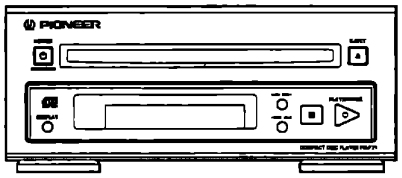
PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
RRV1727

COMPACT DISC PLAYER

PD-F21

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

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

CONTENTS

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T–KZE 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 LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn varoitusmerkki

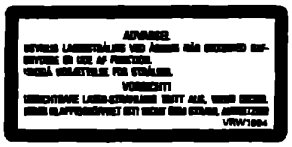
WARNING !
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

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

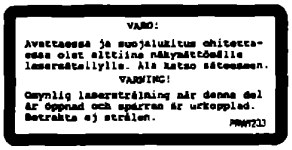
LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780 – 785 nm

LASER
Picture 1
Warning sign for laser radiation

LABEL CHECK



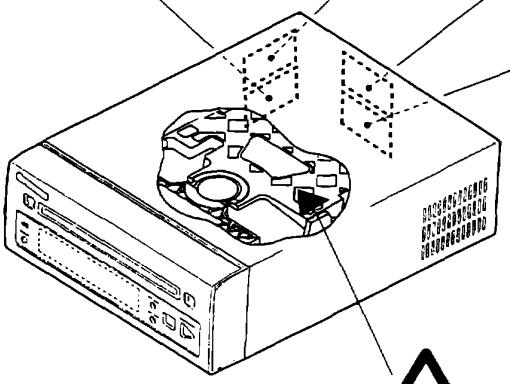
MY Type



MY Type

MY and NV Types

NV Type



MY and NV Types

Additional Laser Caution

1. Laser Interlock Mechanism
   The position of the switch (S601) for detecting loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when the switch (S601) is not on $\overline{\text{CLMP}}$ terminal side ($\overline{\text{CLMP}}$ signal is OFF or high level.). Thus, the interlock will no longer function if the switch (S601) is deliberately set to $\overline{\text{CLMP}}$ terminal side (low level).
   The interlock also does not function in the test mode*.
   Laser diode oscillation will continue, if pin 1 of M51593FP (IC101) on the PRE-AMP BOARD ASSY mounted on the pickup assembly is connected to GND, or pin 19 is connected to low level (ON), or else the terminals of Q101 are shorted to each other (fault condition).

2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.

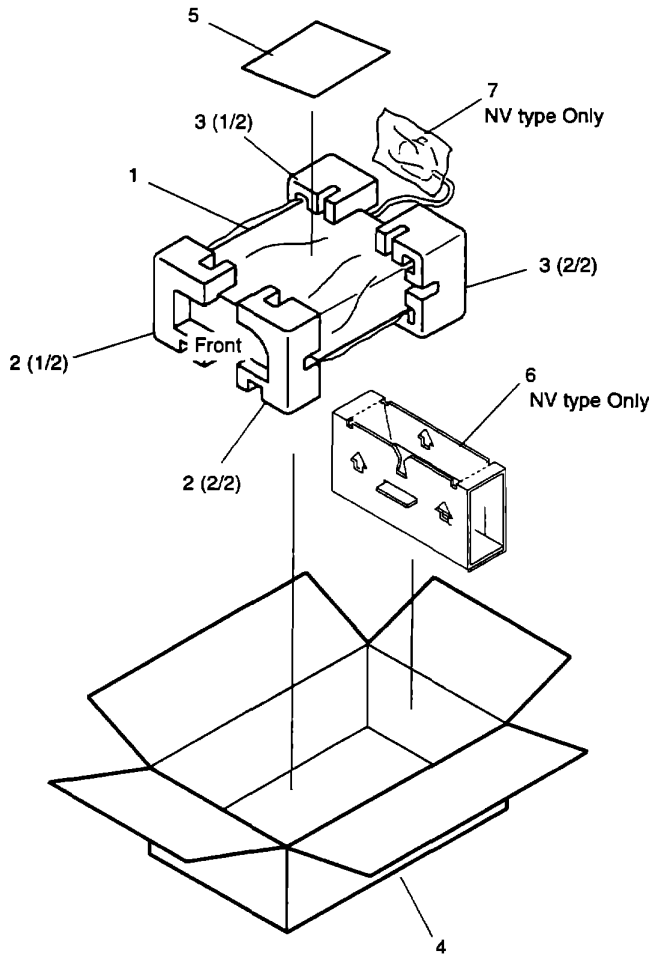
'92S1B

* *Refer to page 28.*

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) Parts List

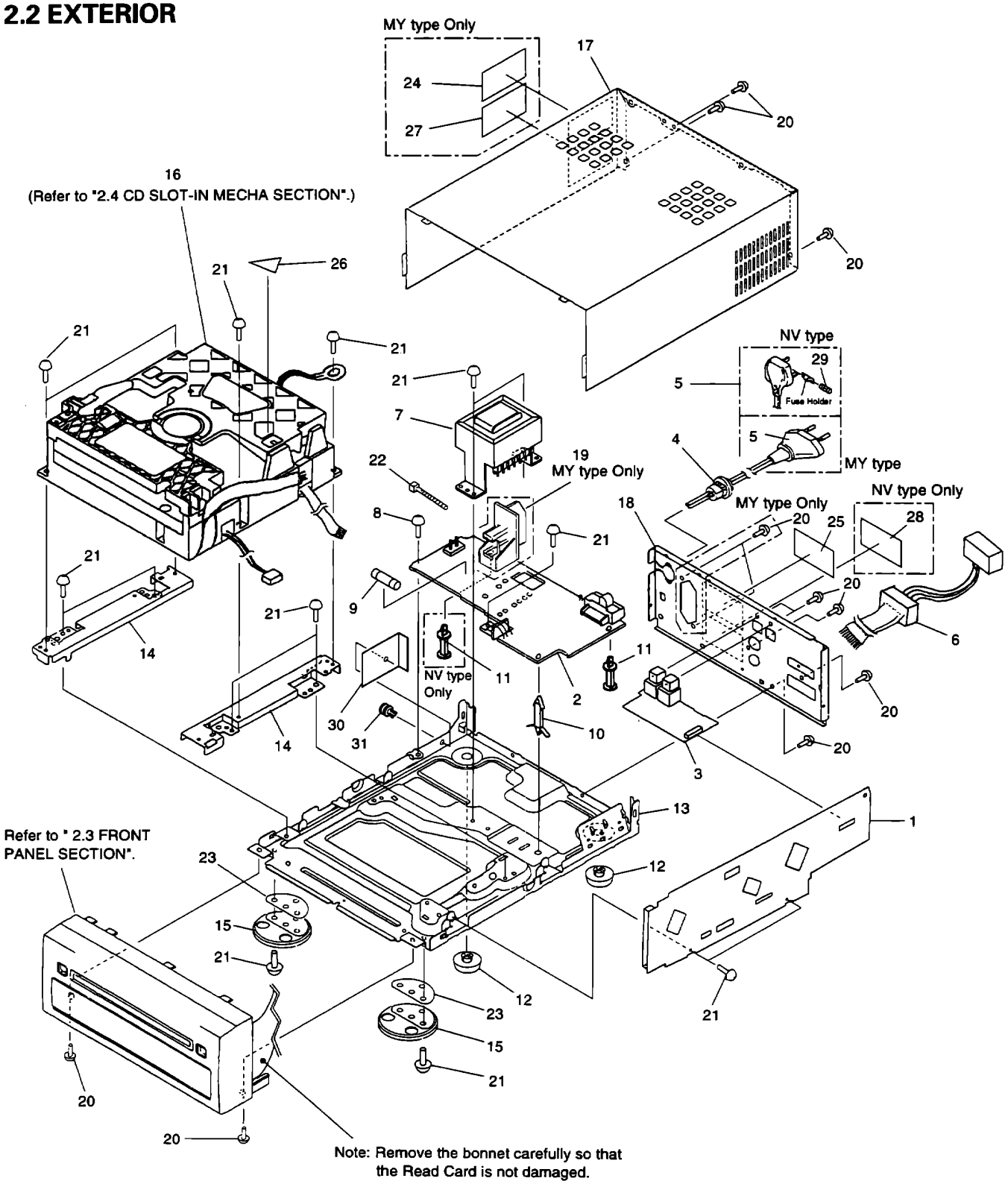
Mark	No.	Description	Parts No.
	1	MIRROR MAT	DHL1050
	2	PAD F MTCD	RHA1222
	3	PAD R MTCD	RHA1223
	4	PACKING CASE	See Contrast table (2)
NSP	5	WARRANTY CARD	ARY7008
	6	SPACER	See Contrast table (2)
	7	POLY. BAG	See Contrast table (2)

(2) Contrast Table

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

Mark	No.	Description	Part No.		Remarks
			PD-F21/MY	PD-F21/NV	
	4	Packing Case	RHG1828	RHG1832	
	6	Spacer	Not used	RHG1836	
	7	Poly. Bag	Not used	RHL1021	

2.2 EXTERIOR


MY type Only
17
24
27
20
16
(Refer to "2.4 CD SLOT-IN MECHA SECTION".)
21
26
21
20
21
NV type
29
5
Fuse Holder
21
7
5
4
MY type
22
19
MY type Only
MY type Only
NV type Only
8
18
20
25
28
21
21
20
9
6
21
14
NV type
Only
11
11
2
30
31
10
20
14
3
20
13
1
Refer to " 2.3 FRONT
PANEL SECTION".
23
12
15
21
12
23
15
21
21
20
20
Note: Remove the bonnet carefully so that
the Read Card is not damaged.

(1) Parts List

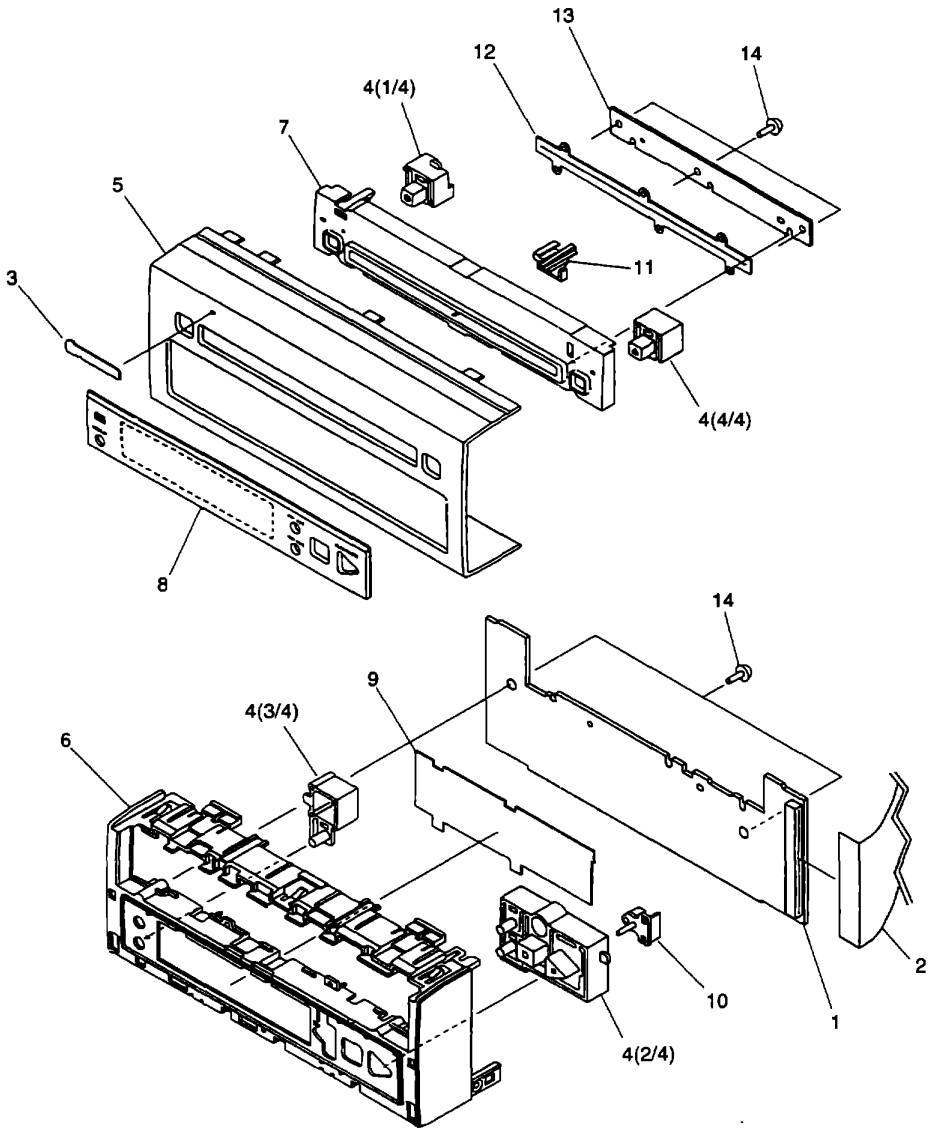
Mark	No.	Description	Parts No.
	1	MAIN ASSY	RWZ4210
	2	POWER ASSY	RWZ4083
	3	OPTICAL ASSY	RWZ4067
	4	STRAIN RELIEF	CM-22B
⚠	5	AC POWER CORD	See Contrast table (2)
	6	CONNECTION CABLE	RDE1049
⚠	7	POWER TRANSFORMER (T1)	RTT1328
	8	SCREW (3×8)	ABA7017
⚠	9	FUSE (T2.5A)	AEK1058
NSP	10	PCB SUPPORT	AEC1006
NSP	11	PCB SPACER (3×12)	AEC1372
	12	FOOT	REC-434
NSP	13	CHASSIS MTCD	RNB1123
NSP	14	MECHA STAY CD	RNE1899
	15	INSULATOR F ASSY	RNK2231
NSP	16	CD SLOT-IN MECHA	AXA7014
	17	BONNET MTCD	REA1266
	18	REAR PANEL	See Contrast table (2)
⚠	19	1P AC OUTLET	See Contrast table (2)
	20	SCREW	BBT30P080FNI
	21	SCREW	BBZ30P080FMC
	22	BINDER	ZCA-SKB90BK
	23	PLATE	RNM1050
	24	CAUTION LABEL HE	See Contrast table (2)
	25	CAUTION LABEL (F)	VRW-328
	26	CAUTION LABEL (G)	VRW-329
	27	CAUTION LABEL	See Contrast table (2)
	28	CAUTION LABEL	See Contrast table (2)
⚠	29	FUSE (T5A)	See Contrast table (2)
	30	BRACKET	RNE1938
	31	NYLON RIVET	AEC-525

(2) Contrast Table

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

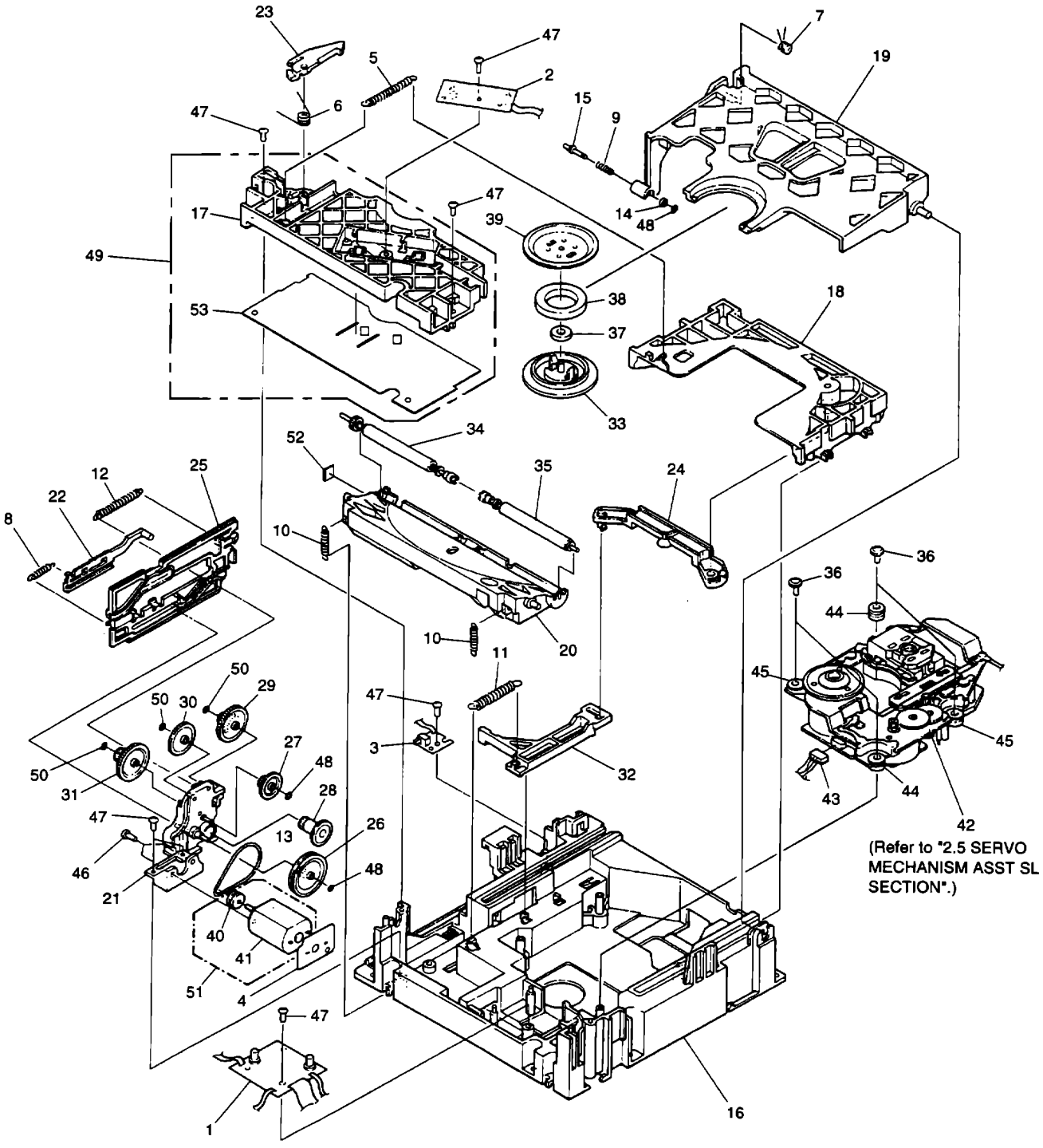
Mark	No.	Description	Part No.		Remarks
			PD-F21/MY	PD-F21/NV	
⚠	5	AC Power Cord	PDG1008	PDG1055	
⚠	29	└ Fuse (T5A)	Not used	PEK1003	
	18	Rear Panel	RNA2111	RNA2114	
⚠	19	1P AC Outlet	AKP1034	Not used	
	24	Caution Label HE	PRW1233	Not used	
	27	Caution Label	VRW1094	Not used	
	28	Caution Label	Not used	PRW1018	

2.3 FRONT PANEL SECTION



Mark	No.	Description	Parts No.
	1	FRONT ASSY	RWZ4065
	2	LEAD CARD 39P (J1)	RDD1380
	3	NAME PLATE	AAM1002
	4	FUNCTION BUTTON CD	RAC2142
	5	FRONT PANEL	RAH2764
	6	PANEL BASE MTCD	RAH2767
	7	FRONT KIT CD	RAH2768
	8	DISPLAY LENS CD	RAH2771
	9	FL FILTER CD	REC1288
	10	PLAY LENS	RNK2232
	11	INDICATOR LENS CD	RNK2233
	12	SHEET	AWL7020
NSP	13	SLOT PCB	RNZ3240
	14	SCREW	BBZ30P080FMC

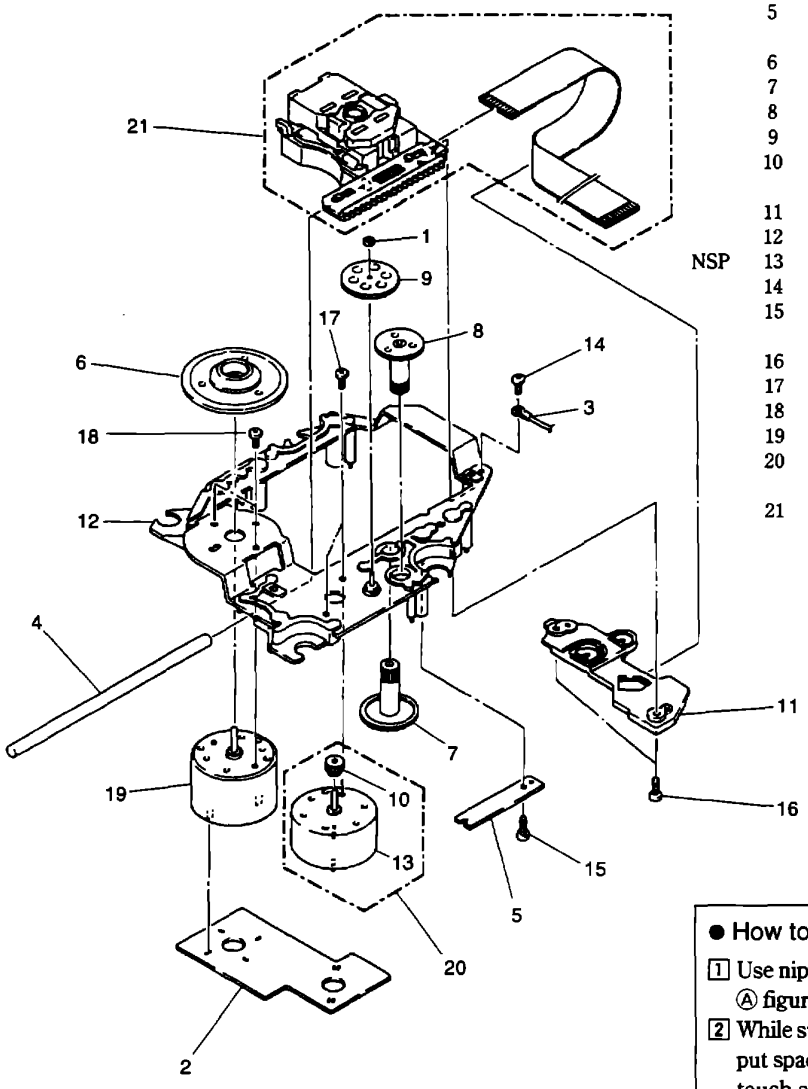
2.4 CD SLOT-IN MECHA SECTION



Parts List for CD Slot-in Mecha Section

Mark	No.	Description	Parts No.
NSP	1	SENSOR PCB ASSY	AWZ7328
NSP	2	LED PCB ASSY	AWZ7329
NSP	3	SW PCB ASSY	AWZ7330
NSP	4	MOTOR PCB ASSY	AWZ7331
	5	SPRING	ABH7035
	6	ROCK LEVER SPRING	ABH7019
	7	SLAMP SPRING	ABH7020
	8	RACK SPRING	ABH7021
	9	P SPRING	ABH7022
	10	ROLLER HOLDER SPRING	ABH7023
	11	SPRING B	ABH7024
	12	CAM PLATE SPRING	ABH7025
	13	BELT A	AEB7012
	14	WASHER	AEB7018
	15	PIN	ALA7005
	16	MECHANISM BASE	ANW7022
	17	DISC PLATE	ANW7023
	18	CENTERING PLATE	ANW7024
	19	CLAMPER HOLDER	ANW7025
	20	ROLLER HOLDER	ANW7078
	21	GEAR HOLDER	ANW7027
	22	RACK	ANW7028
	23	ROCK LEVER	ANW7029
	24	STARTING LEVER	ANW7030
	25	CAM PLATE	ANW7031
	26	GEAR PULLEY	ANW7032
	27	GEAR A	ANW7033
	28	GEAR B	ANW7034
	29	GEAR C	ANW7035
	30	GEAR D	ANW7036
	31	DRIVE GEAR	ANW7037
	32	STARTING PLATE	ANW7038
	33	CLAMPER	ANW7083
	34	ROLLER ASSY L	AXA7019
	35	ROLLER ASSY R	AXA7020
	36	SCREW	PBA1048
NSP	37	H SPACER	PEB1249
	38	CLAMP MAGNET	PMF1014
	39	YOKE	PNB1216
	40	MOTOR PULLEY	PNW1634
NSP	41	MOTOR	PXM1002
NSP	42	SERVO MECHANISM ASSY SL	AXA7017
	43	CONNECTOR ASSY 4P	PDE1238
	44	FLOAT RUBBER	PEB1014
	45	FLOAT RUBBER	PEB1132
	46	SCREW	BMZ20P040FMC
	47	SCREW	PPZ30P060FMC
	48	WASHER	WT12D032D025
	49	DISC PLATE ASSY	AEA7003
	50	WASHER	WT17D034D025
	51	MOTOR ASSY	AEA7000
	52	AV SHEET	AEB7021
NSP	53	DISC PLATE SHEET	AEB7035
		OIL (GREEN)	GEM1015

2.5 SERVO MECHANISM ASSY SL SECTION

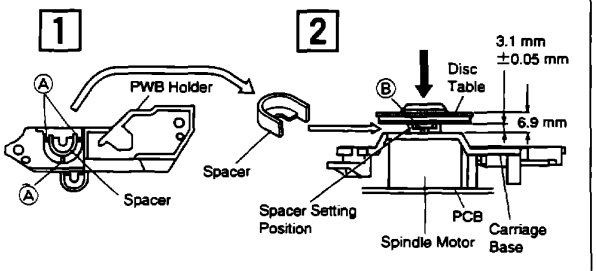


Mark	No.	Description	Parts No.
	1	WASHER	WT12D032D025
	2	MECHANISM BOARD ASSY	PWX1192
	3	GROUND LEAD UNIT	PDF1104
	4	GUIDE BAR	PLA1094
	5	GEAR STOPPER	PNB1303
	6	DISC TABLE	PNW1608
	7	GEAR 1	PNW2052
	8	GEAR 2	PNW2053
	9	GEAR 3	PNW2054
	10	PINION GEAR	PNW2055
	11	PWB HOLDER	PNW2057
	12	CARRIAGE BASE	PNW2699
NSP	13	DC MOTOR (CARRIAGE)	PXM1027
	14	SCREW	BBZ26P060FMC
	15	SCREW	BPZ20P060FMC
	16	SCREW	BPZ26P100FMC
	17	SCREW	JFZ17P025FZK
	18	SCREW	JFZ20P030FNI
	19	DC MOTOR ASSY (SPINDLE)	PEA1235
	20	DC MOTOR ASSY (CARRIAGE)	PEA1246
	21	PICKUP ASSY	PEA1291

● How to install the disc table

1 Use nipper or other tool to cut the three sections marked Ⓐ figure 1. Then remove the spacer.

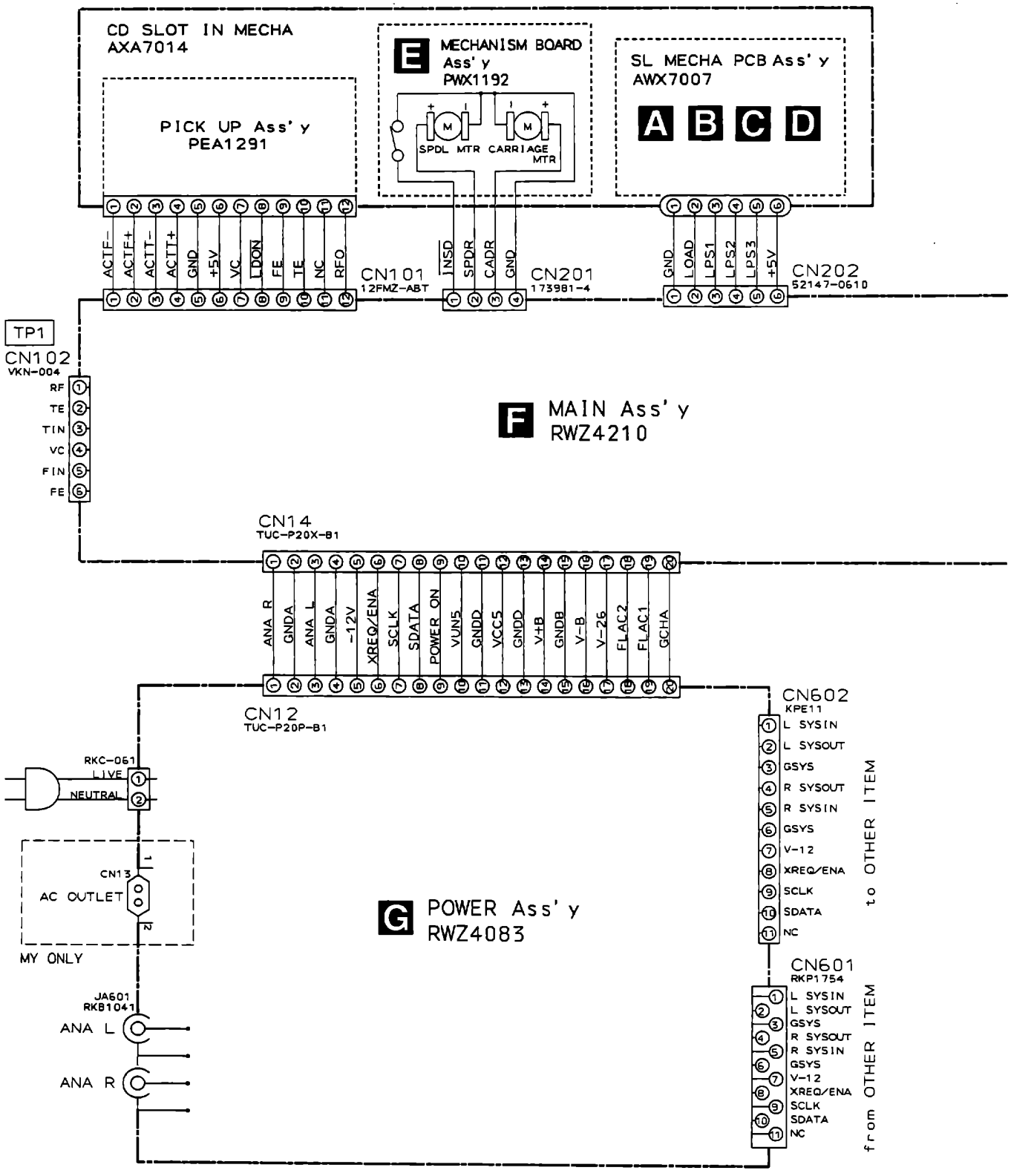
2 While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section Ⓑ), and stick the disc table on top (takes about 9 kg pressure). Take off the spacer.

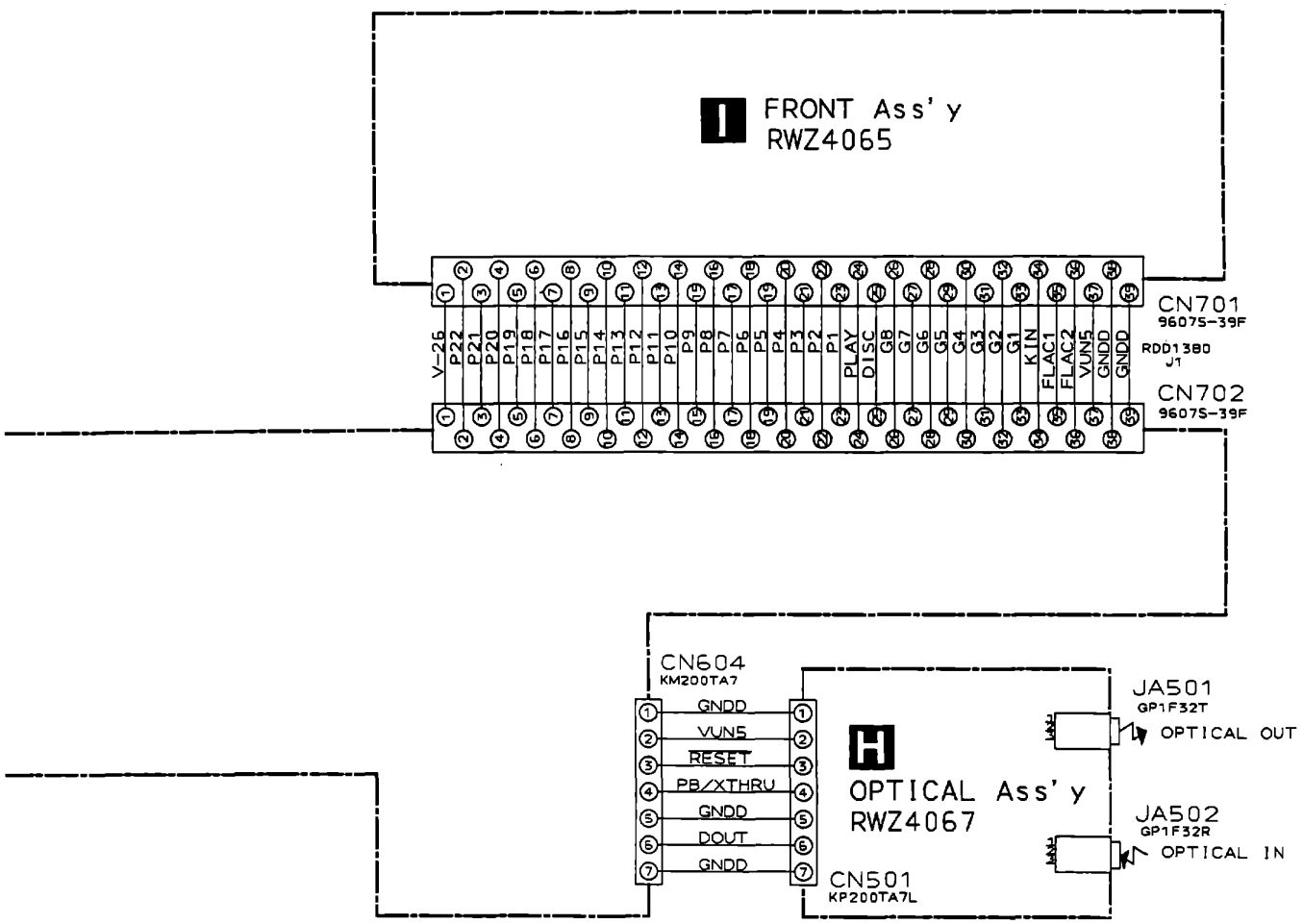


3. SCHEMATIC DIAGRAM

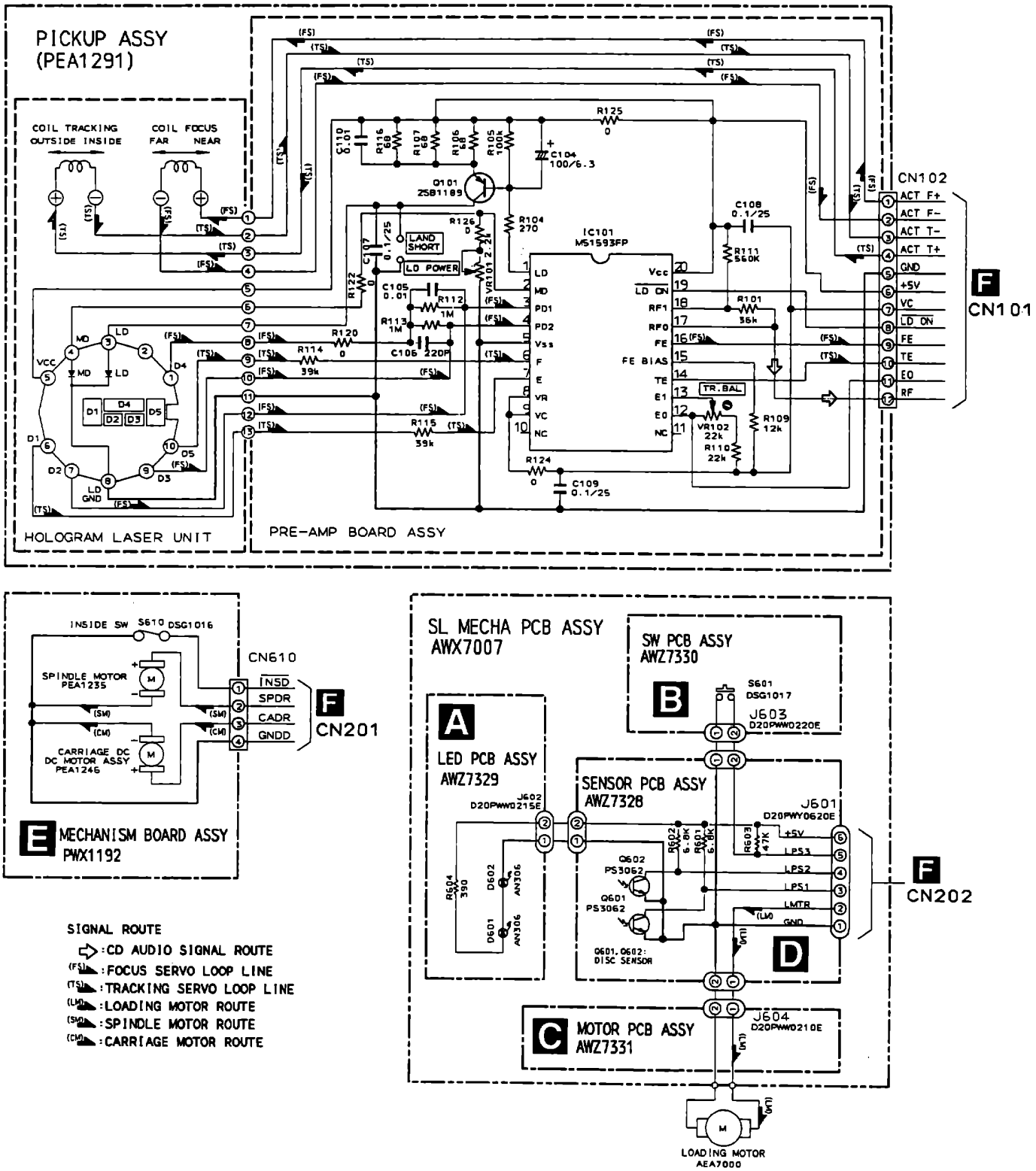
Note: When ordering service parts, be sure to refer to "EXPLODED VIEWS AND PARTS LIST" or "PCB PARTS LIST".

3.1 OVERALL SCHEMATIC DIAGRAM




I
FRONT Ass'y
RWZ4065
CN701
96075-39F
RDD1380
J1
CN702
96075-39F
V-26
P22
P21
P20
P19
P18
P17
P16
P15
P14
P13
P12
P11
P10
P9
P8
P7
P6
P5
P4
P3
P2
P1
PLAY
DISC
GB
G7
G6
G5
G4
G3
G2
G1
KIN
FLAC1
FLAC2
VUN5
GNDD
GNDD
CN604
KM200TA7
GNDD
VUN5
RESET
PB/XTHRU
GNDD
DOUT
GNDD
H
OPTICAL Ass'y
RWZ4067
CN501
KP200TA7L
JA501
GP1F32T
OPTICAL OUT
JA502
GP1F32R
OPTICAL IN

3.2 LED PCB ASSY, SW PCB ASSY, MOTOR PCB ASSY, SENSOR PCB ASSY, MECHANISM BOARD ASSY AND PICKUP ASSY

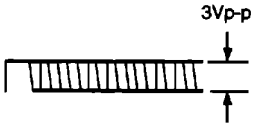
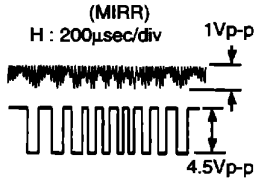
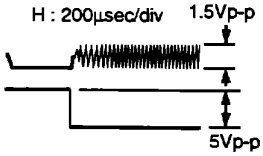
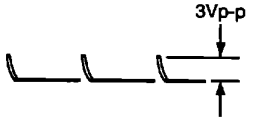
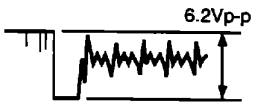
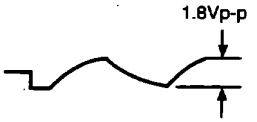
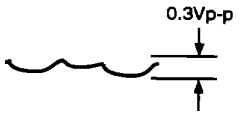


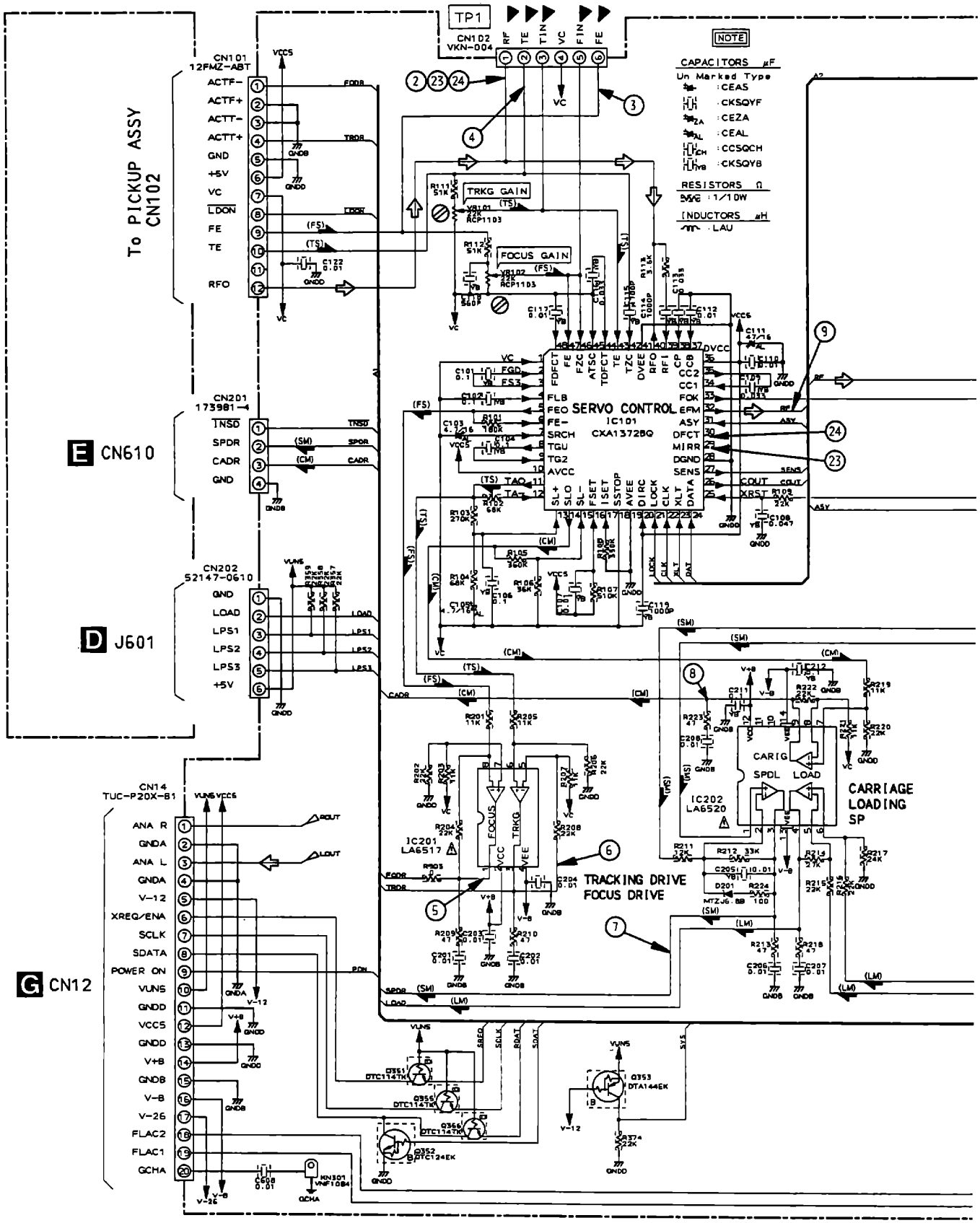
3.3 MAIN ASSY

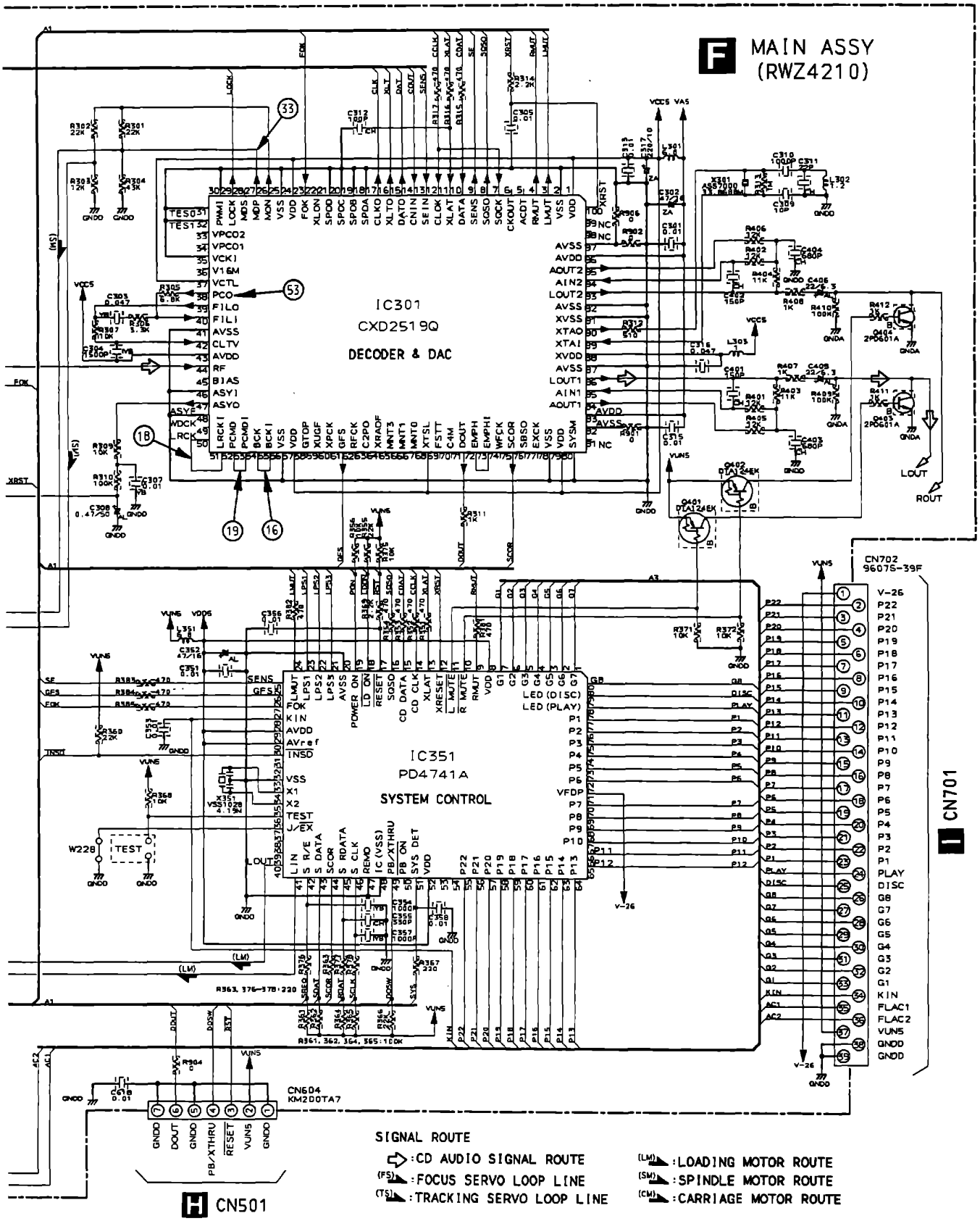
Waveforms

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

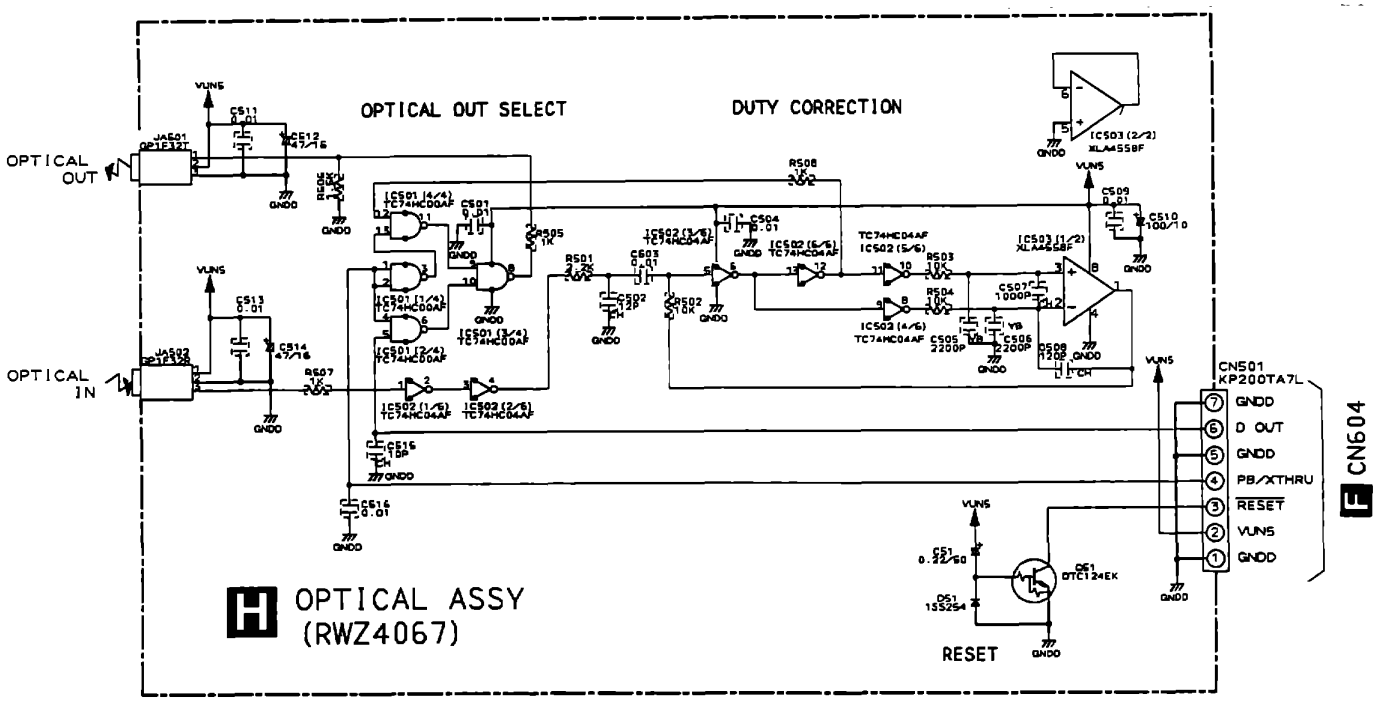
*1 50T-JUMP: After switching to the pause mode, press the manual search key.
*2 FOCUS-IN: Press the play key without loading a disc.

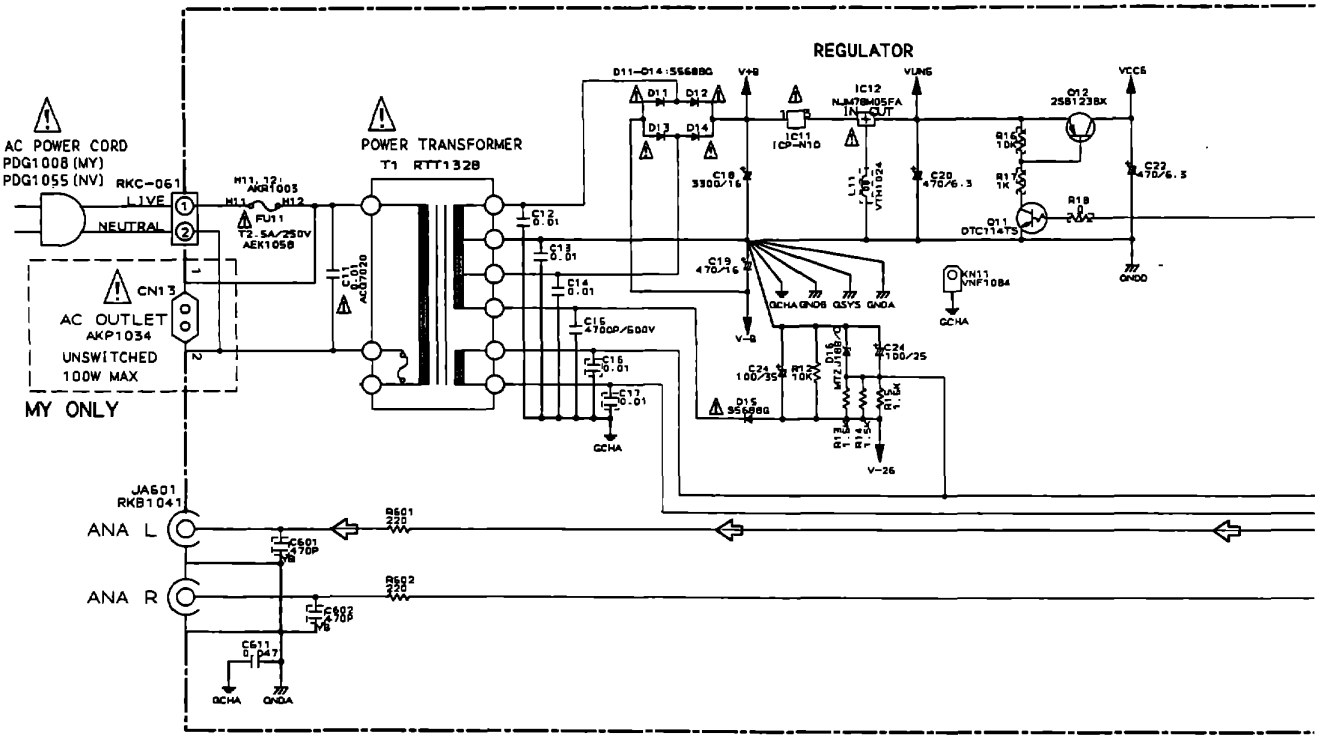
(2) TP1- Pin 1 : PLAY MODE (RF) H : 500nsec/div 	(5) IC201- Pin 1 : PLAY MODE (FODR) H : 1msec/div 	(8) IC202- Pin 9 : TRACK SEARCH MODE (CADR) H : 200msec/div 	(19) IC301- Pin 52 : PLAY MODE (1kHz) (PCMD) H : 500nsec/div 
(2) TP1- Pin 1 : TRACK SEARCH MODE (RF) H : 200µsec/div 	(6) IC201- Pin 3 : PLAY MODE (TRDR) H : 1msec/div 	(9) IC101- Pin 32 : PLAY MODE (EFM) H : 500nsec/div 	(23) TRACK SEARCH MODE Upper:TP1-Pin1(RF) Lower:IC101-Pin 29 (MIRR) H : 200µsec/div 
(3) TP1- Pin 6 : PLAY MODE (FOER) H : 10msec/div 	(6) IC201- Pin 3 : 50T-JUMP(*1) MODE (TRDR) H : 1msec/div 		(24) PLAY MODE Upper:TP1-Pin1(RF) Lower:IC101-Pin 30 (DFCT) H : 200µsec/div 
(4) TP1- Pin 2 : PLAY MODE (TRER) H : 10msec/div 	(7) IC202- Pin 3 : PLAY MODE (SPDR) H : 50msec/div 		(33) IC301- Pin 27 : PLAY MODE (MDP) H : 2µsec/div 
(4) TP1- Pin 2 : 50T- JUMP(*1)MODE (TRER) H : 1msec/div 	(7) IC202- Pin 3 : TRACK SEARCH MODE (SPDR) H : 50msec/div 	(16) IC301- Pin 54 : PLAY MODE (1kHz) (BCLK) H : 500nsec/div 	(53) IC301- Pin 38 : PLAY MODE (PCO) H : 10µsec/div 
(5) IC201- Pin 1 : FOCUS-IN(*2) MODE (FODR) H : 200msec/div 	(8) IC202- Pin 9 : PLAY MODE (CADR) H : 2sec/div 	(18) IC301- Pin 50 : PLAY MODE (1kHz) (LRCK) H : 10µsec/div 	


TP1
CN102
VKN-004
RF
TE
TIN
VC
FIN
FE
NOTE
CAPACITORS µF
Un Marked Type
:CEAS
:CKSQYF
:CEZA
:CEAL
:CCSQCH
:CKSQYB
RESISTORS Ω
:1/10W
INDUCTORS µH
:LAU
To PICKUP ASSY CN102
CN101
12FMZ-ABT
ACTF-
ACTF+
ACTT-
ACTT+
GND
+5V
VC
LDON
FE
TE
RFO
CN201
173981-4
TNSD
SPDR
CADR
GND
E CN610
CN202
52147-0610
GND
LOAD
LPS1
LPS2
LPS3
+5V
D J601
TRKG GAIN
FOCUS GAIN
SERVO CONTROL
IC101
CXA1372BQ
FDFCT
FE
FZC
ATSC
TDFCT
TE
TZC
OVEE
RFO
RFI
CP
CCB
CC2
CC1
FOK
EFM
ASY
DFCT
MIRR
DGND
SENS
COUT
XRST
SL+
SLO
SL-
FSET
ISET
SSTOP
AVEE
DIRC
LOCK
CLK
XLT
DATA
FLB
FEO
FE-
SRCH
TGU
TG2
AVCC
TAO
TA-
IC201
LA6517
FOCUS
TRKG
VCC
VEE
IC202
LA6520
CARIG
SPDL
LOAD
CARRIAGE LOADING SP
TRACKING DRIVE
FOCUS DRIVE
CN14
TUC-P20X-B1
ANA R
GNDA
ANA L
GNDA
V-12
XREQ/ENA
SCLK
SDATA
POWER ON
VUN5
GNDD
VCC5
GNDD
V+8
GNDB
V-8
V-26
FLAC2
FLAC1
GCHA
G CN12
DTC114TK
DTC124EK
DTA144EK


F MAIN ASSY
(RWZ4210)
IC301
CXD2519Q
DECODER & DAC
IC351
PD4741A
SYSTEM CONTROL
CN702
9607S-39F
I CN701
CN604
KM200TA7
H CN501
SIGNAL ROUTE
:CD AUDIO SIGNAL ROUTE
:FOCUS SERVO LOOP LINE
:TRACKING SERVO LOOP LINE
:LOADING MOTOR ROUTE
:SPINDLE MOTOR ROUTE
:CARRIAGE MOTOR ROUTE

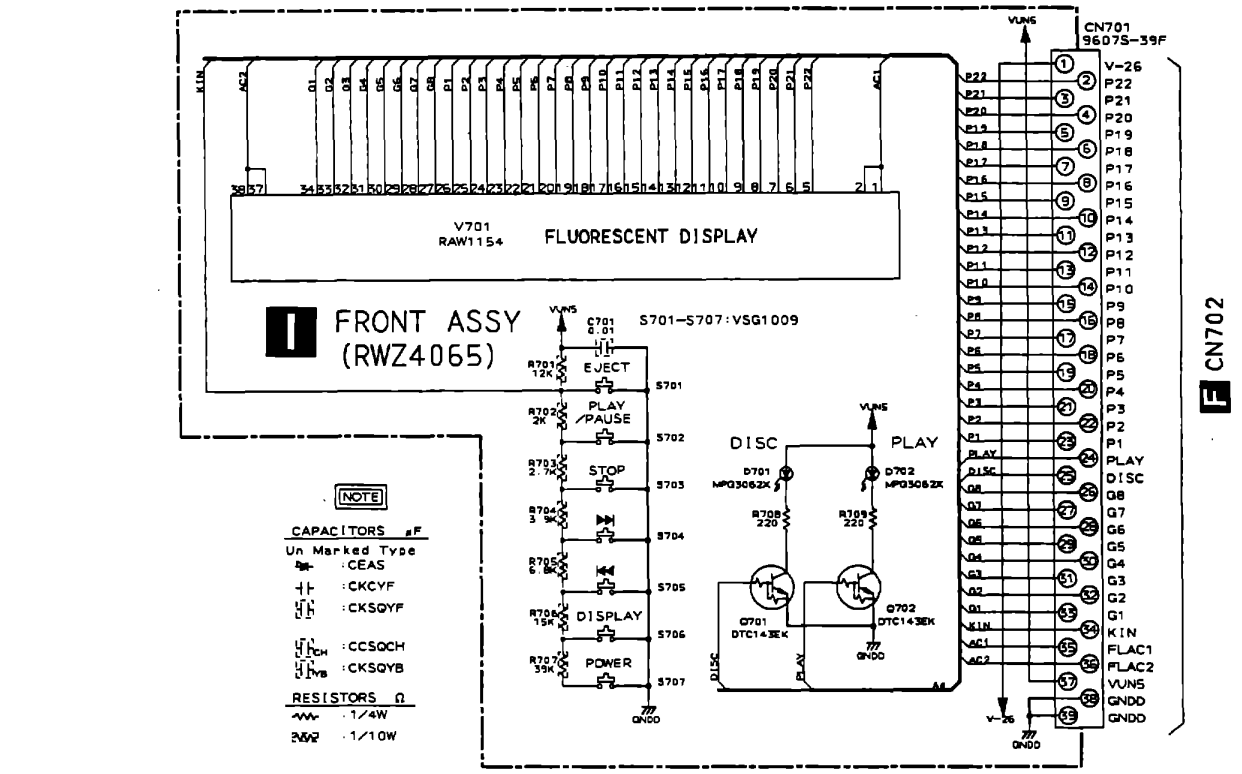
3.4 FRONT ASSY, POWER ASSY AND OPTICAL ASSY

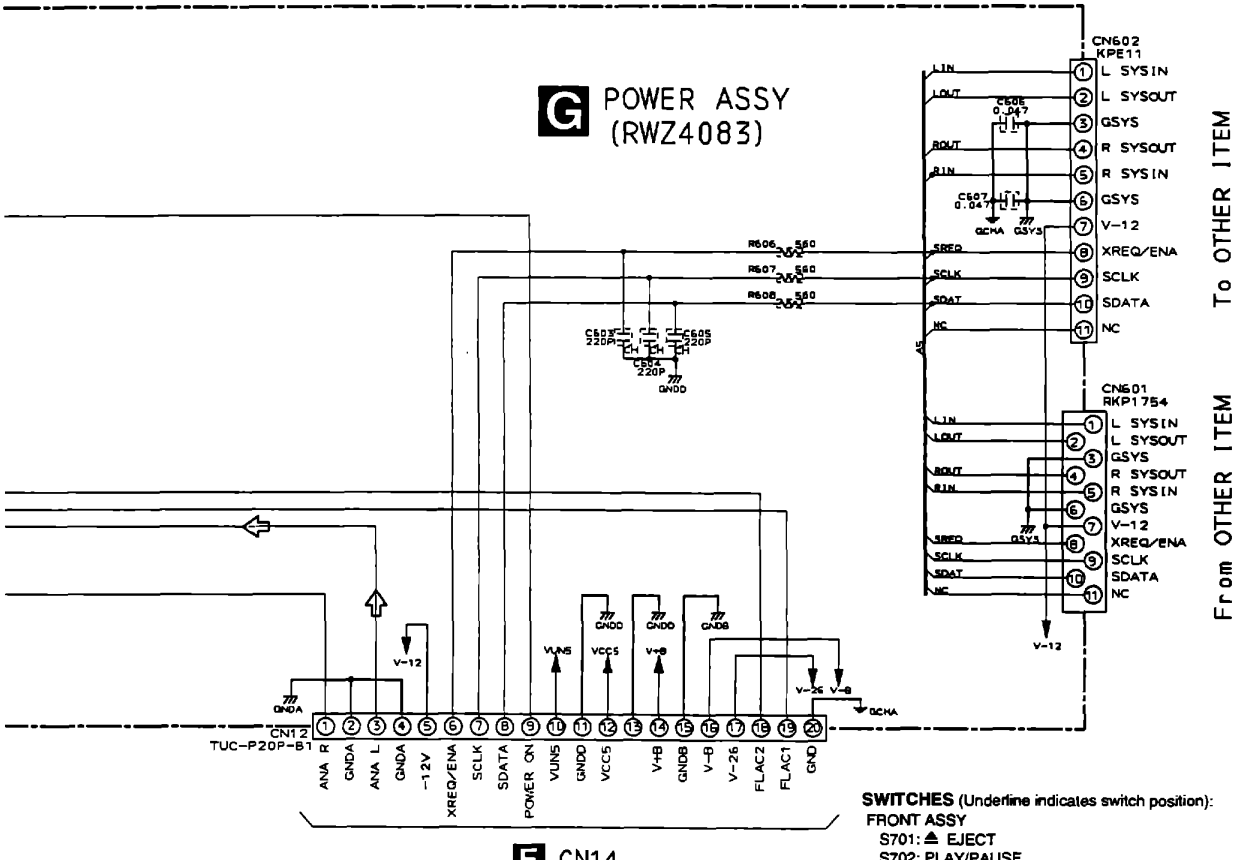




SIGNAL ROUTE

⇨ :CD AUDIO SIGNAL ROUTE

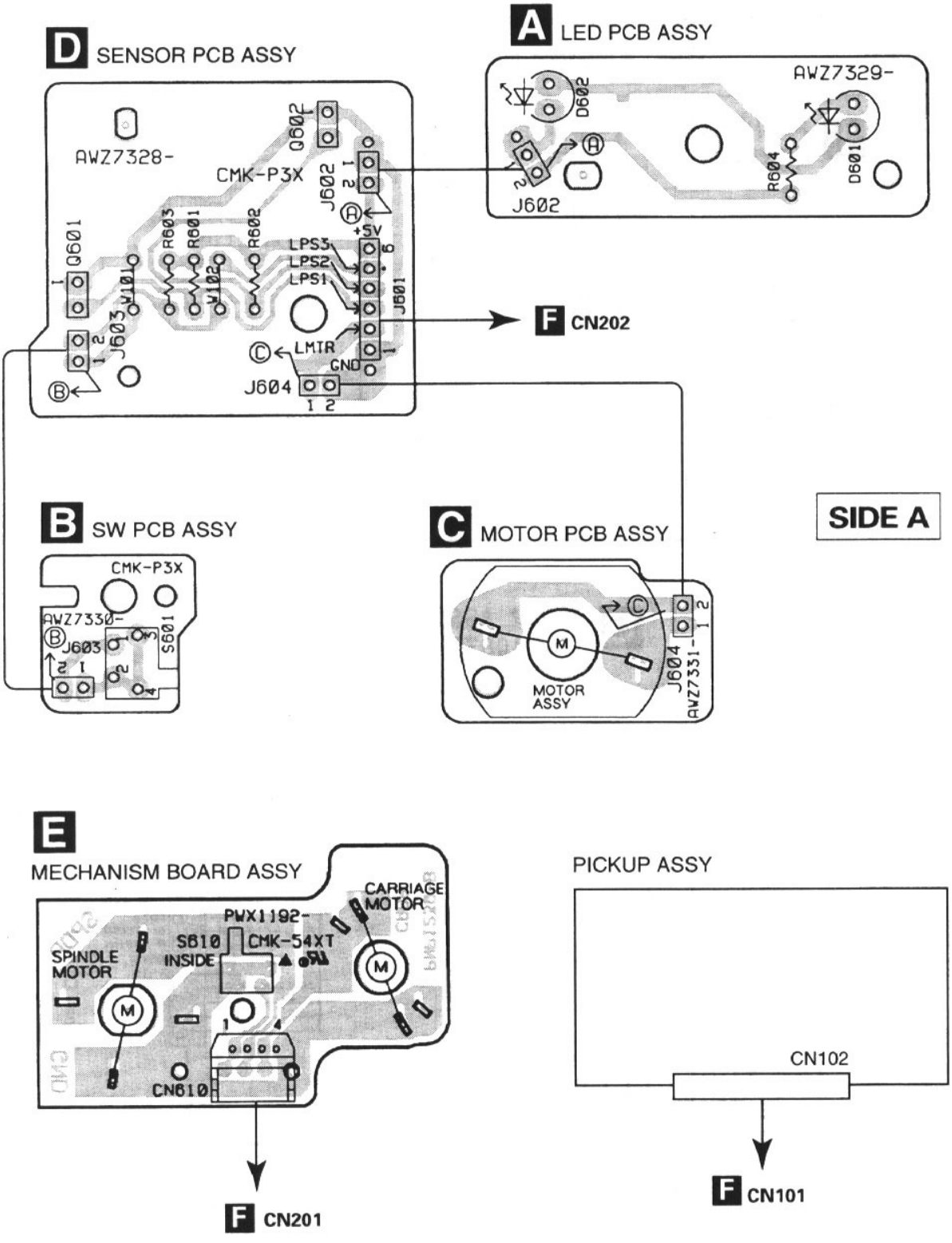




SWITCHES (Underline indicates switch position):
FRONT ASSY
S701: ⏏ EJECT
S702: PLAY/PAUSE
S703: ■ STOP
S704: ▶▶ ▶▶|
S705: |◀◀ ◀◀
S706: DISPLAY
S707: POWER STANDBY/ON

4. PCB CONNECTION DIAGRAM

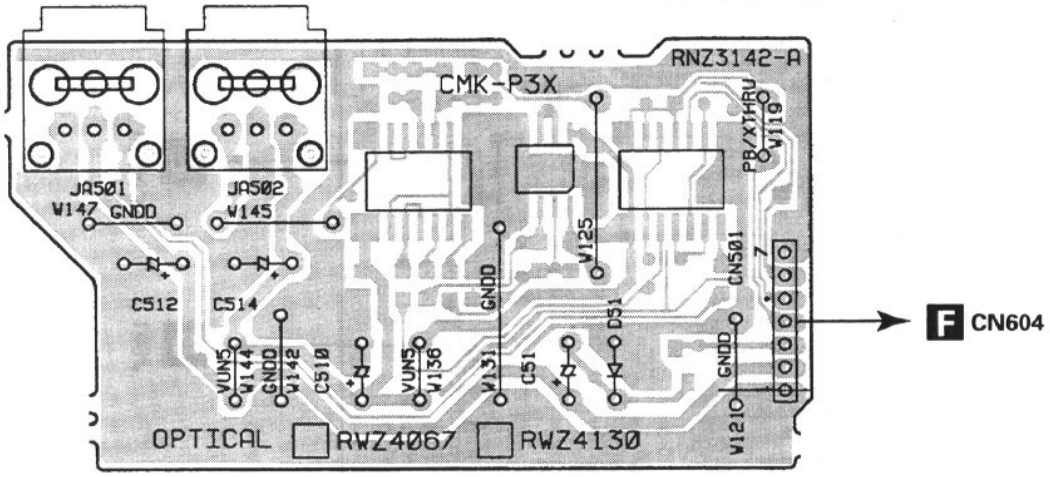
4.1 LED PCB ASSY, SW PCB ASSY, MOTOR PCB ASSY, SENSOR PCB ASSY, MECHANISM BOARD ASSY AND PICKUP ASSY



4.2 OPTICAL ASSY

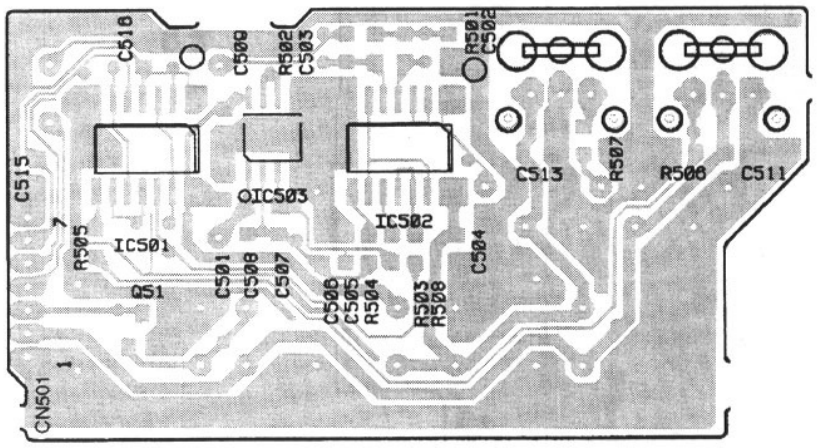
H OPTICAL ASSY

SIDE A



F CN604

SIDE B



IC501 IC503 IC502
Q51

RNP1689–C

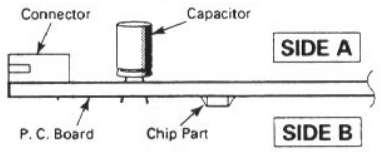
NOTE FOR PCB DIAGRAMS:

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.

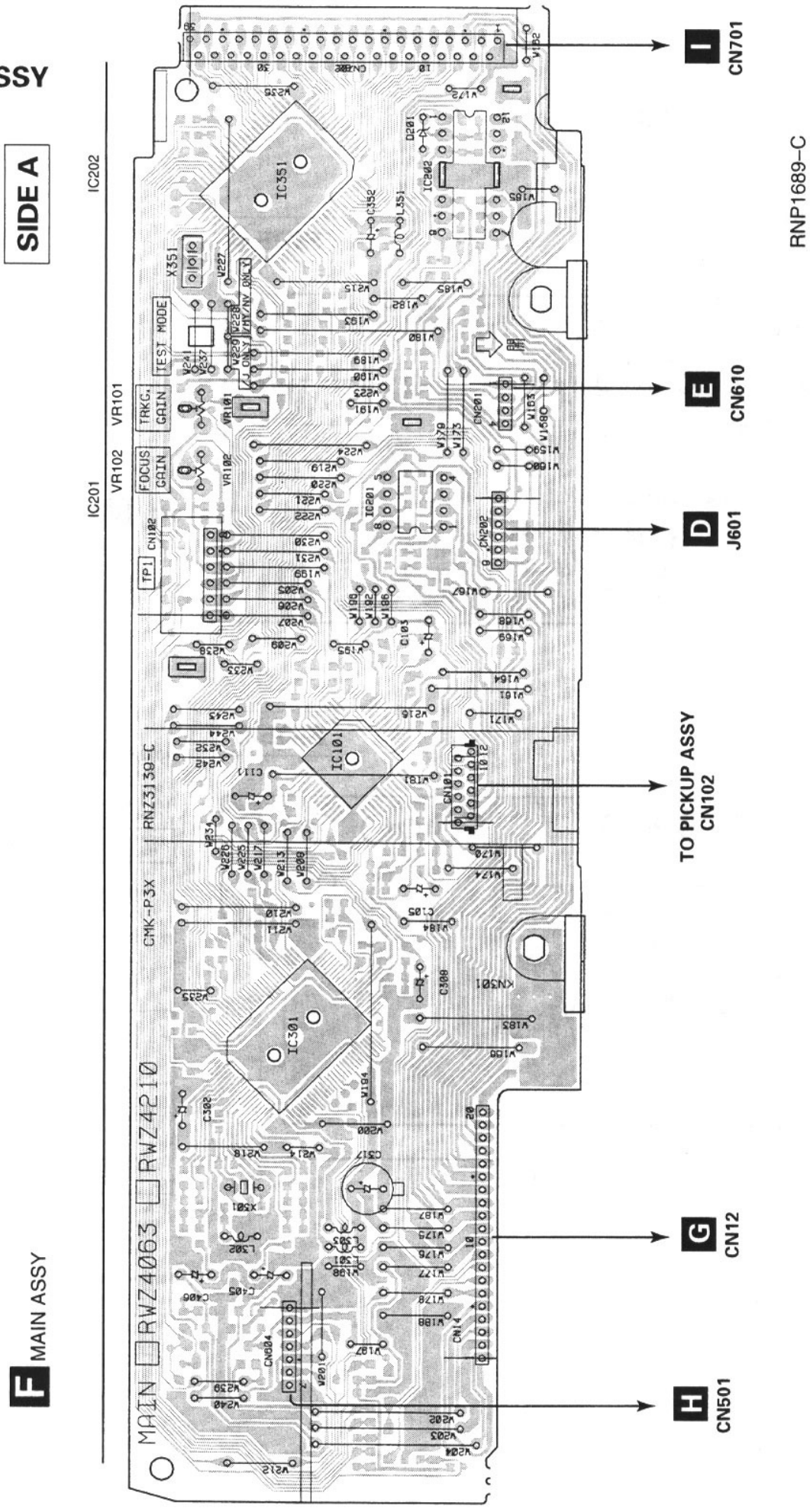
Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
B C E	B C E B C E	Transistor
B C E	B C E B C E	Transistor with resistor
D G S	D G S D G S	Field effect transistor
		Resistor array
		3-terminal regulator

3. The parts mounted on this PCB include all necessary parts for several destination.
For further information for respective destinations, be sure to check with the schematic diagram.

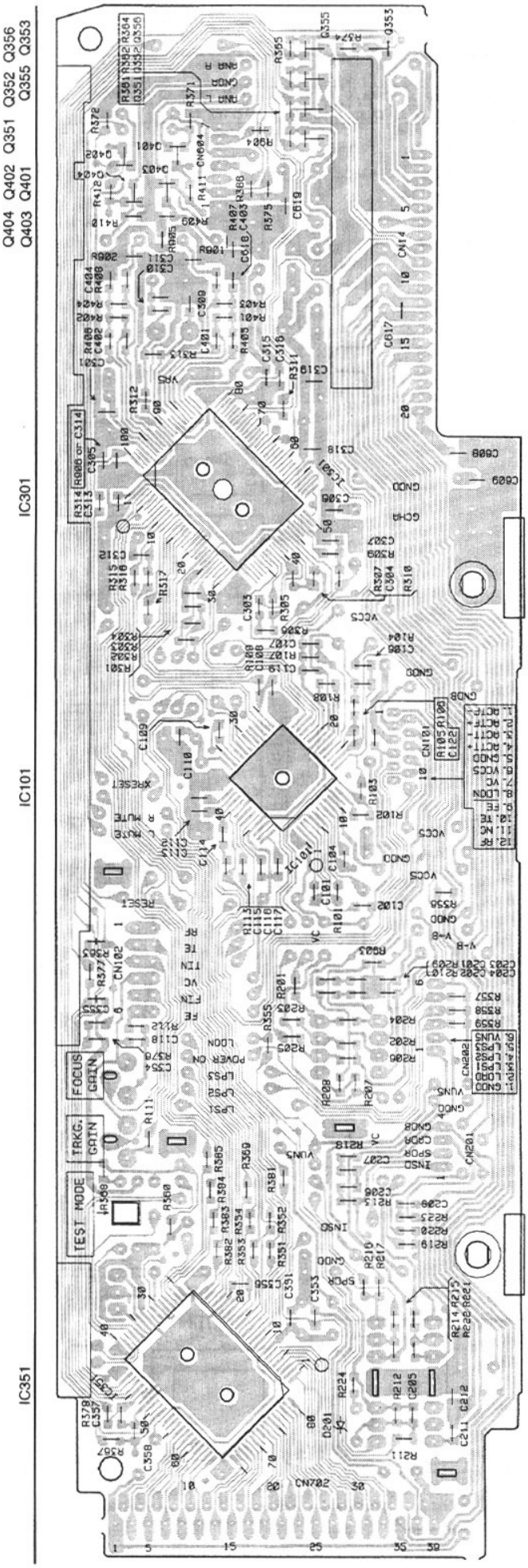
4. Viewpoint of PCB diagrams



4.3 MAIN ASSY

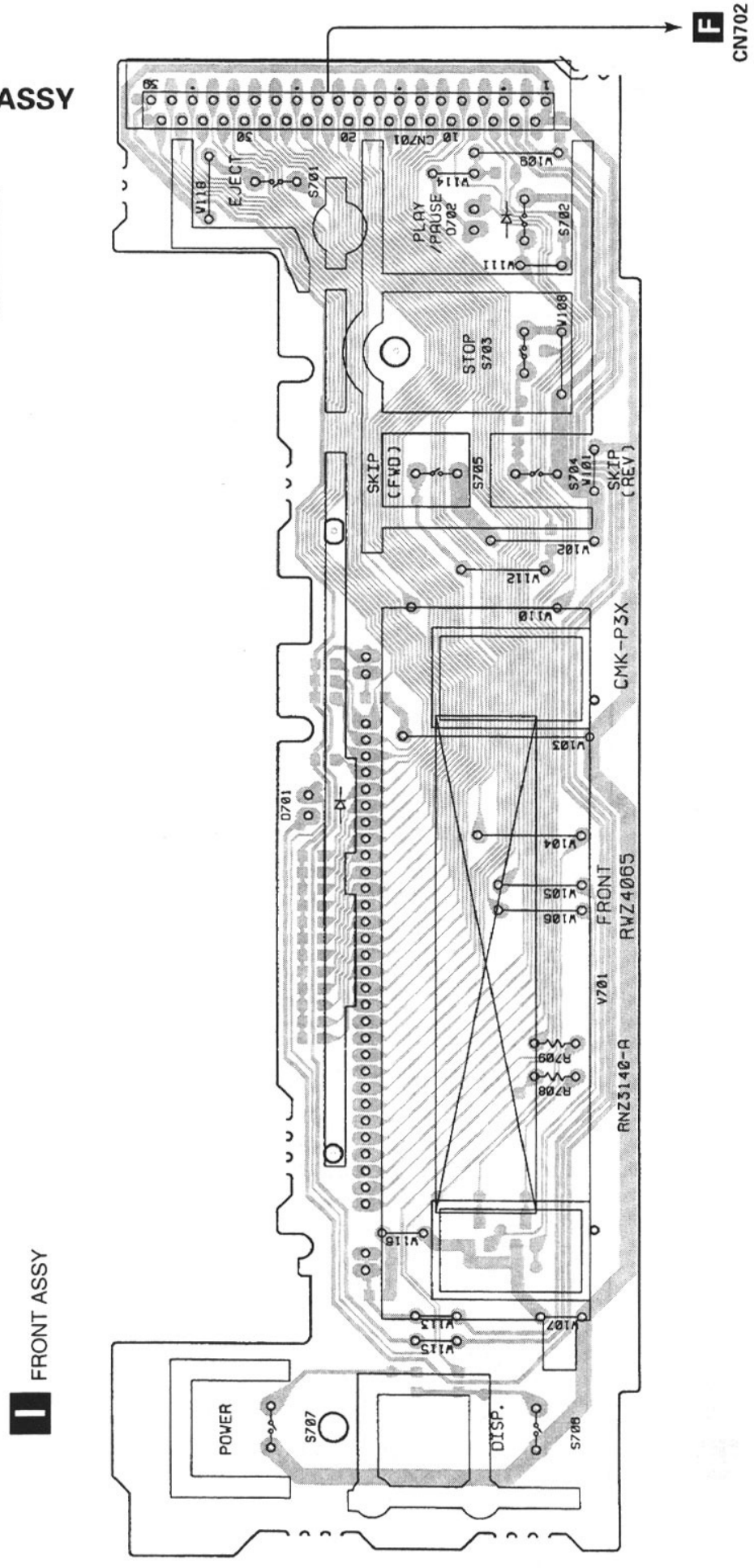

SIDE A
F MAIN ASSY
MAIN RWZ4063 RWZ4210
CMK-P3X RNZ3130-C
IC202
IC201
VR102 VR101
FOCUS GAIN
TRKG. GAIN
TEST MODE
TP1
CN102
X351
IC351
IC101
IC301
IC201
IC202
D201
CN701
I
CN610
E
J601
D
TO PICKUP ASSY
CN102
CN12
G
CN501
H
RNP1689-C

SIDE B

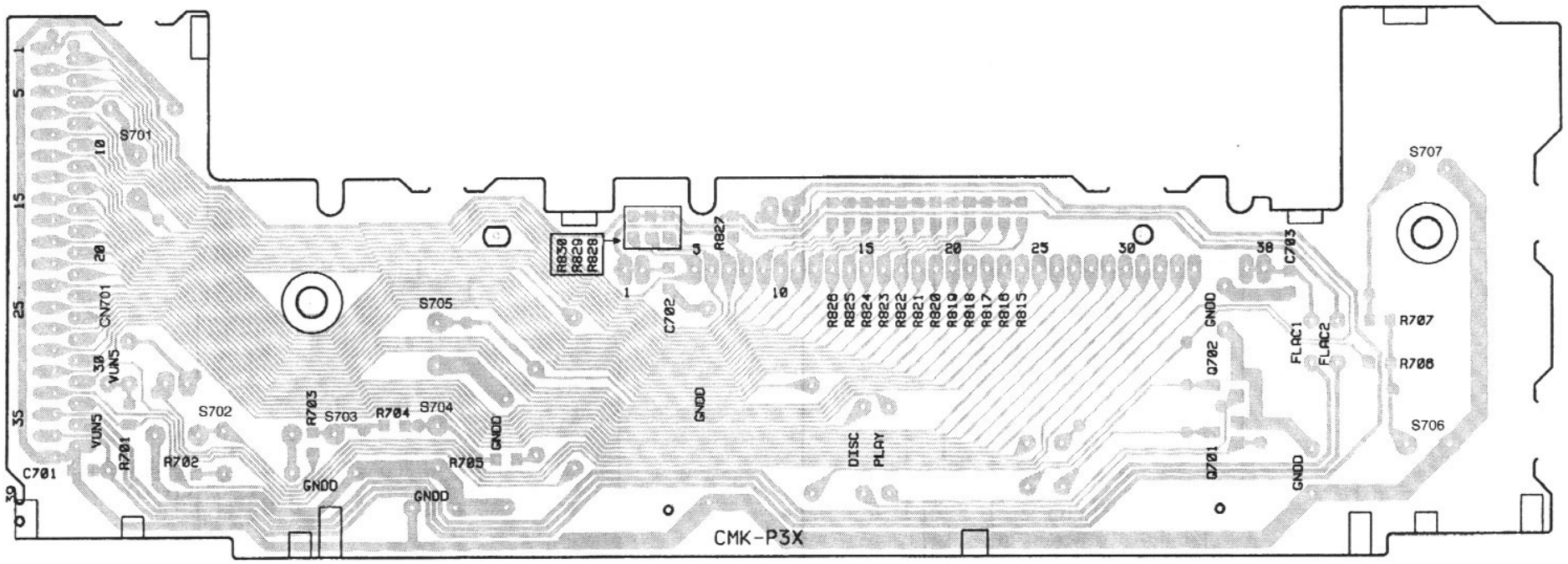


F MAIN ASSY

4.4 FRONT ASSY

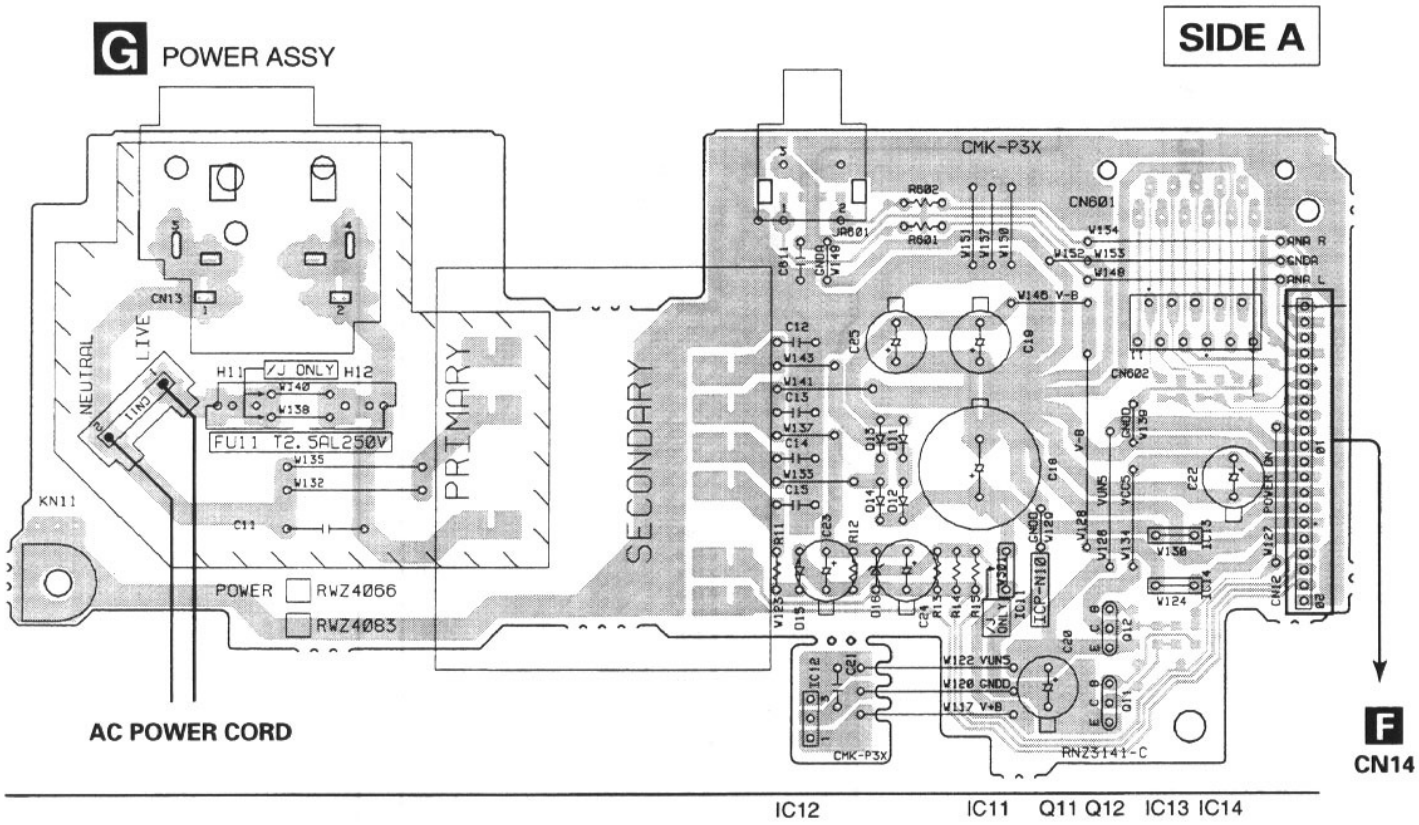


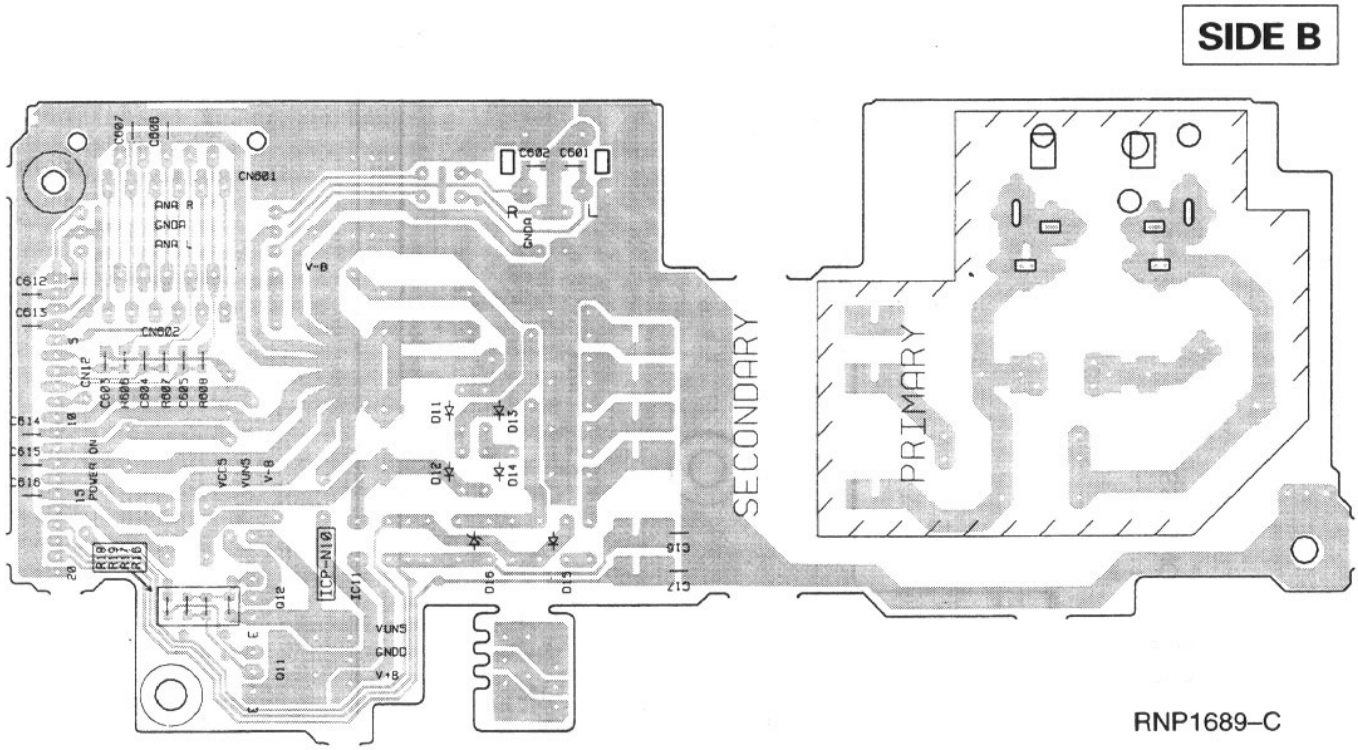
SIDE B



Q701 Q702

4.5 POWER ASSY





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%).*

560Ω → 56 x 10¹ = 561 ..... *RD1/4PU 5 6 1 J*

47kΩ → 47 x 10³ = 473 ..... *RD1/4PU 4 7 3 J*

0.5Ω → R50 ..... *RN2H R 5 0 K*

1Ω → 1R0 ..... *RS1P 1 R 0 K*

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

5.62kΩ → 562 x 10¹ = 5621 ..... *RN1/4PC 5 6 2 1 F*

Mark	No.	Description	Parts No.
LIST OF PCB ASSEMBLIES			
NSP		CD SLOT-IN MECHA	AXA7014
NSP		├ SL MECHA PCB ASSY	AWX7007
NSP		│ ├ SENSOR PCB ASSY	AWZ7328
NSP		│ ├ LED PCB ASSY	AWZ7329
NSP		│ ├ SW PCB ASSY	AWZ7330
NSP		│ └ MOTOR PCB ASSY	AWZ7331
NSP		└ SERVO MECHA ASSY SL	AXA7017
		└ MECHANISM BOARD ASSY	PWX1192
NSP		CDMAIN ASSY	RWM1975
		├ FRONT ASSY	RWZ4065
		├ OPTICAL ASSY	RWZ4067
		├ POWER ASSY	RWZ4083
		└ MAIN ASSY	RWZ4210
D SENSOR PCB ASSY			
SEMICONDUCTORS			
	Q601, Q602		PS3062
RESISTORS			
	All Resistors		RD1/4PU□□□J
A LED PCB ASSY			
SEMICONDUCTORS			
	D601, D602		AN306
RESISTORS			
	All Resistors		RD1/4PU□□□J
B SW PCB ASSY			
SWITCHES AND RELAYS			
	S601		DSG1017
C MOTOR PCB ASSY			
MOTOR PCB ASSY has no service part.			

Mark	No.	Description	Parts No.
E MECHANISM BOARD ASSY			
SWITCHES AND RELAYS			
	S610		DSG1016
OTHERS			
	CN610	MT CONNECTOR 4P	173979-4
I FRONT ASSY			
SEMICONDUCTORS			
	Q701, Q702		DTC143EK
	D701, D702		MPG3062X
SWITCHES AND RELAYS			
	S701-S707		VSG1009
CAPACITORS			
	C701		CKSQYF103Z50
RESISTORS			
	R708, R709		RD1/4PU221J
	Other Resistors		RS1/10S□□□J
OTHERS			
	CN701	FFC CONNECTOR (39P)	9607S-39F
	V701	FL TUBE	RAW1154
H OPTICAL ASSY			
SEMICONDUCTORS			
	IC501		TC74HC00AF
	IC502		TC74HC04AF
	IC503		XLA4558F-P
	Q51		DTC124EK
	D51		1SS254
CAPACITORS			
	C515		CCSQCH100D50
	C502		CCSQCH120J50
	C508		CCSQCH121J50
	C510		CEAS101M10
	C51		CEAS1R0M50
	C512, C514		CEAS470M16
	C507		CKSQYB102K50
	C505, C506		CKSQYB222K50
	C501, C503, C504, C509, C511		CKSQYF103Z50
	C513, C516		CKSQYF103Z50

Mark	No.	Description	Parts No.
	RESISTORS		
	All Resistors		RS1/10S□□□J
	OTHERS		
	JA502	OPTICAL LINK IN	GP1F32R
	JA501	OPTICAL LINK OUT	GP1F32T
	CN501	7P SOCKET	KP200TA7L

G POWER ASSY

Mark	No.	Description	Parts No.
	SEMICONDUCTORS		
⚠	IC11		ICP-N10
⚠	IC12		NJM78M05FA
	Q12		2SB1238X
	Q11		DTC114TS
	D16		MTZJ18B
⚠	D11–D15		S5688G
	COILS AND FILTERS		
⚠	L11		VTH1024
	CAPACITORS		
⚠	C11 (10000pF/AC250V)		ACG7020
	C603–C605		CCSQCH221J50
	C24		CEAS101M25
	C23		CEAS101M35
	C18		CEAS332M16
	C19		CEAS471M16
	C20, C22		CEAS471M6R3
	C15		CKCYE472P2H
	C12–C14		CKCYF103Z50
	C611		CKCYF473Z50
	C601, C602		CKSQYB471K50
	C16, C17		CKSQYF103Z50
	C606, C607		CKSQYF473Z50
	RESISTORS		
	R12		RD1/4PU103J
	R13–R15		RD1/4PU152J
	R601, R602		RD1/4PU221J
	Other Resistors		RS1/10S□□□J
	OTHERS		
	H11, H12	FUSE CLIP	AKR1003
	CN602	11P JUMPER CONNECTOR	KPE11
	JA601	2P PIN JACK	RKB1041
⚠		TERMINAL	RKC-061
	CN601	11P SOCKET	RKP1754
	CN12	CONNECTOR	TUC-P20P-B1
	KN11	EARTH METAL FITTING	VNF1084

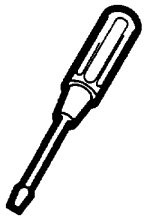
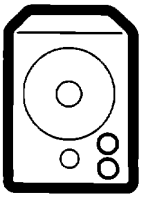
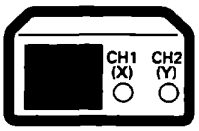
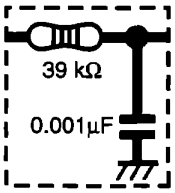
F MAIN ASSY

Mark	No.	Description	Parts No.
	SEMICONDUCTORS		
	IC101		CXA1372BQ
	IC301		CXD2519Q
⚠	IC201		LA6517
⚠	IC202		LA6520
	IC351		PD4741A
	Q403, Q404		2PD601A
	Q401, Q402		DTA124EK
	Q353		DTA144EK
	Q351, Q355, Q356		DTC114TK
	Q352		DTC124EK
	D201		MTZJ6.8B
	COILS AND FILTERS		
	L303		LAU1R0J
	L302		LAU1R2J
	L301, L351		LAU6R8J
	CAPACITORS		
	C309		CCSQCH100D50
	C312		CCSQCH101J50
	C401, C402		CCSQCH151J50
	C311		CCSQCH220J50
	C355		CCSQCH331J50
	C403, C404		CCSQCH681J50
	C405, C406		CEAL220M6R3
	C111, C352		CEAL470M16
	C103, C105		CEAL4R7M16
	C308		CEALR47M50
	C317		CEZA221M16
	C302		CEZA470M16
	C114, C119, C354, C357		CKSQYB102K50
	C107, C112, C117, C205, C307		CKSQYB103K50
	C101, C102, C104, C106		CKSQYB104K25
	C211, C212		CKSQYB104K25
	C304		CKSQYB152K50
	C109, C113, C116		CKSQYB333K25
	C115		CKSQYB472K50
	C303		CKSQYB473K25
	C118		CKSQYB561K50
	C310		CKSQYF102Z50
	C110, C122, C201–C204		CKSQYF103Z50
	C206–C208, C301, C305, C313		CKSQYF103Z50
	C315, C351, C353, C356, C358		CKSQYF103Z50
	C608, C618		CKSQYF103Z50
	C108, C316		CKSQYF473Z50
	RESISTORS		
	VR101, VR102 (22k)		RCP1103
	Other Resistors		RS1/10S□□□J
	OTHERS		
	CN101	FPC CONNECTOR (12P)	12FMZ-ABT
	CN201	MT CONNECTOR (4P)	173981-4
	CN202	6P JUMPER CONNECTOR	52147-0610
	CN702	FFC CONNECTOR (39P)	9607S-39F
	X301	(33.8688MHz)	ASS7000
	CN604	7P PLUG	KM200TA7
	CN14	CONNECTOR (20P)	TUC-P20X-B1
		PCB BINDER	VEF1040
	CN102	6P SIDE POST	VKN-004
	KN301	EARTH METAL FITTING	VNF1084
	X351	(4.19MHz)	VSS1028

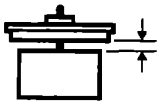
6. ADJUSTMENT

1. PREPARATIONS (準備)

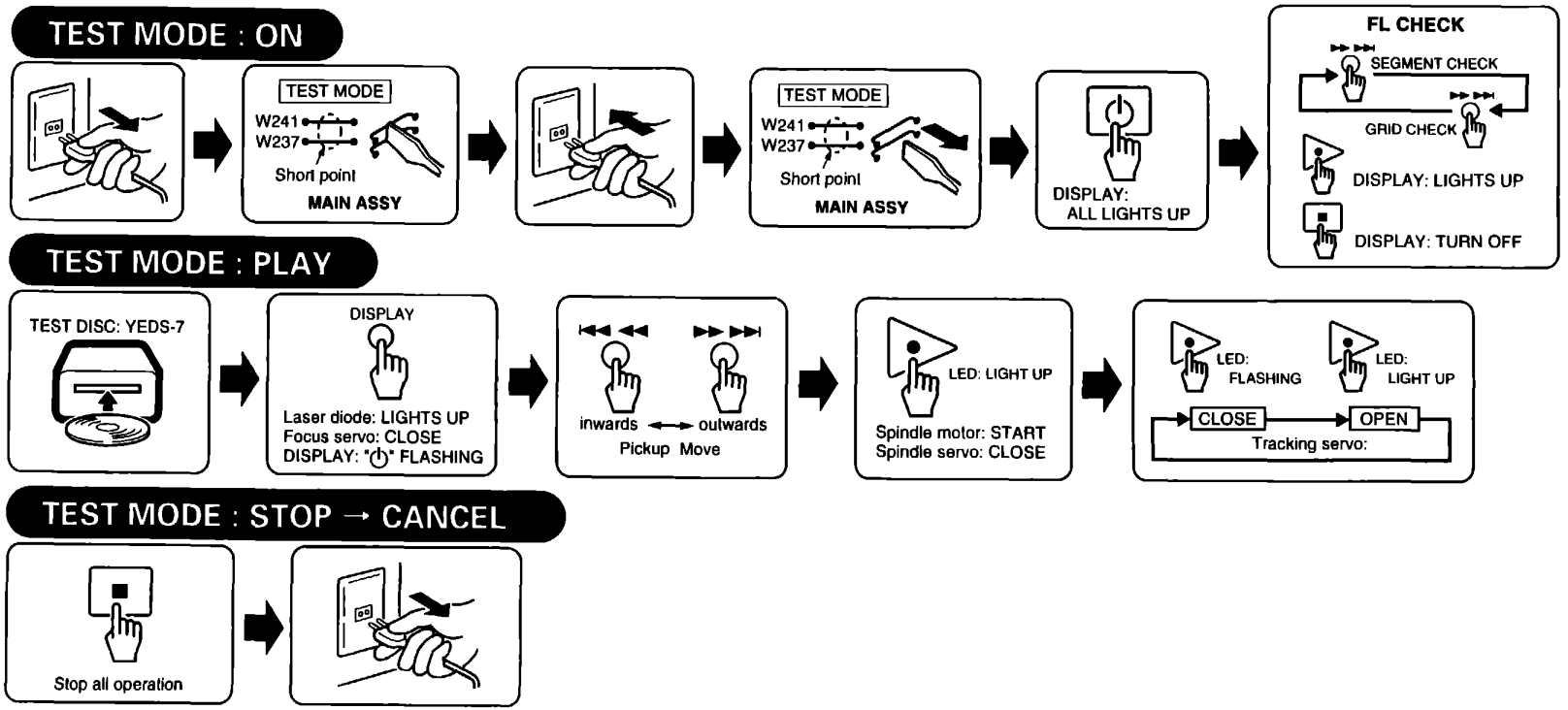
1.1 Jigs and Measuring Instruments (使用測定器/治工具類)

 8-cm DISC (With at least about 20 minutes recording) (20分程度信号の入ったディスク)	 CD TEST DISC (YEDS-7)	 ⊖ Precise screwdriver	 ⊖ screwdriver (small)	 ⊕ screwdriver (medium)
 Ball point hexagon wrench (size: 1.5mm) GGK1002 ボールポイント付 六角ドライバー(対辺 1.5mm)	 ⊕ screwdriver (large)	 Low-frequency oscillator	 Dual-trace oscilloscope (10 : 1 probe)	 Low pass filter (39 kΩ + 0.001μF)

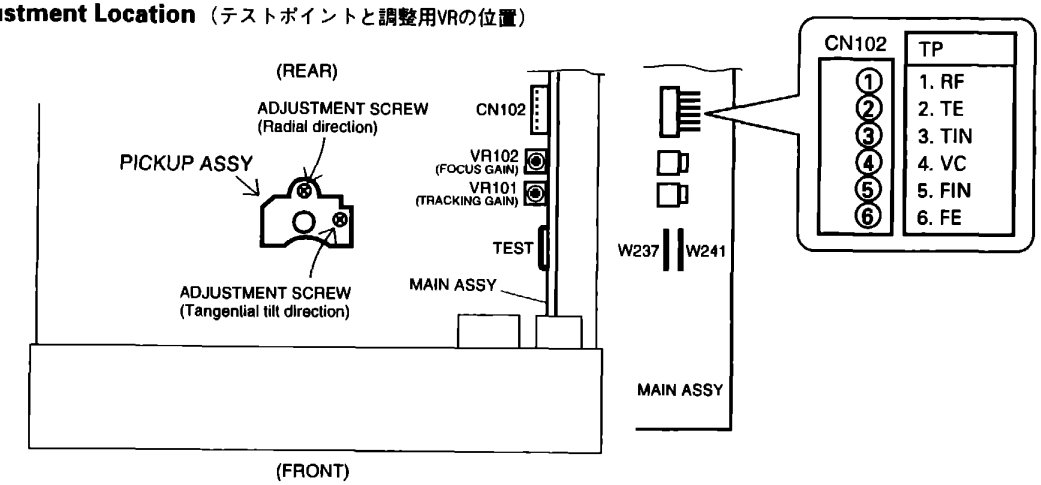
1.2 Necessary Adjustment Points (調整に必要な項目)

When (このような時)	Adjustment points
Exchange PICKUP (ピックアップを交換した時)	1.2.3.4.5.6. → Page 29~31
Exchange MAIN ASSY (MAIN ASSYを交換した時)	1.2.3.4.5.6. → Page 29~31
Exchange SERVO MECH ASSY (サーボメカASSYを交換した時)	1.2.3.4.5.6. → Page 29~31
Exchange SPINDLE MOTOR (スピンドルモーターを交換した時)	 ADJ → Page 9

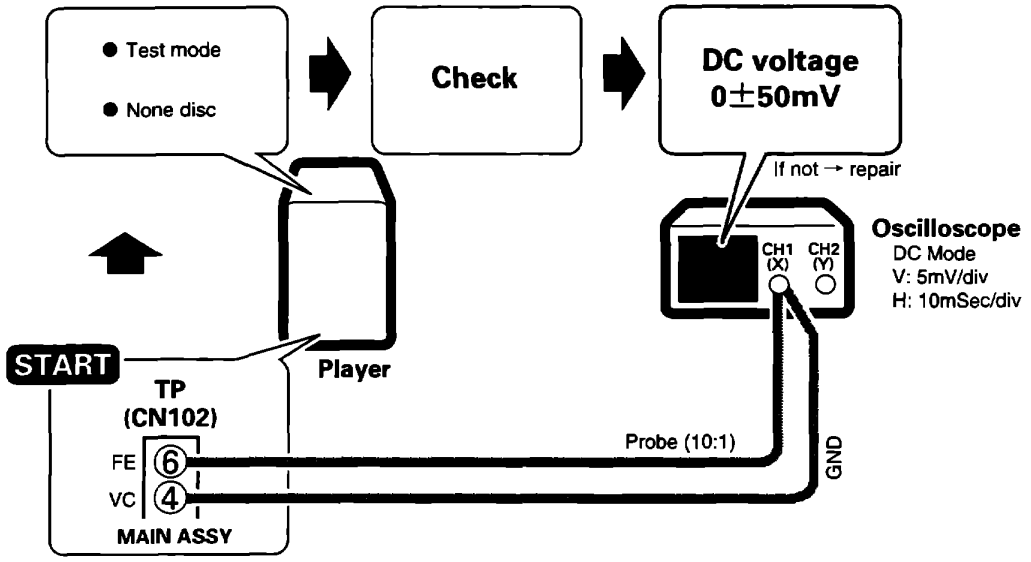
2.1 How to Start/Cancel Test Mode (テストモードの設定／解除)



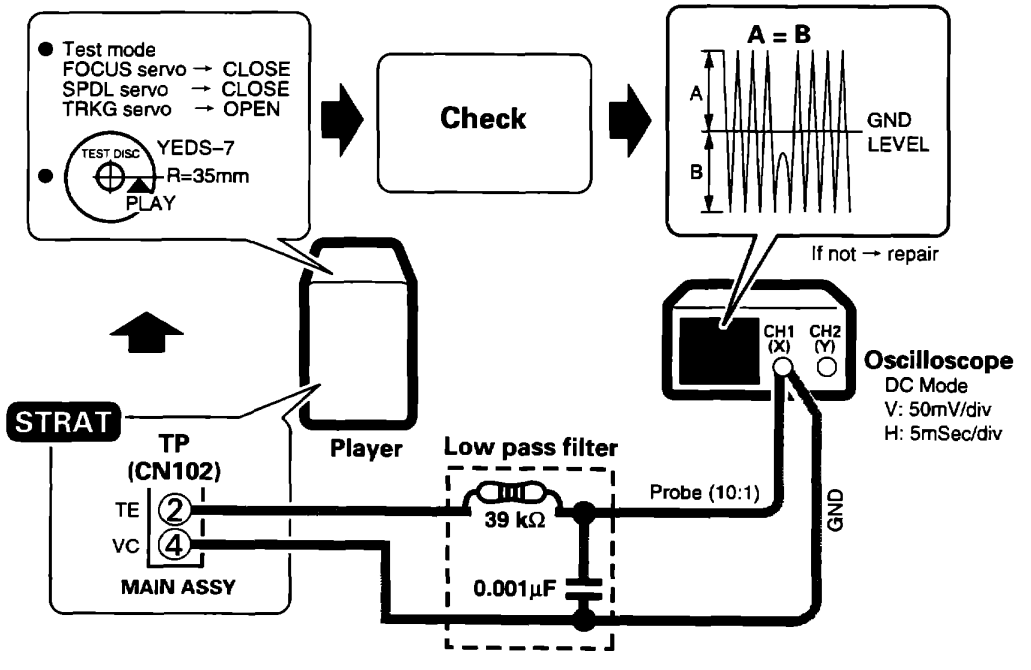
2.2 Adjustment Location (テストポイントと調整用VRの位置)



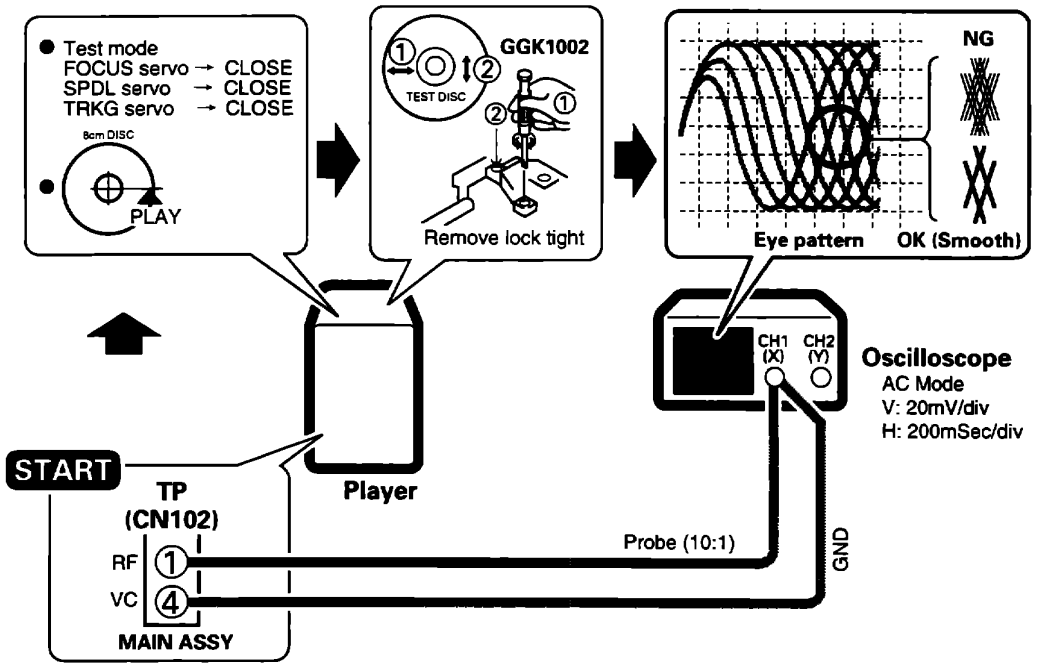
1. Focus Offset Check
（フォーカスオフセット確認）



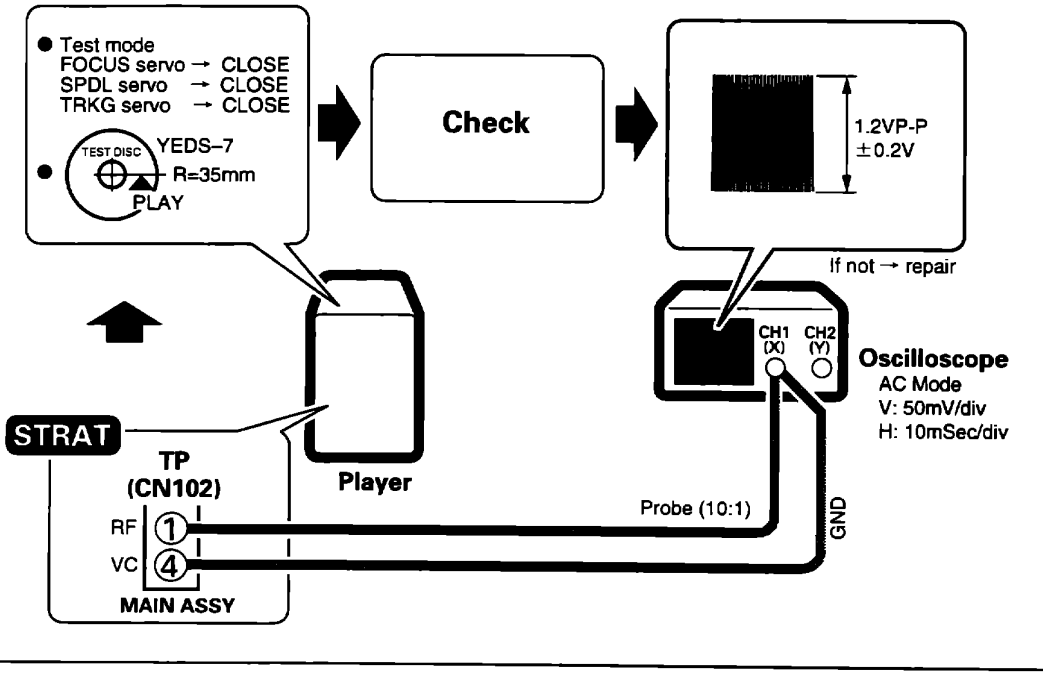
2. Tracking Error Balance Check
（トラッキングエラーバランス確認）



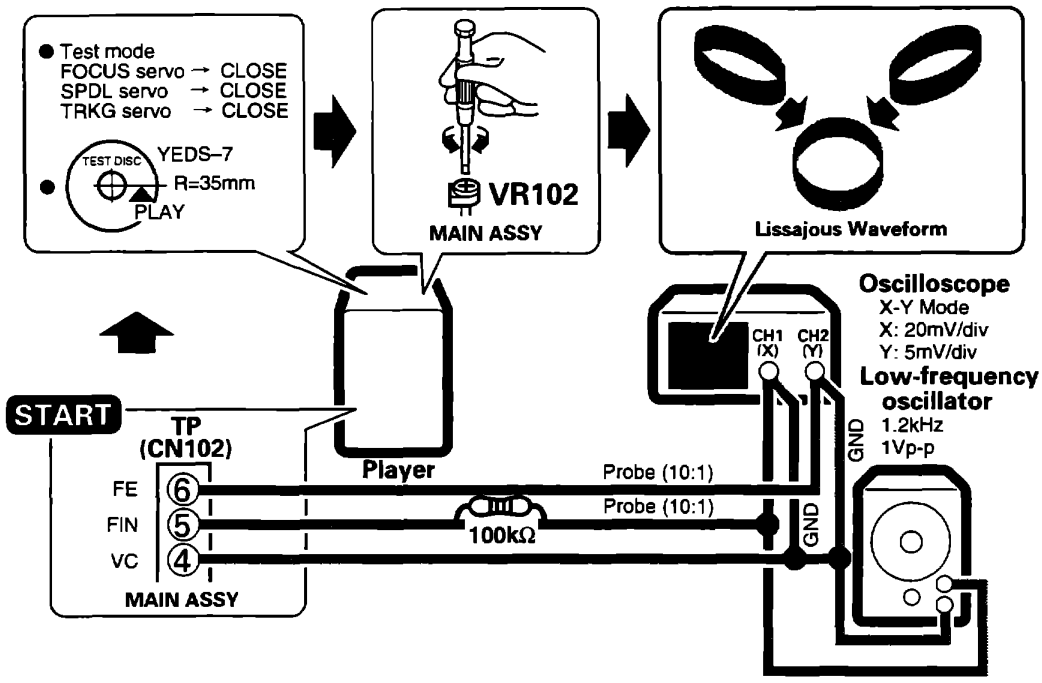
3. Pickup ①Radial/ ②Tangential Direction Tilt Adjustment
（ピックアップ①ラジアル方向②タンジェンシャル方向の傾き調整）



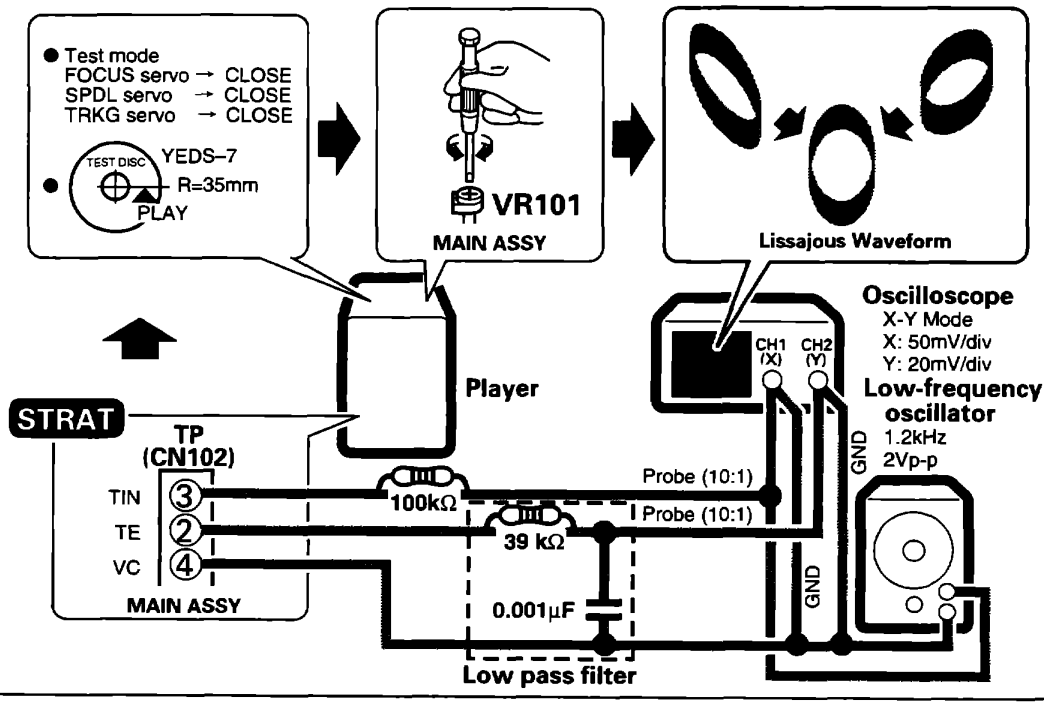
4. RF Level Check
（RFレベル確認）



5. Focus Servo Loop Gain Adjustment
（フォーカスサーボループゲイン調整）



6. Tracking Servo Loop Gain Adjustment
（トラッキングサーボループゲイン調整）



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.

■ PD4741A (IC351: MAIN ASSY)

● System Control Micro-computer

● Pin Function

No.	Port Name	Pin Name	I/O	Description	Logic	Status
1 | 5	P94/FIP6 | P90/FIP2	G7 | G3	O	FL Grid output		
6	P81/FIP1	G2				
7	P80/FIP0	G1				
8	VDD	VDD	—	Power Supply		
9	P27/SCK0	RMUT	I	CH2/"0" Detection input	Detect=H	
10	P26/SO0/SB	R MUTE	O	Analog Mute output	MUTE ON=L	L
11	P25/SI0/SB	L MUTE	O		MUTE ON=L	L
12	P24/BUSY	XRESET	O	CXD2519Q System Reset	RESETON=L	L
13	P23/STB	XLAT	O	CXD2519Q Latch output	LAT=L	L
14	P22/SCK1	CD CLK	O	CXD2519Q Clock output		L
15	P21/SO1	CD DATA	O	CXD2519Q Data output		L
16	P20SI1	SQSO	I	Sub Q Data output		
17	RESET	RESET	I	CPU Reset	RESETON=L	
18	P74	LD ON	O	Laser Diode Control output	LDON=L	L
19	P73	POWER ON	O	Peripheral Circuit Power Supply Control output	POWON=H	L
20	AVss	AVss	—	Analog Ground		
21	P17/ANI7	LPS3	I	Slot-mecha Switch input	ACTIVE=L	
22	P16/ANI6	LPS2	I		ACTIVE=L	
23	P15/ANI5	LPS1	I		ACTIVE=L	
24	P14/ANI4	LMUT	I	CH1/"0" Detection input	Detect=H	
25	P13/ANI3	SENS	I	CXD2519Q SENS input		
26	P12/ANI2	GFS	I	CXD2519Q GFS input		
27	P11/ANI1	FOK	I	Focus Control Signal input	FOK=H	
28	P10/ANI0	KIN	I	Key input for A/D Converter		
29	AVDD	AVDD	—	Analog Power Supply		
30	AVREF	AVREF	I	Analog Reference Voltage		
31	P04/XT1	INSD	I	Inside SW input	ACTIVE=L	
32	XT2	—	—	Non Connection	OPEN	
33	Vss	Vss	—	Ground		

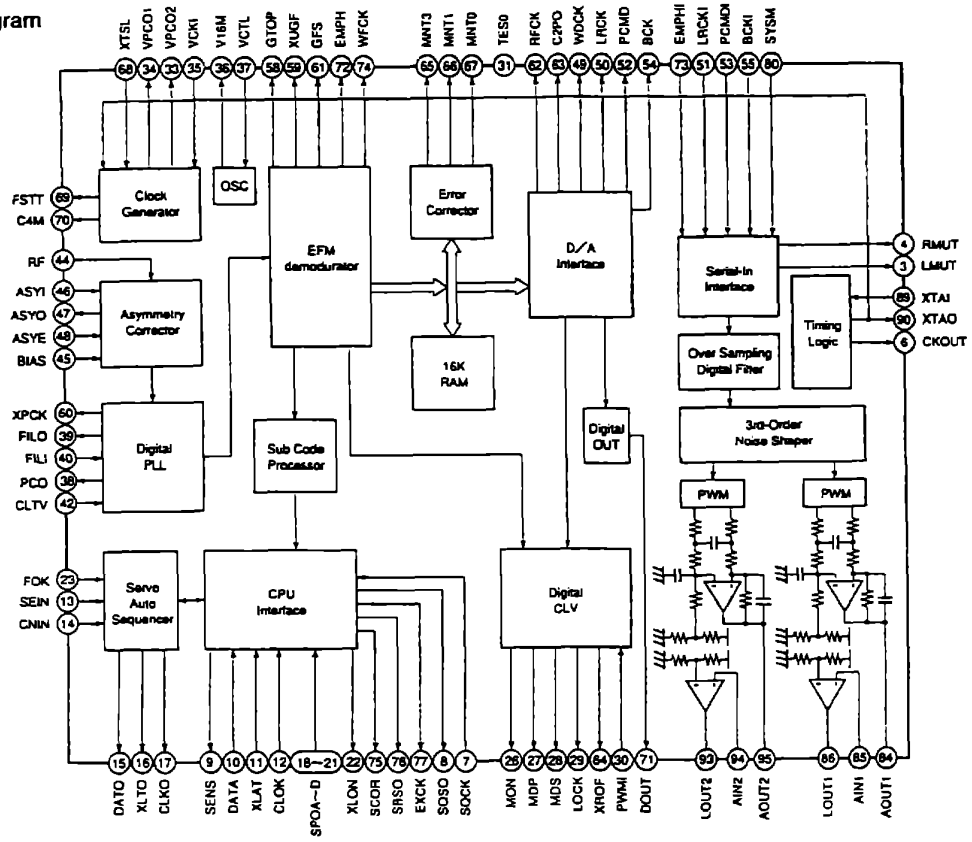
PD4741A

No.	Port Name	Pin Name	I/O	Description	Logic	Status
34	X1	X1	I	Connected to Ceramic Oscillator (4.19MHz)		
35	X2	X2	—			
36	P37	TEST	I	Switching Test Mode input	TEST=L	
37	P36/BUZ	J/EX	I	Switching Destination input	J model=H	
38	P35/PCL	—	O	Non Connection		L
39	P34/TI2	—	O			L
40	P33/TI1	LOUT	O	Loading Motor Control	OUT=H	L
41	P32/TO2	LIN	O		IN=H	L
42	P31/TO1	S R/E	I/O	Request input/output for Bus Communication	REQ=L	H
43	P30/TO0	S DATA	O	Data output for Bus Communication	ACTIVE=H	H
44	P03/INTP3	SCOR	I	CXD2519Q Sub Code Sync input		
45	P02/INTP2	S RDATA	I	Data input for Bus Communication		
46	P01/INTP1	S CLK	I	Clock input for Bus Communication		
47	P00/INTP0	REMO	I	Non Connection to Ground	GND	
48	IC(Vpp)	IC(Vss)	—	Programming Power Supply		
49	P72	PB/XTHRU	O	Optical Out Control output	ACTIVE=H	L
50	P71	PB ON	O	Non Connection	OPEN	L
51	P70	SYS DET	I	12V System Connection input	SYSTEM=H	
52	V_{DD}	V_{DD}	—	Power Supply		
53	P127/FIP33	—	O	Non Connection	OPEN	L
54	P126/FIP32	—	O			
55 | 60	P125/FIP31 | P120/FIP26	P22 | P17	O	Segment output		
61 | 68	P117/FIP25 | P110/FIP18	P16 | P9				
69	P107/FIP17	P8				
70	P106	FIP16				
71	VLOAD	VFDP		Negative Power Supply		
72 | 77	P105/FIP15 | P100/FIP10	P6 | P1	O	Segment output		
78	P97/FIP9	LED(PLAY)	O	LED Drive		
79	P96/FIP8	LED(DISC)				
80	P95/FIP7	G8	O	Grid output		

■ CXD2519Q (IC301: MAIN ASSY)

● EFM Decoder and D/A Converter

● Block Diagram



● Pin Assignment (Top view)

● Pin Function

CXD2519Q

No.	Pin Name	I/O	Description
1	VDD	—	Power Supply (+5V)
2	Vss	—	GND
3	LMUT	O	Lch "0" Detection Flag
4	RMUT	O	Rch "0" Detection Flag
5	TES2	O	Output Test Terminal; Normally Open
6	CKOUT	O	Master Clock Divider output Terminal; selects and outputs XTAI ×1, ×1/2, ×1/4, or "L" only.
7	SQCK	I	Clock input for SQSO leadout
8	SQSO	O	SubQ 80bit Serial output
9	SENS	O	SENS output; Outputs to CPU
10	DATA	I	Serial data input from CPU
11	XLAT	I	Latch input from CPU; Latches serial data at startup.
12	CLOK	I	Serial data transmission clock input from CPU
13	SEIN	I	Sense input from SSP
14	CNIN	I	Track Jump Counter Signal input
15	DATO	O	Serial data output to SSP
16	XLTO	O	Serial data latch output to SSP; latches serial data at startup.
17	CLKO	O	Serial data transmission clock output to SSP
18	SPOA	I	Micro-computer Expansion Interface (input A)
19	SPOB	I	Micro-computer Expansion Interface (input B)
20	SPOC	I	Micro-computer Expansion Interface (input C)
21	SPOD	I	Micro-computer Expansion Interface (input D)
22	XLON	O	Micro-computer Expansion Interface (output)
23	FOK	I	Focus OK input Terminal Used for SENS output and servo auto sequencer.
24	VDD	—	Power Supply (+5V)
25	Vss	—	GND
26	MON	O	Spindle Motor ON/OFF Control output
27	MDP	O	Spindle Motor Servo Control
28	MDS	O	
29	LOCK	O	Samples GFS at 460Hz and outputs H when GFS is H; outputs L when L is output 8 times consecutively.
30	PWMI	I	Spindle motor remote control input
31	TES0	I	TEST Terminal; Normally GND
32	TES1	I	

No.	Pin Name	I/O	Description
33	VPCO2	O	Charge pump output for wide-range EFM PLL; ON/OFF controlled by address E FCSW.
34	VPCO1	O	Charge pump output for wide-range EFM PLL
35	VCKI	I	VCO2 oscillation input for wide-range EFM PLL
36	V16M	O	VCO2 oscillation output for wide-range EFM PLL
37	VCTL	I	VCO2 control voltage input for wide-range EFM PLL
38	PCO	O	Charge pump output for master PLL
39	FILO	O	Master PLL (slave = digital PLL) filter output
40	FILI	I	Master PLL Filter input
41	AVss	—	Analog GND
42	CLTV	I	VCO control voltage input for master
43	AVDD	—	Analog Power Supply (+5V)
44	RF	I	EFM Signal input
45	BIAS	I	Asymmetry circuit constant current input
46	ASYI	I	Asymmetry comparator voltage input
47	ASYO	O	EFM full-swing output (L=Vss; H=VDD)
48	ASYE	I	L: asymmetry circuit OFF H: asymmetry circuit ON
49	WDCK	O	D/A interface; word clock f=2Fs
50	LRCK	O	D/A interface; LR clock output F=Fs
51	LRCKI	I	LR Clock input
52	PCMD	O	D/A interface; serial data output (2's COMP, MSB first)
53	PCMDI	I	D/A interface; serial data input (2's COMP, MSB first)
54	BCK	O	D/A interface; bit clock output
55	BCKI	I	D/A interface; bit clock output
56	Vss	—	GND
57	VDD	—	Power Supply (+5V)
58	GTOP	O	GTOP output
59	XUGF	O	XUGF output
60	XPCK	O	XPLCK output
61	GFS	O	GFS output
62	RFCK	O	RFCK output
63	C2PO	O	C2PO output
64	XROF	O	XRAOF output

CXD2519Q

No.	Pin Name	I/O	Description
65	MNT3	O	MNT3 output
66	MNT1	O	MNT1 output
67	MNT0	O	MNT0 output
68	XTSL	I	X'tal selection input terminal; X'tal is L when input is 16.9344MHz and H when input is 33.8688MHz.
69	FSTT	O	2/3 divider output of terminal Nos. 80 and 90
70	C4M	O	4.2336MHz output; outputs VCK1 1/4 divider during CAV-W mode.
71	DOUT	O	Digital Out output terminal
72	EMPH	O	Outputs H when playback disc emphasis is ON; outputs L when emphasis is OFF.
73	EMPHI	I	inputs H when de-emphasis is ON; inputs L when de-emphasis is OFF.
74	WFCK	O	WFCK output
75	SCOR	O	Outputs H when either subcode sync S0 or S1 is detected.
76	SBSO	O	SubP - W serial output
77	EXCK	I	Clock input for SBSO leadout
78	Vss	—	GND
79	VDD	—	Power Supply (+5V)
80	SYSM	I	Mute input terminal. Active=H
81	NC	—	
82	AVss	—	Analog GND
83	AVDD	—	Analog Power Supply (+5V)
84	AOUT1	O	Lch Analog output terminal
85	AIN1	I	Lch OPAMP input terminal
86	LOUT1	O	Lch LINE output terminal
87	AVss	—	Analog GND
88	XVDD	—	Power Supply for Master Clock
89	XTAI	I	Crystal oscillation circuit input terminal; when master clock is input from an external source, it is input through this terminal.
90	XTAO	O	Crystal oscillation circuit output terminal
91	XVss	—	GND for Master Clock
92	AVss	—	Analog GND
93	LOUT2	O	Rch LINE output terminal
94	AIN2	I	Rch OPAMP input terminal
95	AOUT2	O	Rch Analog output terminal
96	AVDD	—	Analog Power Supply (+5V)
97	AVss	—	Analog GND
98	NC	—	
99	NC	—	
100	XRST	I	System Reset. L= Reset

Notes:

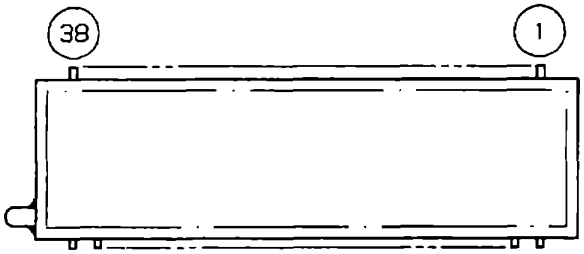
- *PCMD is the 2's complement output of MSB first.*
- *GTOP monitors Frame Sync protection conditions (H: Sync protection window Open).*
- *XUGF is the negative pulse with Frame Sync obtained from the EFM signal; signal before Sync protection.*
- *XPLCK is the inversion of the EFM PLL clock; PLL is created so that edges or points of the leading edge and EFM signal are aligned.*
- *GFS becomes H when Frame Sync and interpolation timing are aligned.*
- *RFCK is the 136μ cycle signal (normally instantaneous) made with X'tal accuracy.*
- *C2PO is the signal that indicates the data error status.*
- *XRAOF is the signal generated when 16k RAM exceeds the ±4F jitter margin.*

7.1.2 DISPLAY

■ RAW1154 (V701: FRONT ASSY)

● FL Indicator Tube

● Pin Assignment

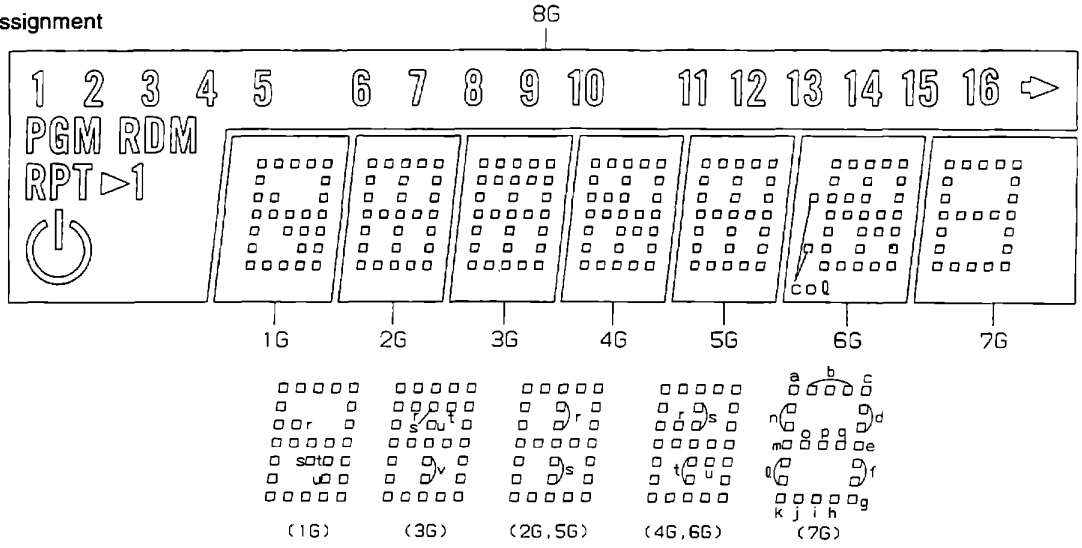


NOTE 1) F1,F2 --- Filament
2) NP ------ No pin
3) DL ------ Datum Line
4) 1G~8G --- Grid

● Pin Connection

PIN NO.	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	F2	F2	NP	NP	1G	2G	3G	4G	5G	6G	7G	8G	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20	P21	P22	NP	NP	F1	F1

● Grid Assignment



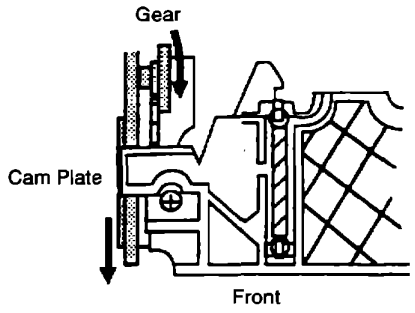
● Anode Connection

	1G	2G	3G	4G	5G	6G	7G	8G
P1	a	a	a	a	a	a	a	1
P 2	b	b	b	b	b	b	b	2
P 3	c	c	c	c	c	c	c	3
P 4	d	d	d	d	d	d	d	4
P 5	e	e	e	e	e	e	e	5
P 6	f	f	f	f	f	f	f	6
P 7	g	g	g	g	g	g	g	7
P 8	h	h	h	h	h	h	h	8
P 9	i	i	i	i	i	i	i	9
P10	j	j	j	j	j	j	j	10
P11	k	k	k	k	k	k	k	11

	1G	2G	3G	4G	5G	6G	7G	8G
P12	q	q	q	q	q	q	q	12
P13	m	m	m	m	m	m	m	13
P14	n	n	n	n	n	n	n	14
P15	o	o	o	o	o	o	o	15
P16	p	p	p	p	p	p	p	16
P17	q	q	q	q	q	q	q	⇨
P18	r	r	r	r	r	r	-	PGM
P19	s	s	s	s	s	s	-	RDM
P20	t	-	t	t	-	t	-	RPT
P21	u	-	u	u	-	u	-	▷1
P22	-	-	v	-	-	col	-	⏻

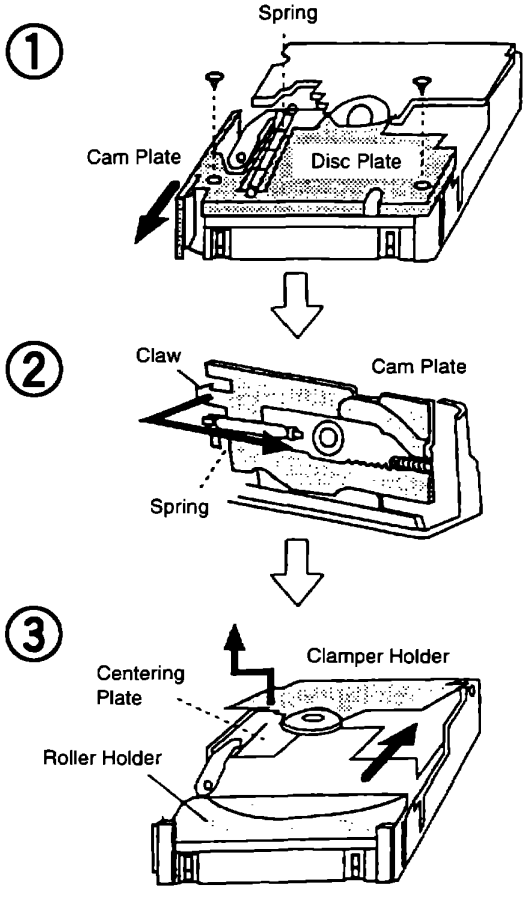
7.2 DISASSEMBLY

● CD Disc Manual Removal Method



Turn the gear in arrow direction to the front, and move the cam plate to the front. When the gear is turned until the cam plate comes to the very front position (EJECT position), the CD disc will be pulled out.

● Servo Mechanism Exchange Method and Mechanism Adjustment Method

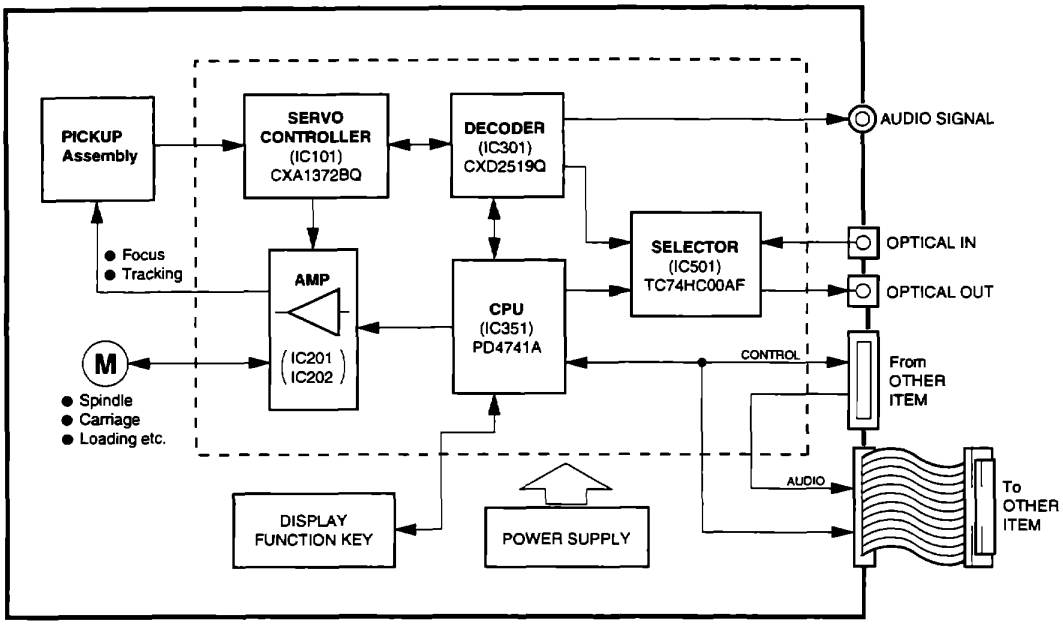


① Remove the spring and the two screws, and then remove the disc plate. Move the cam plate to the very front position (EJECT position). (refer to the CD Disc Manual Removal Method.)

② Remove the spring.
Remove to the front while pulling the claw part of the cam plate to the outside.

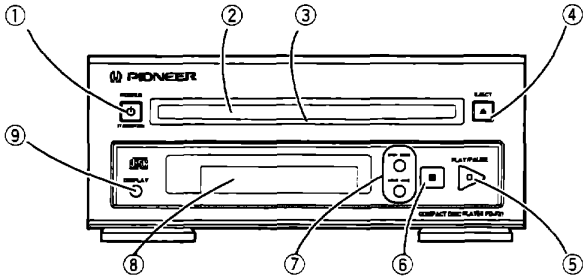
③ Raise the clamper holder lightly, slide it in arrow direction, and remove it. When the centering plate is moved to the rear, the four screws fixing the servo mechanism become visible.
When these screws are removed, the servo mechanism assembly can be removed.
TAN and RAD adjustment are excuted from above with the clamper holder and the roller holder removed and only the magnet clamper placed onto the CD disc.

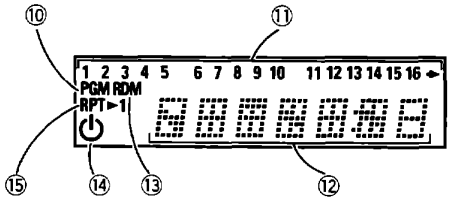
7.3 BLOCK DIAGRAM



8. PANEL FACILITIES AND SPECIFICATIONS

■ PANEL FACILITIES





① POWER, STANDBY/ON switch

② Disc slot

③ Disc indicator
Lights when a disc is loaded

④ CD EJECT button (⏏)

⑤ PLAY/PAUSE button, play indicator

⑥ Stop button (■)

⑦ Manual/Track-search buttons
(⏮ ◀◀ , ▶▶ ⏭)

⑧ Display Section

⑨ DISPLAY button

[DISPLAY SECTION]

⑩ Lights during program input and playback

⑪ Music calendar (track display)

⑫ Track and time display

⑬ Lights during random play

⑭ Standby indicator

⑮ Lights during repeat play
RPT: all-track repeat
RPT►1: one-track repeat

SPECIFICATIONS

Type	Compact Disc digital audio system
Usable discs	Compact Discs
Channels	2 (stereo)
Frequency Response	4 Hz - 20 kHz
Signal-to-Noise Ratio	110 dB (EIAJ)
Wow and Flutter	Limit of measurement (0.001%) or less (EIAJ)
Power Requirements	AC 230 V, 50/60 Hz
Power Consumption	12 W
Dimensions	190 (W) x 80.5 (H) x 274 (D) mm
Weight	2.0 kg

Accessories

Warranty Card	1

NOTE:

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