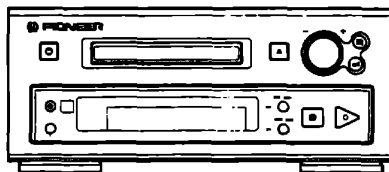


Service Manual

PIONEER
The Art of Entertainment



ORDER NO.
RRV1733

MINI DISC RECORDER

MJ-F21

●Refer to the service guide RRV1734 for MJ-F21.

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

Type	Model	Power Requirement	Remarks
	MJ-F21		
MY	○	AC220 - 230V	
NV	○	AC230V	

CONTENTS

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5. PCB PARTS LIST	23	7.2 BLOCK DIAGRAM	42
6. ADJUSTMENT	25	8. PANEL FACILITIES AND SPECIFICATIONS	43

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T-SZK JAN. 1997 Printed in Japan

1. SAFETY INFORMATION

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVARSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHED SAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.



LASER
Kuva 1
Lasersäteilyn varoitusmerkki

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

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

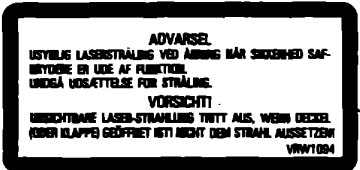
LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780 - 785 nm



LASER
Picture 1
Warning sign for laser radiation

LABEL CHECK

MY type

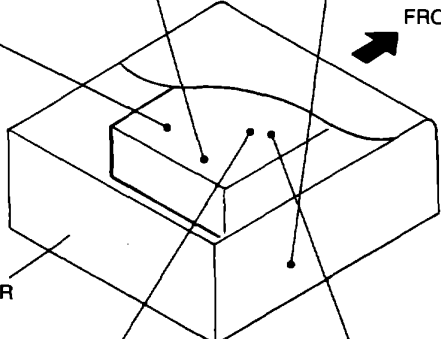


MY/NV types



MY/NV types





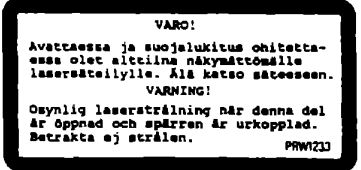
FRONT

REAR

NV type



MY type



Additional Laser Caution

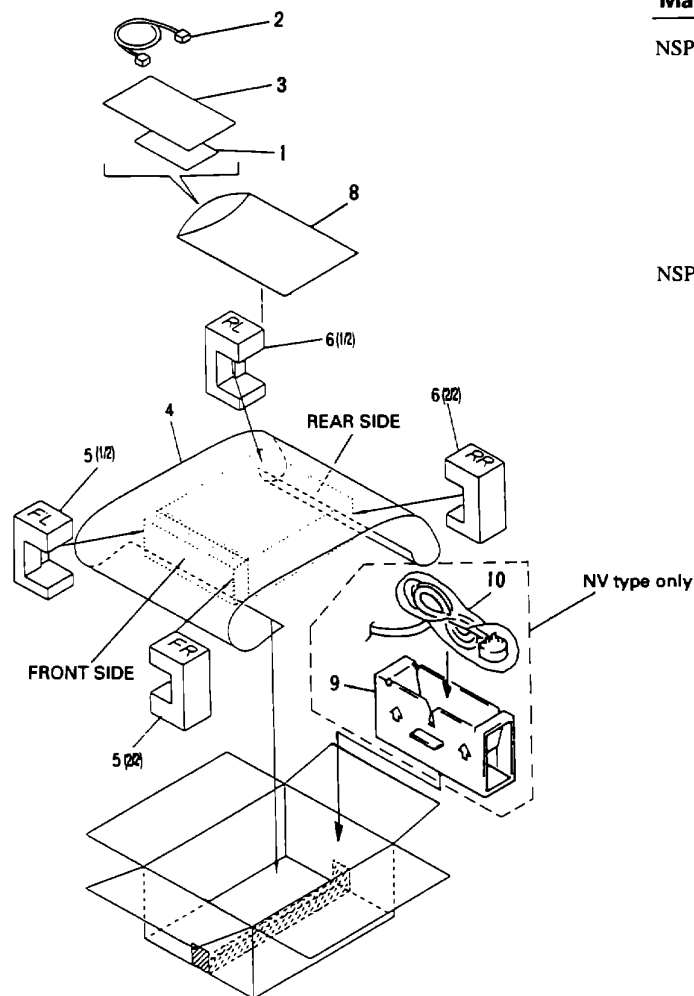
- Laser Interlock Mechanism**
The position of the switch (SW1956) for detecting loading state is detected by the MD mechanism microprocessor (IC1401), and the design prevents laser diode oscillation when the switch (SW1956) is OFF (Pin 6 of IC1401 is high level.) Thus, the interlock will no longer function if the switch (SW1956) is deliberately set to ON. (Pin 6 of IC1401 is low level.)
The interlock also does not function in the test mode*.
Laser diode oscillation will continue, if pin 20 of IR3R50 (IC1101) is connected to GND, or else the terminals (between emitter and collector) of Q1101 are shorted to each other.
- When the cover is opened, and the shielding case of MD mechanism unit (RYM1257) is further opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

* Refer to page 25.

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 parts. Therefore, when replacing, be sure to use parts of identical designation.
 - Screws adjacent to ∇ mark on the product are used for disassembly.

2.1 PACKING



(1) PARTS LIST

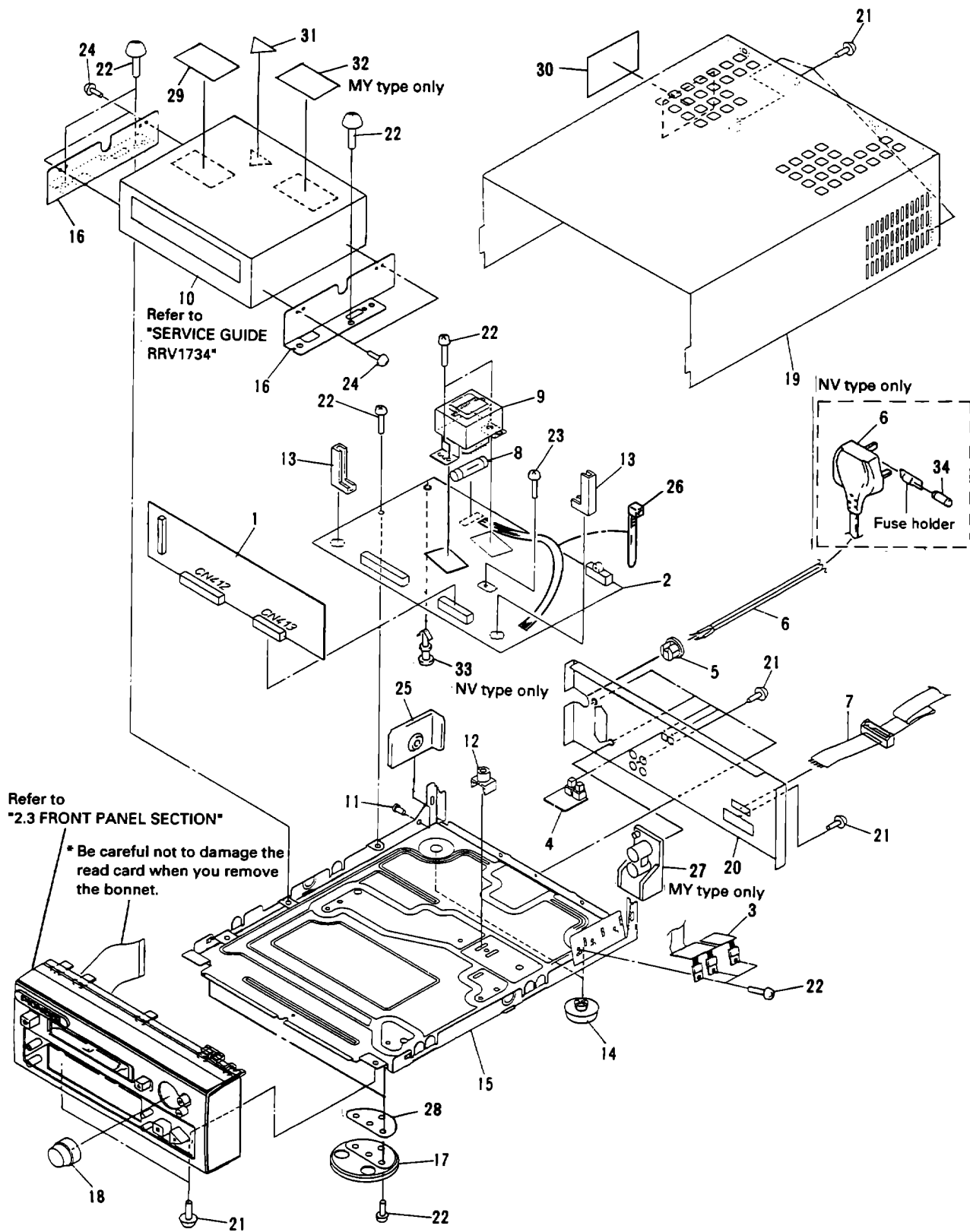
Mark	No.	Description	Parts No.
NSP	1	Warranty Card (E-J)	ARY7008
	2	Optical Fiber Cable (L=0.5m)	RKX1031
	3	Operating Instructions	See Contrast table (2)
	4	Mirror Mat Sheet	DHL1050
	5	Pad F MTCD	RHA1222
NSP	6	Pad R MTCD	RHA1223
	7	Packing Case	See Contrast table (2)
	8	Poly. Bag	Z21-038
	9	Spacer	See Contrast table (2)
	10	Poly. Bag	See Contrast table (2)

(2) CONTRAST TABLE

MJ-F21/MY and NV have the same construction except for the following :

Mark	No.	Symbol & Description	Part No.		Remarks
			MY type	NV type	
NSP	3	Operating Instructions (English/French/German/Italian)	RRD1192	Not used	
	3	Operating Instructions (Dutch/Swedish/Spanish/Portuguese)	RRE1157	Not used	
	3	Operating Instructions (English)	Not used	RRB1182	
	7	Packing Case	RHG1829	RHG1834	
	9	Spacer	Not used	RHG1836	
	10	Poly. Bag	Not used	RHL1021	

2.2 EXTERIOR



(1) PARTS LIST

Mark	No.	Description	Parts No.
	1	MAIN ASSY	RWZ4069
	2	POWER ASSY	RWZ4084
	3	REG ASSY	RWZ4072
	4	OPTICAL ASSY	RWZ4127
	5	STRAIN RELIEF	CM-22B
Δ	6	AC POWER CORD	See Contrast table (2)
	7	CORD WITH CONNECTOR	RDE1049
Δ	8	FUSE (FU2 : T2.5A)	AEK1058
Δ	9	POWER TRANSFORMER	RTT1330
	10	MD MECHA ASSY	RYM1257
	11	NYLON RIVET	AEC-525
NSP	12	PCB MOLD	AMR2115
	13	HOLDER	PNW2343
	14	FOOT (RUBBER)	REC-434
NSP	15	CHASSIS MTCD	RNB1123
	16	MECHA STAY MD	RNE1901
	17	INSULATOR F ASSY	RNK2231
	18	JOG KNOB MD	RAC2145
	19	BONNET MTCD	REA1266
	20	REAR PANEL	See Contrast table (2)
	21	SCREW	BBT30P080FNI
	22	SCREW	BBZ30P080FMC
	23	SCREW	ABA1024
	24	SCREW	PMH20P080FMC
	25	BRACKET	RNE1938
	26	BINDER	ZCA-SKB90BK
Δ	27	AC SOCKET 1-P	See Contrast table (2)
	28	PLATE	RNM1050
	29	CAUTION LABEL (HE)	See Contrast table (2)
NSP	30	CAUTION LABEL (F)	VRW-328
	31	CAUTION LABEL (G)	VRW-329
	32	CAUTION LABEL	See Contrast table (2)
NSP	33	PCB SPASER	See Contrast table (2)
Δ	34	FUSE (T5A)	See Contrast table (2)

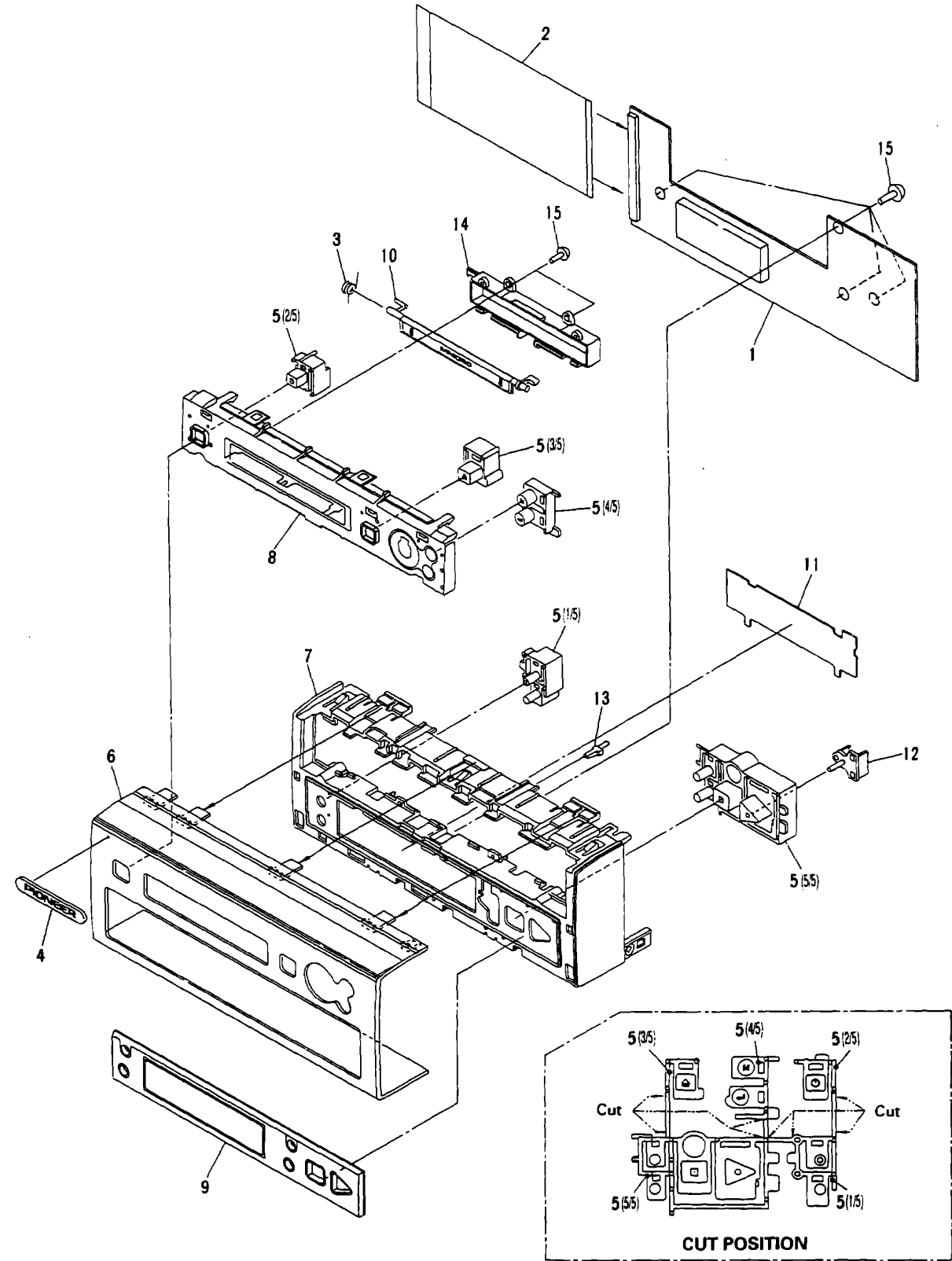
(2) CONTRAST TABLE

MJ-F21/MY and NV have the same construction except for the following :

Mark	No.	Symbol & Description	Part No.		Remarks
			MY type	NV type	
Δ	6	AC Power Cord	PDG1008	PDG1055	
	20	Rear Panel	RNA2113	RNA2116	
Δ	27	AC Socket 1-P	AKP1034	Not used	
	29	Caution Label (HE)	PRW1233	Not used	
	29	Caution Label	Not used	PRW1018	
	32	Caution Label	VRW1094	Not used	
NSP	33	PCB Spacer	Not used	AEC1372	
Δ	34	FUSE (T5A)	Not used	REK1003	

MJ-F21

2.3 FRONT PANEL SECTION

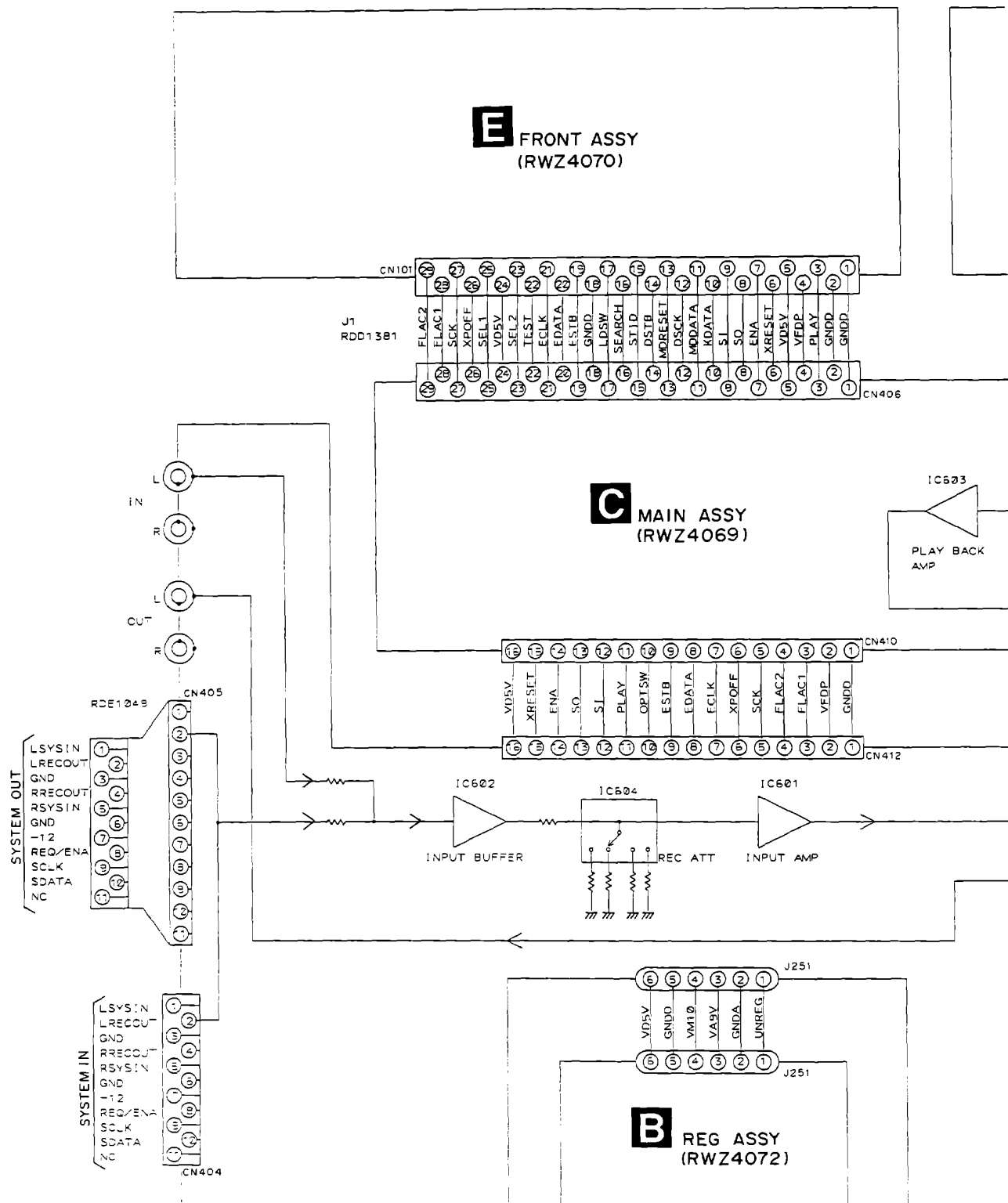


• PARTS LIST

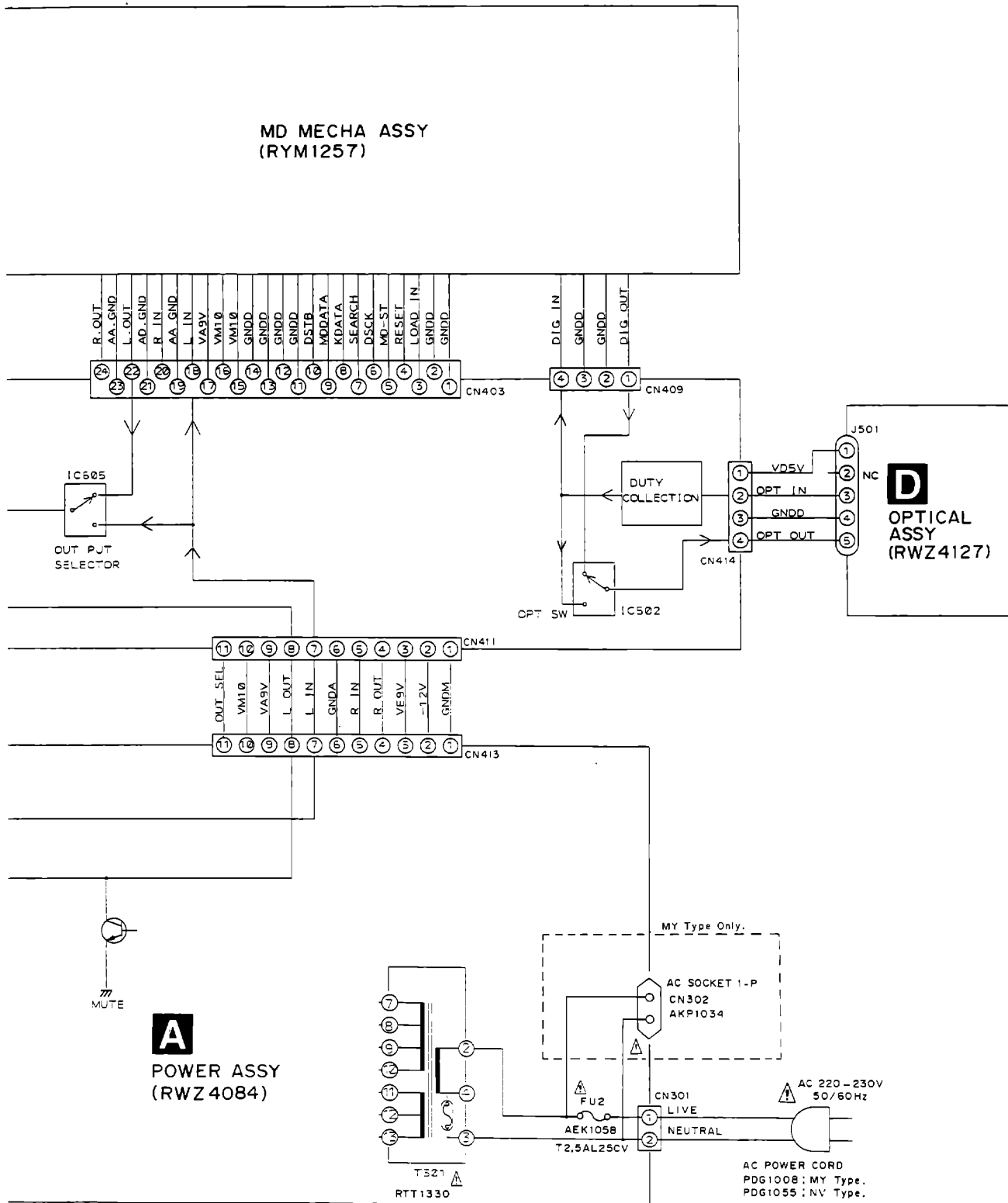
Mark	No.	Description	Parts No.
	1	FRONT ASSY	RWZ4070
	2	LEAD CARD	RDD1381
	3	MD FLAP SPRING	RBH1440
	4	NAME PLATE	AAM1002
	5	OPERATE BUTTON MD	RAC2144
	6	FRONT PANEL	RAH2766
	7	PANEL BASE	RAH2767
	8	FRONT KIT MD	RAH2770
	9	DISPLAY PANEL MD	RAH2773
	10	MD FLAP	RAH2776
	11	FL FILTER CD	REC1288
	12	PLAY LENZ	RNK2232
	13	INDICATOR LENZ MD	RNK2235
	14	MD FLAP HOLDER	RNK2236
	15	SCREW	BBZ30P080FMC

3. SCHEMATIC DIAGRAM

3.1 OVERALL WIRING DIAGRAM



- When ordering service parts, be sure to refer to "PARTS LIST of EXPLODED VIEWS" or "PCB PARTS LIST".



3.2 POWER ASSY, REG ASSY

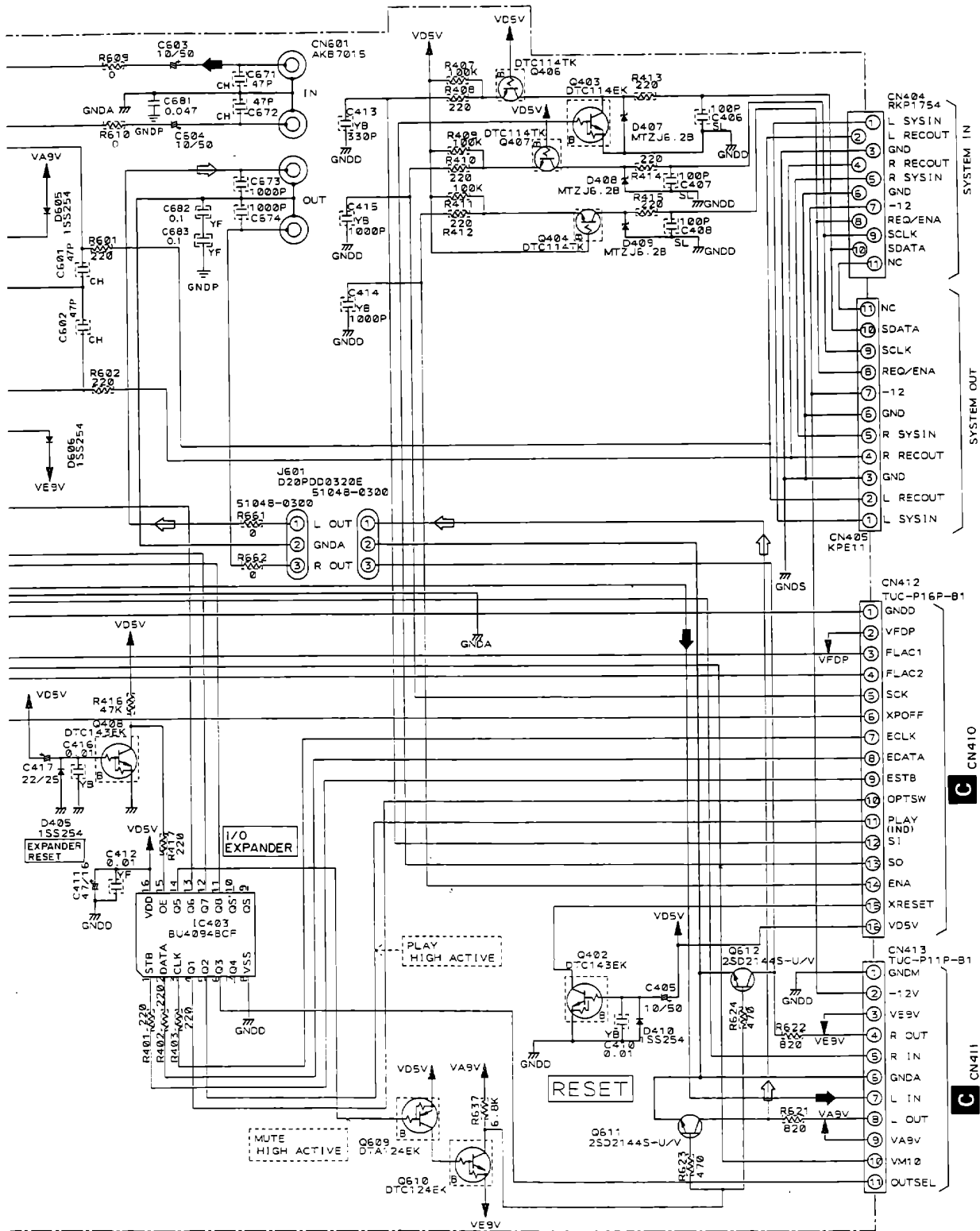
CAPACITORS Unmarked : μF RESISTORS Ω

4HSL	CCSQSL	4	CEAS
4HYB	CKSQYB	4JA	CEJA
4HYF	CKSQYF	4AL	CEAL
4HCH	CCSQCH		

 1/10W
 1/4W
 F RD 1/2 PMF



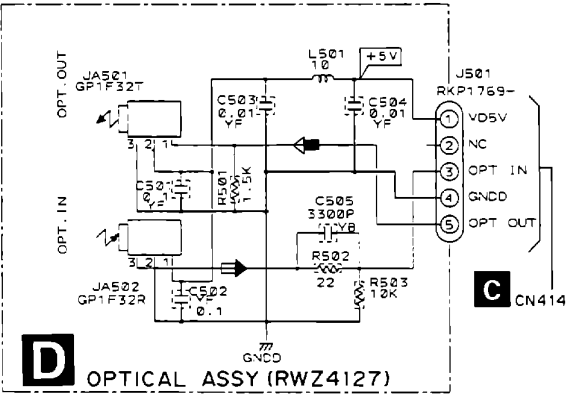
A B



⇨ : PLAYBACK AUDIO SIGNAL
 ⇨ : RECORDING AUDIO SIGNAL

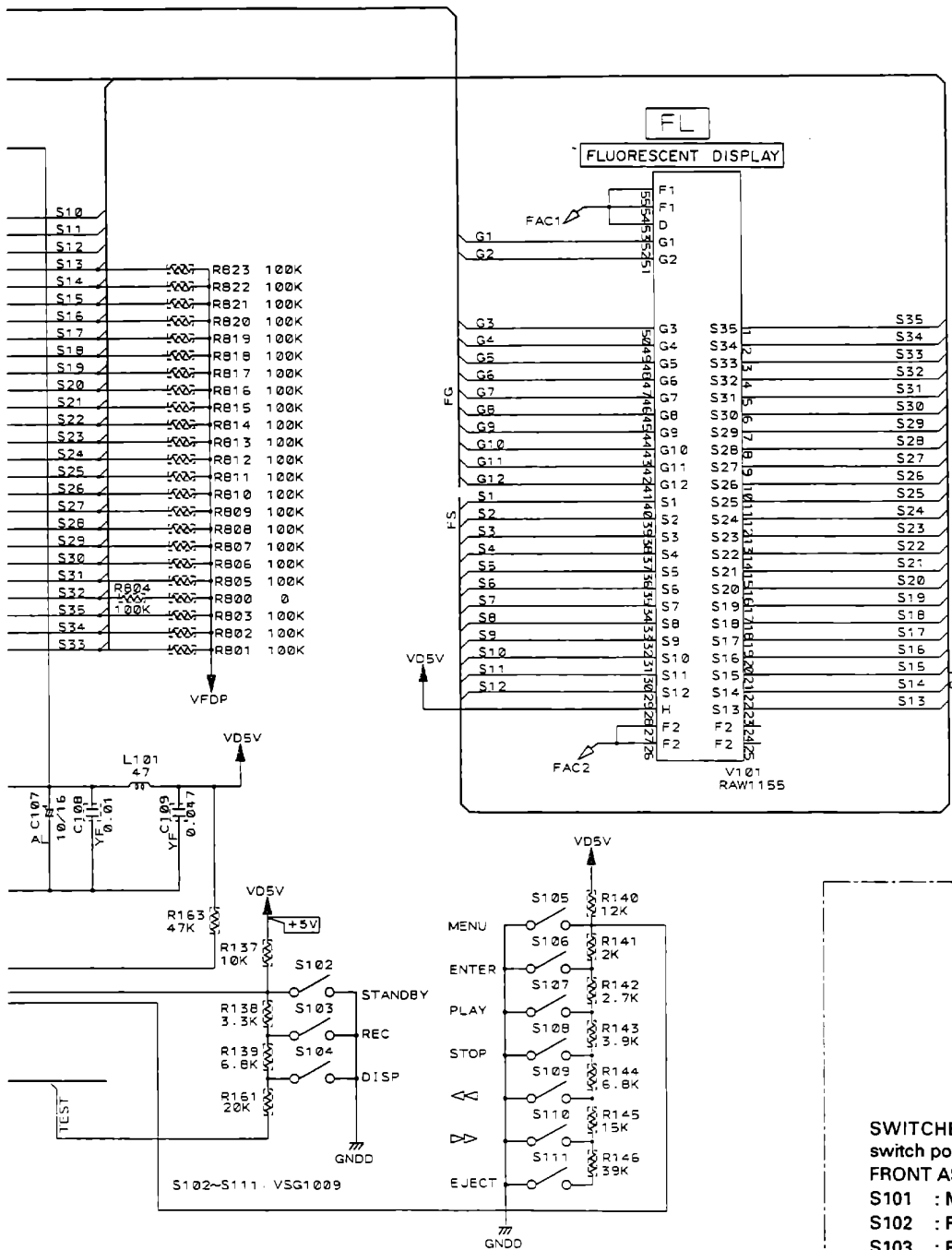
3.3 MAIN ASSY, OPTICAL ASSY





3.4 FRONT ASSY





4. PCB CONNECTION DIAGRAM

4.1 REG ASSY, OPTICAL ASSY

NOTE FOR PCB DIAGRAMS:

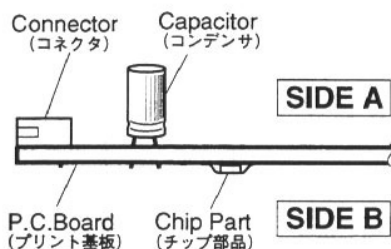
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

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.

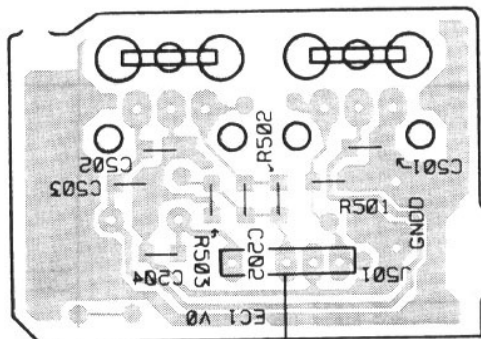
For further information for respective destinations, be sure to check with the schematic diagram.

4. Viewpoint of PCB diagrams



D OPTICAL ASSY

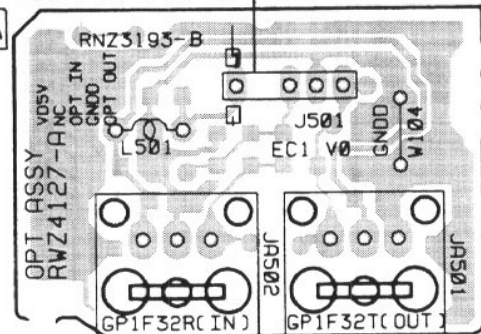
SIDE B



C CN414

D OPTICAL ASSY

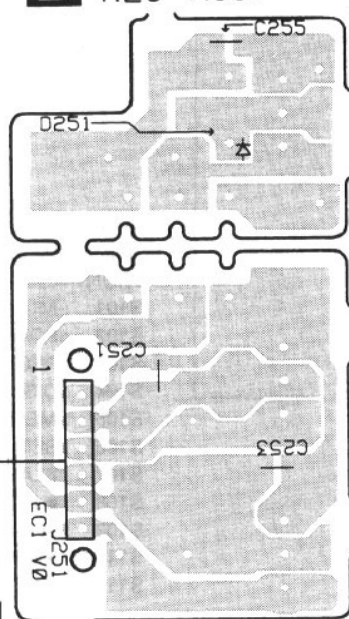
SIDE A



C CN414

B REG ASSY

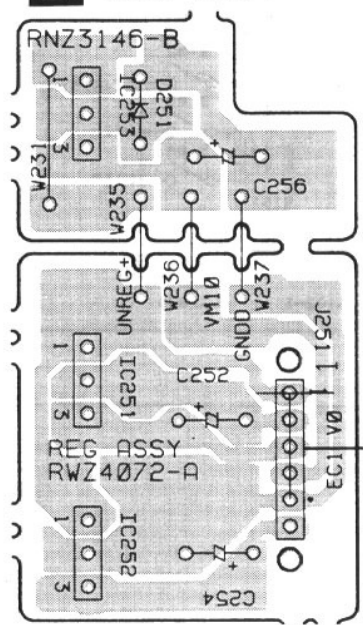
SIDE B



A J251

B REG ASSY

SIDE A



IC253

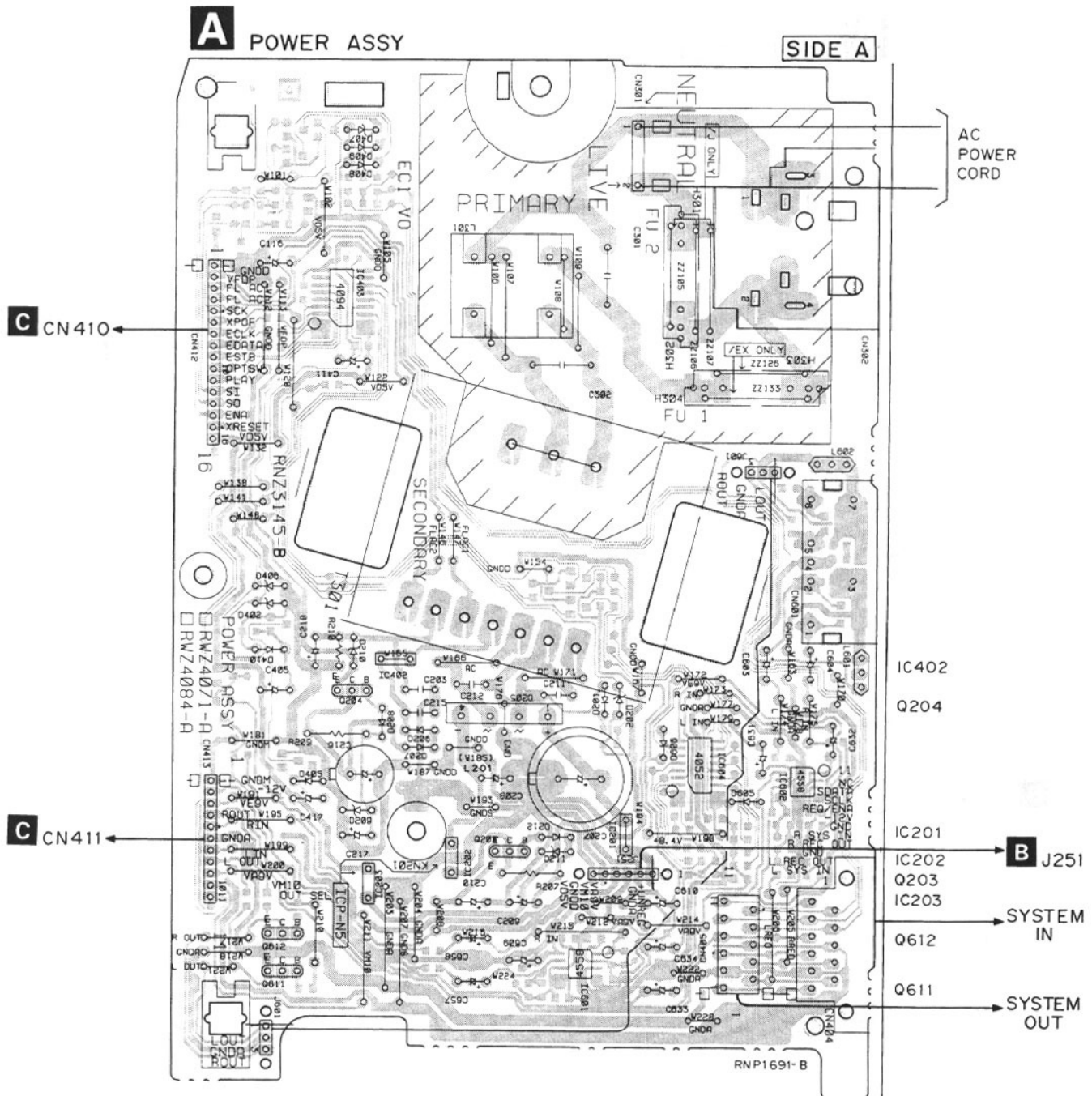
IC251

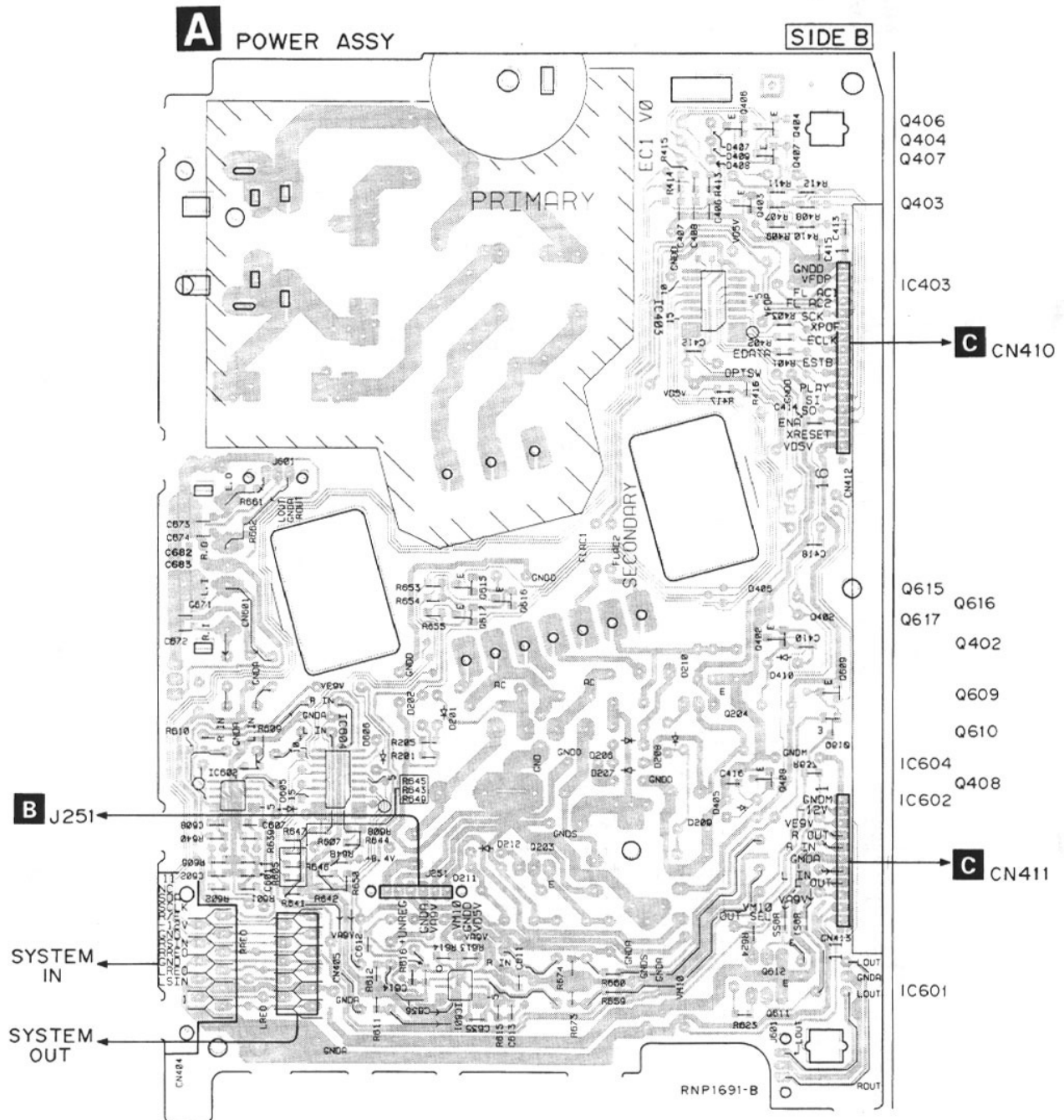
IC252

A J251

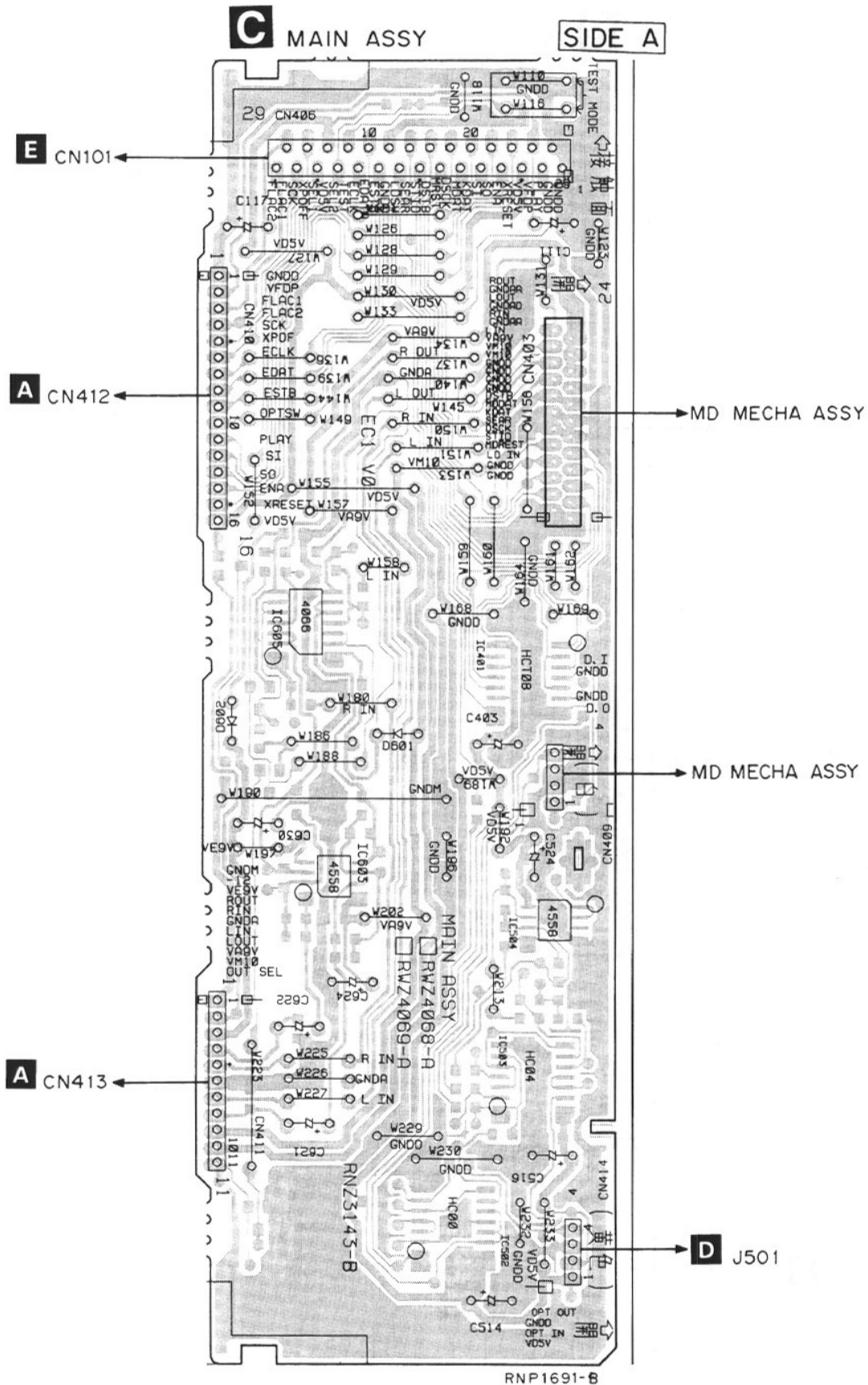
RNP1691-B

4.2 POWER ASSY



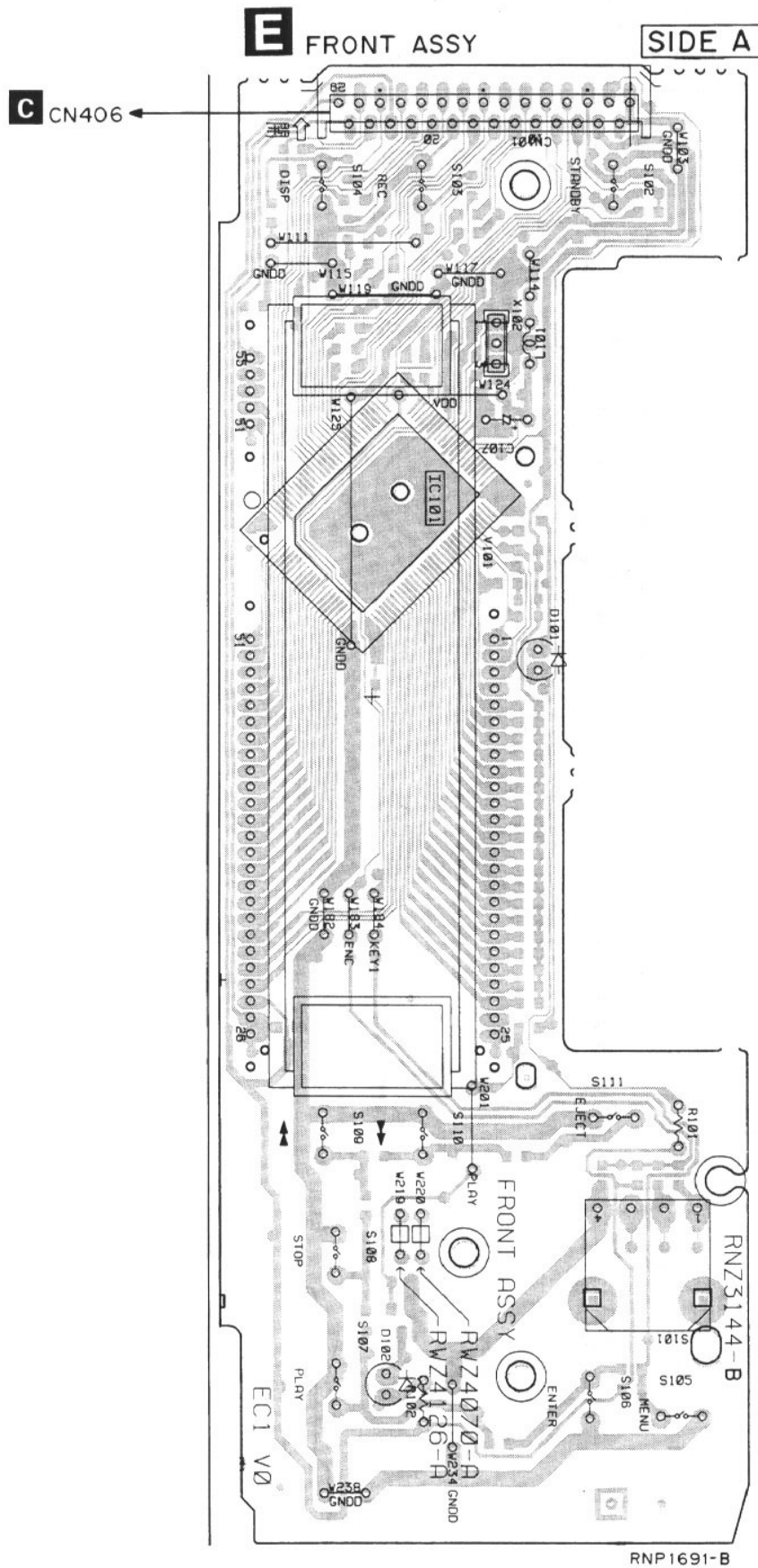


4.3 MAIN ASSY





4.4 FRONT ASSY



RNP1691-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 $\rightarrow 56 \times 10^1 \rightarrow 561$ RD1/4PU 561 J

47 k Ω $\rightarrow 47 \times 10^3 \rightarrow 473$ RD1/4PU 473 J

0.5 Ω $\rightarrow R50$ RN2H R50 K

1 Ω $\rightarrow 1R0$ RS1P 1R0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62 k Ω $\rightarrow 562 \times 10^1 \rightarrow 5621$ RN1/4PC 5621 F

Mark	No.	Description	Parts No.
------	-----	-------------	-----------

LIST OF ASSEMBLIES

NSP	MD MAIN ASSY	RWM1977
	└ MAIN ASSY	RWZ4069
	└ FRONT ASSY	RWZ4070
	└ REG ASSY	RWZ4072
	└ POWER ASSY	RWZ4084
	└ OPTICAL ASSY	RWZ4127

C MAIN ASSY

SEMICONDUCTORS

IC605	BU4066BCF
IC502	TC74HC00AF
IC503	TC74HC04AF
IC401	TC74HCT08AF
IC504 ,IC603	XLA4558F-P
Q624	DTA124EK
Q405	DTA144EK
Q623 ,Q625	DTC124EK
D601 ,D602	ISS254

CAPACITORS

C517 ,C527	CCSQCH120J50
C522	CCSQCH221J50
C621 ,C622	CEAS100M50
C403 ,C624 ,C630	CEAS470M16
C117	CEASR10M50
C514 ,C516 ,C524	CEZA470M16
C521 ,C627 ,C628	CKSQYB102K50
C519 ,C520	CKSQYB222K50
C404 ,C513 ,C515 ,C518 ,C525	CKSQYF103Z50
C623 ,C629	CKSQYF104Z25

RESISTORS

All Resistors	RS1/10S□□□J
---------------	-------------

OTHERS

CN406	CONNECTOR 29P	9604S-29C
CN409	CONNECTOR	S4B-PH-K-S
CN411	CONNECTOR 11P	TUC-P11X-B1
CN410	CONNECTOR 16P	TUC-P16X-B1
CN403	CONNECTOR24P	VKN1228

Mark	No.	Description	Parts No.
------	-----	-------------	-----------

E FRONT ASSY

SEMICONDUCTORS

IC101	PDG185
Q102	2PD601A
Q101	DTC143EK
D101 ,D102 LED (GREEN)	MPG3062X

COILS AND FILTERS

L101	LAU470J
------	---------

SWITCHE AND RELAYS

S101	RSX1008
S102 ,S111	VSG1009

CAPACITORS

C107	CEAL100M16
C103 ,C108 ,C113 ,C114	CKSQYF103Z50
C109	CKSQYF473Z50

RESISTORS

R101 ,R102	RD1/4PU221J
Other Resistors	RS1/10S□□□J

OTHERS

CN101	CONNECTOR 29P	9607S-29F
V101	FL	RAW1155
X102	CERAMIC RESONATOR (8.389MHz)	RSS1042

B REG ASSY

SEMICONDUCTORS

Δ IC253	NJM7809FA
Δ IC252	NJM78M05FA
Δ IC251	NJM78M09FA
Δ D251	ISS254

CAPACITORS

C252 ,C254 ,C256	CEJA220M16
------------------	------------

OTHERS

J251	6P HOLDER	51048-0600
J251	6P JUMPER WIRE	D20PDD0615E

Mark	No.	Description	Parts No.
------	-----	-------------	-----------

A POWER ASSY

SEMICONDUCTORS

	IC604	BU4052BCF
	IC403	BU4094BCF
Δ	IC202 ,IC203	ICP-N5
	IC601 ,IC602	XLA4558F-P
Δ	Q203 ,Q204	2SB1238X
	Q611 ,Q612	2SD2144S
	Q609	DTA124EK
	Q403	DTC114EK
	Q404 ,Q406 ,Q407	DTC114TK
	Q610 ,Q615 -Q617	DTC124EK
	Q402 ,Q408	DTC143EK
	D201	1SS254
Δ	D208	1SS254
	D212 ,D405 ,D410 ,D605 ,D606	1SS254
Δ	D205	D2SBA20(B)
	D211	MTZJ10B
	D209	MTZJ36C
	D202	MTZJ4.7B
	D407 -D409	MTZJ6.2B
Δ	D210	MTZJ8.2B
Δ	D206 ,D207	S5688G

COILS AND FILTERS

L201 VTH1024

CAPACITORS

C601 ,C602 ,C671 ,C672	CCSQCH470J50
C406 -C408	CCSLSL101J50
C633 ,C634	CEAL100M16
C405 ,C603 ,C604	CEAS100M50
C417	CEAS220M25
C208	CEAS221M25
C216	CEAS221M63
C209 ,C210 ,C411 ,C609 ,C610	CEAS470M16
C631 ,C632	CEAS470M16
C217 ,C218	CEAS470M50
C207	CEAS472M25
C116	CEASR10M50
C681	CGCYF473Z25
C414 ,C415 ,C673 ,C674	CKSQYB102K50
C410 ,C416	CKSQYB103K50
C413	CKSQYB331K50
C412	CKSQYF103Z50
C611 ,C612	CKSQYF104Z25
C682 ,C683	CKSQYF104Z50

RESISTORS

R207	RD1/2LMF202J
R209	RD1/2LMF332J
R210	RD1/4PU223J
Other Resistors	RS1/10S□□□J

OTHERS

J601	3P HOLDER	51048-0300
J251	6P HOLDER	51048-0600

Mark	No.	Description	Parts No.
------	-----	-------------	-----------

CN601	PIN JACK 4P	AKB7015
H301 ,H302	FUSE CLIP	AKR1003
J601	3P HOLDER	D20PDD0320E

Δ	CN405	CONNECTOR 11P	KPE11
	CN301	TERMINAL	RKC-061
	CN404	SOCKET 11P	RKP1754
	KN201	EARTH METAL FITTING	RNF1002
	CN413	CONNECTOR 11P	TUC-P11P-B1
	CN412	CONNECTOR 16P	TUC-P16P-B1

D OPTICAL ASSY

COILS AND FILTERS

L501 LAU100J

CAPACITORS

C505	CKSQYB332K50
C503 ,C504	CKSQYF103Z50
C501 ,C502	CKSQYF104Z25

RESISTORS

All Resistors RS1/10S□□□J

OTHERS

JA502	GPIF32R
JA501	GPIF32T

6. ADJUSTMENT

6.1 Adjusting Preparations

● Test disc

	Type	Test Disc	
1.	High reflective disc	TGYS1 (SONY) (For playback)	TGYS1
2.	Low reflective disc	Recording mini disc	GGF1277
3.	—————	Transparent disc for adjusting head	GGF1276

● Extension cable (Refer to page 35 for connection diagram)

	Type	
1.	Extension board for servicing	GGF1275
2.	2-pin extension connector for servicing	GGD1108
3.	26-pin flat cable for servicing	GGD1107
4.	5-pin extension connector for servicing	GGD1112
5.	5-pin flat cable for servicing	GGD1110
6.	24-pin flat cable for servicing	GGD1111

6.2 Test Mode

Entering the Mechanism Module Test Mode

- 1) While short-circuiting the W116 and W110 jumper wires of the MAIN ASSEMBLY, insert the AC cord into the outlet.
- 2) Press the DISPLAY/CHARACTER button of the unit.
The DISPLAY will change as follows.

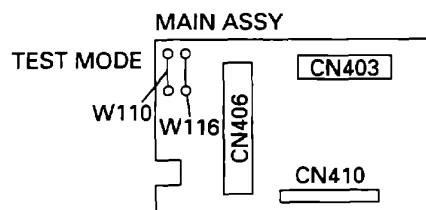


Fig. 6-1



Ⓐ Test mode STOP state

Mechanism module microprocessor Ver. is displayed (For approx. 1 second).

■ ■ Model code (Numerals)

▲ ▲ Microprocessor ROM version (From 01)

☆☆ EEPROM protect data (From 01)



Ⓑ EJECT display state (When NO DISC)

Shifts to state Ⓒ when the disc is inserted.

If a disc is already inserted, automatically shifts to state Ⓒ.



Ⓒ Mode menu display state

When the STOP key of the unit is pressed in this state, the unit shifts to state Ⓐ.

To return to this state again, press the MENU button of this unit.

Entering the mode

Each time the MENU button is pressed when the DISPLAY is in the AUTO state, the mode will change as follows.



Exiting the mechanism module test mode

- 1) The test mode can be exited by disconnecting the AC code from the outlet. (The setting will not be recorded.)
- 2) In the test mode state, short-circuit the W116 and W110 jumper wires of the MAIN ASSEMBLY.
The settings are written in the EEPROM, and the mechanism module will reset and start according to the setting recorded by the LSI. When the operations of Ⓐ are performed again, the LSI settings will be reset.

Note: When the EEPROM settings are changed, the results are written. This operation should be carried out carefully.

● Test Modes

1. AUTO mode	● Performs automatic adjustment. ● Displays settings. ● Performs continuous playback.
2. RESULT mode	● Displays settings. ● For changing settings manually.
3. MANUAL mode	● Displays the temperature. ● For manual adjustment of the measurements/settings displayed. ● Performs continuous playback.
4. EEPROM mode	● For manual adjustment of digital servo coefficients.
5. TEST PLAY mode	● Performs continuous playback from the specified address.
6. TEST REC mode	● Performs continuous recording from the specified address.
7. INNER mode	● Measures the position where the INNER switch turns ON.
8. EJECT mode	● Shifts to TEMP setting (EEPROM setting) ● Shifts to CONTROL setting (EEPROM setting) ● Measures the laser power (Recording/playback power)

6.2.1 AUTO Mode

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■■■▲e☆☆]
Step 2	Press the MENU button or perform LOADING.	AUTO mode menu display	[A U T O]
Step 3	Press the PLAY/PAUSE button.	Performs automatic adjustment after moving to innermost circumference of the slide. ● changes as follows for high reflective disc TEO→FEO→Hfg→HTG→HTB→HFG ● changes as follows for low reflective disc TEO→FEO→Lfg→LTG→GTL→GTG→GTB→LFG	[※※※ : ○○●●]
Step 4	Perform Step 5 if adjustment is OK. Perform step 9 if adjustment is NG.		
Step 5	End of adjustment.		[COMPLETE]
Step 6	Press the PLAY/PAUSE button. Press the STOP button (■).	To step 7 To step 8	
Step 7	When the PLAY/PAUSE button is pressed at step 6. Continuous playback (Pit part) Continuous playback (Groove part)	High reflective disc Low reflective disc	[s□□□c△△△△] [s□□□c△△△△]
Step 8	When the STOP button is pressed at Step 6 (■).	AUTO menu display state	[A U T O]
Step 9	When adjustment is NG at step 4.	● Adjustment NG: When TEO, FEO measurements are outside the specified range, or when focus does not turn ON.	[C a n ' t A D J]
Step 10	Press the STOP button (■).	AUTO menu display state.	

- ※※※: Adjustment name, ○○: Measurement, ●●: Setting, □□□□: Address (Cluster), △△△△: C1 error
■■■: Model code, ▲▲: Microprocessor ROM version (From 01), ☆☆: EEPROM protect data version (From 01)
- When the STOP button (■) is pressed during the AUTO menu display state, sets to the test mode STOP state.
- When the STOP button (■) is pressed during automatic adjustment, sets to the AUTO menu display state.
No adjustment values are output here.
- TEO: Tracking Error Offset, FEO: Focus Error Offset

6.2.2 RESULTS Mode

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■■▲▲e☆☆]
Step 2	Press the MENU button twice	RESULTS mode menu display	[RESULT]
Step 3	Press the PLAY/PAUSE button	Display of measurement: Tracking error offset	[TEO:○○]
Step 4	Press the MENU button	Display of measurement: Focus error offset	[FEO:○○]
Step 5	Press the MENU button	Display of setting: High reflective focus gain	[HFG: ●●]
Step 6	Press the MENU button	Display of setting: High reflective pit tracking gain	[HTG: ●●]
Step 7	Press the MENU button	Display of setting: High reflective pit tracking error balance	[HTB: ●●]
Step 8	Press the MENU button	Display of setting: Low reflective focus gain	[LFG: ●●]
Step 9	Press the MENU button	Display of setting: Low reflective pit tracking gain	[LTG: ●●]
Step 10	Press the MENU button	Display of setting: Low reflective pit tracking error balance	[LTB: ●●]
Step 11	Press the MENU button	Display of setting: Low reflective total signal level	[GTL: ●●]
Step 12	Press the MENU button	Display of setting: Low reflective groove tracking gain	[GTG: ●●]
Step 13	Press the MENU button	Display of setting: Low reflective groove tracking error balance	[GTB: ●●]
Step 14	Press the STOP button (■)	RESULTS menu display state	[RESULT]

- ○○: Measurement, ●●: Setting, ■■: Model code, ▲▲: Microprocessor ROM version (From 01), ☆☆: EEPROM protect data version (From 01)
- When the REC button is pressed in each step, the unit will shift to the opposite step.
- When the MULTI JOG is rotated in the + direction when the setting is displayed, the setting will increase and the new setting will be stored in the RAM.
When the MULTI JOG is rotated in the – direction when the setting is displayed, the setting will decrease and the new setting will be stored in the RAM.
- When the STOP button (■) is pressed when the RESULTS menu is displayed, the test mode STOP state will be set.
- When the STOP button (■) is pressed when the measurement or setting is displayed, the RESULTS menu display will be set.

6.2.3 MANUAL Mode

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■■▲▲e☆☆]
Step 2	Press the MENU button three times	MANUAL mode menu display	[MANUAL]
Step 3	Press the PLAY/PAUSE button	Setting: Temperature	[TMP:◆◆]
Step 4	Press the MENU button	Setting display: Tracking error offset	[TEO:○○]
Step 5	Press the MENU button	Setting display: Focus error offset	[FEO:○○]
Step 6	Press the MENU button	Laser lighting	[LON:]
Step 7	Press the MENU button	Shift to the slide innermost circumference Focus gain rough adjustment (High reflective disc) Focus gain rough adjustment (Low reflective disc)	[Hfg:○○●●] [Lfg:○○●●]
Step 8	Press the MENU button	Pit: Tracking gain adjustment (High reflective disc) Pit: Tracking gain adjustment (Low reflective disc)	[HTG:○○●●] [LTG:○○●●]
Step 9	Press the MENU button	Pit: Tracking error balance adjustment (High reflective disc) Pit: Tracking error balance adjustment (Low reflective disc)	[HTB:○○●●] [LTB:○○●●]
Step 10	Press the MENU button	Focus gain fine adjustment (High reflective disc) Focus gain fine adjustment (Low reflective disc)	[HFG:○○●●] [LFG:○○●●]
Step 11	Press the MENU button Press the PLAY/PAUSE button (▶/■)	Moves to step 14 only for the low reflective disc Moves to step 12	
Step 12	When the PLAY/PAUSE button is pressed at step 11.	Pit continuous playback	[s□□□c△△△△]
Step 13	Press the REC button.	Moves to step 9	

Step No.	Setting Method	Remarks	Display
Step 14	When the MENU button is pressed at step 11.	TOTAL signal level adjustment	[GTL: ○ ○ ● ●]
Step 15	Press the MENU button	Groove: Tracking gain adjustment	[GTG: ○ ○ ● ●]
Step 16	Press the MENU button	Groove: Tracking error balance adjustment	[GTB: ○ ○ ● ●]
Step 17	Press the MENU button	Focus gain fine adjustment	[LFG: ○ ○ ● ●]
Step 18	Press the PLAY/PAUSE button	Groove continuous playback	[a□□□□c△△△△]
Step 19	Press the REC button	Moves to step 16	

- ○○: Measurement, ●●: Setting, □□□□: Address (Cluster), △△△△: CI error, ◆◆: Temperature code, ■■: Model code
▲▲: Microprocessor ROM version (From 01), ☆☆: EEPROM protect data version (From 01)
- When the REC button is pressed in each step, the unit will shift to the opposite step.
- When the MULTI JOG is rotated in the + direction when the setting is displayed, the setting will increase and the new setting will be stored in the RAM.
- When the MULTI JOG is rotated in the – direction when the setting is displayed, the setting will decrease and the new setting will be stored in the RAM.
- When the STOP button (■) is pressed when the MANUAL menu is displayed, the test mode STOP state will be set.
- When the STOP button (■) is pressed when the measurement or setting is displayed, the MANUAL menu display will be set.

Note: Some items have * in front of the setting in the MANUAL mode.

6.2.4 EEPROM Setting Mode

(1) Focus setting

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■▲e☆☆]
Step 2	Press the MENU button four times	Reads each setting from the EEPROM. EEPROM menu display mode	[EEPROM SET]
Step 3	Press the PLAY/PAUSE button	Focus setting menu	[F o c u s]
Step 4	Press the PLAY/PAUSE button	Focus system loop filter gain constant setting	[FG ◆◆]
Step 5	Press the MENU button	Focus system loop filter frequency characteristics 1 setting	[FF1 ◆◆]
Step 6	Press the MENU button	Focus system loop filter frequency characteristics 2 setting	[FF2 ◆◆]
Step 7	Press the MENU button	Focus system loop filter frequency characteristics 3 setting	[FF3 ◆◆]
Step 8	Press the MENU button	Focus system loop filter frequency characteristics 4 setting	[FF4 ◆◆]
Step 9	Press the MENU button	FZC detection hysteresis level setting	[FZHLEV ◆◆]
Step 10	Press the MENU button	FOK generation comparison level setting (Normal)	[FOKLEVn ◆◆]
Step 11	Press the MENU button	FOK generation comparison level setting (When focus is ON)	[FOKLEVf ◆◆]
Step 12	Press the MENU button	FOK generation LPF coefficient setting (Normal)	[FOKLPFn ◆◆]
Step 13	Press the MENU button	FOK generation LPF coefficient setting (When focus is ON)	[FOKLPFf ◆◆]
Step 14	Press the MENU button	Waiting time for Auto focus completion	[WAITf ◆◆]

- ◆◆: Setting
- When the REC button is pressed in each step, the unit will shift to the opposite step.
- When the MULTI JOG is rotated in the + direction when the setting is displayed, the setting will increase and the new setting will be stored in the LSI.
- When the MULTI JOG is rotated in the – direction when the setting is displayed, the setting will decrease and the new setting will be stored in the LSI.
- When the STOP button (■) is pressed when the EEPROM setting menu is displayed, the test mode STOP state will be set.
- When the STOP button (■) is pressed in the focus setting menu state, the EEPROM setting menu state will be set.
- When the STOP button (■) is pressed at each setting item display state, the focus setting menu state will be set.

(2) Spin setting

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■▲▲e☆☆]
Step 2	Press the MENU button four times	Reads each setting from the EEPROM EEPROM menu display mode	[EEPROM SET]
Step 3	Press the PLAY/PAUSE button	Focus setting menu	[F o c u s]
Step 4	Press the MENU button	Spin setting menu	[S p i n d l e]
Step 5	Press the PLAY/PAUSE button	Spin system loop filter gain constant setting (Until servo turns ON)	[SPG ◆◆]
Step 6	Press the MENU button	Spin system loop filter gain constant setting (After servo turns ON, inner circumference)	[SPG in ◆◆]
Step 7	Press the MENU button	Spin system loop filter gain constant setting (After servo turns ON, center)	[SPG mid ◆◆]
Step 8	Press the MENU button	Spin system loop filter gain constant setting (After servo turns ON, outer circumference)	[SPG out ◆◆]
Step 9	Press the MENU button	Spin system loop filter f characteristics setting 1	[SP1 ◆◆]
Step 10	Press the MENU button	Spin system loop filter f characteristics setting 2	[SP2 ◆◆]
Step 11	Press the MENU button	Spin system loop filter f characteristics setting 3	[SP3 ◆◆]
Step 12	Press the MENU button	Spin system loop filter f characteristics setting 4	[SP4 ◆◆]
Step 13	Press the MENU button	Spin system loop filter f characteristics setting 5	[SP5 ◆◆]

- ◆◆: Setting
- When the REC button is pressed at a step, the unit will shift to the opposite step.
- When the MULTI JOG is rotated in the + direction when the setting is displayed, the setting will increase and the new setting will be stored in the LSI.
- When the MULTI JOG is rotated in the – direction when the setting is displayed, the setting will decrease and the new setting will be stored in the LSI.
- When the STOP button (■) is pressed when the EEPROM setting menu is displayed, the test mode STOP state will be set.
- When the STOP button (■) is pressed in the spin setting menu state, the EEPROM setting menu state will be set.
- When the STOP button (■) is pressed at each setting item display state, the spin setting menu state will be set.

(3) Tracking setting

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■▲▲e☆☆]
Step 2	Press the MENU button four times	Reads each setting from the EEPROM. EEPROM menu display mode	[EEPROM SET]
Step 3	Press the PLAY/PAUSE button	Focus setting menu	[F o c u s]
Step 4	Press the MENU button two times	Tracking setting menu	[T r a c k i n g]
Step 5	Press the PLAY/PAUSE button	Tracking system loop filter gain constant setting	[TG ◆◆]
Step 6	Press the MENU button	Tracking system loop filter f characteristics setting 1	[TF1 ◆◆]
Step 7	Press the MENU button	Tracking system loop filter f characteristics setting 2	[TF2 ◆◆]
Step 8	Press the MENU button	Tracking deceleration pulse level setting (For one jump)	[TRBLVo ◆◆]
Step 9	Press the MENU button	Tracking deceleration pulse level setting (For ten jumps)	[TRBLVt ◆◆]
Step 10	Press the MENU button	Tracking pulse level setting (For one jump)	[TRKLVo ◆◆]
Step 11	Press the MENU button	Tracking pulse level setting (For ten jumps)	[TRKLVt ◆◆]
Step 12	Press the MENU button	Tracking drive pulse width setting (For one jump)	[TDPWo ◆◆]
Step 13	Press the MENU button	Tracking drive pulse width setting (For ten jumps)	[TDPWt ◆◆]
Step 14	Press the MENU button	Tracking slide stop time setting (For one jump)	[SLCTo ◆◆]
Step 15	Press the MENU button	Tracking slide stop time setting (For ten jumps)	[SLCTt ◆◆]

Step No.	Setting Method	Remarks	Display
Step 16	Press the MENU button	Tracking slide stop time setting (During moving)	[SLCTm ◆◆]
Step 17	Press the MENU button	H comparison level setting during COUT generation (During playback)	[COTLVHp ◆◆]
Step 18	Press the MENU button	L comparison level setting during COUT generation (During playback)	[COTLVLP ◆◆]
Step 19	Press the MENU button	H comparison level setting during COUT generation (During recording)	[COTLVHr ◆◆]
Step 20	Press the MENU button	L comparison level setting during COUT generation (During recording)	[COTLVLR ◆◆]
Step 21	Press the MENU button	Waiting time setting during automatic moving	[WAITm ◆◆]

- ◆◆: Setting
- When the REC button is pressed at a step, the unit will shift to the opposite step.
- When the MULTI JOG is rotated in the + direction when the setting is displayed, the setting will increase and the new setting will be stored in the LSI.
- When the MULTI JOG is rotated in the – direction when the setting is displayed, the setting will decrease and the new setting will be stored in the LSI.
- When the STOP button (■) is pressed when the EEPROM setting menu is displayed, the test mode STOP state will be set.
- When the STOP button (■) is pressed in the tracking setting menu state, the EEPROM setting menu state will be set.
- When the STOP button (■) is pressed at each setting item display state, the tracking setting menu state will be set.
- When the PLAY button is pressed at each setting display state, only the tracking servo is turned ON/OFF forcibly.

(4) Slide setting

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■▲▲e☆☆]
Step 2	Press the MENU button four times	Reads each setting from the EEPROM. EEPROM menu display mode	[EEPROM SET]
Step 3	Press the PLAY/PAUSE button	Focus setting menu	[F o c u s]
Step 4	Press the MENU button three times	Slide setting menu	[S l e d]
Step 5	Press the PLAY/PAUSE button	Slide system loop filter gain constant setting	[SLG ◆◆]
Step 6	Press the MENU button	Slide system loop filter f characteristics setting 2	[SL2 ◆◆]
Step 7	Press the MENU button	Slide system servo output dead zone level setting	[SLDLEV ◆◆]
Step 8	Press the MENU button	Slide kick pulse level setting (When moving forcibly)	[SLKLVk ◆◆]
Step 9	Press the MENU button	Slide kick pulse level setting (Auxiliary for ten jumps)	[SLKLVt ◆◆]
Step 10	Press the MENU button	Slide kick pulse level setting (When moving)	[SLKLVm ◆◆]

- ◆◆: Setting
- When the REC button is pressed at a step, the unit will shift to the opposite step.
- When the MULTI JOG is rotated in the + direction when the setting is displayed, the setting will increase and the new setting will be stored in the LSI.
- When the MULTI JOG is rotated in the – direction when the setting is displayed, the setting will decrease and the new setting will be stored in the LSI.
- When the STOP button (■) is pressed when the EEPROM setting menu is displayed, the test mode STOP state will be set.
- When the STOP button (■) is pressed in the slide setting menu state, the EEPROM setting menu state will be set.
- When the STOP button (■) is pressed at each setting item display state, the slide setting menu state will be set.

(5) TEMP setting

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■▲▲e☆☆]
Step 2	Press the MENU button four times	Reads each setting from the EEPROM. EEPROM menu display mode	[EEPROM SET]
Step 3	Press the PLAY/PAUSE button	Focus setting menu	[F o c u s]
Step 4	Press the MENU button four times	TEMP setting menu	[T e m p]
Step 5	Press the PLAY/PAUSE button	TEMP setting	[TEMP ■◆◆]

- ◆◆: Setting
- When the MULTI JOG is rotated in the + direction when the setting is displayed, the setting will increase and the new setting will be stored in the LSI.
- When the MULTI JOG is rotated in the – direction when the setting is displayed, the setting will decrease and the new setting will be stored in the LSI.
- When the STOP button (■) is pressed when the EEPROM setting menu is displayed, the test mode STOP state will be set.
- When the STOP button (■) is pressed in the TEMP setting menu state, the EEPROM setting menu state will be set.
- When the STOP button (■) is pressed at each setting item display, the TEMP setting menu state will be set.
- When the ENTER button is pressed in the EJECT state, the unit will move to step 5. (Refer to 6.2.8 EJECT State)

(6) CONTROL setting

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■■▲▲e☆☆]
Step 2	Press the MENU button four times	Reads each setting from the EEPROM. EEPROM menu display mode	[EEPROM SET]
Step 3	Press the PLAY/PAUSE button	Focus setting menu	[F o c u s]
Step 4	Press the MENU button five times	CONTROL setting menu	[C o n t r o l]
Step 5	Press the PLAY/PAUSE button	CONTROL 1 setting	[CONTRL1 ◆◆]
Step 6	Press the MENU button	CONTROL 2 setting	[CONTRL2 ◆◆]

- ◆◆: Setting
- When the MULTI JOG is rotated in the + direction when the setting is displayed, the setting will increase and the new setting will be stored in the LSI.
- When the MULTI JOG is rotated in the – direction when the setting is displayed, the setting will decrease and the new setting will be stored in the LSI.
- When the STOP button (■) is pressed when the EEPROM setting menu is displayed, the test mode STOP state will be set.
- When the STOP button (■) is pressed in the CONTROL setting menu state, the EEPROM setting menu state will be set.
- When the STOP button (■) is pressed at each setting item display, the CONTROL setting menu state will be set.
- CONTROL 1 contents:
 - bit 7: High frequency superimpose ON/OFF (0 = OFF, 1 = ON) during recording
 - bit 6 to 4: Play start SD numbers (30 to 100 sectors, 10 sector-step) Equation $(n + 3) \times 10$ $n = 0$ to 7
 - bit 2 to 0: High speed jump overrun amount (384 to 830 lines, 64 line-step) Equation $(n + 6) \times 64$ $n = 0$ to 7
- CONTROL 2 contents:
 - bits 4 to 0: EEPROM version (From a) Equation $n + 1$, $n = 0$ to 31, ASCII character conversion
- When the DISPLAY button is pressed in the EJECT state, the unit will move to step 5. (Refer to 6.2.8 EJECT State)

6.2.5 TEST PLAY Mode

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■■▲▲e☆☆]
Step 2	Press the ENTER button	TEST PLAY menu	[TEST PLAY]
Step 3	Press the POWER button	Playback start address setting (Cluster)	[ADRES 0032]
Step 4	Press the PLAY/PAUSE button	Continuous playback (Pit part) Continuous playback (Groove part)	[s□□□c△△△] [a□□□c△△△]
Step 5	Press the STOP button (■)	TEST PLAY menu	[TEST PLAY]

- : Address (Cluster), △△△△: CI error
- When the STOP button (■) is pressed during the TEST PLAY menu, the test mode STOP state will be set.
- Press the ◀◀◀◀, ▶▶▶▶ buttons to change the settings at step 3.
 - * ▶▶▶▶ button: Set the address to +01H.
 - * ◀◀◀◀ button: Set the address to –01H.

6.2.6 TEST REC Mode

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■■■▲▲e☆☆]
Step 2	Press the ENTER button two times	TEST REC menu	[TEST REC]
Step 3	Press the POWER button	Recording start address setting (cluster)	[a0032PW▽▽]
Step 4	Press the PLAY/PAUSE button	Continuous recording (Groove part)	[a□□□PW▽▽]
Step 5	Press the STOP button (■)	TEST REC menu	[TEST REC]

- : Address (Cluster), ▽▽: Laser recording power
- When the STOP button (■) is pressed during the TEST REC menu, the test mode STOP state will be set.
- Press the ◀◀◀◀, ▶▶▶▶ buttons to change the settings at step 3.
 - * ▶▶▶▶ button: Set the address to +01H.
 - * ◀◀◀◀ button: Set the address to -01H.
- When the MULTI JOG is rotated in the address setting state or continuous recording state, the laser recording power will change.

6.2.7 INNER Mode (Read In SW Detection)

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■■■▲▲e☆☆]
Step 2	Press the DISPLAY button	INNER mode menu display	[INNER]
Step 3	Press the PLAY/PAUSE button	INNER switch position address display	[s□□□c△△△△]
Step 4	Press the STOP button (■)	INNER mode menu display	[INNER]

- : Address (Cluster), △△△△: CI error
- When the STOP button (■) is pressed during the INNER menu, the test mode STOP state will be set.
- Perform when replacing the mechanism switch boards.
- Perform using the high reflective disc. The unit will not operate on the low reflective disc.

6.2.8 EJECT State

Step No.	Setting Method	Remarks	Display
Step 1	Eject the disc	EJECT mode menu display	[EJECT]
Step 2	Press the POWER button	Laser power switching	[rPw]
	Press the ENTER button	EEPROM setting mode (CONTROL setting)	[pPw]
	Press the DISPLAY button	EEPROM setting mode (TEMP setting)	

- Refer to “6.2.4 EEPROM Setting Mode” for details on the EEPROM setting mode.

6.3 Read-In Switch Position Measurement Mode (Using Test Disk 1)

Measuring with a high reflective disc (Check when replacing the mechanical switch board) -

Step No.	Setting Method	Remarks	Display
Step 1	Test mode STOP state		[tsm■■▲▲☆☆☆]
Step 2	Press the DISPLAY button	INNER mode menu display	[I N N E R]
Step 3	Press the PLAY/PAUSE button (Refer to NOTE)	INNER switch position address display	[s□□□□c△△△△]
Step 4	Press the STOP (■) button	INNER mode menu display	[I N N E R]

NOTE) Adjust the read-in switch position to SUBQ FF85 to FFD2.

1. Loosen the three screws (A) securing the mechanical switch board.
2. While pressing the mechanical switch board in the ← direction, tighten the screws, and measure the read in switch position again. After adjusting the position, secure the three screws (A). (See Fig. 6-2)

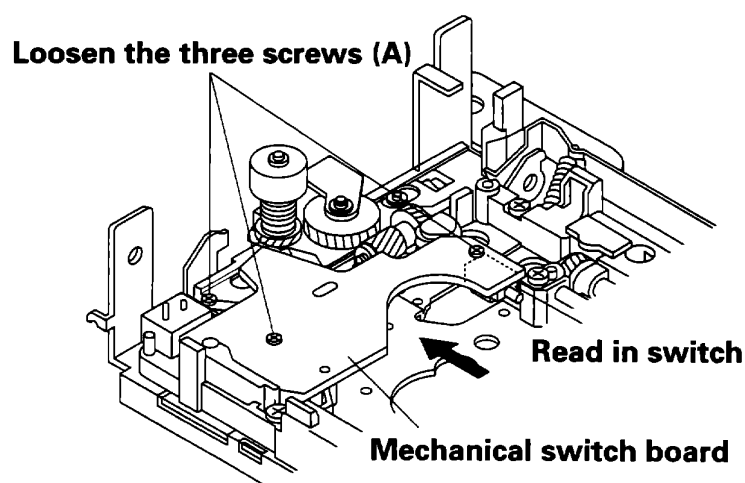


Fig. 6-2

6.4 Magnetic Head Attaching Position Adjustment

- Be sure to adjust the attaching position of the magnetic head when the magnetic head and optical pickup have been replaced.
 - To make the adjustment easy, move the optical pickup to the center position.
- (1) Set transparent disc 3 for adjustment.
 - (2) Lower the magnetic head up shift arm with your hand, and raise the magnetic head.
 - (3) Looking at the unit from the top, adjust the magnetic head to the top of the optical pickup objective lens.
 - In the radial direction: Slightly loosen the head fixing screw (A), and move the magnetic head fixture so that the head fits the top of the pickup objective lens.
 - In the circumference direction: Rotate the magnetic head circumference direction adjusting screw (B), and adjust so that the head is at the top of the objective lens.
 - (4) Check that there is space as shown in Fig. 6-3, and check that the magnetic head moves up and down smoothly.
 - (5) After adjusting, apply screw-locking compound to the head fixing screw (A) and the adjusted screw (B).

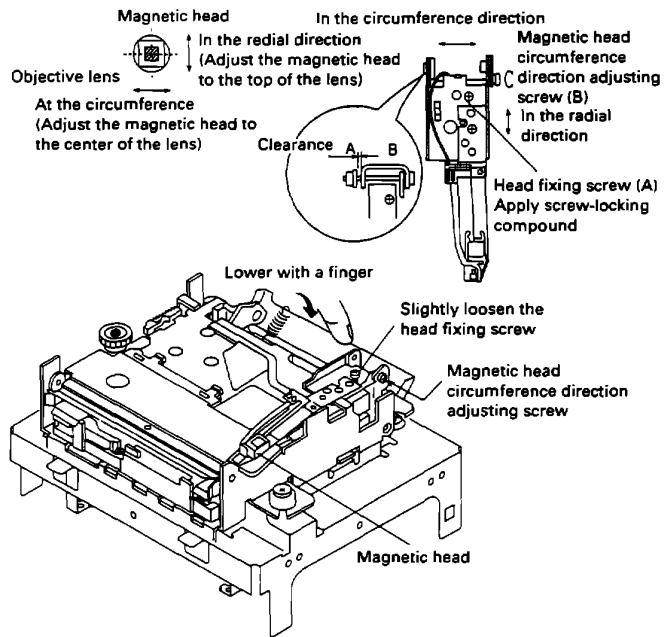


Fig. 6-3

6.5 Mechanism Adjustment

6.5.1 Detecting the Optical Pickup Grating

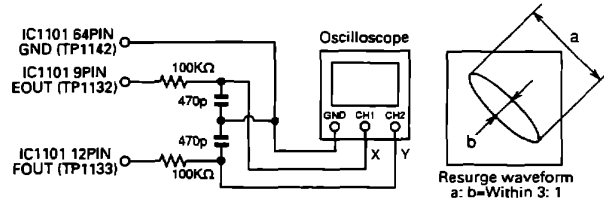


Fig. 6.4 Measuring the Optical Pickup Grating Deviation

Using a high reflective MD disc, perform automatic adjustment in the AUTO test mode (COMPLETE is displayed), and adjust the EOUT: FOUT resurge waveform (x-y).

- (1) Desolder the two points of the disc motor board, solder the lead wire to the motor terminal and board temporarily as shown in the figure, loosen the three screws of the motor slightly, and while looking at the resurge waveform, adjust it.
- (2) After adjusting, tighten the screws in the order of ①, ②, and ③.

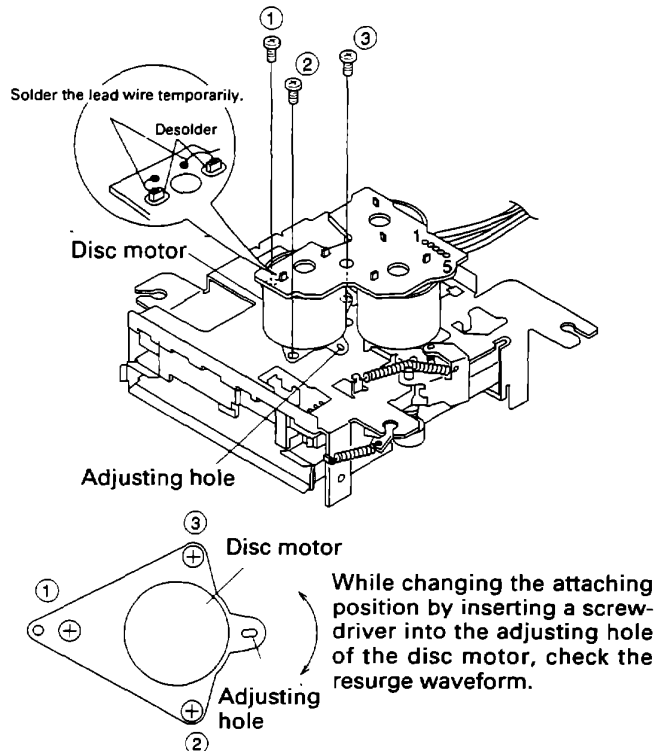


Fig. 6-5.

6.5.2 Adjusting and Checking Jitter

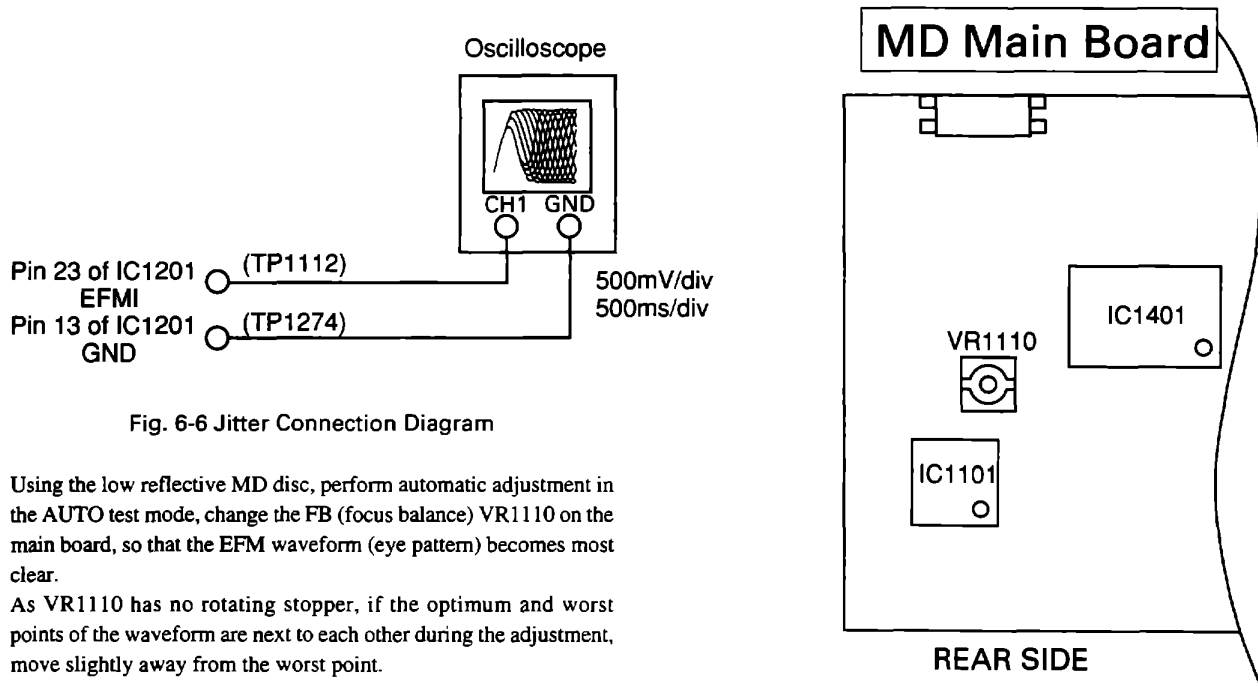


Fig. 6-6 Jitter Connection Diagram

Using the low reflective MD disc, perform automatic adjustment in the AUTO test mode, change the FB (focus balance) VR1110 on the main board, so that the EFM waveform (eye pattern) becomes most clear.

As VR1110 has no rotating stopper, if the optimum and worst points of the waveform are next to each other during the adjustment, move slightly away from the worst point.

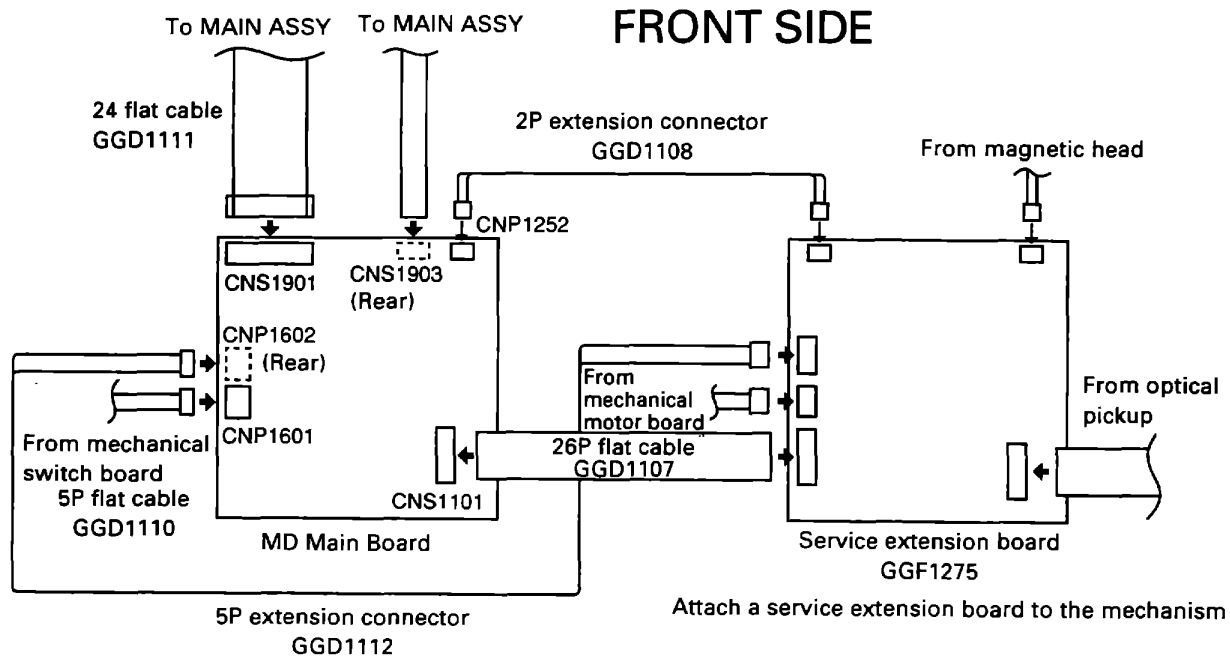


Fig. 6-7

6.6 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 RED-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.) ● Playback digital signal output equipment to check if digital signal data is normal.
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=44.1 kHz.	● Check if D-IN signal line is normal. ● Check if 8.4 MHz clock from MD to CD 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.
UTOC R ERR	● 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.
UTOC ERR A	● Start address > End address.	● Replace with other discs to check if UTOC data is normal.
UTOC ERR L	● 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.
Play back 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 or TR PROTECT	● 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.
TOC FULL	● Area for writing UTOC was full when attempted to set REC-PAUSE or DIVIDE.	● Replace with other recording/playback discs with space remaining for writing UTOC.
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. ● Is temperature of place where unit is used high?

Error Display	Details of Error	Measure
HEAD U ERR	Did not reach LOAD completed position when HEAD UIP operations were performed.	Turn OFF power and try again.
HEAD D ERR	Did not reach HEAD DOWN position when HEAD DOWN operations were performed.	Check signal line to mechanism controller or loading motor.
DISC ERR	- Data read was incorrect or could not be read properly. - Error occurred during music data recording and recording could not be performed correctly.	Faulty TOC or UTOC data or scratch on disc. Replaced with other discs.
UTOC W ERR	Fault occurred during rewriting of UTOC rewriting, and re-writing could not be performed correctly.	Scratch on disc. Replaced with other discs.
BLANK DISC	After reading UTCO, 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.
MEM. FULL	Shock proof memory became full during recording.	Check if there are scratches, dusts, fingerprints, or black spots on disc. Check if disc fluctuates eccentrically or moves up and down largely.
MECHA ERR	Communication was enabled between system and mechanism controllers.	If this error display does not go off even when STOP button is pressed, check microprocessor communication line.
NAME FULL	Total number of characters input for disc exceeded 1700.	Shorten disc or music name.

7. GENERAL INFORMATION

7.1 PARTS

7.1.1 IC

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

■ PDG185 (FRONT ASSY: IC101)

SYSTEM U-COM

No.	Pin Function	Name	I/O	Function	
1	G1/A1	G2	O	FDP control grid	
2	G0/A0	G1	O		
3	NC	—	—		
4	PE0/EC0/INT0	SCK	I	(Connected to VD5V)	
5	PE1/EC1/INT1	XPOF	I	System bus clock input	
6	PE2/INT2	SEL1	I	Power OFF detection input (AC input pulse)	
7	PE3/INT3/NMI	SEL2	I	System bus connection discrimination input L: No	
8	PE4/RMC	—	I	Domestic/overseas discrimination input L: Overseas	
9	PE5	—	I	Not used (Connected to VD 5V)	
10	PE6/PWM	—	O	Not used (Open)	
11	PE7/TO/ADJ	—	O		
12	PC0/KR0	—	O		
13	PC1/KR1	—	O		
14	PC2/KR2	ECLK	O	Output extension (BU4094) serial clock output	The following five types of signals are output from BU4094. ① Optical terminal PB/THRU switching ② PLAY indicator LED ③ Audio (RCA) output control ④ Audio mute ⑤ Recording level attenuation switching (BU4052 control)
15	PC3/KR3	EDAT	O	Output extension (BU4094) serial data output	
16	PC4/KR4	ESTB	O	Output extension (BU4094) strobe output	
17	PC5/KR5	LDSW	I	MD loading SW detection input	
18	PC6/KR6	SEAR	O	MD CD search signal output	
19	PC7/KR7	STID	O	MD ST-ID control output	
20	PB0/CINT	DSTB	I	MD mechanism control communication request detection input	
21	PB1/CS0	MRST	O	MD mechanism control reset output	
22	PB2/SCK0	DSCK	O	MD mechanism control communication clock output	
23	PB3/SI0	MDDA	I	MD mechanism control communication data input	
24	PB4/SO0	KDAT	O	MD mechanism control communication data output	
25	PB5/SCK1	—	O	Not used (Open)	
26	PB6/SC1	—	O		
27	PB7/SO1	—	O		
28	AVref	—	I	A/D reference voltage input (Connected to VD5V)	
29	PA0/AN0	—	O	Not used (Open)	
30	PA1/AN1	KEY1	I	Key detection input 1 (A/D input)	
31	PA2/AN2	SI	I	System bus data input	
32	PA3/AN3	SO	O	System bus data output	
33	PA4/AN4	ENA	I/O	System bus REQ output/ENA input	
34	PA5/AN5	ENC	I	JOG encoder input (A/D input)	
35	PA6/AN6	KEY2	I	Key detection input 2 (A/D input)	
36	PA7/AN7	—	O	Not used (Open)	
37	AVss	—	—	(Connected to GND)	

No.	Pin Function	Name	I/O	Function
38	RST	XRESET	I	Reset input. L: Reset.
39	EXTAL	—	I	Connected to ceramic oscillator (8.38 MHz)
40	XTAL	—	O	
41	Vss	—	—	(Connected to GNDD)
42	TX	—	O	Not used (Open)
43	TEX	—	I	Not used (Connected to GNDD)
44	Vdd	—	—	(Connected to VD5V)
45	Vfdp	—	—	FL power supply terminal (Connected to -30V)
46	PD0/A55	—	O	Not used (Open)
47	PD1/A54	—	O	
48	PD2/A53	—	O	
49	PD3/A52	—	O	
50	PD4/A51	—	O	
51	PD5/A50	—	O	
52	PD6/A49	—	O	
53	PD7/A48	DISK	O	Disc indicator LED output
54	PF0/A47	—	O	Not used (Open)
55	PF1/A46	S33	O	FDP control segment
56	PF2/A45	S34	O	
57	PF3/A44	S35	O	
58	PF4/A43	S32	O	
59	PF5/A42	S31	O	
60	PF6/A41	S30	O	
61	PF7/A40	S29	O	
62	PG0/A39	S28	O	
63	PG1/A38	S27	O	
64	PG2/A37	S26	O	
65	PG3/A36	S25	O	
66	PG4/A35	S24	O	
67	PG5/A34	S23	O	
68	PG6/A33	S22	O	
69	PG7/A32	S21	O	
70	PH0/A31	S20	O	
71	PH1/A30	S19	O	
72	PH2/A29	S18	O	
73	PH3/A28	S17	O	
74	PH4/A27	S16	O	
75	PH5/A26	S15	O	
76	PH6/A25	S14	O	
77	PH7/A24	S13	O	
78	A23	S12	O	
79	A22	S11	O	
80	A21	S10	O	
81	A20	S9	O	
82	A19	S8	O	

No.	Pin Function	Name	I/O	Function
83	A18	S7	O	FDP control segment
84	A17	S6	O	
85	A16	S5	O	
86	G15/A15	S4	O	
87	G14/A14	S3	O	
88	G13/A13	S2	O	
89	Vdd	—	—	(Connected to VD5V)
90	G12/A12	S1	O	FDP control segment
91	G11/A11	G12	O	FDP control grid
92	G10/A10	G11	O	
93	G9/A9	G10	O	
94	G8/A8	G9	O	
95	G7/A7	G8	O	
96	G6/A6	G7	O	
97	G5/A5	G6	O	
98	G4/A4	G5	O	
99	G3/A3	G4	O	
100	G2/A2	G3	O	

■ BU4094BCF (POWER ASSY: IC403)

OUTPUT EXTENSION IC

No.	Pin Function	Name	I/O	Function
1	STB	ESTB	I	Strobe input (From Pin 16 of PDG185)
2	DATA	EDATA	I	Serial data input (From Pin 15 of PDG185)
3	CLK	ECLK	I	Serial clock input (From Pin 14 of PDG185)
4	Q1	OPTSW	O	Optical terminal switching output (PB/THRU). L: THRU.
5	Q2	PLAY	O	PLAY indicator LED output (PLAY/OTHER). L: OTHER.
6	Q3	OUTSEL	O	Analog REC monitor control output (H only during analog REC/REC-PAUSE)
7	Q4	—	O	Not used (Open)
8	Vss	—	—	GND (Connected to GNDD)
9	QS	—	O	Not used (Open)
10	QS	—	O	Not used (Open)
11	Q8	$\bar{A}$	O	Analog REC input level attenuator data output $\bar{A}$ (Connected to Pin 10 of BU4052BCF)
12	Q7	$\bar{B}$	O	Analog REC input level attenuator data output $\bar{B}$ (Connected to Pin 9 of BU4052BCF)
13	Q6	$\overline{INH}$	O	Analog REC input level attenuator data output $\overline{INH}$ (Connected to Pin 6 of BU4052BCF)
14	Q5	MUTE	O	Analog mute output (H during mute)
15	OE	—	I	Output enable input (ENABLE/DISABLE) L: DISABLE
16	VDD	—	—	Power supply (Connected to VD5V)

■ Analog REC Attenuator Setting

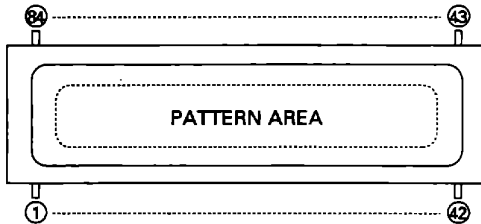
	$\bar{A}$	$\bar{B}$	$\overline{INH}$
+6dB	—	—	L
+3dB	H	H	H
0dB	L	H	H
−3dB	H	L	H
−6dB	L	L	H

(Note) Take note that this logic is reversed when seen from IC604 (BU4052BCF).

7.1.2 DISPLAY

■ RAW1155 (FRONT ASSY : V101)

● Pin Assignment



● Anode and Grid Connection

	G1	G2	G3-G12		G1	G2	G3-G12		G1	G2	G3-G12
S1		1	5-7	S13	TIMER	13	3-5	S25		OV8	1-3
S2		2	4-7	S14	REC	14	2-5	S26		OV7	5-2
S3		3	3-7	S15	S.CUT	15	1-5	S27			4-2
S4		4	2-7	S16	A.MARK	16	5-4	S28			3-2
S5	DIGITAL	5	1-7	S17	L	17	4-4	S29		OV6	2-2
S6	MONO LP	6	5-6	S18	R	18	3-4	S30		OV5	1-2
S7	RPT	7	4-6	S19		19	2-4	S31		OV4	5-1
S8		8	3-6	S20			1-4	S32		OV3	4-1
S9	PGM	9	2-6	S21		OV12	5-3	S33		OV2	3-1
S10	RDM	10	1-6	S22		OV11	4-3	S34		OV1	2-1
S11		11	5-5	S23		OV10	3-3	S35			1-1
S12	TOC	12	4-5	S24		OV9	2-3				

● Pin Connection

Pin No.	1	2	3	4	5	6~17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
Assignment	F1	F1	D	G1	G2	NP	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	H	F2

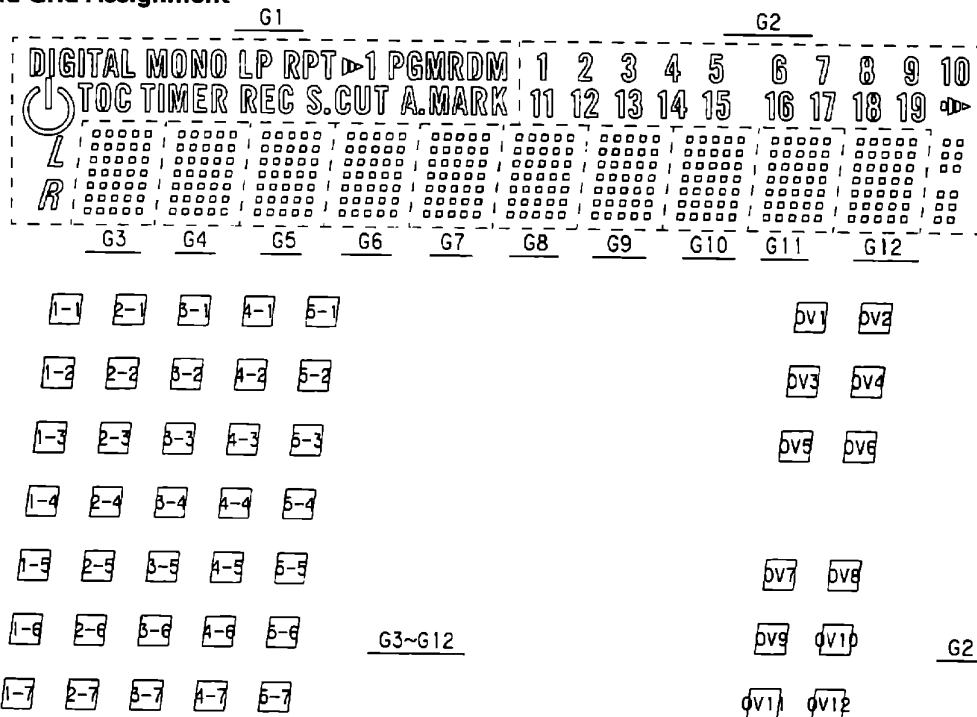
Pin No.	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68~82	83	84
Assignment	F2	F2	F2	S13	S14	S15	S16	S17	S18	S19	S20	S21	S22	S23	S24	S25	S26	S27	S28	S29	S30	S31	S32	S33	S34	S35	NP	NP	NP

F1, F2: Filament G1 to G12: Grid S1 to S35: Anode D: Connect to F1.

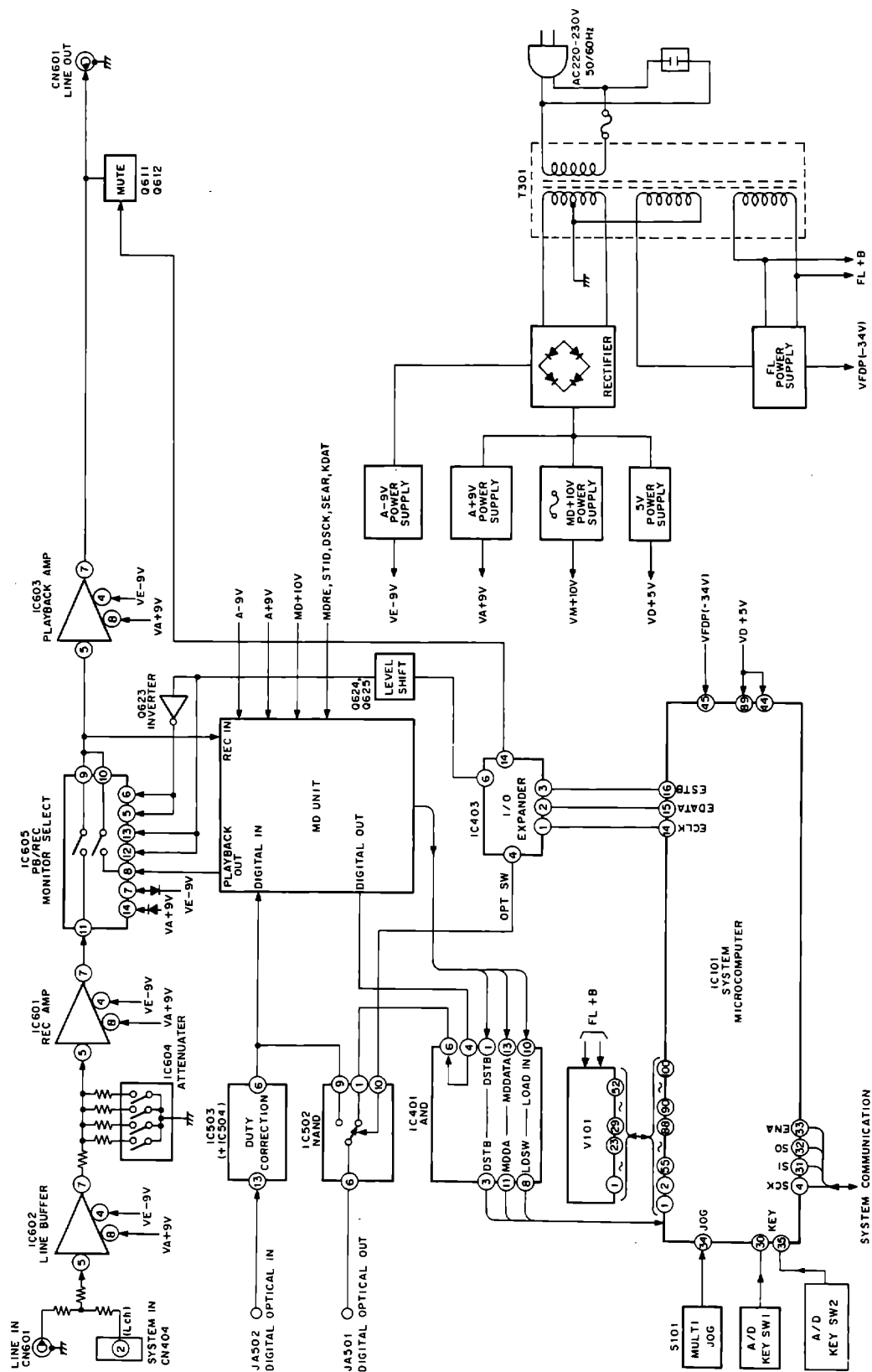
NP: No Pin

H: Always conductive grid (ec level: Apply direct current voltage of Typ. 32.0 Vdc.)

● Anode and Grid Assignment

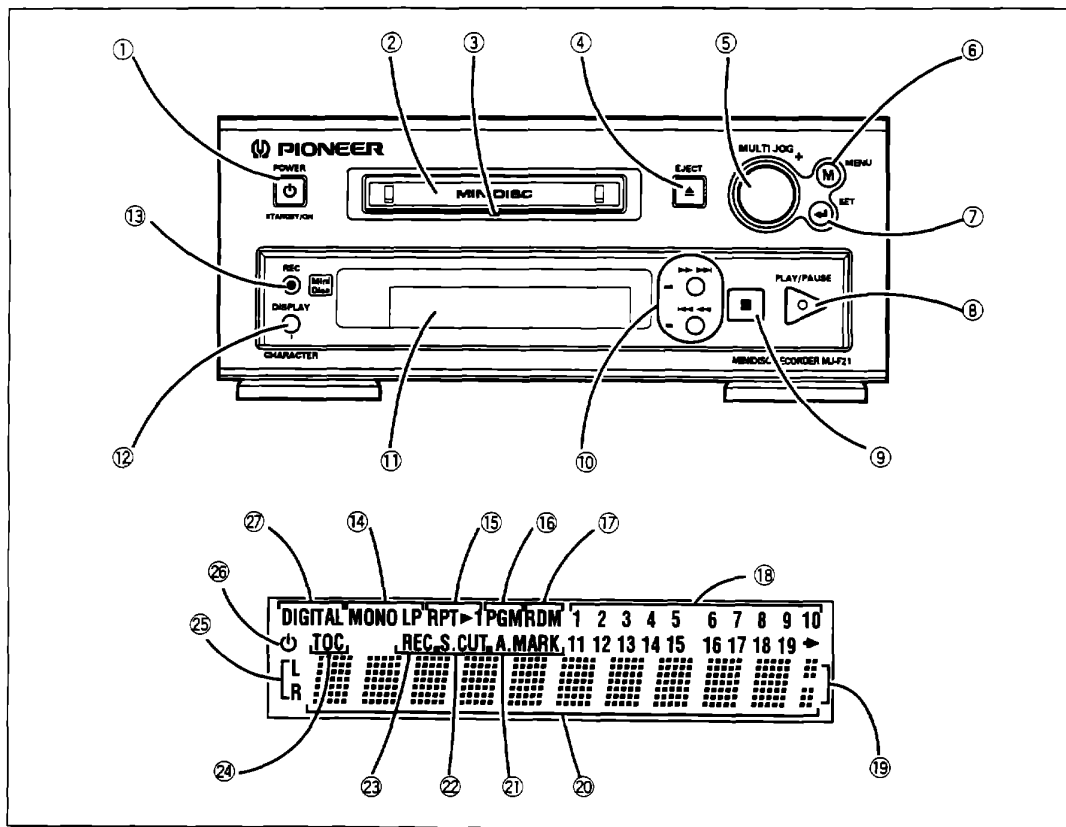


7.2 BLOCK DIAGRAM



8. PANEL FACILITIES AND SPECIFICATIONS

PANEL FACILITIES



① POWER, STANDBY/ON button

② MINIDISC slot

③ Disc indicator
(lights when MD is loaded)

④ Disc EJECT button (▲)

⑤ MULTI JOG dial

⑥ MENU button

⑦ SET button

⑧ PLAY/PAUSE button, PLAY indicator

⑨ Stop button (■)

⑩ Manual/track search buttons (◀◀◀◀, ▶▶▶▶)
Character input/move buttons (←, →)

⑪ Display Section

⑫ DISPLAY/CHARACTER button

⑬ REC button

[DISPLAY SECTION]

⑭ Lights during monaural long-time recording mode

⑮ Lights during repeat mode

⑯ Lights during program input and program play

⑰ Lights during random play

⑱ Music Calendar (track display)

⑲ Lights when recording level is too high

⑳ Displays alphanumeric characters

㉑ Lights when Auto Mark function is used during recording

㉒ Lights during synchro space-cut recording

㉓ REC indicator

㉔ TOC indicator

㉕ Lights when displaying play/recording level

㉖ Standby indicator:

This indicator lights in the power standby mode, and turns off when power is turned on.

㉗ Lights during digital recording

SPECIFICATIONS

Recording Method Magnetic field modulation
overwriting type
Playback Method Non-contact optical type
Sampling Frequency 44.1 kHz
Frequency Response 20 Hz - 20 kHz
Signal-to-Noise Ratio 98 dB
Wow and Flutter Limit of measurement
($\pm 0.001\%$ W.PEAK) or less (EIAJ)
Power Requirements AC 230V, 50/60 Hz
Power Consumption 14 W
Dimensions 190 (W) x 80.5 (H) x 279 (D) mm
Weight 2.3 kg

Accessories

Operating Instructions 1
Optical fiber cable 1
Warranty card 1

NOTE:

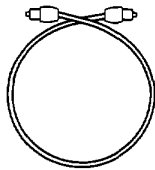
Specifications and design subject to possible modification without notice, due to improvement.

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POWER-CORD CAUTION

Handle the power cord by the plug. Do not pull out the plug by tugging the cord and never touch the power cord when your hands are wet as this could cause a short circuit or electric shock. Do not place the unit, a piece of furniture, etc., on the power cord, or pinch the cord. Never make a knot in the cord or tie it with other cords. The power cords should be routed such that they are not likely to be stepped on. A damaged power cord can cause a fire or give you an electrical shock. Check the power cord once in a while. When you find it damaged, ask your nearest PIONEER authorized service center or your dealer for a replacement.

CONFIRM SUPPLIED ACCESSORIES



Optical fiber cable
(L=0.5m)

Precaution for handling the optical fiber cable

Do not bend the optical fiber cable at a sharp angle since this may damage the cable. Take particular care to avoid bending when installing in a rack, etc. When forming the cable into a loop for storage purposes, make sure that the diameter of the loop is at least 15 cm. When connecting the cable, ensure that the connectors are inserted as far as they will go to safeguard against incomplete connection.

