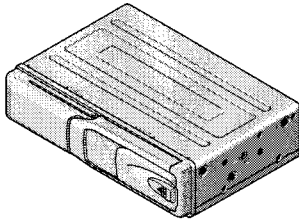


Service Manual

Pioneer

PION-06017



ORDER NO.
CRT2589

MULTI-COMPACT DISC PLAYER

CDX-P670

X1N/EW



● This service manual should be used together with the following manual(s):

Model No.	Order No.	Mech. Module	Remarks
CX-892	CRT2356	C7	CD Mech. Module: Circuit Description, Mech. Description, Disassembly

CONTENTS

1. SAFETY INFORMATION	3	7. GENERAL INFORMATION	38
2. EXPLODED VIEWS AND PARTS LIST	4	7.1 DIAGNOSIS	38
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6. ADJUSTMENT.....	31	7.2 IC	47
		7.3 OPERATIONAL FLOW CHART	49
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PIONEER CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS SERVICE INC. P.O.Box 1760, Long Beach, CA 90801-1760 U.S.A.
PIONEER EUROPE NV Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE.LTD. 253 Alexandra Road, #04-01, Singapore 159936

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K-ZZY, NOV. 2000

CDX-P670

● CD Player Service Precautions

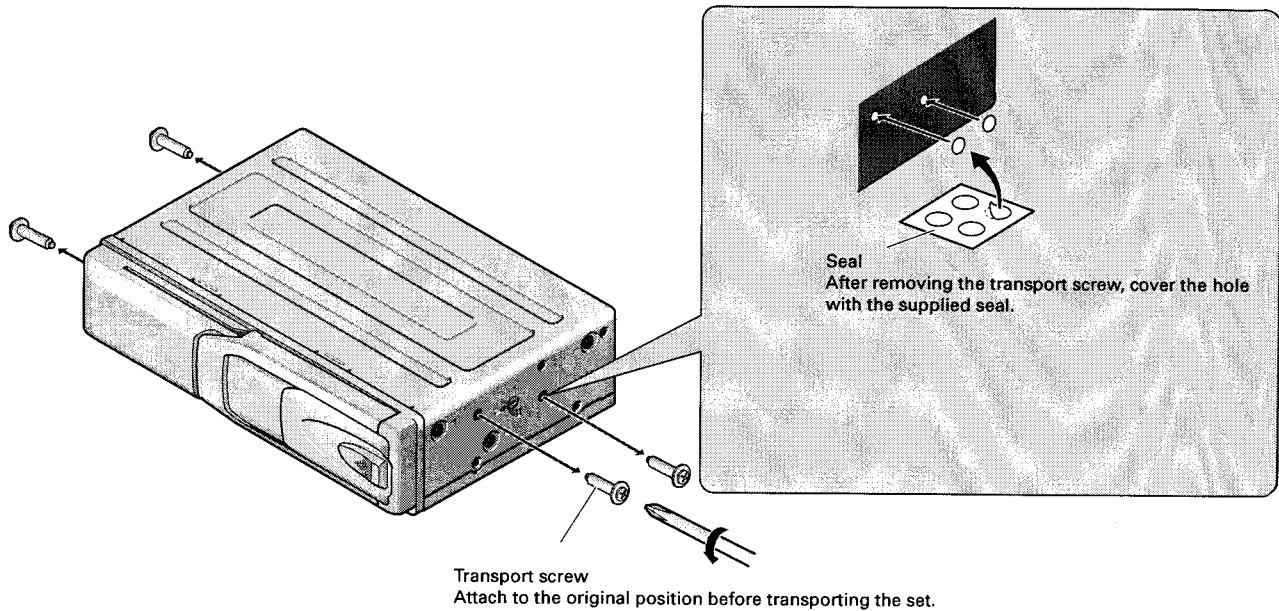
1. For pickup unit(CXX1285) handling, please refer to "Disassembly"(see page 44).

During replacement, handling precautions shall be taken to prevent an electrostatic discharge(Protection by a short pin).

2. During disassembly, be sure to turn the power off since an internal IC might be destroyed when a connector is plugged or unplugged.

3. Please check the grating after changing the service pickup unit(see page 32).

4. Since these screws protect the mechanism during transport, be sure to affix it when it is transported for repair, etc.



A transport screw has been attached to the set in order to protect it during transportation. After removing the transport screw, cover the hole with the supplied seal. Be sure to remove the transport screw before mounting the set. The removed transport screw should be retained in the accessory bag for use the next time the set is transported.

1. SAFETY INFORMATION

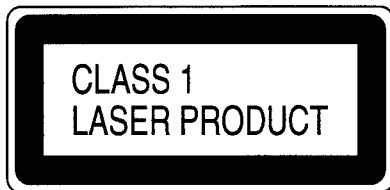
1. Safety Precautions for those who Service this Unit.

- When checking or adjusting the emitting power of the laser diode exercise caution in order to get safe, reliable results.

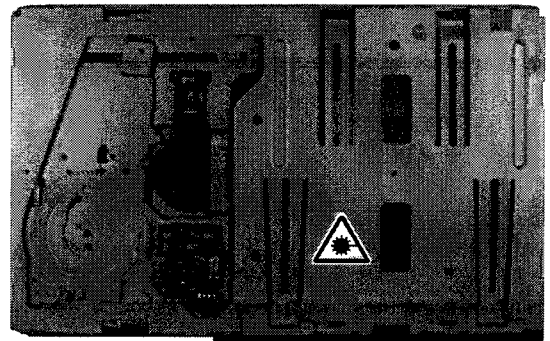
Caution:

1. During repair or tests, minimum distance of 13cm from the focus lens must be kept.
2. During repair or tests, do not view laser beam for 10 seconds or longer.

2. A "CLASS 1 LASER PRODUCT" label is affixed to the rear of the player.



3. The triangular label is attached to the mechanism unit frame.



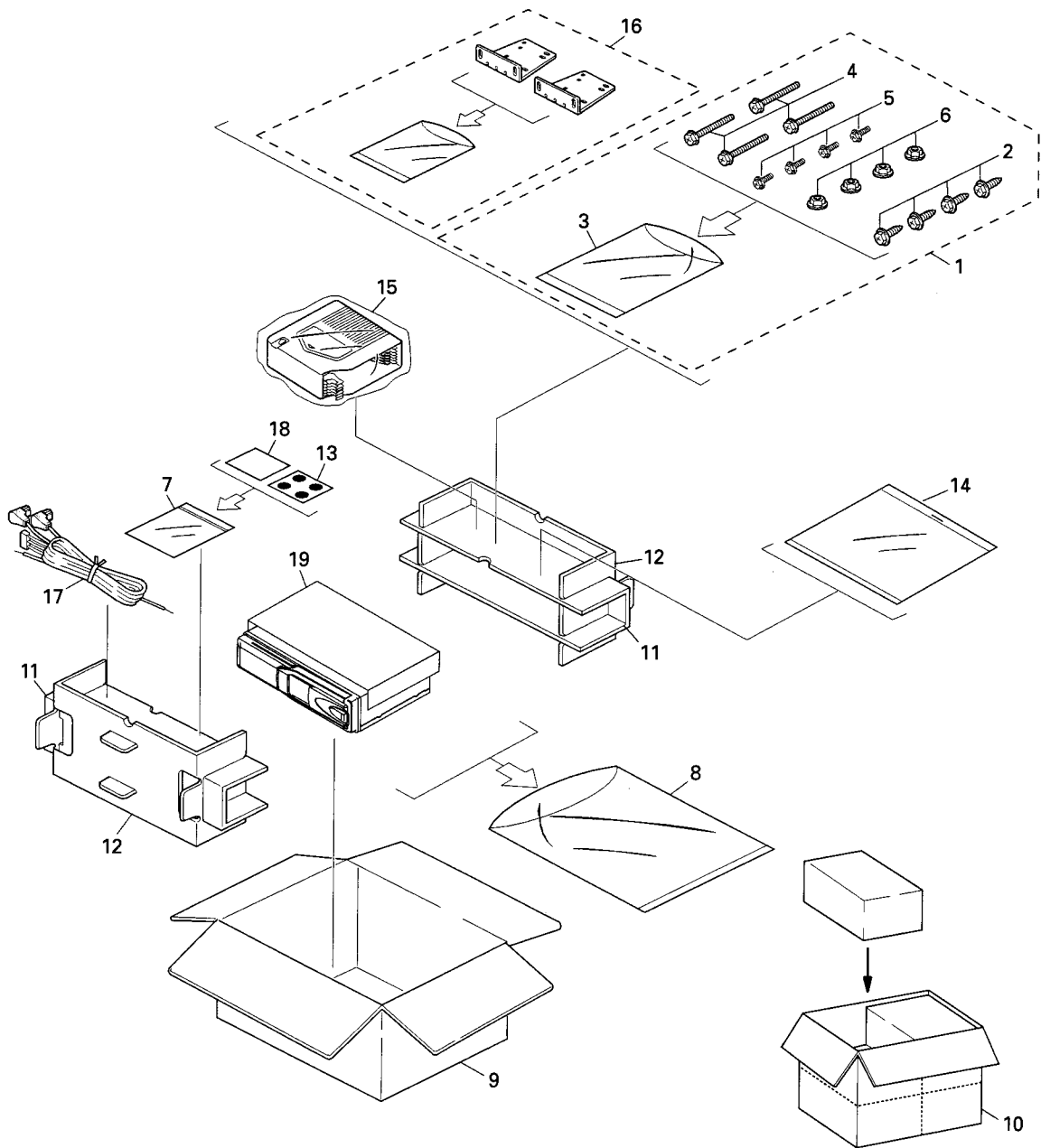
4. Specifications of Laser Diode

Specifications of laser radiation fields to which human access is possible during service.

Wavelength = 800 nanometers

2. EXPLODED VIEWS AND PARTS LIST

2.1 PACKING



NOTE:

- Parts marked by "*" are generally unavailable because they are not in our Master Spare Parts List.
- Screws adjacent to ∇ mark on the product are used for disassembly.

● PACKING SECTION PARTS LIST

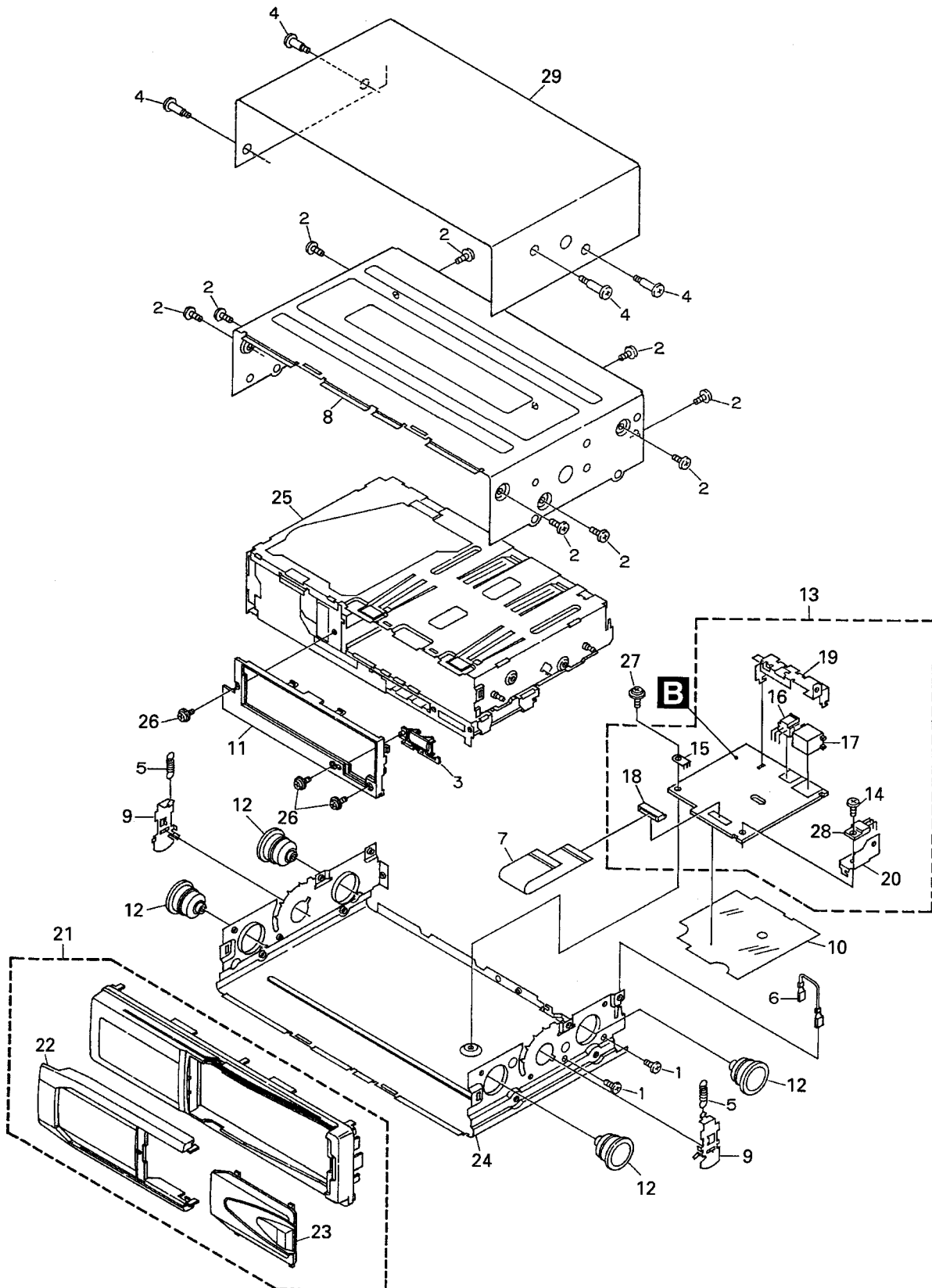
Mark No.	Description	Part No.
	1 Screw Assy	CEA1962
	2 Screw	CBA1295
*	3 Polyethylene Sheet	CNM5158
	4 Screw	HMB60P500FMC
	5 Screw	HMF40P080FZK
	6 Nut	NF60FMC
	8 Polyethylene Bag	CEG1042
*	7 Polyethylene Bag	CEG1099
	9 Carton	CHG4278
	10 Contain Box	CHL4278
	11 Protector	CHP2133
	12 Protector	CHP2134
	13 Seal	CNM5599
	14-1 Owner's Manual	CRD3318
	14-2 Owner's Manual	CRD3319
*	14-3 Warranty Card	CRY1157
	15 Magazine Assy	CXB6518
	16 Angle Assy	CXB3591
	17 Cord	CDE5830
*	18 Caution Card	CRP1090
*	19 Caution Card	CRP1232

● Owner's Manual

Part No.	Language
CRD3318	English, Italian, French
CRD3319	German, Dutch, Spanish

CDX-P670

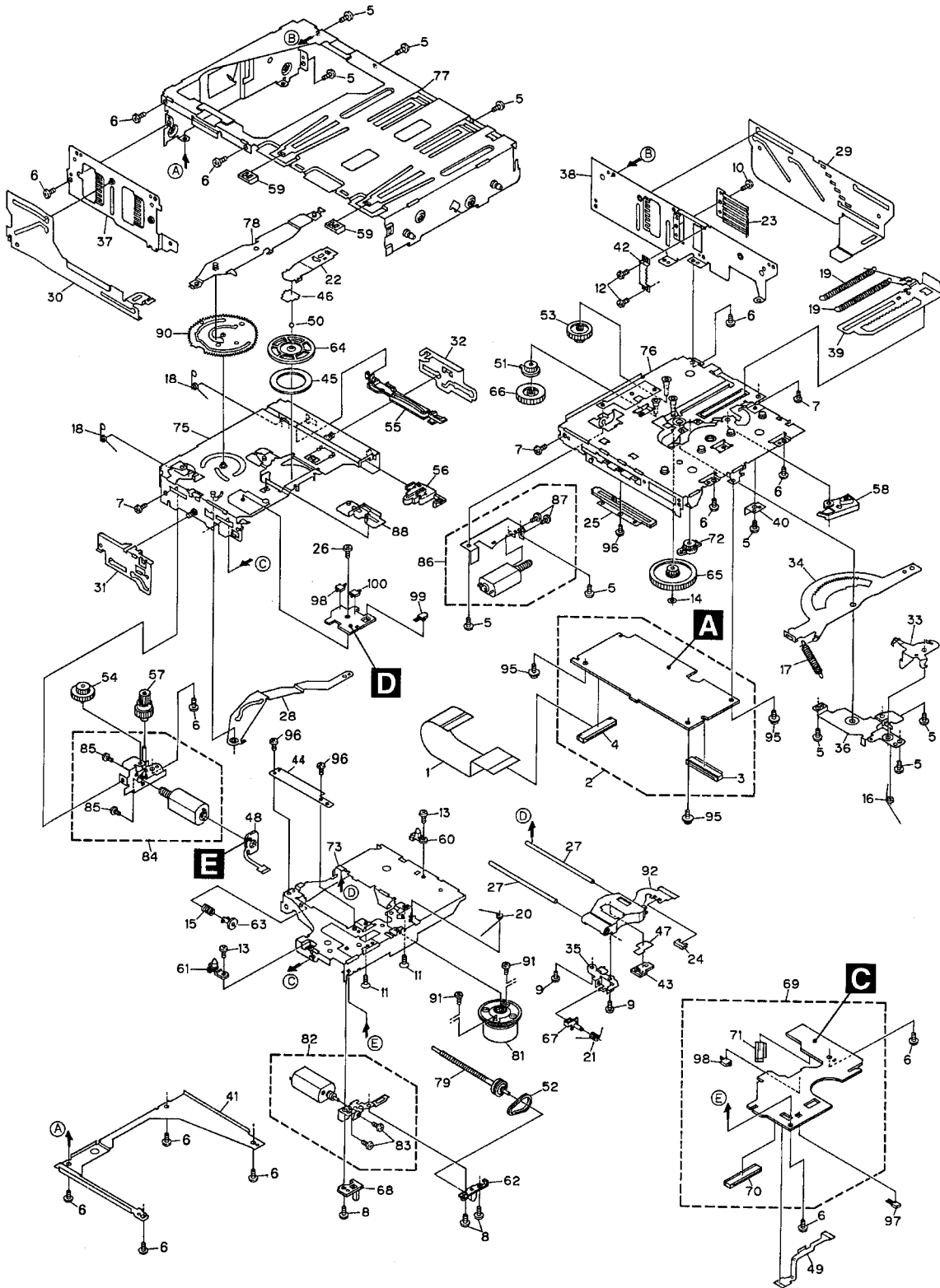
2.2 EXTERIOR



● EXTERIOR SECTION PARTS LIST

Mark No.	Description	Part No.
1	Screw	BMZ26P040FMC
2	Screw	BMZ30P040FZK
3	Button	CAC6363
4	Screw	CBA1460
5	Spring	CBH1859
6	Connector	CDE5525
7	Connector	CDE6478
8	Upper Case	CNB2431
9	Arm	CNC8058
10	Insulator	CNM6074
11	Panel	CNS5216
12	Damper	CNV5591
13	Power Unit	CWX2512
14	Screw	BMZ26P060FMC
15	Terminal(CN902)	CKF1059
16	Plug(CN901)	CKS-460
17	Connector(CN921)	CKS3407
18	Connector(CN911)	CKS3831
19	Holder	CNC8055
20	Holder	CNC8056
21	Grille Assy	CXB6823
22	Door	CAT2198
23	Door	CAT2199
24	Lower Case Unit	CXB7005
25	CD Mechanism Module(C7R2)	CXK4850
26	Screw	IMS20P030FZK
27	Screw	IMS26P040FMC
28	Transistor(Q910)	2SD2396
* 29	Caution Card	CRP1232

2.3 CD MECHANISM MODULE



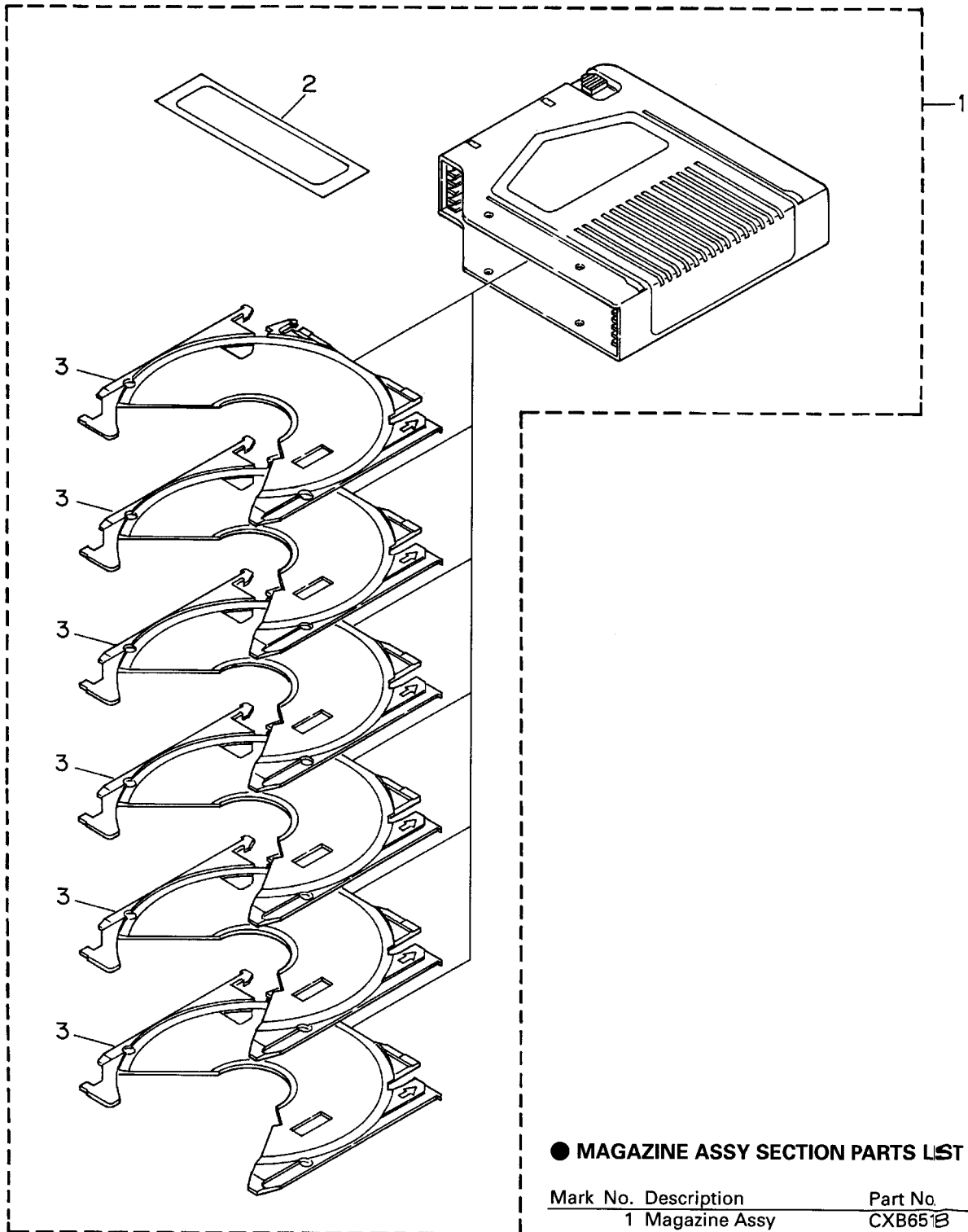
● CD MECHANISM MODULE SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Connector	CDE6069	46	Spacer	CNM6428
2	CD Core Unit	CWX2487	47	Sheet	CNM6296
3	Connector(CN701)	CKS1963	48	PCB	CNP5227
4	Connector(CN101)	CKS2272	49	PCB	CNP5228
5	Screw	BMZ20P025FMC	50	Ball	CNR1189
6	Screw(M2x2.5)	CBA1037	51	Gear	CNR1531
7	Screw(M2x2.5)	CBA1041	52	Belt	CNT1086
8	Screw(M2x2)	CBA1176	53	Gear	CNV5472
9	Screw(M2x4)	CBA1362	54	Gear	CNV5473
10	Screw(M2x1.4)	CBA1387	55	Rail	CNV5920
11	Screw(M2x2.5)	CBA1493	56	Lever	CNV6091
12	Screw(M2x1.6)	CBA1476	57	Gear	CNV5477
13	Screw(M2x3)	CBA1486	58	Arm	CNV5478
14	Washer	CBF1038	59	Holder	CNV5480
15	Spring	CBH2172	60	Guide	CNV5921
16	Spring	CBH2173	61	Guide	CNV5922
17	Spring	CBH2174	62	Holder	CNV5483
18	Spring	CBH2175	63	Holder	CNV5484
19	Spring	CBH2285	64	Clamper	CNV5485
20	Spring	CBH2177	65	Gear	CNV5486
21	Spring	CBH2178	66	Gear	CNV5562
22	Spring	CBL1390	67	Holder	CNV5563
23	Spring	CBL1393	68	Lighting Conductor	CNV5785
24	Short Pin	CBL1239	69	Mechanism PCB	CWX2303
25	Volume(VR801)	CCW1023	70	Connector(CN801)	CKS1965
26	Screw(M2x1.5)	CBA1491	71	Connector(CN802)	CKS3486
27	Shaft	CLA3894	72	Damper Unit	CXA7714
28	Arm	CNC8482	73	Chassis Unit	CXB4463
29	Lever	CNC7902	74	
30	Lever	CNC7904	75	Chassis Unit	CXB4461
31	Lever	CNC7905	76	Magazine Holder Unit	CXB4459
32	Lever	CNC7906	77	Frame Unit	CXB4426
33	Arm	CNC7908	78	Arm Unit	CXB2855
34	Arm	CNC7909	79	Screw Unit	CXB4464
35	Holder	CNC7911	80	
36	Holder	CNC7912	81	Motor Unit(M851)(SPINDLE)	CXB3003
37	Frame	CNC7917	82	Motor Unit(M854)(CARRIAGE)	CXB3004
38	Frame	CNC7918	83	Screw	JFZ20P025FMC
39	Lever	CNC7919	84	Motor Unit(M853)(TRAY)	CXB4421
40	Stopper	CNC7920	85	Screw	JFZ20P025FMC
41	Frame	CNC7921	86	Motor Unit(M852)(ELV)	CXB3006
42	Bracket	CNC8354	87	Screw	JFZ20P025FMC
43	Plate	CNC8375	88	Lever Unit	CXB3938
44	Cover	CNC8434	89	
45	Sheet	CNM6009	90	Gear Unit	CXB5061

CDX-P670

Mark No.	Description	Part No.
91	Screw	JGZ17P025FZK
92	Pickup Unit(Service)	CXX1285
93	
94	
95	Screw	IMS26P040FMC
96	Screw	JFZ20P025FNI
97	Photo-transistor(Q851)	PT4800
98	Spring Switch(S851,S853)	CSN1051
99	LED(D851)	CN504-2
100	Spring Switch(S852)	CSN1052

2.4 MAGAZINE ASSY



● MAGAZINE ASSY SECTION PARTS LIST

Mark No.	Description	Part No.
1	Magazine Assy	CXB651B
2	Label	CRW1415
3	Tray	CNV5341

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

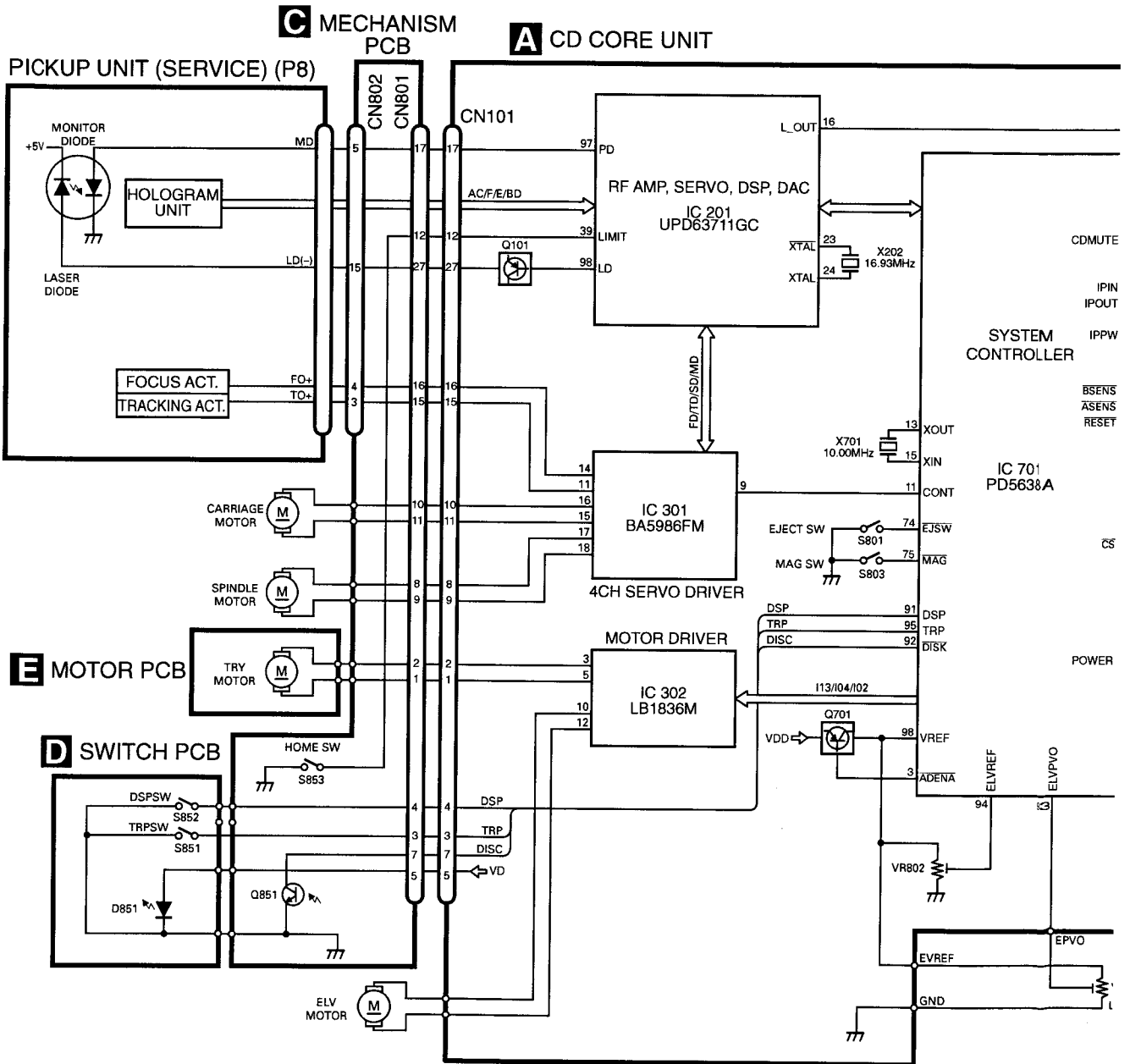
3.1 BLOCK DIAGRAM

A

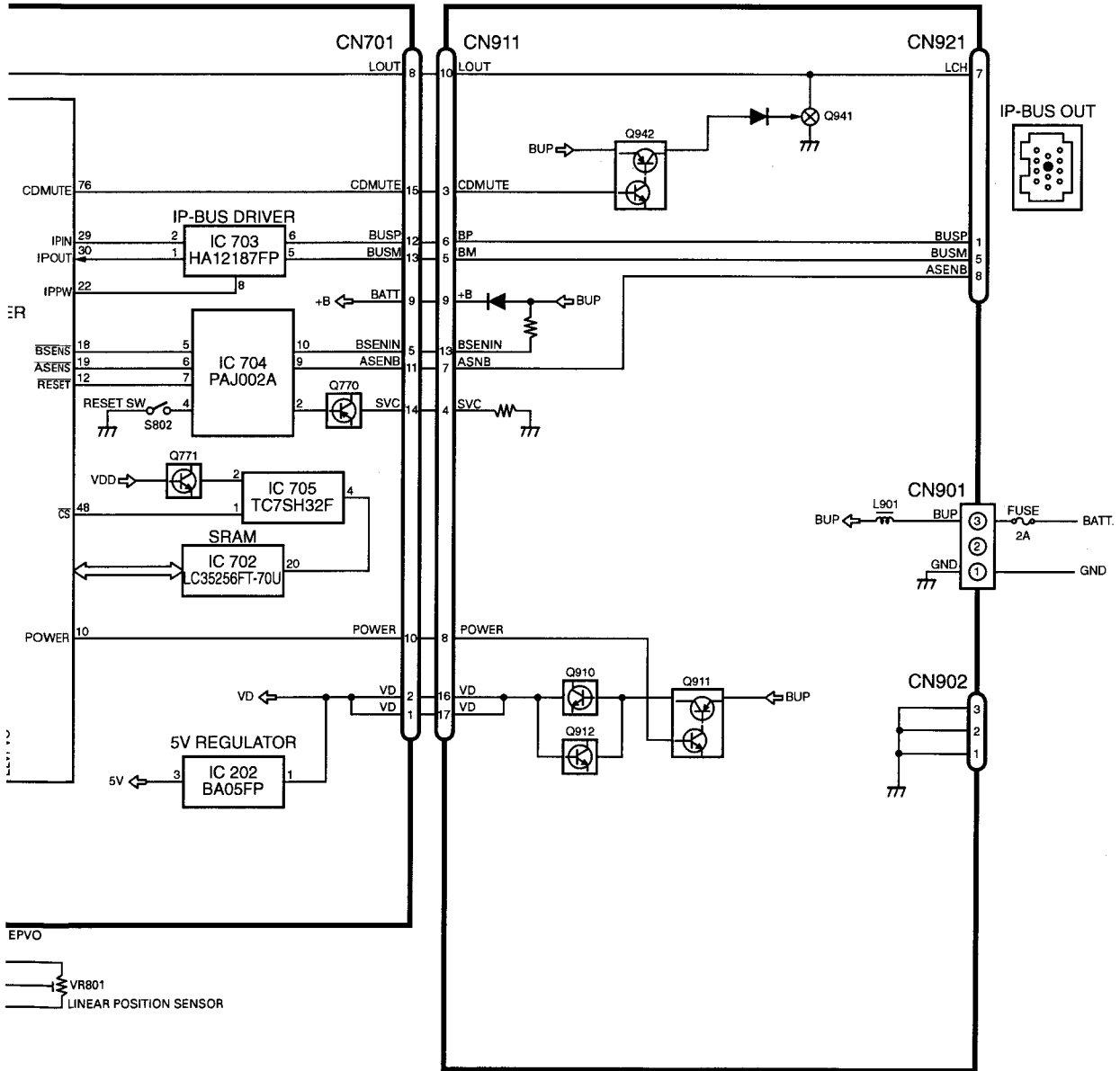
B

C

D

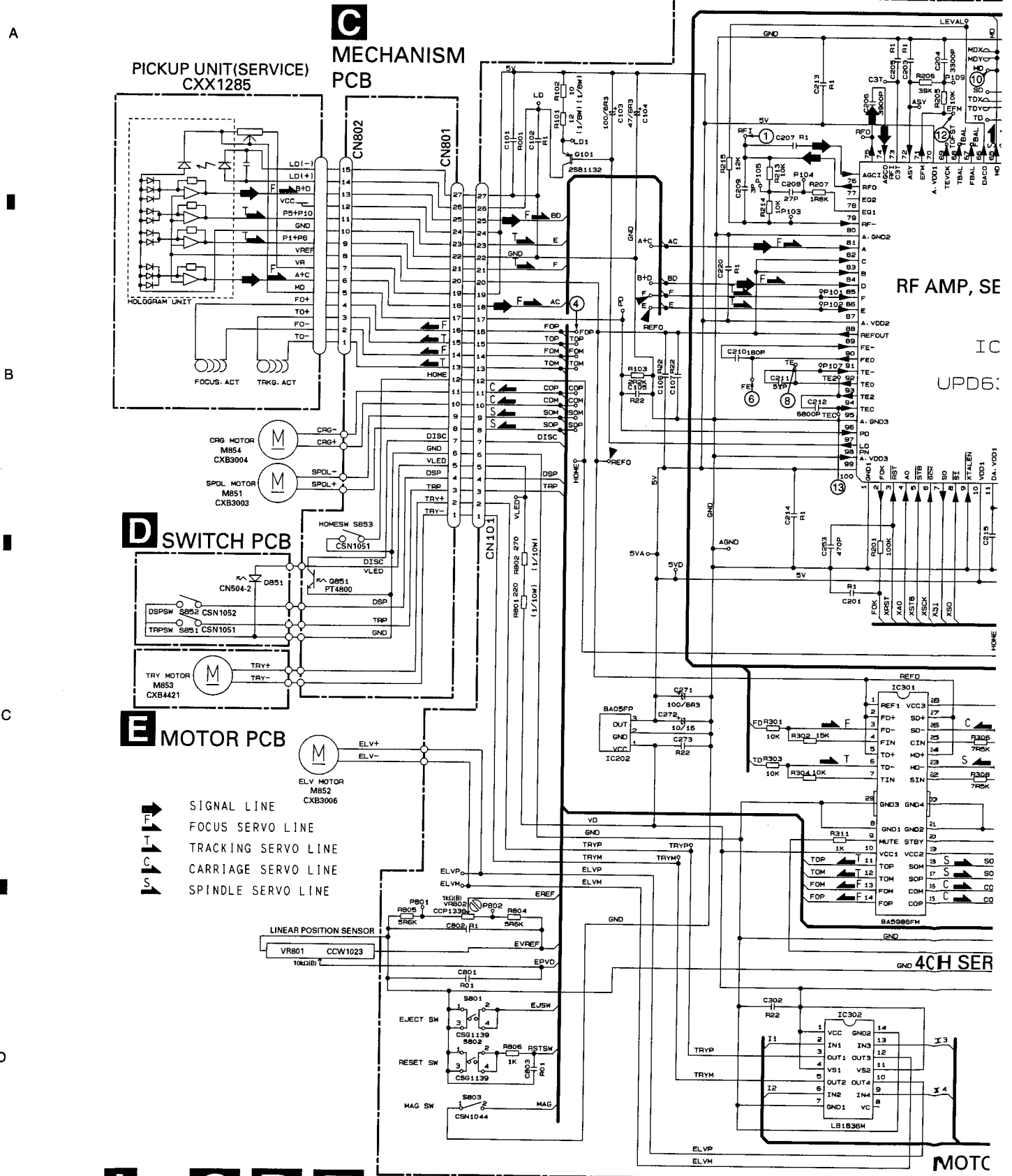


B POWER UNIT



3.2 CD MECHANISM MODULE

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



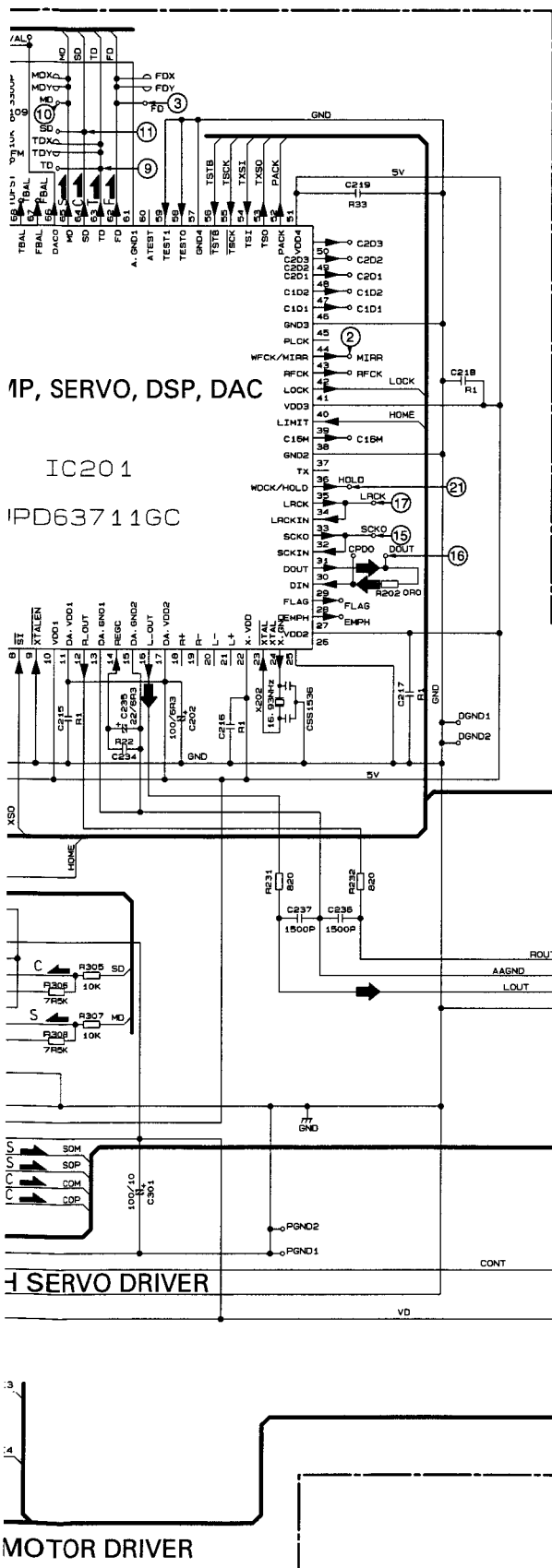
A PICKUP UNIT(SERVICE)
CXX1285

B MECHANISM PCB

C SWITCH PCB

D MOTOR PCB

F SIGNAL LINE
T FOCUS SERVO LINE
C TRACKING SERVO LINE
S CARRIAGE SERVO LINE
S SPINDLE SERVO LINE



NOTE:

- Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
- ⊖ Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2 → 2R2
0.022 → R022

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.

A CD CORE UNIT

A1/2

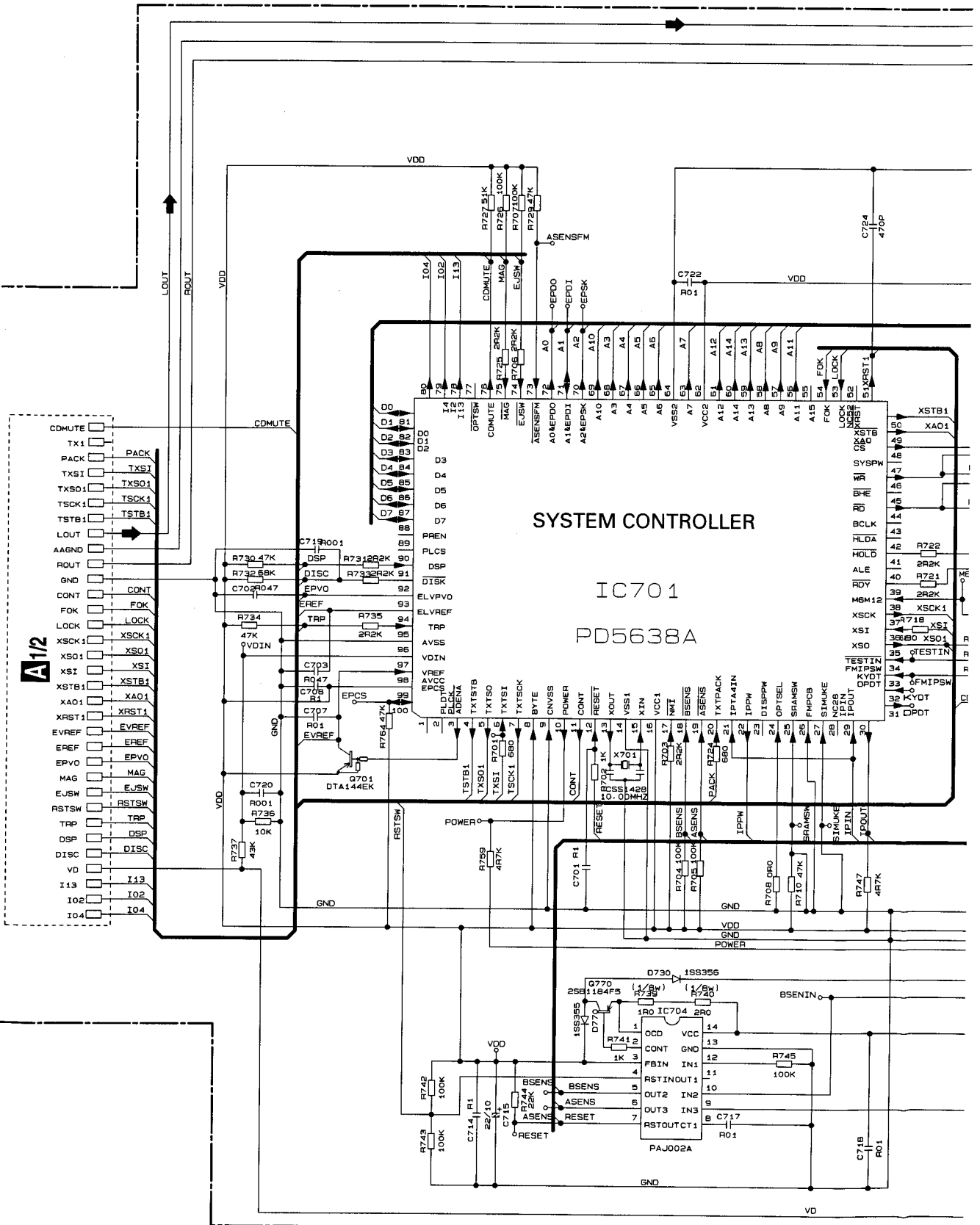
A1/2 15

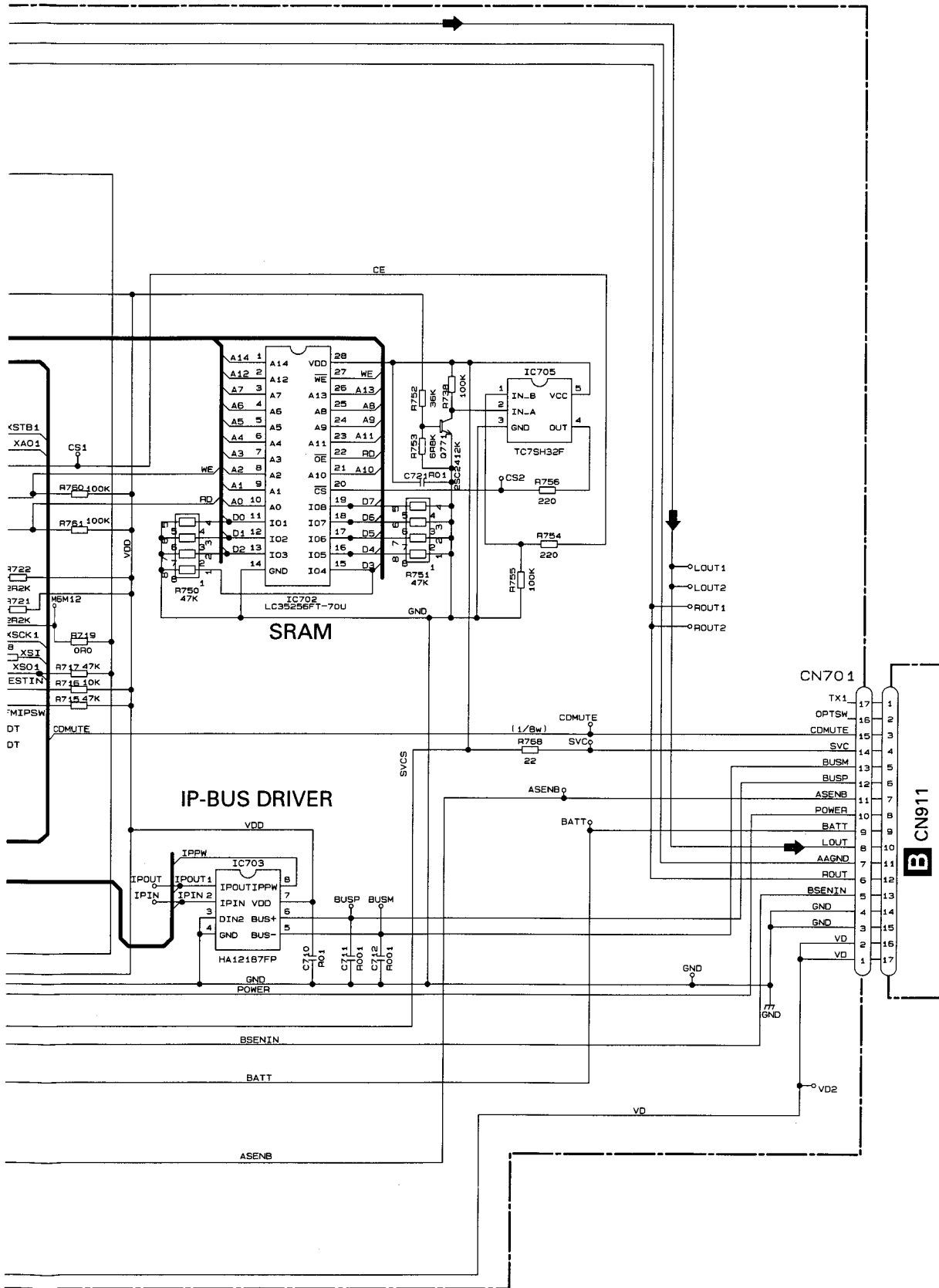
A

B

C

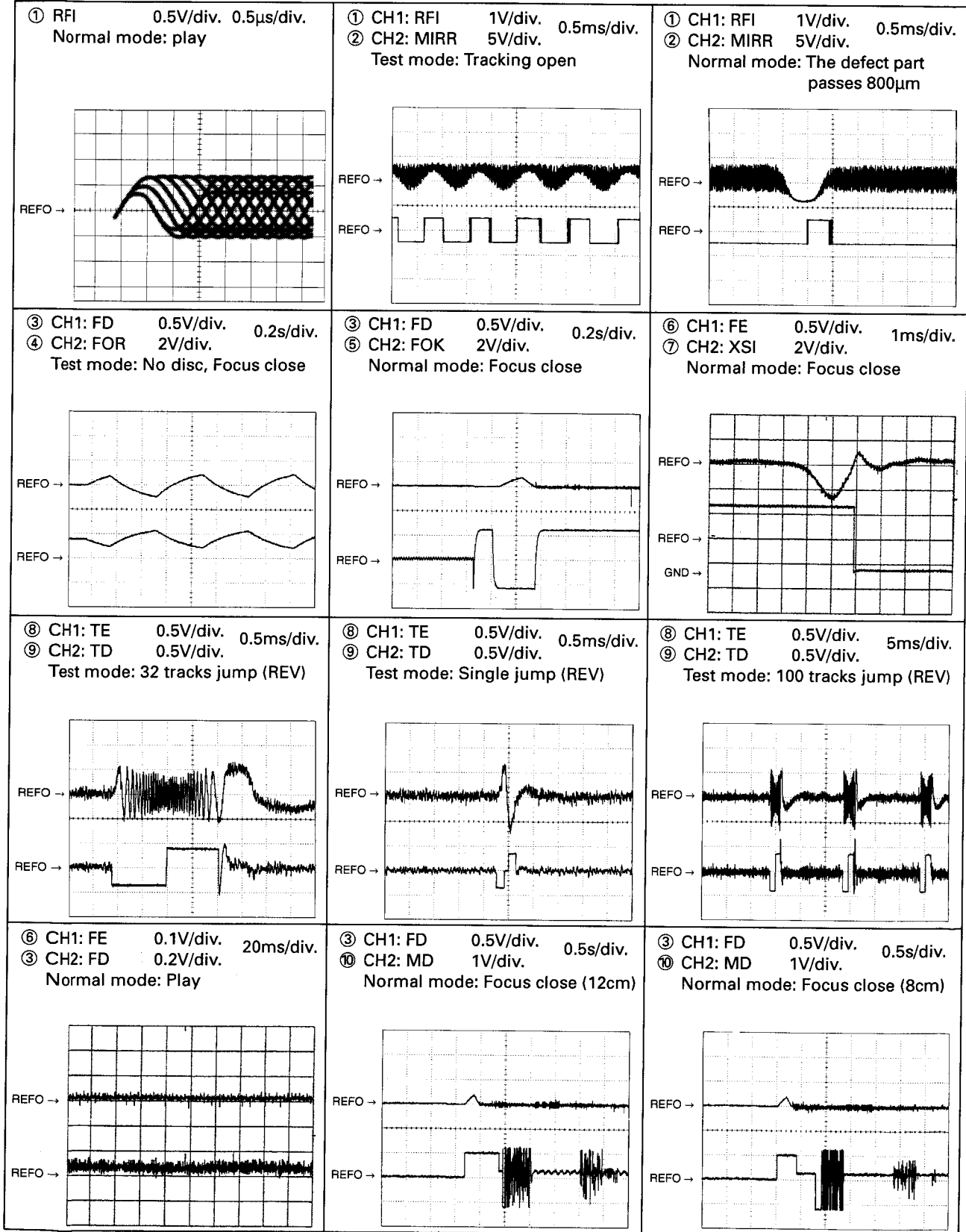
D

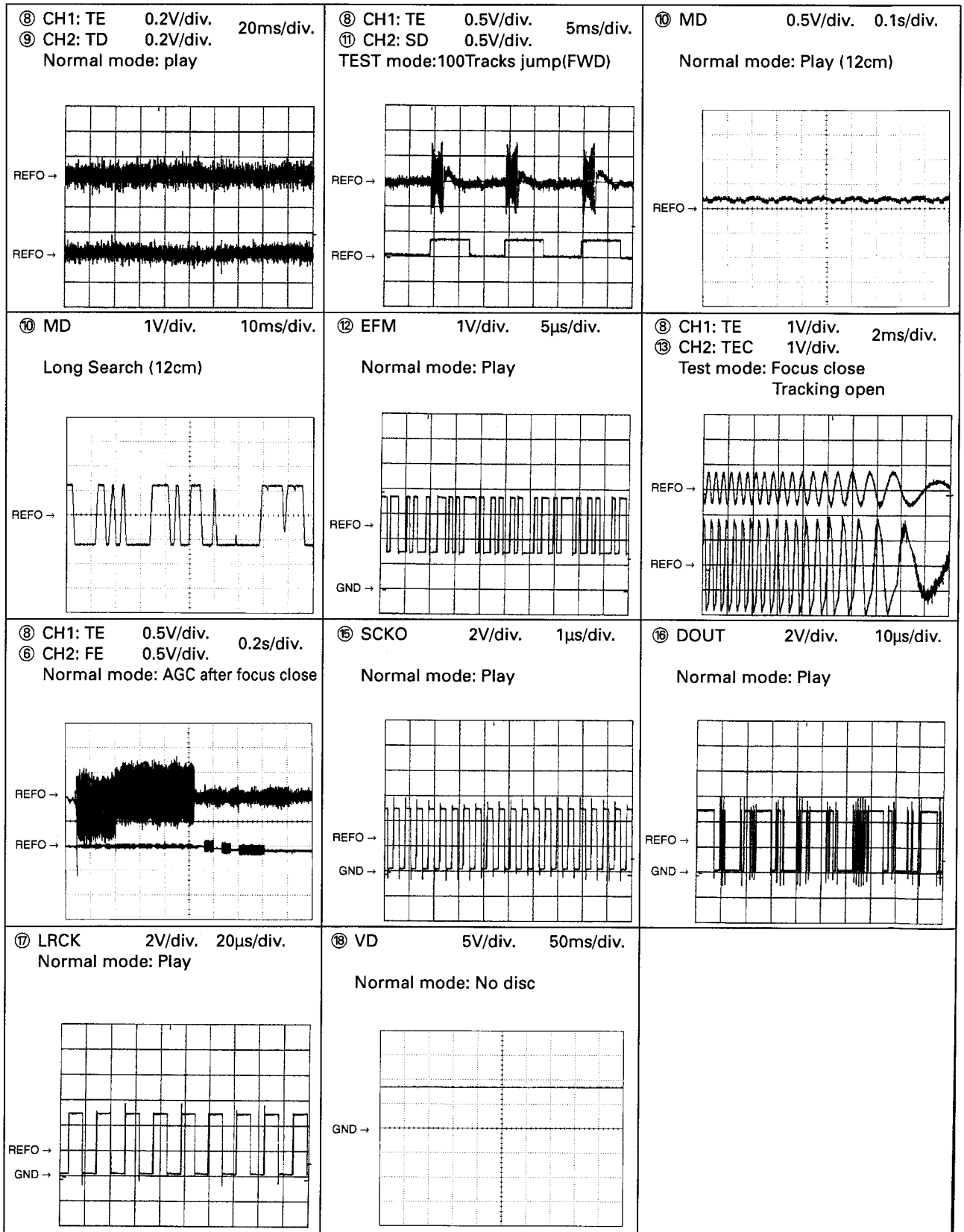




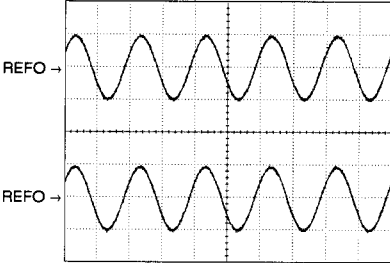
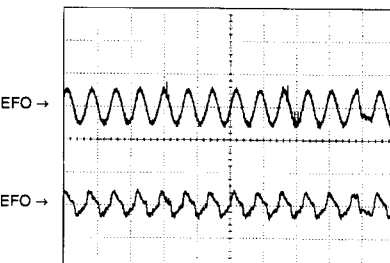
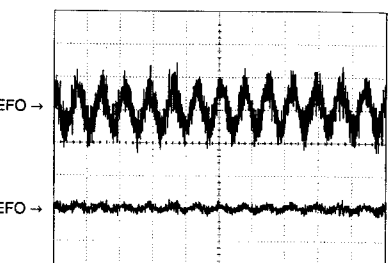
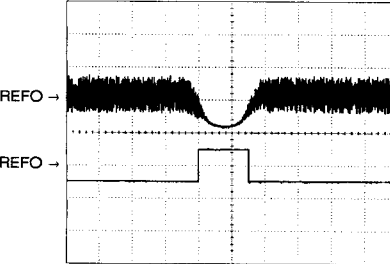
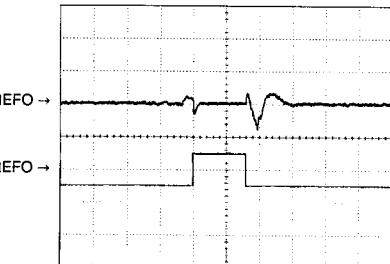
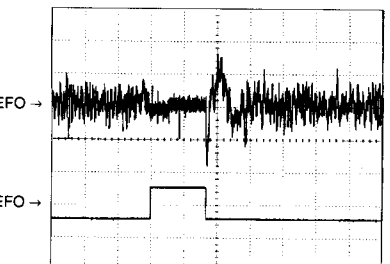
Note:1. The encircled numbers denote measuring points in the circuit diagram.
 2. Reference voltage
 REFO:2.5V

● Waveforms

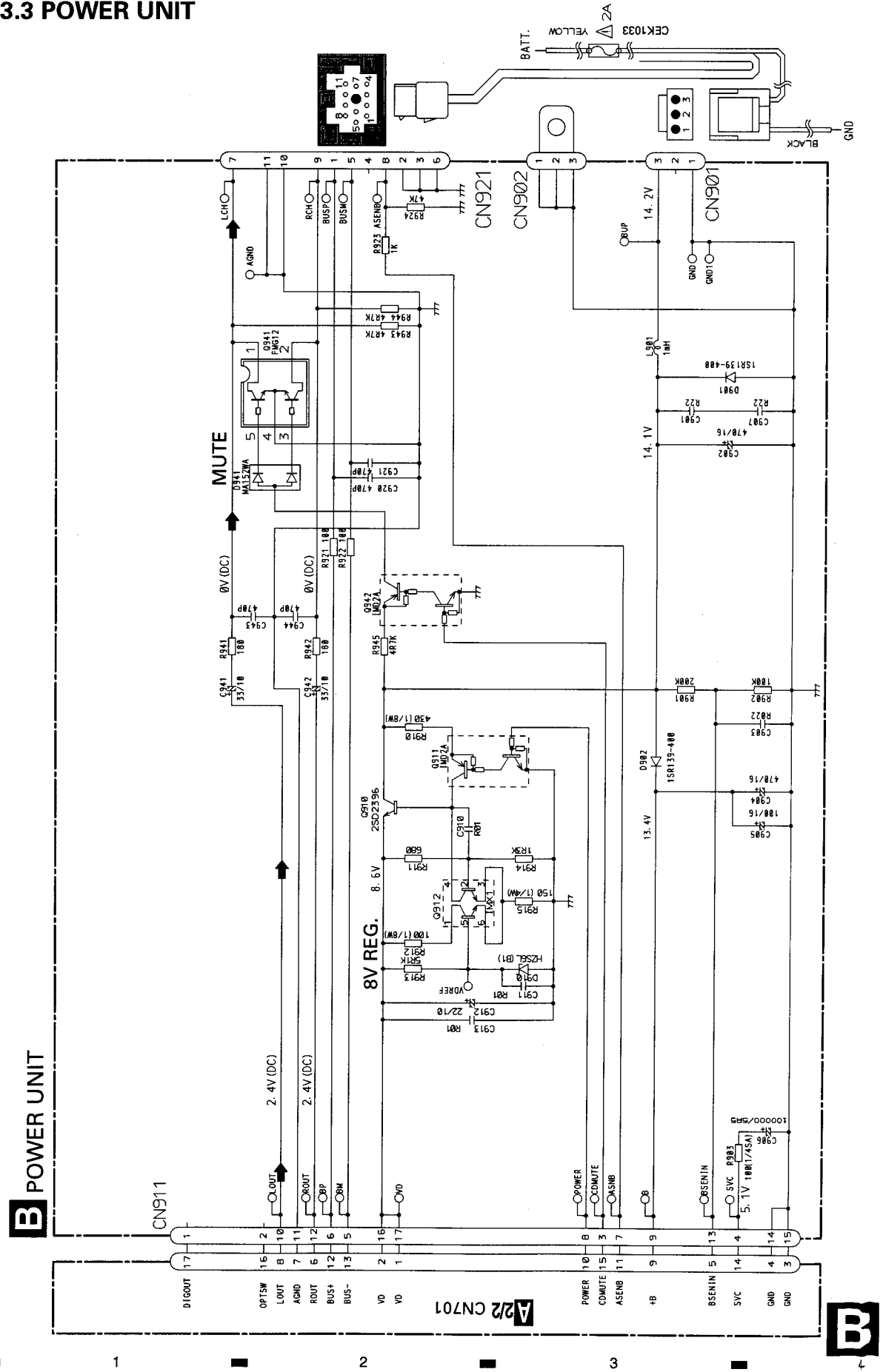




CDX-P670

<p>⑮ CH1: R OUT 2V/div. 500μs/div. ⑯ CH2: L OUT 2V/div. 500μs/div. Normal mode: Play (1kHz 0dB)</p> 	<p>⑥ CH1: FE 0.2V/div. 1ms/div. ③ CH2: FD 0.5V/div. 1ms/div. Normal mode: During AGC</p> 	<p>⑧ CH1: TE 0.2V/div. 1ms/div. ⑨ CH2: TD 0.5V/div. 1ms/div. Normal mode: During AGC</p> 
<p>① CH1: RFI 1V/div. 0.5ms/div. ② CH2: HOLD 5V/div. 0.5ms/div. Normal mode: The defect part passes 800μm(B.D)</p> 	<p>③ CH1: FD 1V/div. 0.5ms/div. ④ CH2: HOLD 5V/div. 0.5ms/div. Normal mode: The defect part passes 800μm(B.D)</p> 	<p>⑤ CH1: TD 0.1V/div. 0.5ms/div. ⑥ CH2: HOLD 5V/div. 0.5ms/div. Normal mode: The defect part passes 800μm(B.D)</p> 

3.3 POWER UNIT



B POWER UNIT

B

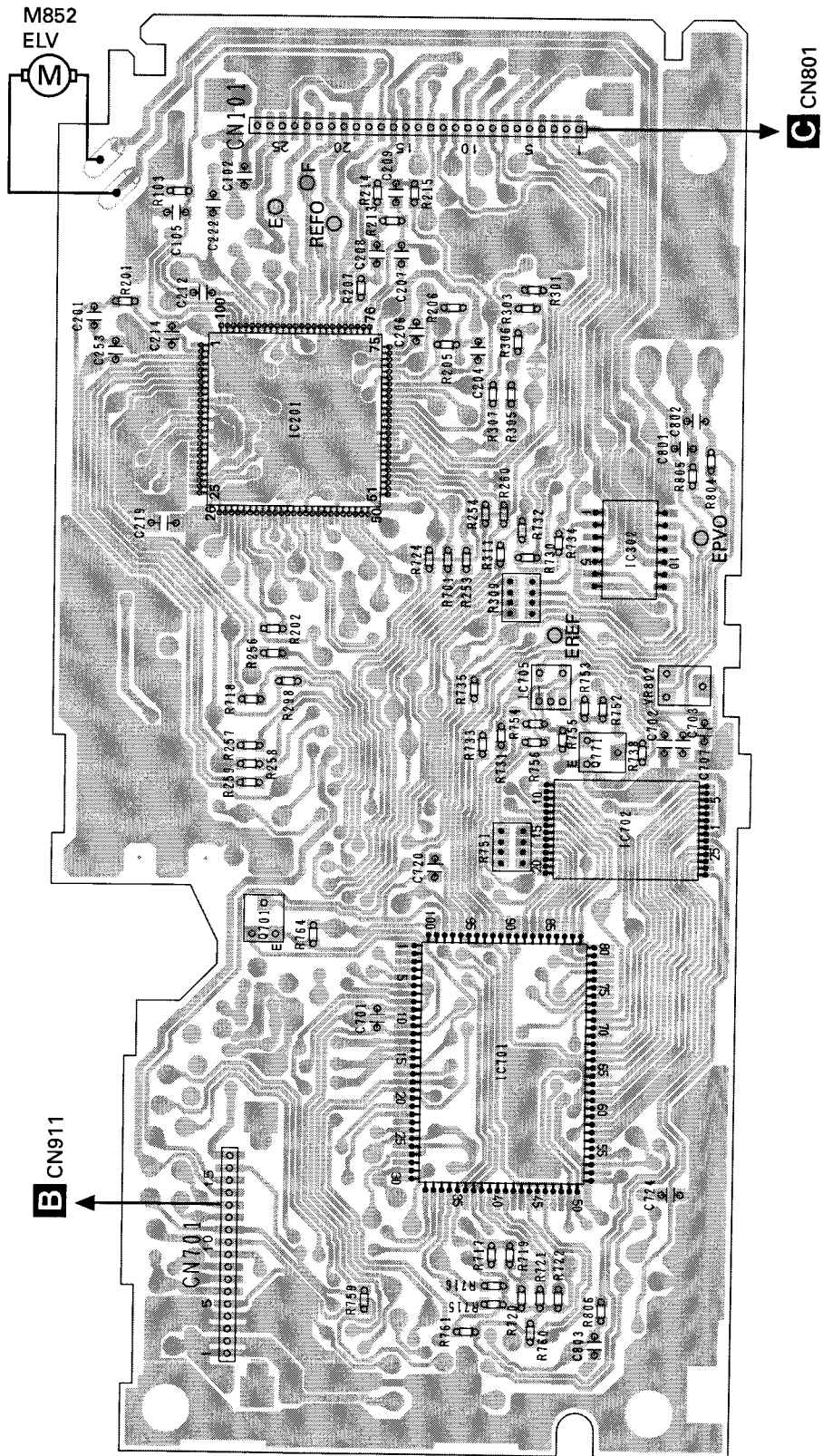
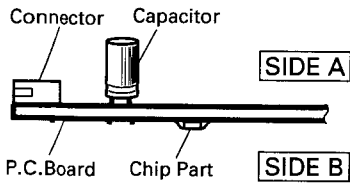
4. PCB CONNECTION DIAGRAM

4.1 CD CORE UNIT

SIDE A

NOTE FOR PCB DIAGRAMS

- A
- 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.
 - Viewpoint of PCB diagrams

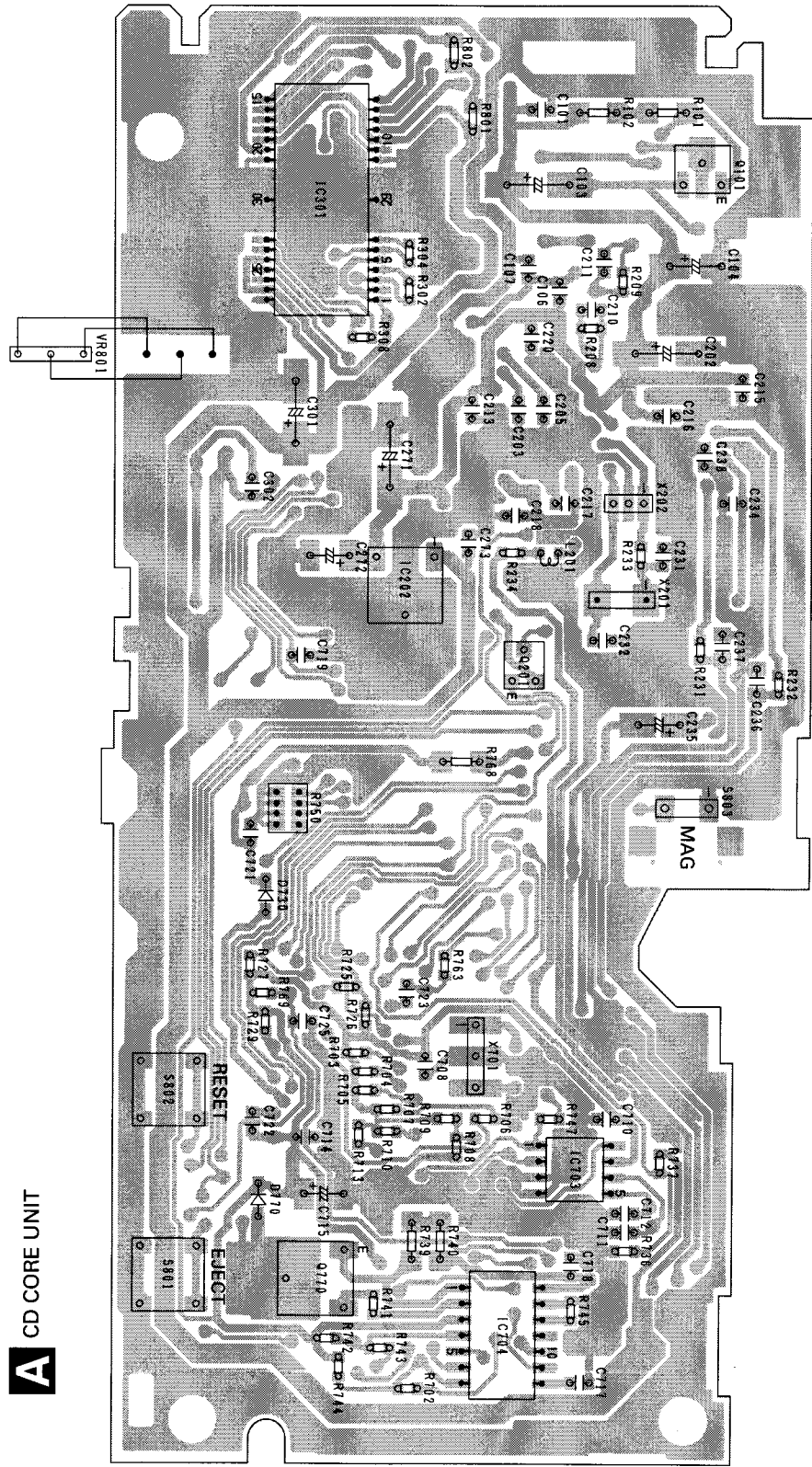


A CD CORE UNIT

B CN911

C CN801

SIDE B



A CD CORE UNIT

A

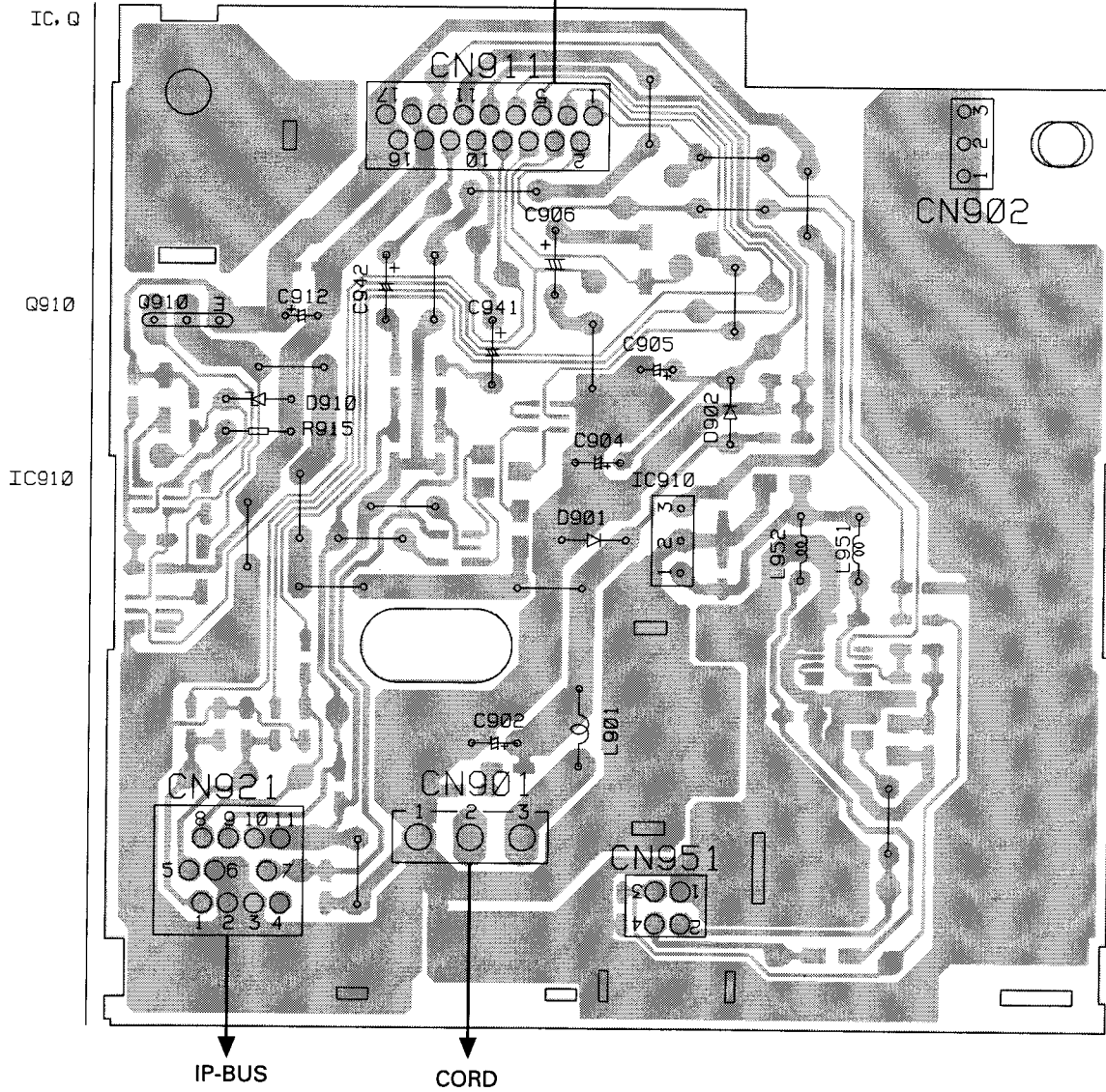
4.2 POWER UNIT

SIDE A

A

B POWER UNIT

A CN701



B

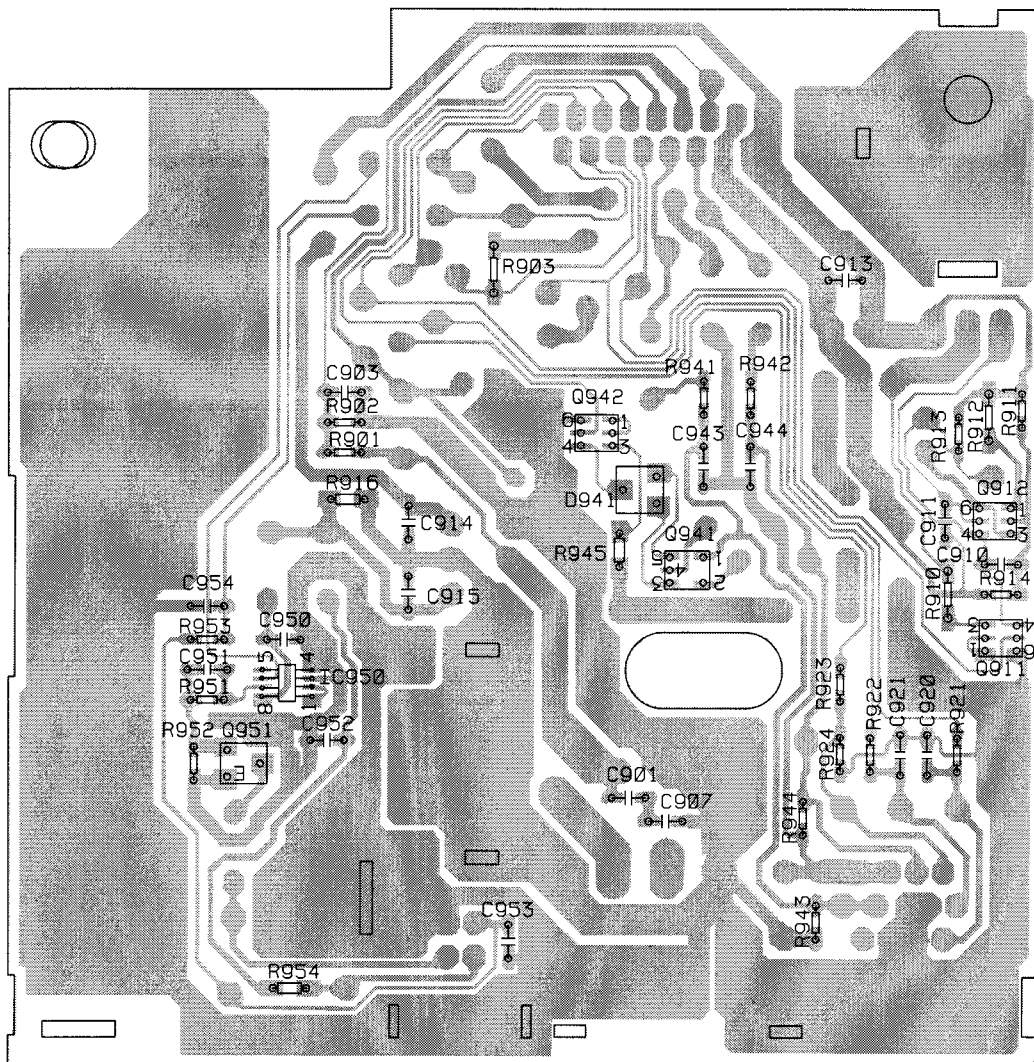
C

D

B

SIDE B

B POWER UNIT



IC, Q

Q942

Q912

Q941

Q911

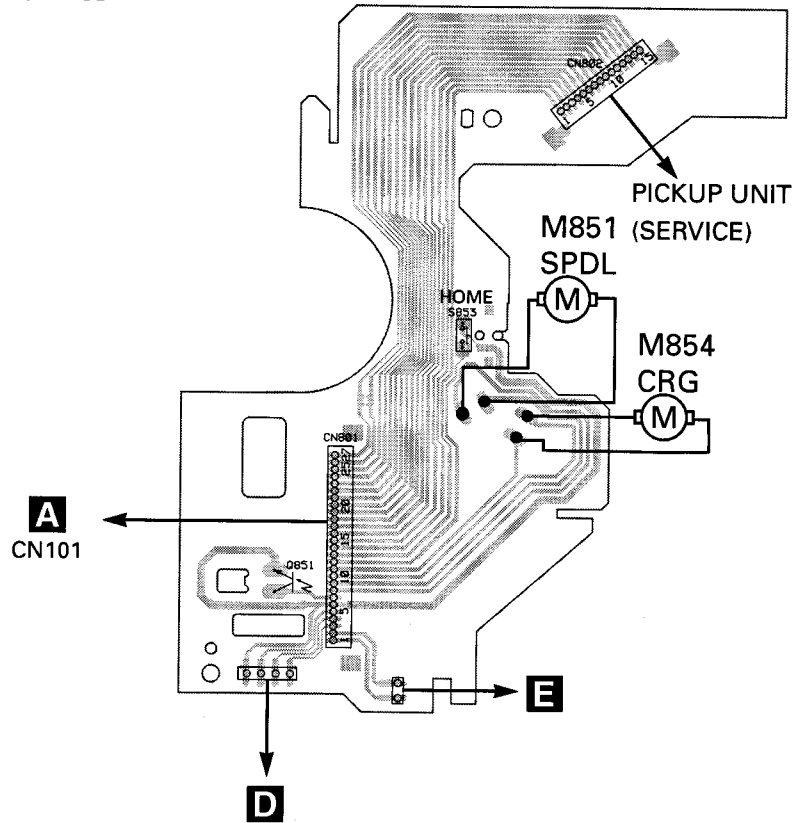
IC950

Q951

4.3 MECHANISM PCB

A

C MECHANISM PCB

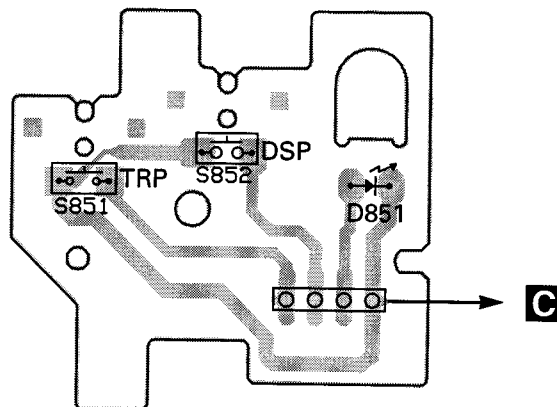


B

4.4 SWITCH PCB

C

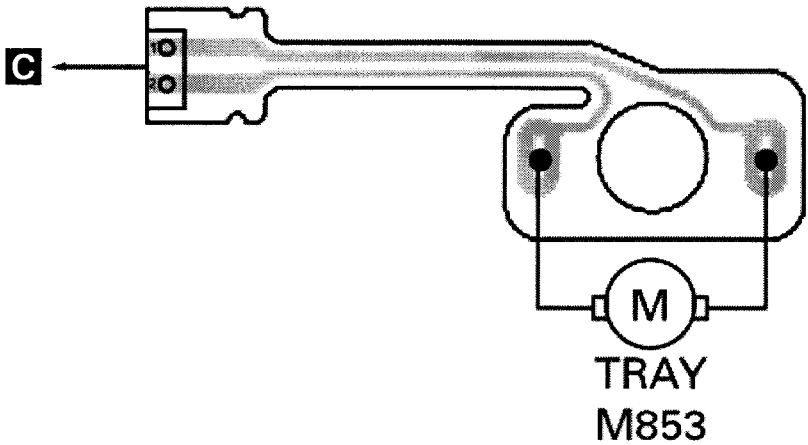
D SWITCH PCB



D

4.5 MOTOR PCB

E MOTOR PCB



5. ELECTRICAL PARTS LIST

NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/OSOOOJ,RS1/OOSOOOJ

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

====Circuit Symbol and No.====Part Name	Part No.	====Circuit Symbol and No.====Part Name	Part No.
A Unit Number : CWX2487		R 305	RS1/16S103J
Unit Name : CD Core Unit		R 306	RS1/16S752J
		R 307	RS1/16S103J
		R 308	RS1/16S752J
		R 309	RAB4C332J
MISCELLANEOUS			
IC 201 IC	UPD63711GC	R 311	RS1/16S102J
IC 202 IC	BA05FP	R 701	RS1/16S681J
IC 301 IC	BA5986FM	R 702	RS1/16S102J
IC 302 IC	LB1836M	R 703	RS1/16S222J
IC 701 IC	PD5638A	R 704	RS1/16S104J
IC 702 IC	LC35256FT-70U	R 705	RS1/16S104J
IC 703 IC	HA12187FP	R 706	RS1/16S222J
IC 704 IC	PAJ002A	R 707	RS1/16S104J
IC 705 IC	TC7SH32F	R 708	RS1/16S0R0J
Q 101 Transistor	2SB1132	R 715	RS1/16S473J
Q 701 Transistor	DTA144EK	R 716	RS1/16S103J
Q 770 Transistor	2SB1184F5	R 717	RS1/16S473J
Q 771 Transistor	2SC2412K	R 718	RS1/16S681J
D 730 Diode	1SS356	R 719	RS1/16S0R0J
D 770 Diode	1SS355	R 721	RS1/16S222J
X 202 Ceramic Resonator 16.93MHz	CSS1536	R 722	RS1/16S222J
X 701 Radiator 10.00MHz	CSS1428	R 724	RS1/16S681J
S 801 Push Switch(EJECT)	CSG1139	R 725	RS1/16S222J
S 802 Push Switch(RESET)	CSG1139	R 726	RS1/16S104J
S 803 Spring Switch(MAG)	CSN1044	R 727	RS1/16S513J
VR 802 Semi-fixed 1kΩ(B)	CCP1338	R 729	RS1/16S473J
RESISTORS		R 730	RS1/16S473J
R 101	RS1/8S120J	R 731	RS1/16S222J
R 102	RS1/8S100J	R 732	RS1/16S683J
R 103	RS1/16S222J	R 733	RS1/16S222J
R 201	RS1/16S104J	R 734	RS1/16S473J
R 202	RS1/16S0R0J	R 735	RS1/16S222J
R 205	RS1/16S103J	R 736	RS1/16S103J
R 206	RS1/16S393J	R 737	RS1/16S433J
R 207	RS1/16S182J	R 738	RS1/16S104J
R 213	RS1/16S103J	R 739	RS1/8S1R0J
R 214	RS1/16S103J	R 740	RS1/8S2R0J
R 215	RS1/16S123J	R 741	RS1/16S102J
R 231	RS1/16S821J	R 742	RS1/16S104J
R 232	RS1/16S821J	R 743	RS1/16S104J
R 253	RS1/16S681J	R 744	RS1/16S223J
R 254	RS1/16S681J	R 745	RS1/16S104J
R 256	RS1/16S681J	R 747	RS1/16S472J
R 257	RS1/16S681J	R 750	RAB4C473J
R 258	RS1/16S681J	R 751	RAB4C473J
R 259	RS1/16S102J	R 752	RS1/16S3602D
R 260	RS1/16S681J	R 753	RS1/16S6801D
R 298	RS1/16S681J	R 754	RS1/16S221J
R 301	RS1/16S103J	R 755	RS1/16S104J
R 302	RS1/16S153J	R 756	RS1/16S221J
R 303	RS1/16S103J	R 759	RS1/16S472J
R 304	RS1/16S103J	R 760	RS1/16S104J
		R 761	RS1/16S104J
		R 764	RS1/16S473J
		R 768	RS1/8S220J

====Circuit Symbol and No.====Part Name	Part No.
R 801	RS1/10S221J
R 802	RS1/10S271J
R 804	RS1/16S562J
R 805	RS1/16S562J
R 806	RS1/16S102J
CAPACITORS	
C 101	CKSRYB102K50
C 102	CKSRYB104K16
C 103	CEV101M6R3
C 104	CEV470M6R3
C 105	CKSRYB224K16
C 106	CKSRYB224K16
C 107	CKSRYB224K16
C 201	CKSRYB104K16
C 202	CEV101M6R3
C 203	CKSRYB104K16
C 204	CKSRYB332K50
C 205	CKSRYB104K16
C 206	CKSRYB392K50
C 207	CKSRYB104K16
C 208	CCSRCH270J50
C 209	CCSRCJ3R0C50
C 210	CCSRCH181J50
C 211	CCSRCH510J50
C 212	CKSRYB682K50
C 213	CKSRYB104K16
C 214	CKSRYB104K16
C 215	CKSRYB104K16
C 216	CKSRYB104K16
C 217	CKSRYB104K16
C 218	CKSRYB104K16
C 219	CKSQYB334K16
C 220	CKSRYB104K16
C 234	CKSRYB224K16
C 235	CEV220M6R3
C 236	CCSQSL152J50
C 237	CCSQSL152J50
C 238	CKSRYB103K25
C 253	CKSRYB471K50
C 271	CEV101M6R3
C 272	CCH1399
C 273	CKSRYB224K16
C 301	CEV101M10
C 302	CKSRYB224K16
C 701	CKSRYB104K16
C 702	CKSRYB473K16
C 703	CKSRYB473K16
C 707	CKSRYB103K25
C 708	CKSRYB104K16
C 710	CKSRYB103K25
C 711	CKSRYB102K50
C 712	CKSRYB102K50
C 714	CKSRYB104K16
C 715	CCH1403
C 717	CKSRYB103K25
C 718	CKSRYB103K25
C 719	CKSRYB102K50
C 720	CKSRYB102K50
C 721	CKSRYB103K25
C 722	CKSRYB103K25
C 724	CKSRYB471K50
C 801	CKSRYB103K25
C 802	CKSRYB104K16
C 803	CKSRYB103K25

10μF/16V

22μF/10V

====Circuit Symbol and No.====Part Name	Part No.	
B Unit Number : CWX2512		
Unit Name : Power Unit		
MISCELLANEOUS		
Q 910	Transistor	2SD2396
Q 911	Transistor	IMD2A
Q 912	Transistor	IMX1
Q 941	Transistor	FMG12
Q 942	Transistor	IMD2A
D 901	Diode	1SR139-400
D 902	Diode	1SR139-400
D 910	Diode	HZS6L(B1)
D 941	Diode	MA152WA
L 901	Choke Coil 1mH	CTH1047
RESISTORS		
R 901		RS1/16S204J
R 902		RS1/16S104J
R 903		RS1/4SA101J
R 910		RS1/8S431J
R 911		RS1/16S681J
R 912		RS1/8S101J
R 913		RS1/16S512J
R 914		RS1/16S132J
R 915		RD1/4PU151J
R 921		RS1/16S101J
R 922		RS1/16S101J
R 923		RS1/16S102J
R 924		RS1/16S473J
R 941		RS1/16S181J
R 942		RS1/16S181J
R 943		RS1/16S472J
R 944		RS1/16S472J
R 945		RS1/10S472J
CAPACITORS		
C 901		CKSRYB224K16
C 902		CEAT471M16
C 903		CKSRYB223K25
C 904		CEAT471M16
C 906	0.1F/5.5V	CCL1054
C 907		CKSRYB224K16
C 910		CKSRYB103K50
C 911		CKSRYB103K50
C 912		CEJA220M10
C 913		CKSRYB103K50
C 920		CCSRCH471J50
C 921		CCSRCH471J50
C 941		CEJA330M10
C 942		CEJA330M10
C 943		CCSRCH471J50
C 944		CCSRCH471J50
C Unit Number :		
Unit Name : Mechanism PCB		
Q 851	Photo-transistor	PT4800
S 853	Spring Switch(HOME)	CSN1051
D Unit Number :		
Unit Name : Switch PCB		
D 851	LED	CN504-2
S 851	Spring Switch(TAP)	CSN1051
S 852	Spring Switch(DSP)	CSN1052

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====Circuit Symbol and No.====Part Name Part No.

E Unit Number :
Unit Name : Motor PCB

M 853 Motor Unit(TRAY) CXB4421

Miscellaneous Parts List

M	851	Pickup Unit(P8)(Service)	CXX1285
M	852	Motor Unit(SPINDLE)	CXB3003
M	852	Motor Unit(ELV)	CXB3006
M	854	Motor Unit(CARRIAGE)	CXB3004
VR	801	Volume 10k Ω (B)	CCW1023

6. ADJUSTMENT

6.1 CD ADJUSTMENT

● Precautions

- This unit uses a single power supply (+5V) for the regulator. The signal reference potential, therefore, is connected to REFO (approx. 2.5V) instead of GND. If REFO and GND are connected to each other by mistake during adjustments, not only will it be impossible to measure the potential correctly, but the servo will malfunction and a severe shock will be applied to the pick-up. To avoid this, take special note of the following.

Do not connect the negative probe of the measuring equipment to REFO and GND together. It is especially important not to connect the channel 1 negative probe of the oscilloscope to REFO with the channel 2 negative probe connected to GND.

Since the frame of the measuring instrument is usually at the same potential as the negative probe, change the frame of the measuring instrument to floating status.

If by accident REFO comes in contact with GND, immediately switch the regulator or power OFF.

- Always make sure the regulator is OFF when connecting and disconnecting the various filters and wiring required for measurements.
- Before proceeding to further adjustments and measurements after switching regulator ON, let the player run for about one minute to allow the circuits to stabilize.
- Since the protective systems in the unit's software are rendered inoperative in test mode, be very careful to avoid mechanical and /or electrical shocks to the system when making adjustment.

- Disc detection during tray extraction and return operations is performed by means of the photo transistor in this unit. Consequently, if the inside of the unit is exposed to a strong light source with the outer casing removed for repairs or adjustment, the following malfunctions may occur:

*Even with a disc loaded, the unit detects "no disc" and cannot start play.

*Although a 12-cm disc is loaded, the unit detects "8cm disc" mistakenly.

When the unit malfunctions this way, either re-position the light source, move the unit or cover the photo transistor.

- During exchanging discs, do not press the keys for the discs to be exchanged.

Key to adjustment text inside (12 keys type)	HEAD UNIT (6 keys type)
BAND	BAND
TRK+/FF	TRK+/FF
TRK-/REV	TRK-/REV
7	1
8	2
9	3
10	4
11	5
12	6
DISC-	DISC-
SOURCE ON/OFF	SOURCE ON/OFF

6.2 CHECKING THE GRATING

● Checking the Grating After Changing the Pickup Unit

• Note :

CD mechanism modules the grating angle of the pickup unit cannot be adjusted after the pickup unit is changed. The pickup unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted pickup unit for the CD mechanism module. Changing the pickup unit is thus best considered as a last resort. However, if the pickup unit must be changed, the grating should be checked using the procedure below.

• Purpose :

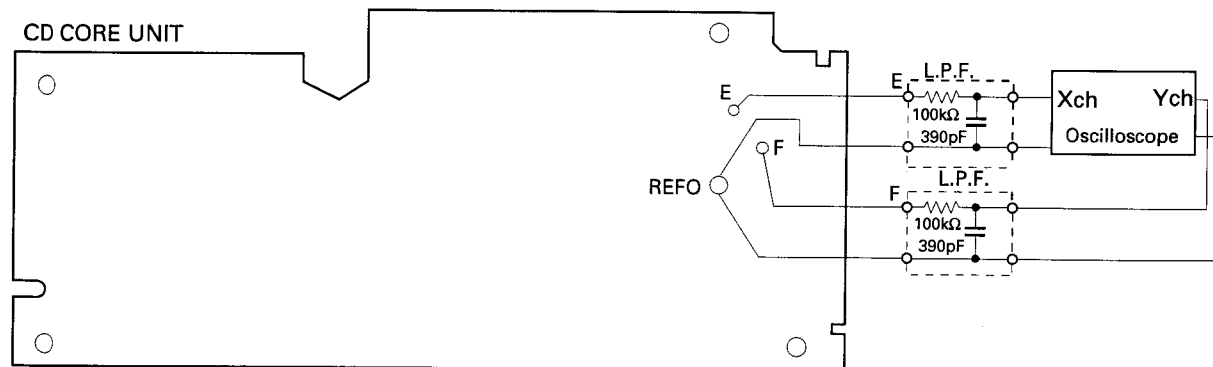
To check that the grating is within an acceptable range.

• Symptoms of Mal-adjustment :

If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or track searching taking a long time, may appear.

• Method :

- | | |
|-----------------------|----------------------------|
| • Measuring Equipment | • Oscilloscope, Two L.P.F. |
| • Measuring Points | • E, F, REFO |
| • Disc | • ABEX TCD-784 |
| • Mode | • TEST MODE |



• Checking Procedure

1. Enter Test mode, then select Multi-CD player and switch the 5V regulator on.
2. Using the **TRK+** and **TRK-** buttons, move the pickup unit to the innermost track.
3. Press key **9** to close focus, the display should read "91". Press key **9** 2 times. Enter Rough Servo mode. Press key **8** to implement the tracking balance adjustment the display should now read "81".
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75°. Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75° try changing the pickup unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75° then the mechanism should be judged to be at fault.

• Note

Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

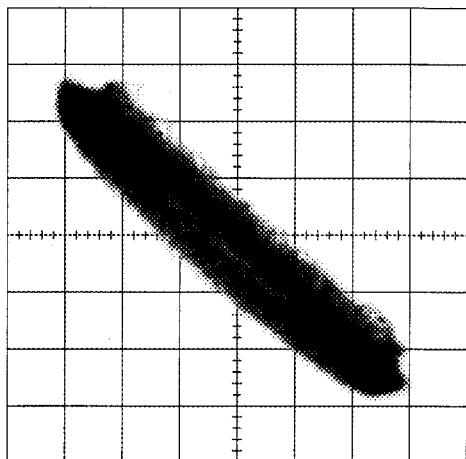
• Hint

Change the disc changes the clamp position and may decrease the "wobble".

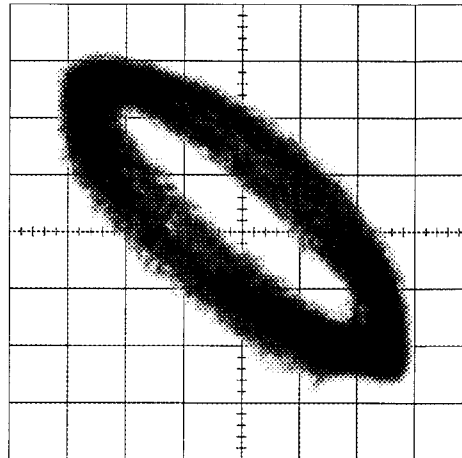
Grating waveform

Ech→ Xch 20mV/div, AC
Fch→ Ych 20mV/div, AC

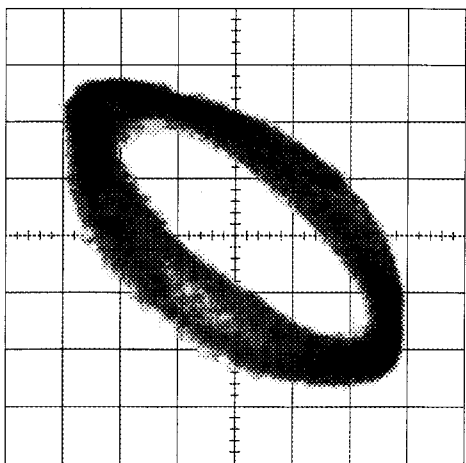
0°



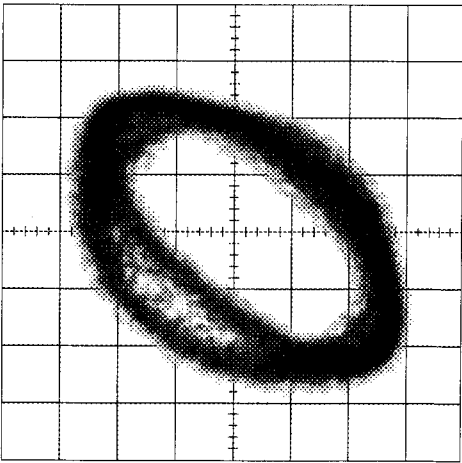
30°



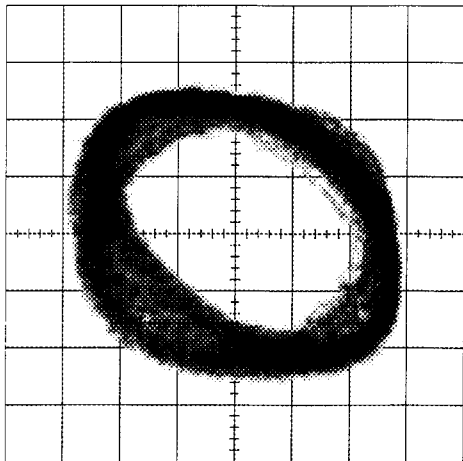
45°



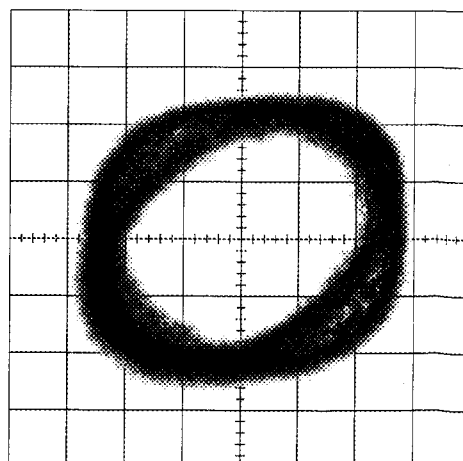
60°



75°



90°



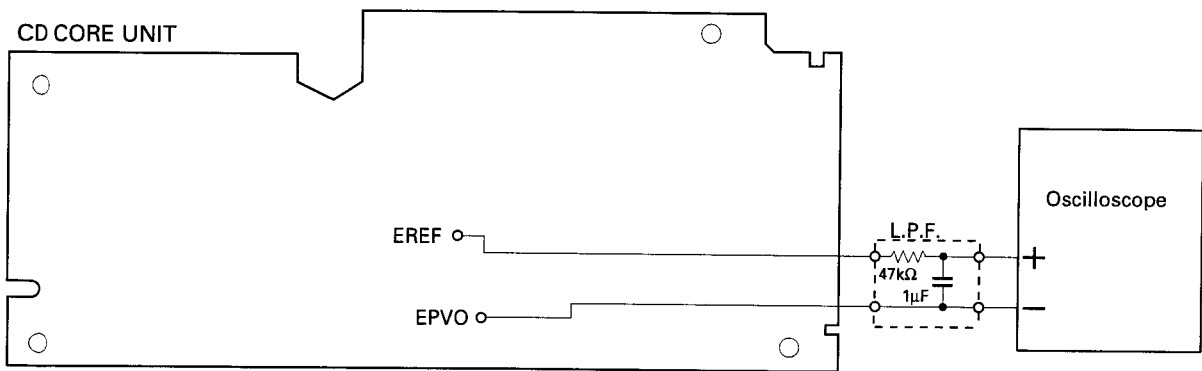
6.3 ADJUSTMENT OF ELEVATION WHEN THE CD CORE UNIT HAS BEEN REMOVED FOR MAINTENANCE

● Adjustment When Error Code 60 is Displayed Because of Malfunctioning Elevation

• Note :
 This mechanism detects the height of the stage using slide-variable resistance.
 To absorb dislocation of the stage height caused by differences in the mechanism and the CD core unit, adjustment must be made for each CD-mechanism module using a variable resistor.
 Normally, readjustment is not needed, as this has been adjusted at the factory. However, adjustment of elevation is required according to the procedure explained below if an elevation error has occurred or if the CD core unit has been removed.

• Purpose :
 To adjust and confirm whether or not elevation operates correctly.

• Adjustment Method :
• Measuring Equipment: Oscilloscope, One L.P.F.
• Measuring Points : EREF, EPVO
• Setting : Without a magazine in Test mode
 With the mechanism placed upside-down (Place the CD mechanism module so that the CD core unit is above.)



• Confirmation Procedure

1. Enter Test mode, then select Multi-CD player.
2. Press key 7 to enter Mechanism Test mode.
3. Press key 12 twice to specify the amount of movement.

Examples of display

TRACK	FUNCTION
	' "

TRACK	FUNCTION
72	00' 00"

The amount of movement changes each time key 12 is pressed.

maximum movement

↑

Key 12

↓

during movement

↑

Key 12

↓

minimum movement

TRACK	FUNCTION
72	00' 02"

TRACK	FUNCTION
72	00' 01"

TRACK	FUNCTION
72	00' 00"

<p>4. Press key 9 to set ELV/TRAY mode to TRAY.</p>	<p>Examples of display</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px;">TRACK</td> <td style="padding: 2px;">FUNCTION</td> </tr> <tr> <td style="padding: 2px;">72</td> <td style="padding: 2px;">01' 02"</td> </tr> </table>	TRACK	FUNCTION	72	01' 02"
TRACK	FUNCTION				
72	01' 02"				
<p>5. Press key FF to release the clamp and return the tray to the magazine.</p>	<p>Release the clamp</p>				
<p>6. Press key 9 to enter Elevation Move mode.</p>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px;">TRACK</td> <td style="padding: 2px;">FUNCTION</td> </tr> <tr> <td style="padding: 2px;">72</td> <td style="padding: 2px;">00' 02"</td> </tr> </table>	TRACK	FUNCTION	72	00' 02"
TRACK	FUNCTION				
72	00' 02"				
<p>7. Use key FF/REV to operate elevation and set if to the graduation of the third step (Fig. 1).</p>					
<p>8. Make the adjustment. Use VR802 to adjust the difference in potential between EREF and EPVO to 0 ± 10 mV.</p>					
<p>9. When adjustment is completed, press key BAND to exit Mechanism Test mode.</p>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px;">TRACK</td> <td style="padding: 2px;">FUNCTION</td> </tr> <tr> <td style="padding: 2px;">72</td> <td style="padding: 2px;">00' 02"</td> </tr> </table>	TRACK	FUNCTION	72	00' 02"
TRACK	FUNCTION				
72	00' 02"				
<p>10. Confirm operation of the mechanism. Place the mechanism horizontally (CD core unit below). Take care not to short-circuit the PCB.</p>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px;">TRACK</td> <td style="padding: 2px;">FUNCTION</td> </tr> <tr> <td style="padding: 2px;">"</td> <td style="padding: 2px;">"</td> </tr> </table>	TRACK	FUNCTION	"	"
TRACK	FUNCTION				
"	"				
<p>11. Confirm the height of the stage. Use the DISC± key to select Disc No.3. Check if the stopper bend of the clamp lever is engaged in the groove of the frame stopper (Fig. 2-4).</p>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="padding: 2px;">TRACK</td> <td style="padding: 2px;">FUNCTION</td> </tr> <tr> <td style="padding: 2px;">04</td> <td style="padding: 2px;">00' 00"</td> </tr> </table>	TRACK	FUNCTION	04	00' 00"
TRACK	FUNCTION				
04	00' 00"				
<p>• Note : The stopper bend will be pressed downward into the groove for final clamping. Confirm the engagement position of the stopper bend.</p> <ul style="list-style-type: none"> • If the stopper bend is engaged in the center and pressed downward, adjustment is completed. Go to step 15. • If the stopper bend is dislocated, check the amount of dislocation by following steps 12 to 14. 					

12. To see the amount of dislocation, place the mechanism upside-down. If the stopper bend has been dislocated in the direction of the first CD, turn VR802 to the left(Fig. 2).

To lower the stage toward the sixth step by 0.1 mm, reduce the voltage of EREF (adjusted in step 8) by 20 mV.

If the stopper bend has been dislocated in the direction of the sixth CD, turn VR802 to the right(Fig. 4).

To raise the stage toward the first step by 0.1 mm, increase the voltage of EREF (adjusted in step 8) by 20 mV.

13. Place the mechanism horizontal. Go back to step 11 to reconfirm the stage height.

14. When adjustment of the stage height is completed, proceed as follows:

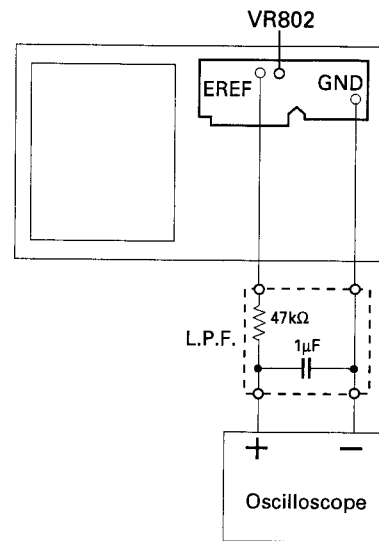
15. Press the **EJECT** switch.

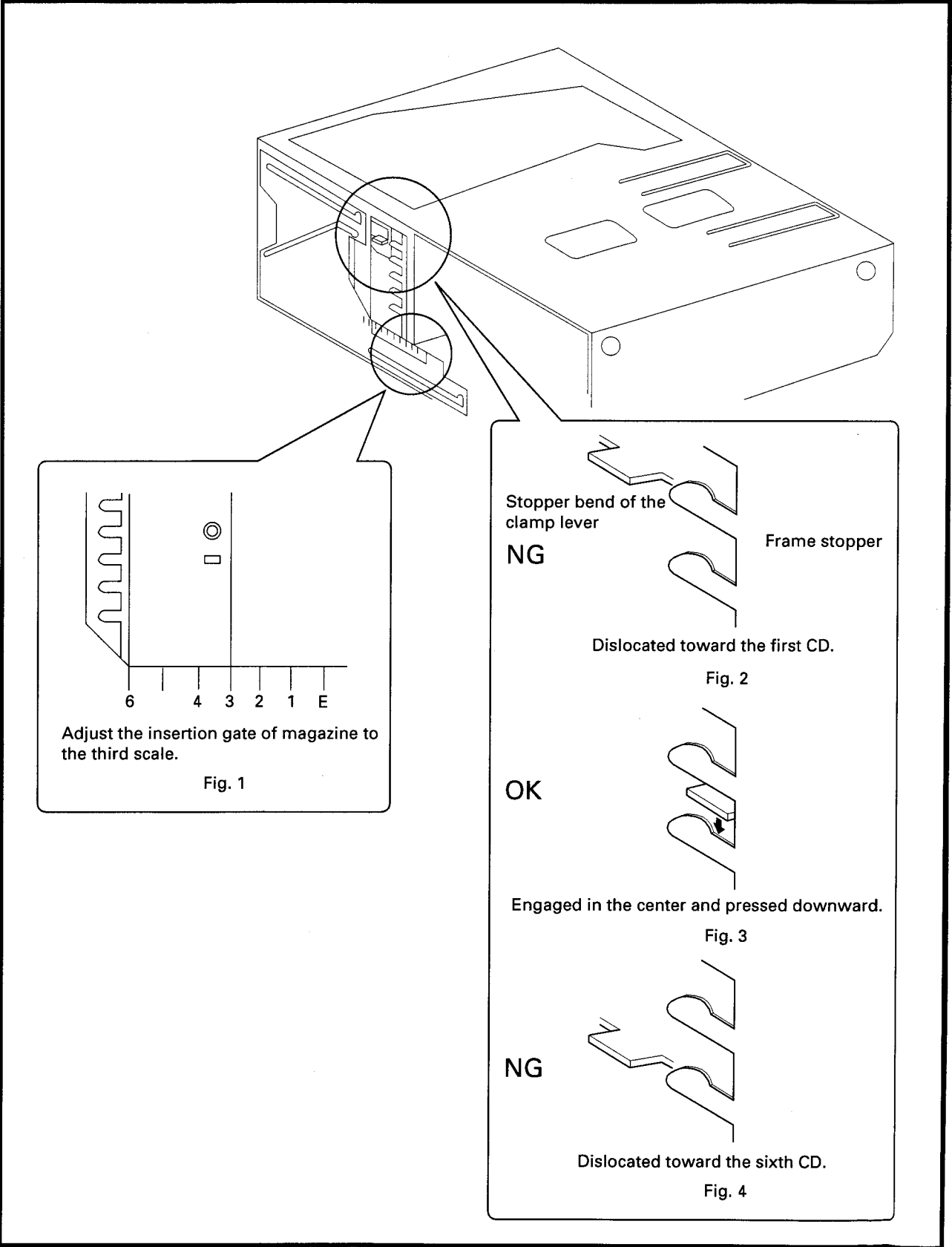
16. Once operation of the mechanism has stopped, turn the power OFF.

17. Wait more than one minute after the power is turned off, then turn the power ON and insert a magazine.

18. Check if the mechanism operates correctly with the first and fourth CDs.

19. If the mechanism operates properly, adjustment is completed. If the mechanism operates improperly, make the adjustment again.





7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 TEST MODE

● CD Test mode

This mode is used for adjusting the CD mechanism module of the device.

- Test mode starting procedure
Reset while pressing the **4** and **6** keys together.
- Test mode cancellation
Switch ACC, back-up OFF.
- If the 8 or 9 key is pressed while focus search is in progress, immediately turn the power off (otherwise the actuator may be damaged due to the lens stuck).
- Jump operation of TRs other than 100TR continues after releasing the key. CRG move and 100TR jump operations are brought into the "Tracking close" status when the key is released.
- Powering Off/On resets the jump mode to "Single TR (91)", the RF AMP gain setting to 0 dB, and the automatic adjustment value to the initial value.
- During exchanging discs, do not press the keys for the discs to be exchanged.

- The following head units are exceptional so that their entering ways to the test mode are different from others.

Test mode starting procedure

Reset while pressing the **3** and **5** keys together.

KEH-P5010R/X1M/EW

KEH-4011/X1M/EE

KEH-P5011/X1M/EE

KEH-4010R/X1M/EW

KEH-P4010RB/X1M/EW

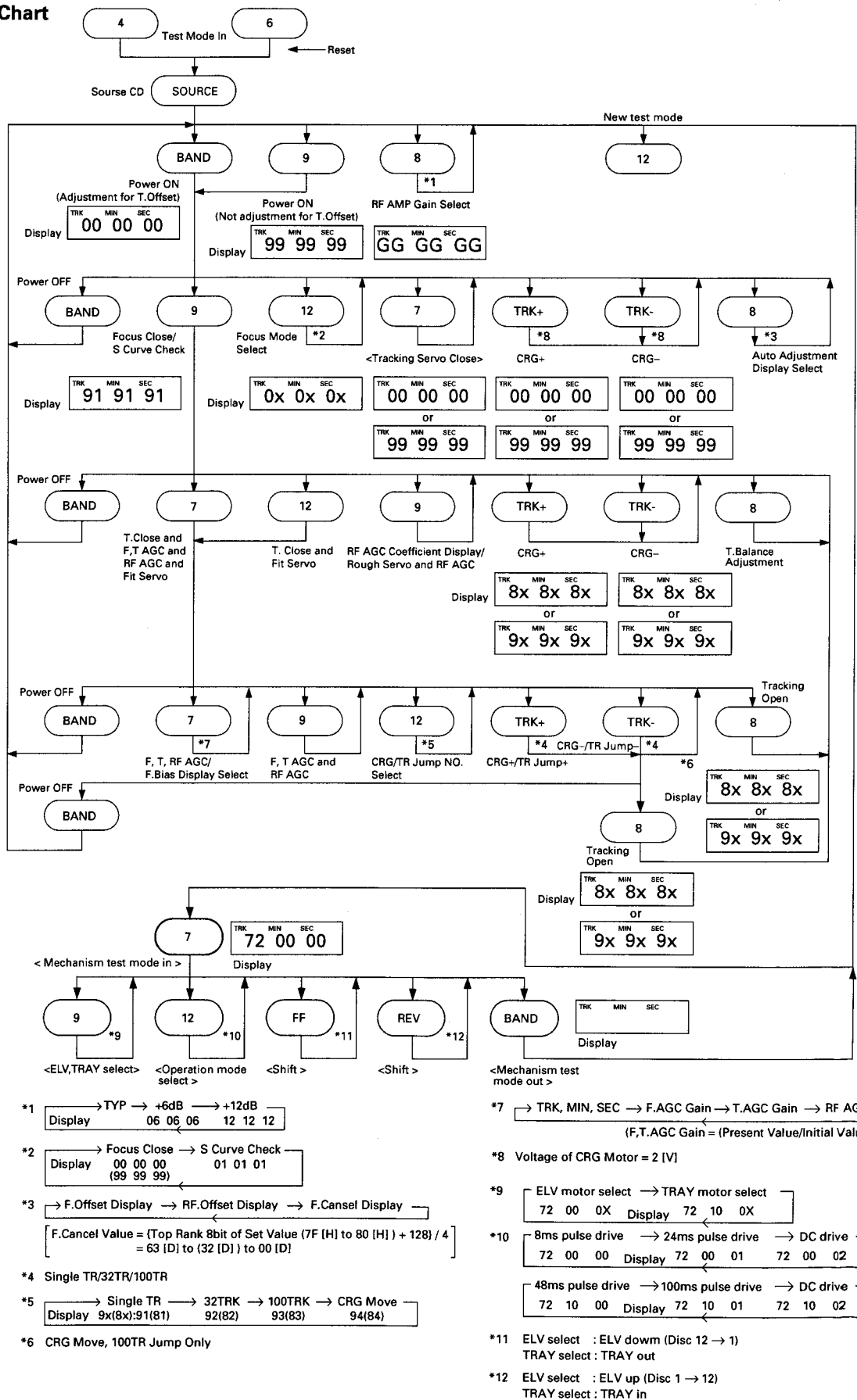
KEH-P4013R/X1M/EW

KEH-5015/X1M/ES

KEH-P4010/X1M/UC

KEH-P4015/X1M/ES

● Flow Chart



● Error Messages

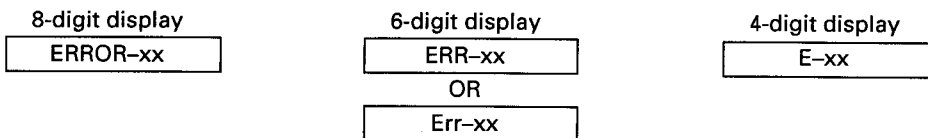
If a CD is not operative or stopped during operation due to an error, the error mode is turned on and cause(s) of the error is indicated with a corresponding number. This arrangement is intended at reducing nonsense calls from the users and also for facilitating trouble analysis and repair work in servicing.

(1) Basic Indication Method

1) When SERRORM is selected for the CSMOD (CD mode area for the system), error codes are written to DMIN (minutes display area) and DSEC (seconds display area). The same data is written to DMIN and DSEC. DTNO remains in blank as before.

2) Head unit display examples

Depending on display capability of LCD used, display will vary as shown below. xx contains the error number.



* When the system is manufactured for an OEM basis, the error display will be configured according to the customer specification.

(2) Error Code List

Code	Class	Displayed error code	Description of the code and potential cause(s)
10	Electricity	Carriage Home NG	CRG can't be moved to inner diameter. CRG can't be moved from inner diameter. → Failure on home switch or CRG move mechanism.
11	Electricity	Focus Servo NG	Focusing not available. → Stains on rear side of disc or excessive vibrations on REWRITABLE.
12	Electricity	Spindle Lock NG Subcode NG RF AMP NG	Spindle not locked. Sub-code is strange (not readable). → Failure on spindle, stains or damages on disc, or excessive vibrations. A disc not containing CD-R data is found. Turned over disc are found, though rarely. → Failure on home switch or CRG move mechanism. An appropriate RF AMP gain can't be determined. → CD signal error.
17	Electricity	Setup NG	APC protection doesn't work. Focus can be easily lost. → Damages or stains on disc, or excessive vibrations.
30	Electricity	Search Time Out	Failed to reach target address. → CRG tracking error or damages on disc.
A0	System	Power Supply NG	Power (VD) is ground faulted. → Failure on SW transistor or power supply (failure on connector).
A1	System	Mechanism power failure	Mechanism elevation reference voltage is out of prescription. → EREF adjustment VR and/or power abnormal.
50	Mechanism	An error upon ejection	MAG switch release time has time out. Elevation time out when eject.
60	Mechanism	An error while putting in and out the tray	Tray in / out time has time out. Tray is caught when put in.

Code	Class	Displayed error code	Description of the code and potential cause(s)
70	Mechanism	An error upon elevation	Elevation time has time out.
80	Mechanism	An error with an empty magazine inserted	No disc is available.

Remarks: Unreadable TOC does not constitute an error. An intended operation continues in this case.

A newly designed head unit must conform to the example given above.

Upper digits of an error code are subdivided as shown below:

1x: Setup relevant errors, 3x: Search relevant errors, 3x: Search relevant errors, Ax: Other errors.

● New Test Mode

M-CD plays the same way as before.

If an error such as off focus, spindle unlocking, unreadable sub-code, or sound skipping occurs after setup, its cause and time occurred (in absolute time) are displayed.

During setup, operational status of the control software (internal RAM: CPOINT) is displayed.

These displays and functions are prepared for enhancing aging in the servicing and efficiency of trouble analysis.

(1) Shifting to the New Test Mode

- ① Turn on the current test mode by starting the reset from the 4 and 6 keys together.
- ② Select M-CD for the source through the specified procedure including use of the [SOURCE] key. Then, press the 12 key while maintaining the regulator turned off.
- ③ After the above operations, the new test mode remains on irrespective of whether the M-CD is turned on or off. You can reset the new test mode by turning on the reset start.

* With some products, the new test mode can be reset through the same operations as that employed for shifting to the STBY mode (while maintaining the Acc turned off).

(2) Key Correspondence

Key (Example)	Test mode		New test mode	
	Power Off	Power On	In-play	Error Production
BAND	To power on (offset adjustment performed)	To power off	-	Time/Err.No. switching
UP	-	FWD-Kick	FF/TR+	-
DOWN	-	REV-Kick	REV/TR-	-
7	-	T.Close (AGC performed) /parameter display switching	Scan	-
8	RF AMP gain switching	Parameter display switching /T.BAL adjustment/T.Open	Mode	-
9	To power on (offset adjustment not performed)	F.Close/RF AGC/F.T.AGC	-	-
10	-	F.Open	-	-
11	-	Jump Off	-	-
12	-	F.Mode switching /T.Close (no AGC)/Jump switching	Auto/Manu	T.No./Time switching

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Key (Example)	Mechanism Test Mode
BAND	Back to the test mode
UP	Playing the mechanism
DOWN	Playing the mechanism
7	Mechanism test mode in
8	-
9	TRAY/ELV select
10	-
11	-
12	Operation step select

Note: Eject and CD on/off is performed in the same procedure as that for the normal mode.

(3) Cause of Error and Error Code

Code	Class	Contents	Description and cause
40	Electricity	Off focus detected.	FOK goes low. → Damages/stains on disc, vibrations or failure on servo.
41	Electricity	Spindle unlocked.	FOK = Low continued for 50 msec. → Damages/stains on disc, vibrations or failure on servo.
42	Electricity	Sub-code unreadable.	Sub-code was unreadable for 50 msec. → Damages/stains on disc, vibrations or failure on servo.
43	Electricity	Sound skipping detected.	Last address memory function was activated. → Damages/stains on disc, vibrations or failure on servo.

Note: Mechanical errors during aging are not displayed.

The error codes should be indicated in the same way as in the normal mode.

(4) Display of Operational Status (CPOINT) during Setup

Status No.	Contents	Protective action
00	CD+5V ON process in progress.	None
01	Servo LSI initialization (1/3) in progress.	None
02	Servo LSI CRAM initialization in progress.	None
03	Servo LSI initialization (2/3) in progress.	None
04	Offset adjustment (1/3) in progress.	None
05	Offset adjustment (2/3) in progress.	None
06	Offset adjustment (3/3) in progress.	None
07	FZD adjustment in progress.	None
08	Servo LSI initialization (3/3) in progress.	None
10	Carriage move to home position started.	None
11	Carriage move to home position started.	None
12	Carriage is moving toward inner diameter.	Specified 10 seconds has been passed or failure on home switch.
13	Carriage is moving toward outer diameter.	Specified 10 seconds has been passed or failure on home switch.
14	Carriage outer kick in progress.	None
15	Carriage outer diameter feed (1 second) in progress.	None
20	Servo close started.	None
21	Pre-processing for focus search started.	None
22	Spindle rotation and focus search started.	None
23	Waiting for focus close (XSI=Low).	Specified focus search time has been passed.
24	Standing by after focus close is over.	Specified focus search time has been passed.
25	Focus search preprocessing is in progress while setup protection is turned on.	None

Status No.	Contents	Protective action
26	Focus search preprocessing is in progress while focus recovery is turned on.	None
27	Wait time after focus close is set up.	Off focus.
28	Standing by after focus close is over.	Off focus.
29	Setup (1/2) before T balance adjustment is started.	Off focus.
30	Setup (2/2) before T balance adjustment is started.	Off focus.
31	T balance adjustment started.	Off focus.
32	T balance adjustment (1/2).	Off focus.
33	T balance adjustment (2/2).	Off focus.
34	Waiting for spindle rotation to end. Spindle rough servo.	Off focus.
35	Standing by after spindle rough servo is over.	Off focus.
36	RF AGC started.	Off focus.
37	RF AGC started.	Off focus.
38	RF AGC ending process in progress.	Off focus.
39	Tracking close in progress.	Off focus.
40	Standing by after tracking is closed. Carriage closing in progress.	Off focus.
41	Focus/tracking AGC started.	Off focus.
42	Focus AGC started.	Off focus.
43	Focus AGC in progress.	Off focus.
44	Tracking AGC in progress.	Off focus.
45	Standing by after focus/tracking AGC are over.	Off focus.
46	Spindle processes applicable servo.	Off focus.
47	Check for servo close is started.	Off focus.
48	Check of LOCK pin started.	Off focus or spindle not locked.
49	RF AGC started.	Off focus.
50	RF AGC in progress.	Off focus.
51	Standing by after RF AGC is over.	Off focus.

(5) Display Examples

1) During Setup (When status no. = 11)

TRK No.	MIN.	SEC.
11	11'	11"

2) During Operation (TOC read, TRK search, Play, FF and REV)

The same as in the normal mode.

3) When a Protection Error Occurred

Switch to the following displays (A) and (B) using the [BAND] switch:

(A) Error occurrence timing display in absolute time.

An example: Error occurred in 12th tune at 34'56" in absolute time.

TRK No.	MIN.	SEC.
12	34'	56"

(B) Error No. display

An example: Error #40 (Off focus is detected)

ERROR-40

7.1.2 DISASSEMBLY

● **Removing the Upper Case (not shown)**

1. Remove the nine screws.
2. Remove the Upper Case.

● **Removing the CD Mechanism Module (Fig.5)**

- ➡ 1 Remove the four dampers.
- ➡ 2 Remove the two springs.

Disconnect the connector and then remove the CD Mechanism Module.

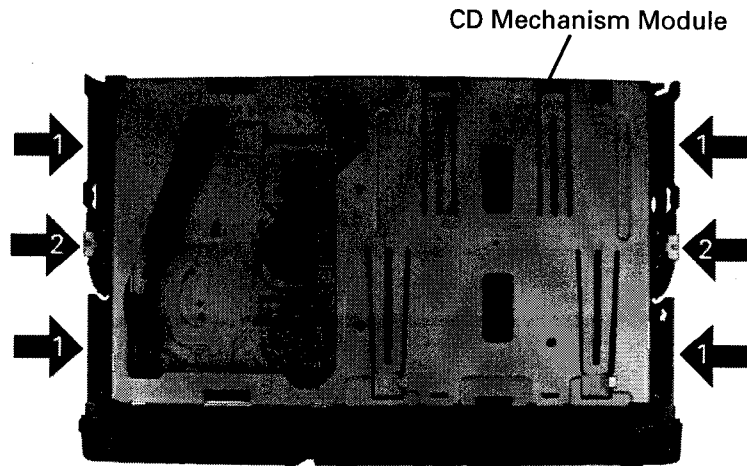


Fig.5

● **Removing the Power Unit (Fig.6)**

- ➡ 1 Remove the two screws.
- ➡ 2 Remove the screw.
- ➡ 3 Straight the tabs at location indicated and then remove the Power Unit.

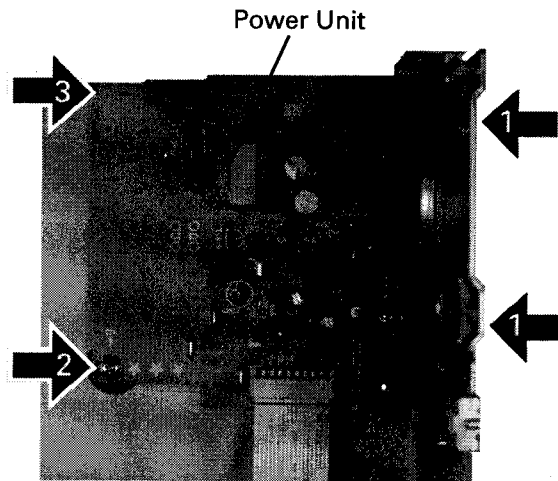


Fig.6

● **Removing the Door**

1. Remove the Door(A) in the direction of arrow② while pushing the Grille in the direction of arrow①, the slide is done as it is in the direction of arrow③ and remove the Door(A). (Fig.7)

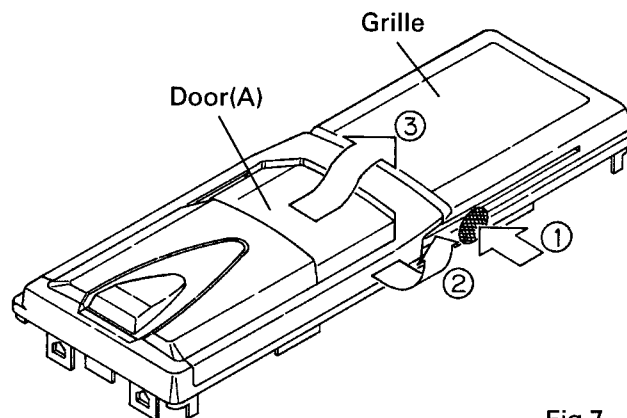


Fig.7

- The slide is done in the direction of arrow⑤ and remove the Door(B) while spread out the Door(A) in the direction of arrow④. (Fig.8)

*) The illustration of the text for 12-Disc type but disassembling method is the same for 6-Disc type.

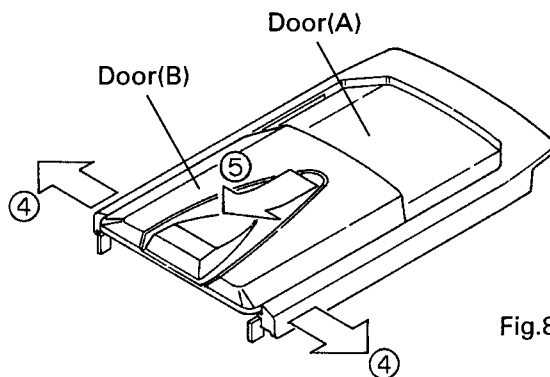


Fig.8

● Removing the Pickup Unit

- Insert the short pin from the pickup unit in the flexible PCB.
- Remove the flexible PCB from the connector.
- Remove the flexible card from the connector.
- Remove the lead wires to which the spindle motor and carriage motor assy were soldered.
- Remove the two screws and lift the mechanism PCB up as shown in the figure on the upper right. At this time, make sure that the motor PCB and flexible relay card are not pulled excessively.

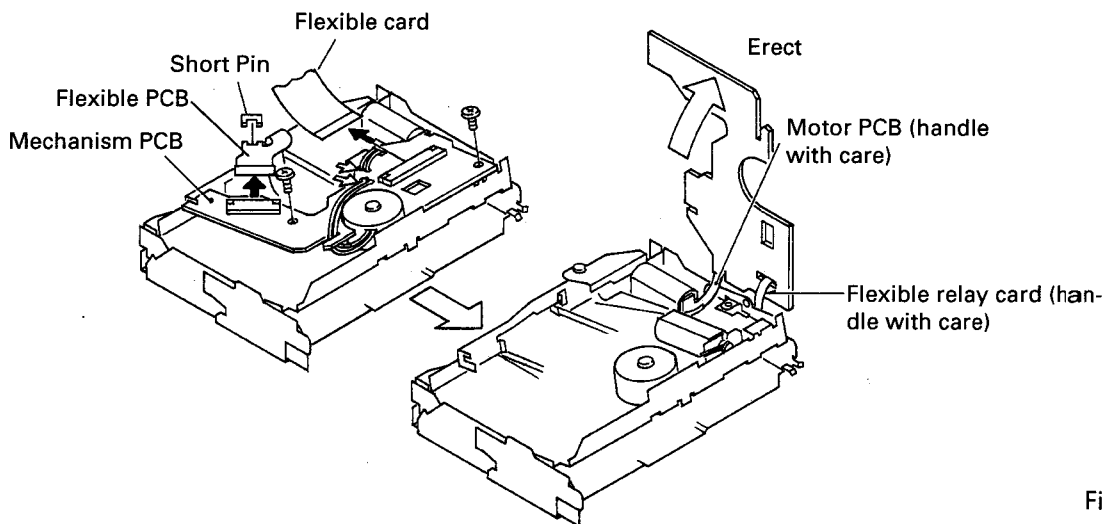


Fig.9

- Remove screw A and then remove the carriage motor assy, lighting conductor, feed screw holder, feed screw and belt (see Fig.10).
- Remove screw B on the main side and the pickup unit together with the guide shaft (see Fig.10).

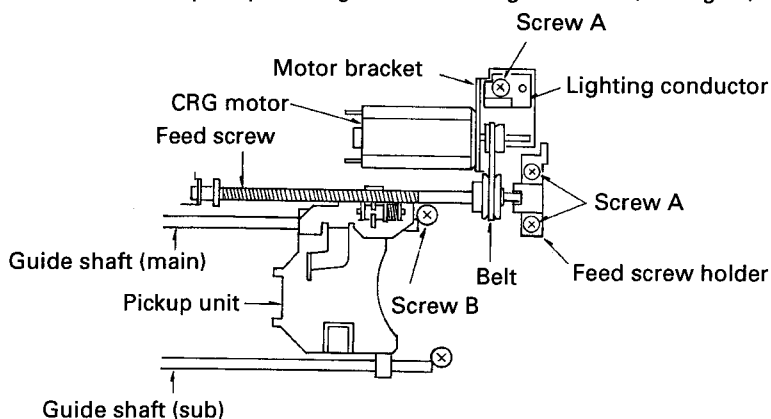
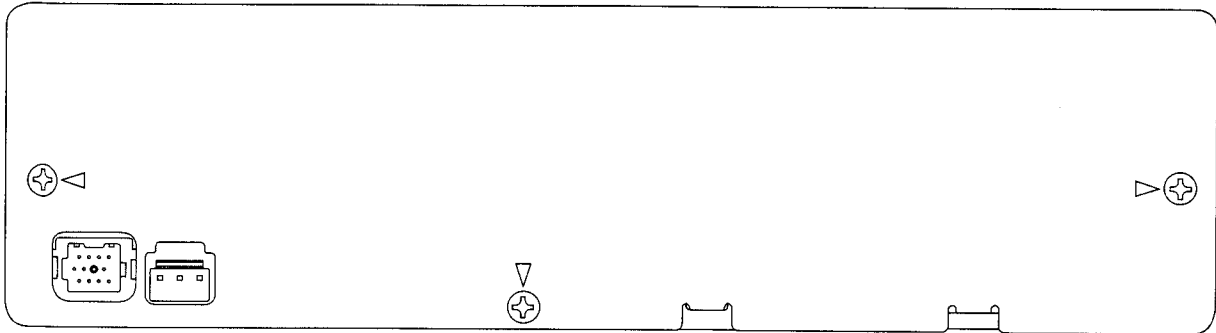
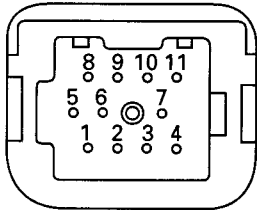


Fig.10

7.1.3 CONNECTOR FUNCTION DESCRIPTION

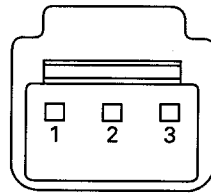


IP-BUS



- | | |
|--------|----------|
| 1.BUS+ | 7.LCH |
| 2.GND | 8.ASENB |
| 3.GND | 9.RCH |
| 4.NC | 10.SGNDR |
| 5.BUS- | 11.SGNDL |
| 6.GND | |

POWER SUPPLY



- | |
|--------|
| 1.GND |
| 2.ACC |
| 3.BATT |

7.2. IC

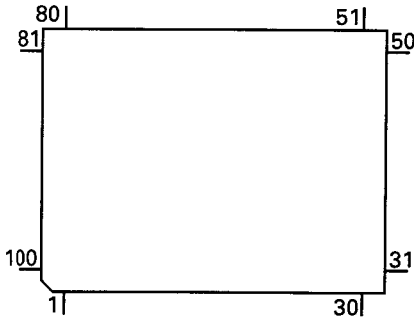
● Pin Functions (PD5638A)

Pin No.	Pin Name	I/O	Format	Function and Operation
1,2	NC			Not used
3	ADENA	O	C	A/D reference voltage output
4	TXTSTB	O	C	TEXT parameter output
5	TXTSO	O	C	TEXT control parameter serial output
6	TXTSI	I		TEXT data serial input
7	TXTSCK	O	C	TEXT clock output
8	BYTE	I		VCC joint
9	CNVSS	I		VSS joint
10	POWER	O	C	CD +5V control output
11	CONT	O	C	Servo driver output control
12	RESET	I		Reset input
13	XOUT	O		Crystal oscillating element connection pin
14	VSS			GND
15	XIN	I		Crystal oscillating element connection pin
16	VCC			VDD
17	NMI	I		Pull up
18	BSENS	I		Back up power sense input
19	ASENS	I		Acc sense input
20	TXTPACK	I		TEXT PACK interrupt input
21	IPTA4IN	I		IPIN joint
22	IPPW	O	C	Power supply control output for IP-BUS interface IC
23	NC			Not used
24	OPTSEL	I		Pull down
25	SRAMSW	I		"L"
26	FMPCB	I		Pull down
27	SIMUKE	I		Pull down
28	NC			Not used
29	IPIN	I		Data input from IP-BUS interface IC
30	IPOUT	O	C	Data output for IP-BUS interface IC
31,32	NC			Not used
33	FMIPSW	I		"H"
34	TESTIN	I		Test program mode input
35	XSO	O	C	CD LSI data output
36	XSI	I		CD LSI data input
37	XSCK	O	C	CD LSI clock output
38	M6M12	I		6/12 disc select input
39-43	NC			Not used
44	RD	O	C	SRAM enable output
45	NC			Not used
46	WR	O	C	SRAM write enable output
47	SYSPW	O	C	System power supply control output
48	CS	O	C	SRAM chip select output
49	XAO	O	C	CD LSI data discernment control signal output
50	XSTB	O	C	CD LSI strobe output
51	XRST	O	C	CD LSI reset output
52	NC			Not used
53	LOCK	I		Spindle lock detector input
54	FOK	I		FOK signal input
55	NC			Not used
56	A11	O	C	SRAM address bus output
57	A9	O	C	SRAM address bus output
58	A8	O	C	SRAM address bus output
59	A13	O	C	SRAM address bus output
60	A14	O	C	SRAM address bus output
61	A12	O	C	SRAM address bus output
62	VCC			VDD
63	A7	O	C	SRAM address bus output
64	VSS			GND

CDX-P670

Pin No.	Pin Name	I/O	Format	Function and Operation
65-68	A6-A3	O	C	SRAM address bus output
69	A10	O	C	SRAM address bus output
70	A2 & (EPSK)	O	C	SRAM address bus output and (E2PROM clock output)
71	A1 & (EPDI)	O/I	C	SRAM address bus output and (E2PROM data input)
72	A0 & (EPDO)	O	C	SRAM address bus output and (E2PROM data output)
73	ASENSFM	I		Pull up
74	EJSW	I		Eject key switch interrupt input
75	MAG	I		Magazine lock switch interrupt input
76	CDMUTE	O	C	CD mute output
77	NC			Not used
78	I13	O	C	Motor driver control output
79	I2	O	C	Motor driver control output
80	I4	O	C	Motor driver control output
81-88	D0-D7	I/O	C	SRAM data bus input/output
89,90	NC			Not used
91	DSP	I		DISC detect timing input
92	DISK			Disc detector input
93	ELVPVO			Voltage input from ELV position sense
94	ELVREF			ELV reference voltage input
95	TRP	I		Tray position input
96	AVSS			A/D GND
97	VDIN			Power supply short sensor input
98	VREF	I		A/D converter reference voltage input
99	AVCC			A/D VCC
100	EPCS	I/O	C	E2PROM detect input , Chip select output

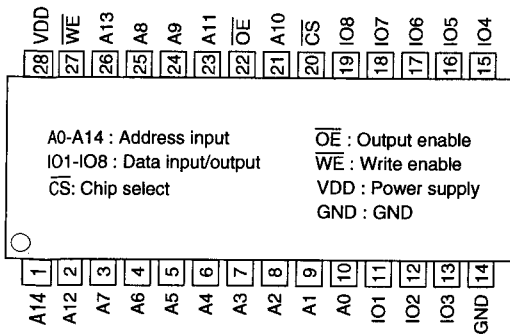
*PD5638A



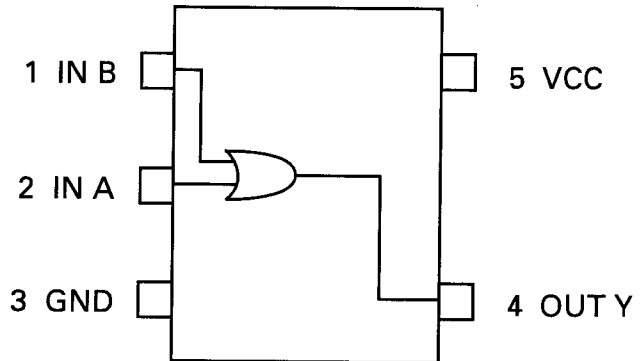
Format	Meaning
C	C MOS

IC's marked by* are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

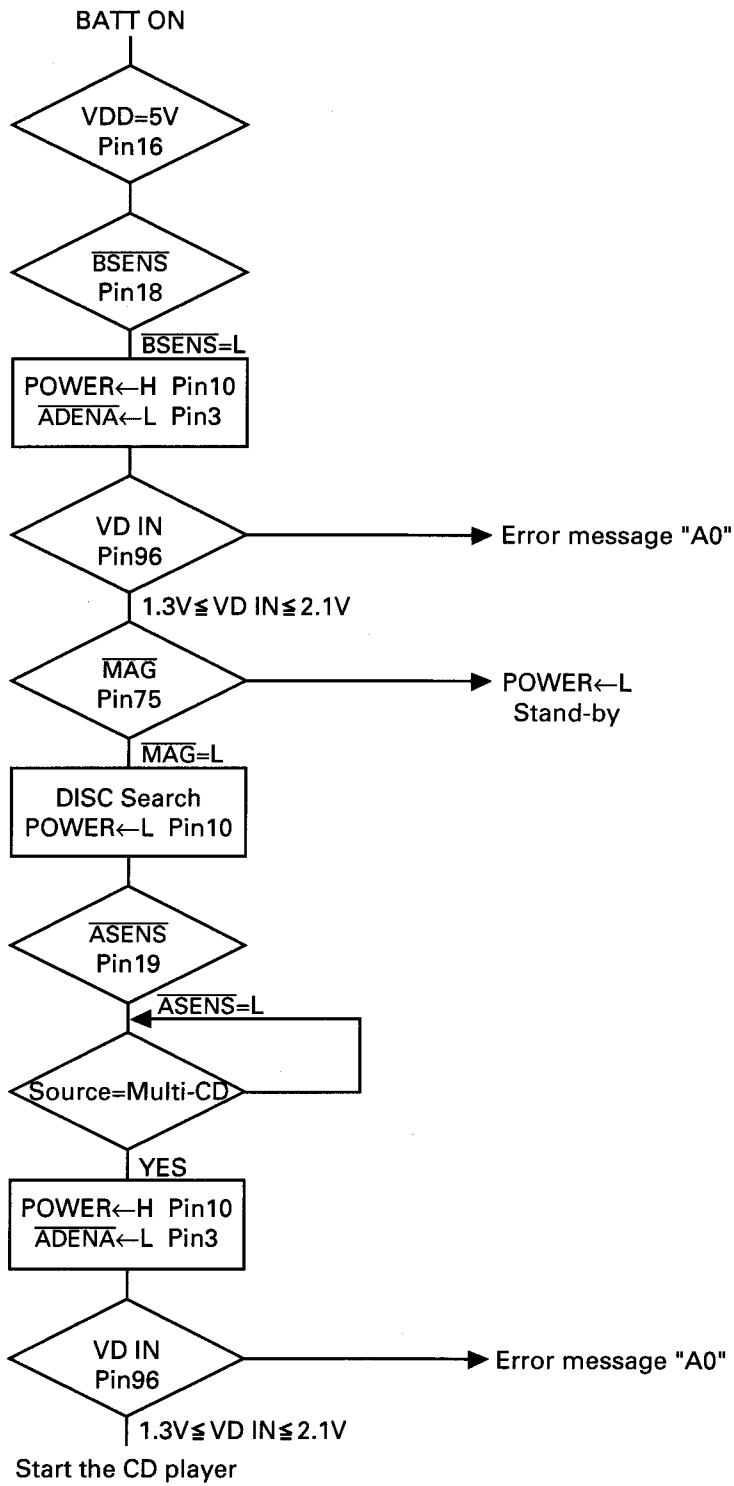
LC35256FT-70U



TC7SH32F



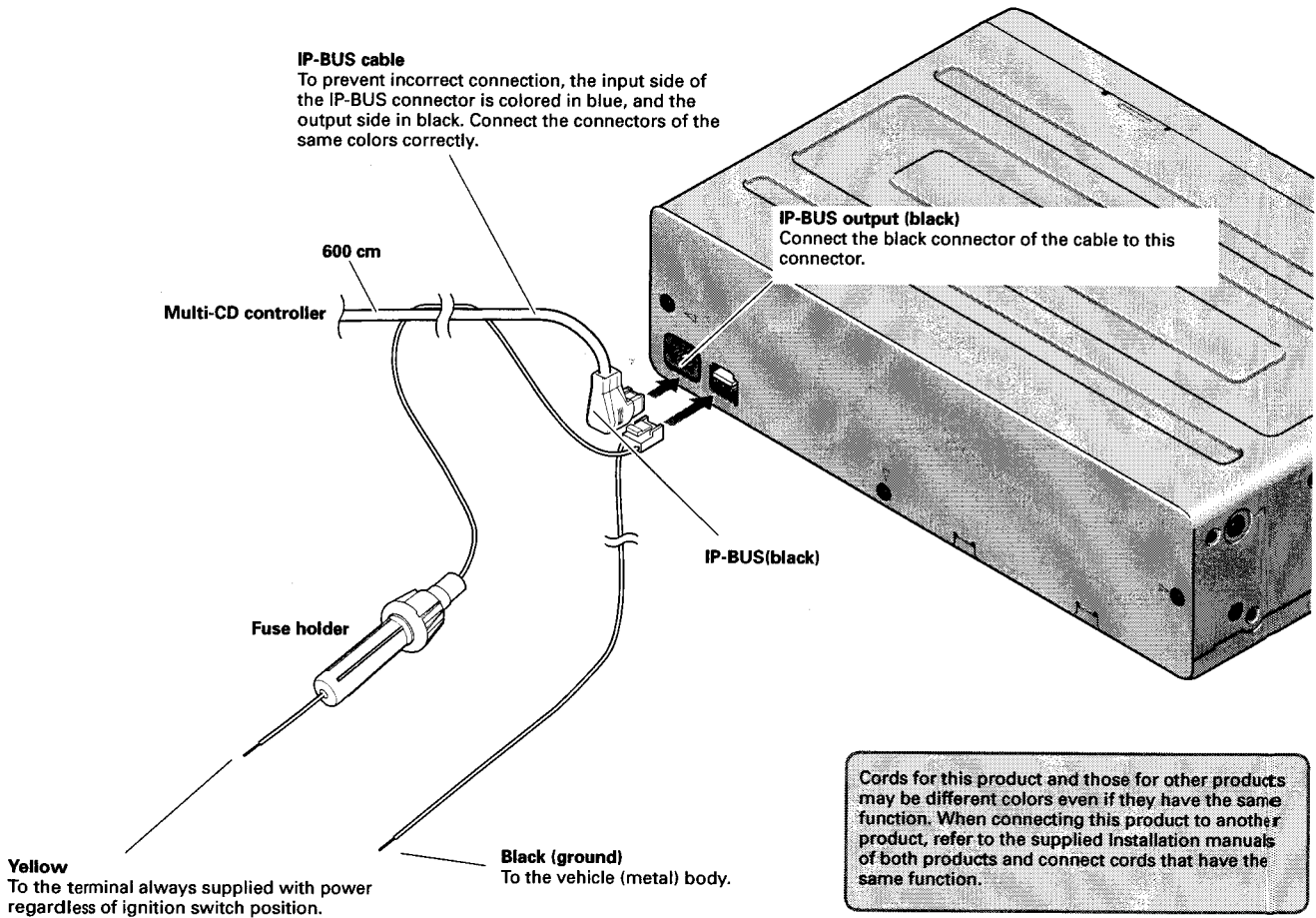
7.3 OPERATIONAL FLOW CHART



8. OPERATIONS AND SPECIFICATIONS

8.1 OPERATIONS

Connecting the Units



8.2 SPECIFICATIONS

General

System	Compact disc audio system
Usable discs	Compact Disc
Signal format	Sampling frequency: 44.1 kHz Number of quantization bits: 16; linear
Power source	14.4 V DC (10.8 — 15.1 V allowable)
Max. current consumption	1.0 A
Weight	1.9 kg (4.2 lbs.)
Dimensions	248 (W) × 66 (H) × 168 (D) mm [9-3/4 (W) × 2-5/8 (H) × 6-5/8 (D) in.]
Backup current	1mA or less

Audio

Frequency characteristics	5 — 20,000 Hz (± 1 dB)
Signal-to-noise ratio	92 dB (1 kHz) (IHF-A Network)
Distortion	0.006 %
Dynamic range	90 dB (1 kHz)
Output level	1,000 mV (1 kHz, 0 dB)
Number of channels	2 (stereo)

Note:

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