

Service Manual

CC9100 /U1B

CD Changer

CC9100

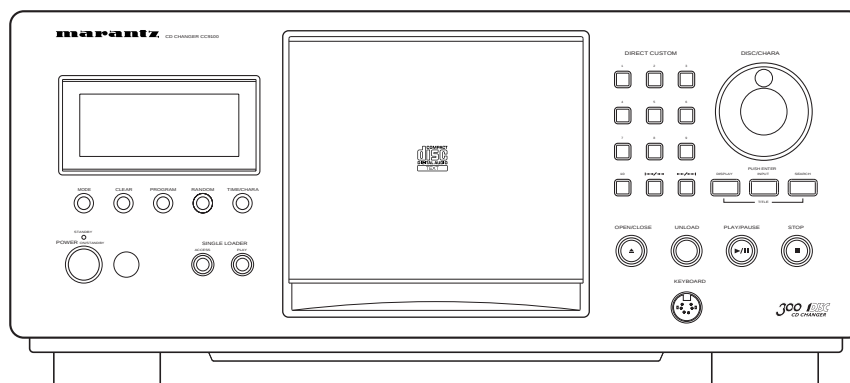


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Please use this service manual with referring to the user guide (D.F.U) without fail.

marantz®

CC9100

MARANTZ DESIGN AND SERVICE

Using superior design and selected high grade components, **MARANTZ** company has created the ultimate in stereo sound. Only original **MARANTZ** parts can insure that your **MARANTZ** product will continue to perform to the specifications for which it is famous.

Parts for your **MARANTZ** equipment are generally available to our National Marantz Subsidiary or Agent.

ORDERING PARTS :

Parts can be ordered either by mail or by Fax.. In both cases, the correct part number has to be specified.

The following information must be supplied to eliminate delays in processing your order :

1. Complete address
2. Complete part numbers and quantities required
3. Description of parts
4. Model number for which part is required
5. Way of shipment
6. Signature : any order form or Fax. must be signed, otherwise such part order will be considered as null and void.

USA

MARANTZ AMERICA, INC.

440 MEDINAH ROAD
ROSELLE, ILLINOIS 60172
USA
PHONE : 630 - 307 - 3100
FAX : 630 - 307 - 2687

EUROPE / TRADING

MARANTZ EUROPE B.V.

P.O.BOX 80002, BUILDING SFF2
5600 JB EINDHOVEN
THE NETHERLANDS
PHONE : +31 - 40 - 2732241
FAX : +31 - 40 - 2735578

BRAZIL

PHILIP DA AMAZONIA IND. ELET. ITDA

CENTRO DE INFORMACOES AO
CEP 04698-970
SAO PAULO, SP, BRAZIL
PHONE : 0800 - 123123(Discagem Direta Gratuita)
FAX : +55 11 534. 8988

PROFESSIONAL AMERICAS

SUPERSCOPE TECHNOLOGIES, INC.

MARANTZ PROFESSIONAL PRODUCTS
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AURORA, ILLINOIS 60504 USA
PHONE : 630 - 820 - 4800
FAX : 630 - 820 - 8103

PROFESSIONAL AUSTRALIA

TECHNICAL AUDIO GROUP PTY, LTD

558 DARLING STREET,
BALMAIN, NSW 2041,
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PHONE : 61 - 2 - 9810 - 5300
FAX : 61 - 2 - 9810 - 5355

CANADA

LENBROOK INDUSTRIES LIMITED

633 GRANITE COURT,
PICKERING, ONTARIO L1W 3K1
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FAX : 905 - 831 - 6936

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1 EXPO COURT, P.O. BOX 350
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THAILAND

MRZ STANDARD CO.,LTD

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WANGBURAPAPIROM, PHRANAKORN,
BANGKOK, 10200 THAILAND
PHONE : +66 - 2 - 222 9181
FAX : +66 - 2 - 224 6795

SINGAPORE

WO KEE HONG (S) PTE LTD

WO KEE HONG CENTRE
NO.23, LORONG 8, TOA PAYOH
SINGAPORE 319257
PHONE : +65 2544555
FAX : +65 2502213

NEW ZEALAND

WILDASH AUDIO SYSTEMS NZ

14 MALVERN ROAD MT ALBERT
AUCKLAND NEW ZEALAND
PHONE : +64 - 9 - 8451958
FAX : +64 - 9 - 8463554

TAIWAN

PAI- YUING CO., LTD.

6 TH FL NO, 148 SUNG KIANG ROAD,
TAIPEI, 10429, TAIWAN R.O.C.
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FAX : +886 - 2 - 25630415

MALAYSIA

WO KEE HONG ELECTRONICS SDN. BHD.

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NO. 33, JALAN SULTAN ISMAIL,
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FAX : +60 3 - 2458180

JAPAN *Technical*

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SAGAMIHARA - SHI, KANAGAWA
JAPAN 228-8505
PHONE : +81 42 748 1013
FAX : +81 42 741 9190

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営業本部 〒150-0022
東京都渋谷区恵比寿南1-11-9

KOREA

MK ENTERPRISES LTD.

ROOM 604/605, ELECTRO-OFFICETEL, 16-58,
3GA, HANGANG-RO, YONGSAN-KU, SEOUL
KOREA
PHONE : +822 - 3232 - 155
FAX : +822 - 3232 - 154

SHOCK, FIRE HAZARD SERVICE TEST :

CAUTION : After servicing this appliance and prior to returning to customer, measure the resistance between either primary AC cord connector pins (with unit NOT connected to AC mains and its Power switch ON), and the face or Front Panel of product and controls and chassis bottom.

Any resistance measurement less than 1 Megohms should cause unit to be repaired or corrected before AC power is applied, and verified before it is return to the user/customer.

Ref. UL Standard No. 1492.

In case of difficulties, do not hesitate to contact the Technical Department at above mentioned address.

1. SPECIFICATIONS

1. General

Type	Compact disc digital audio system
Power requirements	AC 120V, 60 Hz
Power consumption	15 W
Power consumption in standby mode	1 W
Operating temperature	+5°C – +35°C (+41°F – +95°F)
Weight (without package)	7.8 kg (17.2 lbs)
External dimensions	440 (W) X 434 (D) X 193 (H) mm (17-5/16 (W) X 17-1/8 (D) X 7-5/8 (H) in.)

2. Audio section

Frequency response	2 Hz - 20 kHz
S/N ratio	98 dB or more (EIAJ)
Dynamic range	96 dB or more (EIAJ)
Harmonic distortion	0.003 % or less (EIAJ)
Level difference between channels	1.0 dB or less (EIAJ)
Output voltage	2 Vrms (EIAJ)
Wow and flutter	less than ±0.001 % (W.PEAK) (below measurable level) (EIAJ)
Channels	2-channel (stereo)

3. Input/Output terminal

Audio line output jack
Remote Control IN/OUT jack
Optical digital output jack
PC keyboard input jack

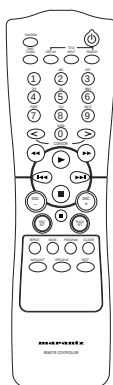
4. Accessories

• Remote controller	1
• Size AA/R6 dry cell batteries	2
• Audio cable	1
• D-BUS remote control cable	1
• Warranty card (U.S. and Canadian models only)	2
• User Guide (this manual)	1

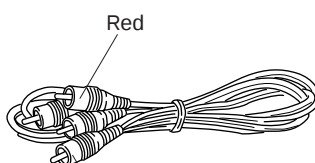
Note!!

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

Accessories



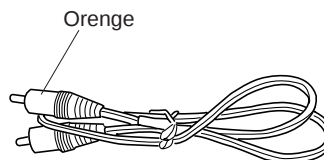
Remote control x 1



Red

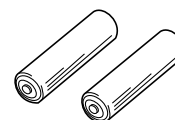
White

Audio cable x 1
(PDE1248) (L=1 m)



Orenge

Control cable x 1
(PDE1247) (L=0.9 m)



Size AA/R6P dry cell
batteries x 2

Other included items

- Warranty card
- Operating Instructions

2. SAFETY INFORMATION

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

WARNING

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

Health & Safety Code Section 25249.6 – Proposition 65

NOTICE

(FOR CANADIAN MODEL ONLY)

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

REMARQUE

(POUR MODÈLE CANADIEN SEULEMENT)

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

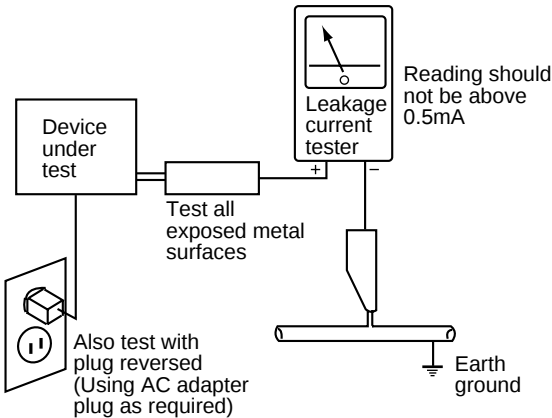
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

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

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

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

2. PRODUCT SAFETY NOTICE

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

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

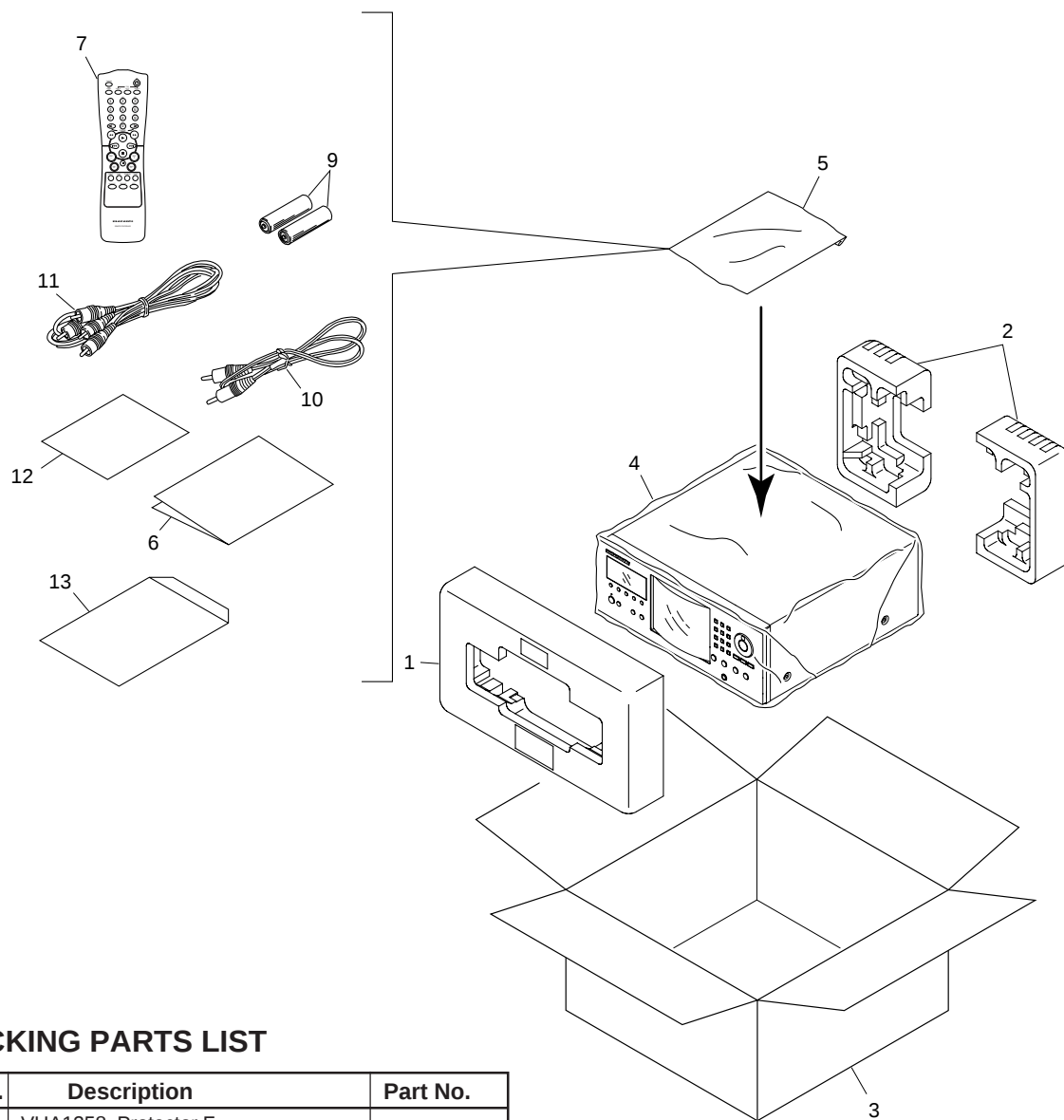
The use of a substitute replacement component which does not have the same safety characteristics as the MARANTZ recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

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

3. EXPLODED VIEWS AND PARTS LIST

NOTES : ● Parts marked by “NSP” are generally unavailable because they are not in our Master Spare Parts List.
 ● The $\triangle$ 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.

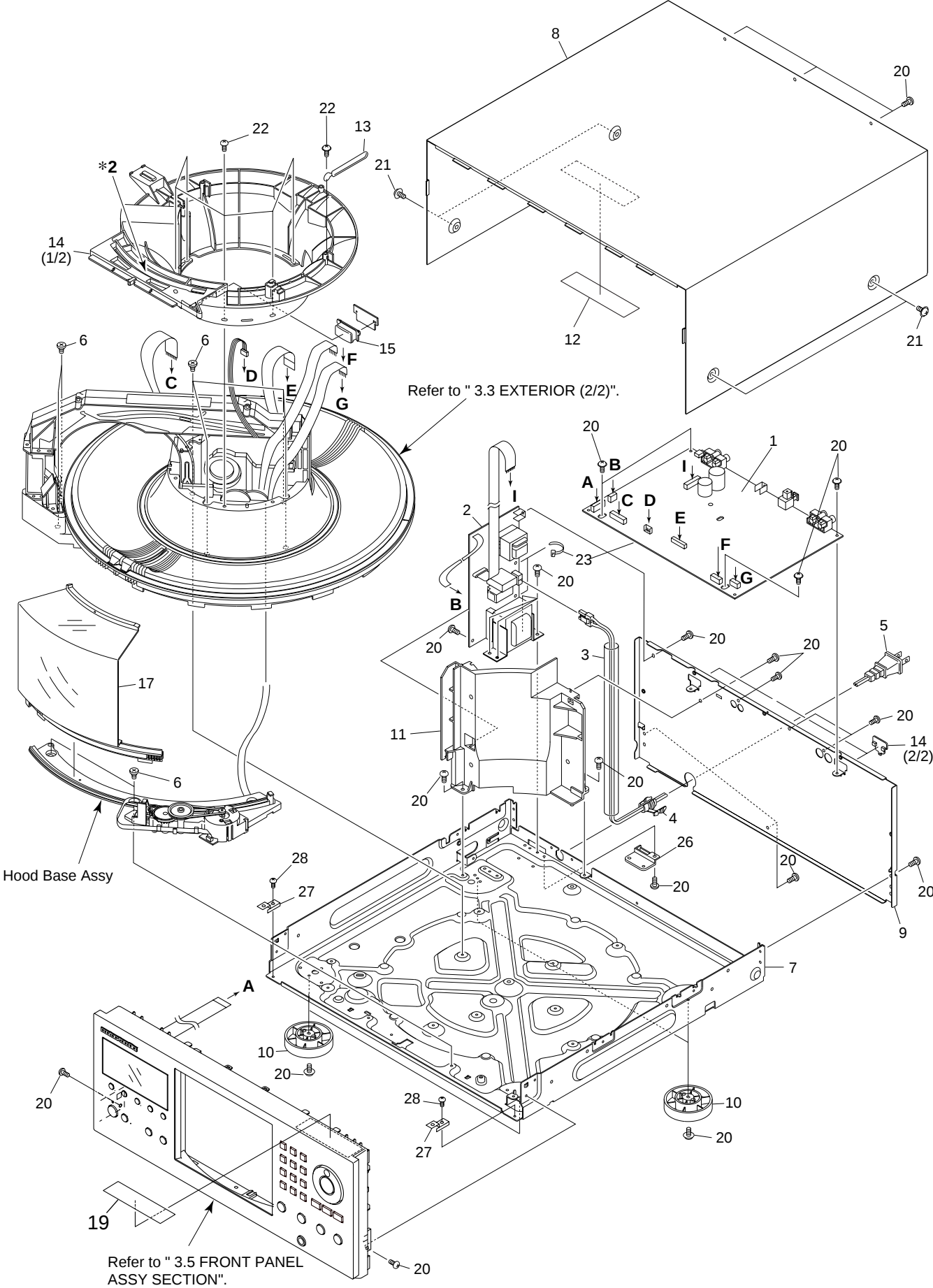
3.1 PACKING



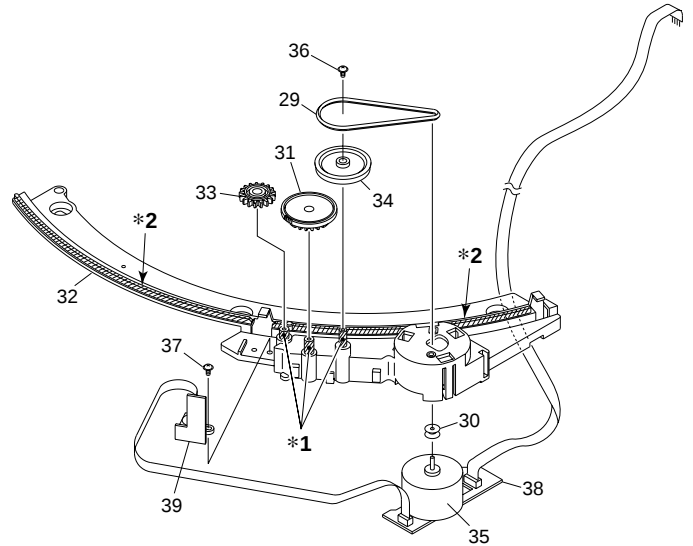
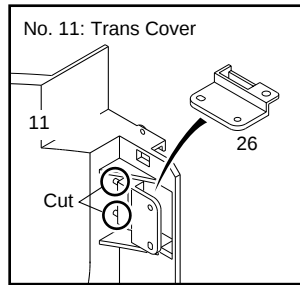
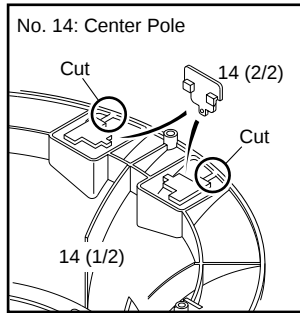
(1) PACKING PARTS LIST

Mark	No.	Description	Part No.
NSP	1	VHA1258, Protector F	—
NSP	2	VHA1259, Protector R	—
NSP	3	PHG2421, Packing Case	—
NSP	4	RHC1023, Packing Sheet	—
NSP	5	Z21-038, Polyethylene Bag (0.03 x 230 x 340)	—
	6	PRE1292, User Guide	305W851250
	7	ZK305W0010, Remote Control Unit	ZK305W0010
NSP	8	3139 224 22280, Battery Lid	—
NSP	9	VEM-013, Dry Cell Batteries (R6P, AA)	—
NSP	10	ZD00900100, Control Cable (L=0.9 m)	—
NSP	11	PDE1248, Audio Cable (L=1 m)	—
NSP	12	092J854110, Warranty Card	—
NSP	13	183J813500, Envelope Kit	—

3.2 EXTERIOR (1/2)



■ Hood Base Assy Section



(1) EXTERIOR (1/2) PARTS LIST

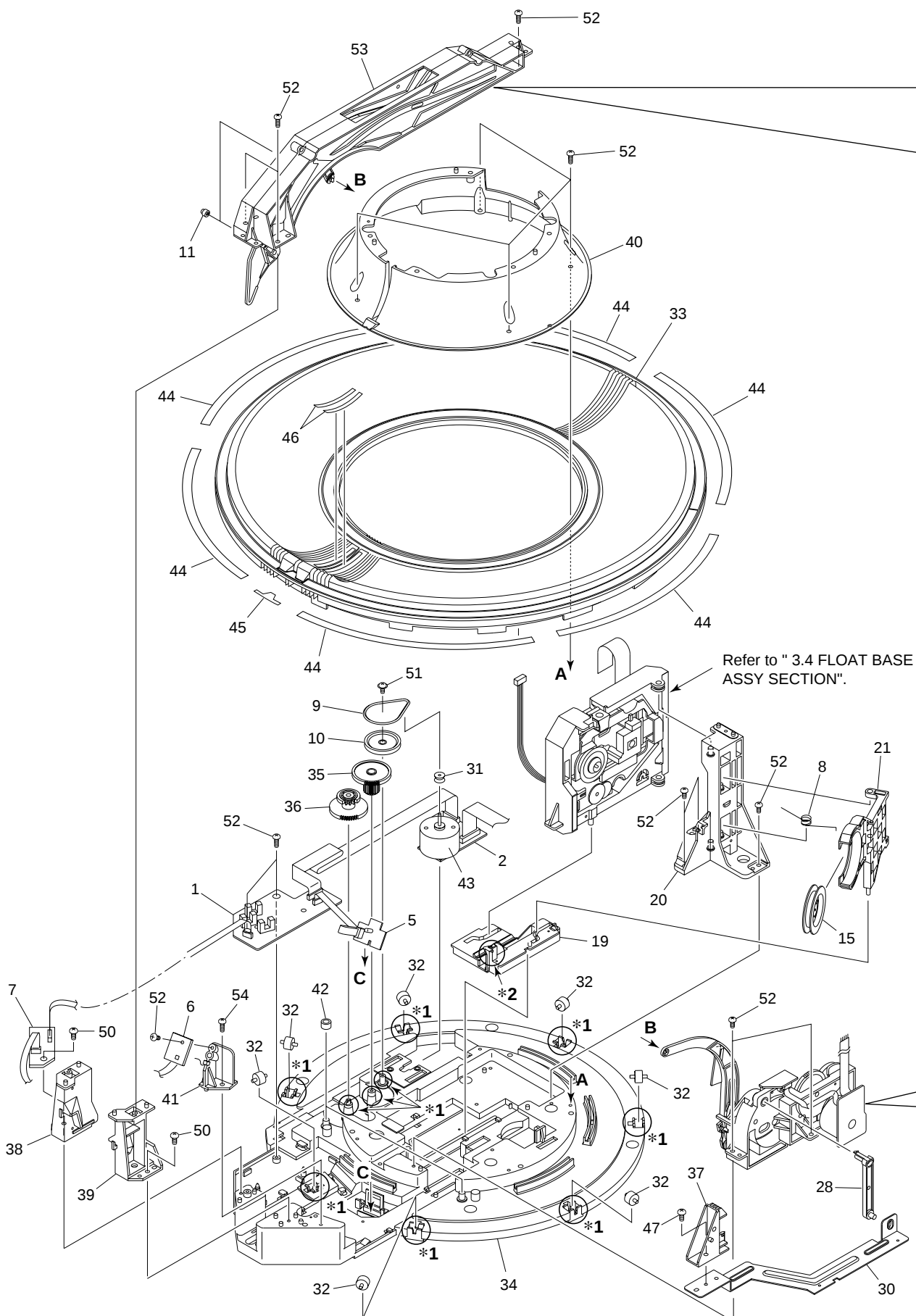
Mark	No.	Description	Part No.
NSP	1	PWZ4165, MAIN BOARD ASSY	—
NSP	2	PWZ3856, POWER BOARD ASSY	—
⚠	4	CM-22C, Strain Relief	296W259010
⚠	5	ADG7024, AC Power Cord	*ZC000080R
NSP	6	PBA1106, Screw C	—
NSP	7	PNA2421, Under Base	—
NSP	8	PYY1255, Bonnet Case	—
NSP	9	PNA2558, Rear Base	—
	10	PNW2766, Insulator	296W057010
NSP	11	VNK4542, Trans Cover	—
NSP	12	ARW7050, 65 Label"	—
NSP	13	RNH-184, Cord Clamper	—
NSP	14	PNW2792, Center Pole	—
NSP	15	PNW2961, CR Spacer	—
	17	PNW2992, Hood	296W162020
NSP	19	VRW1817, Caution Label	—
NSP	20	BBZ30P080FZK, Screw	—
	21	RBA1099, Screw	51260408M0
NSP	22	IPZ30P080FMC, Screw	—
NSP	23	ZCA-SKB90BK, Binder	—
NSP	26	PNW2802, Trans Cover	—
NSP	27	296W160010, Earth Bracket	—
NSP	28	BBZ30P080FCC, Screw	—

Mark	No.	Description	Part No.
		Hood Base Assy Section	
	29	PEB1300, Belt	296W264010
	30	PNW1634, Motor Pulley	296W262010
	31	PNW2906, Gear AW	296W058020
NSP	32	PNW2791, Hood Base	—
	33	PNW2800, Gear M1	296W058010
	34	VNL1662, Gear Pulley	296W058030
	35	VXM1033, Slider Motor	*MM001070R
NSP	36	IPZ20P080FMC, Screw	—
NSP	37	BPZ20P080FZK, Screw	—
NSP	38	PWZ4061, DOOR MOTOR BOARD ASSY	—
NSP	39	PWZ4062, DOOR SW BOARD ASSY	—

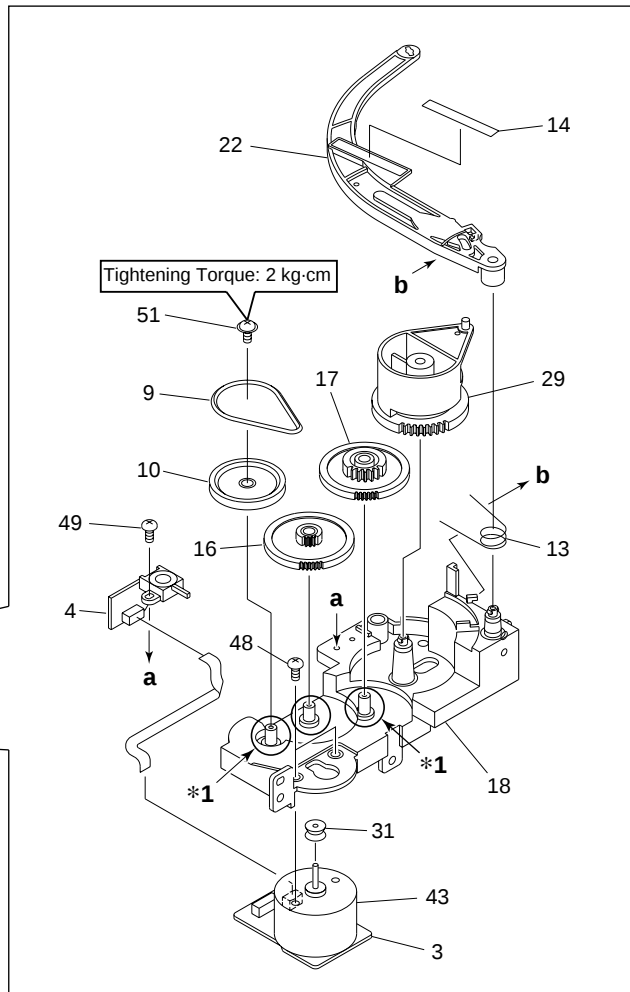
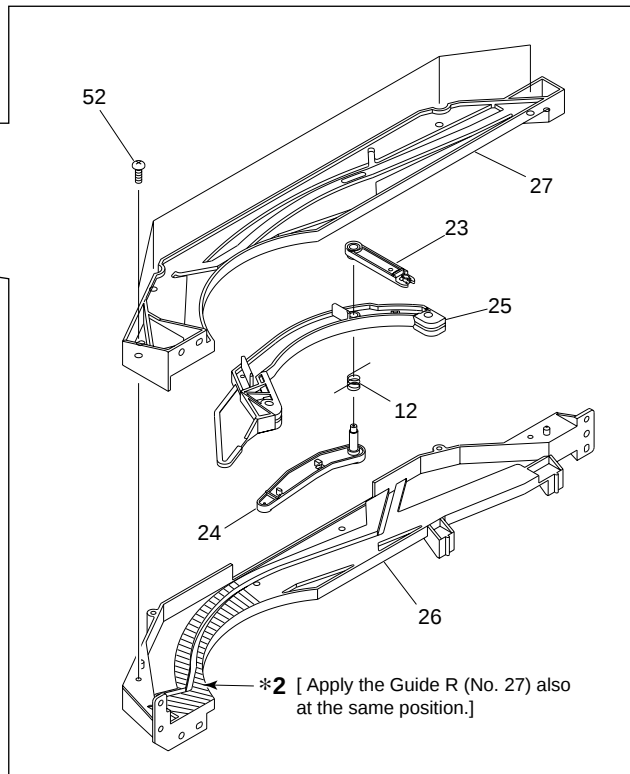
*1 GYA1001, KANTO KASEI FROIL PN-397 (for Service)

*2 GEM1016, KANTO KASEI HANARL PN-955R (for Service)

3.3 EXTERIOR (2/2)



EXTERIOR (2/2) PARTS LIST

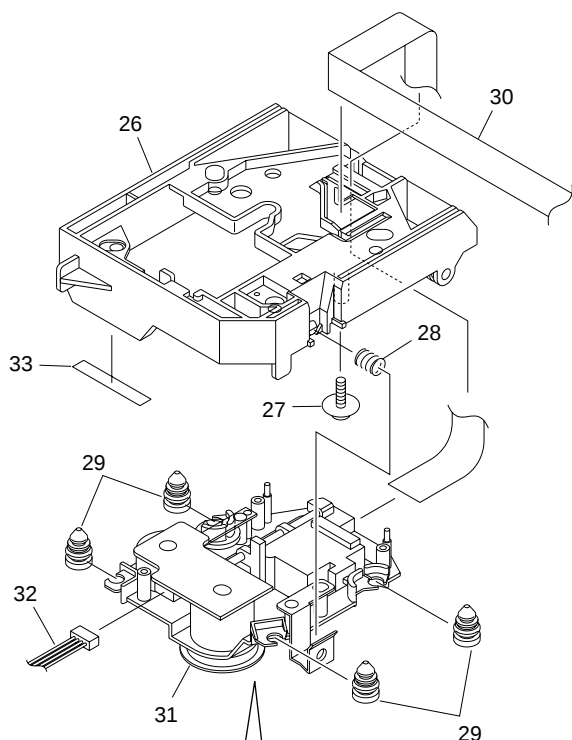


Mark	No.	Description	Part No.
NSP	1	PWZ3781, SENSOR BOARD ASSY	—
NSP	2	PWZ3785, SELECT BOARD ASSY	—
NSP	3	PWZ3788, LOADING BOARD ASSY	—
NSP	4	PWZ3790, LOADING SW BOARD ASSY	—
NSP	5	PWZ3791, RADIATE BOARD ASSY	—
NSP	6	PWZ3792, RECEIVE BOARD ASSY	—
NSP	7	PWZ3864, VOLUME BOARD ASSY	—
	8	ABH7107, Clamp Spring	296W115110
	9	AEB7029, Loading Belt	296W264020
	10	ANW7062, Gear Pulley B	296W058040
	11	ANW7075, Roller B	296W358010
NSP	12	PBH1225, Arm Spring	—
	13	PBH1226, L Arm Spring	296W115020
NSP	14	PED1028, Sheet	—
	15	PNW2743, Clamper	305W005010
	16	PNW2819, Gear 1	296W058050
	17	PNW2820, Gear 2	296W058060
NSP	18	PNW2822, Gear Holder	—
	19	PNW2823, Slider Cam	296W054010
	20	PNW2826, Clamp Pole	296W272010
	21	PNW2827, Clamp Holder	296W271010
	22	PNW2829, Drive Arm"	296W002010
NSP	23	PNW2830, Link	—
NSP	24	PNW2831, L Slider	—
NSP	25	PNW2832, L Arm	—
NSP	26	PNW2833, Guide L	—
NSP	27	PNW2834, Guide R	—
	28	PNW2844, Link L	296W121010
	29	PNW2873, Drive Cam	296W054020
NSP	30	PNA2438, Lock Plate	—
	31	PNW1634, Motor Pulley	296W262010
	32	PNW2647, Roller	296W358020
	33	PNW2790, Disc Rack	296W064010
NSP	34	PNW2835, Rack Base	—
	35	PNW2836, ST Gear 0.6	296W058070
	36	PNW2837, ST Gear 1.0	296W058080
NSP	37	PNW2838, Disc Divider	—
NSP	38	PNW2839, Guide Support L	—
NSP	39	PNW2840, Guide Support R	—
NSP	40	PNW2841, Disc Guard	—
NSP	41	PNW2842, Sensor Stay	—
	42	PNW2843, Guide Roller	296W358030
	43	VXM1033, Slider Motor	*MM001070R
	44	PAM1770, Rack Label	296W861020
	45	PAM1771, S Label	296W861030
	46	PRW1507, +1 Label	296W861040
NSP	47	BBZ30P080FZK, Screw	—
NSP	48	BMZ26P040FZK, Screw	—
NSP	49	BPZ26P060FMC, Screw	—
NSP	50	BPZ30P100FCU, Screw	—
NSP	51	IPZ20P080FMC, Screw	—
NSP	52	PPZ30P080FMC, Screw	—
	53	PXA1615, Arm Assy	296W002500
NSP	54	IPZ30P080FMC, Screw	—

*1 GYA1001, KANTO KASEI FROIL PN-397 (for Service)

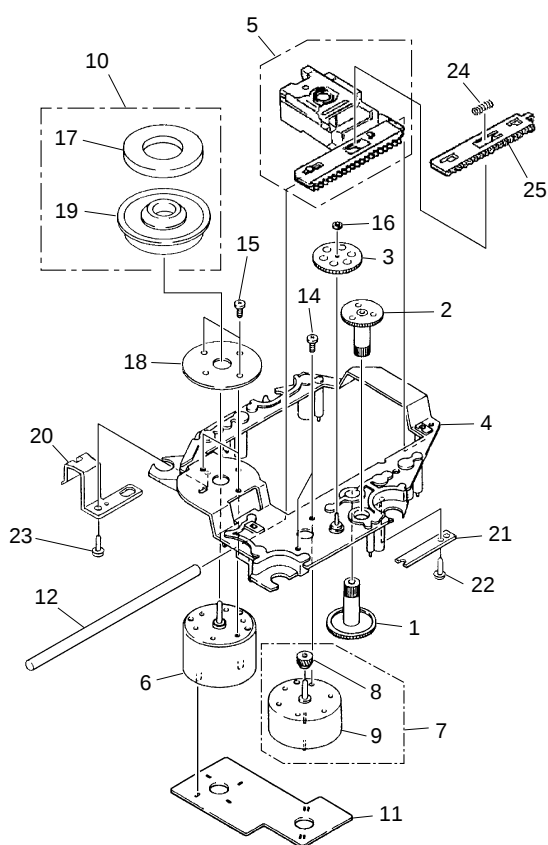
*2 GEM1016, KANTO KASEI HANARL PN-955R (for Service)

3.4 FLOAT BASE ASSY SECTION



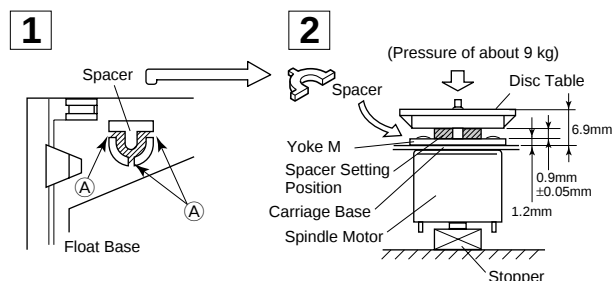
FLOAT BASE ASSY SECTION PARTS LIST

Mark	No.	Description	Part No.
	1	PNW2052, Gear 1	305W058010
	2	PNW2053, Gear 2	305W058020
	3	PNW2054, Gear 3	305W058030
	4	PNW2699, Carriage Base	305W401010
	5	PEA1335, Pickup Assy - S	*ZZ001560R
	6	PEA1235, D.C. Motor Assy (SPINDLE)	*ZZ001570R
	7	PEA1246, Carriage DC Motor Assy	*ZZ001580R
NSP	8	PNW2055, Pinion Gear	—
NSP	9	PXM1027, Carriage DC Motor/0.3W	—
	10	PEA1314, Disc Table Assy	305W004500
NSP	11	PWX1192, Mechanism Board Assy	—
	12	PLA1094, Guide Bar	305W051010
NSP	14	JFZ17P025FZK, Screw	—
NSP	15	JFZ20P040FMC, Screw	—
NSP	16	WT12D032D025, Washer	—
NSP	17	PMF1014, Clamp Magnet	—
	18	PNB1312, Yoke M	305W104010
NSP	19	PNW2410, Disc Table	—
NSP	20	ANB7020, Float Angle	—
	21	PNB1303, Gear Stopper	305W058040
NSP	22	BPZ20P060FMC, Screw	—
NSP	23	BPZ26P100FMC, Screw	—
	24	ABH7077, PU Rack Spring	296W115120
	25	PNW2056, Rack Holder	305W271010
	26	PNW2828, Float Base	305W105010
NSP	27	ABA7009, Screw	—
	28	ABH7049, Float Spring	296W115130
	29	AEB7028, Float Rubber	305W066010
	30	PDD1185, 16P FFC/30V	*YU000690R
NSP	31	PXA1591, Servo Mechanism Assy GM	—
NSP	32	RDE1043, Connector Assy (4P)	—
NSP	33	PED1028, Sheet	—

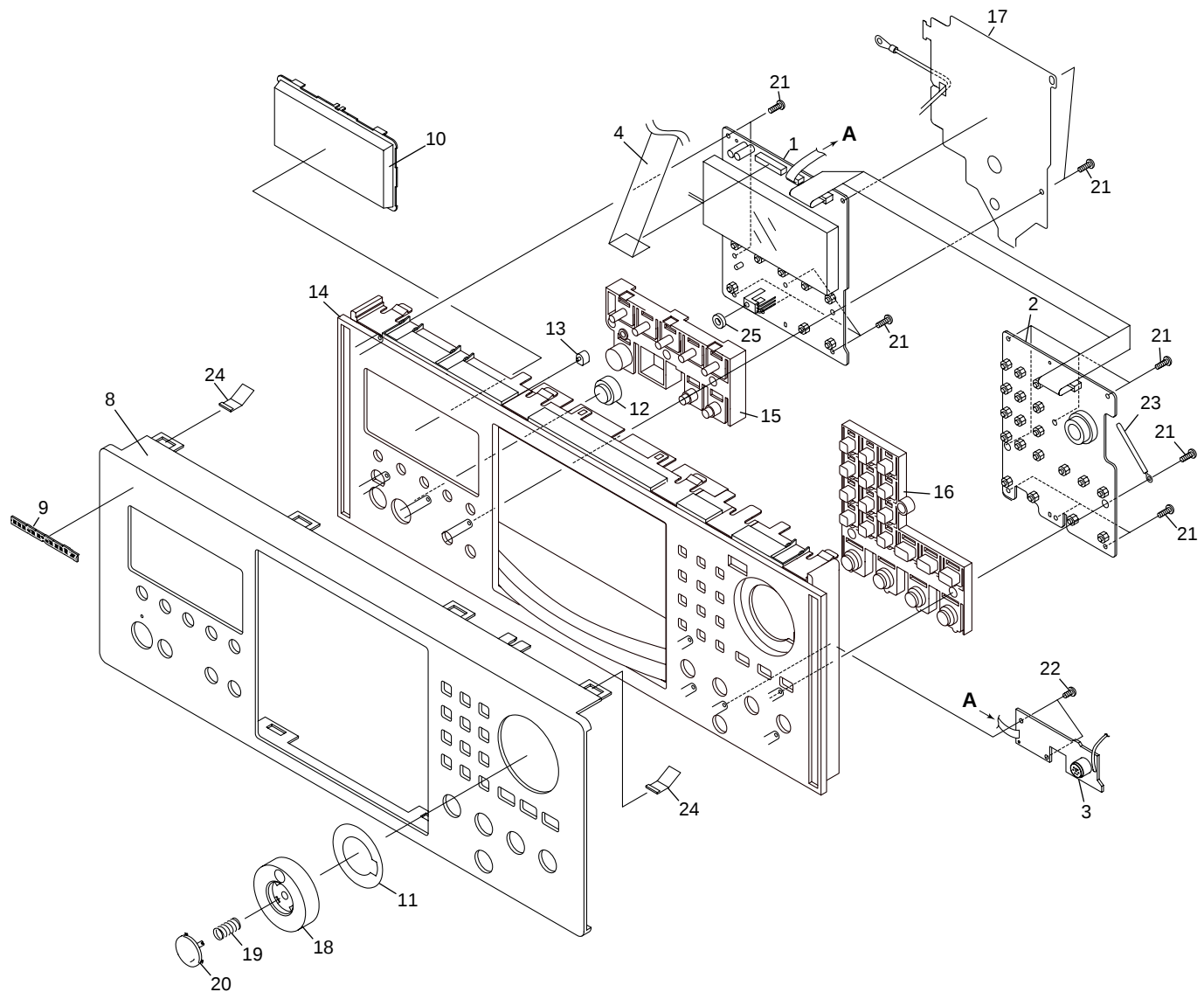


● How to Install the Disc Table

- 1 Use nipper or other tool to cut the three sections marked **A** in figure 1. Then remove the spacer
- 2 While supporting the spindle motor shaft with the stopper, put spacer on top of the yoke M, and stick the disc table on top (takes about 9kg pressure). Detach the spacer.



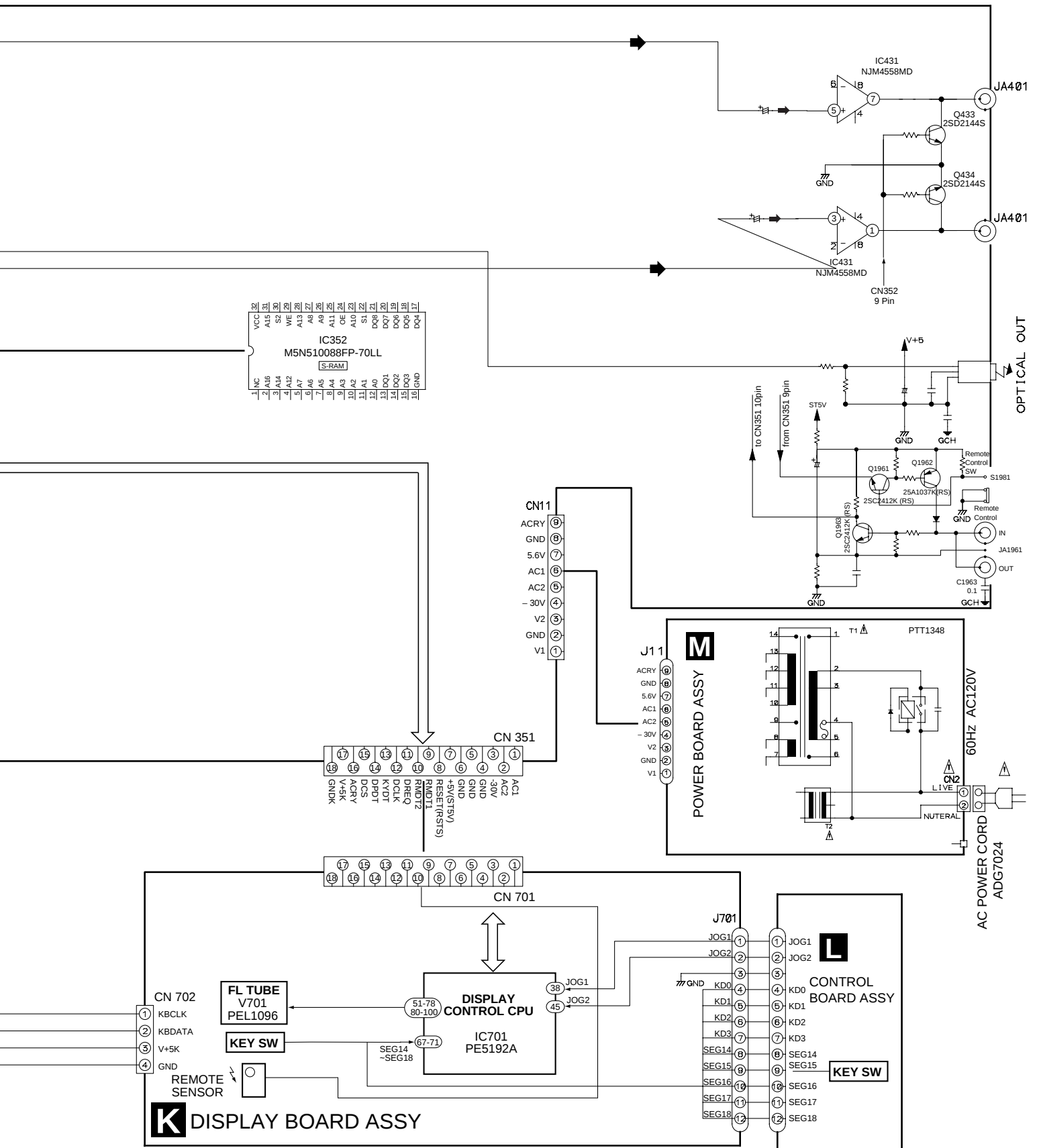
3.5 FRONT PANEL ASSY SECTION



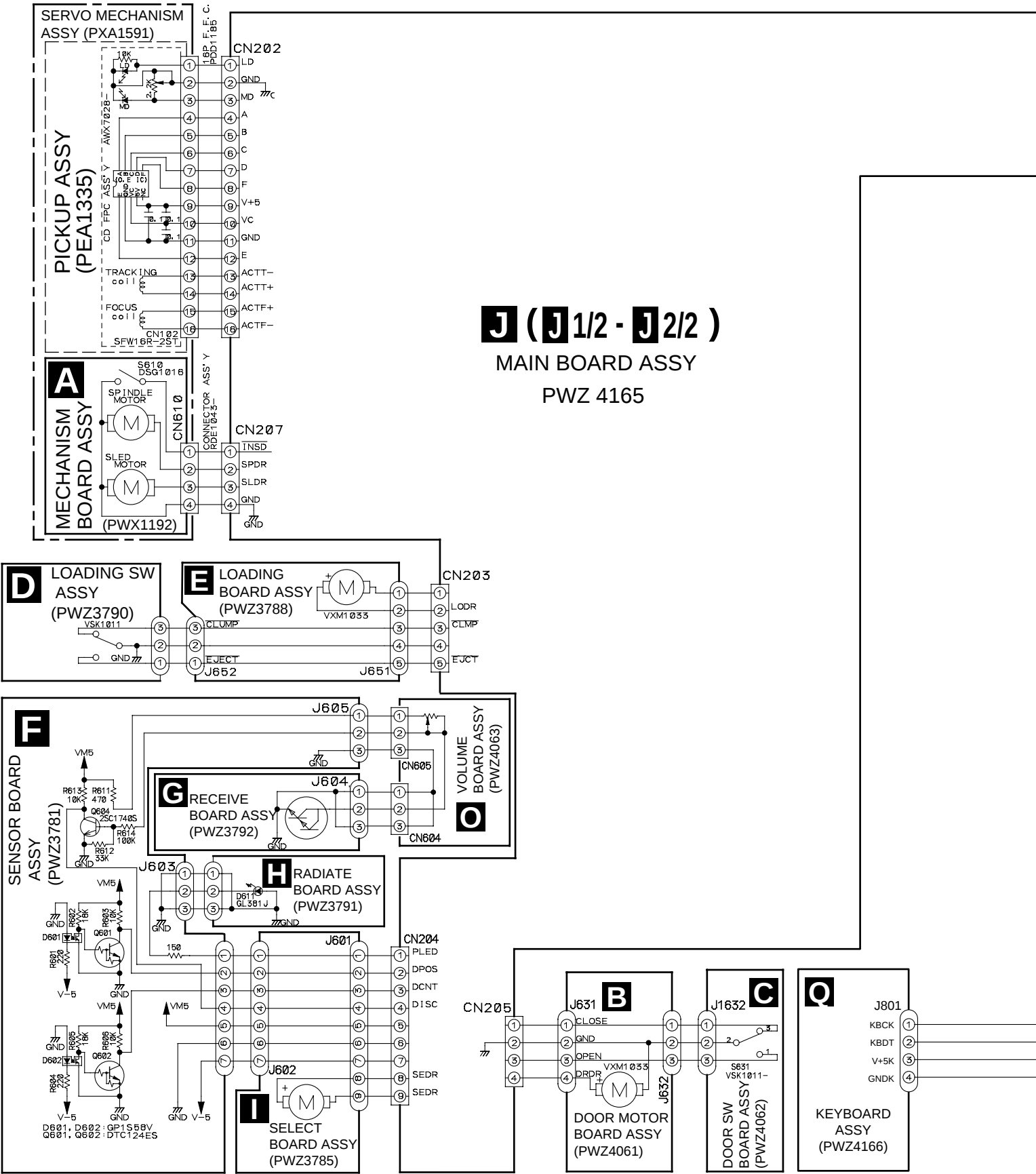
(1) FRONT PANEL ASSY SECTION PARTS LIST

Mark	No.	Description	Part No.
NSP	1	PWZ3846, DISPLAY BOARD ASSY	—
NSP	2	PWZ3849, CONTROL BOARD ASSY	—
NSP	3	PWZ4166, KEY BOARD ASSY	—
	4	PDD1188, Flexible Cable (18P)	*YU000700R
	8	296W248110, Front Panel	296W248110
	9	185J251012, Marantz Badge	185J251010
	10	296W158010, Display Window	296W158010
NSP	11	PEC1042, Jog Sheet	—
	12	296W355010, IR Lens	296W355010
	13	PNW2019, LED Lens	296W355020
	14	296W105010, Front Chassis	296W105010

Mark	No.	Description	Part No.
	15	296W270010, Mode Button	296W270010
	16	296W270120, Play Button	296W270120
NSP	17	PNW1324, PCB Cover	—
	18	PAC1882, JOG Dial	296W067010
	19	PBH1228, Enter Spring	296W115040
	20	PAC1883, Enter Button	296W270050
NSP	21	PPZ30P080FMC, Screw	—
NSP	22	PPZ30P050FMC, Screw	—
NSP	23	RNH-184, Cord Clamper	—
NSP	24	VBK1128, Earth Bracket	—
NSP	25	296W120010, IR Filter	—

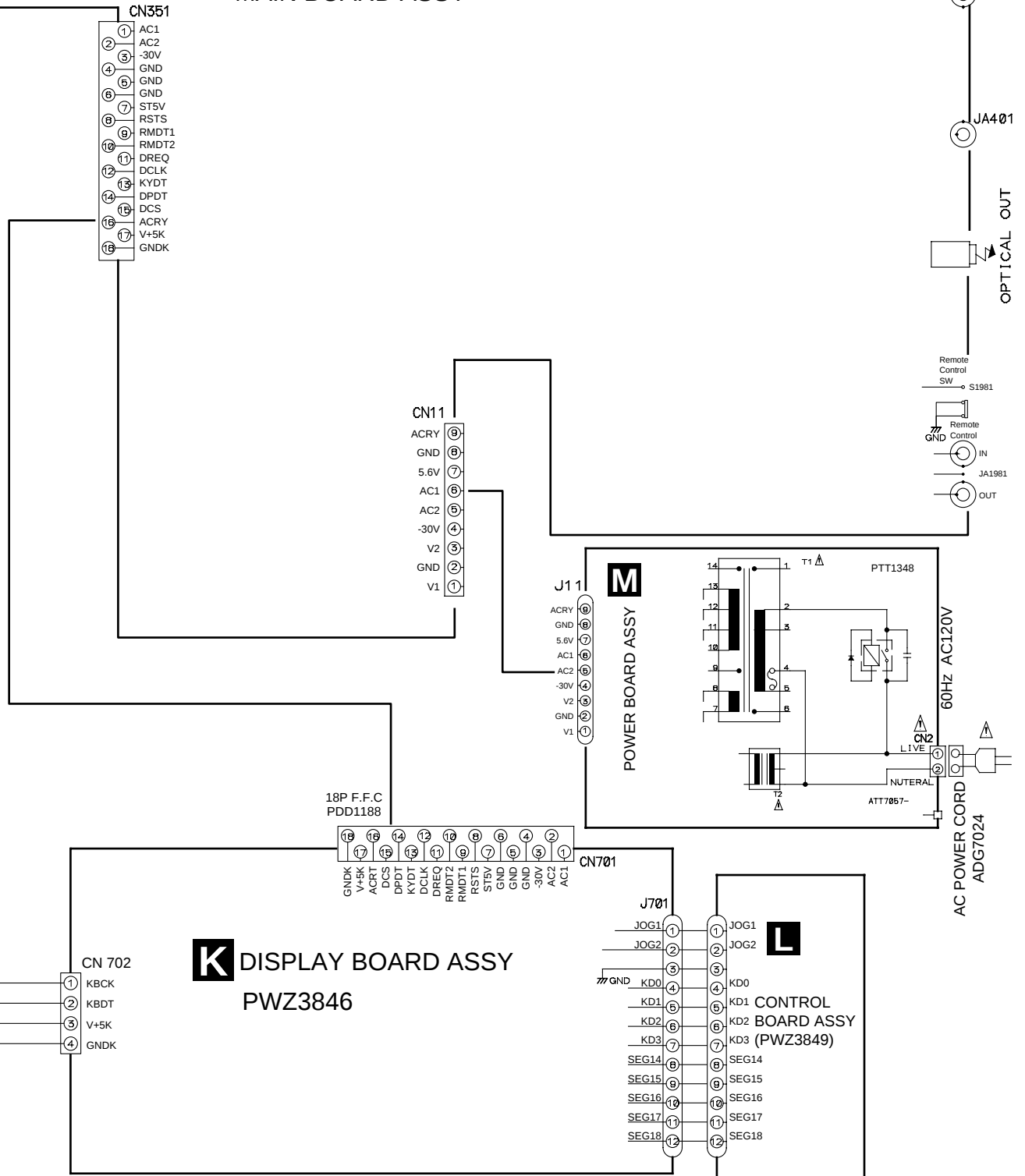


4.2 OVERALL WIRING DIAGRAM

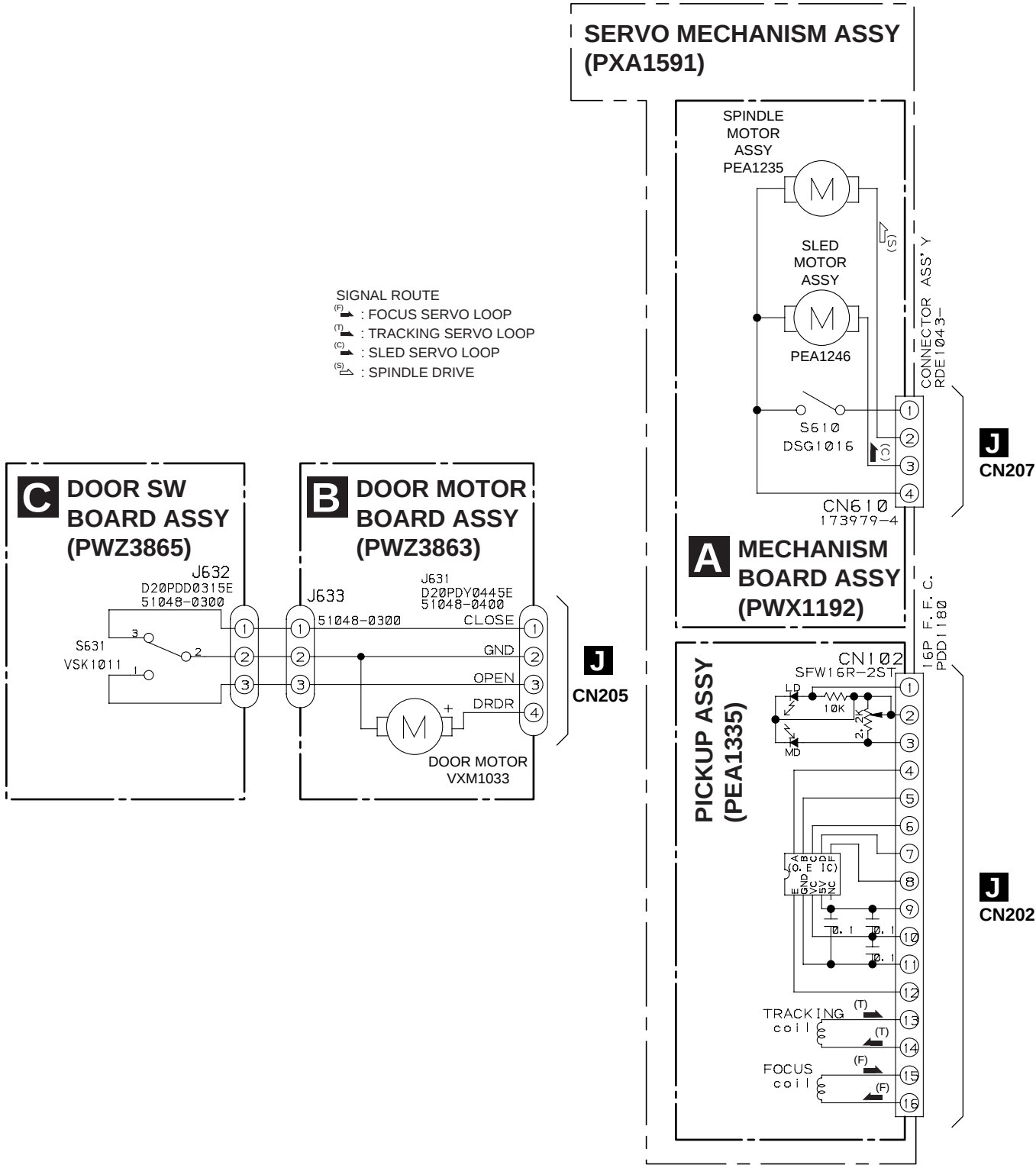


Note : When ordering service parts, be sure to refer to "EXPLODED VIEWS and PARTS LIST" or "PCB PARTS LIST".

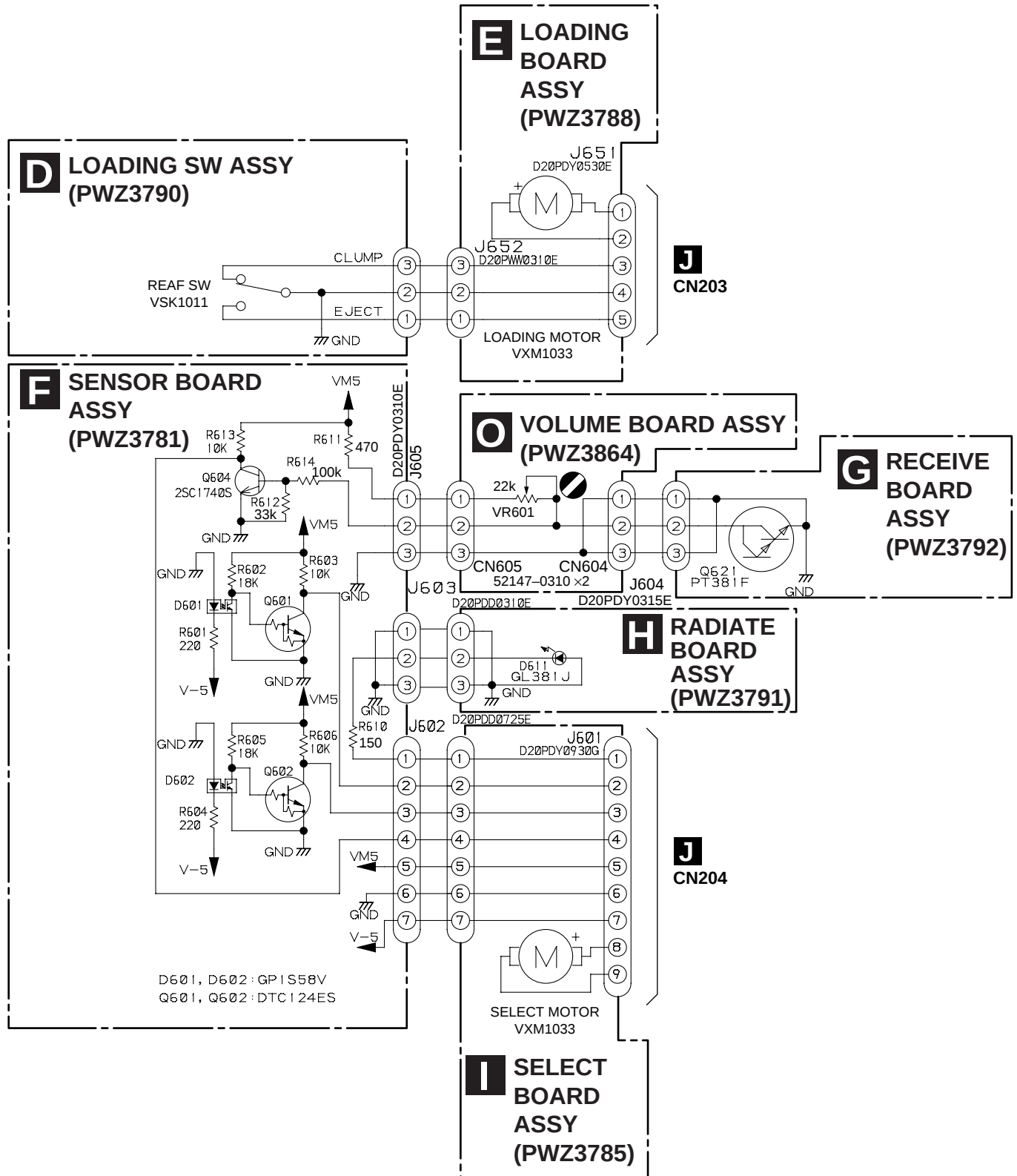
J (J 1/2 - J 2/2) MAIN BOARD ASSY



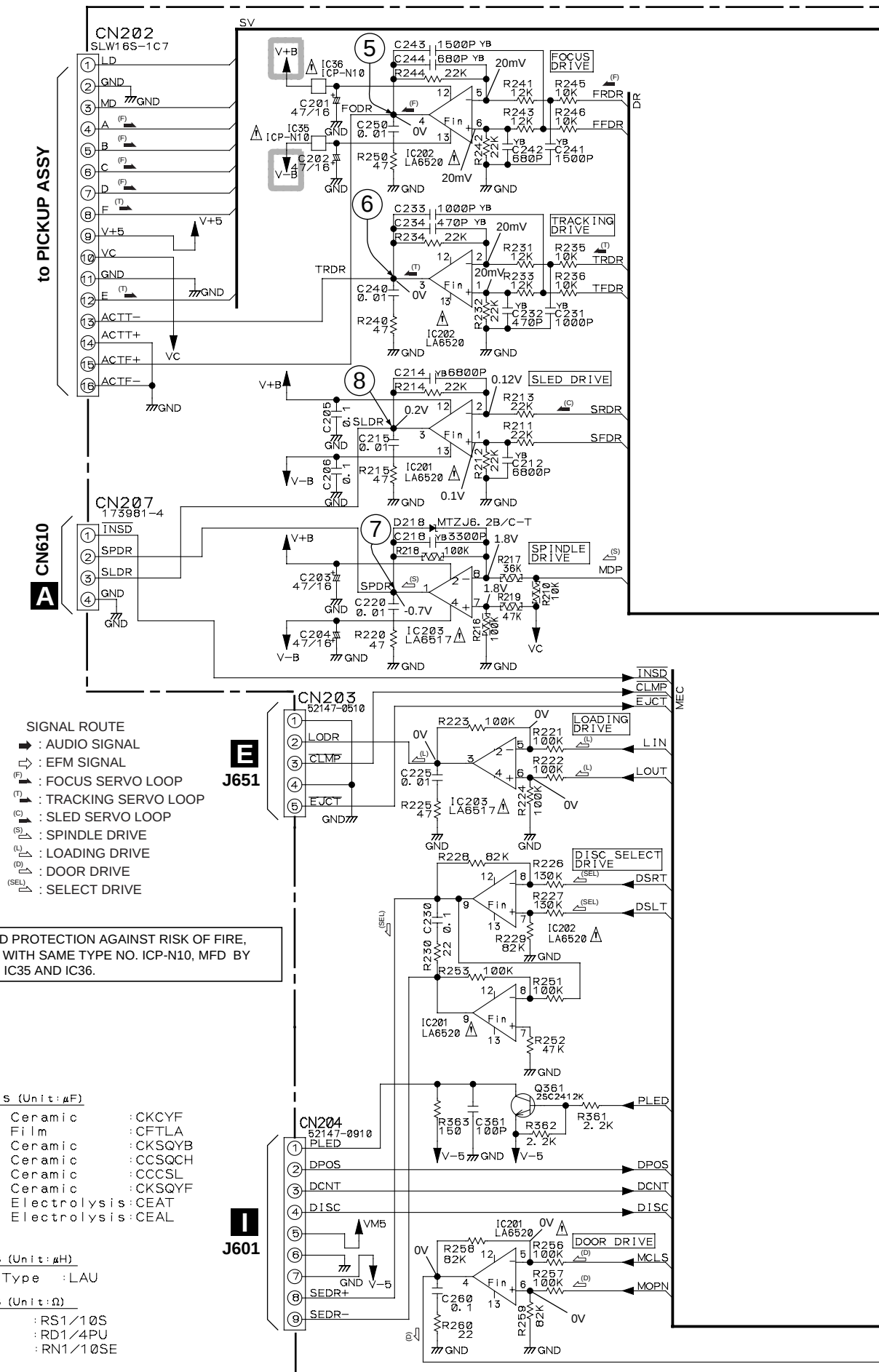
4.3 MECHANISM BOARD, DOOR MOTOR BOARD,
DOOR SW BOARD and PICKUP ASSYS

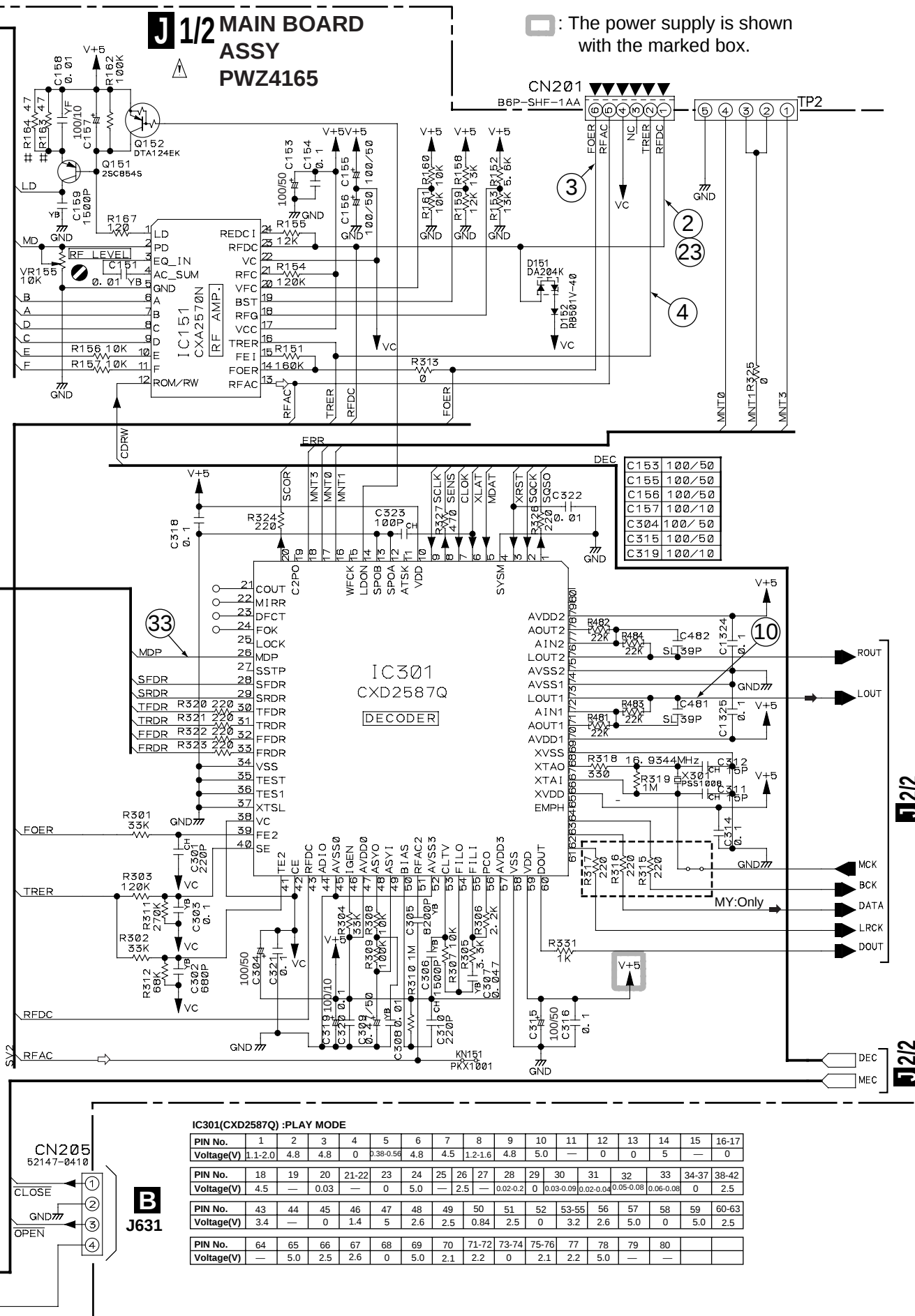


4.4 LOADING SW, LOADING BOARD, SENSOR BOARD, RECEIVE BOARD, RADIATE BOARD and SELECT BOARD ASSYS



4.5 MAIN BOARD ASSY





 J MAIN BOARD ASSY
(PWZ3831)



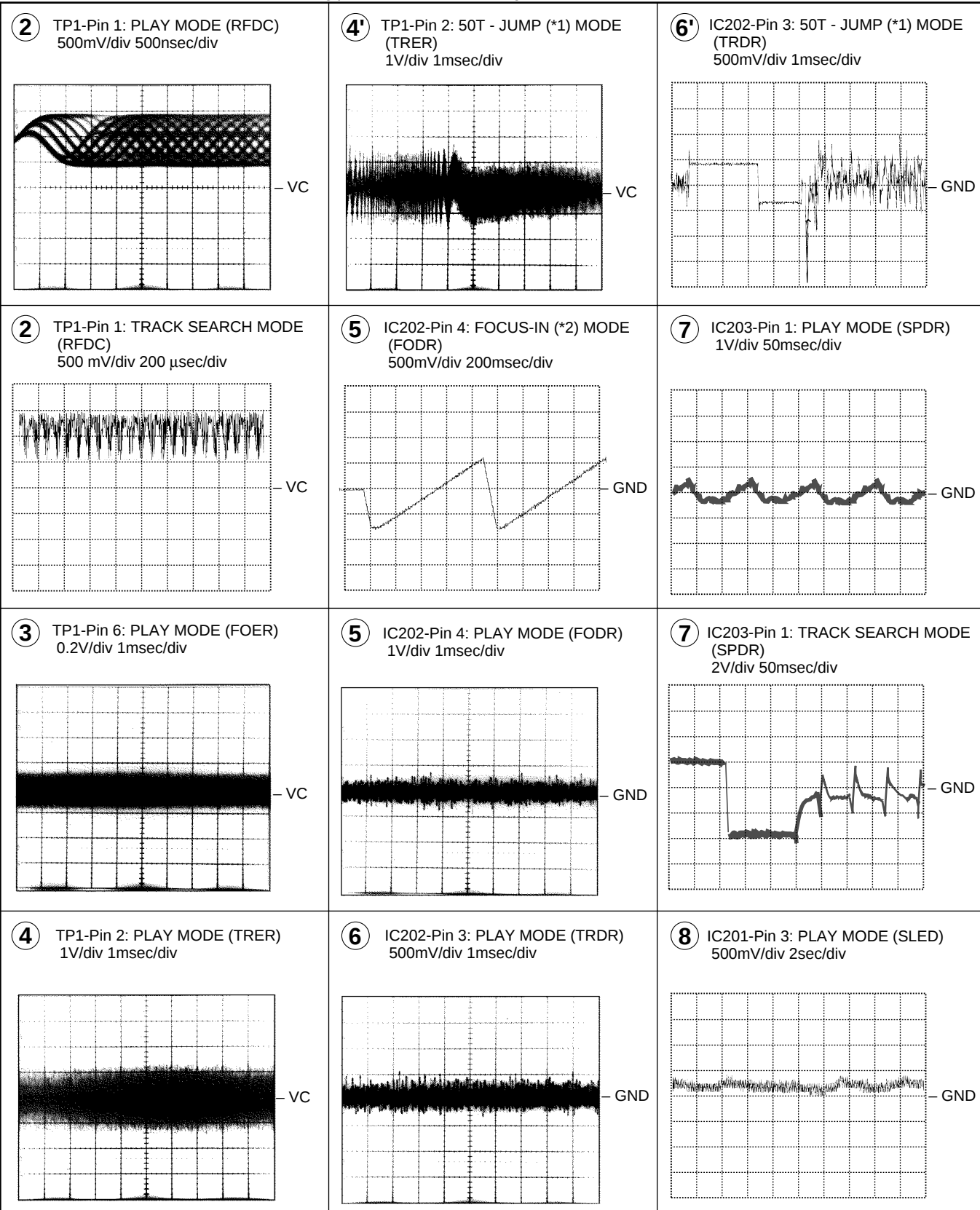
Waveforms

Main Board Assy

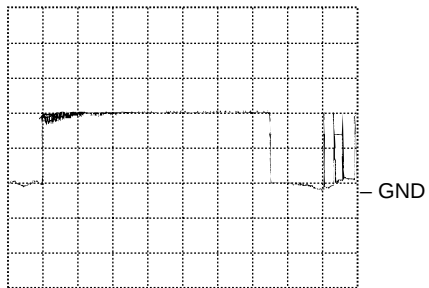
Note: The encircled numbers denote measuring point in the schematic diagram.

*1 50T-JUMP: After switching to the pause mode, press the manual search key.

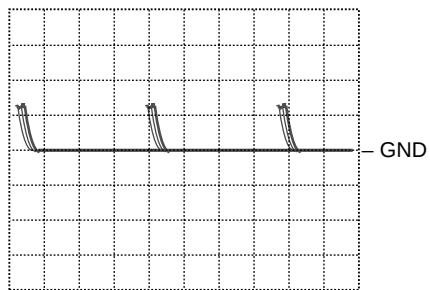
*2 FOCUS-IN: Press the play key without loading a disc.



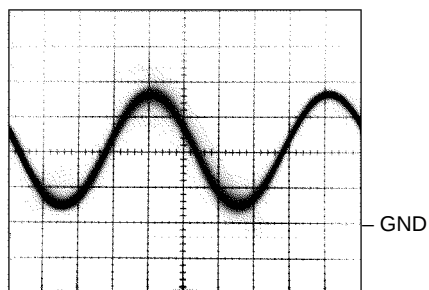
8 IC201-Pin 3: TRACK SEARCH MODE (SLED)
2V/div 200msec/div



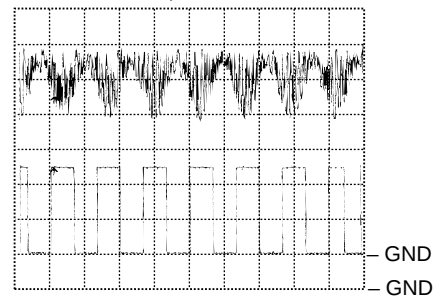
33 IC301-Pin 26 : PLAY MODE (MDP)
2V/div 2 μ sec/div



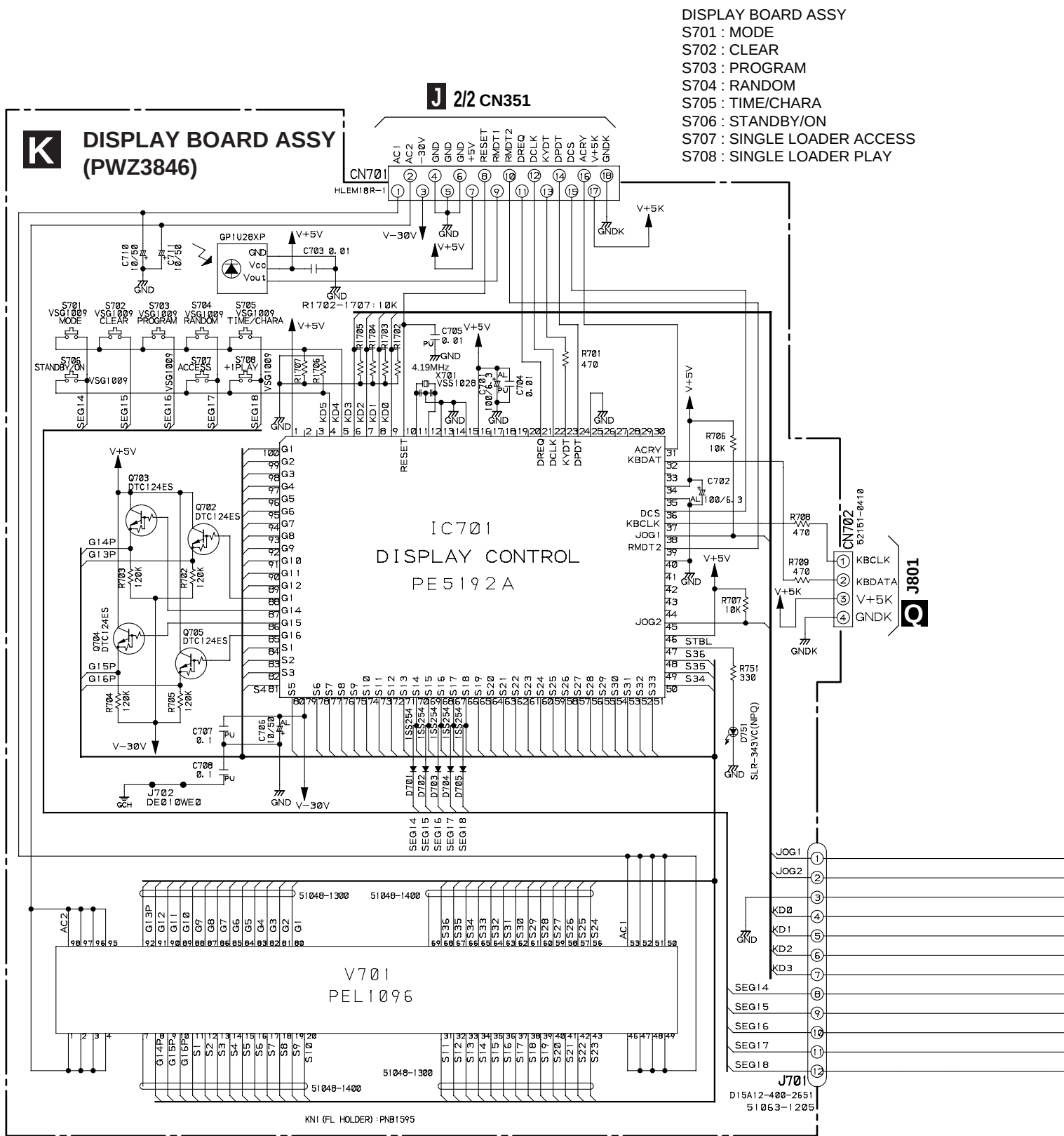
10 IC301-Pin 72 : PLAY MODE (1kHz) (LOUT 1)
1V/div 200 μ sec/div

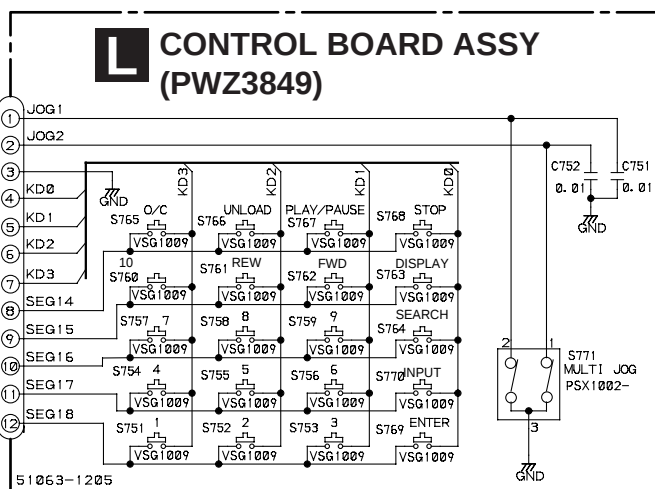
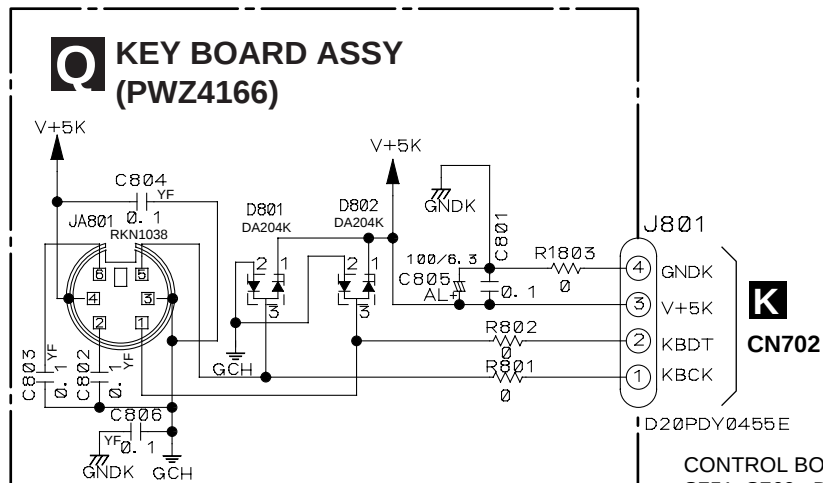
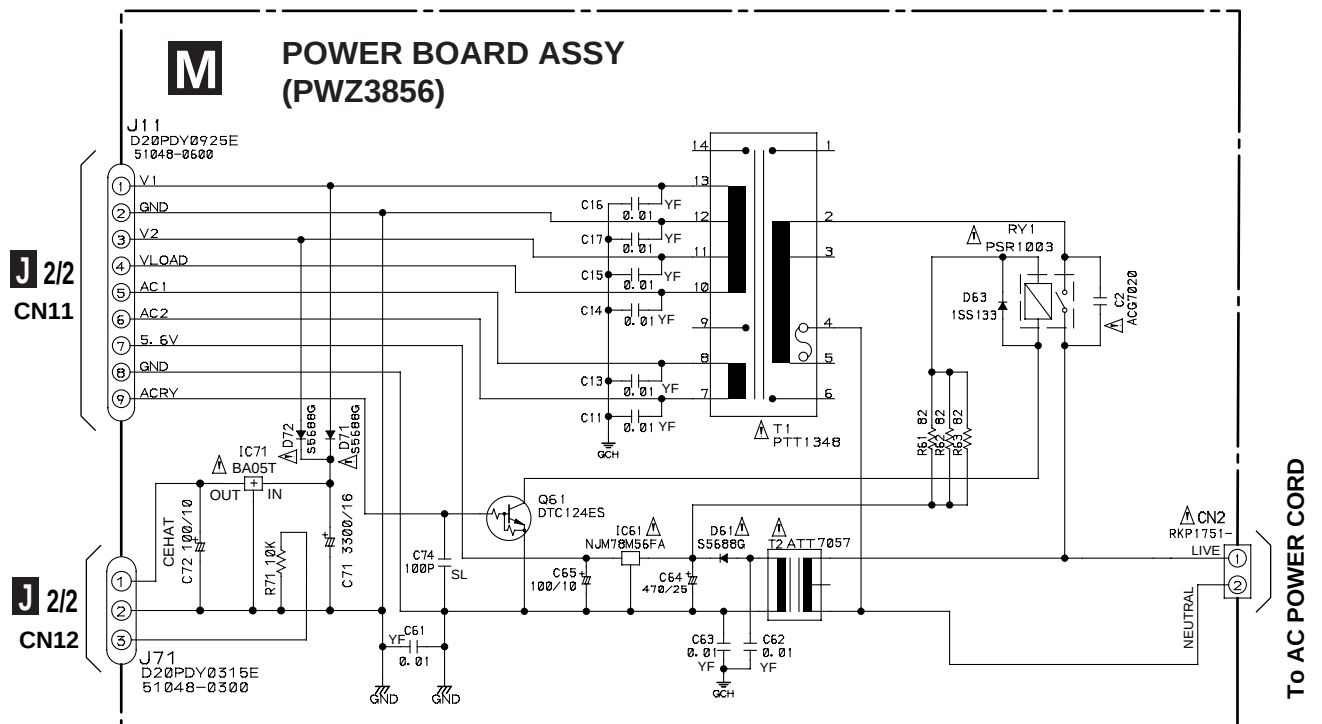


23 TRACK SEARCH MODE
Upper : TP1-Pin 1 (RFDC) 0.5V/div
Lower : IC301-Pin 21 (C.OUT)
2V/div 50 μ sec/div



4.7 DISPLAY BOARD, CONTROL BOARD, KEY BOARD and POWER BOARD ASSYS





CONTROL BOARD ASSY
 S751-S760 : DIRECT CUSTOM (1-10)
 S761 : Track/Manual search (reverse direction)
 S762 : Track/Manual search (forward direction)
 S763 : TITLE DISPLAY
 S764 : TITLE SEARCH
 S765 : OPEN/CLOSE
 S766 : UNLOAD
 S767 : Play/Pause
 S768 : Stop
 S769 : ENTER
 S770 : TITLE INPUT
 S771 : Jog dial

Notes

Capacitors (Unit: μ F)

SL	Ceramic	: CCCSL
PU	Ceramic	: CKPUYF
Unmarked	Ceramic	: CKCYF
MA	Mylar	: CQMA
TL	Film	: CFTLA
AL	Electrolysis	: CEAL
Unmarked	Electrolysis	: CEAT

Resistors (Unit: Ω)

Unmarked : RD1/4PU

: The power supply is shown with the marked box.

5. PCB CONNECTION DIAGRAM

5.1 MECHANISM BOARD, DOOR MOTOR and DOOR SW BOARD ASSYS

SIDE A

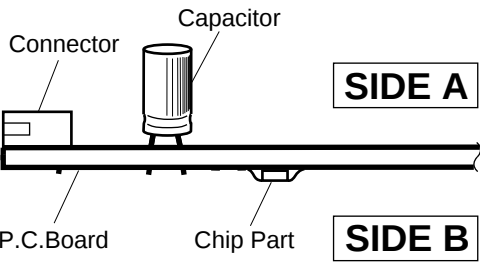
NOTE FOR PCB DIAGRAMS:

- 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.

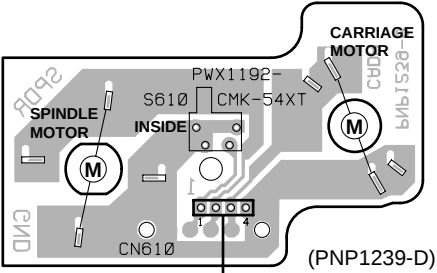
Symbol in PCB Diagrams	Symbol in Schematic Diagrams	Part Name
		Transistor
		Transistor with resistor
		Field effect transistor
		Resistor array
		3-terminal regulator

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

4. Viewpoint of PCB diagrams

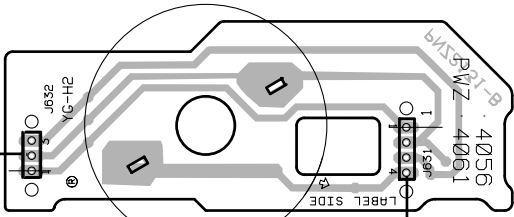


A MECHANISM BOARD ASSY



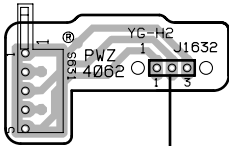
J CN207

B DOOR MOTOR BOARD ASSY



J CN205

C DOOR SW BOARD ASSY



(PNP1467-B)

LOADING BOARD ASSY

SIDE A

(PNP1452-C)

J
CN203

LOADING SW ASSY

(PNP1452-C)

RADIATE BOARD ASSY

(PNP1452-C)

SENSOR BOARD ASSY

(PNP1452-C)

VOLUME BOARD ASSY

(PNP1467-B)

RECEIVE BOARD ASSY

(PNP1452-C)

SELECT BOARD ASSY

(PNP1452-C)

J
CN204

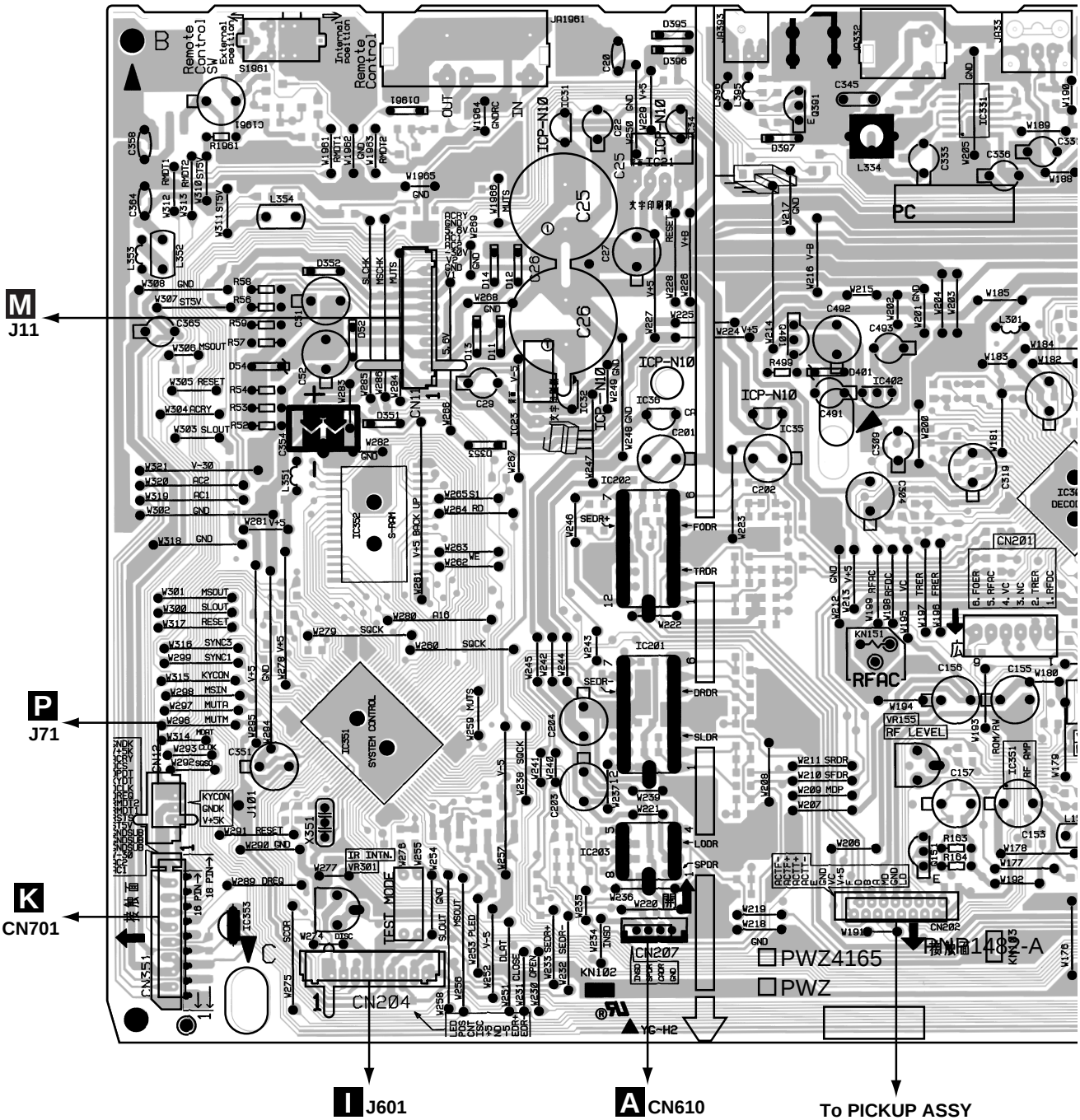
5.3 MAIN BOARD and KEY BOARD ASSYS

J

MAIN BOARD ASSY

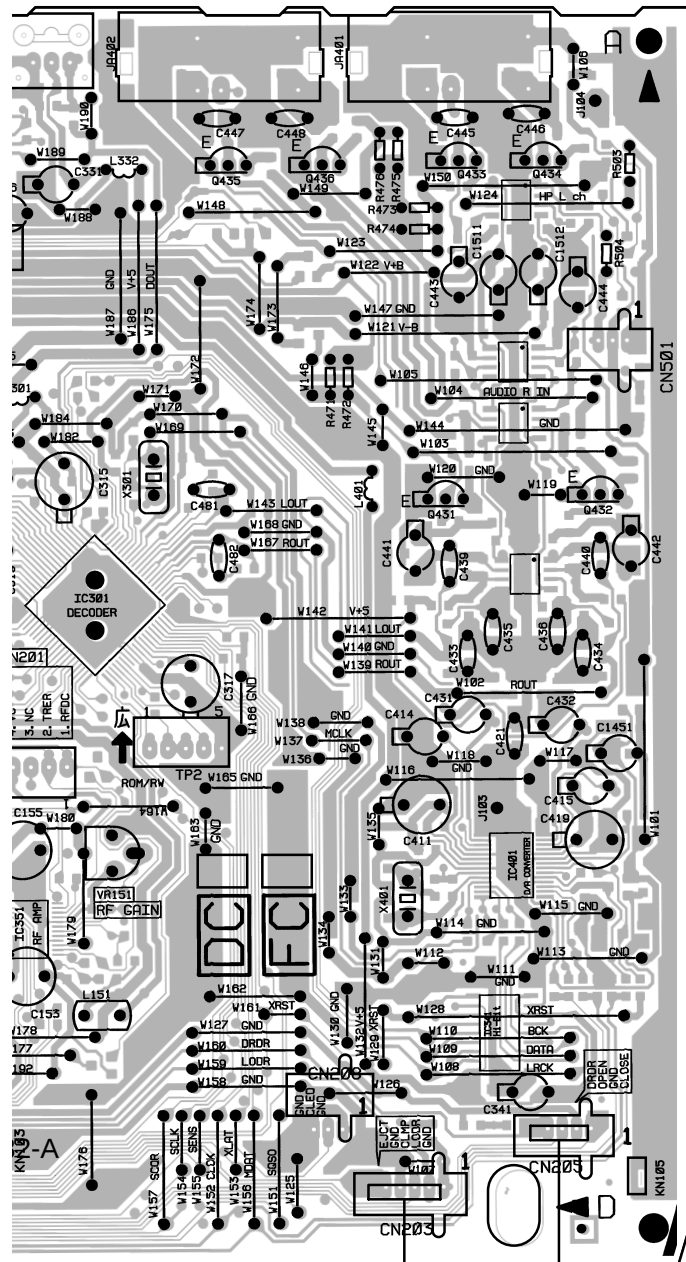
SIDE A

IC353	IC352	IC31	IC21		Q301	IC402	IC331	IC351	IC
	IC351	IC32	IC203	IC202	Q401	Q151			
	VR301		IC36	IC34	IC35	VR155			VI



SIDE A

31 IC351 IC301 Q435 Q436 Q431 Q432 Q434
VR151

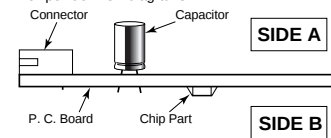


NOTE FOR PCB DIAGRAMS:

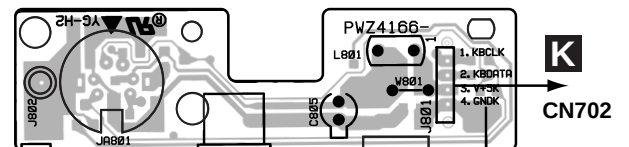
1. Part numbers in PCB diagrams match those in the schematic diagrams.
2. A comparison between the main parts of PCB and schematic diagrams is shown below.

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 destination.
For further information for respective destinations, be sure to check with the schematic diagram.
4. Viewpoint of PCB diagrams



KEY BOARD ASSY SIDE A

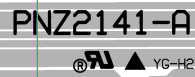


(PNP1482-A)

E J651

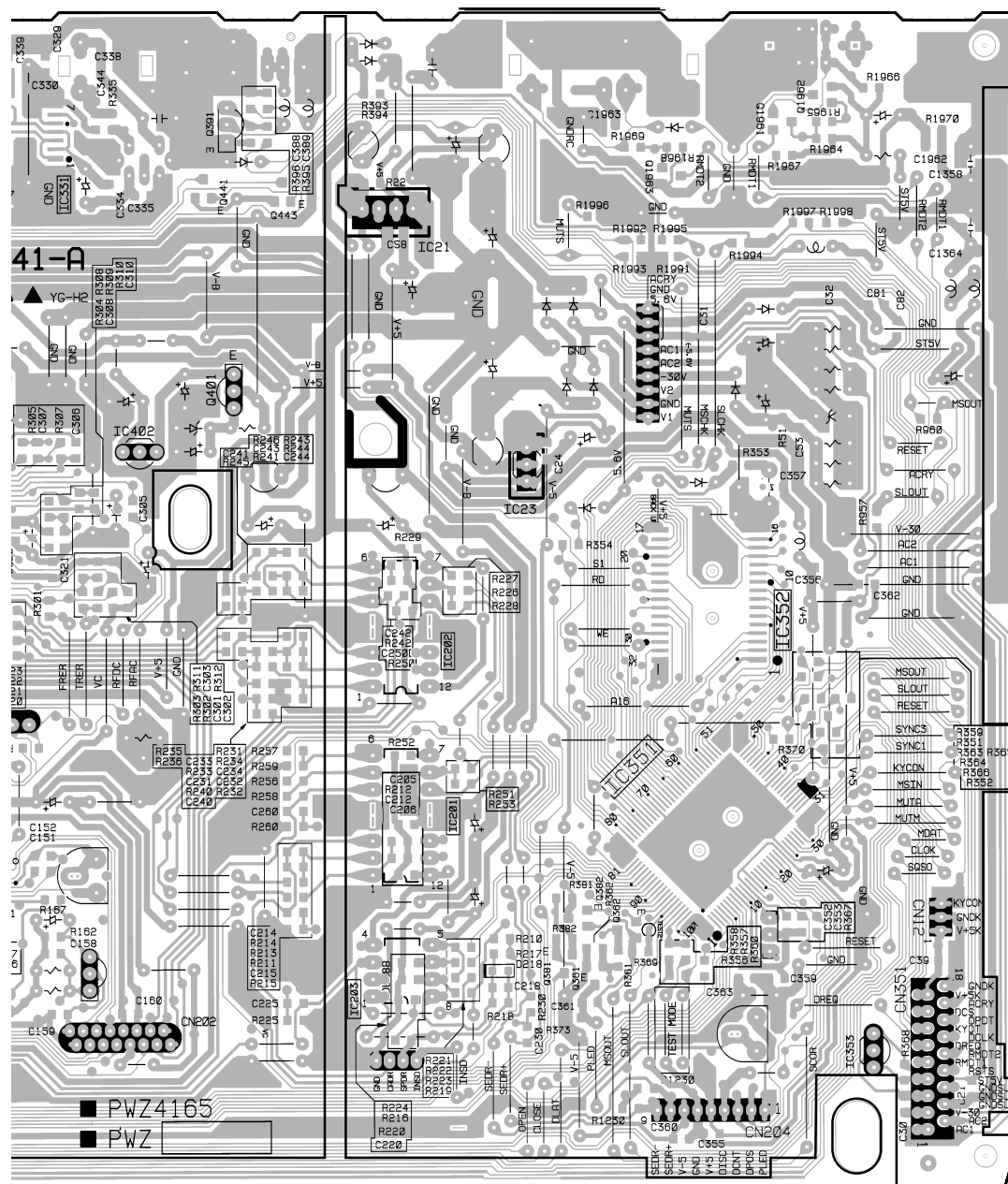
B J631

Q470
Q471
Q432
Q439



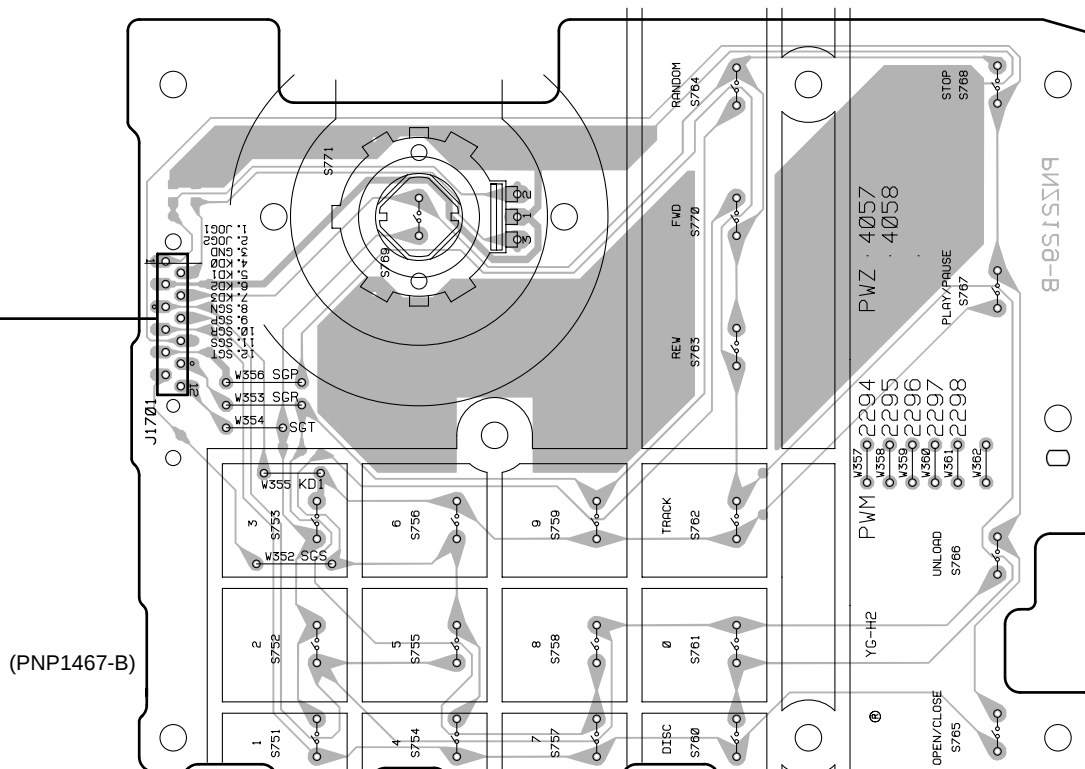
(PNP1482-A)

SIDE B

[illegible]

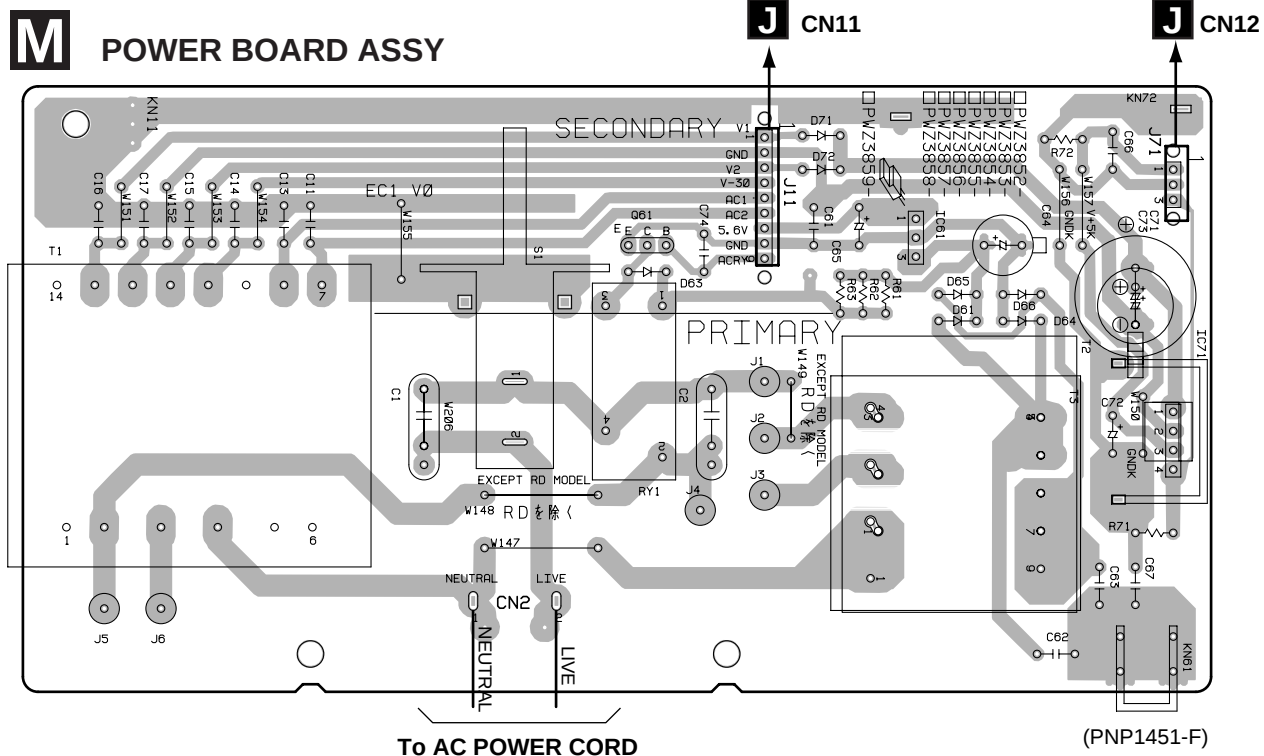
K DISPLAY BOARD ASSY

L CONTROL BOARD ASSY



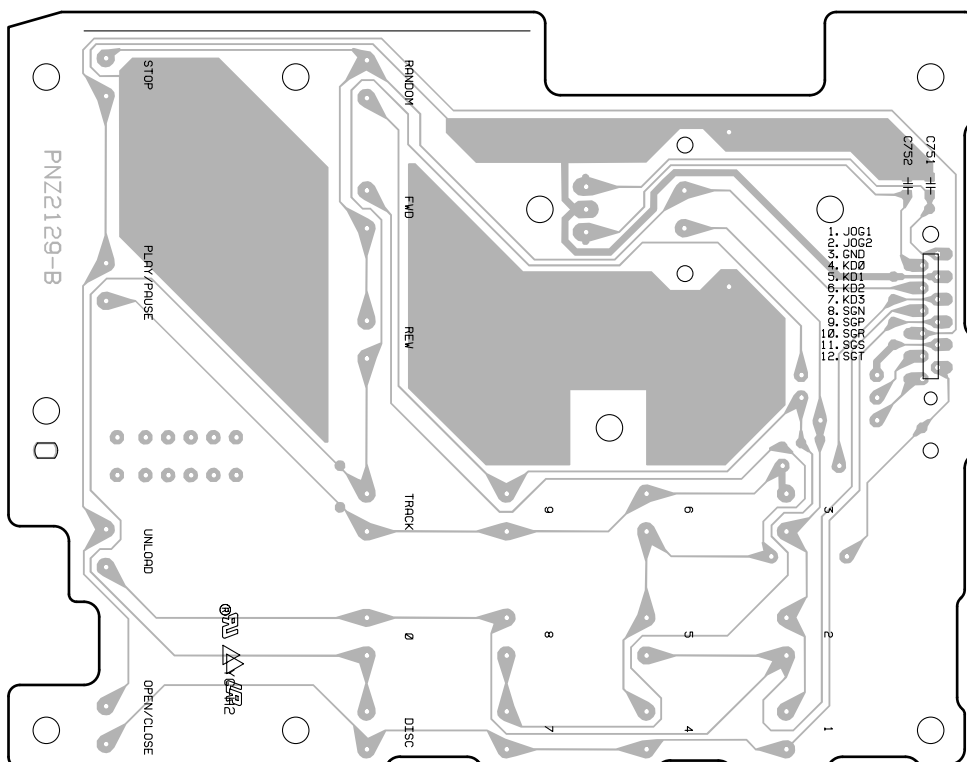
5.5 POWER BOARD and CONTROL BOARD ASSYS

SIDE A



SIDE B

L CONTROL BOARD ASSY



6. 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 $\rightarrow$ 56 x 10¹ $\rightarrow$ 561 RD1/4PU561J
47k $\rightarrow$ 47 x 10³ $\rightarrow$ 473 RD1/4PU473J
0.5 $\rightarrow$ R50 RN2HR50K
1 $\rightarrow$ 1R0 RS1P1R0K
Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).
5.62k $\rightarrow$ 562 x 10¹ $\rightarrow$ 5621 RN1/4PC5621F

■ PARTS LIST FOR PD-F1009/KU/CA

A MECHANISM BOARD ASSY (PWX1192)

Mark	No.	Description	Part No.
	S610	SWITCHES AND RELAYS DSG1016	*SP001020R
NSP	CN610	OTHERS 173979-4	—

F SENSOR BOARD ASSY (PWZ3781)

Mark	No.	Description	Part No.
	Q601	SEMICONDUCTORS DTC124ES, TRANSISTOR"	BA20003000
	Q602	DTC124ES, TRANSISTOR"	BA20003000
	Q604	2SC1740S, TRANSISTOR"	HT317402F0
	D601	GP1S58V, PHOTO INTERRUPTOR	HW10036320
	D602	GP1S58V, PHOTO INTERRUPTOR	HW10036320
NSP	Other	RESISTORS Resistors RD1/4PUxxxJ	—
NSP	—	OTHERS 51048-0300, 3P CABLE HOLDER	—
NSP	—	51048-0700, 7P CABLE HOLDER	—
NSP	J602	D20PDD0725E, JUMPER WIRE	—
NSP	J603	D20PDD0310E, 3P JUMPER WIRE	—
NSP	J605	D20PDY0310E, 3P JUMPER WIRE	—

I SELECT BOARD ASSY (PWZ3785)

Mark	No.	Description	Part No.
NSP	—	OTHERS 51048-0700, 7P CABLE HOLDER	—
NSP	—	51048-0900, 9P CABLE HOLDER	—
NSP	J601	D20PDY0930G, JUMPER WIRE	—

E LOADING BOARD ASSY (PWZ3788)

Mark	No.	Description	Part No.
NSP	—	OTHERS 51048-0300, 3P CABLE HOLDER	—
NSP	—	51048-0500, 5P CABLE HOLDER	—
NSP	J651	D20PDY0530E, JUMPER WIRE	—
NSP	J652	D20PDD0310E, 3P JUMPER WIRE	—

D LOADING SW BOARD ASSY (PWZ3790)

Mark	No.	Description	Part No.
NSP	—	OTHERS 51048-0300, 3P CABLE HOLDER	—
	—	VSK1011, REAF SWITCH	*SM000340R

H RADIATE BOARD ASSY (PWZ3791)

Mark	No.	Description	Part No.
	D611	SEMICONDUCTORS GL381J, DIODE"	*HI100870R
NSP	—	OTHERS 51048-0300, 3P CABLE HOLDER	—
NSP	—	RNK1795, L.E.D.HOLDER	—

G RECEIVE BOARD ASSY (PWZ3792)

Mark	No.	Description	Part No.
	Q621	SEMICONDUCTORS PT381FBC, PHOTO TRANSISTOR	*HF000050R
NSP	—	OTHERS 51048-0300, 3P CABLE HOLDER	—
NSP	J604	D20PDY0315E, JUMPER WIRE"	—

M POWER BOARD ASSY (PWZ3856)

Mark	No.	Description	Part No.
Δ	Q61	SEMICONDUCTORS DTC124ES, TRANSISTOR	BA20003000
	D61	S5688G, DIODE	HD20029050
	D63	1SS133, DIODE	HD20015210
	D71, D72	S5688G, DIODE	HD20029050
Δ	IC61	NJM78M56FA, REGULATOR IC	*HC300330R
Δ	IC71	BA05T, REGULATOR IC	HC3690521F
Δ	RY1	SWITCHES AND RELAYS PSR1003, RELAY	*LY000250R
NSP	C11	CAPACITORS CKCYF103Z50, CERAMIC CAPACITOR	—
NSP	C13	CKCYF103Z50, CERAMIC CAPACITOR	—
NSP	C14	CKCYF103Z50, CERAMIC CAPACITOR	—
NSP	C15	CKCYF103Z50, CERAMIC CAPACITOR	—
NSP	C16	CKCYF103Z50, CERAMIC CAPACITOR	—
NSP	C17	CKCYF103Z50, CERAMIC CAPACITOR	—
Δ	C2	ACG7020, CKA (10000P/AC250V)	*DK100680R
NSP	C61	CKCYF103Z50, CERAMIC CAPACITOR	—

Mark	No.	Description	Part No.
NSP	C62	CKCYF103Z50, CERAMIC CAPACITOR	—
NSP	C63	CKCYF103Z50, CERAMIC CAPACITOR	—
NSP	C64	CEAT471M25, ELECT. CAPACITOR	—
NSP	C65	CEAT101M50, ELECT. CAPACITOR	—
NSP	C71	CEAT332M16, ELECT. CAPACITOR	—
NSP	C72	CEHAT101M10, ELECT. CAPACITOR	—
NSP	C74	CCCSL101J50, CERAMIC CAPACITOR	—
OTHERS			
NSP	—	51048-0300, 3P CABLE HOLDER	—
NSP	—	51048-0900, 9P CABLE HOLDER	—
	T2	ATT7057, STANDBY TRANSFORMER	*TS001200R
NSP	J11	D20PDY0925E, 2mm 9P WIRE	—
	T1	PTT1348, POWER TRANSFORMER	*TS001210R
	CN2	RKP1751, AC CODE SOCKET	*YJ002220R
NSP	—	VNE1948, SCREW PLATE	—
NSP	KN11	VNF1084, EARTH METAL FITTING	—
NSP	J71	D20PDY0315E, 2mm 3P WIRE	—

K DISPLAY BOARD ASSY (PWZ3846)

Mark	No.	Description	Part No.
SEMICONDUCTORS			
	IC701	PE5192A, MICROCOMPUTER IC	*HU100430R
	D701	1SS133, DIODE	HD20015210
	D702	1SS133, DIODE	HD20015210
	D703	1SS133, DIODE	HD20015210
	D704	1SS133, DIODE	HD20015210
	D705	1SS133, DIODE	HD20015210
	D751	SLR-343VC(NPQ), LED(RED)	*HI100920R
	Q702-Q705	DTC124ES, TRANSISTOR	BA20003000
SWITCHES AND RELAYS			
	S701	VSG1009, SWITCH	*SP001050R
	S702	VSG1009, SWITCH	*SP001050R
	S703	VSG1009, SWITCH	*SP001050R
	S704	VSG1009, SWITCH	*SP001050R
	S705	VSG1009, SWITCH	*SP001050R
	S706	VSG1009, SWITCH	*SP001050R
	S707	VSG1009, SWITCH	*SP001050R
	S708	VSG1009, SWITCH	*SP001050R
CAPACITORS			
NSP	C701	CEAL101M6R3, ELECT. CAPACITOR	—
NSP	C702	CEAL101M6R3, ELECT. CAPACITOR	—
NSP	C703	CKCYF103Z50, CERAMIC CAPACITOR	—
NSP	C704	CKPUYF103Z25, CERAMIC CAPACITOR	—
NSP	C705	CKPUYF103Z25, CERAMIC CAPACITOR	—
NSP	C706	CEAL100M50, ELECT. CAPACITOR	—
NSP	C707	CKPUYF104Z50, CERAMIC CAPACITOR	—
NSP	C708	CKPUYF104Z50, CERAMIC CAPACITOR	—
NSP	C710	CEAT100M50, ELECT. CAPACITOR	—
NSP	C711	CEAT100M50, ELECT. CAPACITOR	—
RESISTORS			
NSP	—	Other Resistors RD1/4PUxxxJ	—
OTHERS			
NSP	—	51063-1205, CABLE HOLDER(12P)	—
NSP	J701	D15A12-400-2651, JUMPER WIRE	—
	—	GP1U28XP, REMOTE RECEIVER UNIT	*HW000110R
NSP	CN701	HLEM18R-1, CONNECTOR	—
NSP	CN702	52151-0410, 4P JUMPER CONNECTOR	—
	V701	PEL1096, FL INDICATOR TUBE	*HQ300450R
	KN701	PNB1595, FL HOLDER(MTL)	—
	X701	VSS1028, CERAMIC RESONATOR (4.19MHz)	*FQ000470R

Mark	No.	Description	Part No.
NSP	—	51048-1300, CABLE HOLDER	—
NSP	—	51048-1400, CABLE HOLDER	—
NSP	J702	DE010WE0, CORD WITH PLUG	—

L CONTROL BOARD ASSY (PWZ3849)

Mark	No.	Description	Part No.
SWITCHES AND RELAYS			
	S751	VSG1009, SWITCH	*SP001050R
	S752	VSG1009, SWITCH	*SP001050R
	S753	VSG1009, SWITCH	*SP001050R
	S754	VSG1009, SWITCH	*SP001050R
	S755	VSG1009, SWITCH	*SP001050R
	S756	VSG1009, SWITCH	*SP001050R
	S757	VSG1009, SWITCH	*SP001050R
	S758	VSG1009, SWITCH	*SP001050R
	S759	VSG1009, SWITCH	*SP001050R
	S760	VSG1009, SWITCH	*SP001050R
	S761	VSG1009, SWITCH	*SP001050R
	S762	VSG1009, SWITCH	*SP001050R
	S763	VSG1009, SWITCH	*SP001050R
	S764	VSG1009, SWITCH	*SP001050R
	S765	VSG1009, SWITCH	*SP001050R
	S766	VSG1009, SWITCH	*SP001050R
	S767	VSG1009, SWITCH	*SP001050R
	S768	VSG1009, SWITCH	*SP001050R
	S769	VSG1009, SWITCH	*SP001050R
	S770	VSG1009, SWITCH	*SP001050R
	S771	PSX1002, ROTARY ENCODER	*SR000140R
CAPACITORS			
NSP	C751	CKPUYF103Z25, CERAMIC CAPACITOR	—
NSP	C752	CKPUYF103Z25, CERAMIC CAPACITOR	—
OTHERS			
NSP	—	51063-1205, CABLE HOLDER(12P)	—

B DOOR MOTOR BOARD ASSY(PWZ3863)

Mark	No.	Description	Part No.
OTHERS			
NSP	—	51048-0300, 3P CABLE HOLDER	—
NSP	—	51048-0400, 4P CABLE HOLDER	—
NSP	J631	D20PDY0445E, JUMPER WIRE	—

C DOOR SW BOARD ASSY(PWZ3865)

Mark	No.	Description	Part No.
OTHERS			
NSP	—	51048-0300, 3P CABLE HOLDER	—
	—	VSK1011, REAF SWITCH	*SM000340R
NSP	J632	D20PDD0315E, 3P JUMPER WIRE	—

O VOLUME BOARD ASSY(PWZ3864)

Mark	No.	Description	Part No.
RESISTORS			
	VR601	VCP1158, VR (22kW)	*RA000970R
OTHERS			
NSP	CN604	52147-0310, 3P JUMPER	—
NSP	CN605	52147-0310, 3P JUMPER	—
NSP	KN601	PKX1001, JUMPER TERMINAL	—



KEY BOARD ASSY (PWZ4166)

Mark	No.	Description	Part No.
		SEMICONDUCTORS	
	D801, D802	DA204K	*HZ200140R
		CAPACITORS	
NSP	C805	CEAL101M6R3	—
NSP	C801-C804, C806	CKSQYF104Z50	—
		RESISTORS	
NSP	R801-R803, R1803	RS1/10S0R0J	—
		OTHERS	
NSP	J801	D20PWY0455E, 4P JUMPER WIRE	—
NSP	J802	PDF1012, LEAD WIRE UNIT	—
	JA801	RKN1038, MIN DIN 6P SOCKET	*YT002110R



MAIN BOARD ASSY (PWZ4165)

Mark	No.	Description	Part No.
		SEMICONDUCTORS	
	IC151	CXA2570N	*HC106150R
	IC301	CXD2587Q	*HC106160R
⚠	IC35, IC36	ICP-N10	FU40115020
⚠	IC203	LA6517	*HC106170R
⚠	IC201, IC202	LA6520	*HC106180R
	IC352	M5M51008BFP-70LL	*HC106190R
	IC431, IC432, IC433	NJM4558MD	HC10035090
⚠	IC23	NJM79M05FA	HC3950509F
	IC351	PDE5133B	*HC106200R
⚠	IC21	PQ05RR12	*HC300340R
	IC353	S-806E	*HC106210R
	Q151	2SA854S	*HX100070R
	Q361, Q1961, Q1963	2SC2412K	HX324121M0
	Q431, Q432, Q433, Q434	2SD2144S	*HX400130R
	Q152, Q362, Q438, Q441	DTA124EK	BA10002210
	Q437, Q440	DTC124EK	BA10002210
	Q1962	2SA1037K(RS)	HX110372B0
	D351- D353, D1961	1SS133	HD20015210
	D151	DA204K	*HZ200140R
	D54	MTZJ24B	*HD301880R
⚠	D11-D14, D52	S5688G	HD20029050
	D152	RB501V-40	*HZ200100R
	D218	UDZS6.2B	*HD301890R
		COILS AND FILTERS	
	L351	LAU100J	*LC104980R
		CAPACITORS	
NSP	C481, C482	CCCSL390J50	—
NSP	C323, C361	CCSQCH101J50	—
NSP	C437, C438	CCSQCH121J50	—
NSP	C311, C312	CCSQCH150J50	—
NSP	C301, C310	CCSQCH221J50	—
NSP	C302	CCSQCH681J50	—
NSP	C27, C29, C157, C317, C319	CEAT101M10	—
NSP	C331, C351, C365	CEAT101M10	—
NSP	C51	CEAT101M35	—

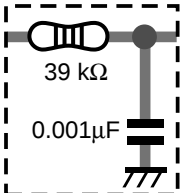
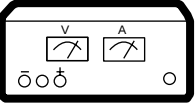
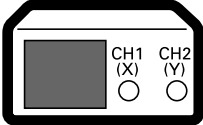
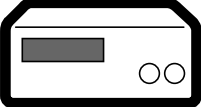
Mark	No.	Description	Part No.
NSP	C52, C153, C155, C156, C304, C315	CEAT101M50	—
NSP	C441-C444	CEAT220M25	—
NSP	C201-C204, C1961	CEAT470M16	—
NSP	C309	CEATR47M50	—
NSP	C364	CFTLA104J50	—
NSP	C445, C446	CKCYB102K50	—
NSP	C358	CKCYF473Z50	—
NSP	C231, C233	CKSQYB102K50	—
NSP	C151, C215, C220, C225, C240	CKSQYB103K50	—
NSP	C250, C308	CKSQYB103K50	—
NSP	C230, C260, C303	CKSQYB104K25	—
NSP	C159, C241, C243, C306	CKSQYB152K50	—
NSP	C218	CKSQYB332K50	—
NSP	C232, C234	CKSQYB471K50	—
NSP	C307	CKSQYB473K25	—
NSP	C242, C244	CKSQYB681K50	—
NSP	C212, C214	CKSQYB682K50	—
NSP	C305	CKSQYB822K50	—
NSP	C158, C322, C339, C352, C353	CKSQYF103Z50	—
NSP	C362, C363	CKSQYF103Z50	—
NSP	C28, C154, C205, C206, C314	CKSQYF104Z25	—
NSP	C316, C318, C320, C321, C332	CKSQYF104Z25	—
NSP	C449, C450, C1324	CKSQYF104Z25	—
NSP	C1325, C1962, C1963	CKSQYF104Z25	—
NSP	C359	CKSQYF473Z50	—
NSP	C354	PCH1133, (0.1F/5.5V)	*EX000060R
NSP	C25, C26	PCH1135, (4700uF/16V)	*EA001000R
		RESISTORS	
NSP	R1961	RD1/4PU101J	—
NSP	R56-R59	RD1/4PU241J	—
NSP	R52-R54	RD1/4PU272J	—
NSP	R471-R474	RD1/4PU332J	—
NSP	R163, R164	RD1/4PU470J	—
NSP	R210, R439-R446	RN1/10SE1002D	—
NSP	R216, R218	RN1/10SE1003D	—
NSP	R457-R460, R481-R484	RN1/10SE2202D	—
NSP	R217	RN1/10SE3602D	—
NSP	R219, R451, R452, R455, R456	RN1/10SE4702D	—
NSP	R437, R438	RN1/10SE5601D	—
NSP	VR155	VCP1156, (10kW)	*RA000990R
NSP		Other Resistors RS1/10SxxxJ	—
		OTHERS	
NSP	CN207	173981-4, MT 4P CONNECTOR	—
NSP	CN12	SBRK03S-4, 3P JUMPER CONNECTOR	—
NSP	CN205	SBRK04S-4, 4P JUMPER CONNECTOR	—
NSP	CN203	SBRK05S-4, 5P JUMPER CONNECTOR	—
NSP	CN11, CN204	SBRK09S-4, 9P JUMPER CONNECTOR	—
	JA401	PKB1034, JACK	*YT002180R
	KN151	PKX1001, JUMPER TERMINAL	—
NSP	CN351	HLEM18S-1, CONNECTOR	—
	JA331	GP1F32T, OPTICAL LINK OUT	YJ15000090

Mark	No.	Description	Part No.
	JA1961	DKB1027, JACK	*YT002190R
NSP	CN201	B6P-SHF-1AA, 6P TOP POST	—
NSP	CN202	SLW16S-1C7, CONNECTOR	—
	X301	PSS1008, XTAL. RES. (16.9344MHz)	*JX000690R
	S1961	VSH1009, SLIDE SWITCH	*SS000630R
	X351	VSS1028, CERAMIC RESONATOR (4.19MHz)	*FQ000470R
NSP	—	VEF1040, PCB BINDER	—
NSP	—	VNE1948, SCREW PLATE	—

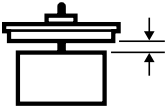
7. ADJUSTMENT

7.1 PREPARATIONS

7.1.1 Jigs and Measuring Instruments

 CD TEST DISC PHILIPS SBC429	 ⊖ screwdriver (small)	 ⊕ screwdriver (medium)	 ⊖ Precise screwdriver	 Low pass filter (39 kΩ + 0.001μF)
 DC power supply	 Dual-trace oscilloscope (10 : 1 probe)	 Digital multi meter		

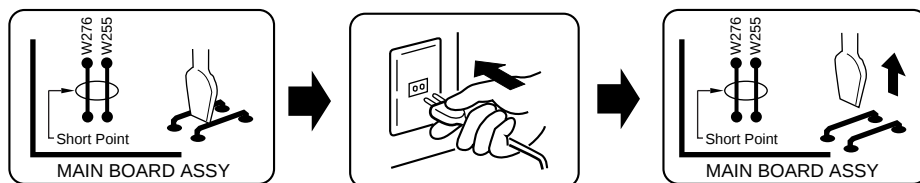
7.1.2 Necessary Adjustment Points

When	Adjustment points
Exchange PICKUP	① ② ③ → Page 38 - 39
Exchange MAIN BOARD ASSY	③ → Page 39
Exchange SERVO MECH ASSY	③ → Page 39
Exchange SPINDLE MOTOR	 ADJ → Page 8
Remove or Exchange EXTERIOR (2/2)	④ → Page 39

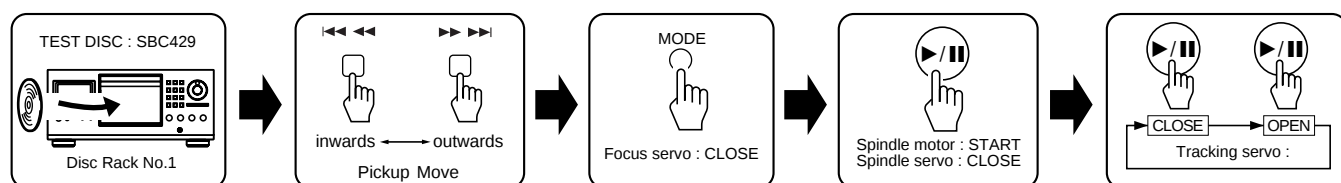
7.2 ADJUSTMENT

7.2.1 How to Start/Cancel Test Mode

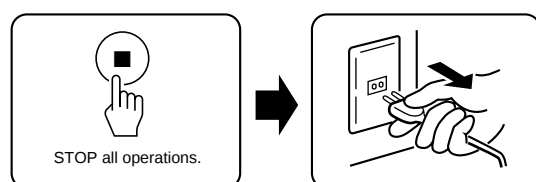
TEST MODE : ON



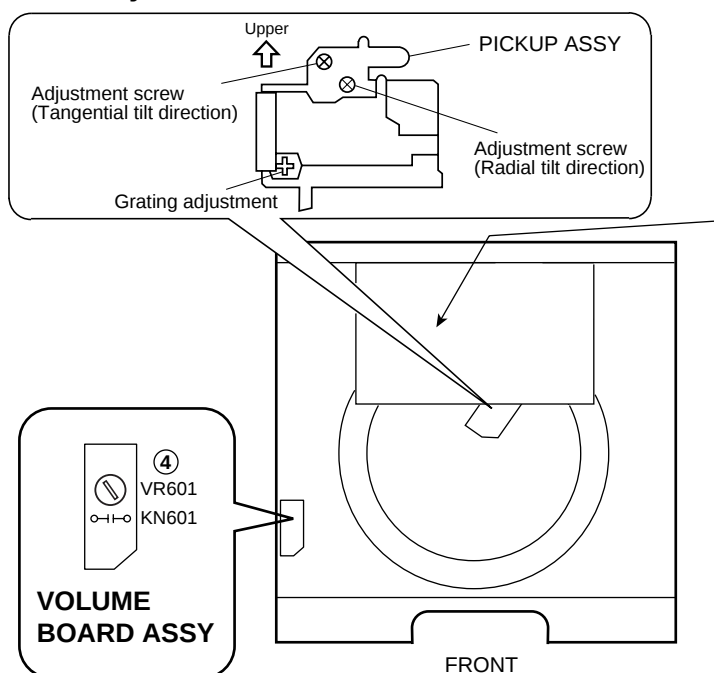
TEST MODE : PLAY



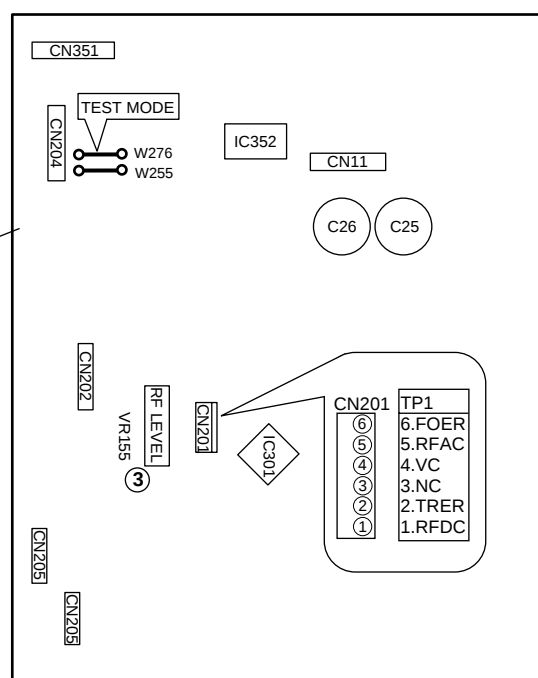
TEST MODE : STOP → CANCEL



7.2.2 Adjustment Location



FRONT



SIDE A

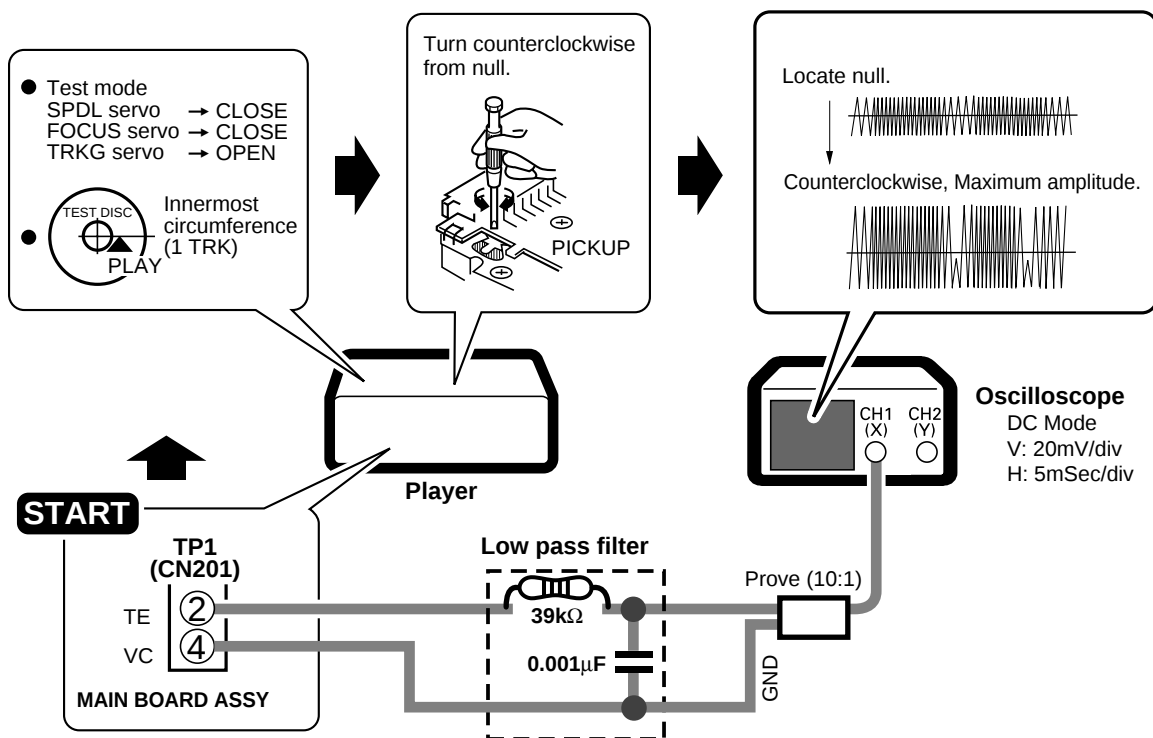
■ Adjustment Items

[Electrical Part]

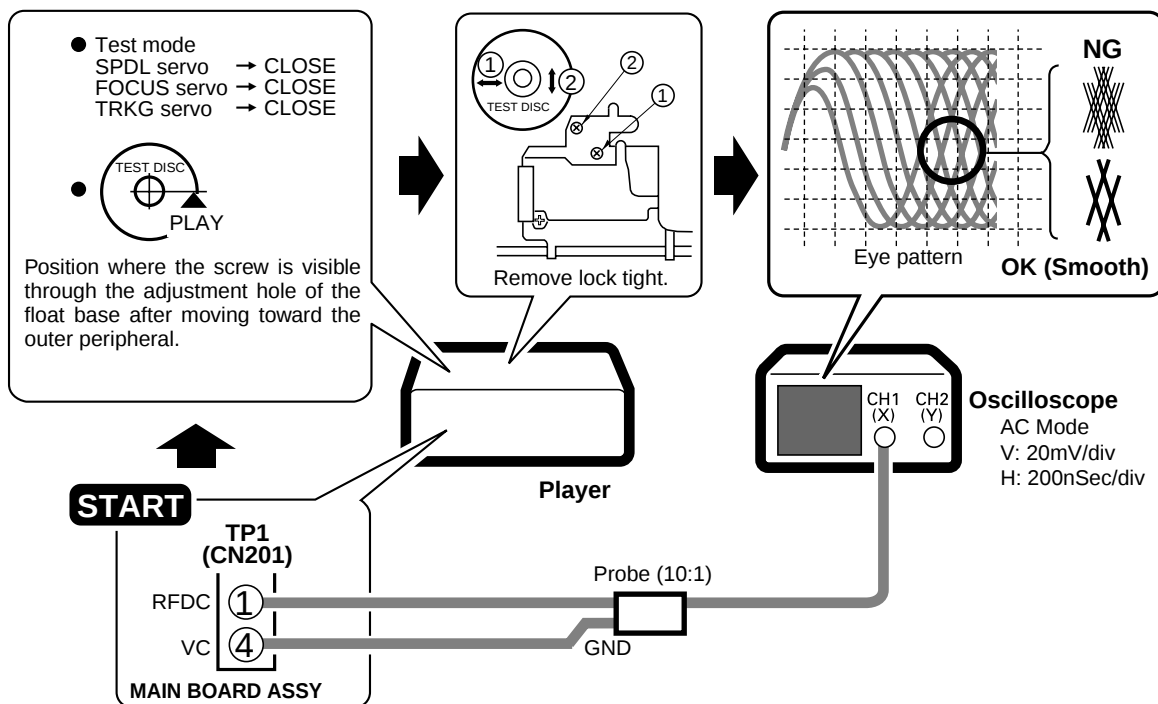
- ③ RF Level Adjustment
- ④ Disc Detection Adjustment

7.2.3 Electrical Adjustment

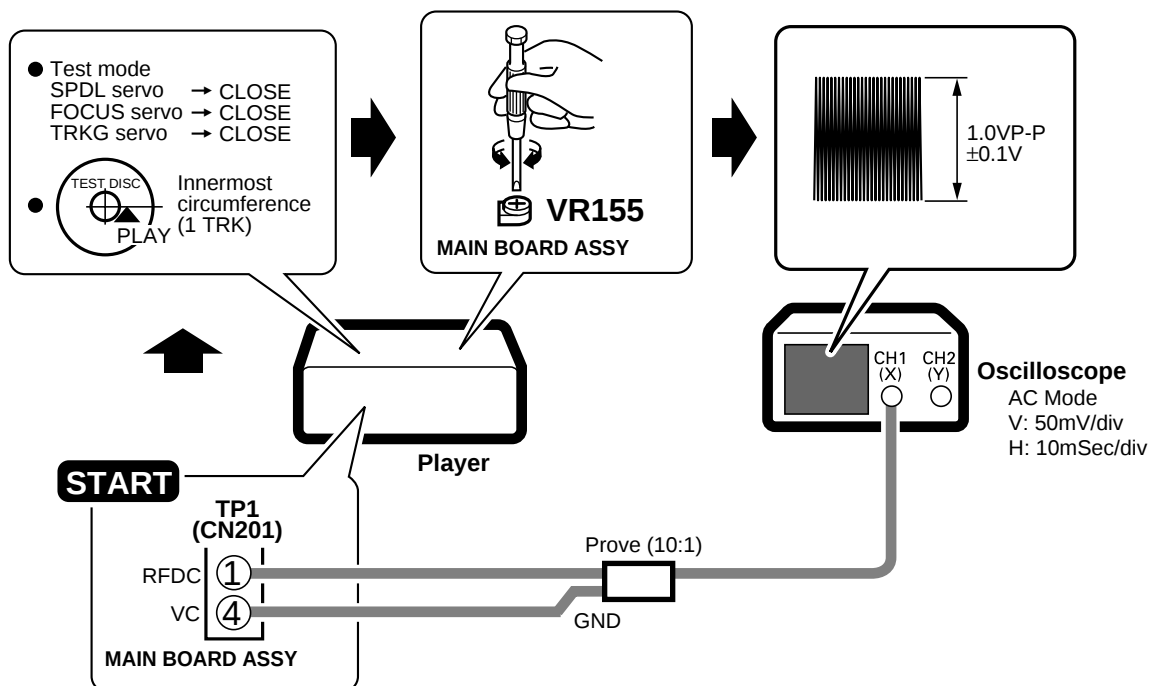
① Grating Adjustment



② Pickup ① Radial/ ② Tangential Direction Tilt Adjustment

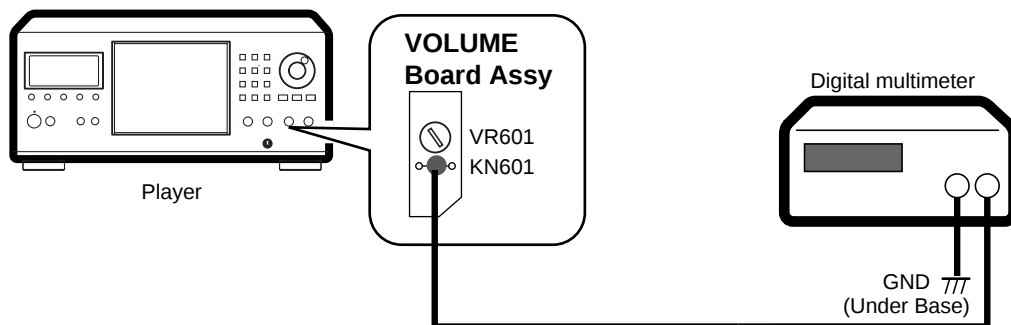


③ RF Level Adjustment



④ Disc Detection Adjustment

● Connection Diagram for Adjustment



● Adjustment Procedure

1. Connect all equipment as shown in the diagram.
2. Turn on the power (Normal mode) and put the test disc in the No. 1 disc slot.
3. Rotate the Jog Dial to select "DISC 1".
4. Press the "ENTER" button . (Disc 1 is clamped.)
5. Adjust VR601 on the VOLUME Board Assy so that the voltage becomes $860 \pm 5mV$.
 (Adjust so that the free play value is $860mV \pm 5mV$ at the low point)
6. Check the free play value at the high point.
 If it is higher than $1500mV$, re-adjust low value $840mV \pm 5mV$.
 If it is lower than $1000mV$, re-adjust low value $880mV \pm 5mV$.
7. Take off at the Digital Multi Meter.

8. GENERAL INFORMATION

8.1 DIAGNOSIS

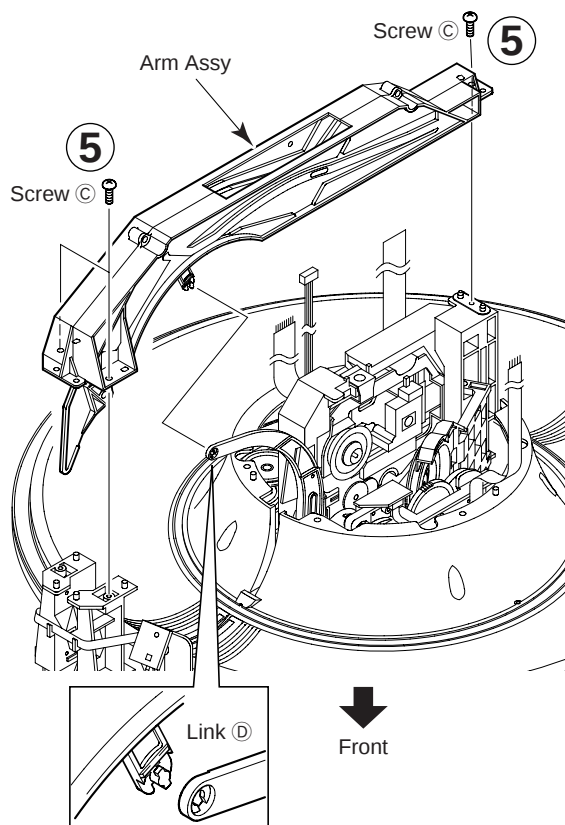
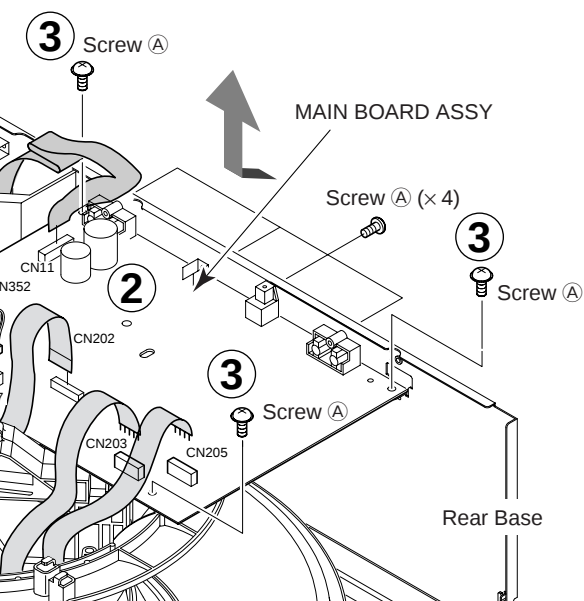
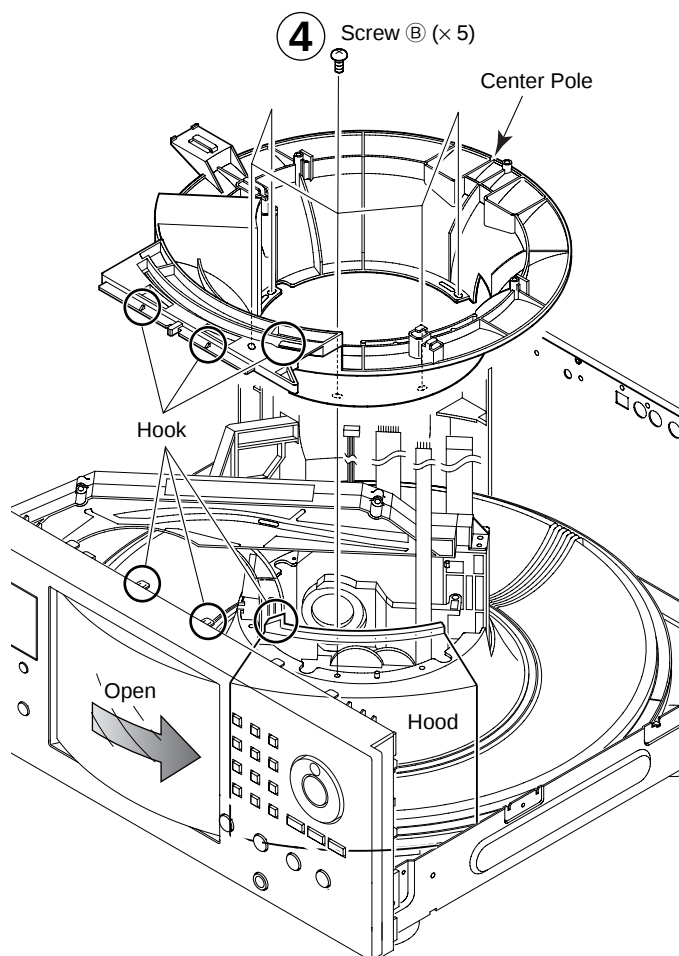
8.1.1 DISASSEMBLY

■ Removal of the Servo Mechanism Assy GM

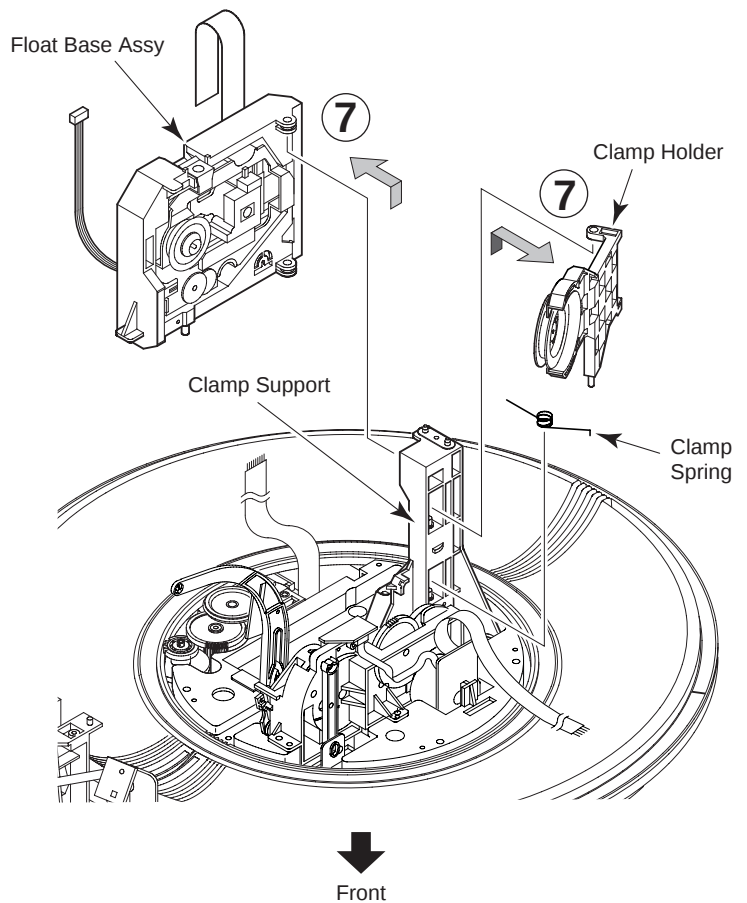
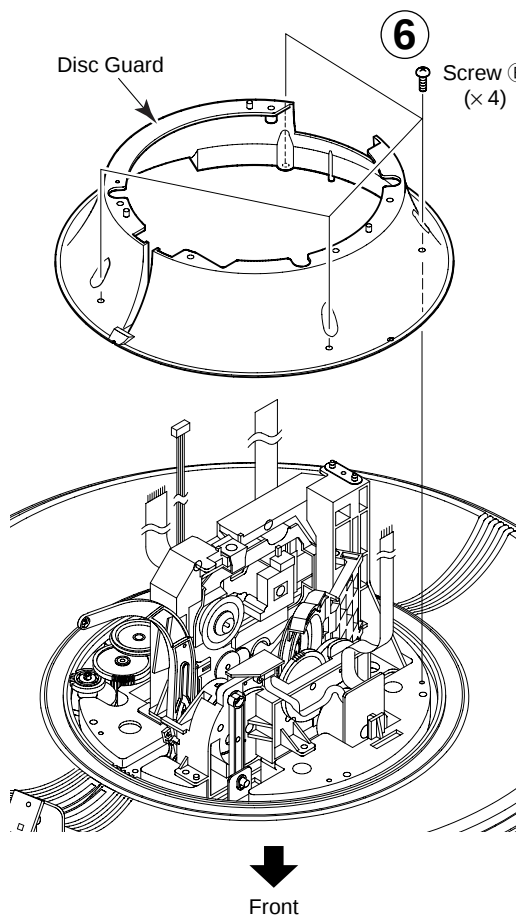
- ① Remove the Bonnet. (Left and right side : 2 screws, rear side : 3 screws)
- ② Remove the wires from the MAIN BOARD Assy. (8 places)
- ③ Remove the screws ① (8 screws), and remove the MAIN BOARD Assy.

Note) When the screws (3 screws) are removed in this condition, the mechanical unit can be removed as one entity. Refer to "2. EXPLODED VIEWS AND PARTS LIST".

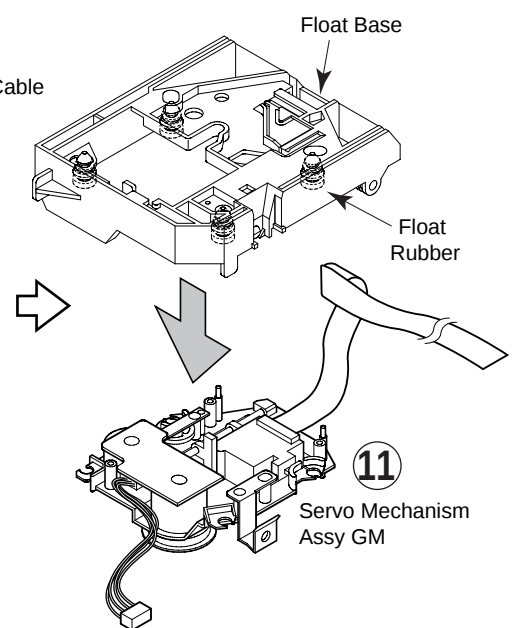
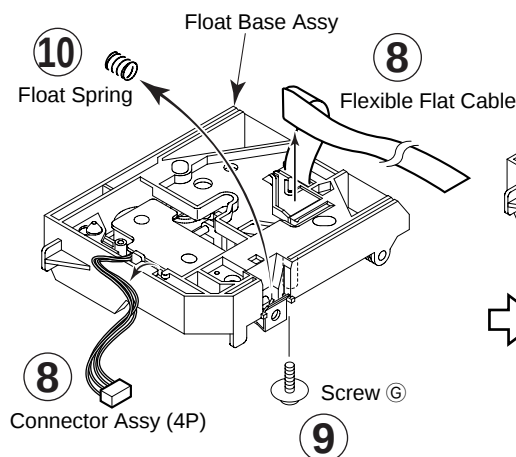
- ④ Open the Hood, remove the screws ② (5 screws), disconnect the hooks of Front Panel Assy and Hood (3 places), and remove the Center Pole.
- ⑤ Remove the screws ③ (3 screws), remove the link section ④, and remove the Arm Assy.



- ⑥ Remove the screws ⑤ (4 screws), and then remove the Disc Guard.
- ⑦ Remove the Float Base Assy and Clamp Holder.

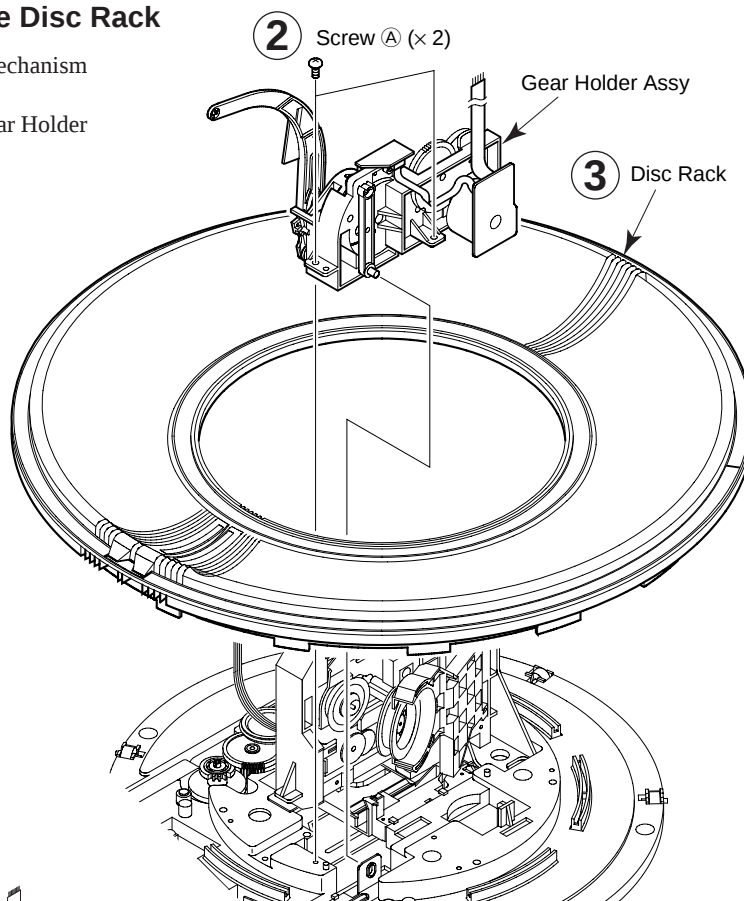


- ⑧ Remove the Flexible Flat Cable and the Connector Assy (4P) from the Float Base.
- ⑨ Remove the screw G.
- ⑩ Remove the float spring.
- (To install this part, line up the float angle side of the Servo Mechanism ASSY GM first, and press down on the float base side.)
- ⑪ Remove the float rubber from the Servo Mechanism ASSY GM. At this time the Float Rubber should remain on the Float Base side. (To install it on the Float Base when it has been removed, push it into place with a thin cylindrical object.)



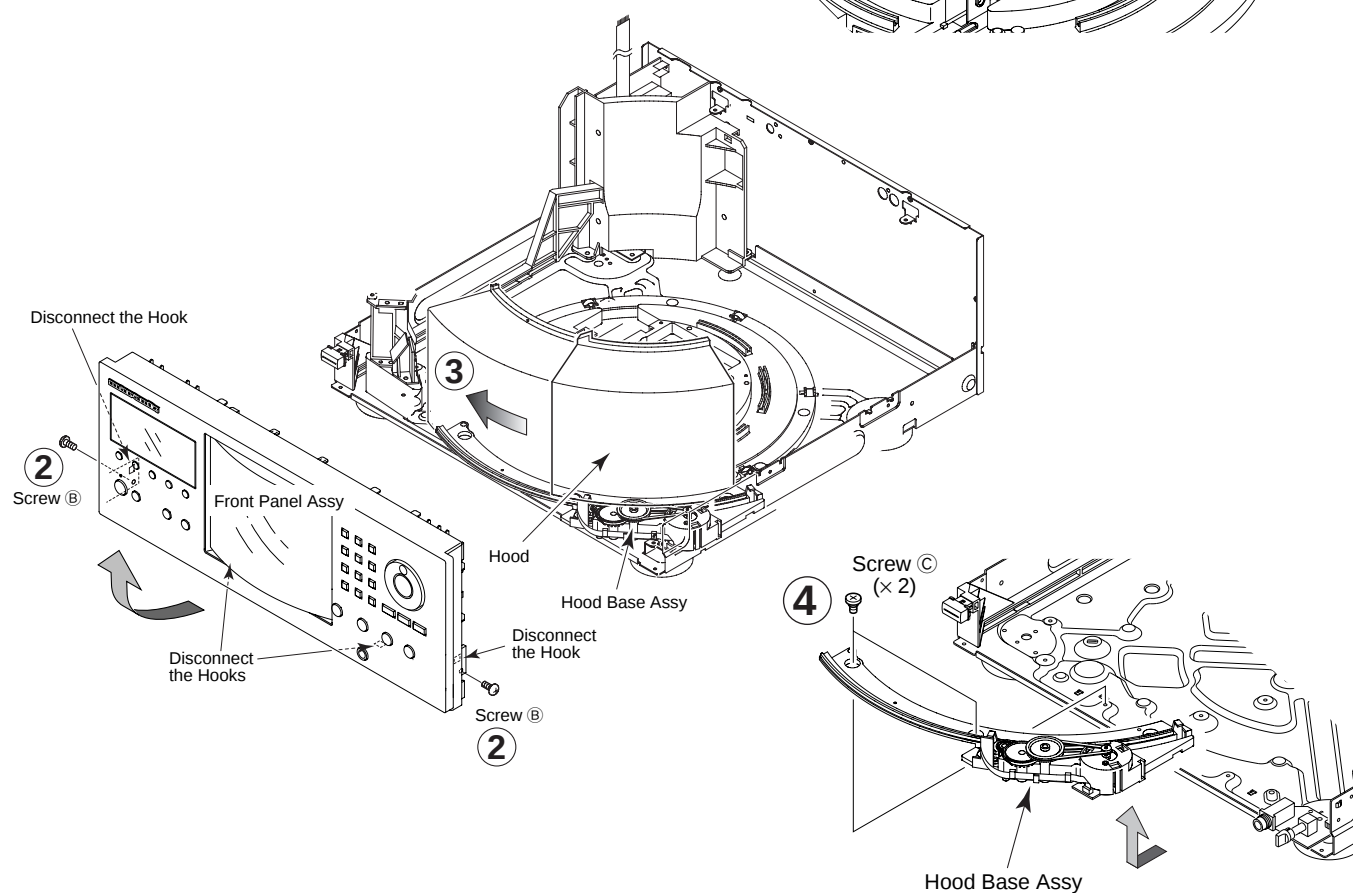
■ Removal of the Gear Holder Assy and the Disc Rack

- ① Perform the steps ① to ⑥ of "■ Removal of the Servo Mechanism Assy GM".
- ② Remove the screws ① (2 screws), and then remove the Gear Holder Assy.
- ③ Remove the Disc Rack.



■ Removal of the Hood and Hood Base Assy

- ① Perform the steps ① to ⑥ of "■ Removal of the Servo Mechanism Assy GM". and the steps ② and ③ of "■ Removal of the Gear Holder Assy and the Disc Rack".
- ② Remove the screws ② (2 screws), and then remove the Front Panel Assy.
- ③ Slide the Hood to the left side and remove it.
- ④ Remove the screws ③ (2 screws) and remove the Hood Base Assy.



8.1.2 ERROR CHECK DISPLAY

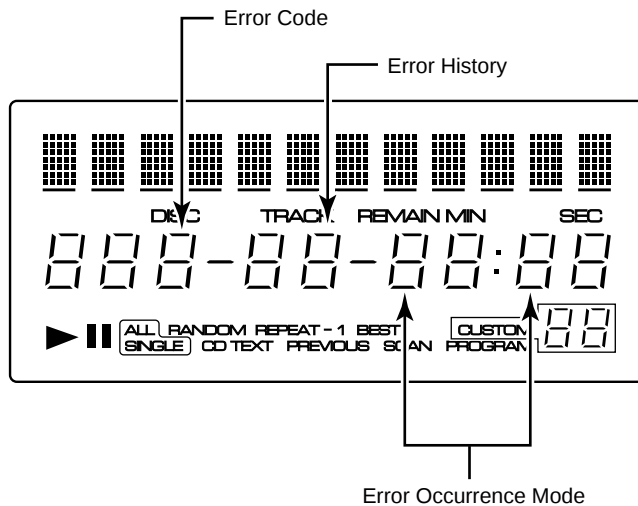
Error check mode (display of the error history for the last 16 times) is entered when the "TIME/CHARA" button is pressed in test mode. By looking at this display, it can be seen in which status the microcomputer has stopped.

(1) Explanation of the display

Disc No. = Error code

Track No. = Error history

Min : sec = Error occurrence mode



Press the "TIME/CHARA" button again to check past error codes. This switches the display. The contents of each display are as follows.

① Track No.: Error History

Display is possible from 1 to 16. The smaller numbers have occurred more recently. Accordingly, the error No. 1 is the error which has occurred most recently.

② Min : sec: Error Occurrence Mode

The internal mode at the time of occurrence of the displayed error is displayed. With Min : sec, the meaning is provided by the first digit.

Minutes digits

Display	Contents
0	During spindle stop operation
1	During disc return
2	During disc selection (during clamping operation at the time of 26)
3	During setup
4	During CDR setup operation
5	During TOC reading
6	During search operation on the disc
7	During play operation
8	During pause operation
9	During manual search

Seconds digits

Display	Contents
0	During hood closing operation and closed condition
1	During hood opening operation and open condition

③ Disc No.: Error Code Details

Note: A used display is displayed only when return to normal operation after error occurrence is not possible even when failsafe operation is performed.

<<< Rack Section >>>

User Display	Display	Contents
None	R0	- Disc playing was tried after loading, but the disc could not be detected because there was no disc, the disc was upside down, the disc was dirty, disc loading had not been completed, etc. - Focus was lost during disc playing because of disc scratches, dirt, etc.
None	R1	At the time of track selection during play, or when trying to play, the servo mechanism could not move to the position of the intended track within a fixed time.
U1	R3	Disc loading was tried, but loading was not possible within a fixed time. (The disc was not brought from the rack.)
	R4	It was tried to return the disc to the rack, but the disc could not be returned within a fixed time.
U2	R2	At the time of disc selection during play, or at the start of play from stopped condition, the selection mechanism could not move to the position of the intended disc within a fixed time.
	R5	After initialization of the selection mechanism, after selection mechanism NG, etc., forced rack section position detection is performed for the selection mechanism, but detection was not possible within a fixed time.
None	R6	- Playing was tried after disc loading, but normal disc rotation was not possible because the disc was upside down, the disc was dirty, disc loading had not been completed, etc. - During play normal rotation was not possible because of disc scratches, dirt, etc.

<<< Rack section >>>

User Display	Display	Contents
None	<i>RR 7</i>	When the position of the selection mechanism just before switching to disc selection operation os DCNT terminal = "L". (Normally, DCNT terminal = "H" exists when the selection mechanism is stopped, so that it can be assumed that the position of the mechanism has deviated for some reason. There is the possibility that a position deviation of the mechanism can cause a defect of the mechanism.)
None	<i>RR</i>	At the time of movement of the selection mechanism, a deviation has occurred between the present position of the disc and the disc position according to position detection. (It can be assumed that the waveform at the DCNT terminal and/or at the DPOS terminal has been miscounted. When a miscount occurs, a discrepancy occurs between the displayed disc No. and the counted disc position.)
None	<i>RR</i>	When the position of the mechanism became DCNT terminal = "L" during disc loading. (Normally, DCNT terminal = "H" exists when the selection mechanism is stopped, so that it can be assumed that the position of the mechanism has deviated for some reason. There is the possibility that a position deviation of the mechanism can cause a defect of the mechanism.)
None	<i>RR</i>	At the time of shifting to a different disc after play completion, the pickup does not return to the innermost circumference.

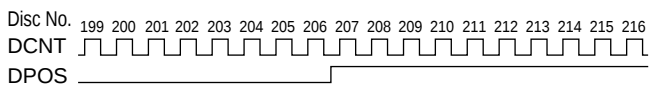
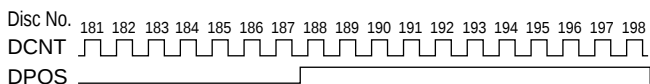
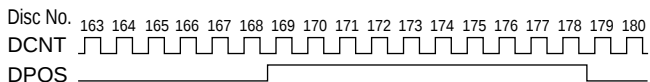
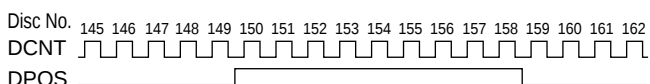
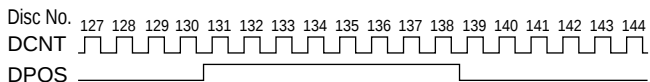
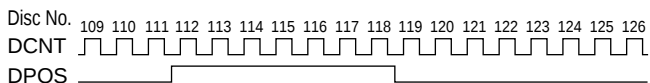
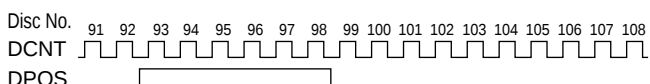
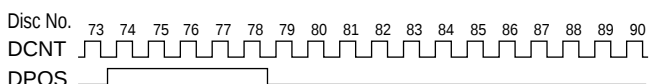
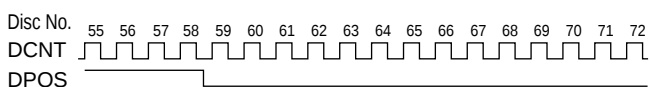
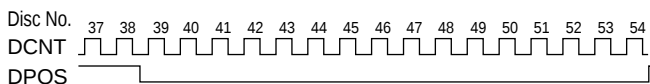
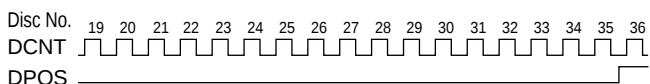
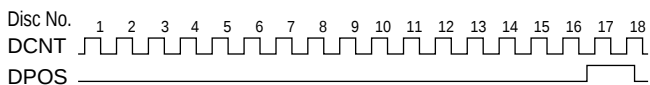
<<< Hood Section >>>

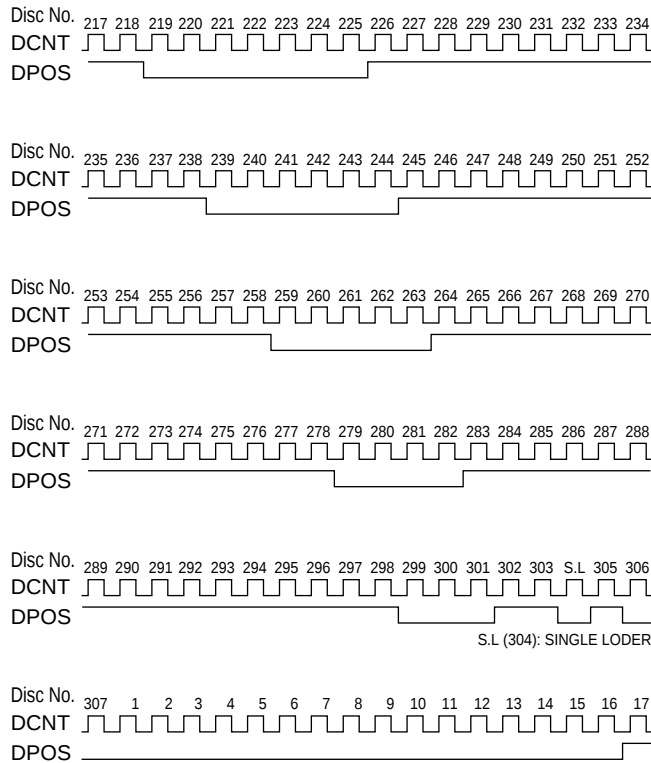
User Display	Display	Contents
<i>U3</i>	<i>P0</i>	The hood did not open within a fixed time. The hood switch was broken.
	<i>P1</i>	The hood did not close within a fixed time. The hood switch was broken.
None	<i>P2</i>	It was tried to force the closed hood open. The hood switch was broken.

8.1.3 EXPLANATION OF DISC DETECTION

1. Detection of the rack position

There are two types of slits on the rear of the rack, and their combination is used to find which disc has been selected during rack rotation. The input ports (DCNT, DPOS) are as follows.





Relation between input port DCNT, DPOS and position of the mechanism

2. Position relation between position of the rack mechanism and photocell for disc detection

The relation between these two positions is as follows.

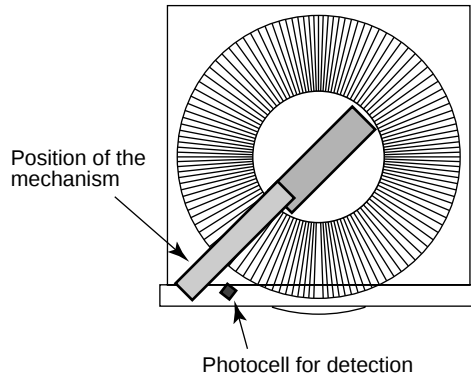


Fig.: The rack seen from above

The position of the mechanism and the photocell for detection are offset by a distance corresponding to 9 discs. Accordingly, the photocell for detection sees the disc number 9 discs before the position of the mechanism.

Example: Disc No. at the rack position : Disc No. 100
Disc No. seen by the photocell for detection : Disc No. 91

Note: The rack has 307 slits, but the slits 301 to 303 and 304 to 307 are the space for the side of the single loader and are not used. Disc detection also is not performed for them.

3. Disc Detection Method

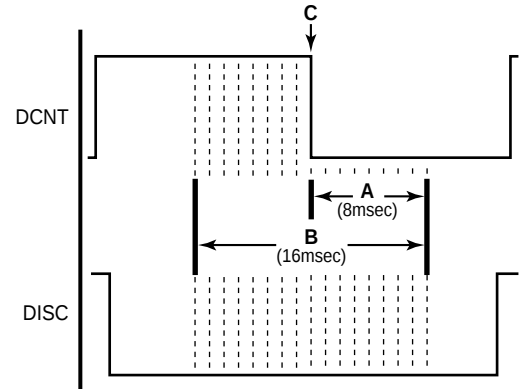
3-1 In Regard to the Disc Detection Method

- Disc detection is performed after stabilization of the rotation speed after rack rotation start and completion of acceleration. (After start of rotation, detection starts after feed of 20 discs.)
- The input ports DCNT and DISC of the microcomputer are used for disc detection.

Port Explanation : DCNT : As described above.

DISC : Input of the disc detection result by the photocell for disc detection.
Input value "H" : No disc,
"L" : Disc present

3-2 In Regard to the Disc Detection Timing



- ① The microcomputer looks every 1 msec at the status (H or L) of the two inputs DCNT and DISC.
- ② 8 msec (A in the figure) after the drop of DCNT (C in the figure), the last 17 DISC inputs (B in the figure) are checked. A disc is assumed to be resent when even one of them is "L".
- ③ No disc is assumed when DISC was "H" all 17 times (B in the figure) in ②.

Note: In regard to the drop ($\downarrow$) of DCNT

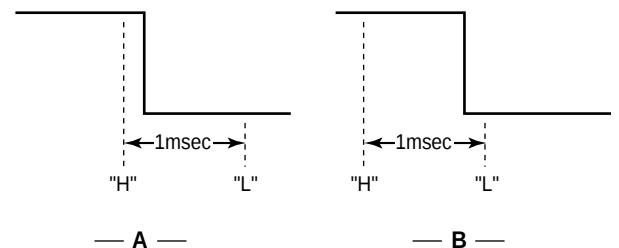
For looking at the drop or rise of DCNT, it is necessary to check DCNT every 1 msec for "H" or "L".

"H" $\rightarrow$ "L" means a drop ($\downarrow$).

"L" $\rightarrow$ "H" means a rise ($\uparrow$).

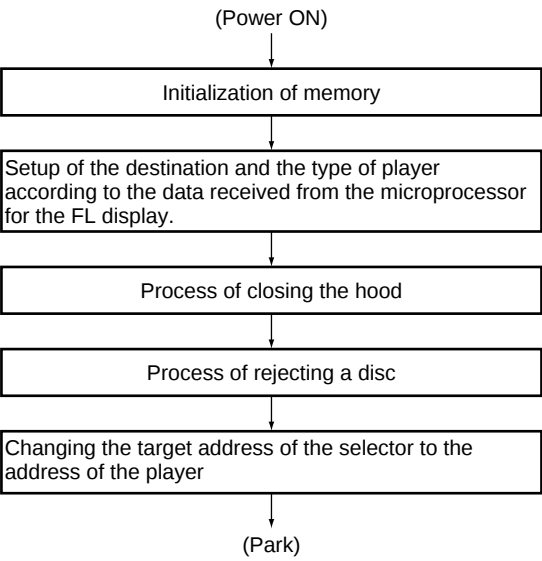
For the timing, either one of the following A and B can be assumed. Accordingly, the point where a drop is found differs by max. 1 msec for A and B.

Thus, using the above figure, it can be said that the time from finding that a drop has occurred until starting to check for disc presence (A in the above figure) becomes 8 to 9 msec.

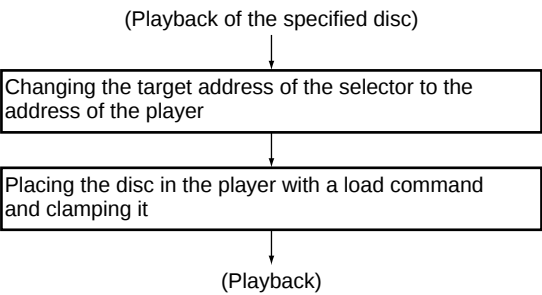


8.1.4 OPERATION FLOWCHART

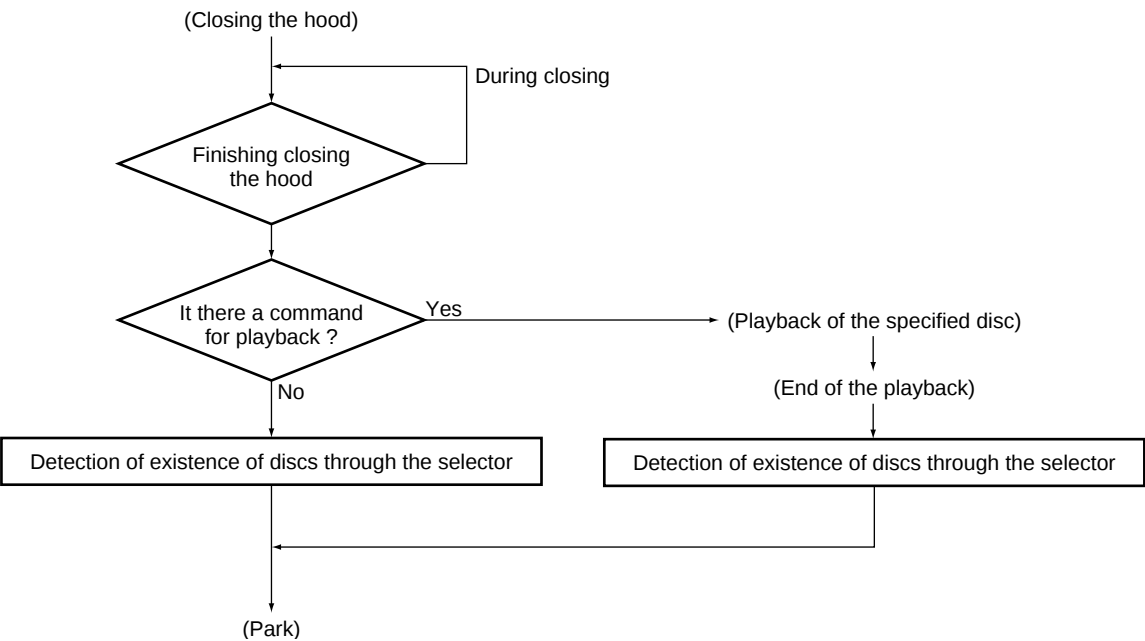
• From power-on till the end of initialization



•Until start of playback of the specified disc



•Closing the hood



8.2 PARTS

8.2.1 IC

■ PE5192A(IC701:DISPLAY BOARD ASSY)

● Display Control Micro-computer

● Pin Function

No.	Symbol	Name	I/O	Description
1	VDD	VDD	–	+5V
2	P37	Not used	O	OPEN
3	P36/BUZ	Not used	O	OPEN
4	P35/PCL	KD5	I	Key data input
5	P34/TI2	KD4	I	
6	P33/TI1	KD3	I	
7	P32/TO2	KD2	I	
8	P31/TO1	KD1	I	
9	P30/TO0	KD0	I	
10	RESET	RESET	I	CPU reset(L:Reset)
11	X2	X2	–	Connected to System
12	X1	X1	–	clock oscillator (4.19MHz)
13	IC	IC	–	GND
14	XT2	XT2	–	Not connect(open)
15	P04/XT1	Not used	–	Only for input:Input of GND
16	VDD	VDD	–	+5V
17	P27/SCK0	Not used	O	OPEN
18	P26/SO0/SB1	Not used	O	OPEN
19	P25/SI0/SB0	Not used	O	OPEN
20	P25/BUSY	Not used	O	OPEN
21	P23/STB	DERQ	O	Completion of transmission setting to the System Control Microcomputer
22	P22/SCK1	DCLK	I	Clock input for serial communication with the System Control Microcomputer
23	P21/SO1	KYDT	O	Serial data output to the System Control Microcomputer
24	P20/SI1	DPDT	I	Serial data input from the System Control Microcomputer
25	AVSS	AVSS	–	GND
26	P17/ANI7	Not used	O	OPEN
30	P13/ANI3			
31	P12/ANI2	ACRY	O	Main microcomputer power ON/OFF
32	P11/ANI1	KBDAT	I&O	Keyboard communication data transmission and reception
33	P10/ANI0	Not used	O	OPEN
34	AVDD	AVDD	–	+5V
35	AVREF	AVREF	–	GND
36	P03/INTP3	DCS	I	Serial communication timing input with the main microcomputer
37	P02/INTP2	KBCLK	I	Keyboard communication data clock input
38	P01/INTP0	JOG1	I	Jog input 1
39	P00/INTP0/TI0	RMDET	I	Remote control data input
40	VSS	VSS	–	GND
41	P74	Not used	O	OPEN
44	P71			
45	P70	JOG2	I	Jog input 2
46	VDD	VDD	–	+5V
47	P127/FIP52	STBL	O	STANDBY LED

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

No.	Symbol	Name	I/O	Description	
48 54	P126/FIP51 P120/FIP45	S36 S30	O	Segment output for FL drive	
55 62	P117/FIP44 P110/FIP37	S29 S22	O		
63 70	P107/FIP36 P100/FIP29	S21 S14	O		
71 78	P97/FIP28 P90/FIP21	S13 S6	O		
79	VLOAD	VLOAD	–		-30V
80 84	P87/FIP20 P84/FIP16	S5 S1	O		Segment output for FL drive
85 87	P83/FIP15 P80/FIP13	G16 G14	O		Digit output for FL drive
88 100	FIP12 FIP0	G13 G1	O		

■ PE5133B (IC351:MAIN BOARD ASSY)

● System Control Micro-computer

● Pin Function

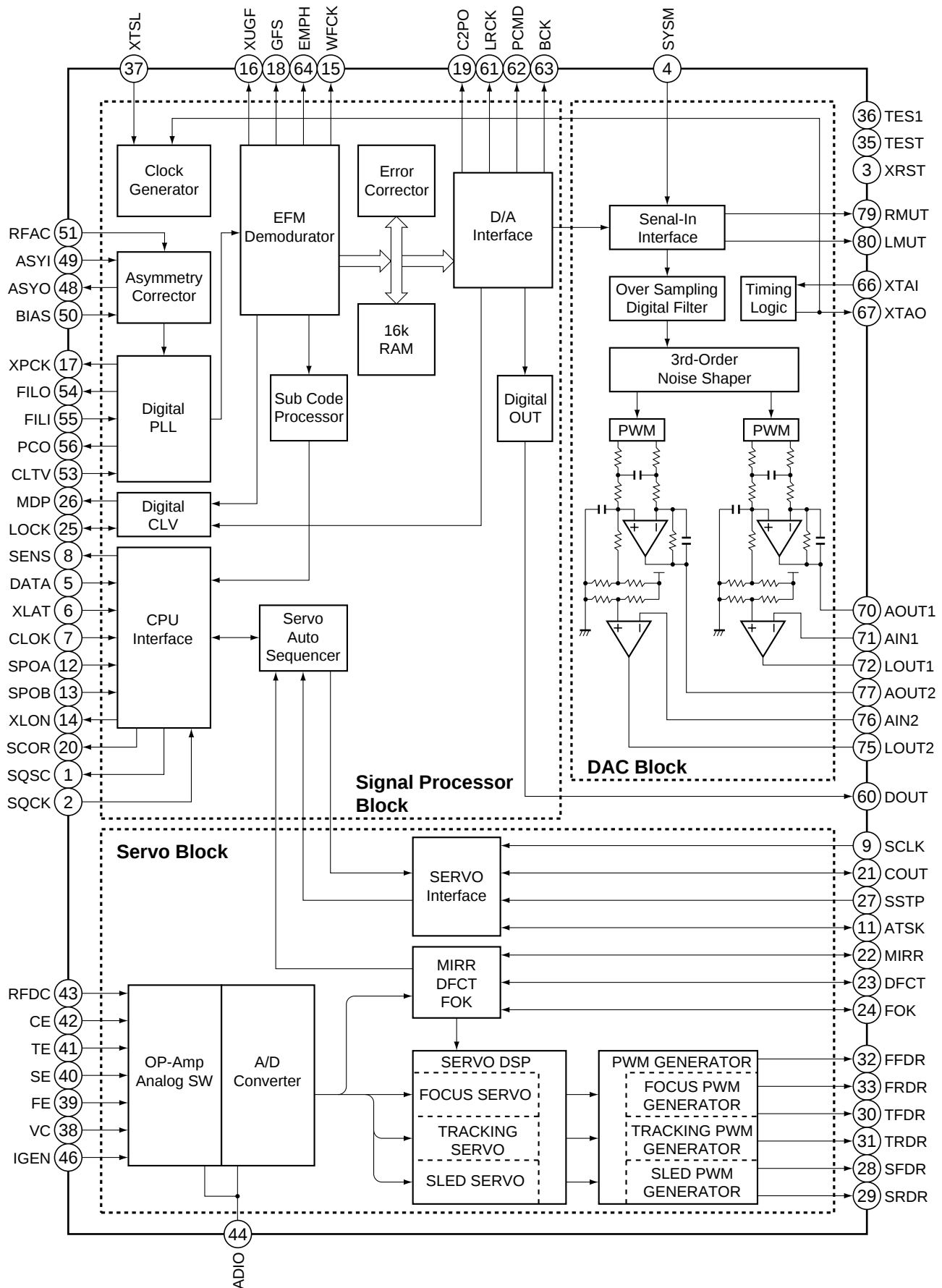
No.	Symbol	Name	I/O	Description
1	P120/RTP0	Not used	O	OPEN
2	P121/RTP1	$\overline{\text{XLAT}}$	O	LSI control data , latch pulse output
3	P122/RTP2	Not used	O	Output of "L"
4	P123/RTP3	$\overline{\text{NST}}$	I	Slider INSIDE switch input(L:INSIDE)
5	P124/RTP4	$\overline{\text{OPEN}}$	I	Hood open switch input (L:Opening completed)
6	P125/RTP5	$\overline{\text{CLS}}$	I	Hood close switch input (L:Closing completed)
7	P126/RTP6	$\overline{\text{EJCT}}$	I	Loading out switch input (L:Ejection completed)
8	P127/RTP7	$\overline{\text{CLMP}}$	I	Loading mechanism clamping switch nput (L:Clamping completed)
9	IC	IC	—	GND
10	X2	X2	—	Connected to System
11	X1	X1	—	clock oscillator (4.19MHz)
12	VDD	VDD	—	+5V
13	XT2	(XT2)	—	Not connect(open)
14	P07/XT1	Not used	I	Input of 5V(only for input)
15	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$	I	CPU reset(L:Reset)
16	P00/INTP0/TI00	DREQ	I	Communication start request input from the Display Control Microcomputer (L:communication start)
17	P01/INTP1/TI01	Not used	O	Output of "L"
18	P02/INTP2	DPOS	I	Pulse input for disc position detection
19	P03/INTP3	SCOR	I	Subcode synchronization S0+S1 input
20	P04/INTP4	DISC	I	Disc detection pulse input (L:Disc present)
21	P05/INTP5	Not used	O	Output of "L"
22	P06/INTP6	DCNT	I	Disc count pulse input
23	AVDD	AVDD	—	+5V
24	AVREF0	AVREF0	—	GND
25	P10/ANI0	Not used	O	Output of "L"
26	P11/ANI1	MUTM	O	Master side mute output(L:Mute)
27	P12/ANI2	MUTA	O	Audio muting output(L:Mute)
28	P13/ANI3	Not used	O	Output of "L"
29	P14/ANI4	MSIN	I	Not used (pull-down required)
30	P15/ANI5	KYCON	O	Not used
31	P16/ANI6	SYNC1	I	Not used (pull-up required)
32	P17/ANI7	Not used	O	OPEN
33	AVSS	AVSS	—	GND
34	P130/AN00	Not used	O	Output of "L"
35	P131/AN01	Not used	O	Output of "L"
36	AVREF1	AVREF1	—	+5V
37	P70/SI2/RxD	SENS	I	SENS input
38	P71/SO2/TxD	Not used	O	Output of "L"
39	P71/ $\overline{\text{SCK2}}$ /ASCK	SCLK	O	SENS input clock
40	VSS	VSS	—	GND

No.	Symbol	Name	I/O	Description
41	P20/SI1	KYDT	I	Communication data input in regard to the Display Control Microcomputer
42	P21/SO1	DPDT	O	Communication data output in regard to the Display Control Microcomputer
43	P22/SCK1	DCLK	O	Communication clock in regard to the Display Control Microcomputer
44	P23/STB	DCS	O	Communication request output in regard to the Display Control Microcomputer (H-L:communication request)
45	P24/BUSY	SQCK	O	Q data serial clock output(Text)
46	P25/SI0/SB0	SQSO	I	Q data serial input (combined use for FCOK/GFS/SENS)
47	P26/S00/SB1	MDAT	O	LSI control data serial output
48	P27/SCK0	CLOCK	O	Serial clock
49	P80/A0	A0	O	External RAM address line
56	P87/A7	A7	O	External RAM data input/output
57	P40/AD0	A14		
58	P41/AD1	A12		
59	P42/AD2	A10	O	External RAM data input/output
60	P43/AD3	A11	O	
61	P44/AD4	A9	O	
62	P45/AD5	A8	O	External RAM data input/output
63	P46/AD6	A13	O	
64	P47/AD7	A15	O	
65	P50/A8	IO4	O	External RAM data input/output
69	P54/A12	IO8	O	External RAM data input/output
70	P55/A13	IO1		
71	VSS	VSS		
72	P56/A14	IO2	O	External RAM data input/output
73	P57/A15	IO3	O	
74	P60	SLCHK	I	
75	P61	MSCHK	I	Not used (pull-up required)
76	P62	Not used	O	Output of "L"
77	P63	Not used	O	Output of "L"
78	P64/ $\overline{\text{RD}}$	A16	O	External RAM address line
79	P65/ $\overline{\text{WR}}$	$\overline{\text{WE}}$	O	Write control output (L:Write)
80	P66/ $\overline{\text{WAIT}}$	$\overline{\text{CS}}$	O	External RAM chip selection output (H:Standby)
81	P67/ASTB	$\overline{\text{RD}}$	O	Read control output(L:Read)
82	P100/TI5/TO5	Not used	O	OPEN
83	P101/TI6/TO6	DSL T	O	Selector output
84	P102	DRST	O	Count-up (DSRT:L ,DSL T:H) Count-down (DSRT:H ,DSL T:L) STOP (DSRT:L ,DSL T:L)
85	P103	MOPN	O	Output for hood motor
86	P30/TO0	MCLS	O	OPEN (MOPN:H ,MCLS:L) CLOSE (MOPN:L ,MCLS:H) STOP (MOPN:L ,MCLS:L)
87	P31/TO1	LIN	O	Output for loading motor

No.	Symbol	Name	I/O	Description
88	P32/TO2	LOUT	O	IN (LIN:H ,LOUT:L) OUT (LIN:L ,LOUT:H) STOP (LIN:L ,LOUT:L)
89	P33/TI1	CDRW	O	CD/RW Gain change
90	P34/TI2	XRST	O	Reset output for each LSI
91	P35/PCL	Not used	O	Output of "L"
92	P36/BUZ	Not used	O	OPEN
93	P37	PLED	O	Sensor output for disc detection (H:Light on)
94	P90	Not used	O	Output of "L"
95	P91	TEST2	I	Test mode input for checker (H:Test)
96	P92	Not used	O	OPEN
97	P93	Not used	O	OPEN
98	P94	HBIT	I	Not used (pull-down required)
99	P95	TEST	I	Test mode switching input (H:Test mode)
100	P96	Not used	O	Output of "L"

■ CXD2587Q (IC301: MAIN BOARD ASSY)

● Decoder



●Pin Function

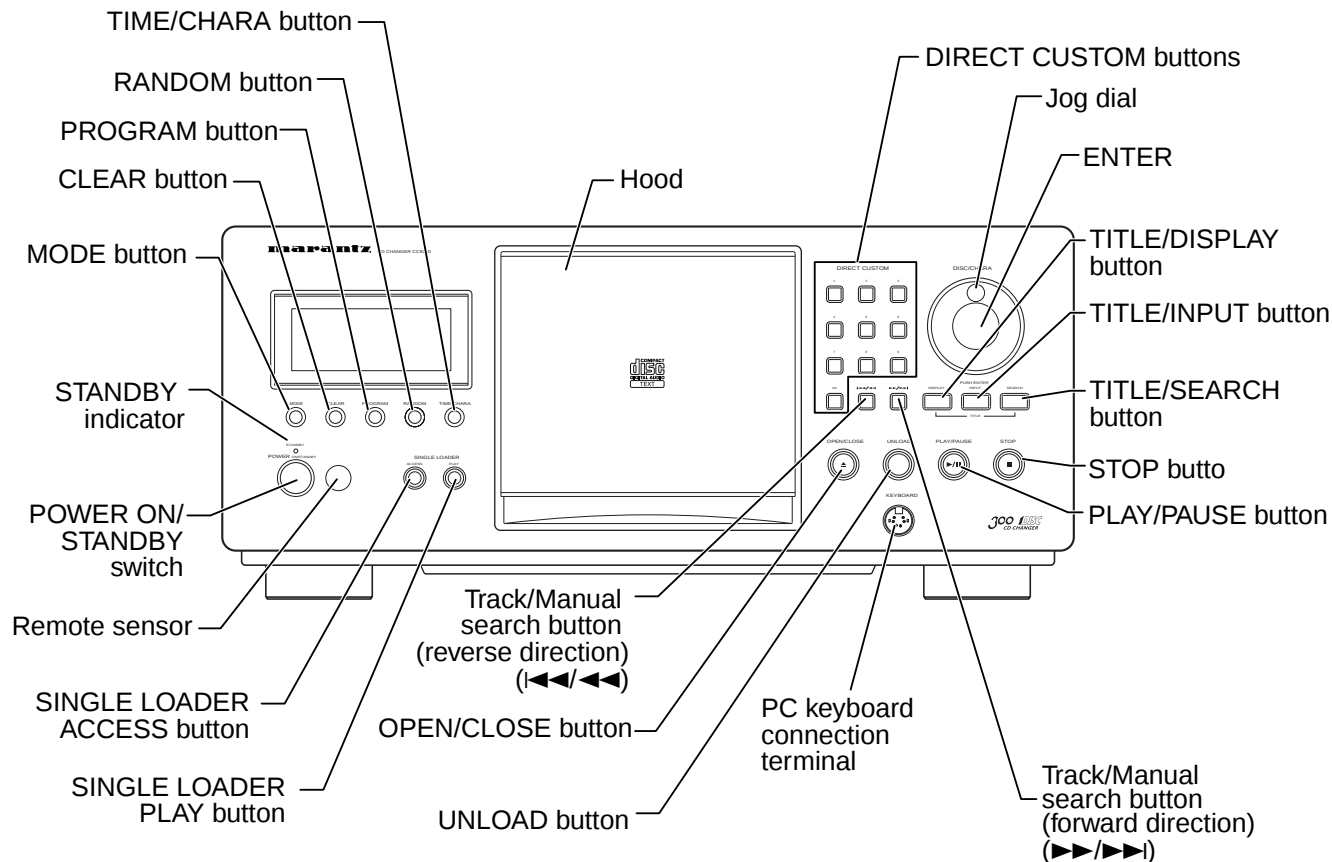
iN- o.	Pin Name	I/O	Function	No.	Pin Name	I/O	Function
1	SQSO	O	SubQ 80-bit, PCM peak and level data output CD TEXT data output	41	TE	I	Tracking error input
2	SQCK	I	Clock input for SQSO readout	42	CE	I	Center servo analog input
3	XRST	I	System reset Reset when "L"	43	RFDC	I	RF signal input
4	SYSM	I	Mute input Mute when "H"	44	ADIO	O	OP amplifier output
5	DATA	I	Serial data input from CPU	45	AVss0	–	Analog GND
6	XLAT	I	Latch input from CPU Serial data is latched at the falling edge.	46	IGEN	I	Constant current input for OP amplifier
7	CLOK	I	Serial data transfer clock input from CPU	47	AVdd0	–	Analog power supply
8	SENS	O	SENS output to CPU	48	ASYO	O	EFM full-swing output ("L"=VSS, "H"=VDD)
9	SCLK	I	Clock input for SENS serial-data readout	49	ASYI	I	Asymmetry compare voltage input
10	VDD	–	Digital power supply	50	BIAS	I	Constant current input of the asymmetry circuit
11	ATSK	I/O	Input and output for anti-shock	51	RFAC	I	EFM signal input
12	SPOA	I	Microcomputer extended interface (input A)	52	AVss3	–	Analog GND
13	SPOB	I	Microcomputer extended interface (input B)	53	CLTV	I	VCO control voltage input for master
14	XLON	O	Microcomputer extended interface (output)	54	FILO	O	Filter output for master PLL (Slave=digital PLL)
15	WFCK	O	WFCK output	55	FILI	I	Filter input for master PLL
16	XUGF	O	XUGF output MNT1 and RFCK output by switching the command.	56	PCO	O	Charge pump output for master PLL
17	XPCK	O	XPLCK output MNT0 output by switching the command.	57	AVdd3	–	Analog power supply
18	GFS	O	GFS output MNT3 and XRAOF output by switching the command.	58	Vss	–	Digital GND
19	C2PO	O	C2PO output GTOP output by switching the command.	59	VDD	–	Digital power supply
20	SCOR	O	Outputs "H" when either subcode sync. S0 or S1 is detected.	60	DOUT	O	DIGITAL OUT output
21	COUT	I/O	Input and output of track-number count signal	61	LRCK	O	D/A interface LR clock output f=F _s
22	MIRR	I/O	Mirror signal input and output	62	PCMD	O	D/A interface Serial data output (two's complement, MSB first)
23	DFCT	I/O	Defect signal input and output	63	BCK	O	D/A interface Bit clock output
24	FOK	I/O	Focus OK signal input and output	64	EMPH	O	Outputs "H" when the playback disc has emphasis, and "L" when there is no emphasis.
25	LOCK	I/O	GFS is sampled at 460Hz; when GFS is "H", this pin outputs "H". If GFS is "L" eight consecutive samples, this pin outputs "L". Input when LKIN="H".	65	XVDD	–	Power supply for master clock
26	MDP	O	Servo control output of spindle motor	66	XTAI	I	Crystal oscillation circuit input Input the external master clock via this pin.
27	SSTP	I	Detection signal input of disc innermost	67	XTAO	O	Crystal oscillation circuit output
28	SFDR	O	Sled drive output	68	XVss	–	GND for master clock
29	SRDR	O		69	AVdd1	–	Analog power supply
30	TFDR	O	Tracking drive output	70	AOUT1	O	L ch analog output
31	TRDR	O		71	AIN1	I	L ch OP amp. input
32	FFDR	O	Focus drive output	72	LOUT1	O	L ch LINE output
33	FRDR	O		73	AVss1	–	Analog GND
34	Vss	–	Digital GND	74	AVss2	–	Analog GND
35	TEST	I	TEST pin : normally GND	75	LOUT2	O	R ch LINE output
36	TEST	I		76	AIN2	I	R ch OP amp. input
37	XTSL	I	Crystal selector input "L":16.9344MHz, "H":33.8688MHz	77	AOUT2	O	R ch analog output
38	VC	I	Center voltage input	78	AVdd2	–	Analog power supply
39	FE	I	Focus error signal input	79	RMUT	O	R ch zero detection flag
40	SE	I	Sled error signal input	80	LMUT	O	L ch zero detection flag

Notes)

- PCMD is an MSB first. two's complement output.
- GTOP is used to monitor the frame sync protection status. (High:sync protection window released)
- XUGF is the negative pulse for the frame sync derived from the EFM signal. It is the signal before sync protection.
- XPCK is the inverse of the EFM PLL clock. The PLL is designed so that the falling edge of XPLCK and the EFM signal transition point coincide.
- GFS goes high when the frame sync and the insertion protection timing match.
- RFCK is derived with the crystal accuracy. This signal has a cycle of 136μs.
- C2PO represents the data error status.
- XROF is generated when the 16K RAM exceeds the ±4F jitter margin.

9. PANEL FACILITIES

FRONT PANEL



DISPLAY

