

Service Manual

Pioneer



ORDER NO.
CRT2321

UNIVERSAL MULTI-CD SYSTEM

CDX-FM653

X1N/UC



- See the separate manual CX-892(CRT2356) for the CD mechanism description, disassembly and circuit description.
- The CD mechanism employed in this model is one of C7 series.

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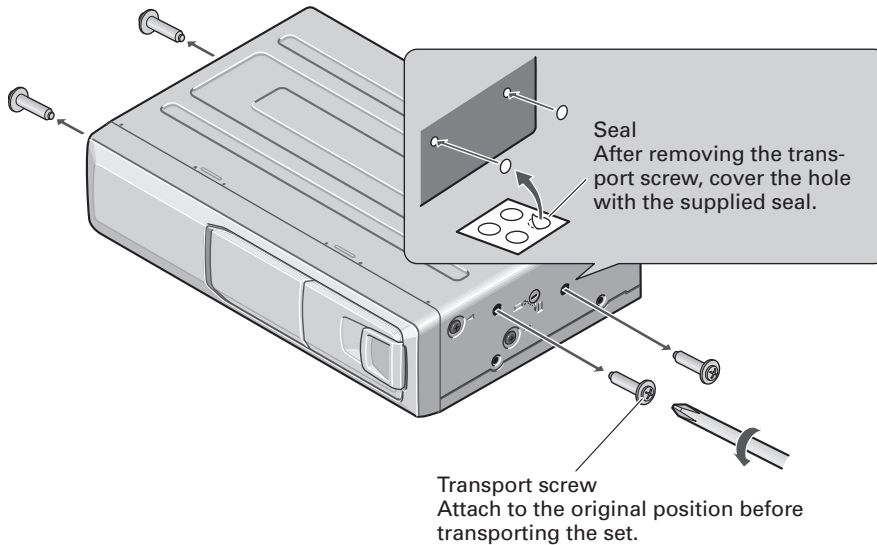
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● CD Player Service Precautions

1. For pickup unit(CXX1285) handling, please refer to "Disassembly"(See page 50). 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 checking the grating after changing the pick-up unit (See page 37).
4. Since these screws protects 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

CAUTION

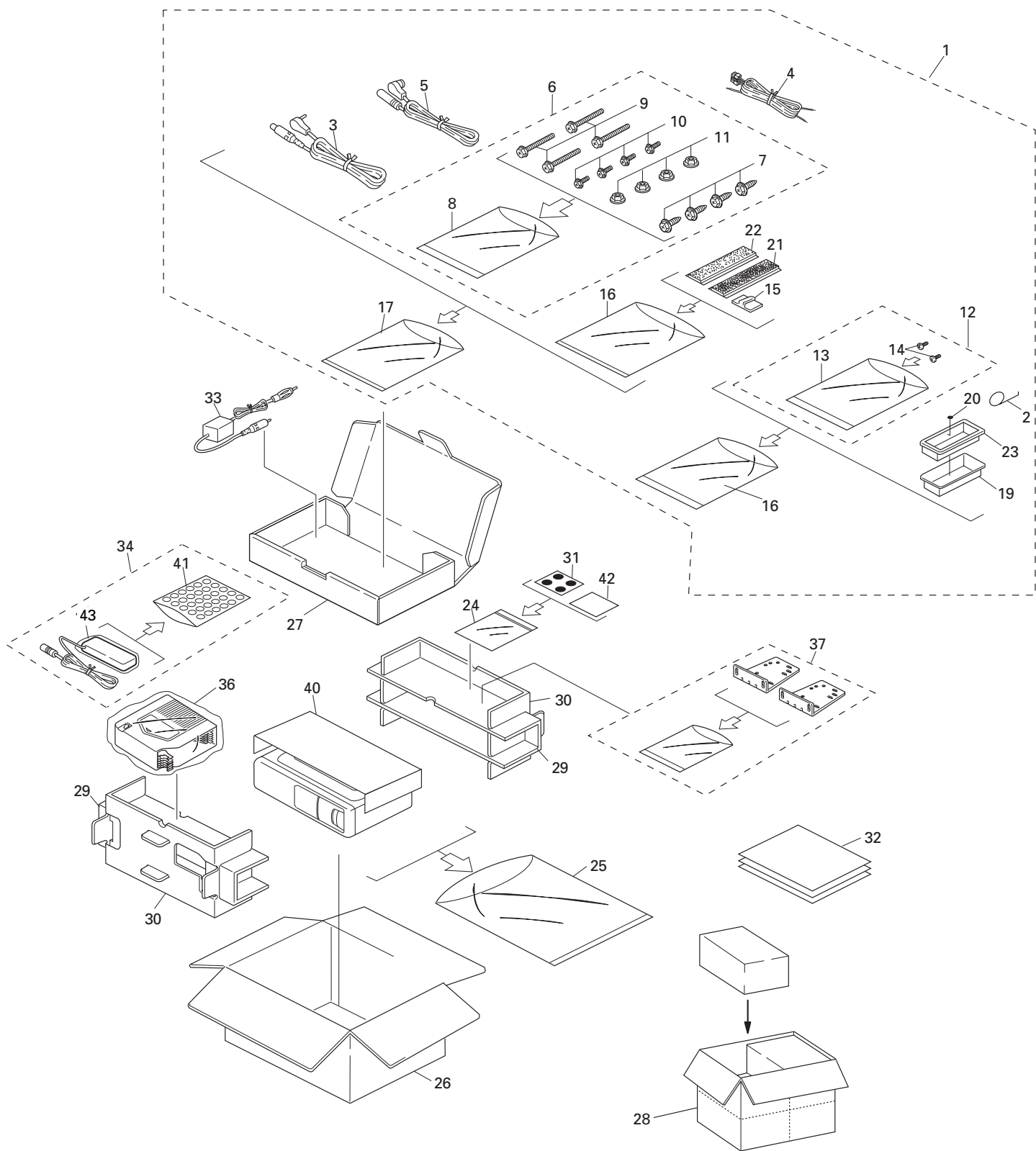
This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly 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

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.	Mark	No.	Description	Part No.
	1	Accessory Assy	CEA2497		31	Seal	CNM5599
	2	Spring	CBH-865		32-1	Installation Manual	CRD2886
	3	Cord	CDE4289		32-2	Owner's Manual	CRD2885
	4	Cord	CDE5812	*	32-3	.....
	5	Cord	CDE5008		33	Antenna Select Assy	CWM6445
	6	Screw Assy	CEA1962		34	Display Assy	CXB3249
	7	Screw	CBA1295		35	.....
*	8	Polyethylene Sheet	CNM5158		36	Magazine Assy	CXB4027
	9	Screw	HMB60P500FMC		37	Angle Assy	CXB3591
	10	Screw	HMF40P080FZK		38	.....
	11	Nut	NF60FMC		39	.....
	12	Screw Assy	CEA1965	*	40	Caution Card	CRP1195
*	13	Polyethylene Bag	CEG-127		41	Air Cushioned Bag	CEG1055
	14	Screw	IMS30P050FZK	*	42	Caution Card	CRP1090
	15	Clamper	CEF1010		43	Cover	CEG1062
*	16	Polyethylene Bag	CEG-158				
	17	Polyethylene Bag	CEG1185				
	18	.....				
	19	Bracket	CNC8061				
	20	Cushion	CNM3182				
	21	Fastener(Soft)	CNM3872				
	22	Fastener(Rough)	CNM4041				
	23	Panel	CNS5428				
*	24	Polyethylene Bag	CEG1099				
	25	Polyethylene Bag	CEG1185				
	26	Carton	CHG3727				
	27	Sub Carton	CHG3735				
	28	Contain Box	CHL3727				
	29	Protector	CHP2133				
	30	Protector	CHP2135				

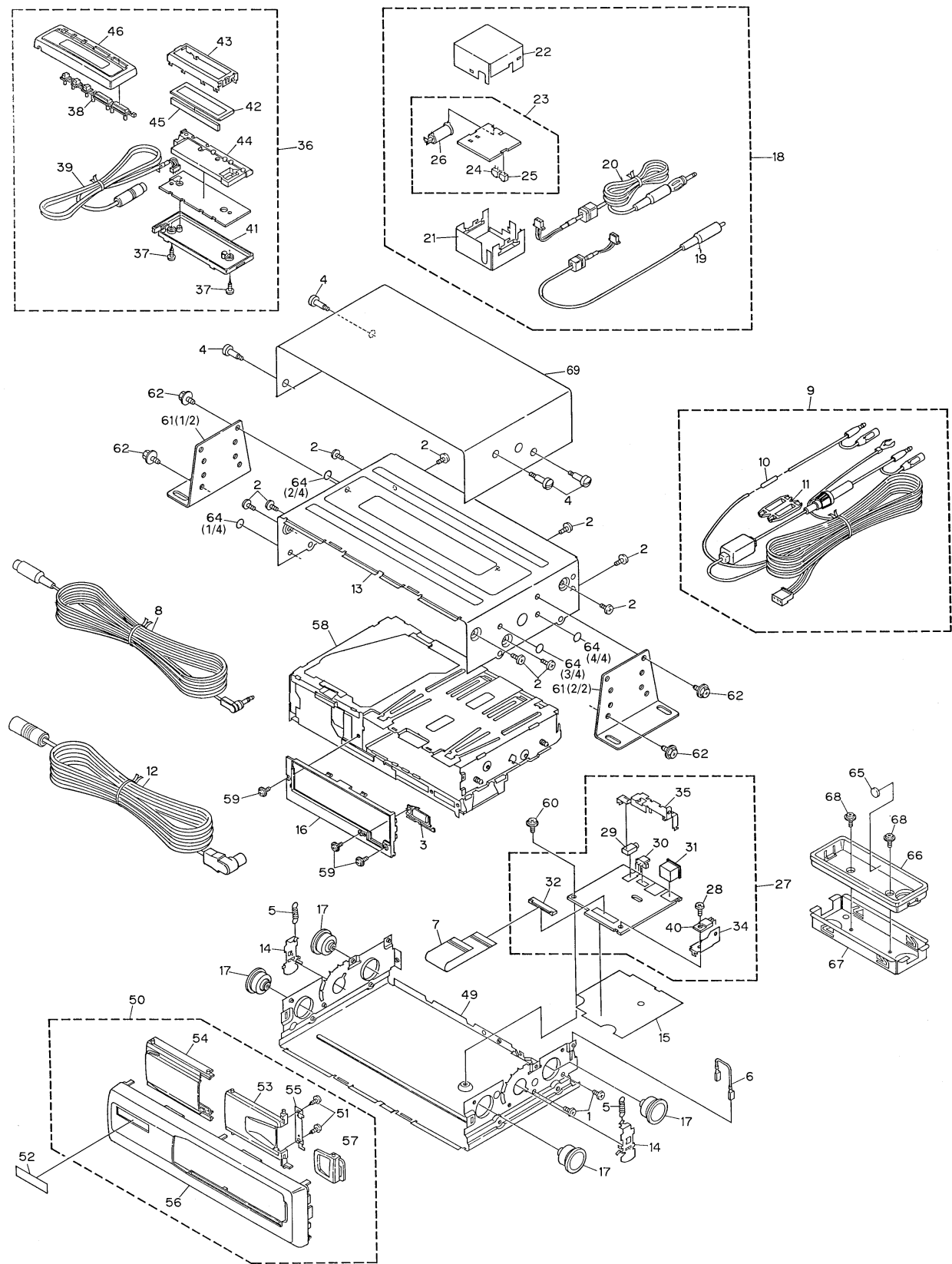
● Owner's Manual

Part No.	Language
CRD2885	English, French, Spanish

● Installation Manual

Part No.	Language
CRD2886	English, French, Spanish

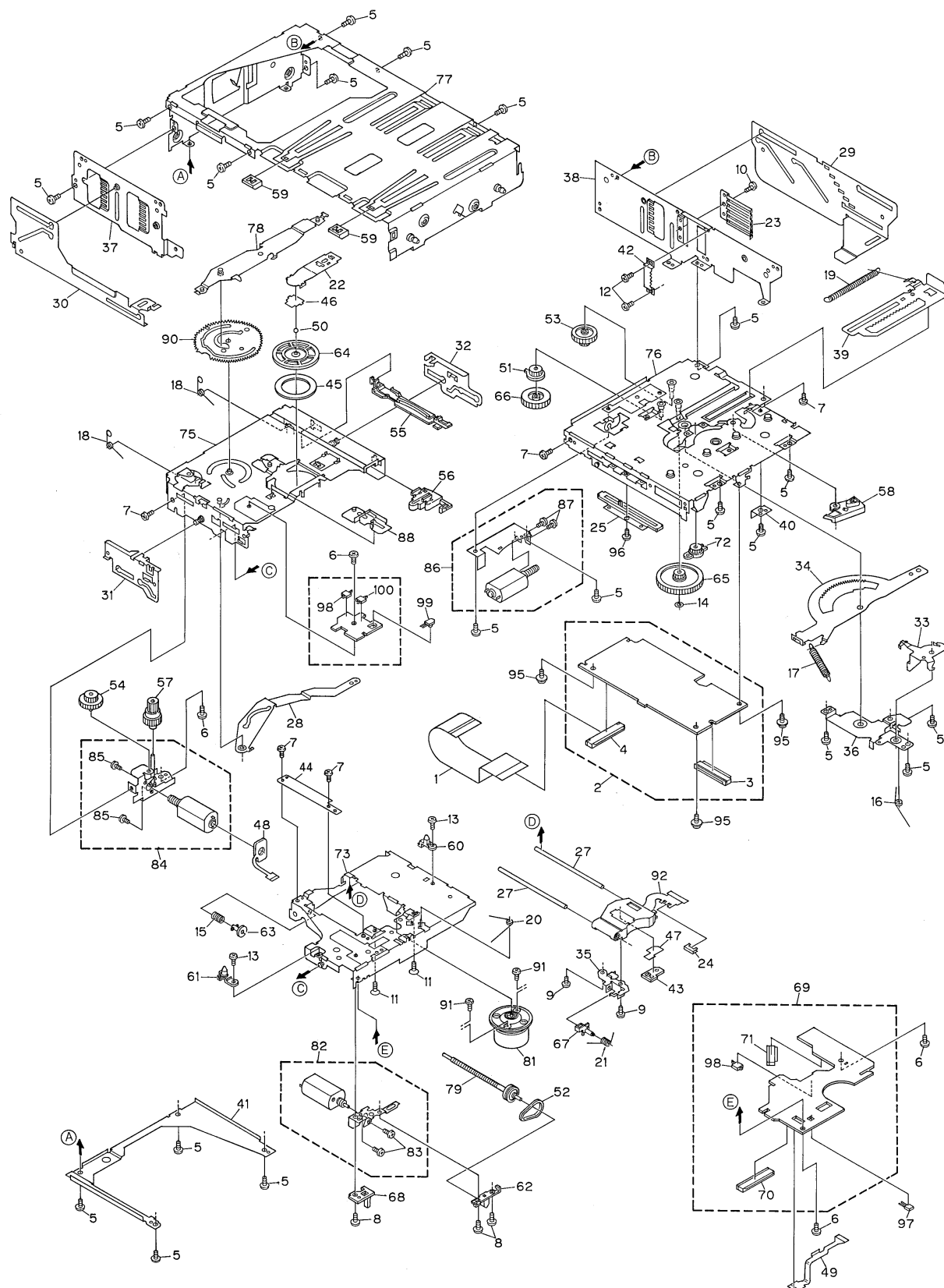
2.2 EXTERIOR



● EXTERIOR SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Screw	BMZ26P040FMC	36	Display Assy	CXB3249
2	Screw	BMZ30P040FZK	37	Screw	BPZ20P100FZK
3	Button	CAC4632	38	Button	CAC5887
4	Screw	CBA1460	39	Cord	CDE5834
5	Spring	CBH1859	40	Transistor(Q801)	2SD2396
6	Connector	CDE5525	41	Cover	CNS5223
7	Connector	CDE5833	42	LCD(LCD901)	CAW1514
8	Cord	CDE4289	43	Holder	CNC8062
9	Cord	CDE5812	44	Lighting Conductor	CNV5594
10	Resistor	RS1/2PMF102J	45	Rubber	CNV5599
11	Cap	CNS1472	46	Grille Unit	CXB3825
12	Cord	CDE5008	47	.....
13	Upper Case	CNB2394	48	.....
14	Arm	CNC8058	49	Lower Case Unit	CXB3395
15	Insulator	CNM6074	50	Grille Unit	CXB4378
16	Panel	CNS5216	51	Screw	BPZ20P080FMC
17	Damper	CNV5591	52	Sheet	CAH1682
18	Antenna Select Assy	CWM6445	53	Door	CAT2013
19	Cord	CDE4087	54	Door	CAT2014
20	Antenna Cable	CDH1207	55	Holder	CNC8139
21	Chassis	CNA1555	56	Grille	CNS5285
22	Case	CNB1764	57	Lever	CNS5391
23	Antenna Select Unit	CWX2200	58	CD Mechanism Module	CXK4811
24	Plug(CN502)	CKS1222	59	Screw	IMS20P035FZK
25	Plug(CN501)	CKS2812	60	Screw	IMS26P040FMC
26	Antenna Jack(CN503)	CKX1006	61	Angle Assy	CXB3591
27	Extension Unit	CWX2312	62	Screw	HMF40P080FZK
28	Screw	BMZ26P060FMC	63	.....
29	Jack(CN401)	CKN1022	64	Seal	CNM5599
30	Plug(CN801)	CKS-460	65	Cushion	CNM3182
31	Connector(CN802)	CKS3195	66	Panel	CNS5428
32	Connector(CN201)	CKS4019	67	Bracket	CNC8061
33		68	Screw	IMS30P050FZK
34	Holder	CNC8056	* 69	Caution Card	CRP1195
35	Holder	CNC8070			

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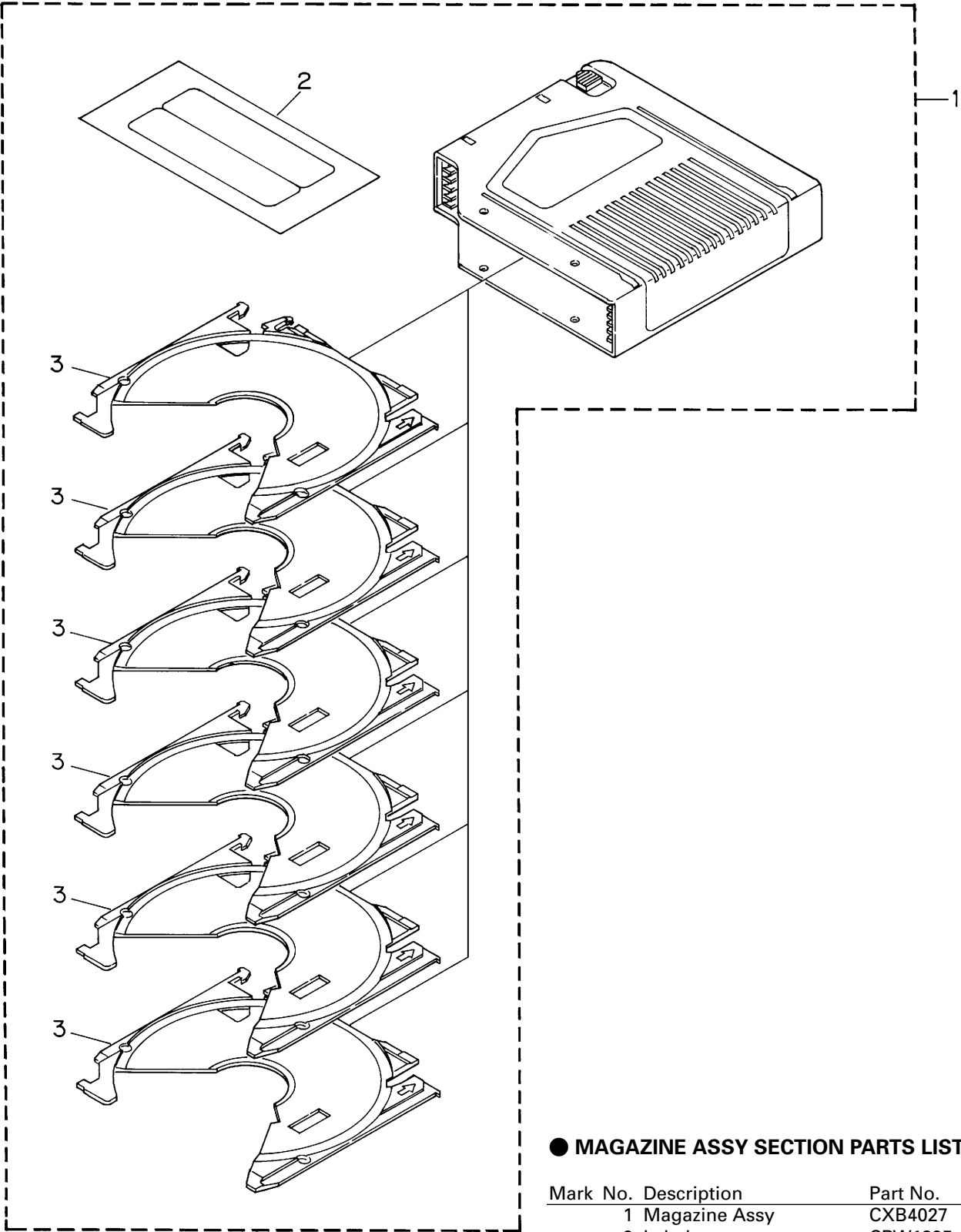


● CD MECHANISM MODULE SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Connector	CDE6069	46	Spacer	CNM6146
2	CD Core Unit (C7)	CWX2279	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	CBA1037	51	Gear	CNR1531
7	Screw	CBA1041	52	Belt	CNT1086
8	Screw	CBA1176	53	Gear	CNV5472
9	Screw	CBA1362	54	Gear	CNV5473
10	Screw	CBA1387	55	Rail	CNV5474
11	Screw	CBA1470	56	Lever	CNV5475
12	Screw	CBA1476	57	Gear	CNV5477
13	Screw	CBA1486	58	Arm	CNV5478
14	Washer	CBF1038	59	Holder	CNV5480
15	Spring	CBH2172	60	Guide	CNV5481
16	Spring	CBH2173	61	Guide	CNV5482
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	CBL1392	68	Lighting Conductor	CNV5785
24	Short Pin	CBL1239	69	Mechanism PCB	CWX2303
25	Volume(VR801)	CCW1023	70	Connector(CN801)	CKS1965
26	.....		71	Connector(CN802)	CKS3486
27	Shaft	CLA3304	72	Damper Unit	CXA7714
28	Arm	CNC7901	73	Chassis Unit	CXB2850
29	Lever	CNC7902	74	.....
30	Lever	CNC7904	75	Chassis Unit	CXB2851
31	Lever	CNC7905	76	Magazine Holder Unit	CXB2853
32	Lever	CNC7906	77	Frame Unit	CXB4426
33	Arm	CNC7908	78	Arm Unit	CXB2855
34	Arm	CNC7909	79	Screw Unit	CXB2857
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	CXB4338

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



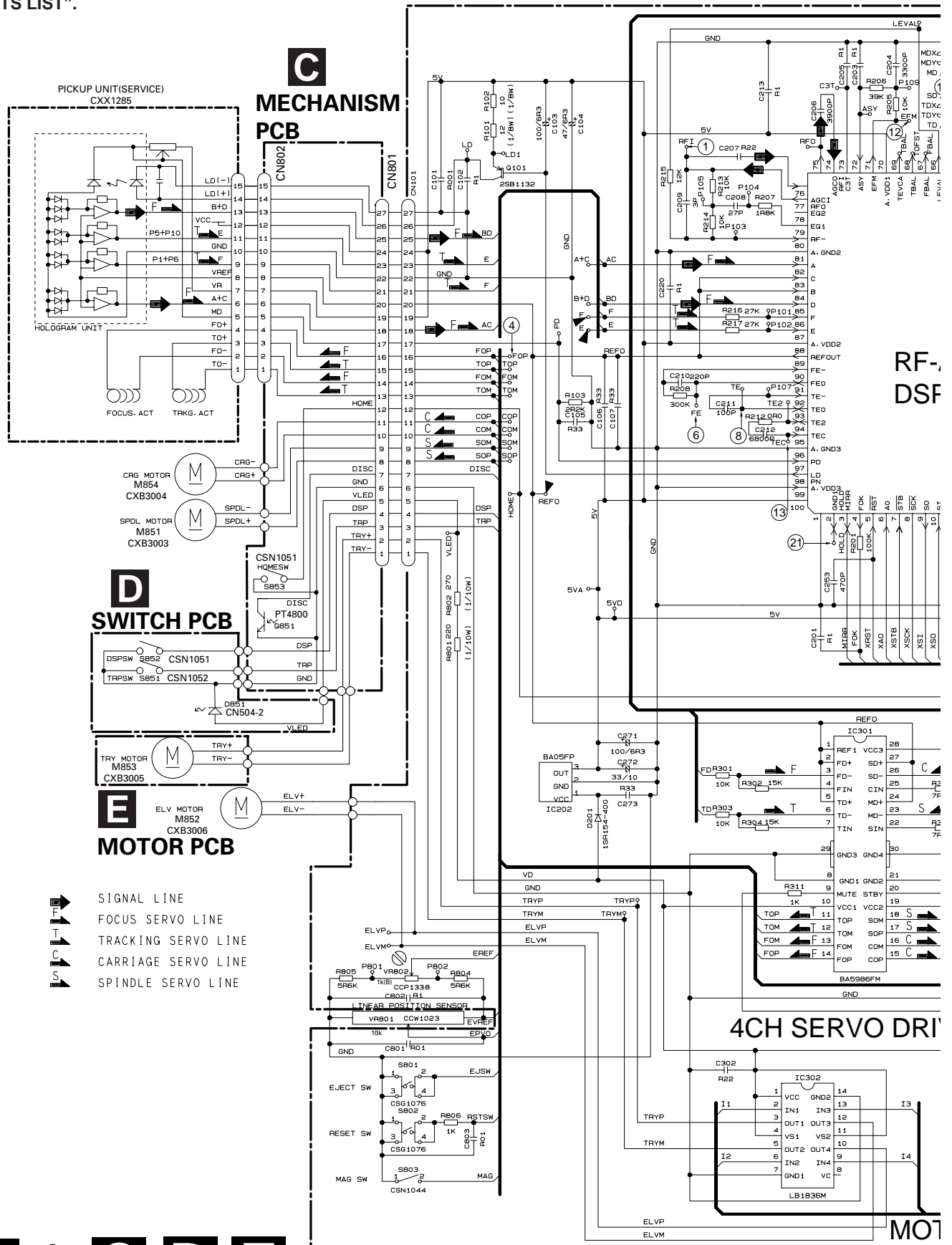
● MAGAZINE ASSY SECTION PARTS LIST

Mark No.	Description	Part No.
1	Magazine Assy	CXB4027
2	Label	CRW1395
3	Tray	CNV5341

3. SCHEMATIC DIAGRAM

3.1 OVERALL CONNECTION DIAGRAM

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

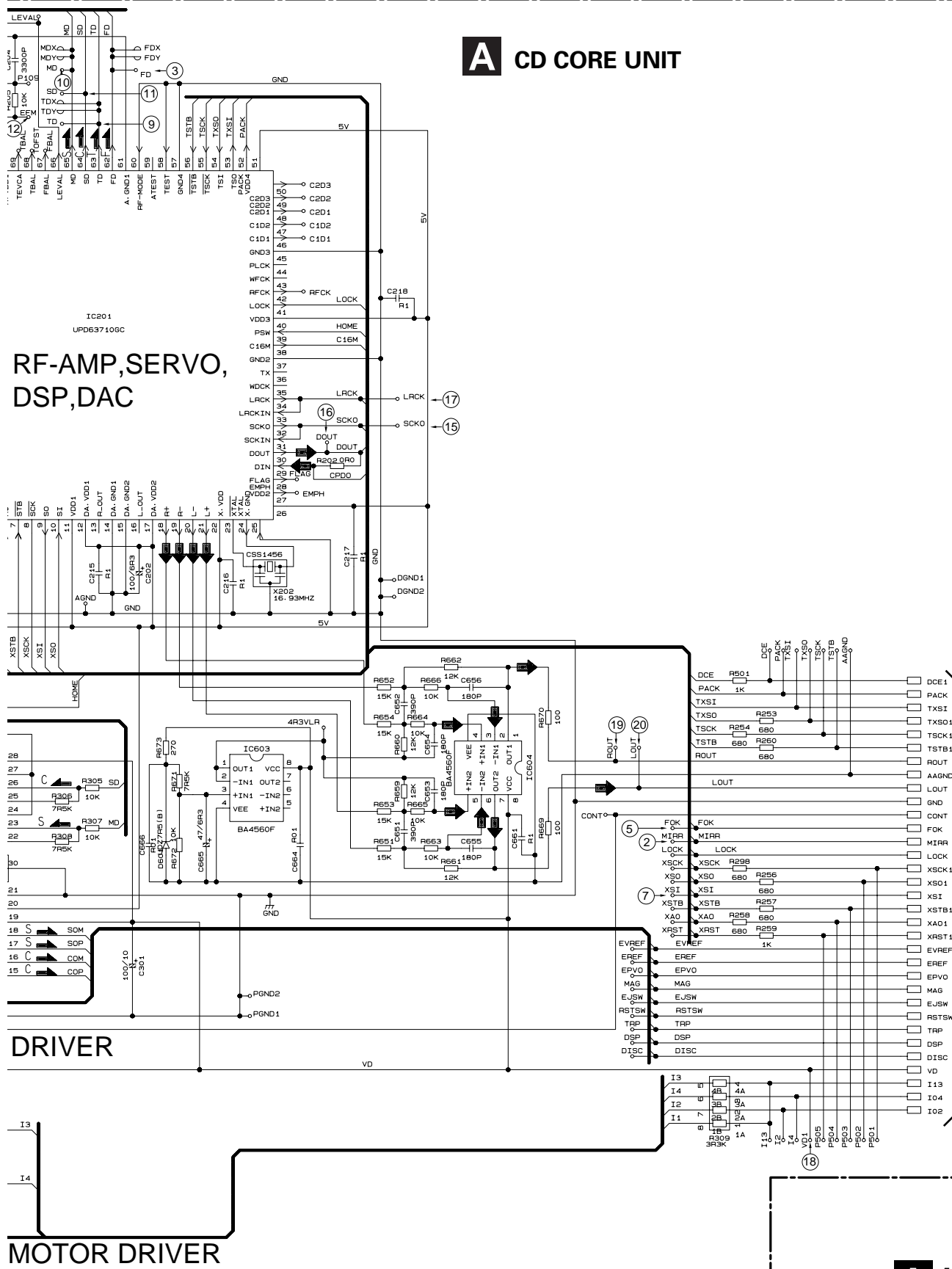


NOTE:

- 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.

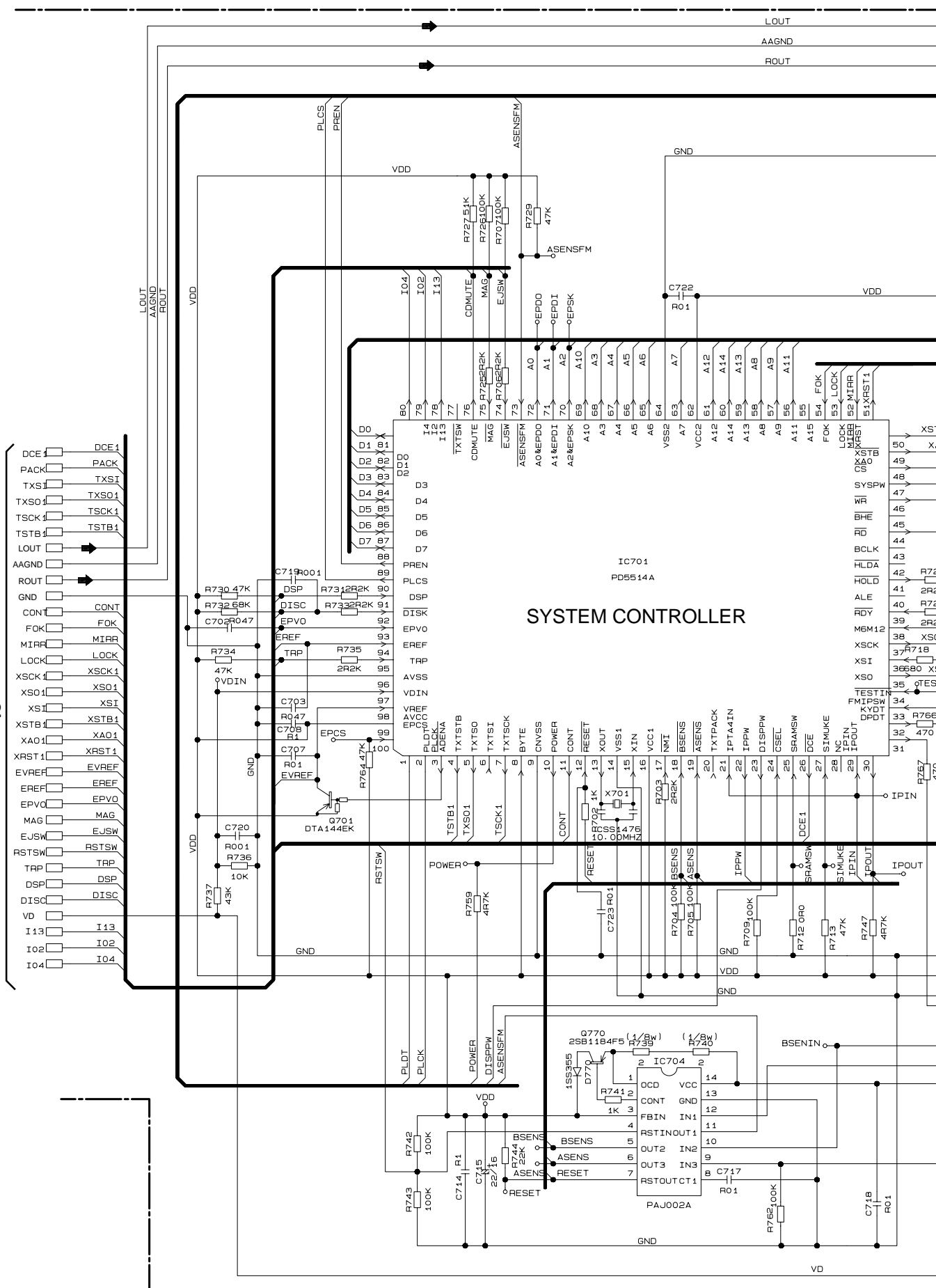
Decimal points for resistor and capacitor fixed values are expressed as:
2.2→R22
0.022→R022

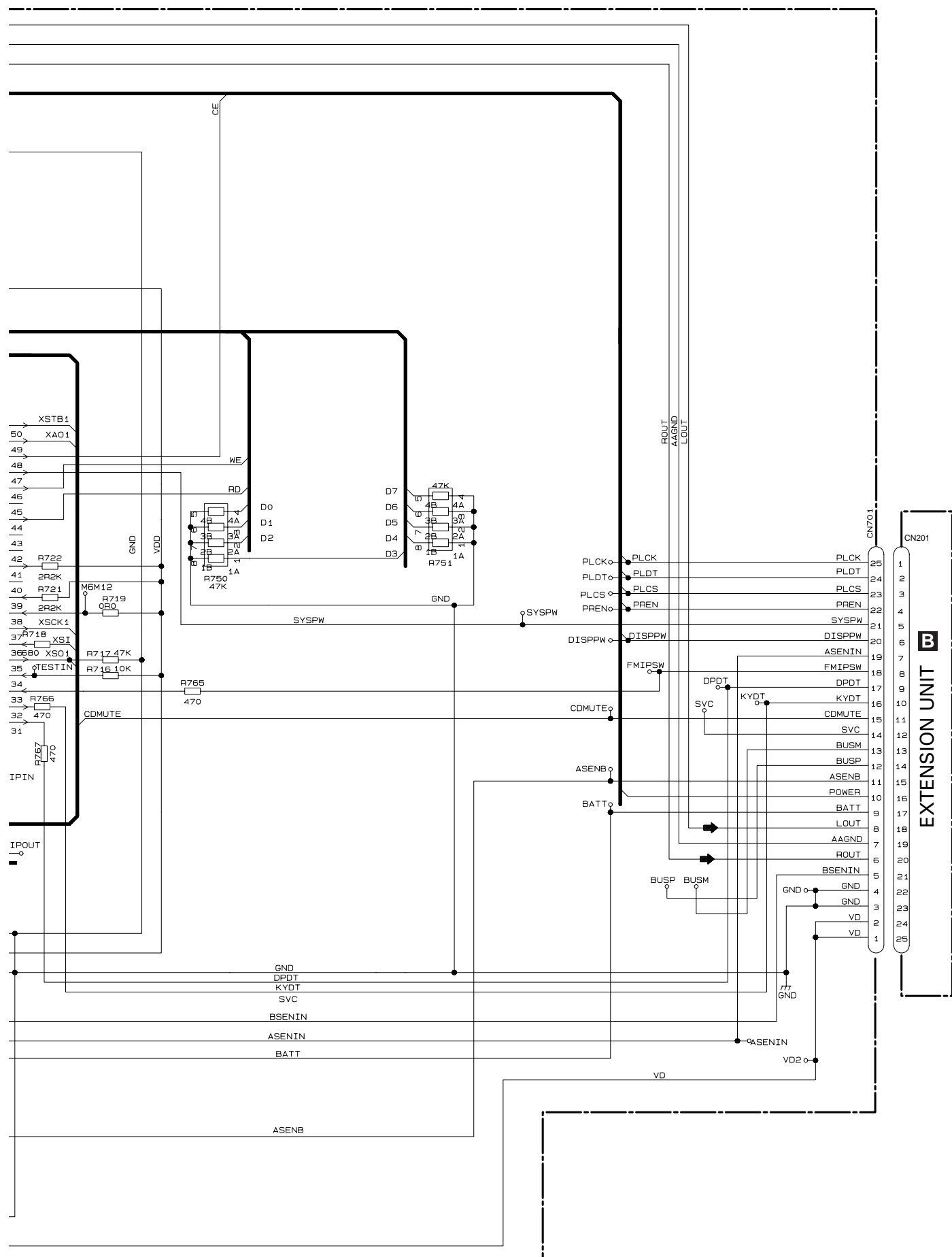
A CD CORE UNIT



A 2/2

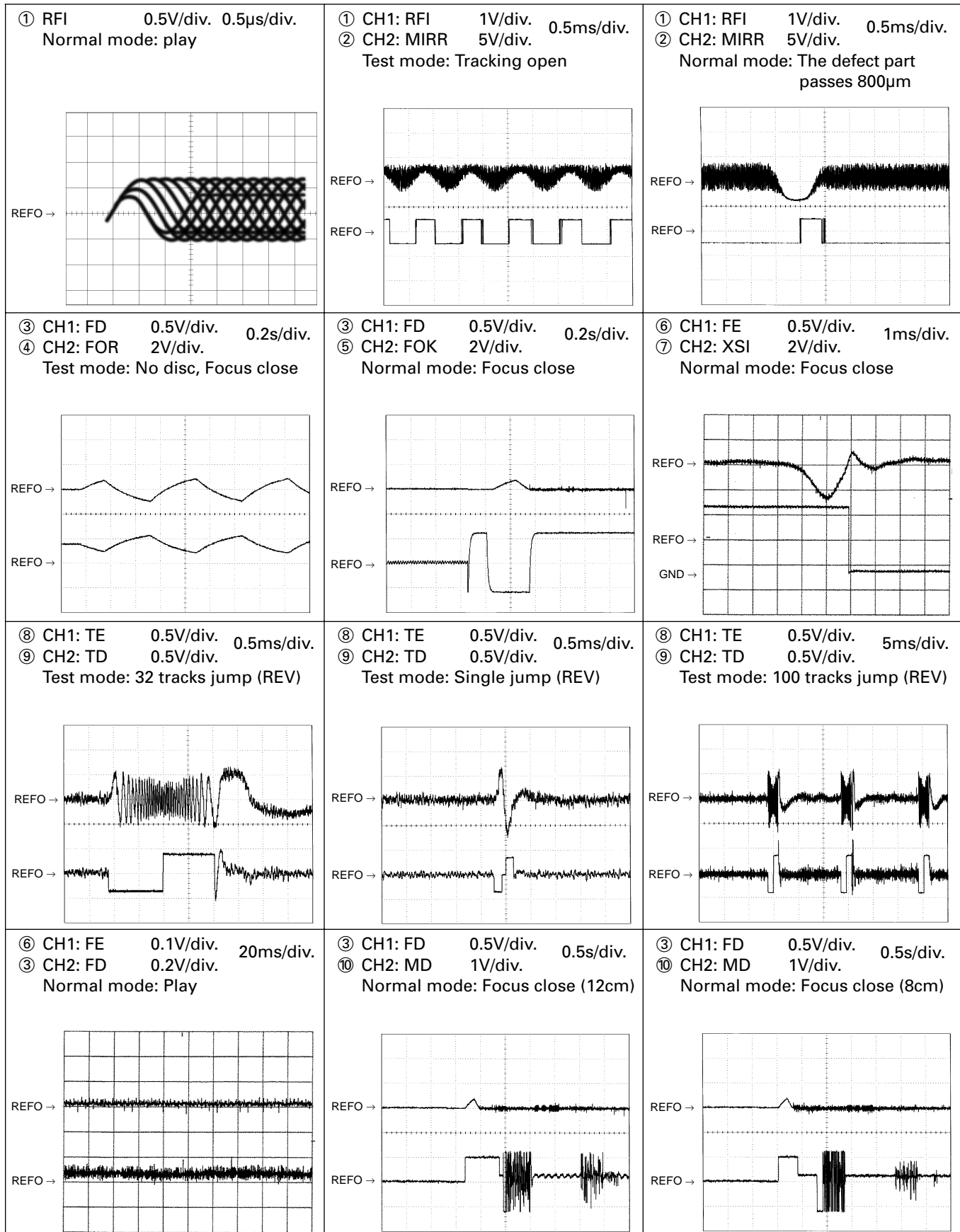
A 1/2

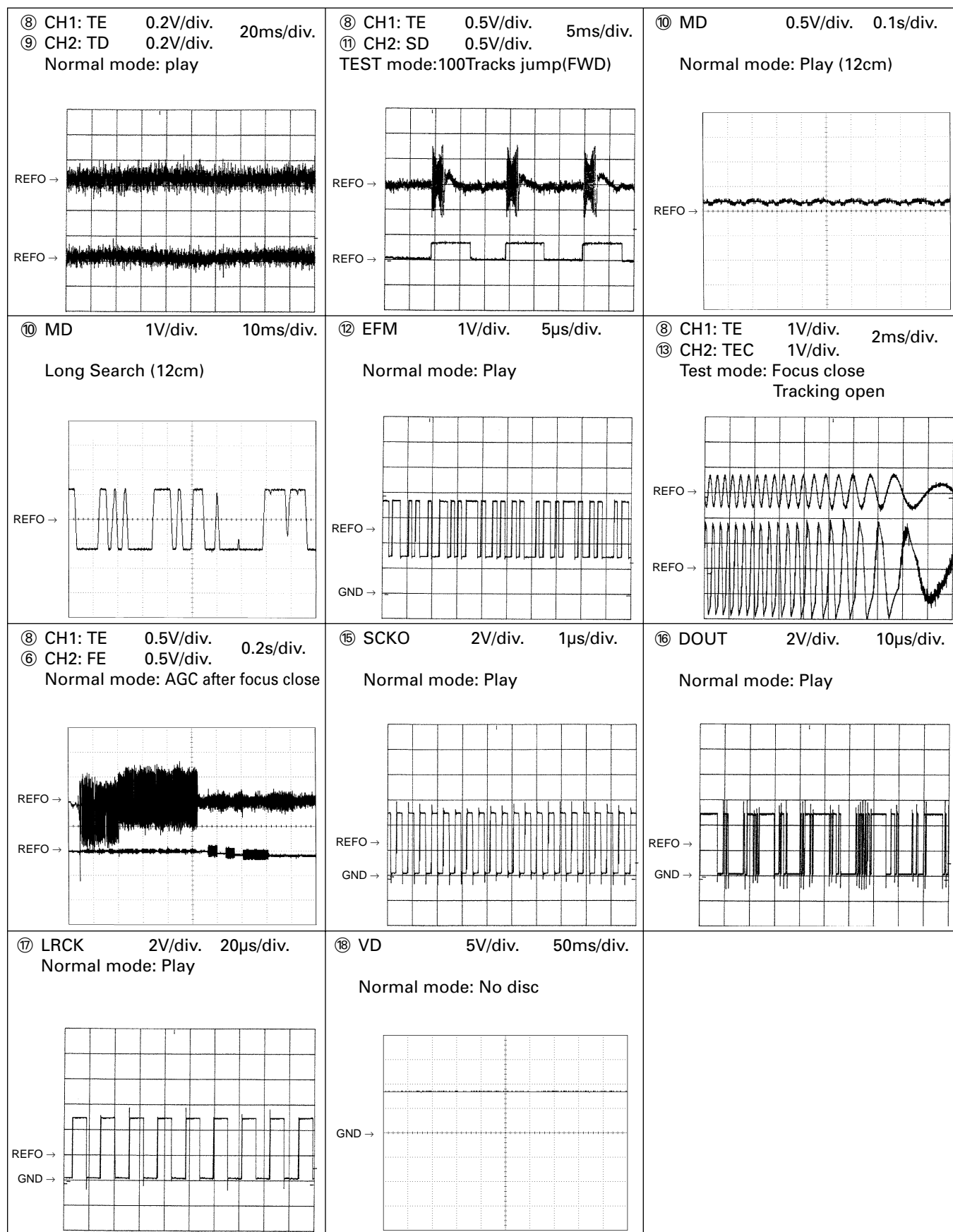


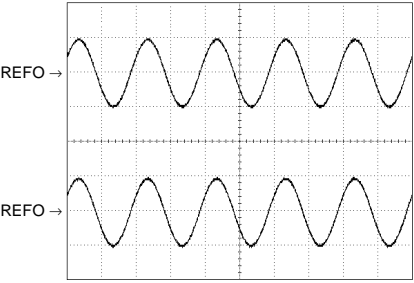
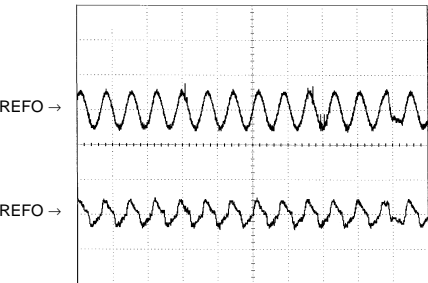
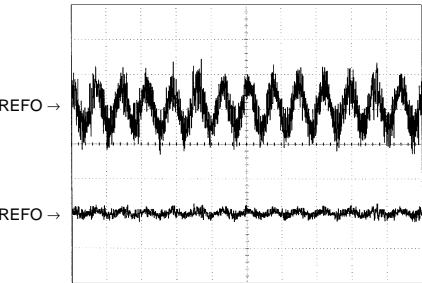
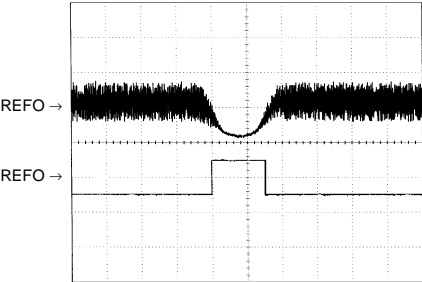
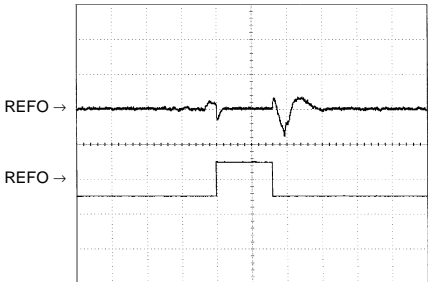
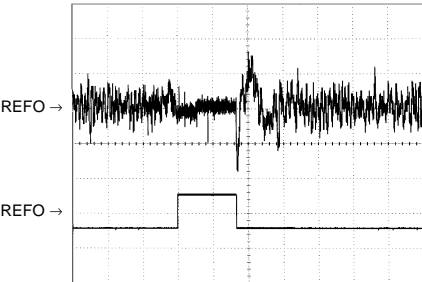


Note:1. The encircled numbers denote measuring pointes in the circuit diagram.
 2. Reference voltage
 REFO:2.5V

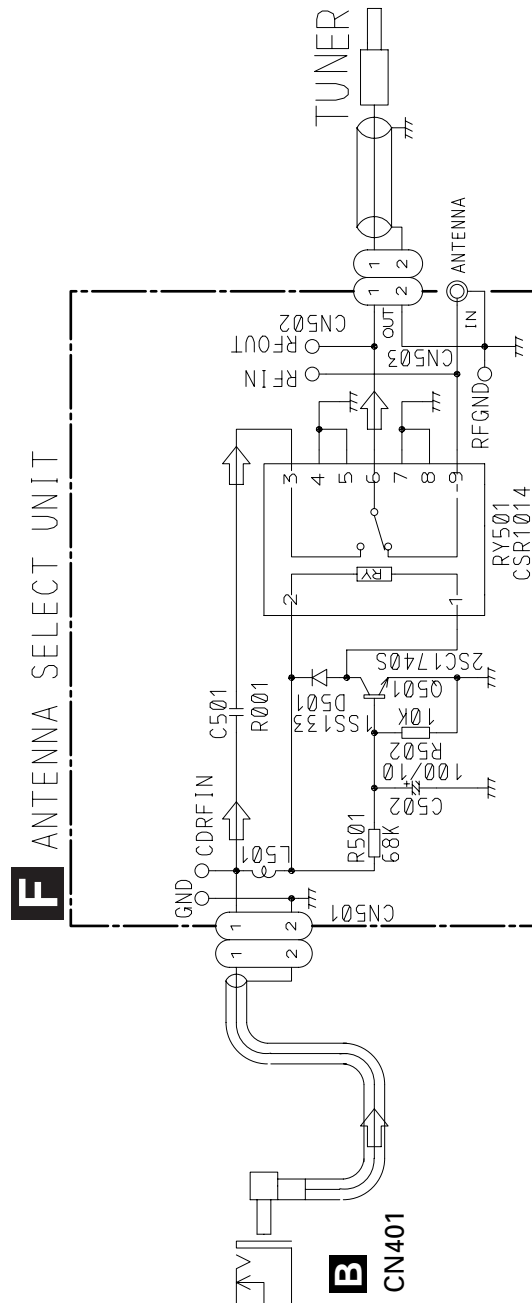
● Waveforms





<div><div><div>⑩ CH1: R OUT 2V/div. 500μs/div.</div><div>⑪ CH2: L OUT 2V/div.</div><div>Normal mode: Play (1kHz 0dB)</div></div><div></div></div>	<div><div><div>⑥ CH1: FE 0.2V/div. 1ms/div.</div><div>③ CH2: FD 0.5V/div.</div><div>Normal mode: During AGC</div></div><div></div></div>	<div><div><div>⑧ CH1: TE 0.2V/div. 1ms/div.</div><div>⑨ CH2: TD 0.5V/div.</div><div>Normal mode: During AGC</div></div><div></div></div>
<div><div><div>① CH1: RFI 1V/div. 0.5ms/div.</div><div>② CH2: HOLD 5V/div.</div><div>Normal mode: The defect part passes 800μm(B.D)</div></div><div></div></div>	<div><div><div>③ CH1: FD 1V/div. 0.5ms/div.</div><div>② CH2: HOLD 5V/div.</div><div>Normal mode: The defect part passes 800μm(B.D)</div></div><div></div></div>	<div><div><div>⑨ CH1: TD 0.1V/div. 0.5ms/div.</div><div>② CH2: HOLD 5V/div.</div><div>Normal mode: The defect part passes 800μm(B.D)</div></div><div></div></div>

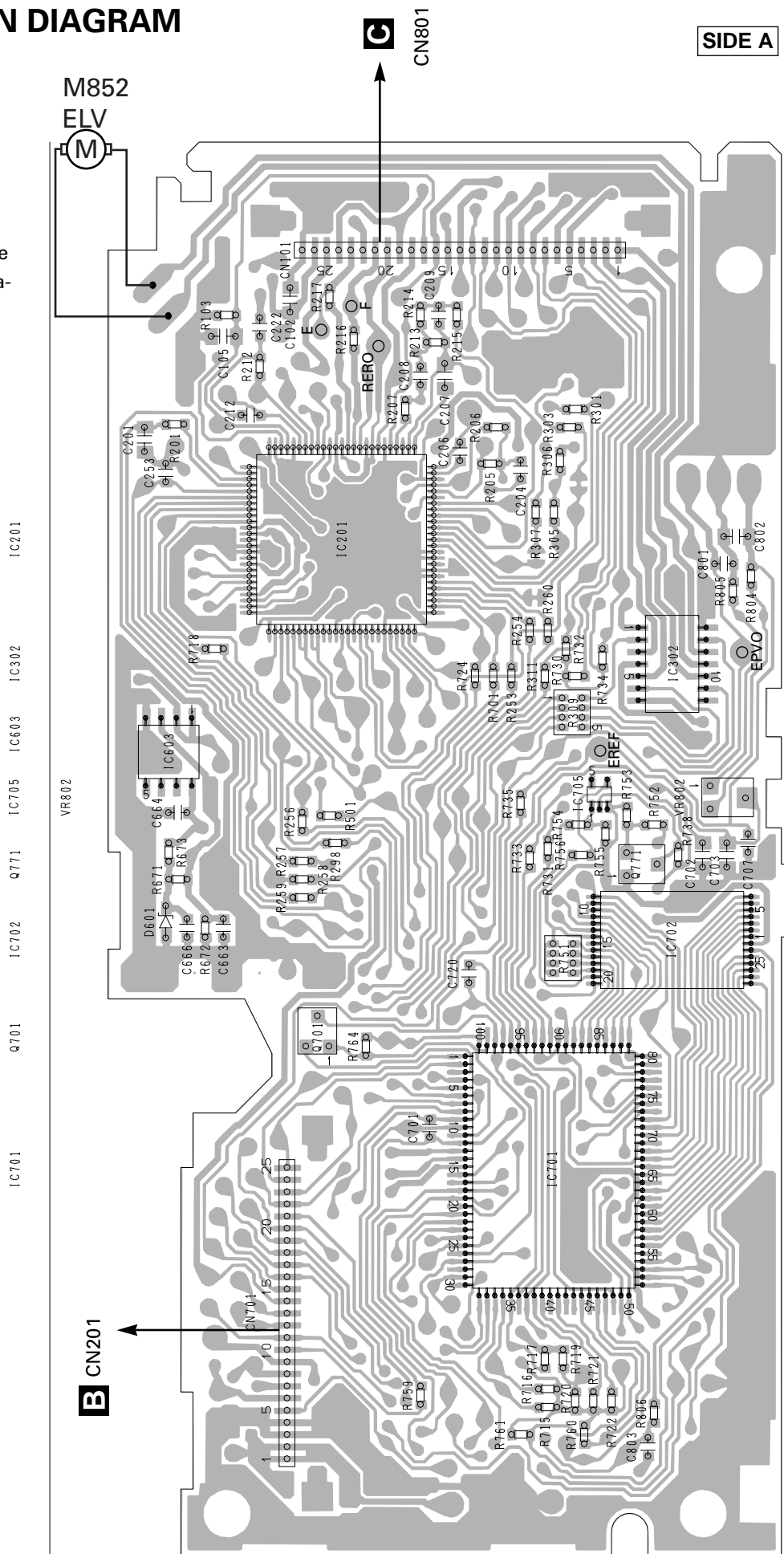
3.3 ANTENNA SELECT UNIT



4.1 CD CORE UNIT

1. 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.

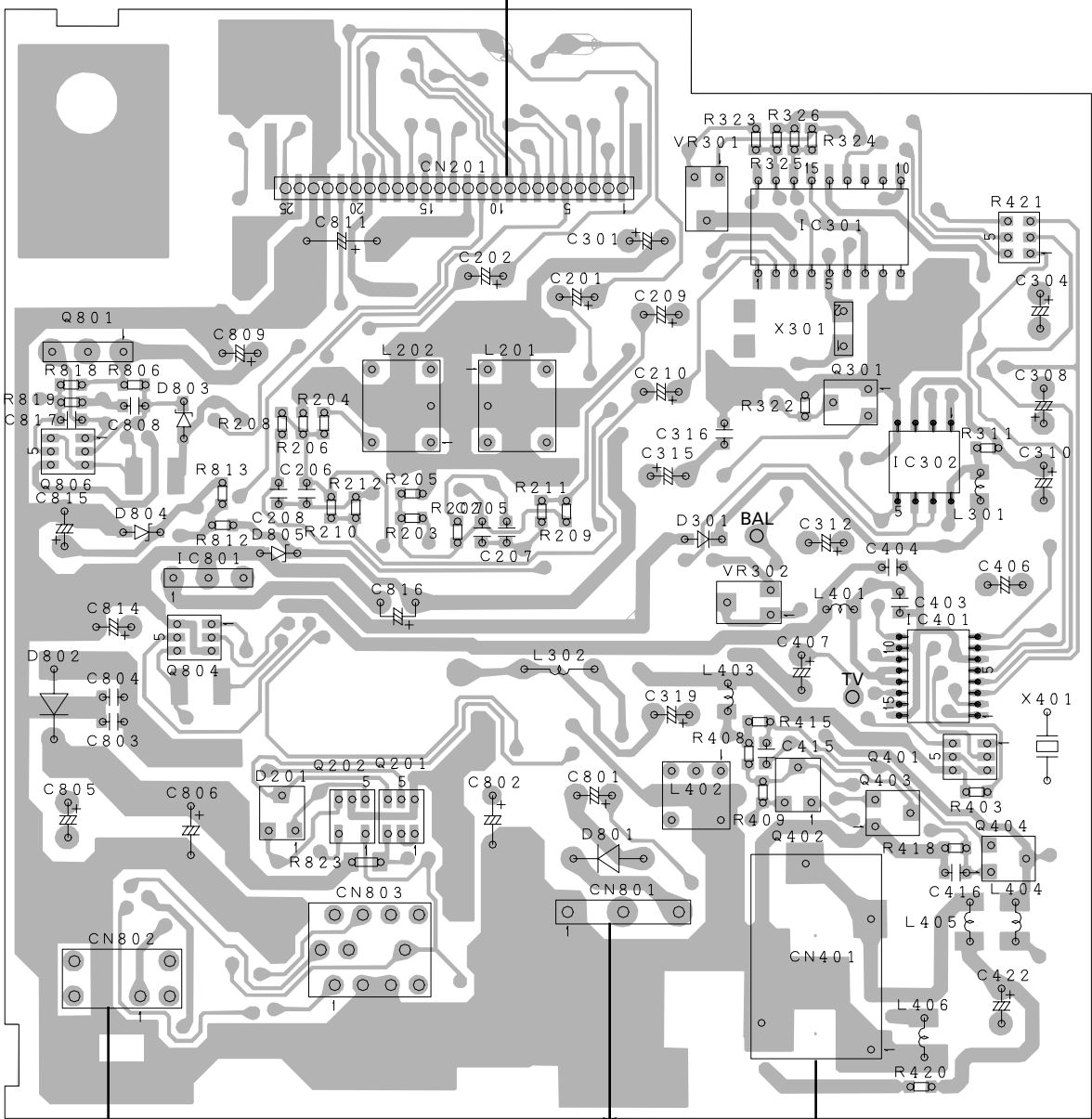


4.2 EXTENSION UNIT

SIDE A

B EXETENSION UNIT

A CN701



- VR301
- IC301
- Q801
- Q301
- IC302
- Q806
- IC801
- VR302
- IC401
- Q804
- Q401 Q201
- Q403 Q202
- Q404 L402
- Q402

G CN901

CORD

F CN501

A

B

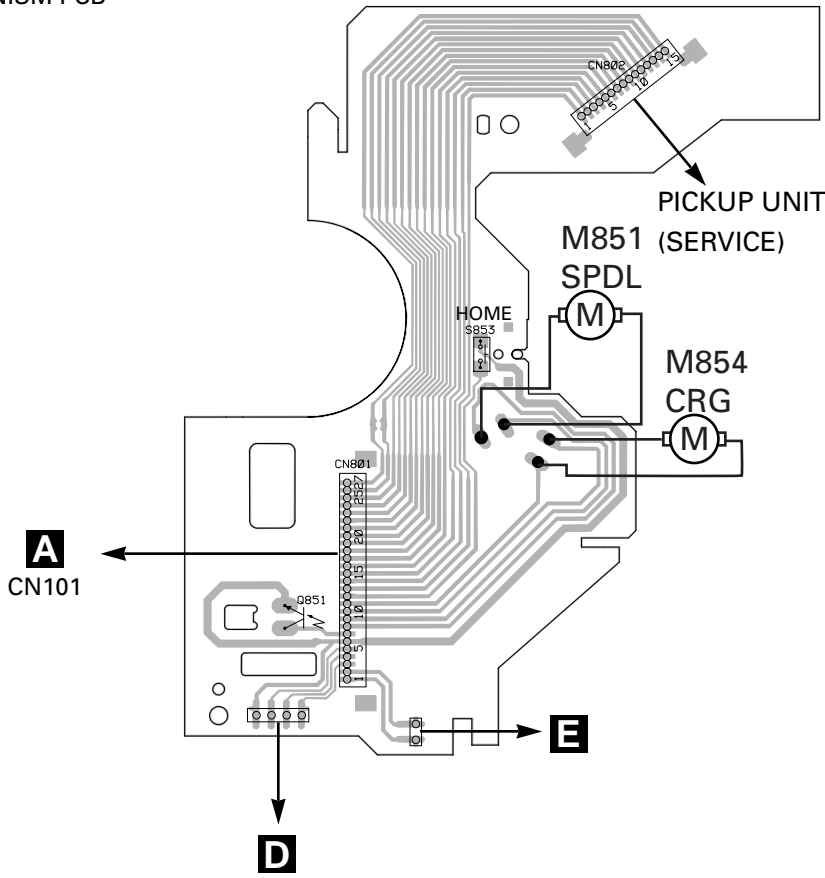


C

D

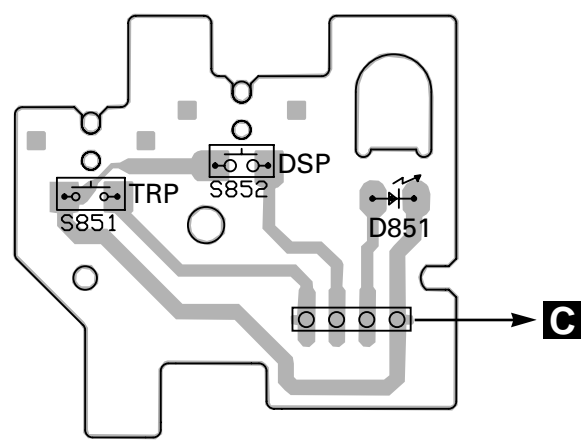
4.3 MECHANISM PCB

C MECHANISM PCB



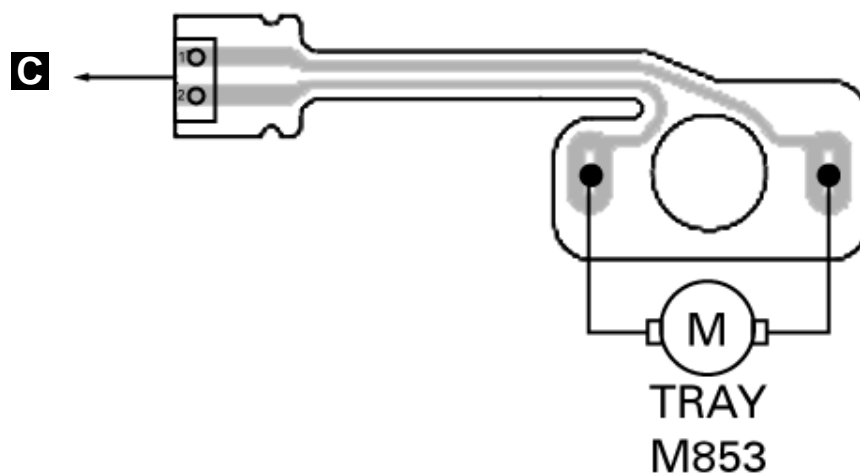
4.4 SWITCH PCB

D SWITCH PCB



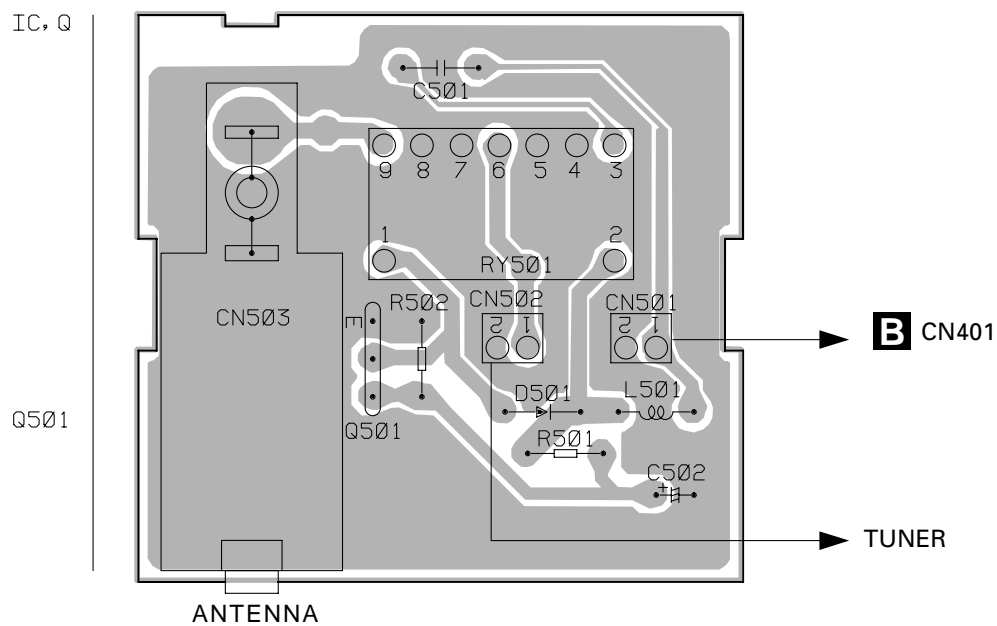
4.5 MOTOR PCB

E MOTOR PCB



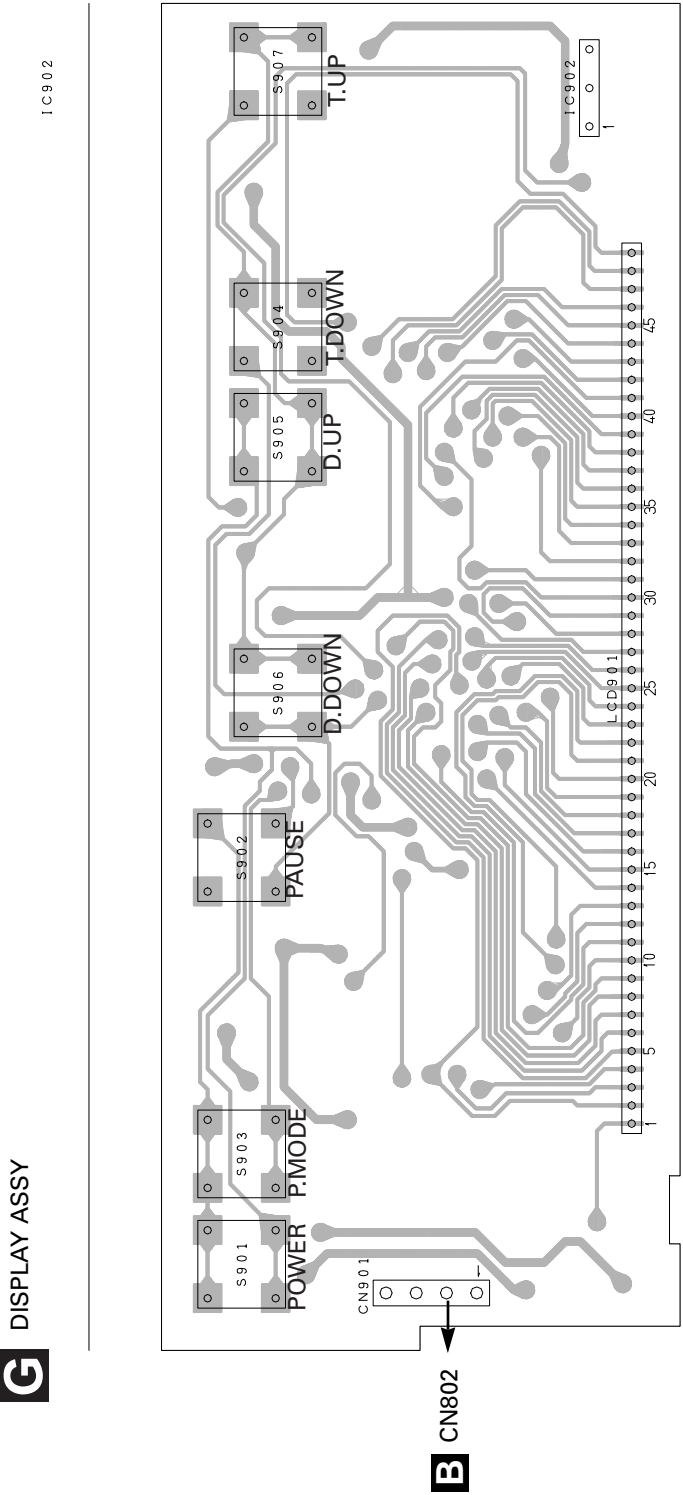
4.6 ANTENNA SELECT UNIT

F ANTENNA SELECT UNIT



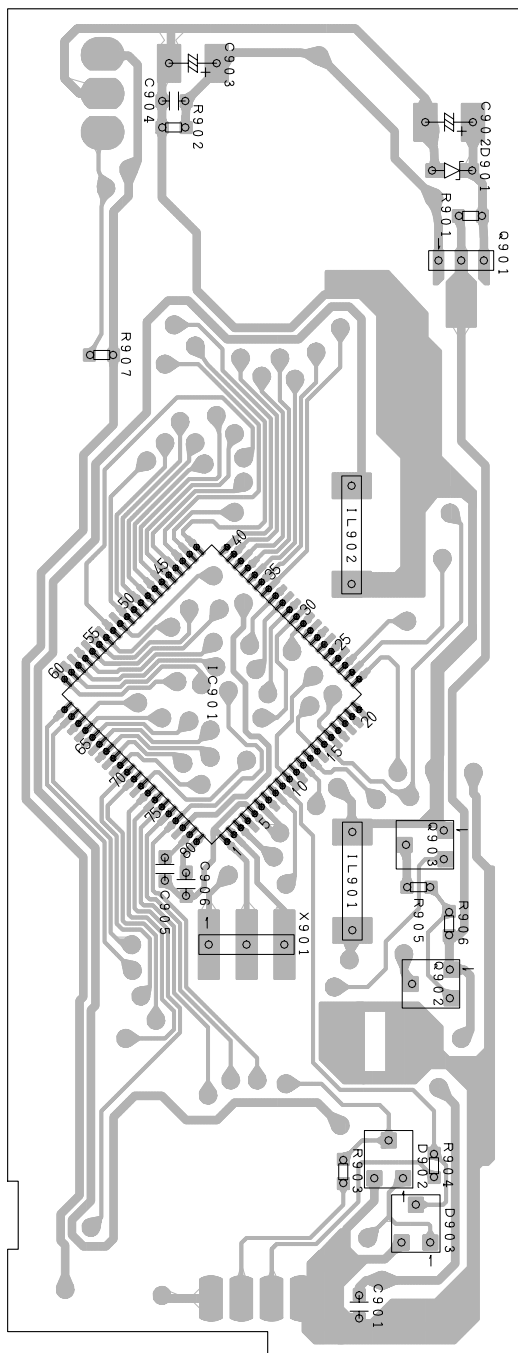
4.7 DISPLAY ASSY

SIDE A



SIDE B

G DISPLAY ASSY



Q901

IC901

Q903

Q902

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/○S○○○○J, RS1/○○S○○○○J

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 : CWX2279		R 303	RS1/16S103J
Unit Name : CD Core Unit		R 304	RS1/16S153J
MISCELLANEOUS		R 305	RS1/16S103J
IC 201 IC	UPD63710GC	R 306	RS1/16S752J
IC 202 IC	BA05FP	R 307	RS1/16S103J
IC 301 IC	BA5986FM	R 308	RS1/16S752J
IC 302 IC	LB1836M	R 309	RA4C332J
IC 603 IC	BA4560F	R 311	RS1/16S102J
		R 501	RS1/16S102J
		R 651	RSK1/16S153J
IC 604 IC	BA4560F		
IC 701 IC	PD5514A	R 652	RSK1/16S153J
IC 704 IC	PAJ002A	R 653	RSK1/16S153J
Q 101 Transistor	2SB1132	R 654	RSK1/16S153J
Q 701 Transistor	DTA144EK	R 659	RSK1/16S123J
		R 660	RSK1/16S123J
Q 770 Transistor	2SB1184F5		
D 201 Diode	1SR154-400	R 661	RSK1/16S123J
D 601 Diode	UDZ7R5(B)	R 662	RSK1/16S123J
D 770 Diode	1SS355	R 663	RSK1/16S103J
X 202 Ceramic Resonator 16.93MHz	CSS1456	R 664	RSK1/16S103J
		R 665	RSK1/16S103J
X 701 Ceramic Resonator 10.00MHz	CSS1476		
S 801 Push Switch(EJECT)	CSG1076	R 666	RSK1/16S103J
S 802 Push Switch(RESET)	CSG1076	R 669	RS1/16S101J
S 803 Spring Switch(MAG)	CSN1044	R 670	RS1/16S101J
VR 802 Semi-fixed 1kΩ(B)	CCP1338	R 671	RS1/16S752J
		R 672	RS1/16S103J
RESISTORS			
R 101	RS1/8S120J	R 673	RS1/16S271J
R 102	RS1/8S100J	R 702	RS1/16S102J
R 103	RS1/16S222J	R 703	RS1/16S222J
R 201	RS1/16S104J	R 704	RS1/16S104J
R 202	RS1/16S0R0J	R 705	RS1/16S104J
R 205	RS1/16S103J	R 706	RS1/16S222J
R 206	RS1/16S393J	R 707	RS1/16S104J
R 207	RS1/16S182J	R 709	RS1/16S104J
R 208	RS1/16S304J	R 712	RS1/16S0R0J
R 212	RS1/16S0R0J	R 713	RS1/16S473J
R 213	RS1/16S103J	R 716	RS1/16S103J
R 214	RS1/16S103J	R 717	RS1/16S473J
R 215	RS1/16S123J	R 718	RS1/16S681J
R 216	RS1/16S273J	R 719	RS1/16S0R0J
R 217	RS1/16S273J	R 721	RS1/16S222J
R 253	RS1/16S681J	R 722	RS1/16S222J
R 254	RS1/16S681J	R 725	RS1/16S222J
R 256	RS1/16S681J	R 726	RS1/16S104J
R 257	RS1/16S681J	R 727	RS1/16S513J
R 258	RS1/16S681J	R 729	RS1/16S473J
R 259	RS1/16S102J	R 730	RS1/16S473J
R 260	RS1/16S681J	R 731	RS1/16S222J
R 298	RS1/16S681J	R 732	RS1/16S683J
R 301	RS1/16S103J	R 733	RS1/16S222J
R 302	RS1/16S153J	R 734	RS1/16S473J
		R 735	RS1/16S222J
		R 736	RS1/16S103J
		R 737	RS1/16S433J
		R 739	RS1/8S2R0J
		R 740	RS1/8S2R0J

====Circuit Symbol and No.====Part Name	Part No.	====Circuit Symbol and No.====Part Name	Part No.
R 741	RS1/16S102J	C 714	CKSQYB104K25
R 742	RS1/16S104J	C 715	CSZST220M16
R 743	RS1/16S104J	C 717	CKSRYB103K25
R 744	RS1/16S223J	C 718	CKSRYB103K25
R 747	RS1/16S472J	C 719	CKSRYB102K50
R 750	RA4C473J	C 720	CKSRYB102K50
R 751	RA4C473J	C 722	CKSRYB103K25
R 759	RS1/16S472J	C 723	CKSRYB103K25
R 762	RS1/16S104J	C 801	CKSRYB103K25
R 764	RS1/16S473J	C 802	CKSQYB104K25
R 765	RS1/16S471J	C 803	CKSRYB103K25
R 766	RS1/16S471J		
R 767	RS1/16S471J		
R 801	RS1/10S221J		
R 802	RS1/10S271J		
R 804	RS1/16S562J		
R 805	RS1/16S562J		
R 806	RS1/16S102J		
CAPACITORS		<div> <div>B</div> <div>Unit Number : CWX2312</div> <div>Unit Name : Extension Unit</div> </div>	
C 101	CKSRYB102K50	MISCELLANEOUS	
C 102	CKSQYB104K25	IC 301	IC
C 103	CEV101M6R3	IC 302	IC
C 104	CEV470M6R3	IC 401	IC
C 105	CKSQYB334K16	IC 801	IC
C 106	CKSQYB334K16	Q 201	Transistor
C 107	CKSQYB334K16	Q 202	Transistor
C 201	CKSQYB104K25	Q 301	Transistor
C 202	CEV101M6R3	Q 401	Transistor
C 203	CKSQYB104K25	Q 402	Transistor
C 204	CKSRYB332K50	Q 403	Transistor
C 205	CKSQYB104K25	Q 404	Transistor
C 206	CKSRYB392K50	Q 801	Transistor
C 207	CKSQYB224K16	Q 802	Transistor
C 208	CCSRCH270J50	Q 803	Transistor
C 209	CCSRCH270J50	Q 804	Transistor
C 210	CCSRCH221J50	Q 805	Transistor
C 211	CCSRCH101J50	Q 806	Transistor
C 212	CKSRYB682K50	D 201	Chip Diode
C 213	CKSQYB104K25	D 301	Diode
C 215	CKSQYB104K25	D 302	Diode
C 216	CKSQYB104K25	D 401	Diode
C 217	CKSQYB104K25	D 402	Diode
C 218	CKSQYB104K25	D 403	Diode
C 220	CKSQYB104K25	D 801	Diode
C 253	CKSRYB471K50	D 802	Diode
C 271	CEV101M6R3	D 803	Diode
C 272	CCH1300	D 804	Diode
C 273	CKSQYB334K16	D 805	Diode
C 301	CEV101M10	L 201	Filter
C 302	CKSQYB224K16	L 202	Filter
C 651	CCSRCH391J50	L 301	Inductor
C 652	CCSRCH391J50	L 302	Inductor
C 653	CCSRCH181J50	L 401	Inductor
C 654	CCSRCH181J50	L 402	Coil
C 655	CCSRCH181J50	L 403	Inductor
C 656	CCSRCH181J50	L 404	Inductor
C 661	CKSQYB104K25	L 405	Inductor
C 664	CKSRYB103K25	L 406	Inductor
C 665	CEV470M6R3	X 301	Radiator 38.000kHz
C 666	CKSRYB103K25	X 401	Crystal Resonator 7.2MHz
C 702	CKSQYB473K16	VR 301	Semi-fixed 47kΩ(B)
C 703	CKSQYB473K16	VR 302	Semi-fixed 33kΩ(B)
C 707	CKSRYB103K25	RESISTORS	
C 708	CKSQYB104K25	R 201	RS1/16S471J
		R 202	RS1/16S471J
		R 203	RS1/16S472J
		R 204	RS1/16S472J
		R 205	RS1/16S361J

====Circuit Symbol and No.==Part Name		Part No.	====Circuit Symbol and No.==Part Name		Part No.
R	206	RS1/16S361J	R	812	RS1/16S181J
R	209	RS1/16S223J	R	813	RS1/16S560J
R	210	RS1/16S223J	R	817	RS1/4S750J
R	211	RS1/16S681J	R	818	RS1/16S102J
R	212	RS1/16S681J	R	819	RS1/16S152J
R	213	RS1/16S112J	R	820	RS1/4S121J
R	214	RS1/16S112J	R	823	RS1/10S222J
R	215	RS1/16S362J	CAPACITORS		
R	216	RS1/16S362J			
R	219	RS1/16S0R0J			
R	220	RS1/16S0R0J			
R	301	RS1/16S362J			
R	302	RS1/16S823J	C	201	CEAL330M6R3
R	303	RS1/16S681J	C	202	CEAL330M6R3
R	304	RS1/16S392J	C	203	CKSRYB103K50
			C	204	CKSRYB103K50
			C	205	CKSRYB392K50
			C	206	CKSRYB392K50
R	305	RS1/16S102J	C	209	CEAL1R0M50
R	306	RS1/16S392J	C	210	CEAL1R0M50
R	307	RS1/16S102J	C	211	CKSRYB102K50
R	308	RS1/16S392J	C	212	CKSRYB102K50
R	309	RS1/16S513J			
			C	213	CKSRYB102K50
R	310	RS1/16S103J	C	214	CKSRYB102K50
R	311	RS1/16S103J	C	301	CEAL100M16
R	312	RS1/16S103J	C	302	CKSRYB103K50
R	313	RS1/16S513J	C	303	CCSRCH120J50
R	314	RS1/16S101J			
			C	304	CEAL220M16
R	315	RS1/16S221J	C	305	CKSRYB104K16
R	316	RS1/10S104J	C	306	CKSRYB103K50
R	317	RS1/10S104J	C	307	CCSRCH101J50
R	318	RS1/16S683J	C	308	CEALR47M50
R	319	RS1/16S123J			
			C	309	CKSRYB103K50
R	320	RS1/16S472J	C	310	CEAL100M16
R	322	RS1/16S393J	C	311	CCSRCH160J50
R	323	RS1/16S0R0J	C	312	CEAL100M16
R	324	RS1/16S0R0J	C	313	CKSRYB104K16
R	401	RS1/16S223J			
			C	314	CKSQYB105K16
R	402	RS1/16S681J	C	315	CEAL220M16
R	403	RS1/16S362J	C	316	CKSRYB104K16
R	404	RS1/16S242J	C	317	CCSQCH271J50
R	405	RS1/16S822J	C	318	CCSQCH162J50
R	406	RS1/16S103J			
			C	319	CEAL100M16
R	407	RS1/16S103J	C	401	CCSRCH270J50
R	408	RS1/16S560J	C	402	CCSRCH270J50
R	409	RS1/16S103J	C	403	CKSRYB104K16
R	410	RS1/16S103J	C	404	CKSRYB102K50
R	411	RS1/16S332J			
			C	405	CKSQYB473K16
R	412	RS1/16S101J	C	406	CEALNP330M10
R	413	RS1/16S222J	C	407	CEAL470M6R3
R	414	RS1/16S104J	C	408	CKSRYB104K16
R	415	RS1/16S244J	C	409	CCSRCH180J50
R	416	RS1/16S154J			
			C	410	CCSRCH100D50
R	417	RS1/16S152J	C	411	CCSRCH330J50
R	418	RS1/16S331J	C	412	CCSRCH180J50
R	419	RS1/16S122J	C	413	CCSRCK1R0C50
R	420	RS1/16S470J	C	414	CKSRYB103K50
R	421	RA3C471J			
			C	415	CCSRCK1R0C50
R	801	RS1/16S183J	C	416	CKSRYB103K50
R	802	RS1/16S822J	C	417	CKSRYB103K50
R	803	RS1/16S204J	C	418	CCSRCJ3R0C50
R	804	RS1/16S913J	C	419	CKSRYB103K50
R	805	RS1/8S391J			
			C	421	CKSRYB473K16
R	806	RS1/16S681J	C	422	CEAL220M16
R	808	RS1/4S152J	C	801	CEAL100M16
R	809	RS1/16S223J	C	802	CCH1183
R	810	RS1/16S223J	C	803	CKSRYB104

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

Part No.

C 805
C 806 470μF/16V
C 807
C 808
C 809

CEJA101M16
CCH1183
CKSRYB473K16
CKSRYB103K50
CEAL220M16

C 810
C 812
C 813
C 814
C 815

CKSQYB104K16
CKSQYB334K16
CKSQYB334K16
CEJA221M6R3
CEJA101M10

C 816
C 817

CEAS331M6R3
CKSRYB103K50



Unit Number : CXB3249
Unit Name : Display Assy

MISCELLANEOUS

IC 901 IC
Q 901 Transistor
Q 902 Transistor
Q 903 Transistor
D 901 Diode

PD6294A
2SD1767
2SB710A
DTC114EK
UDZS5R6(B)

D 902 Diode
D 903 Diode
X 901 Ceramic Resonator 4.9152MHz
S 901 Switch
S 902 Switch

MA153
MA153
CSS1449
CSG1110
CSG1110

S 903 Switch
S 904 Switch
S 905 Switch
S 906 Switch
S 907 Switch

CSG1110
CSG1110
CSG1110
CSG1110
CSG1110

IL 901 Lamp 14V 40mA
IL 902 Lamp 14V 40mA
LCD 901 LCD

CEL1608
CEL1608
CAW1514

RESISTORS

R 901
R 902
R 903
R 904
R 905

RS1/16S102J
RS1/16S332J
RS1/16S471J
RS1/16S471J
RS1/16S332J

R 906
R 907

RS1/16S223J
RS1/16S473J

CAPACITORS

C 901
C 902
C 903
C 904
C 905

CKSRYB473K16
CSZSR100M16
CSZSR100M16
CKSRYB104K16
CKSRYB104K16

C 906

CKSRYB104K16



Unit Number : CWX2200
Unit Name : Antenna Select Unit

MISCELLANEOUS

Q 501 Transistor
D 501 Diode
L 501 Ferri-Inductor
RY 501 Relay

2SC1740S
1SS133
LAU4R7K
CSR1014

RESISTORS

R 501
R 502

RD1/4PU683J
RD1/4PU103J

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

Part No.

CAPACITORS

C 501
C 502

CKCYB102K50
CEAL101M10



Unit Number :
Unit Name : Mechanism PCB

Q 851 Photo-transistor
S 853 Spring Switch(HOME)

PT4800
CSN1051



Unit Number :
Unit Name : Switch PCB

D 851 LED
S 851 Spring Switch(DSP)
S 852 Spring Switch(TAP)

CN504-2
CSN1051
CSN1052



Unit Number :
Unit Name : Motor PCB

M 853 Motor(TRAY)

CXB3005

Miscellaneous Parts List

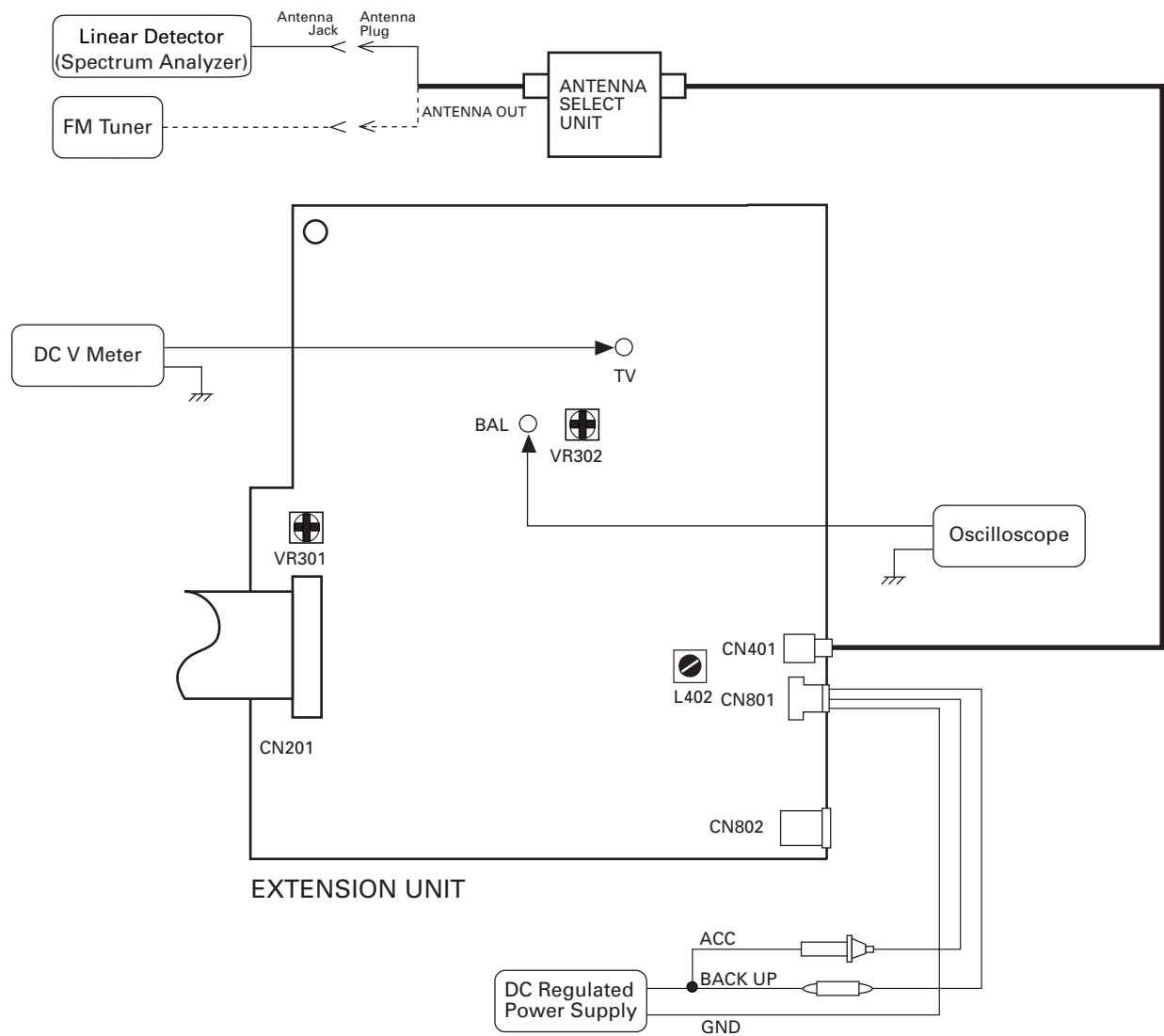
M 851 Pickup Unit(P8)(Service)
M 851 Motor(SPINDLE)
M 852 Motor(ELEVATION)
M 854 Motor(CARRIAGE)
VR 801 Volume 10kΩ

CXX1285
CXB3003
CXB3006
CXB3004
CCW1023

6. ADJUSTMENT

6.1 MODULATOR ADJUSTMENT

● Connection Diagram



● Adjustment

Note: When adjusting, the frequency is made 89.1MHz.

	CD Signal	Adjusting Point	Adjustment Method	Notes
Tuning Voltage Adjustment	-∞	L402	DC V Meter: 3.0V±0.1V	
Balance Adjustment	-∞	VR301	Oscilloscope: 38kHz signal becomes minimum	
Modulation Adjustment	400Hz 0dB (*1) or 500Hz 0dB	VR302	Linear Detector (Spectrum Analyzer): 135±5kHz	LEVEL = 7

*1 : L and R are input at the same time.

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 :

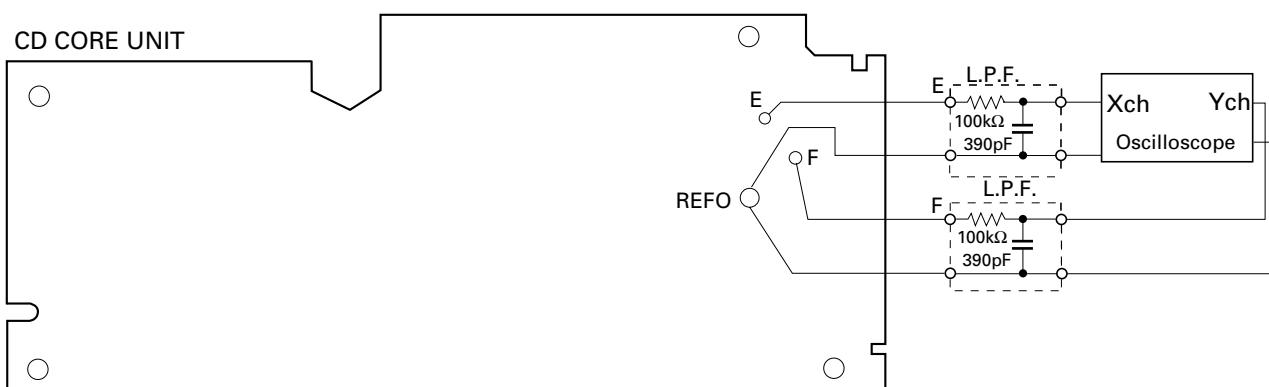
To check that the grating is within an acceptable range.

• 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 switch the 5V regulator on.
2. Using the **TRACK+** and **TRACK-** buttons, move the pickup unit to the innermost track.
3. Press key **PAUSE** to close focus, the display should read "91". Press key **PAUSE** 2 times. Enter Rough Servo mode. Press key **ADJ** 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.

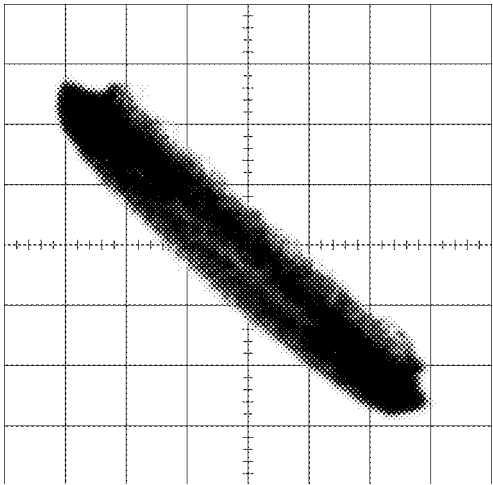
• Hint

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

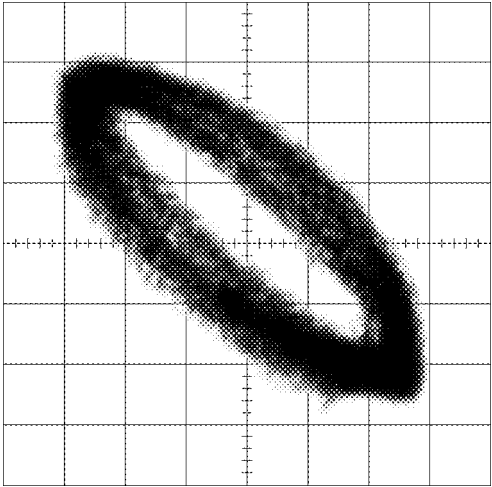
Grating waveform

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

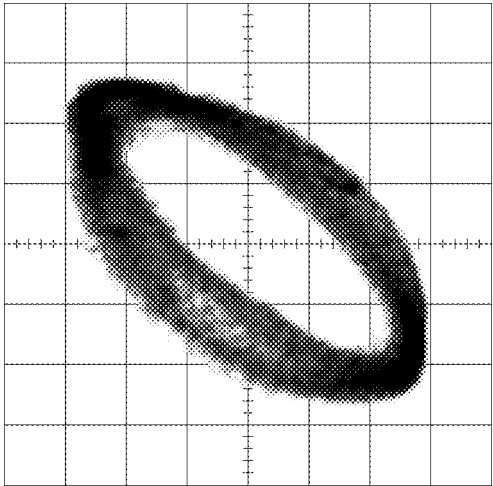
0°



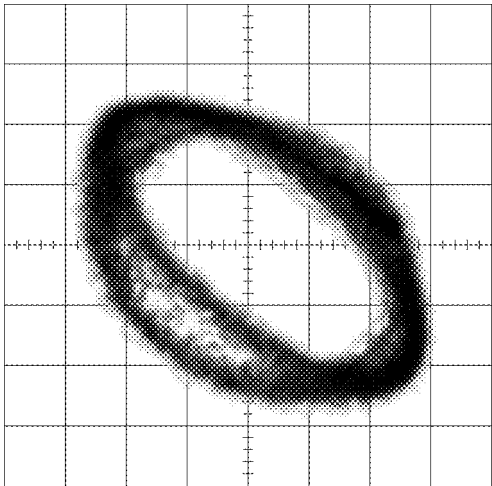
30°



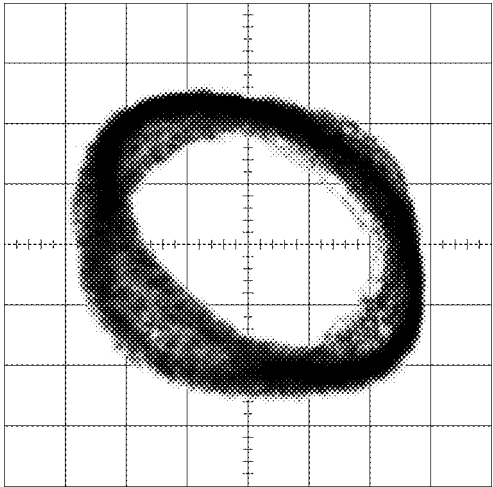
45°



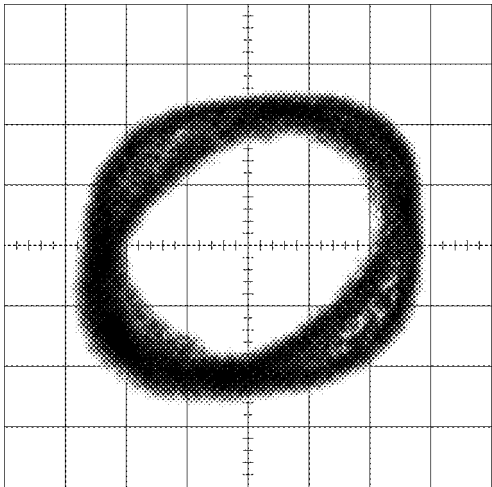
60°



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 :**

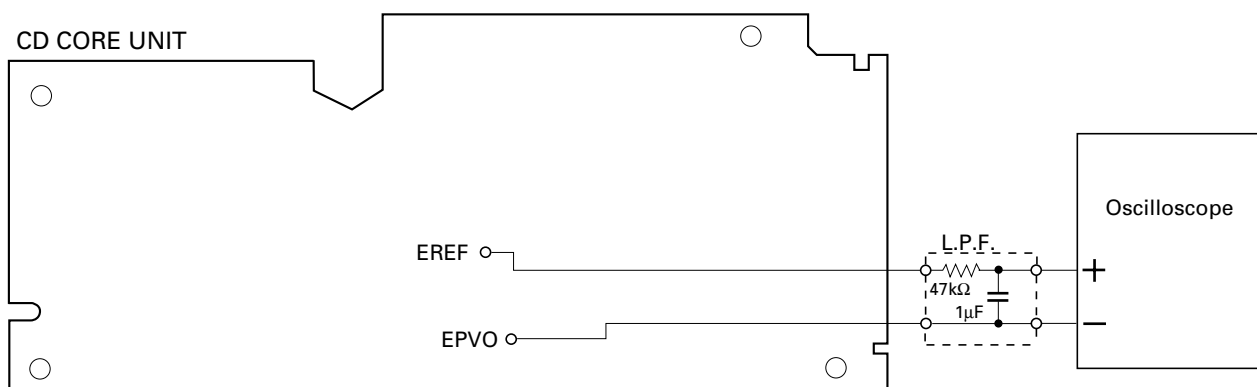
This mechanism detects the height of the stage using slide-variable resistance. To absorb dislocation of the stage height caused by differences in the mechanism and the CD core unit, adjustment must be made for each CD-mechanism module using a variable resistor. Normally, readjustment is not needed, 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**

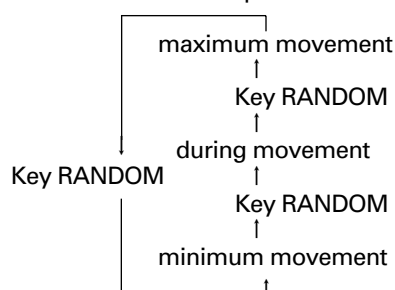
1. Enter Test mode.
2. Press key **P.MODE** to enter Mechanism Test mode.
3. Press key **RANDOM** twice to specify the amount of movement.

Examples of display

TRACK	FUNCTION
I	II

TRACK	FUNCTION
72	00' 00"

The amount of movement changes each time key **RANDOM** is pressed.



TRACK	FUNCTION
72	00' 02"

TRACK	FUNCTION
72	00' 01"

TRACK	FUNCTION
72	00' 00"

4. Press key **PAUSE** to set ELV/TRAY mode to TRAY.

5. Press key **TRACK+** to release the clamp and return the tray to the magazine.

6. Press key **PAUSE** to enter Elevation Move mode.

7. Use key **TRACK±** to operate elevation and set if to the graduation of the third step (Fig. 1).

8. Make the adjustment.
Use VR802 to adjust the difference in potential between EREF and EPVO to 0 ±10mV.

9. When adjustment is completed, press key **DISC+** to exit Mechanism Test mode.

10. Confirm operation of the mechanism.
Place the mechanism horizontally (CD core unit below). Take care not to short-circuit the PCB.

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).

Examples of display

TRACK	FUNCTION
72	01' 02"

Release the clamp

TRACK	FUNCTION
72	00' 02"

TRACK	FUNCTION
72	00' 02"

TRACK	FUNCTION
	' "

TRACK	FUNCTION
04	00' 00"

• **Note :**
The stopper bend will be pressed downward into the groove for final clamping. Confirm the engagement position of the stopper bend.

• 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:

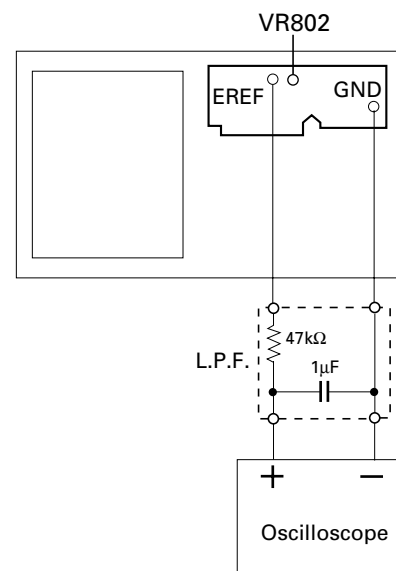
15. Press the **EJECT** switch.

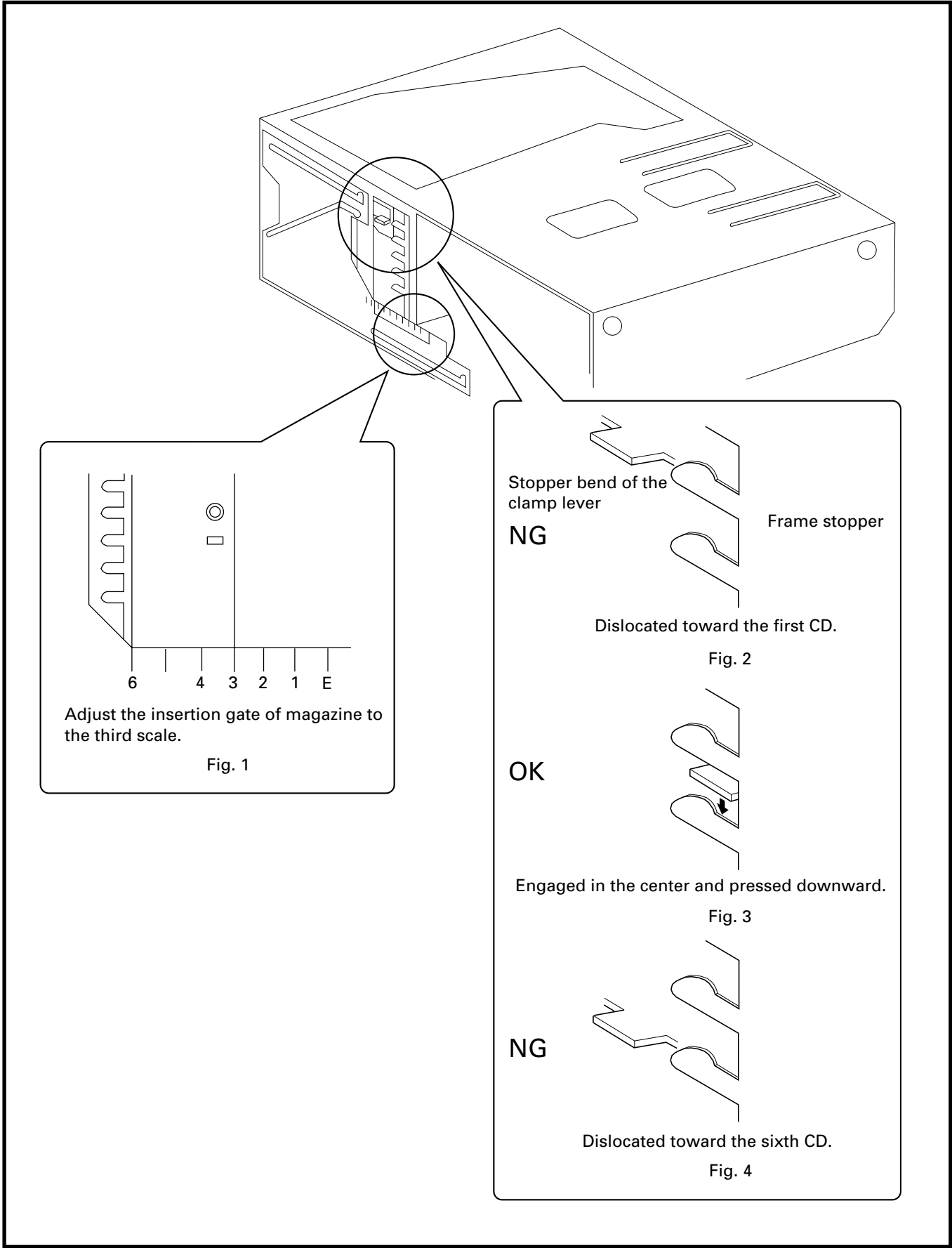
16. Once operation of the mechanism has stopped, turn the power OFF.

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 PARTS

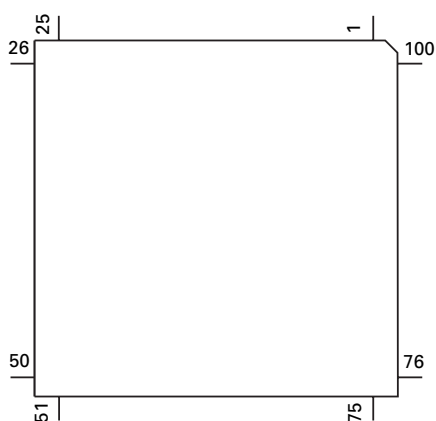
7.1.1 IC

● Pin Functions (UPD63710GC)

Pin No.	Pin Name	I/O	Function and Operation
1	GND		Logic circuit GND
2	HOLD	I/O	Defect detection output
3	MIRR	I/O	MIRR output
4	FOK	O	RFOK signal output
5	RST	I	Reset signal input
6	A0	I	Command/parameter identification signal input
7	STB	I	Data strobe signal input
8	SCK	I	Clock signal input for serial data input/output
9	SO	O	Serial data and status signal output
10	SI	I	Serial data input
11	VDD		Positive power supply terminal to logic circuit
12	DA.VDD		Positive power supply terminal to D/A converter
13	NC		Not used
14, 15	DA.GND		D/A converter GND
16	NC		Not used
17	DA.VDD		Positive power supply terminal to D/A converter
18	R+	O	Right channel audio data output
19	R-	O	Right channel audio data output
20	L-	O	Left channel audio data output
21	L+	O	Left channel audio data output
22	X.VDD		Positive power supply terminal to crystal oscillation circuit
23	XTAL	O	Crystal oscillator connect pin
24	XTAL	I	Crystal oscillator connect pin
25	X.GND		Crystal oscillation circuit GND
26	VDD		Positive power supply terminal to logic circuit
27	EMPH	O	Output pin for the pre-emphasis data in the sub-Q code
28	FLAG	O	Flag output pin to indicate that audio data currently being output consists of noncorrectable data
29	DIN	I	Serial data input to internal DAC
30	DOUT	O	Serial audio data output
31	SCKIN	I	Serial clock input to internal DAC
32	SCKO	O	Audio data that is output from DOUT changes at rising edge of this clock
33	LRCKIN	I	LRCK signal input to internal DAC
34	LRCK	O	Signals to distinguish the right and left channels of the audio data output from DOUT
35	WDCK	O	Output double the frequency of LRCK
36	TX	O	Digital audio interface data output
37	GND		Logic circuit GND
38	C16M	O	Oscillator clock buffering output
39	LIMIT	I	Status of the pin is output at Bit 5 of the status output
40	VDD		Positive power supply terminal to logic circuit
41	LOCK	O	EFM synchronous detection signal
42	RFCK	O	Frame synchronous signal of XTAL-system
43	WFCK	O	Frame synchronous signal of PLL-system
44	PLCK	O	Monitor pin of bit clock
45	GND		Logic circuit GND
46	C1D1	O	Output pin for indicating the C1 error correction results
47	C1D2	O	Output pin for indicating the C1 error correction results
48	C2D1	O	Output pin for indicating the C2 error correction results
49	C2D2	O	Output pin for indicating the C2 error correction results
50	C2D3	O	Output pin for indicating the C2 error correction results
51	VDD		Positive power supply terminal to logic circuit

Pin No.	Pin Name	I/O	Function and Operation
52	PACK	O	CD-TEXT PACK synchronous signal
53	TSO	O	CD-TEXT data serial output
54	TSI	I	CD-TEXT control parameter serial input
55	TSCK	I	CD-TEXT serial clock input
56	TSTB	I	CD-TEXT parameter strobe signal input
57	GND		Logic circuit GND
58	TEST	I	Test pin
59	ATEST	I/O	Test pin
60	RFMODE	I	Use/not use select for internal RF amplifier
61	A.GND		Analog circuit GND
62	FD	O	Focus drive output
63	TD	O	Tracking drive output
64	SD	O	Sled drive output
65	MD	O	Spindle drive output
66	DACO	O	DAC output for adjustment
67	FBAL	O	DAC output for adjustment
68	TBAL	O	DAC output for adjustment
69	TEVCA	O	DAC output for adjustment
70	A.VDD		Power supply terminal to analog circuit
71	EFM	O	EFM signal output
72	ASY	I	EFM comparator reference voltage input
73	C3T		3T detection capacitor additional pin
74	RFI	I	RF signal input for EFM data regulation
75	AGCO	O	RF signal output of after gain adjustment
76	AGCI	I	RF-AGC amplifier input
77	RFO	O	RF summing amplifier output
78	EQ2		RF amplifier equalizer parts additional pin
79	EQ1		RF amplifier equalizer parts additional pin
80	RF-	I	RF summing amplifier inverted input
81	A.GND		Analog circuit GND
82	A	I	Photo detector A input
83	C	I	Photo detector C input
84	B	I	Photo detector B input
85	D	I	Photo detector D input
86	F	I	Photo detector F input
87	E	I	Photo detector E input
88	A.VDD		Positive power supply terminal to analog circuit
89	REFOUT	O	Reference electric potential output
90	FE-	I	Focus error amplifier inverted input
91	FEO	I/O	Focus error amplifier output
92	TE-	I	Tracking error amplifier inverted input
93	TEO	I/O	Tracking error amplifier output
94	TE2	I/O	Tracking error output of after amplification
95	TEC	I	Tracking comparator input
96	A.GND		Analog circuit GND
97	PD	I	PD detection signal input for LD output monitor
98	LD	O	LD control current output
99	PN	I	APC circuit control polarity set pin
100	A.VDD		Positive power supply terminal to analog circuit

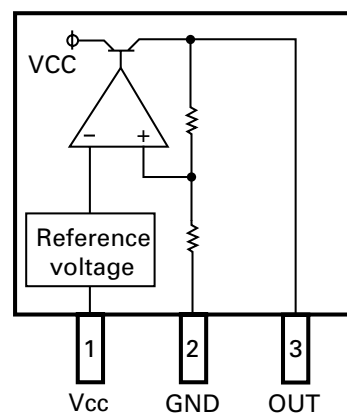
*UPD63710GC



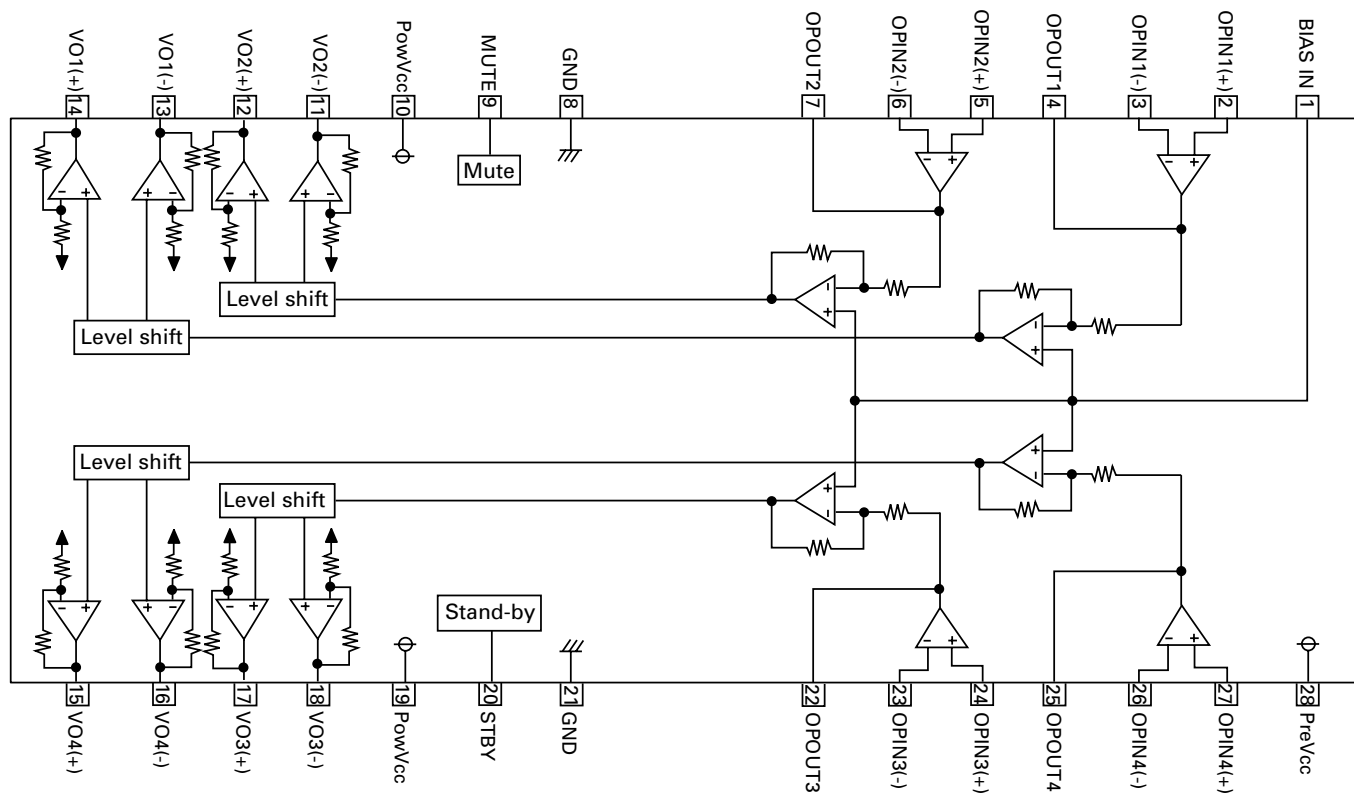
IC's marked by* are MOS type.

Be careful in handling them because they are very liable to be damaged by electrostatic induction.

BA05FP



BA5986FM

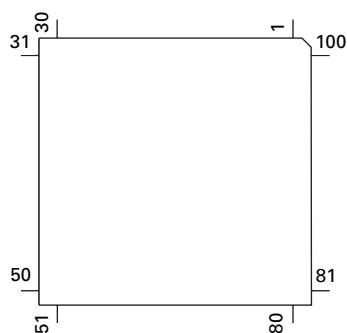


● Pin Functions (PD5514A)

Pin No.	Pin Name	I/O	Format	Function and Operation
1	PLDT	O	C	PLL data output
2	PLCK	O	C	PLL clock output
3	ADENA	O	C	A/D reference voltage output
4-7	NC			Not used
8	BYTE	I		VCC joint
9	CNVSS	I		VSS joint
10	POWER	O	C	CD +5V control
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
19-22	NC			Not used
23	DISPPW	O	C	Key/Display microcomputer supply control
24-26	NC			Not used
27	SIMUKE	I		Destination information input
28-30	NC			Not used
31	DPDT	O	C	Display data output
32	KYDT	I		Key data input
33	NC			Not used
34	TESTIN	I		Test program mode input
35	XSO	O	NM	LSI data output
36	XSI	I		LSI data input
37	XSCK	O	NM	LSI clock output
38	M6M12	I		6/12 disc select input
39-46	NC			Not used
47	SYSPW	O	C	System power supply control output
48	CS	O	C	SRAM chip select
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	MIRR	I		Mirror detector input
53	LOCK	I		Spindle lock detector input
54	FOK	I		FOK signal input
55-61	NC			Not used
62	VCC			VDD
63	NC			Not used
64	VSS			GND
65-69	NC			Not used
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		Select FM="ASENS"
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	NC			Not used
89	PREN	O	C	Preemphasis select output
90	PLCS	O	C	PLL chip select output
91	DSP	I		DISC detect timing input

Pin No.	Pin Name	I/O	Format	Function and Operation
92	DISK	I		Disc detector input
93	ELVPVO	I		Voltage input from ELV position sense
94	ELVREF	I		ELV reference voltage input
95	TRP	I		Tray position input
96	AVSS	I		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

*PD5514A

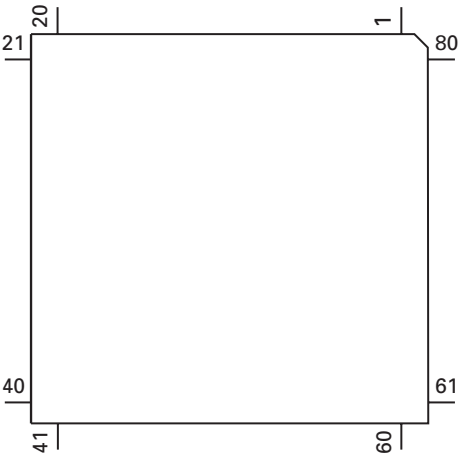


Format	Meaning
C	C MOS
NM	Middle resistivity N channel open drain

● Pin Functions (PD6294A)

Pin No.	Pin Name	I/O	Function and Operation
1	VSS		GND
2	X1		Crystal oscillator connection pin
3	X0		Crystal oscillator connection pin
4	RST	I	System reset
5,6	MODE1,0		GND
7	GRN/AMB	O	GREEN/AMBER select output
8	SO	O	UART output
9	SI	I	UART output
10	REMIN	I	Remote control signal input
11	RVER		Not used
12	NC		Not used
13-16	KDT4-1	I	Key data input
17-22	KST6-1	O	Key strobe output
23	VCC		5V
24-73	SEG49-0	O	LCD segment output
74-77	COM3-0	O	Common driver output
78-80	V3-1		LCD bias power supply

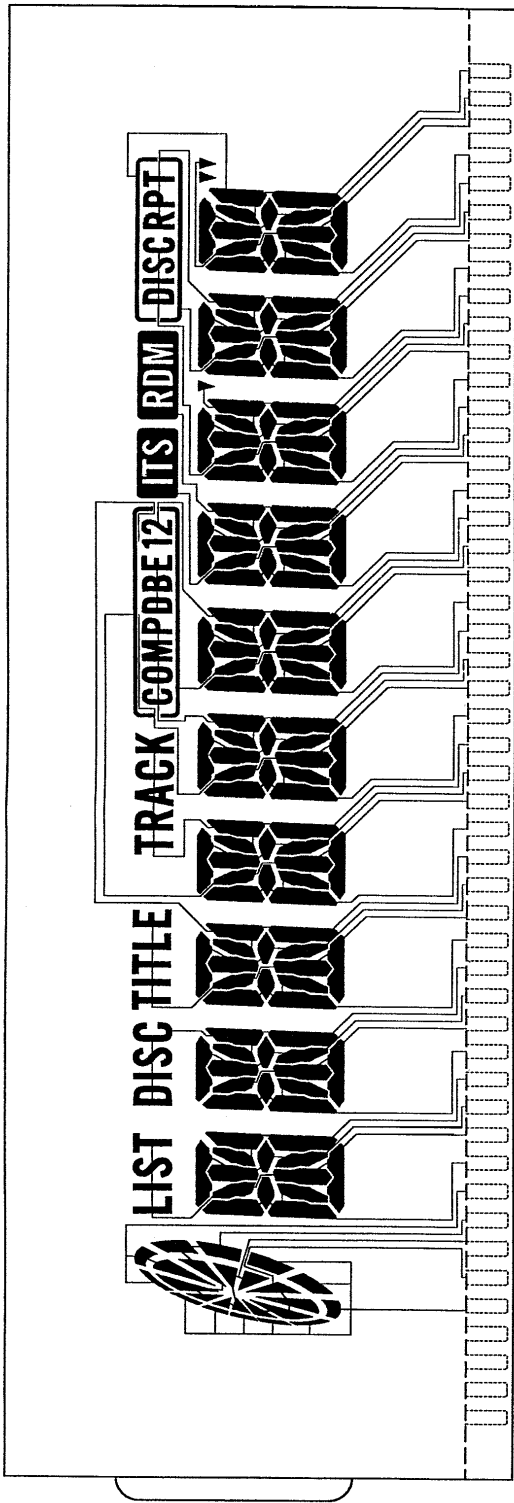
*PD6294A



7.1.2 DISPLAY

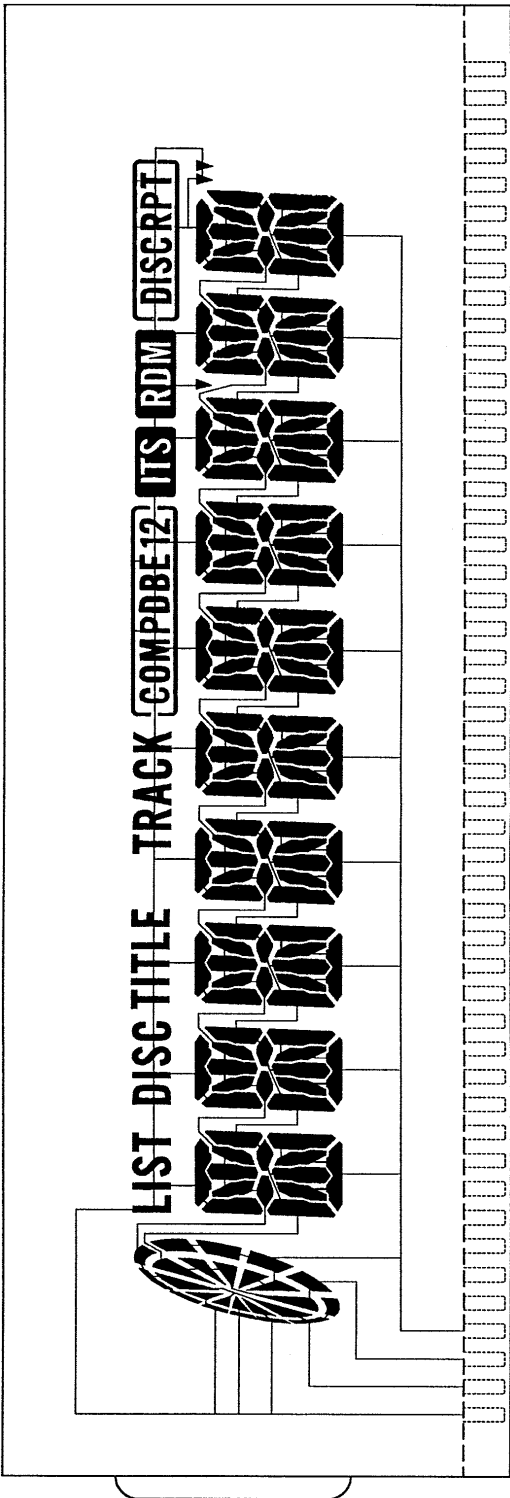
● CAW1514

SEGMENT



SEG.1
SEG.2
SEG.3
SEG.4
SEG.5
SEG.6
SEG.7
SEG.8
SEG.9
SEG.10
SEG.11
SEG.12
SEG.13
SEG.14
SEG.15
SEG.16
SEG.17
SEG.18
SEG.19
SEG.20
SEG.21
SEG.22
SEG.23
SEG.24
SEG.25
SEG.26
SEG.27
SEG.28
SEG.29
SEG.30
SEG.31
SEG.32
SEG.33
SEG.34
SEG.35
SEG.36
SEG.37
SEG.38
SEG.39
SEG.40
SEG.41
SEG.42
SEG.43
SEG.44
SEG.45

COMMON



COM.1
COM.2
COM.3
COM.4





7.2 DIAGNOSIS

7.2.1 DISASSEMBLY

● Removing the Upper Case(not shown)

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




● Removing the CD Mechanism Module

-  1 Remove the four dampers(Fig.5).
-  2 Disconnect the connector(Fig.5).
-  3 Remove the two springs(Fig.5).
-  1 Disconnect the connector and then remove the CD Mechanism Module(Fig.6).

● Removing the Grille Unit(not shown)

- 1.Press the two tabs indicated by arrows and then pull out the Grille Unit(Exterior section parts list No.50).

● Removing the Extension Unit(Fig.7)

-  1 Remove the two screws.
-  2 Remove the screw.
-  3 Remove the claw and remove the Extension Unit.

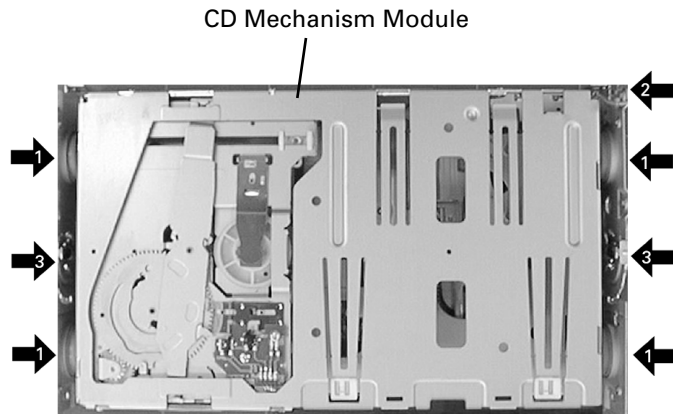


Fig.5

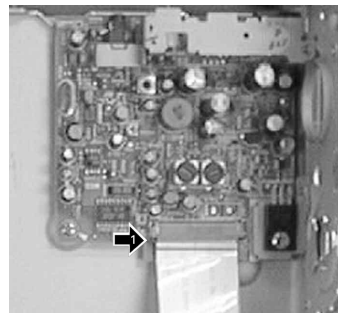
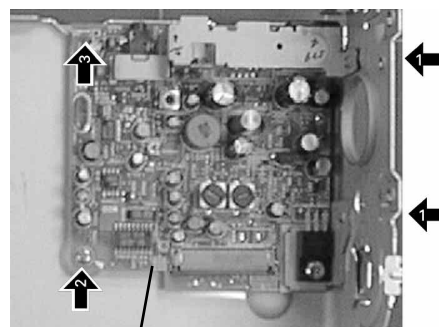


Fig.6



Extension Unit

Fig.7

● Removing the Pickup Unit

1. Insert the short pin from the pickup unit in the flexible substrate.
 2. Remove the flexible substrate from the connector.
 3. Remove the flexible card from the connector.
 4. Remove the lead wires to which the spindle motor and carriage motor assy were soldered.
 5. Remove the two screws and lift the relay substrate up as shown in the figure on the upper right.
- At this time, make sure that the flexible tray motor printed circuit board and flexible relay card are not pulled excessively.

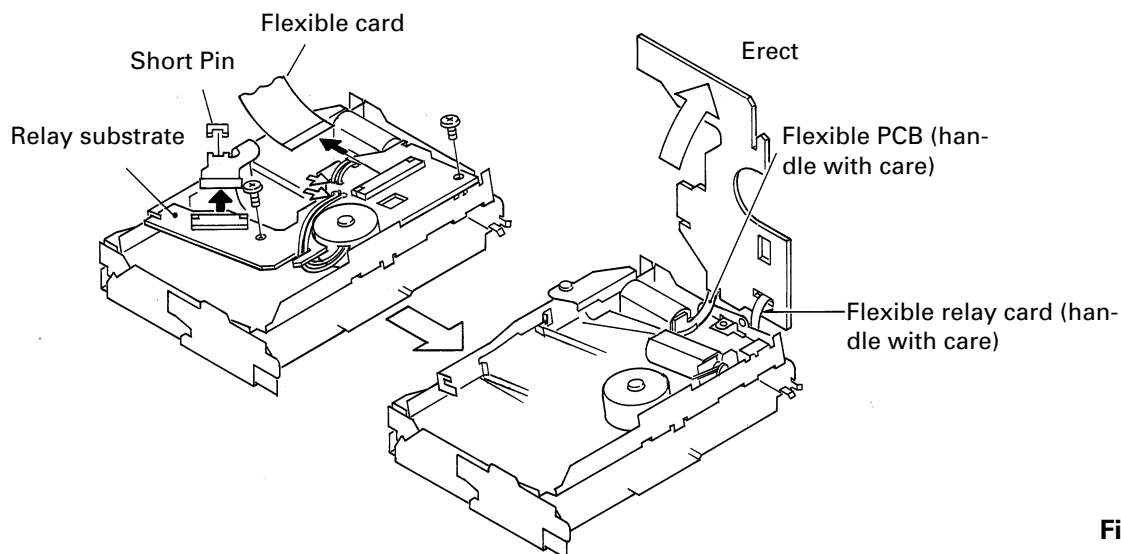


Fig.8

6. Remove screw A and then remove the carriage motor assy, lighting conductor, feed screw holder, feed screw and belt (see Fig. 9).
7. Remove screw B on the main side and the pickup unit together with the guide shaft (see Fig. 9).

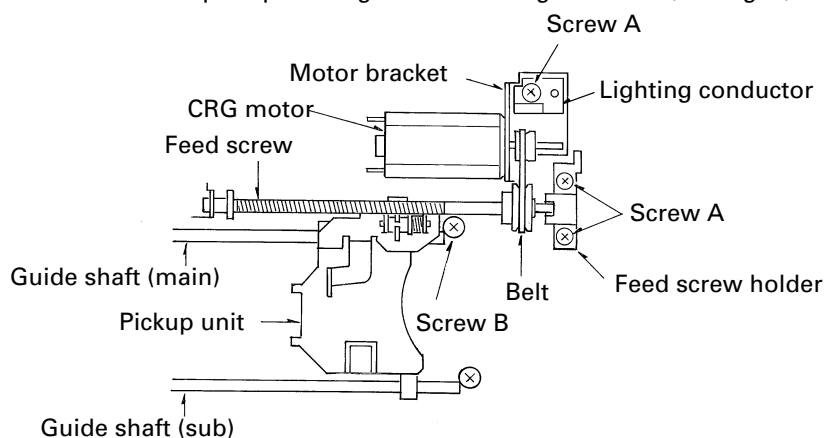


Fig.9

7.2.2 TEST MODE

● CD Test Mode

1) 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.

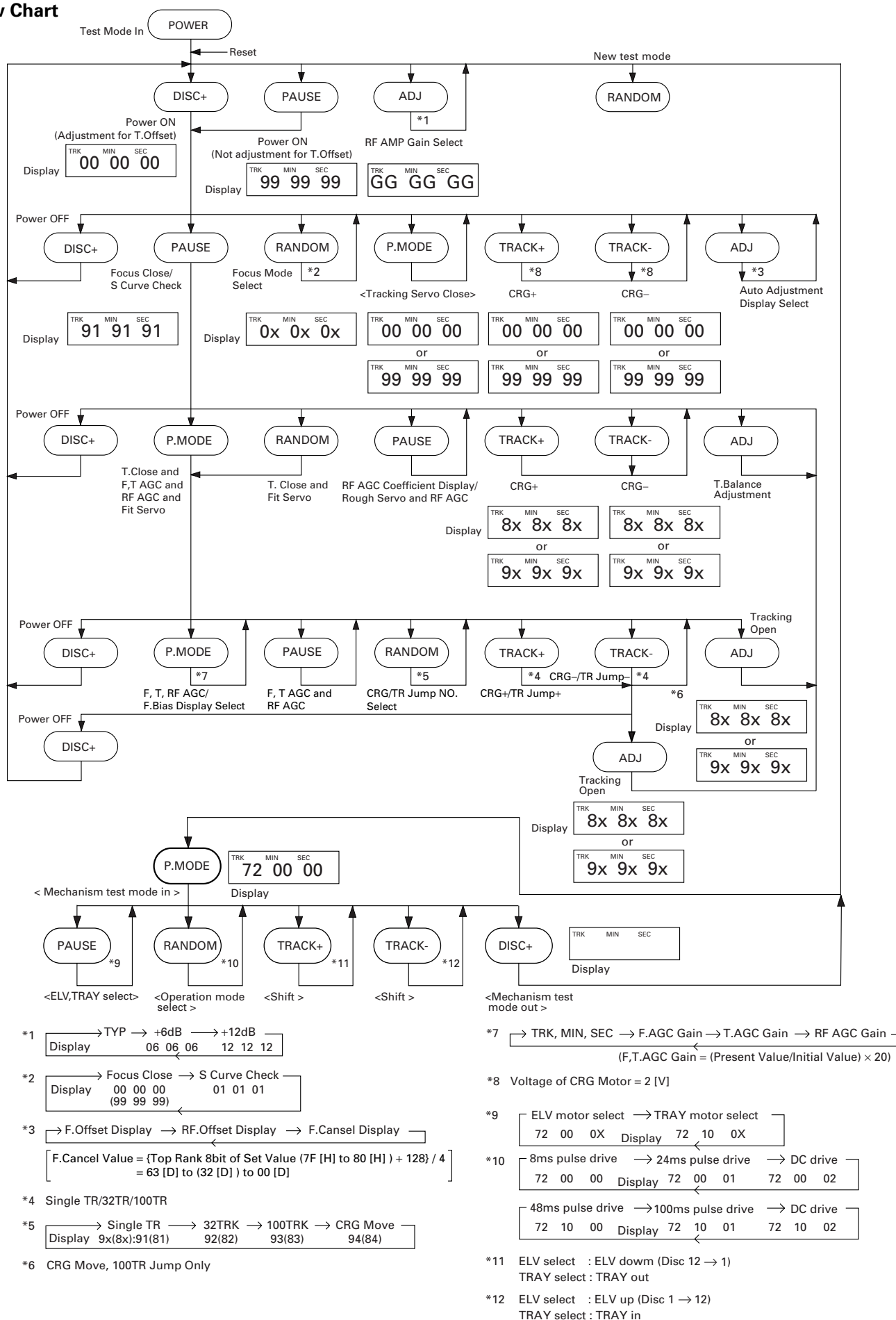
When the unit malfunctions this way, either re-position the light source, move the unit or cover the photo transistor.
- During exchanging discs, do not press the keys for the discs to be exchanged.

2) Test Mode

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

- Test mode starting procedure
Pressing the POWER and Reset keys together.
- Test mode cancellation
Switch ACC, back-up OFF.
- If the ADJ or PAUSE 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.

● 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) Example of Display

xx contains the error number.

Err-xx

(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	Spindle not locked. Sub-code is strange (not readable). → Failure on spindle, stains or damages on disc, or excessive vibrations.
		Subcode NG	A disc not containing CD-R data is found. Turned over disc are found, though rarely. → Failure on home switch or CRG move mechanism.
		RF AMP NG	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.
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 POWER key.
- ② Press the RANDOM 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
DISC+	To power on (offset adjustment performed)	To power off	–	Time/Err.No. switching
TRACK+	–	FWD-Kick	FF/TR+	–
TRACK-	–	REV-Kick	REV/TR-	–
P.MODE	–	T.Close (AGC performed) /parameter display switching	Scan	–
ADJ	RF AMP gain switching	Parameter display switching /T.BAL adjustment/T.Open	Mode	–
PAUSE	To power on (offset adjustment not performed)	F.Close/RF AGC/F.T.AGC	–	–
–	–	F.Open	–	–
–	–	Jump Off	–	–
RANDOM	–	F.Mode switching /T.Close (no AGC)/Jump switching	Auto/Manu	T.No./Time switching

Key (Example)	Mechanism Test Mode
DISC+	Back to the test mode
TRACK+	Playing the mechanism
TRACK-	Playing the mechanism
P.MODE	Mechanism test mode in
ADJ	–
PAUSE	TRAY/ELV select
–	–
–	–
RANDOM	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
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.

Status No.	Contents	Protective action
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.

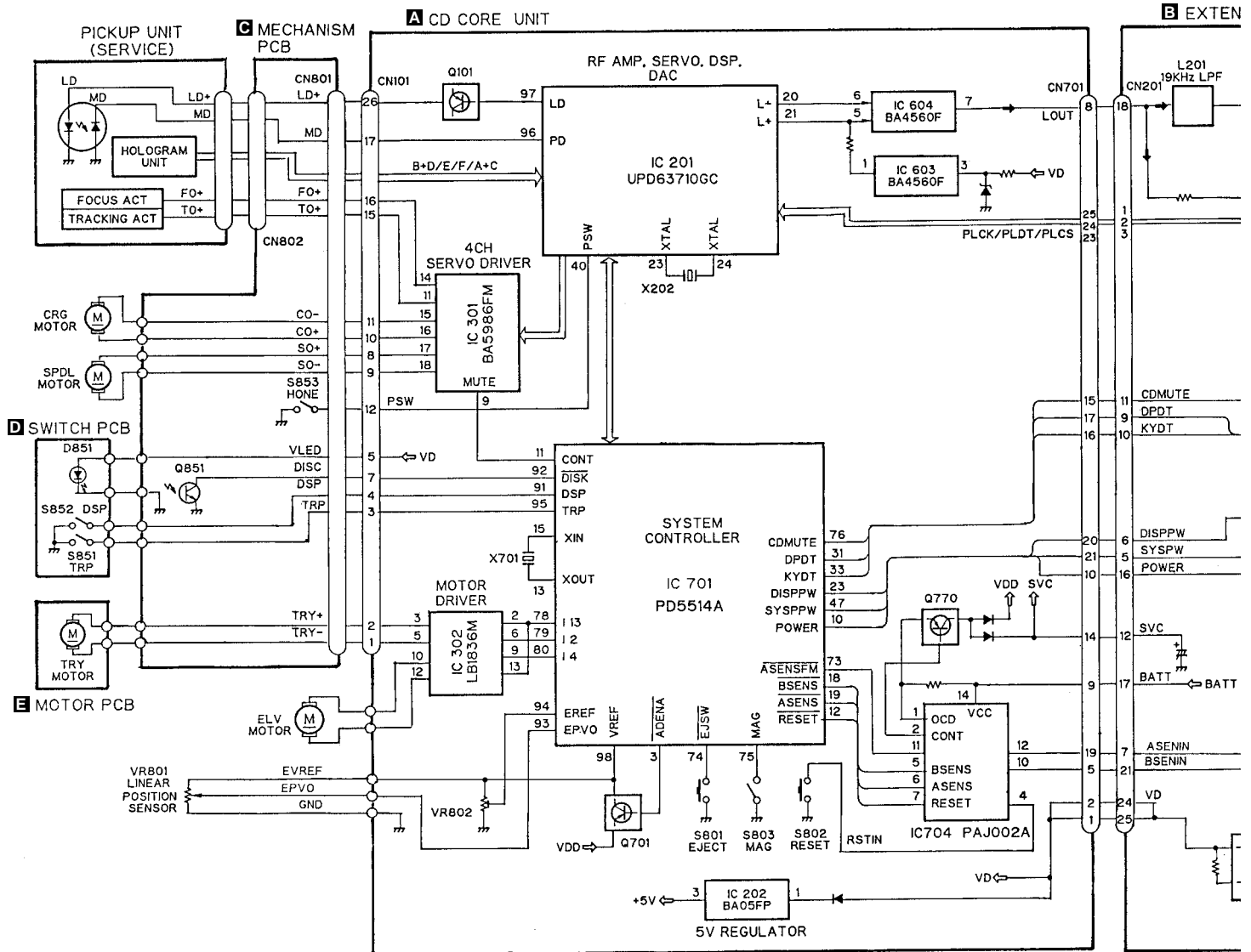
TRK No.	MIN.	SEC.
12	34'	56"

(B) Error No. display

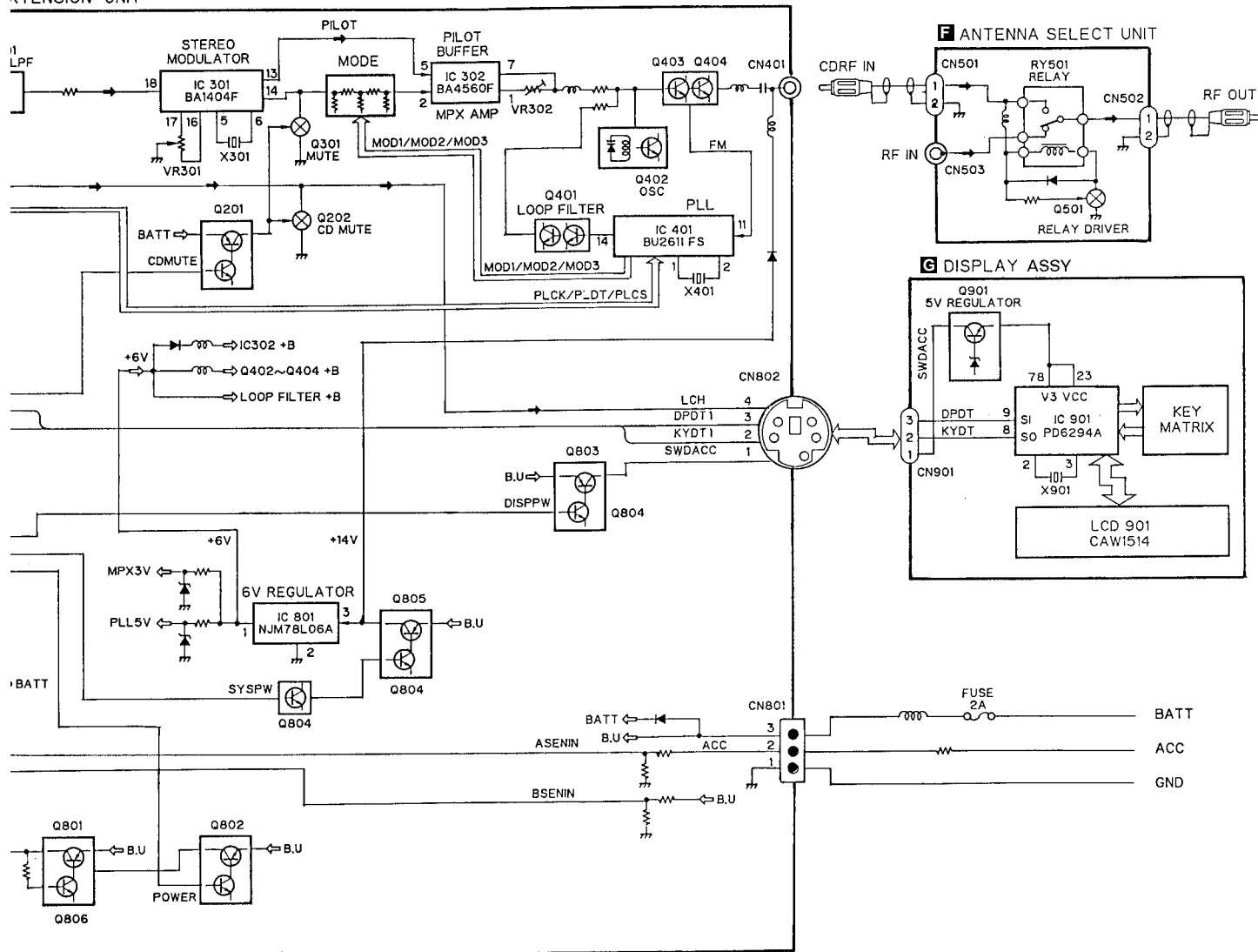
An example: Error #40 (Off focus is detected)

ERROR-40

7.3 BLOCK DIAGRAM

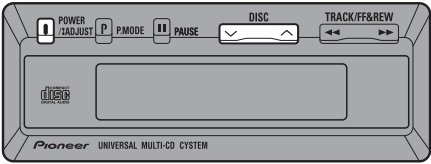


XTENSION UNIT



8. OPERATIONS AND SPECIFICATIONS

8.1 OPERATIONS



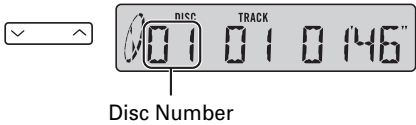
Start the CD player

1. Switch the radio on and tune to **Modulating Frequencies**.
- The initial value is 89.1 MHz.
 - If your radio does not have muting, there may be some noise before power switch of control unit is ON. If this happens, turn down the volume of the radio.

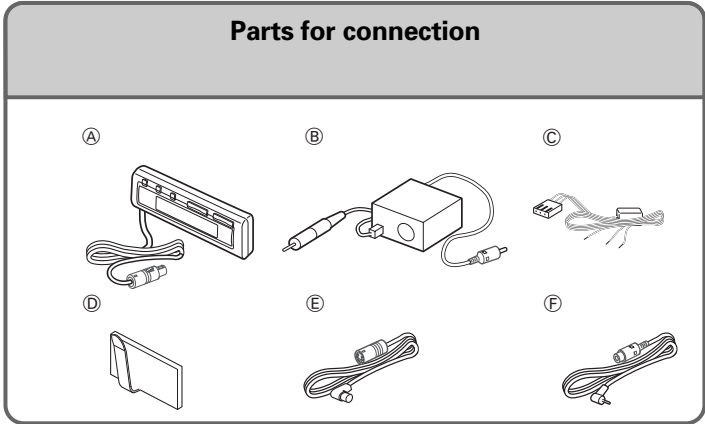


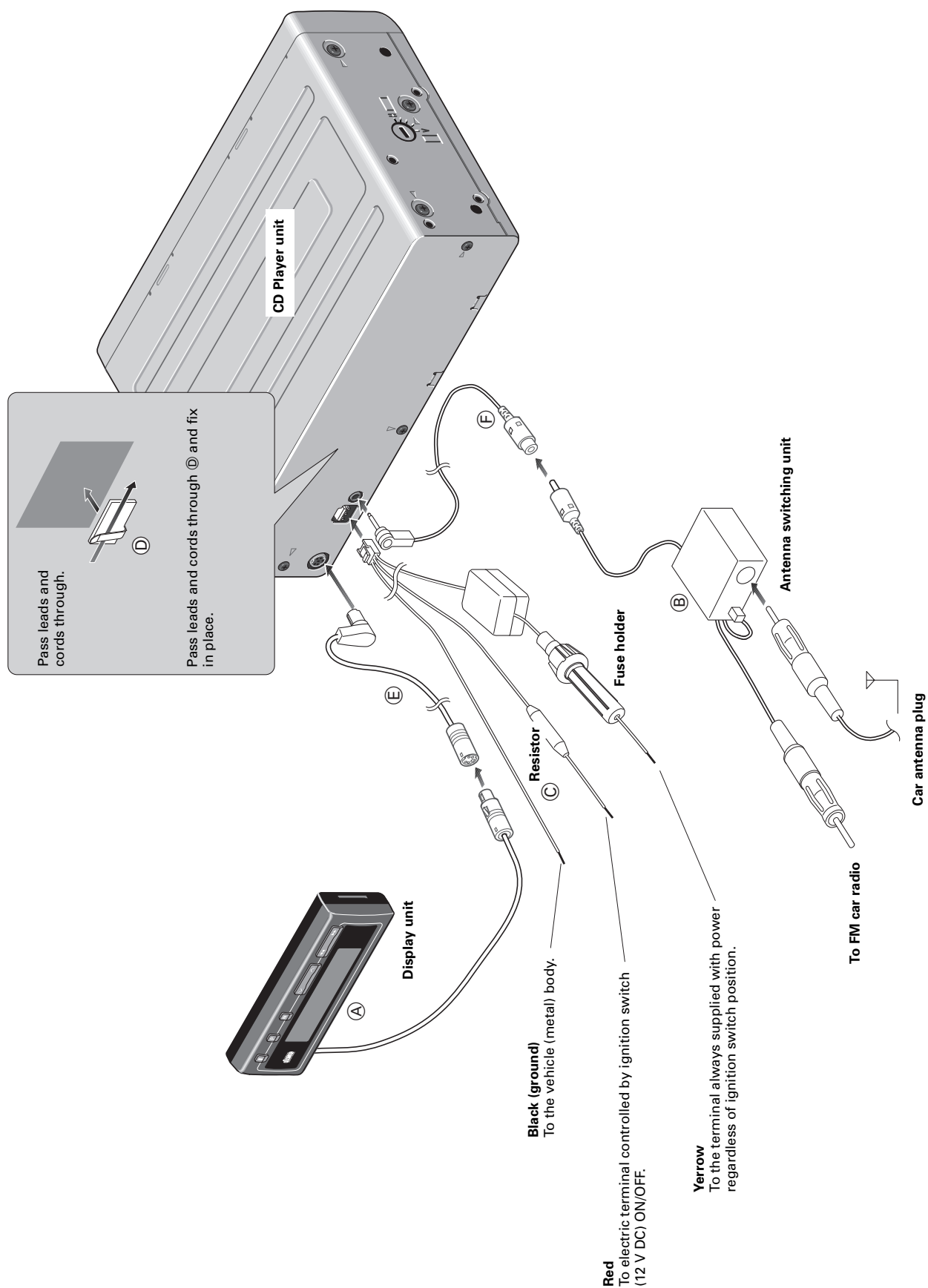
2. Press button to switch on and start the player.

Disc Number Search



- ^ : increase the number.
v : decrease the number.





8.2 SPECIFICATIONS

CD Player unit

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) × 169 (D) mm
..... [9-3/4 (W) × 2-5/8 (H) × 6-5/8 (D) in]
FM modulator usable frequency
..... 87.9/88.1/88.3/88.5/88.7/88.9/89.1
..... /89.3/89.5/89.7/89.9/90.1 MHz

Antenna Switching unit

Weight 140 g (0.3 lbs)
Dimensions
..... 45 (W) × 25 (H) × 43 (D) mm
..... [1-3/4 (W) × 1 (H) × 1-5/8 (D) in]

Display unit

Weight 78 g (0.1 lbs)
Dimensions
..... 100 (W) × 37 (H) × 18 (D) mm
..... [3-15/16 (W) × 1-7/16 (H) × 5/8 (D) in]

Note:

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