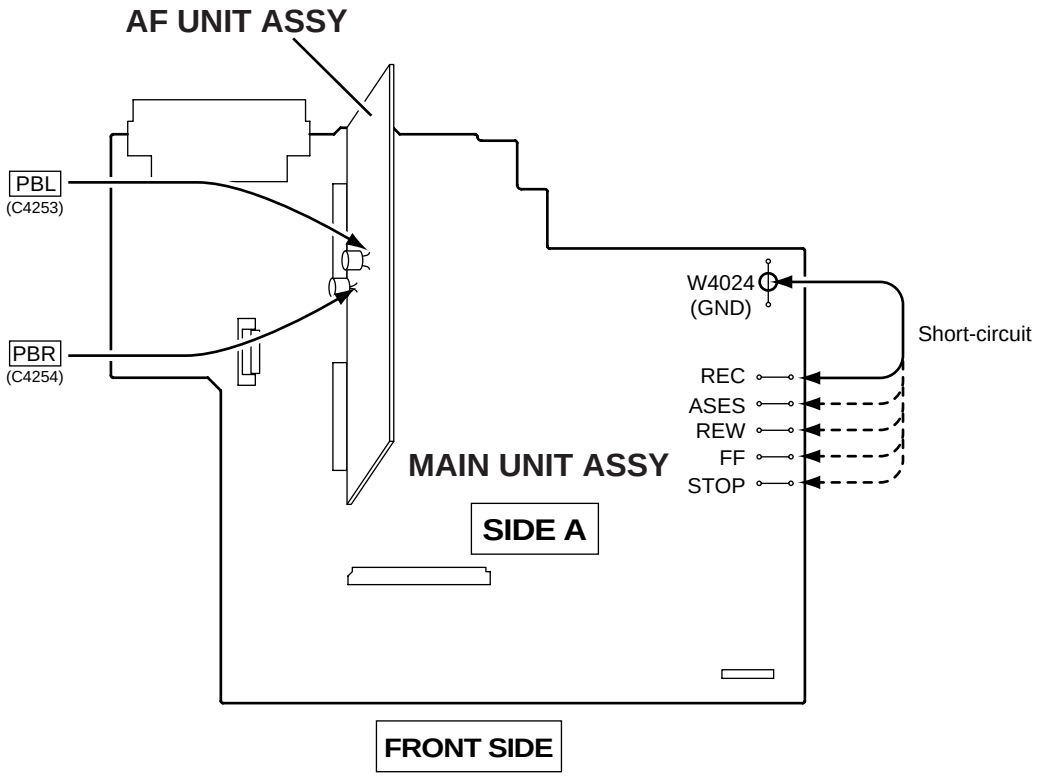
Special care should be taken when shorting.
This point is located at the stage of the primary circuit.
- Be sure to disconnect the plug before shorting.
- Be careful to avoid electric shocks.

■ Key operations in the single operation mode

The MJ-L77 has only the EJECT and PLAY/PLAY PAUSE keys on the operation panel. For other main operations in this mode, five jumper wires are arranged on the MAIN UNIT ASSY as shown below. Short between W4024 and each jumper wire to activate each operation.

Operation keys:
[PLAY] To play
[EJECT] To eject

Jumper wires:
[ASES] To switch the input in the recording mode (Digital/Analog)
[REC] To record
[STOP] To stop recoding/playing
[FF] To search tracks forward
[REW] To search tracks backward



■ Input selection in the recording mode

In the recording mode, the input can be switched by shorting the [ASES] jumper wire.
Each time the [ASES] jumper wire is shorted, the input is switched between digital and analog alternately.
The factory setting is the digital input.

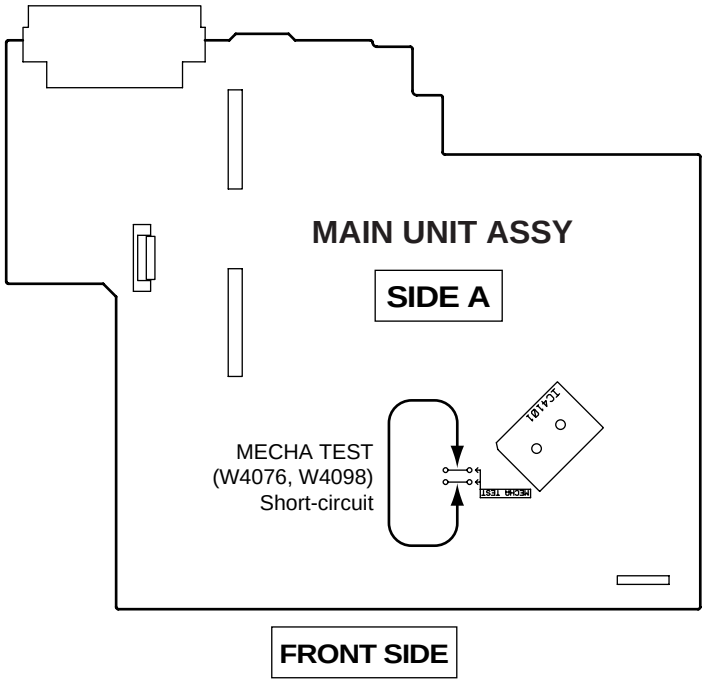
- The MJ-L77 has no LEDs for the recoding mode indications.
  In the digital input mode, when the audio signal is applied to the product, you can monitor it at the MD audio output , even in the stop, recording, or recoding pause mode.
- In the single operation mode, it is impossible to make the adjustments of the MD mechanism and/or to select the MD mech adjustment mode.

6.2.2 MD mech adjustment mode

- The MJ-L77 should be connect to the XC-L77 (CD receiver) and DU-L77 (Display unit provided with the XC-L77).
- When the MD mech adjustment is done, use the CLD service remote control (GGF1067) or the remote control provided with the XC-L77.

■ How to enter the MD mech adjustment mode

1) Connect the XC-L77 and DU-L77 to the MJ-L77. Turn on the power of the XC-L77, and select "MD".
2) Short the jumper wires named MECHA TEST (W4076 and W4098) on the MAIN UNIT ASSY, or press the ESC button on the CLD service remote control.



■ Remote Key comparison table

Remote control supplied with XC-L77 (MJ-L77)	CLD service remote control
+ ►►	►► SCAN
- ◄◄	◄◄ SCAN
►►I	►►I SKIP
I◄◄	I◄◄ SKIP
MD PLAY	► PLAY
■	■/⏏
(⏏)	II► STILL STEP
MENU	FRM/TIM
MD REC	CHAP
SET	SEARCH
DISPLAY	CLEAR

■ MD mech adjustment items

Note: The operation buttons mentioned in the following explanations are those for the MJ-L77 or the remote control equipped with the product. When using the service remote control, refer to the key comparison table on the previous page.

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

Note: When IC101 (RF-AMP), IC104 (mechanical controller) or IC110 (EEPROM) has been exchanged or when a correction changing VD+3 has been made, be sure to correctly perform all steps up to step 6.

<table>
<tr><th>Step No.</th><th>Operation Keys and Operation Method</th><th>FL Display</th><th>Status</th><th>Remarks</th></tr>
<tr><td>1</td><td>Turn on the power. Then, short the MECHA TEST jumpers (W4076 and W4098).</td><td>EJECT</td><td>Test mode</td><td></td></tr>
<tr><td>2</td><td>Press the MD REC key.</td><td>TEMP ○○ □□</td><td>The microcomputer starts measuring.</td><td rowspan="2">○○: Measuring value
□□: Set value</td></tr>
<tr><td>3</td><td>When □□ is 80 or more at this time, the adjustment is OK (step 4 and following can be omitted).</td><td></td><td>End</td></tr>
<tr><td colspan="2">When □□ is 80 (not passed)</td><td>TEMP ○○ 8 0</td><td>80 is the default value (unadjusted).</td><td></td></tr>
<tr><td>4</td><td>Measure the ambient temperature T (°C) andcheck 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.</td><td colspan="3">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 ↓ +</td></tr>
<tr><td>5</td><td>Change □□ with the ►►I key (UP) and the I◄◄ key (DOWN).</td><td>TEMP 7B 7B</td><td></td><td></td></tr>
<tr><td>6</td><td>Power OFF</td><td>No Disc</td><td>Writing to EEPROM is made and return is made automatically from test mode to normal mode.</td><td></td></tr>
</table>

② Laser Power Check

CAUTION

- **Never look directly at the objective lens. Rec power (rpw) is than ten times greater than Playback power (ppw) is released.**
- **Never turn the pickup volume and be careful of touch it. Laser power of pickup has been adjusted in the factory shipping.**

<table>
<tr><th>Step No.</th><th>Operation Keys and Operation Method</th><th>FL Display</th><th>Status</th><th>Remarks</th></tr>
<tr><td>1</td><td>Turn on the power. Then, short the MECHA TEST jumpers (W4076 and W4098).</td><td>EJECT</td><td>Test mode</td><td>Laser Wavelength: 780 nm</td></tr>
<tr><td>2</td><td>Press the SET key.</td><td>ppw</td><td>PLAY power output status</td><td></td></tr>
<tr><td>3</td><td>Measure the laser power with an optical power meter.</td><td>ppw</td><td></td><td></td></tr>
<tr><td>4</td><td>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 MD mech adjustment mode shall be taken as the standard.</td><td>ppw</td><td>TEMP ○○ □□
μ-com Measuring value ↑ ↑ μ-com 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></td><td>May be omitted.</td></tr>
<tr><td>5</td><td>Press the SET key.</td><td>rpw</td><td>REC power output status</td><td></td></tr>
</table>

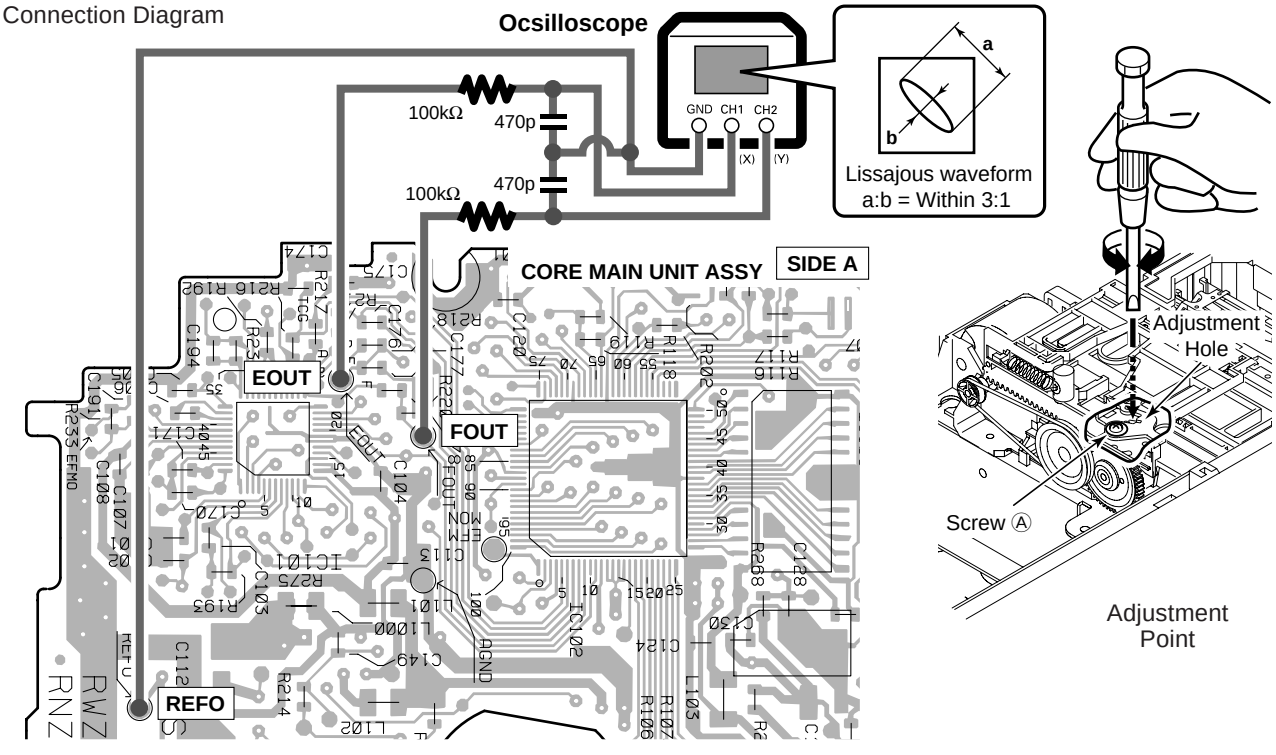
② Laser Power Check

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
6	At this time, check that the measuring value (REC power) meets the standard value of the table on the right.	rpw	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 ▲ key.		The LD goes out.	

③ Grating Adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Turn on the power. Then, short the MECHA TEST jumpers (W4076 and W4098).	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST	Grating adjustment status	
3	Press the MD 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 Ⓐ 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 Ⓐ.	GRT AJST	Lissajous waveform a:b = Within 3:1	
5	Press the ■ key.		Adjustment end	

Connection Diagram



④ Preliminary Adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Turn on the power. Then, short the MECHA TEST jumpers (W4076 and W4098).	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST		
3	Press the MENU key (until AUT YOBI is displayed).	AUT YOBI	Preliminary adjustment mode	
4	Preliminary adjustment starts when the MD PLAY key is pressed.	HAo : RFg : PTG : | Can't ADJ. COMPLETE	 Defective adjustment (problem with the servo system) Adjustment end	
5	Press the ■ key.	AUT YOBI	Return to menu display	
6	Power OFF	EEPROM W Toc Reading 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.

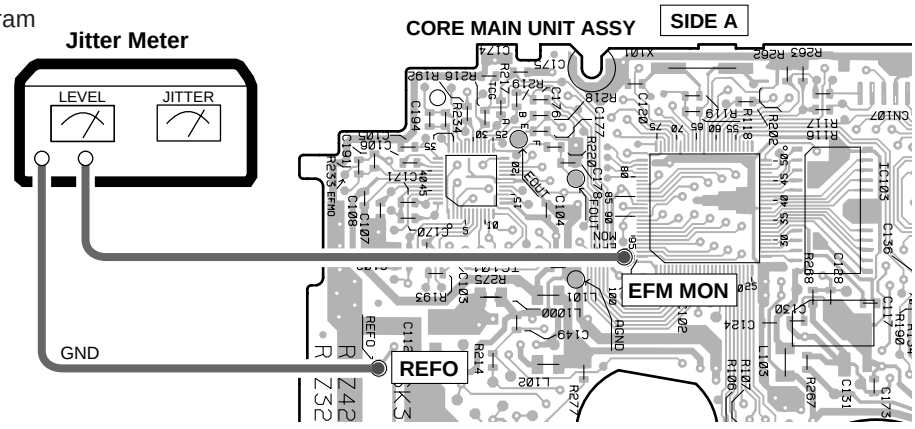
⑤ Normal adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Turn on the power. Then, short the MECHA TEST jumpers (W4076 and W4098).	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST		
3	Press the MENU key (until AUTO AJST is displayed).	AUTO AJST	Normal adjustment mode	
4	Normal adjustment starts when the MD PLAY key is pressed.	PEG : HAG: | Can't ADJ. COMPLETE	 Defective adjustment (problem with the servo system) Adjustment end	
5	Press the ■ key.	AUTO AJST	Return to menu display	

⑥ Defocus adjustment

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Turn on the power. Then, short the MECHA TEST jumpers (W4076 and W4098).	EJECT	Test mode	
2	Insert the test disc GGF1328 (MMD-212).	LOADING GRT AJST		
3	Press the MENU key. (until deFO AJST is displayed).	deFO AJST		
4	Press the MD PLAY key. of ○○○○ c □□□□ Deforcus 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 MD 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.	
7	Press the MD 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 MD 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 + ►►/- ◄◄ key 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 and return to step 4.	
10	Press the MD 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.	

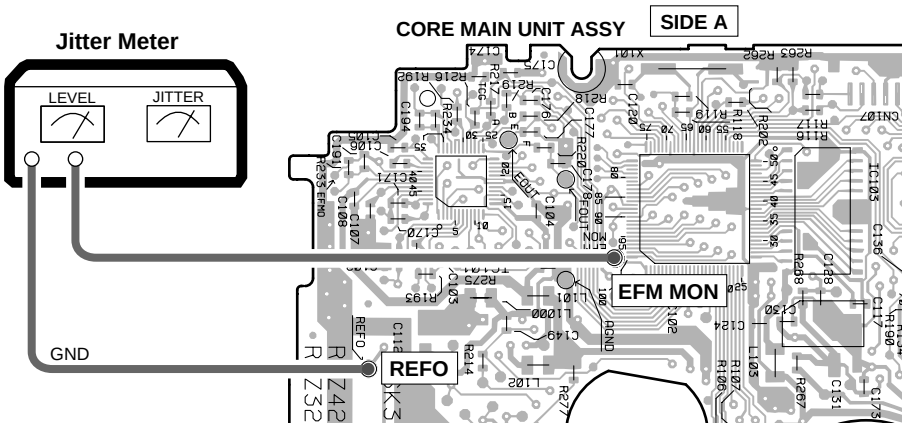
Connection diagram



⑦ Jitter/C1 Error Check at the time of Playback

<table>
<tr><th>Step No.</th><th>Operation Keys and Operation Method</th><th>FL Display</th><th>Status</th><th>Remarks</th></tr>
<tr><td>1</td><td>Turn on the power. Then, short the MECHA TEST jumpers (W4076 and W4098).</td><td>EJECT</td><td>Test mode</td><td></td></tr>
<tr><td>2</td><td>Insert the test disc GGF1328 (MMD-212).</td><td>LOADING
GRT AJST</td><td></td><td></td></tr>
<tr><td>3</td><td>Perform “ ⑤ Normal Adjustment ” (step 3, step 4).</td><td>AUTO AJST</td><td></td><td></td></tr>
<tr><td>4</td><td>Press the MD REC key.</td><td>TEST PLAY</td><td>TEST PLAY mode</td><td></td></tr>
<tr><td>5</td><td>Press the SET key and display the inner circumference address.</td><td>ADRES 0050</td><td></td><td></td></tr>
<tr><td>6</td><td>Press the MD PLAY key and display the C1 error for the inner circumference.</td><td>a0050 c0015</td><td>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></td><td></td></tr>
<tr><td>7</td><td>Press the DISPLAY key.</td><td>A0062 c0013
AVE. c0012</td><td>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.</td><td></td></tr>
<tr><td>8</td><td>Press the DISPLAY key.</td><td>a006F c0017</td><td>The fixed display of the C1 error is ended.</td><td></td></tr>
<tr><td>9</td><td>Press the ■ key.</td><td>TEST PLAY</td><td></td><td></td></tr>
<tr><td>10</td><td>Press the SET key and display the inner circumference address.</td><td>ADRES 0050</td><td rowspan="4"></td><td rowspan="4">Intermediate and outer circumference may be omitted.</td></tr>
<tr><td>11</td><td>Press the MD REC key and display the intermediate circumference address.
Perform steps 6 to 9 in this condition.</td><td>ADRES 03C0
a03C0 c0009
TEST PLAY</td></tr>
<tr><td>12</td><td>Press the SET key and display the inner circumference address.</td><td>ADRES 0050</td></tr>
<tr><td>13</td><td>Press the MD REC key twice to display the outer circumference address.
Perform steps 6 to 9 in this condition.</td><td>ADRES 0700
a0700 c0008
TEST PLAY</td></tr>
<tr><td>14</td><td>Press the ▲ key, eject the test disc GGF1328 (MMD-212), and insert TGYS1 (or MMD-110.)</td><td>EJECT
LOADING
GRT AJST</td><td></td><td></td></tr>
<tr><td>15</td><td>Perform steps 3 to 13 and check the jitter/C1 error with the test disc TGYS1 (or MMD-110).</td><td>a0062 c0009
a03d2 c0007
a0712 c0006</td><td>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></td><td></td></tr>
<tr><td>16</td><td>Press the ▲ key.</td><td>EJECT</td><td>The test disc TGYS1 (or MMD-110) is ejected.</td><td></td></tr>
<tr><td>17</td><td>Power OFF</td><td></td><td>Test mode is ended.</td><td></td></tr>
</table>

⑦ Jitter/C1 Error Check at the time of Playback



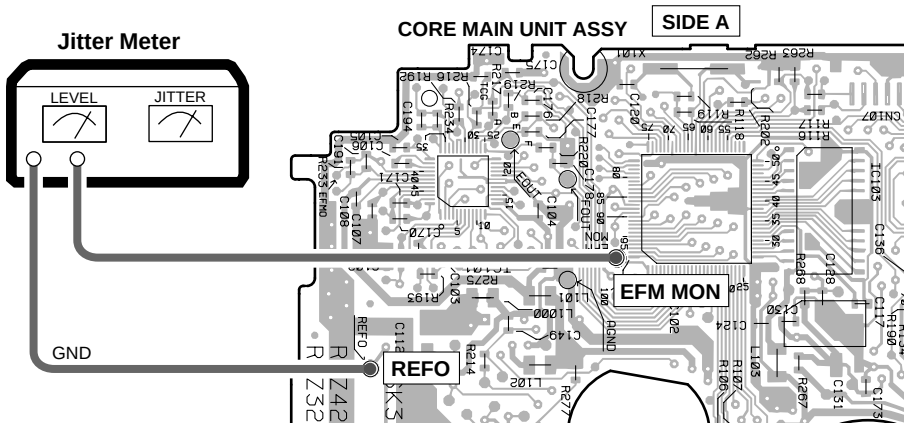
Connection diagram

⑧ Jitter/C1 Error Check at the time of Recording/Playback

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
1	Turn on the power. Then, short the MECHA TEST jumpers (W4076 and W4098).	EJECT	Test mode	
2	Insert the test disc (GGF1277).	LOADING GRT AJST		
3	Perform " ⑤ Normal Adjustment " (step 3, step 4).	AUTO AJST		
4	Press the MD REC key twice.	TEST REC	TEST REC mode	
5	Press the SET key and display the inner circumference address.	a0050 pw0D	Note: When the initial address (0050) part of the inner circumference (or intermediate/ outer circumference) has been used 1000 times or more, press the + ►► 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.
6	When the MD PLAY key is pressed, TEST REC starts, and when 25 addresses or more have been sent, stop by pressing the ■ key.	a0069 pw0D TEST REC		
7	Press the SET key and display the inner circumference address.	a0050 pw0D		
8	Press the MD REC key and display the intermediate circumference.	a03C0 pw0D		
9	Perform step 6.	a03D9 pw0D TEST REC		
10	Press the SET key and display the inner circumference address.	a0050 pw0D		
11	Press the MD REC key twice and display the outer circumference address.	a0700 pw0D		
12	Perform step 6.	a0719 pw0D TEST REC		
13	Press the MD REC key.	TEST PLAY	TEST PLAY mode	

⑧ Jitter/C1 Error Check at the time of Recording/Playback

Step No.	Operation Keys and Operation Method	FL Display	Status	Remarks
14	Perform steps 5 to 13 of " ⑦ 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 DISPLAY key 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** Inner circumference: 33 nsec or less Intermediate circumference: 31 nsec or less Outer circumference: 31 nsec or less	Intermediate and outer circumference may be omitted.
15	Press the ▲ key.	EJECT	The test disc (GGF1277) is ejected.	
16	Power OFF		Test mode is ended.	



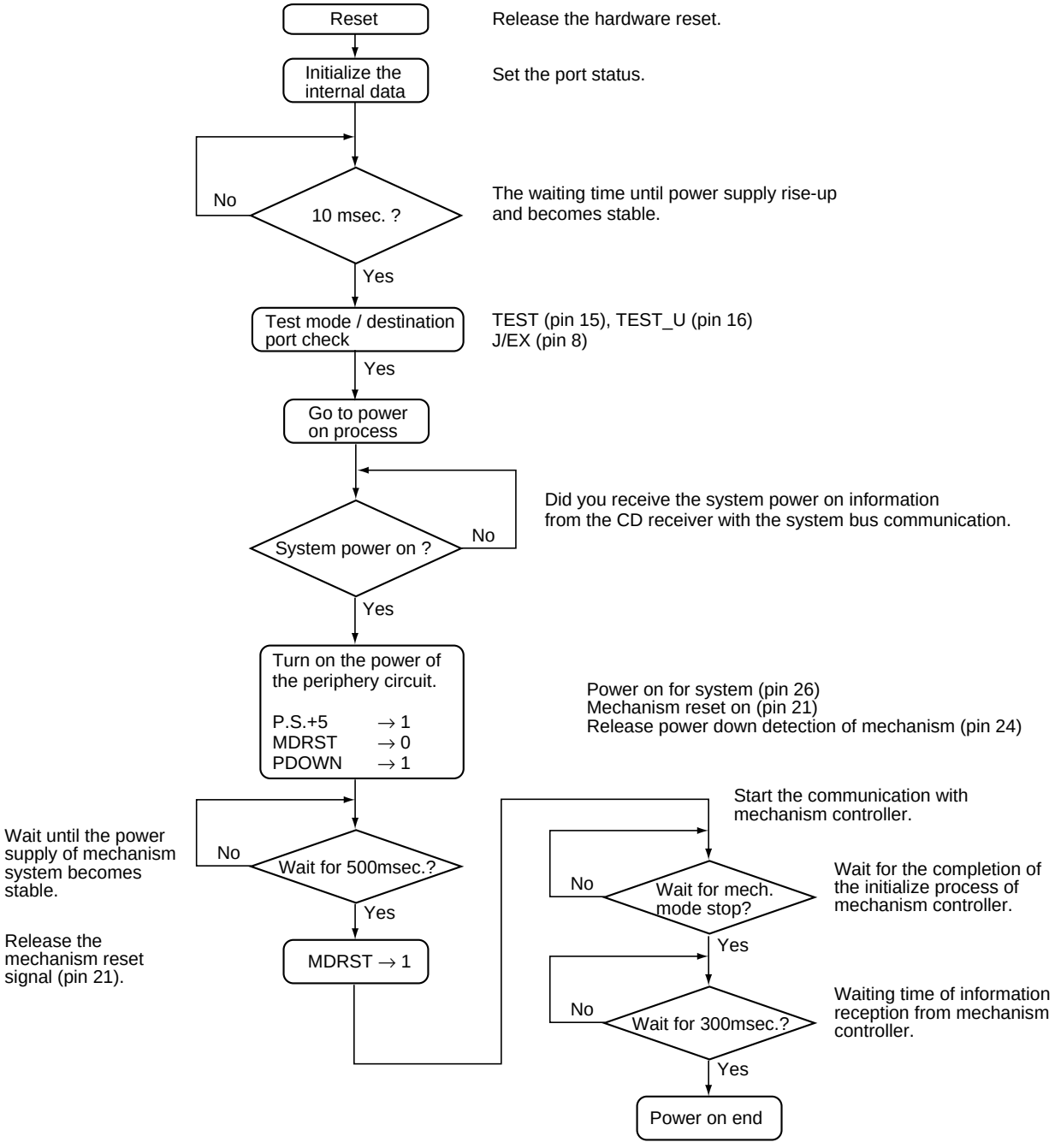
Connection diagram

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 TROUBLESHOOTING

• 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.

■ 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 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. ● Check if D-IN signal is FS = 32, 44.1 and 48 kHz.
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.
TOC ERR 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.
	● 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.
	● 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.
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.

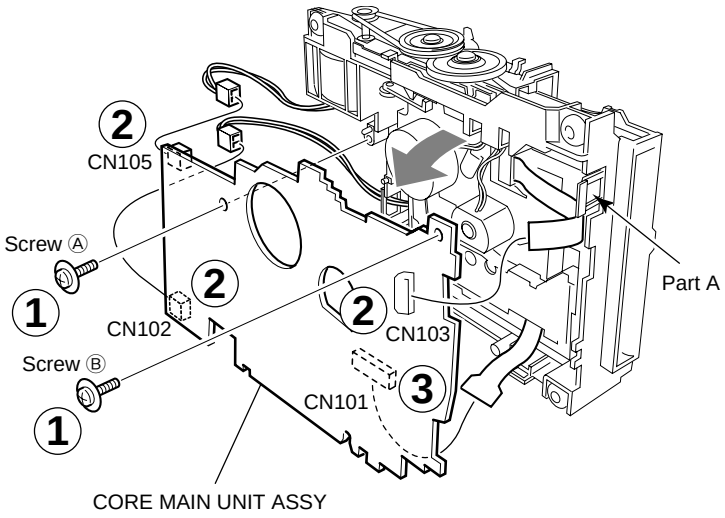
Details of Error Display

Error Display	Details of Error	Measure
Can' t EDIT	● Editing conditions were not satisfied for each editing function.	● Operating method is wrong. Try again using correct method.
Temp Over	● Temperature inside unit (MD unit) was too high due to fault.	● Check according to TROUBLESHOOTING.
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.
UTOCER W	● Fault occurred during rewriting of UTOC rewriting, and rewriting could not be performed correctly.	● Scratch on disc. Replaced with other discs.
	● 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.
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.
EEPROM ER	● The EEPROM data are incorrect.	● Try doing a RESET operation again. 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.

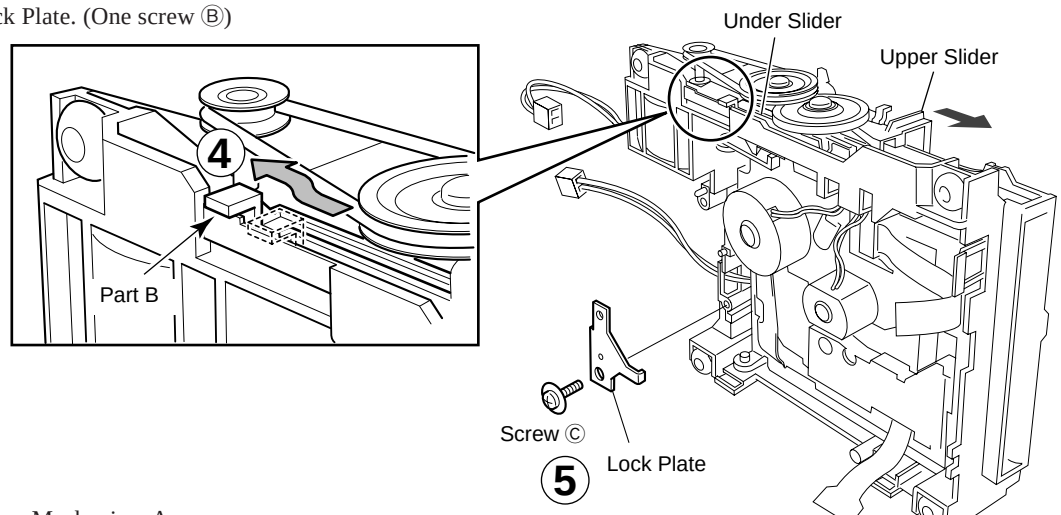
7.1.2 DISASSEMBLY

■ Removal of the Servo Mechanism Assy

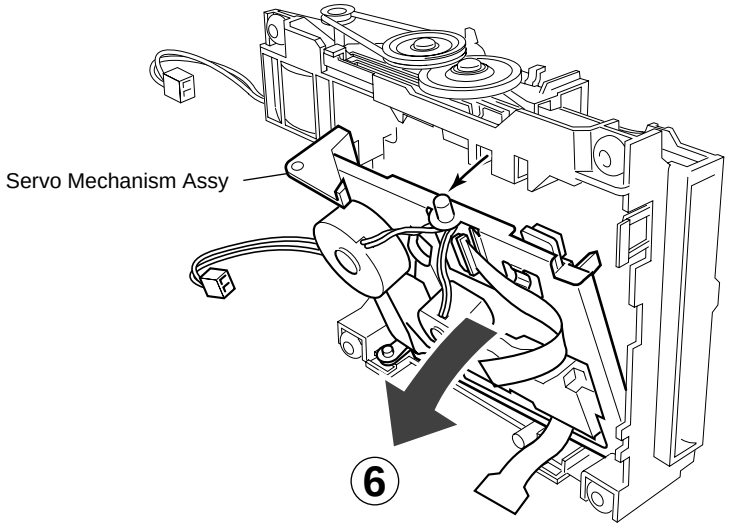
① Remove the screw Ⓐ and screw Ⓑ.
② Disconnect the connectors (CN102, CN103, CN105), open the hook of part A, and tilt the upper side of the CORE MAIN UNIT ASSY to the front.
③ Disconnect the connector (CN101) at the rear of the CORE MAIN UNIT ASSY and remove the CORE MAIN UNIT ASSY.



④ 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.)
⑤ Remove the Lock Plate. (One screw Ⓑ)



⑥ Remove the Servo Mechanism Assy.

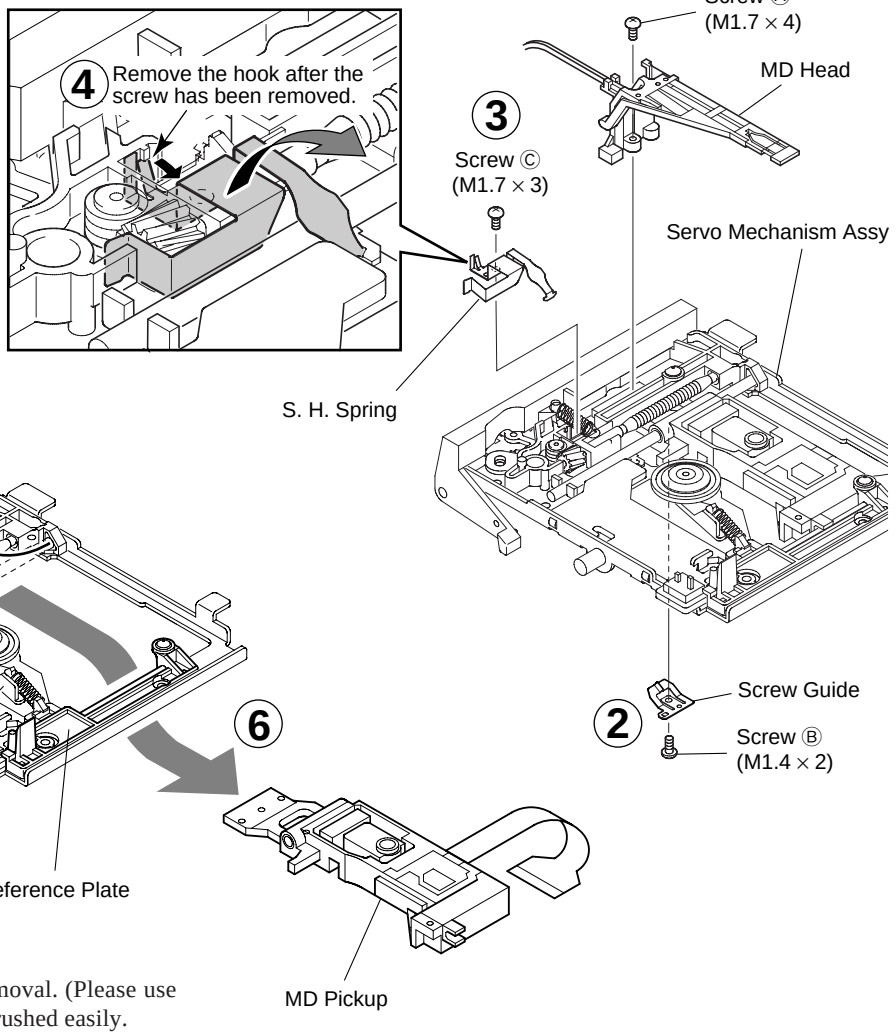


■ Caution for the time of installation of the servo mechanism assy

Move the MD Pick-up to the innermost circumference.
The servo mechanism assembly is not installed other than the innermost circumference.

■ Removal of the MD Pick-up

① Remove the MD Head. (One screw Ⓐ)
② Remove the Screw Guide at the lower side of the MD Pick-up. (One screw Ⓑ)
③ Remove the S. H. Spring. (One screw Ⓒ)
④ Remove the hook of the S. H. Spring as shown in the figure on the right.
⑤ Raise the left side of the Guide Shaft and pull it out to the left.
⑥ 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.)

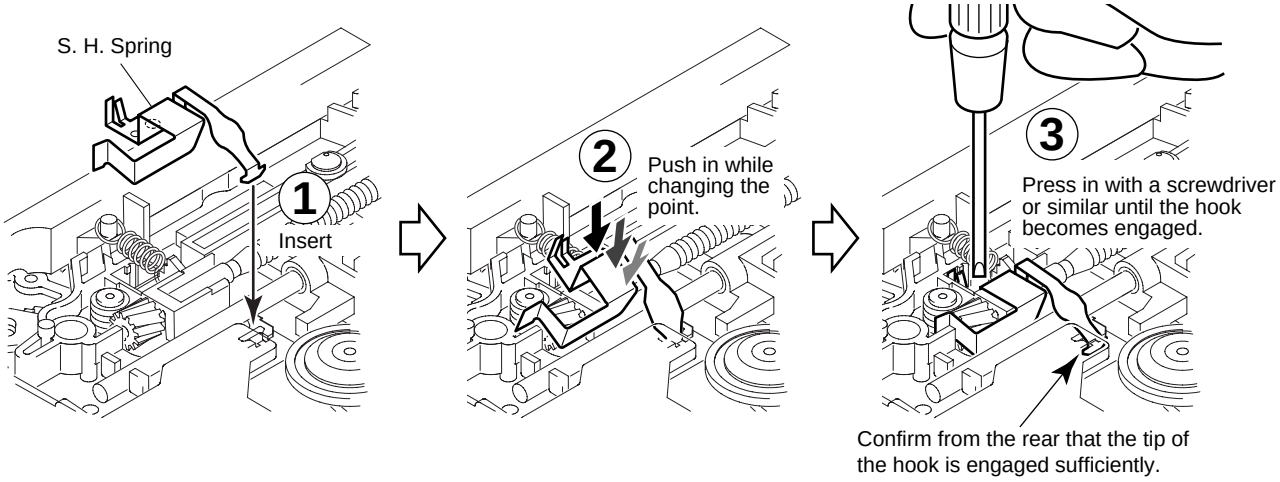


■ MD Pick-up Installation

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: 1.1 kg • cm

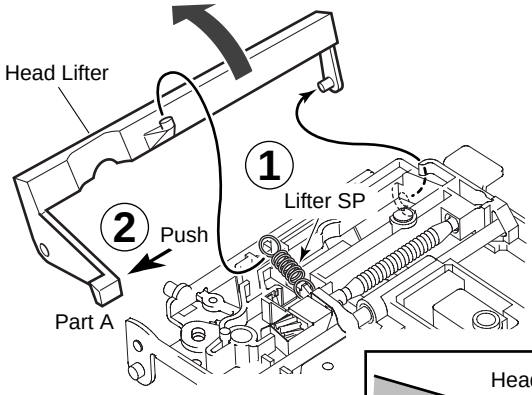
When the Reference Plate has been removed, confirm that the hook is engaged with the shaft of the spindle motor. (Take care that the mounting reference boss does not ride up.)

■ S. H. Spring Installation



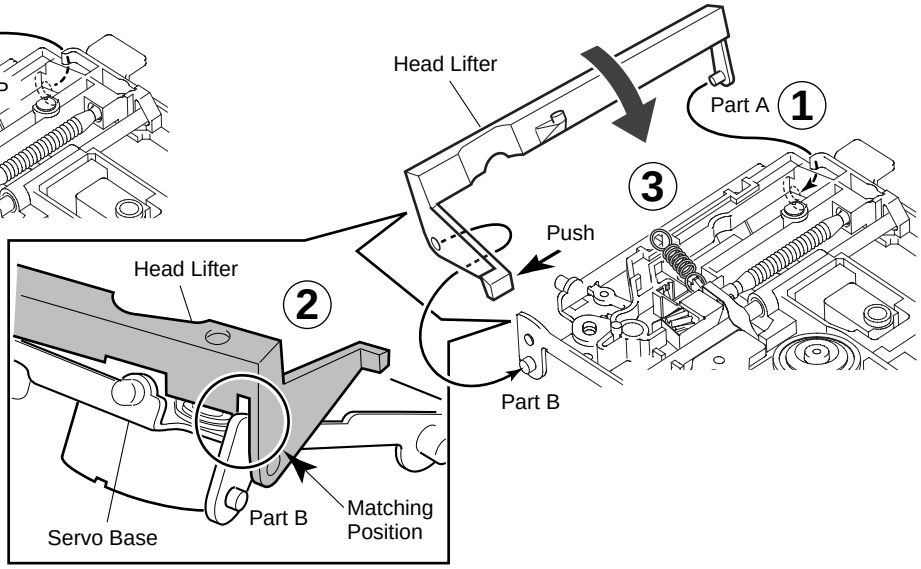
■ Removal of the Head Lifter

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.



7.2 PARTS

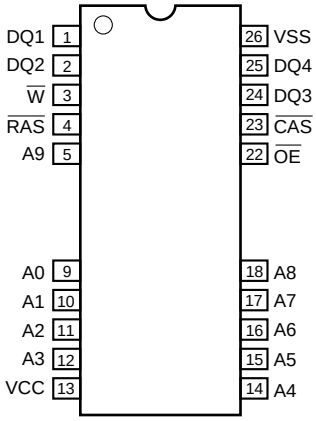
7.2.1 IC

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

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

● DRAM

● Pin Assignment (Top view)

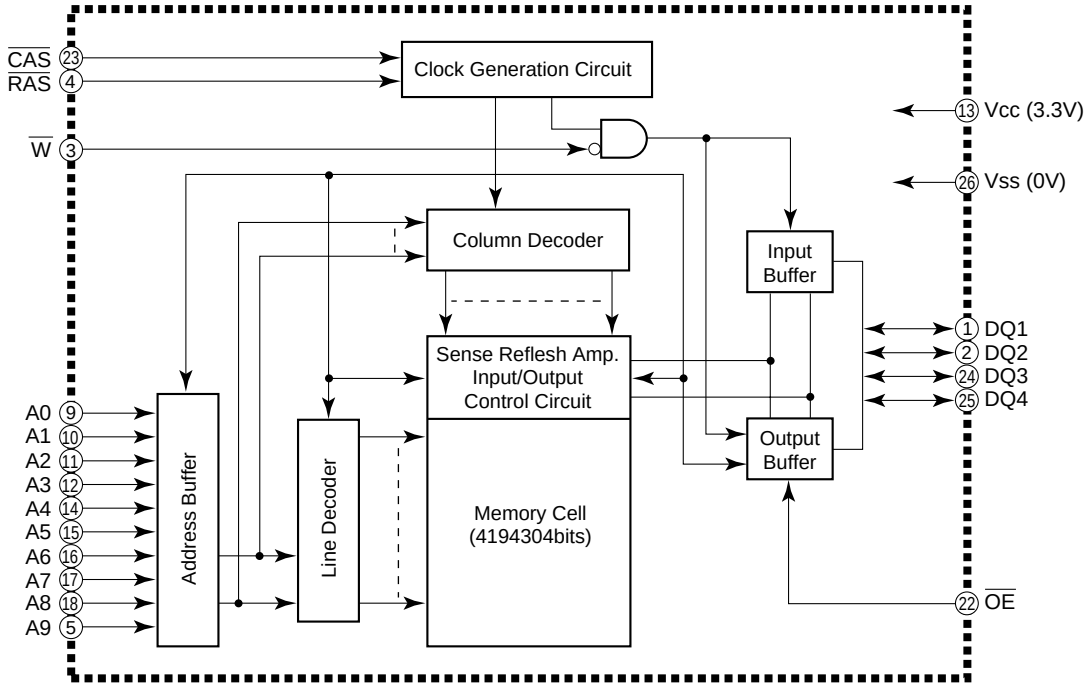


● Pin Function

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 | 8		
9 | 12	A0 | A3	Address input
13	Vcc	Power supply voltage (+3.3 V)

No.	Name	Description
14 | 18	A4 | A8	Address input
19 | 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)

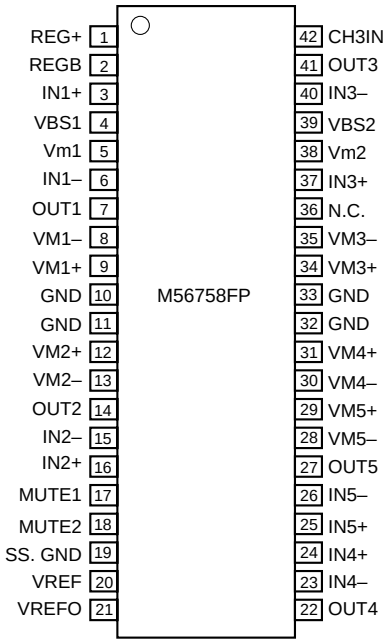
● Block Diagram



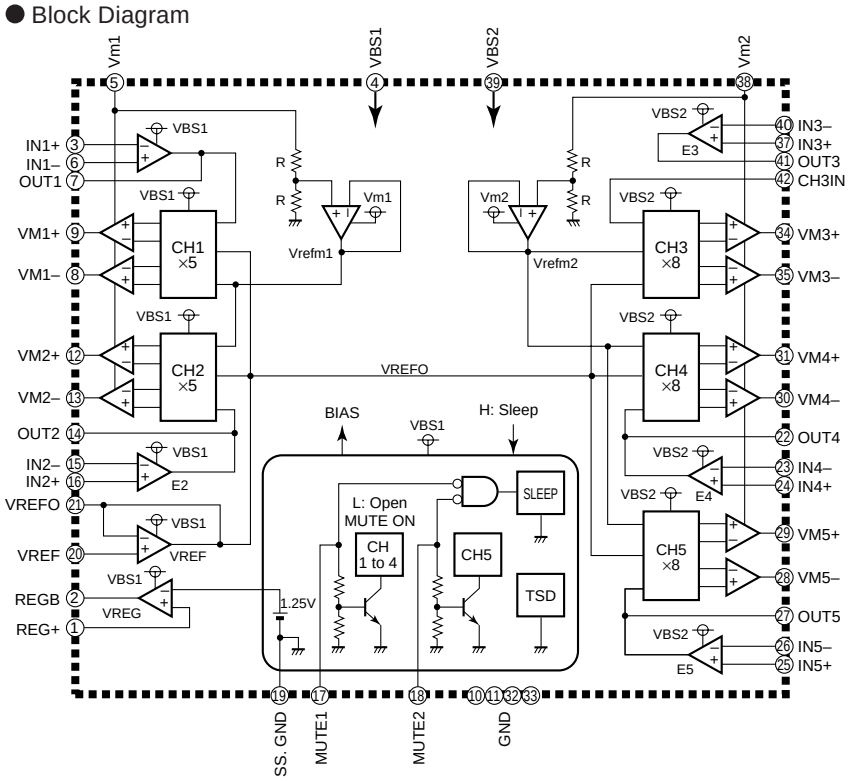
■ M56758FP (IC106: CORE MAIN UNIT ASSY)

● 5-channel Actuator Driver

● Pin Assignment (Top view)



● Block Diagram



● Pin Function

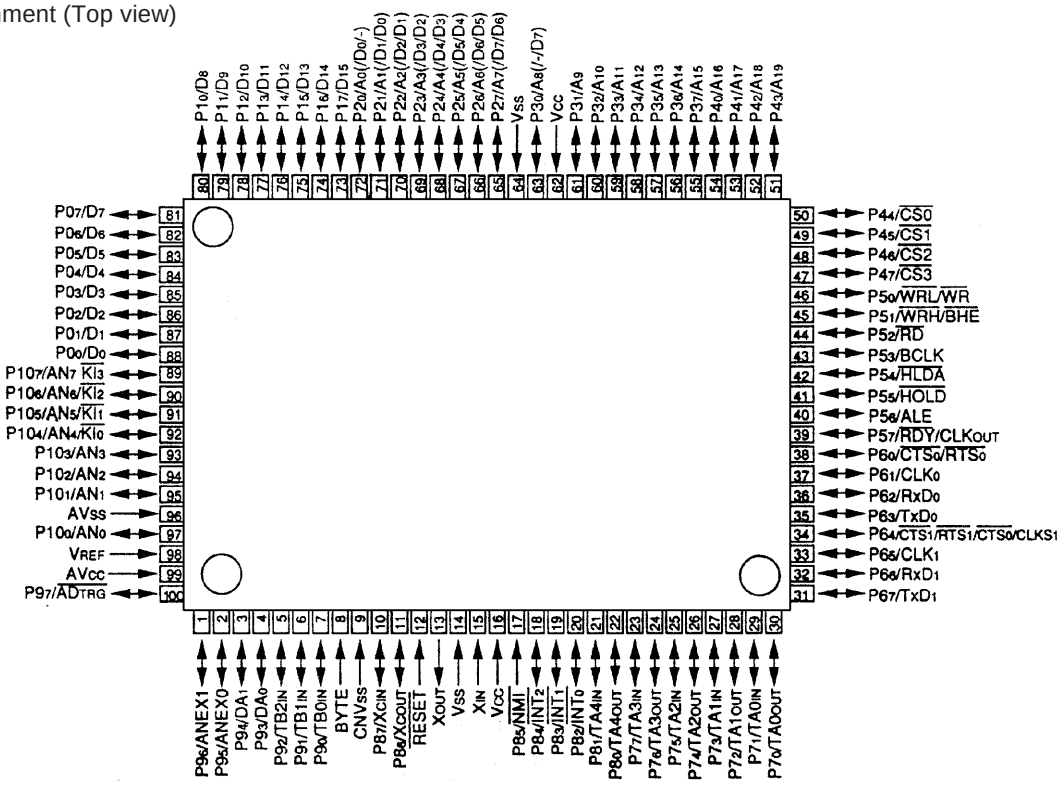
No.	Name	Description
1	REG+	Regulator voltage setting resistor connection terminal
2	REGB	Regulator PNP base connection terminal
3	IN1+	E1 amplifier nonreversed input terminal
4	VBS1	Bootstrap power supply terminal
5	Vm1	Motor power supply terminal
6	IN1–	E1 amplifier reversed input terminal
7	OUT1	E1 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

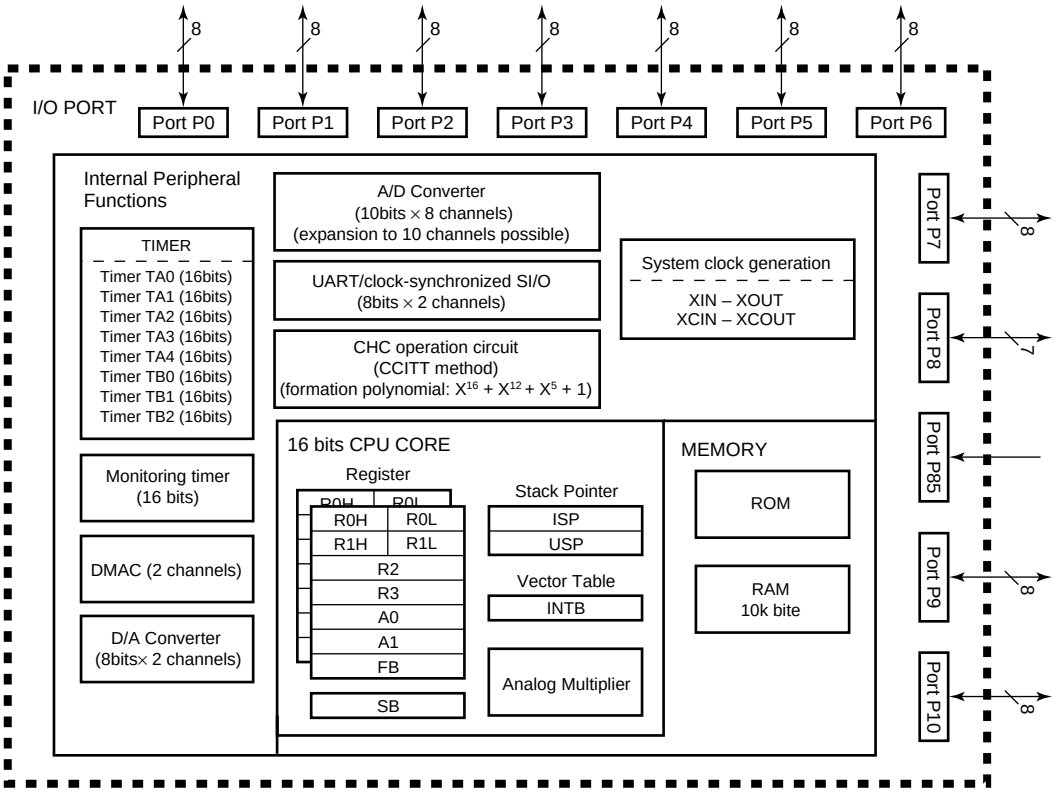
■ PD5523A (IC104: CORE MAIN UNIT ASSY)

● Mechanism Control m-com.

● Pin Assignment (Top view)



● Block Diagram



● Pin Function

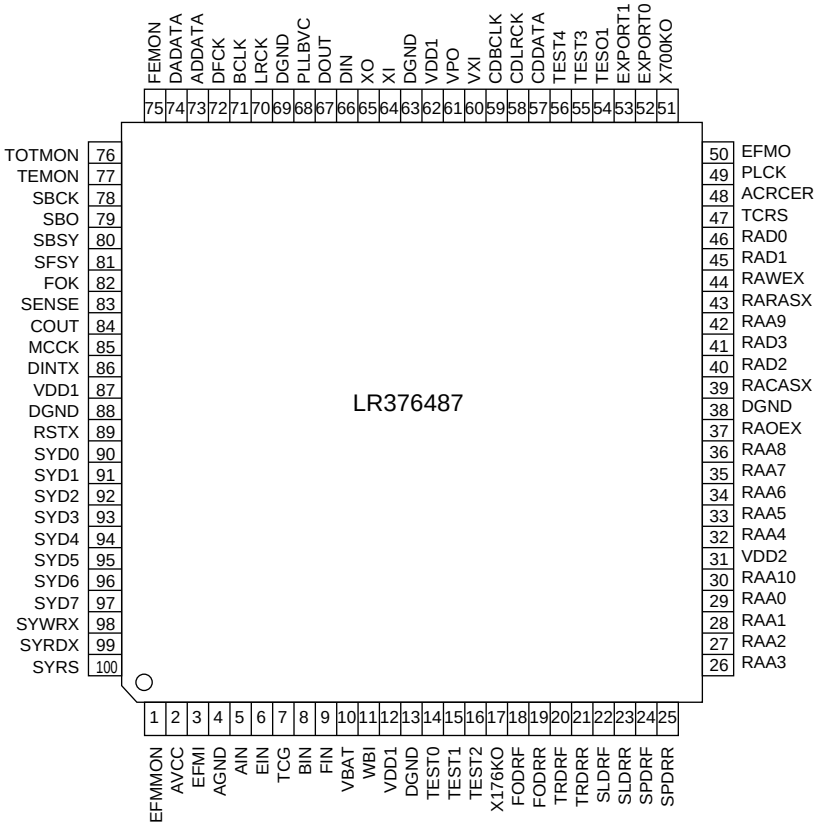
No.	Name	I/O	Description
1 to 7, 100	P96 to P90, P97	I/O	These are 8 bit I/O ports with the same functions as P0. By software selection, it functions as the input terminals for the timers B0 to B2, the output terminals for the D/A converter, the expansion input terminals of the A/D converter, or the 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 toP80	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.
	$\overline{\text{WRL}}$/$\overline{\text{WR}}$, $\overline{\text{WRH}}$/$\overline{\text{BHE}}$, $\overline{\text{RD}}$, BCLK, $\overline{\text{HLDA}}$, $\overline{\text{HOLD}}$, ALE, $\overline{\text{RDY}}$	O O O O O I O I	WRL, WRH, ($\overline{\text{WR}}$, BHE), $\overline{\text{RD}}$, BCLK, HLDA, and 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. 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 ø is put out from the 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 toA9 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.

■ LR376487 (IC102: CORE MAIN UNIT ASSY)

● 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 PLLLR 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	PLLBVC	–	Capacitor connection terminal for PLLB signal
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	MCCK	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

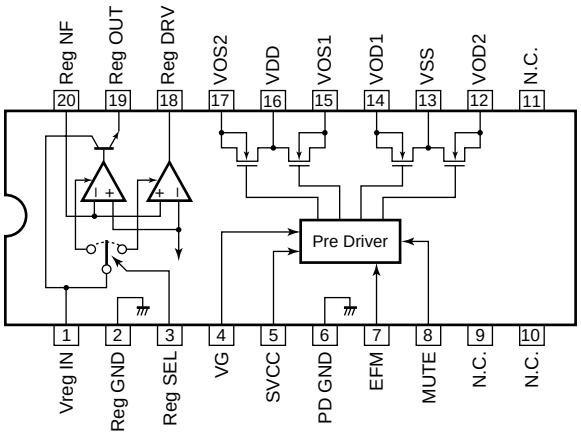
Terminals denoted with an asterisk (*) are (Open) terminals that are not externally connected.

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

■ BD7910FV (IC116: CORE MAIN UNIT ASSY)

● Head Driver

● Block Diagram



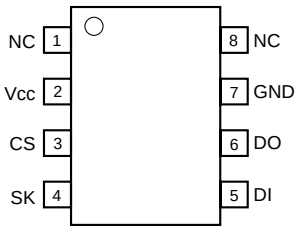
● Pin Function

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
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 (IC110: CORE MAIN UNIT ASSY)

● EEPROM

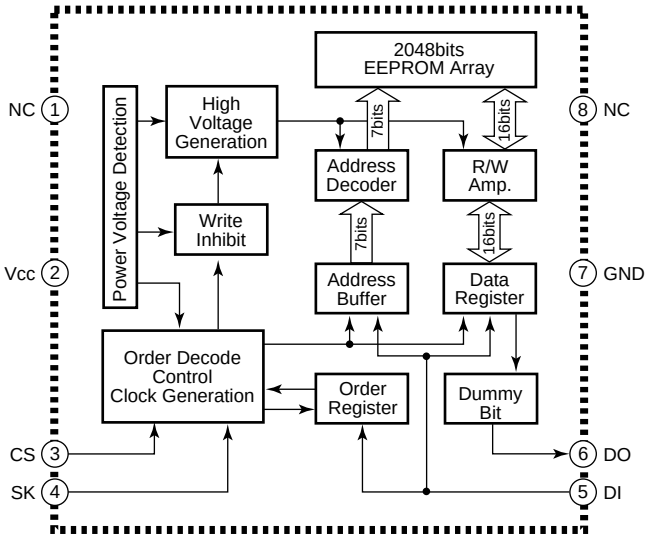
● Pin Assignment (Top view)



● 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

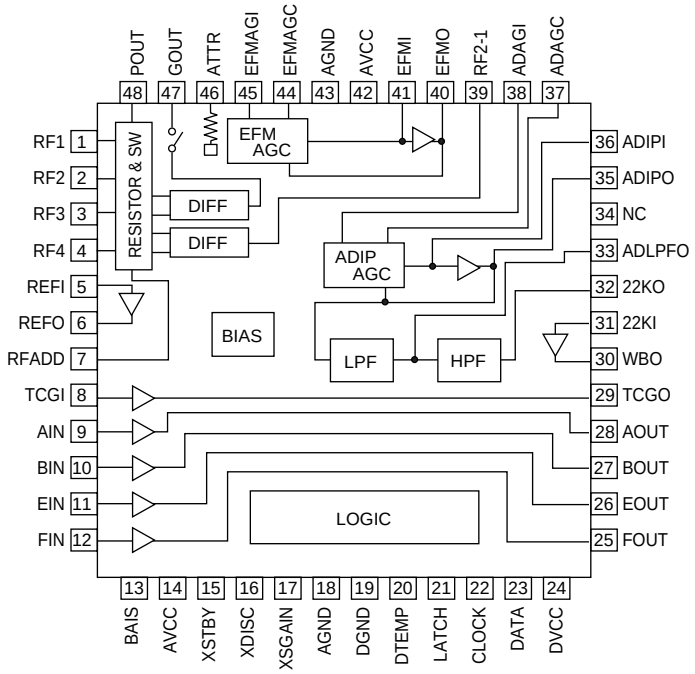
● Block Diagram



■ IR3R55M (IC101: CORE MAIN UNIT ASSY)

● 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)
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.

■ PDG249A (IC4101: MAIN UNIT ASSY)

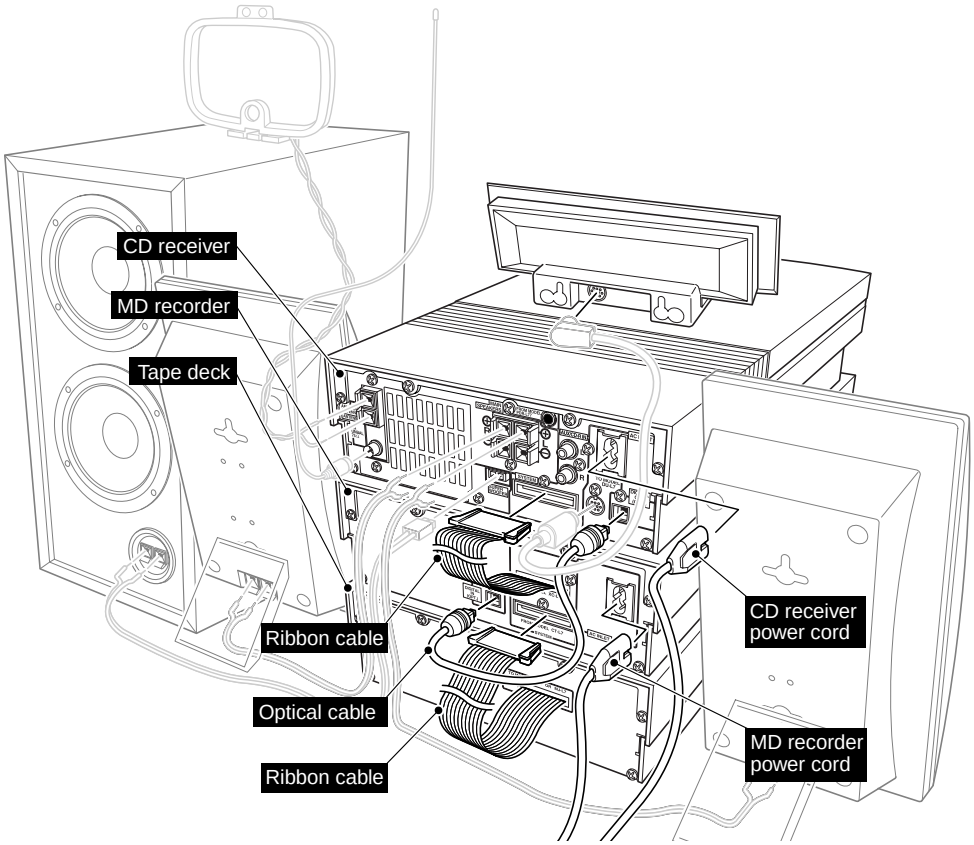
● System Control μ-com

● 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	NC	I	Connect to GND
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	NC	I	Connect to GND	57	PE3/NM1	NC		
18	PC4	NC	O	Not used (open)	58	PE4	NC	O	Not used (open)
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	PI2INT2	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	NC	O	Not used (open)	65	PI5/SCK2	NC		
26	PH4	P.S.+5	O	Periphery circuit control output (H:POWER ON)	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	NC		
36	AVss	Vss	–	Connect to GND	76	PG6	NC		
37	AVref	AVref	–	A/D reference voltage input (Connect to +5V).	77	PG7	NC		
38	PA0/AN0	KEYIN1	I	Key detection input 1 (A/D input)	78	PF0/SCL0	NC	O	Not used (open) (N ch open-drain)
39	PA1/AN1	KEYIN2	I	Key detection input 2 (A/D input)	79	PF1/SCL1	LEDPLAY	O	PLAY LED output (L:ON) (N ch open-drain)
40	PA2/AN2	NC	O	Not used (open)	80	PF2/SDA0	NC	O	Not used (open) (N ch open-drain)

8. PANEL FACILITIES AND SPECIFICATIONS

Connecting to the Rest of the System



Important: Before making or changing any rear panel connections, make sure that all the components are switched off and unplugged from the power supply.

The MJ–L77 connects directly to the XC–L77 CD receiver, so if you also have the CT–L77 tape deck and are adding it to your existing system, you'll need to disconnect the tape deck from the CD receiver first. If you're setting the whole system up for the first time, be sure to also refer to chapter 2 of the XC–L77 manual for full installation and connection details.

There are two audio connections to make:

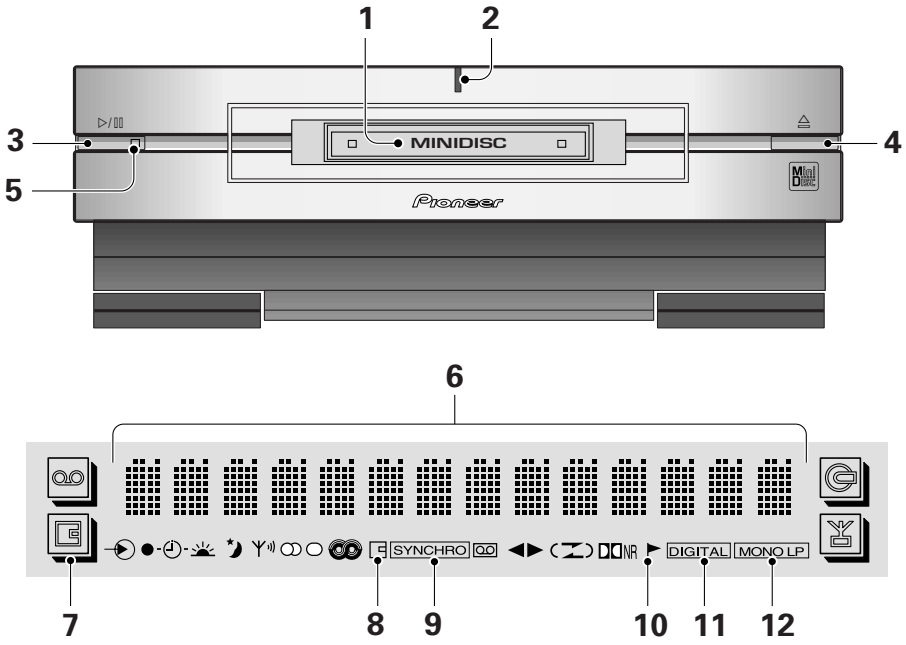
1. MD ribbon cord to the CD receiver
2. Optical cord from the CD receiver to the MD recorder

Additionally, if you have the CT–L77 tape deck:

3. Tape deck ribbon cord to the MD recorder

Having connected these up, you're ready to connect the power cords—one from the CD receiver and one from the MD recorder.

Controls & Display(DU-L77)



1 **MD loading slot**

2 **Power light** – lights when the unit is on.

3 **►/II button** – Press to play an MD, or pause one that's already playing (press again to restart playback). In record mode, also use to start or pause recording.

4 **▲ button** – Press to eject the MD.

5 **Play light** – Lights when an MD is playing; blinks when paused.

6 **Character display**

7 **MD function** – Highlights when in MD recorder mode.

8 **MD record indicator** – Lights during record or record-pause mode.

9 **Synchro indicator** – Lights in CD or tape synchro-recording mode.

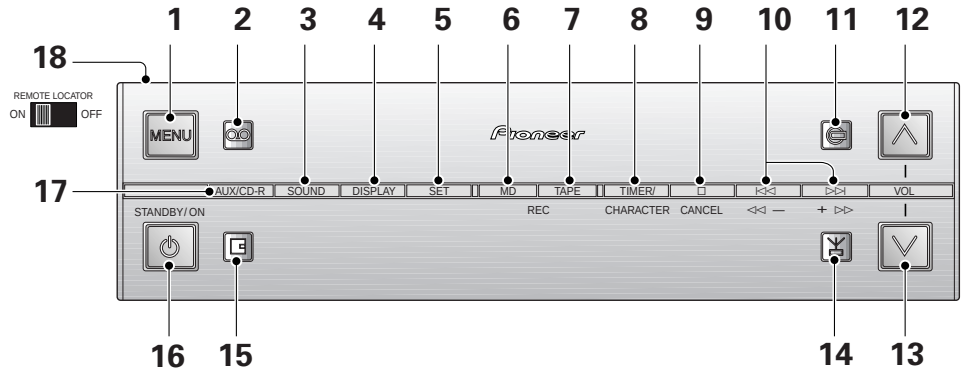
10 **Auto mark indicator** – Lights when automatic track numbering is switched on.

11 **Digital indicator** – Lights when MD recorder is in digital signal input mode.

12 **Mono LP indicator** – Lights when recording in mono/long-play mode.

- *Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.*
- *"DOLBY" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.*

Remote Control(DU-L77)



1 **MENU** – Press to access various features, including station memory naming, changing the tape reverse mode, and so on.

2 **Tape deck mode** – Press to switch the sound to tape deck and start the tape playing (if there's one loaded).

3 **SOUND** – Press to put the ⏮ and ⏭ buttons into tone, subwoofer level and balance control mode.

4 **DISPLAY** – Press to change the kind of information that the display shows. The choices available depend on the current function (CD, tape, etc.).

5 **SET** – Press to finish operations such as setting the clock, setting the reverse mode, and so on.

6 **MD REC** – Press to put MD recorder into record-pause mode.

7 **TAPE REC** – Press to put tape deck into record-pause mode.

8 **TIMER/CHARACTER** – Press to start setting the timer. Also use to select characters when naming tuner station memories, etc.

9 □ **CANCEL** – Press to stop playback (or recording) of the CD/MD/tape. Also use to cancel operations, such as setting the clock, before the SET button has been pressed (see 5 above).

10 ⏮ ⏭ **buttons** – Press to fast-reverse / fast-forward the CD/MD/tape.

11 **CD mode** – Press to switch the sound to CD and start the disc playing (if there's one loaded).

12 **Up** – Use to raise the volume.

13 **Down** – Use to lower the volume.

14 **Tuner mode** – Press to switch the sound to tuner, switch between AM and FM, and switch between preset station memories.

15 **MD mode** – Press to switch the sound to MD and start the disc playing (if there's one loaded).

16 **STANDBY/ON** – Press to switch the unit between standby and on modes.
Note: *this unit consumes about 1W of electricity in standby mode.*

17 **AUX/CD-R mode** – Press to switch the sound to the component connected to the AUX/CD-R inputs.

18 **REMOTE LOCATOR** – Use to switch on/off auto locate.

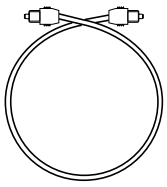
Specifications

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 220- 230V, 50/60 Hz (MYXK type)
AC 230V, 50/60 Hz (NVXK type)
Power consumption ..... 18 W
Dimensions ..... 220 (W) x 75 (H) x 310 (D) mm
Weight ..... 2.6 kg

Accessories
Operating instructions 1
Optical digital cord 1
Power cord 1
Warranty card 1

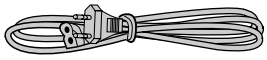
Note: *Specifications and design subject to possible modification without notice, due to improvement.*

Accessories



● Optical digital cord
(RKX1031) (L = 0.5m)

● Power cord
(ADG7010)
(For MYXK type)



● Power cord
(ADG7009)
(For NVXK type)