

Service Manual

Pioneer

CDX-FM657/X1N/UC



ORDER NO.
CRT2316

UNIVERSAL MULTI-CD SYSTEM

CDX-FM657

X1N/UC

CDX-FM657

X1N/EW

CDX-FM657

X1N/ES

COMPACT
disc
DIGITAL AUDIO

- 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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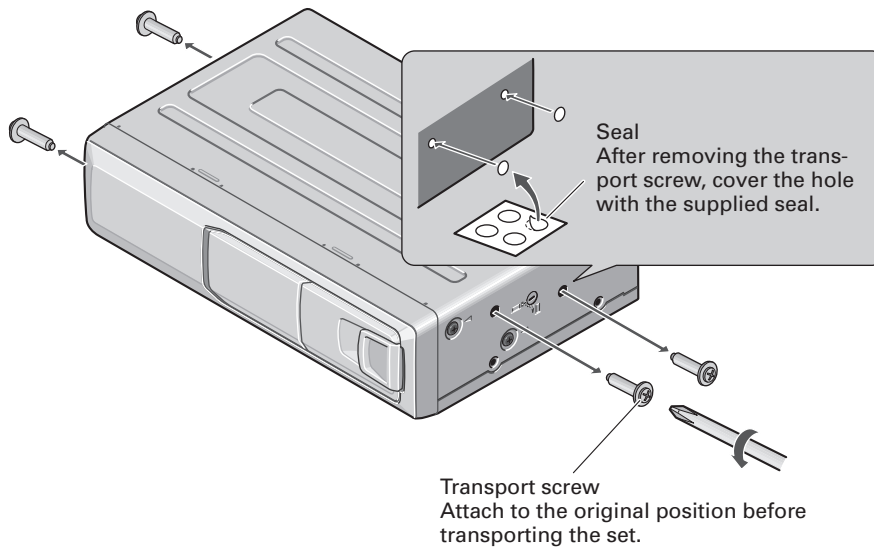
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K-ZZY. FEB. 1999 Printed in Japan

● CD Player Service Precautions

1. For pickup unit(CXX1285) handling, please refer to "Disassembly"(See page 52). 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 39).
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

1.1 CDX-FM657/X1N/UC

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

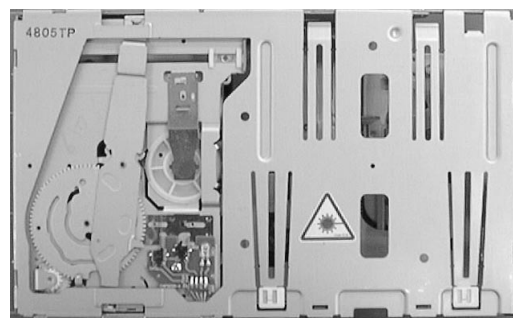
1.2 CDX-FM657/X1N/EW

1. Safety Precautions for those who Service this Unit.

- Follow the adjustment steps (see pages 38 through 44) in the service manual when servicing 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.

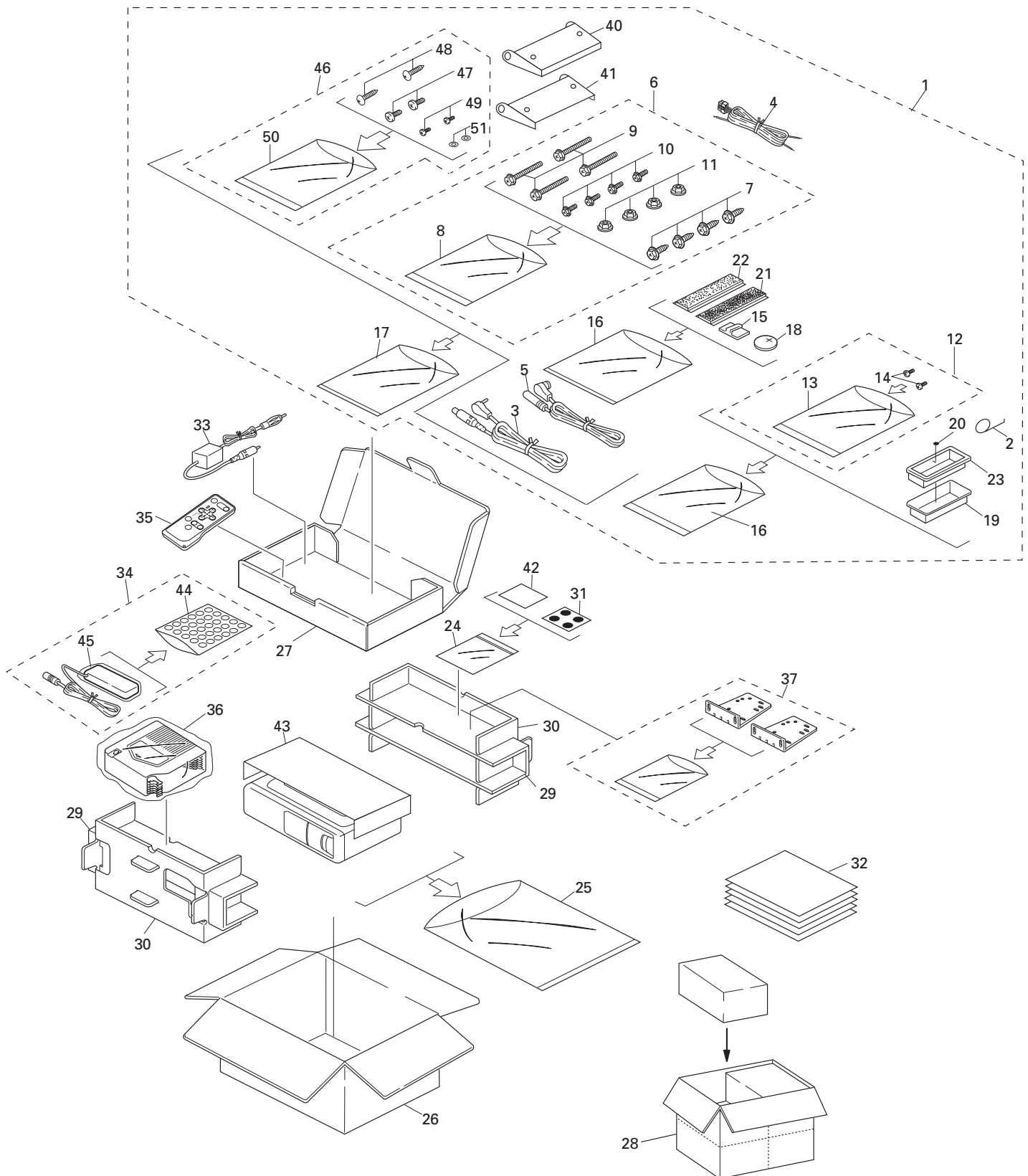


4. Specifications of Laser Diode

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.		
		CDX-FM657/X1N/UC	CDX-FM657/X1N/EW	CDX-FM657/X1N/ES
1	Accessory Assy	CEA2494	CEA2493	CEA2495
2	Spring	CBH-865	Not used	CBH-865
3	Cord	CDE4289	CDE4289	CDE4289
4	Cord	CDE5812	CDE5813	CDE5812
5	Cord	CDE5814	CDE5814	CDE5814
6	Screw Assy	CEA1962	CEA1962	CEA1962
7	Screw	CBA1295	CBA1295	CBA1295
* 8	Polyethylene Sheet	CNM5158	CNM5158	CNM5158
9	Screw	HMB60P500FMC	HMB60P500FMC	HMB60P500FMC
10	Screw	HMF40P080FZK	HMF40P080FZK	HMF40P080FZK
11	Nut	NF60FMC	NF60FMC	NF60FMC
12	Screw Assy	CEA1965	Not used	CEA1965
* 13	Polyethylene Bag	CEG-127	Not used	CEG-127
14	Screw	IMS30P050FZK	Not used	IMS30P050FZK
15	Clamper	CEF1010	CEF1010	CEF1010
* 16	Polyethylene Bag	CEG-158	CEG-158	CEG-158
17	Polyethylene Bag	CEG1185	*E36-622	*E36-622
18	Battery	CEX1030	CEX1030	CEX1030
19	Bracket	CNC8061	Not used	CNC8061
20	Cushion	CNM3182	Not used	CNM3182
21	Fastener(Soft)	CNM3872	CNM3872	CNM3872
22	Fastener(Rough)	CNM4041	CNM4041	CNM4041
23	Panel	CNS5428	Not used	CNS5428
* 24	Polyethylene Bag	CEG1099	CEG1099	CEG1099
25	Polyethylene Bag	CEG1185	CEG1042	CEG1042
26	Carton	CHG3759	CHG3725	CHG3726
27	Sub Carton	CHG3763	CHG3733	CHG3734
28	Contain Box	CHL3759	CHL3725	CHL3726
29	Protector	CHP2133	CHP2133	CHP2133
30	Protector	CHP2135	CHP2135	CHP2135
31	Seal	CNM5599	CNM5599	CNM5599
32-1	Installation Manual	CRD2944	CRD2882	CRD2884
32-2	Owner's Manual	CRD2943	CRD2880	CRD2883
32-3	Owner's Manual	Not used	CRD2881	Not used
* 32-4	Warranty Card	Not used	CRY1087	Not used
* 32-5	Caution Card	CRP1205	CRP1205	CRP1205
33	Antenna Select Assy	CWM6445	CWM6445	CWM6445
34	Display Assy	CXB3248	CXB3247	CXB3248
35	Remote Control Assy	CXB3261	CXB3261	CXB3261
36	Magazine Assy	CXB4027	CXB4027	CXB4027

Mark No.	Description	Part No.		
		CDX-FM657/X1N/UC	CDX-FM657/X1N/EW	CDX-FM657/X1N/ES
37	Angle Assy	CXB3591	CXB3591	CXB3591
38	.....		
39	.....		
40	Bracket	Not used	CNC5114	Not used
41	Bracket	Not used	CNC5115	Not used
*	42 Caution Card	CRP1090	CRP1090	CRP1090
*	43 Caution Card	CRP1195	CRP1195	CRP1195
	44 Air Cushioned Bag	CEG1055	CEG1055	CEG1055
	45 Cover	CEG1062	CEG1062	CEG1062
	46 Screw Assy	Not used	CEA1964	Not used
	47 Screw	Not used	BMZ40P060FZK	Not used
	48 Screw	Not used	BNC40P120FZK	Not used
	49 Screw	Not used	BPZ30P050FZK	Not used
*	50 Polyethylene Bag	Not used	CEG-127	Not used
	51 Washer	Not used	WG40FZK	Not used

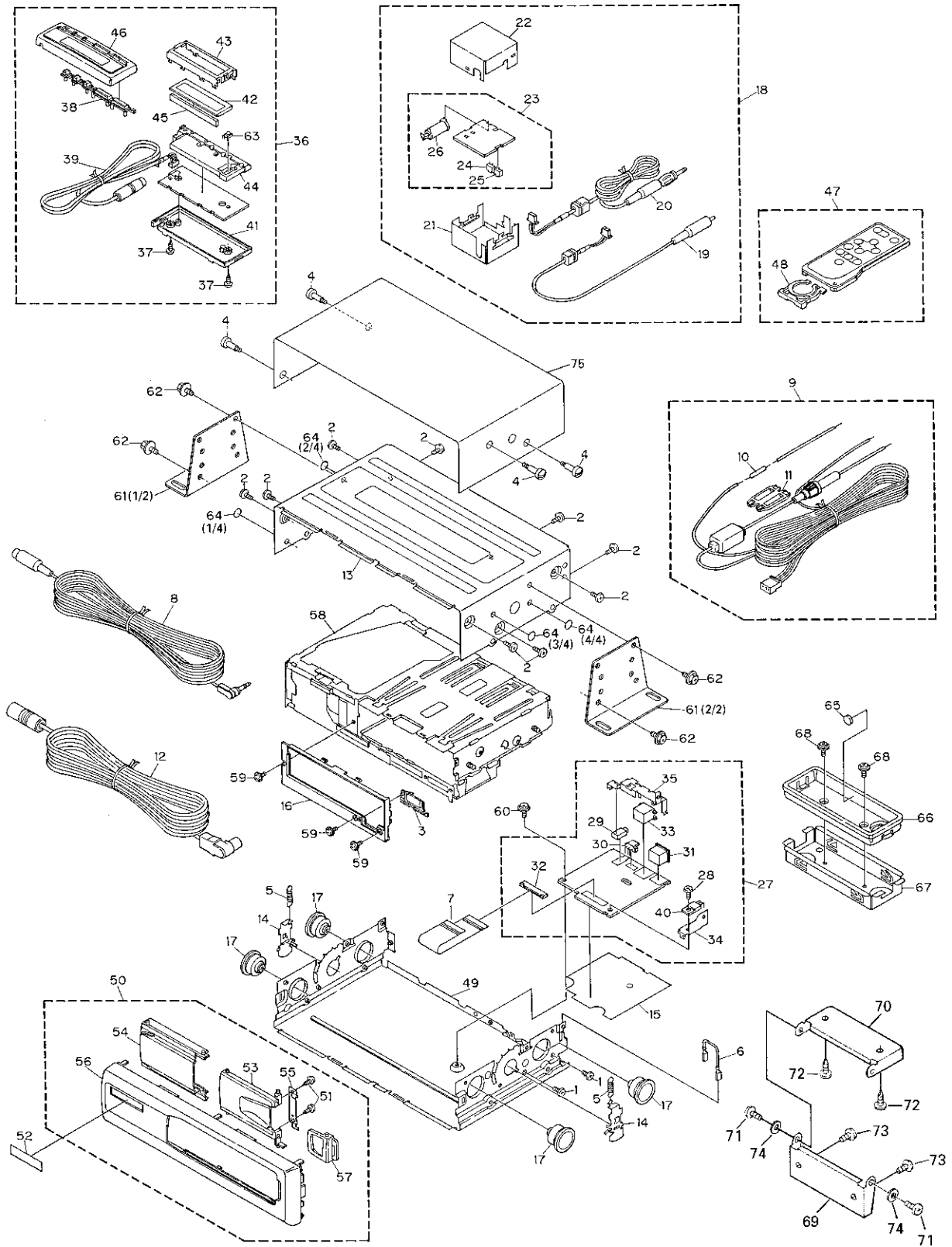
● Owner's Manual

Model	Part No.	Language
CDX-FM657/X1N/UC	CRD2943	English, French
CDX-FM657/X1N/EW	CRD2880	English, Italian, French
	CRD2881	German, Dutch, Spanish
CDX-FM657/X1N/ES	CRD2883	English, Spanish, Portuguese(B), Arabic

● Installation Manual

Model	Part No.	Language
CDX-FM657/X1N/UC	CRD2944	English, French
CDX-FM657/X1N/EW	CRD2882	English, Italian, French, German, Dutch, Spanish
CDX-FM657/X1N/ES	CRD2884	English, Spanish, Portuguese(B), Arabic

2.2 EXTERIOR



(1) EXTERIOR SECTION PARTS LIST

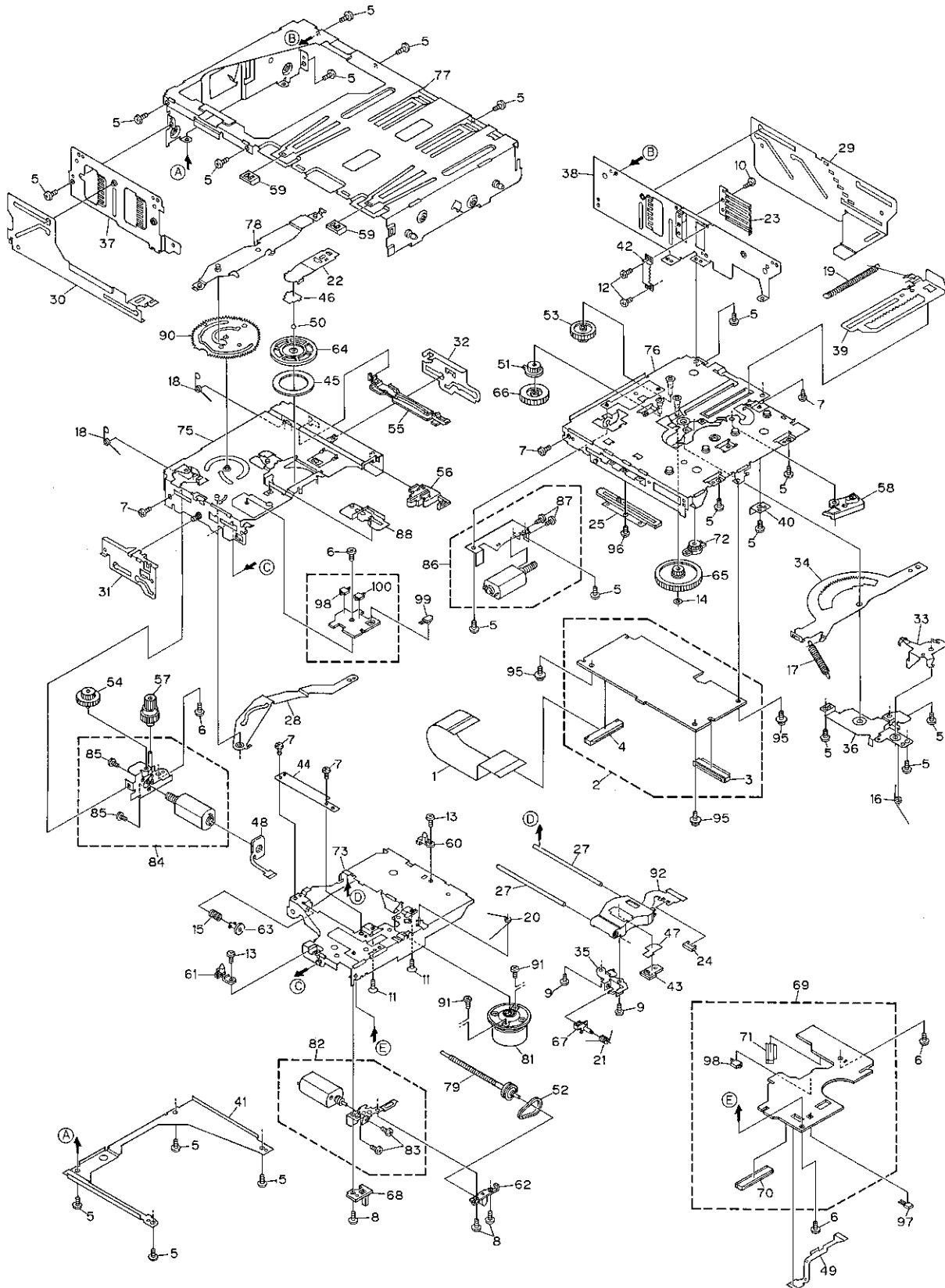
Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Screw	BMZ26P040FMC	41	Cover	CNS5223
2	Screw	BMZ30P040FZK	42	LCD(LCD901)	CAW1514
3	Button	CAC4632	43	Holder	CNC8062
4	Screw	CBA1460	44	Lighting Conductor	CNV5594
5	Spring	CBH1859	45	Rubber	CNV5599
6	Connector	CDE5525	46	Grille Unit	CXB3826
7	Connector	CDE5833	47	Remote Control Assy	CXB3261
8	Cord	CDE4289	48	Cover	CNS4948
9	Cord	See Contrast table(2)	49	Lower Case Unit	CXB3395
10	Resistor	RS1/2PMF102J	50	Grille Unit	CXB4379
11	Cap	CNS1472	51	Screw	BPZ20P080FMC
12	Cord	CDE5814	52	Sheet	CAH1682
13	Upper Case	CNB2389	53	Door	CAT2013
14	Arm	CNC8058	54	Door	CAT2014
15	Insulator	CNM6074	55	Holder	CNC8139
16	Panel	CNS5216	56	Grille	CNS5439
17	Damper	CNV5591	57	Lever	CNS5391
18	Antenna Select Assy	CWM6445	58	CD Mechanism Module	CXK4815
19	Cord	CDE4087	59	Screw	IMS20P035FZK
20	Antenna Cable	CDH1207	60	Screw	IMS26P040FMC
21	Chassis	CNA1555	61	Angle Assy	CXB3591
22	Case	CNB1764	62	Screw	HMF40P080FZK
23	Antenna Select Unit	CWX2200	63	IC(IC902)	TSOP1840SB1
24	Plug(CN502)	CKS1222	64	Seal	CNM5599
25	Plug(CN501)	CKS2812	65	Cushion	See Contrast table(2)
26	Antenna Jack(CN503)	CKX1006	66	Panel	See Contrast table(2)
27	Extension Unit	See Contrast table(2)	67	Bracket	See Contrast table(2)
28	Screw	BMZ26P060FMC	68	Screw	See Contrast table(2)
29	Jack(CN401)	CKN1022	69	Bracket	See Contrast table(2)
30	Plug(CN801)	CKS-460	70	Bracket	See Contrast table(2)
31	Connector(CN802)	CKS3195	71	Screw	See Contrast table(2)
32	Connector(CN201)	CKS4019	72	Screw	See Contrast table(2)
33	Connector(CN803)	CKS3407	73	Screw	See Contrast table(2)
34	Holder	CNC8056	74	Washer	See Contrast table(2)
35	Holder	CNC8070	* 75	Caution Card	CRP1195
36	Display Assy	See Contrast table(2)			
37	Screw	BPZ20P100FZK			
38	Button	CAC5887			
39	Cord	CDE5834			
40	Transistor(Q801)	2SD2396			

(2) CONTRAST TABLE

CDX-FM657/X1N/UC,CDX-FM657/X1N/EW and CDX-FM657/X1N/ES are constructed the same except for the following:

Mark No.	Symbol and Description	Part No.		
		CDX-FM657/X1N/UC	CDX-FM657/X1N/EW	CDX-FM657/X1N/ES
9	Cord	CDE5812	CDE5813	CDE5812
27	Extension Unit	CWX2305	CWX2311	CWX2305
36	Display Assy	CXB3248	CXB3247	CXB3248
65	Cushion	CNM3182	Not used	CNM3182
66	Panel	CNS5428	Not used	CNS5428
67	Bracket	CNC8061	Not used	CNC8061
68	Screw	IMS30P050FZK	Not used	IMS30P050FZK
69	Bracket	Not used	CNC5114	Not used
70	Bracket	Not used	CNC5115	Not used
71	Screw	Not used	BMZ40P060FZK	Not used
72	Screw	Not used	BNC40P120FZK	Not used
73	Screw	Not used	BPZ30P050FZK	Not used
74	Washer	Not used	WG40FZK	Not used

2.3 CD MECHANISM MODULE

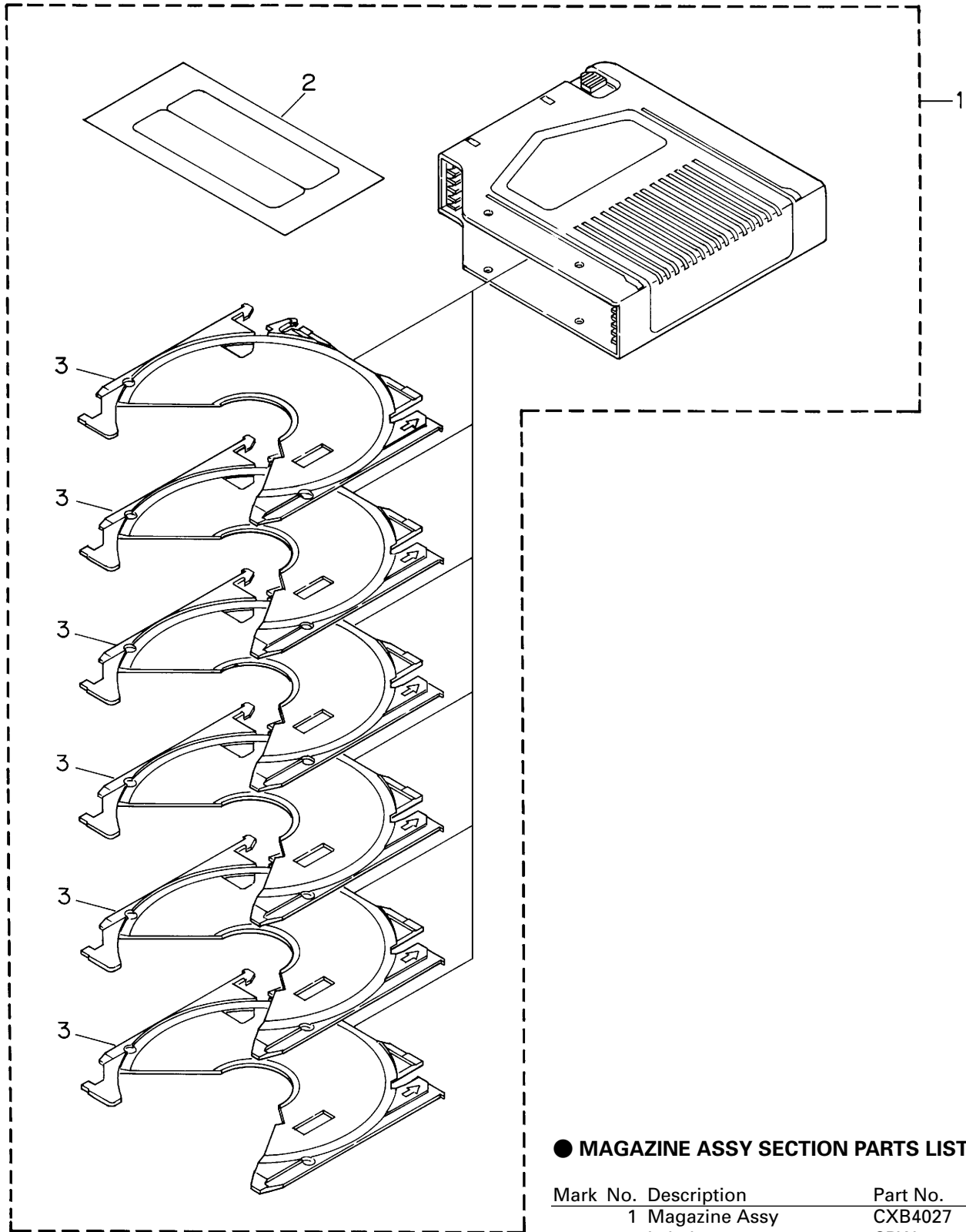


● CD MECHANISM MODULE SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Connector	CDE6069	46	Spacer	CNM6146
2	CD Core Unit (C7)	CWX2273	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



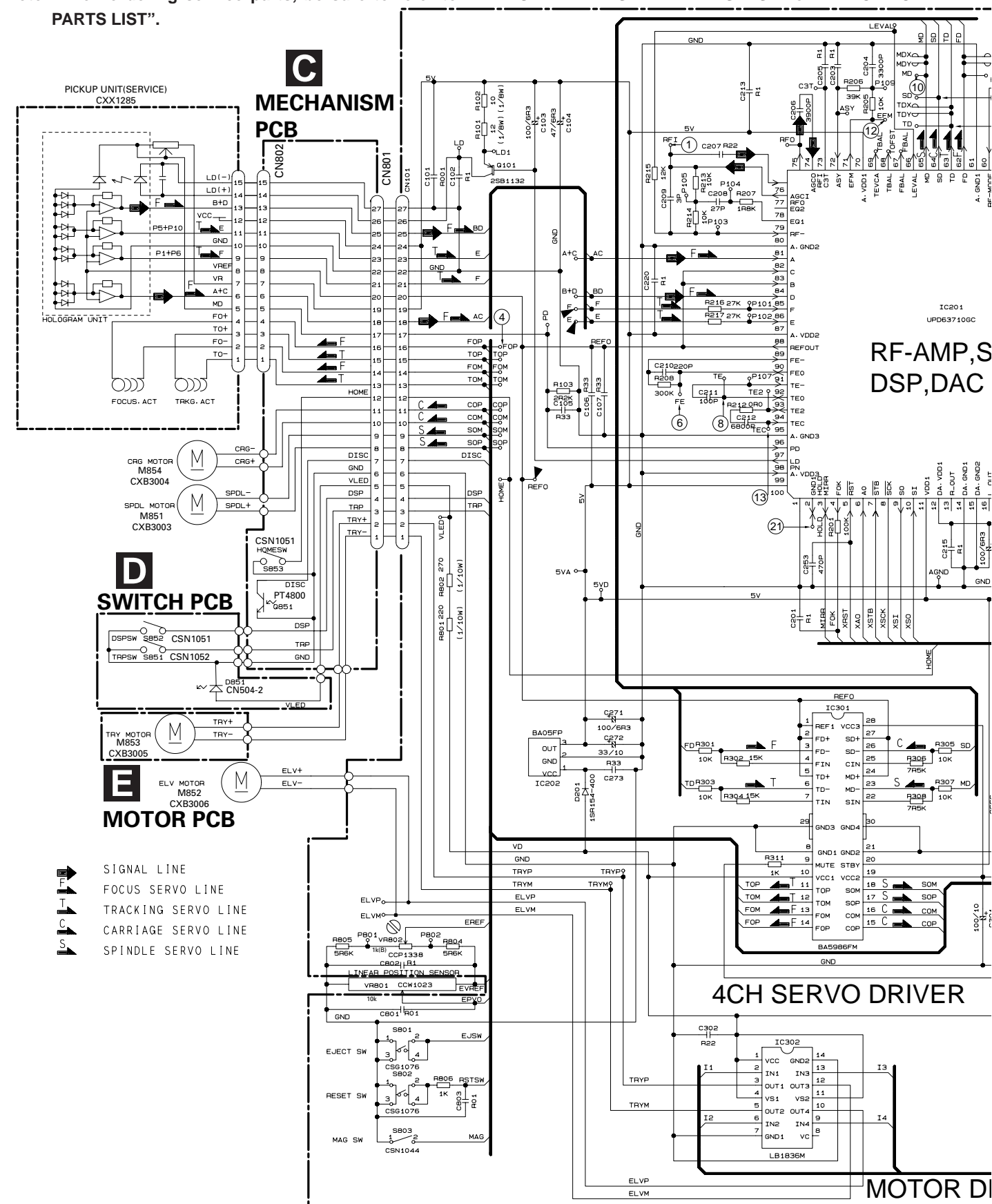
● MAGAZINE ASSY SECTION PARTS LIST

Mark No.	Description	Part No.
1	Magazine Assy	CXB4027
2	Label	CRW1396
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".



- SIGNAL LINE
- FOCUS SERVO LINE
- TRACKING SERVO LINE
- CARRIAGE SERVO LINE
- SPINDLE SERVO LINE

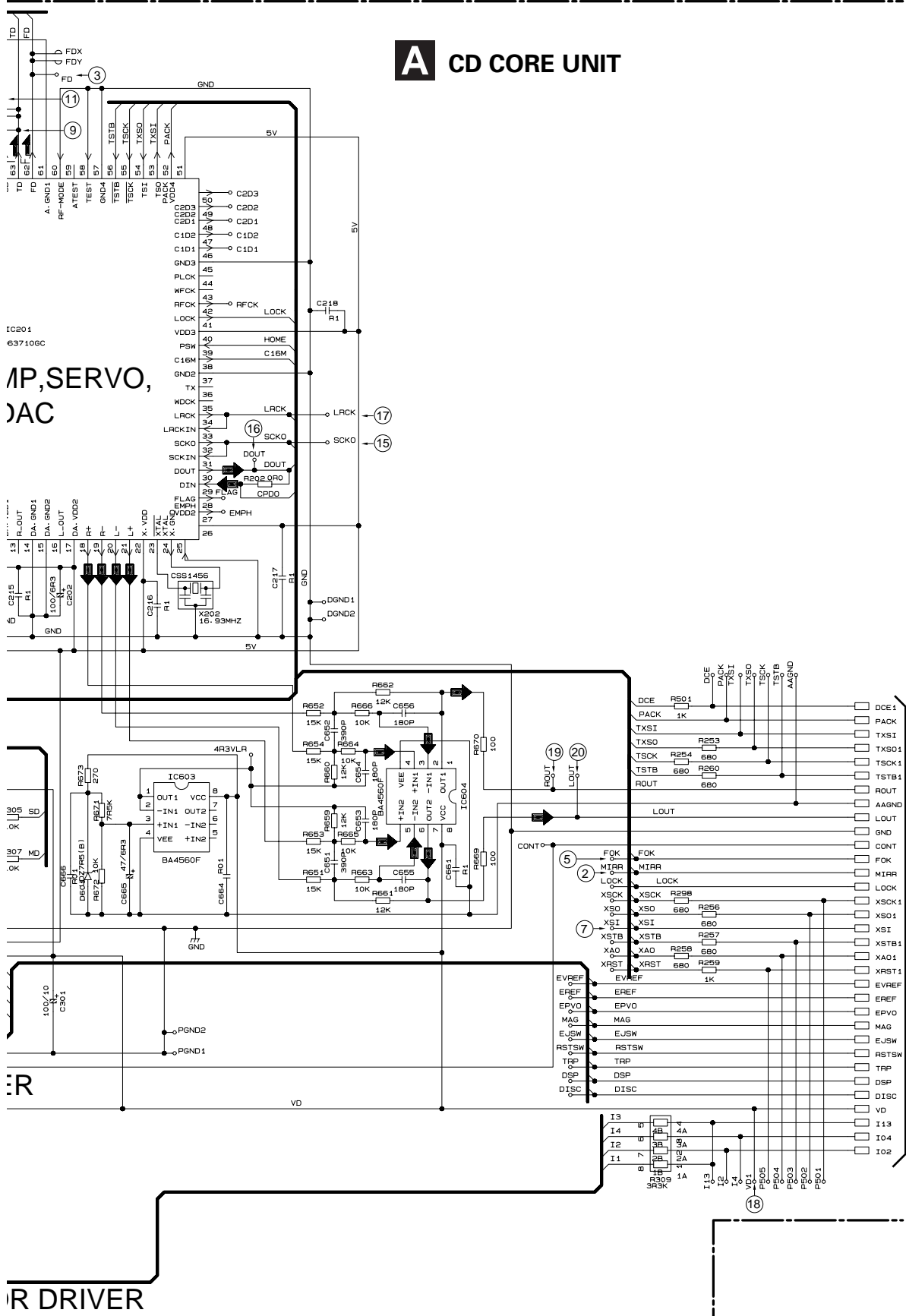
NOTE:

□ 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→R22
 0.022→R022

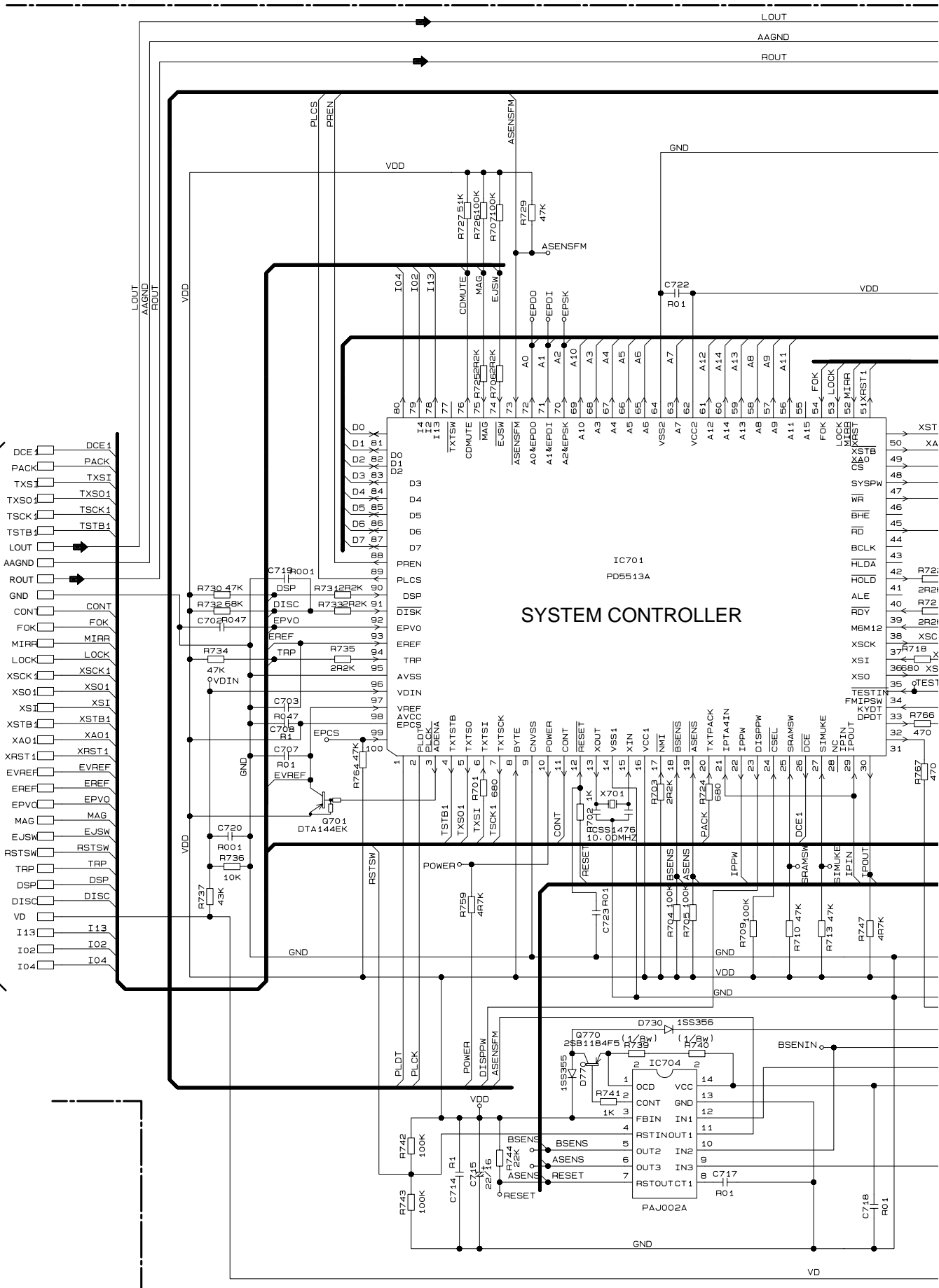
A CD CORE UNIT



IC201
63710GC
MP, SERVO,
DAC

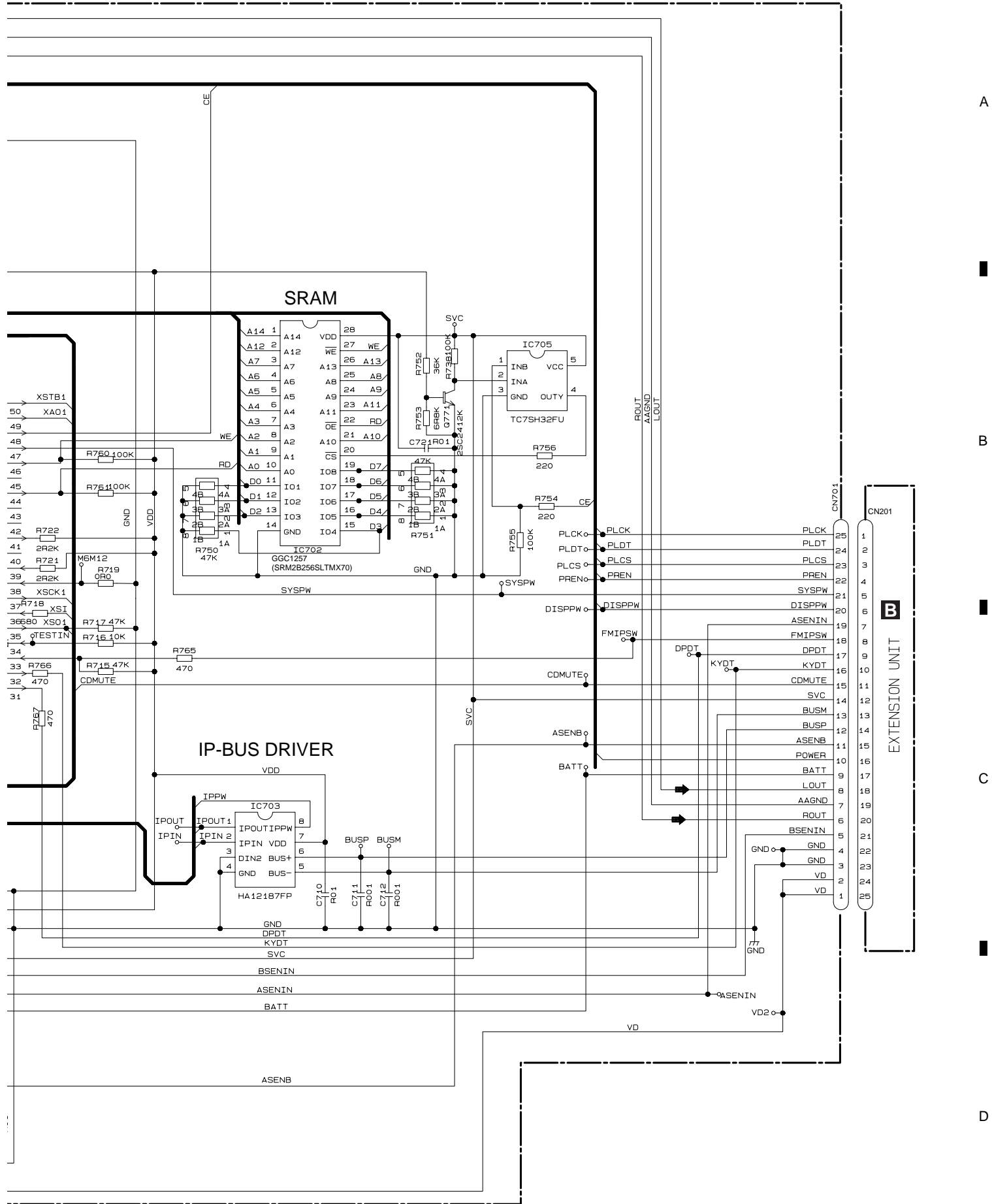
A 2/2

A 1/2



SYSTEM CONTROLLER

A1/2



A

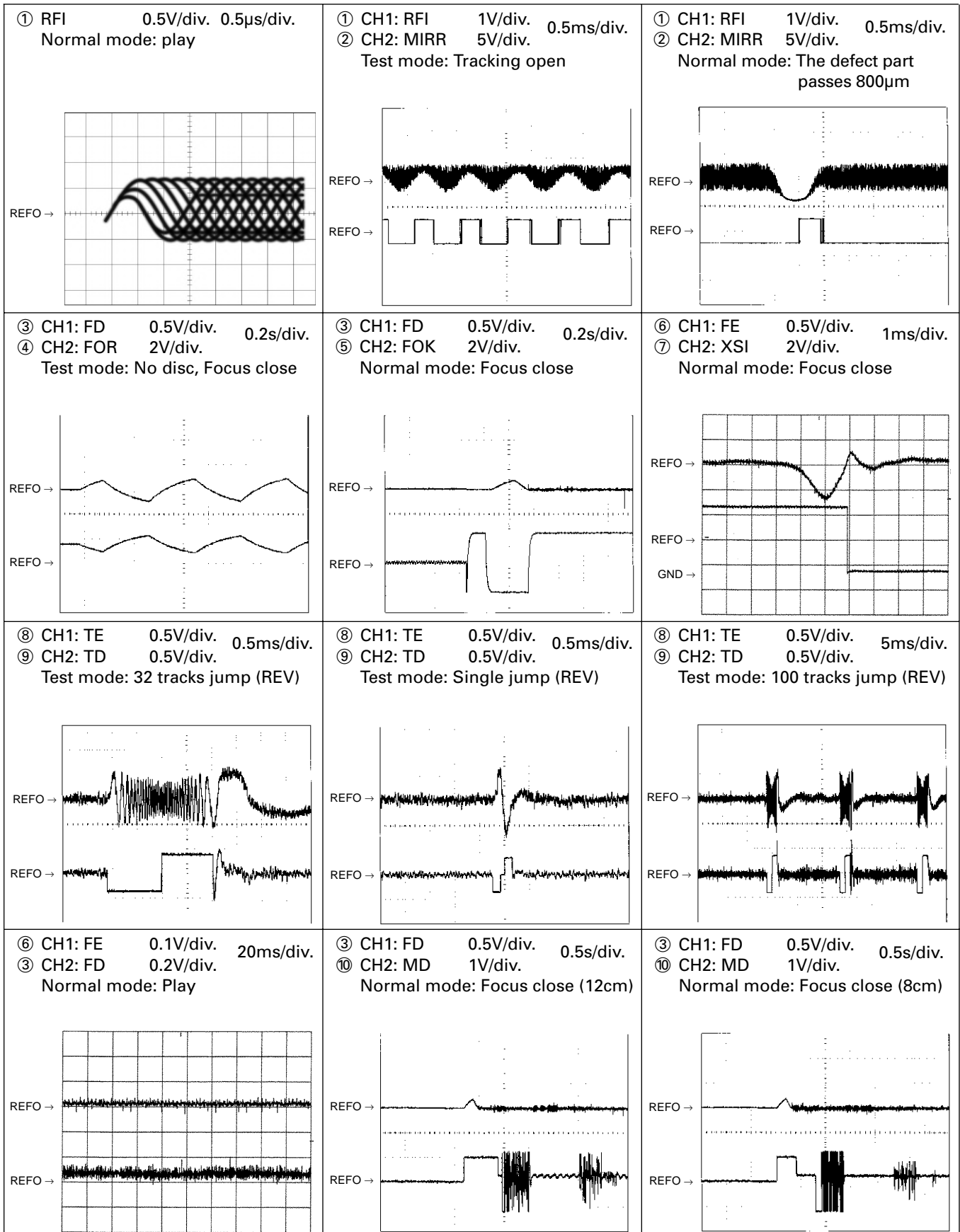
B

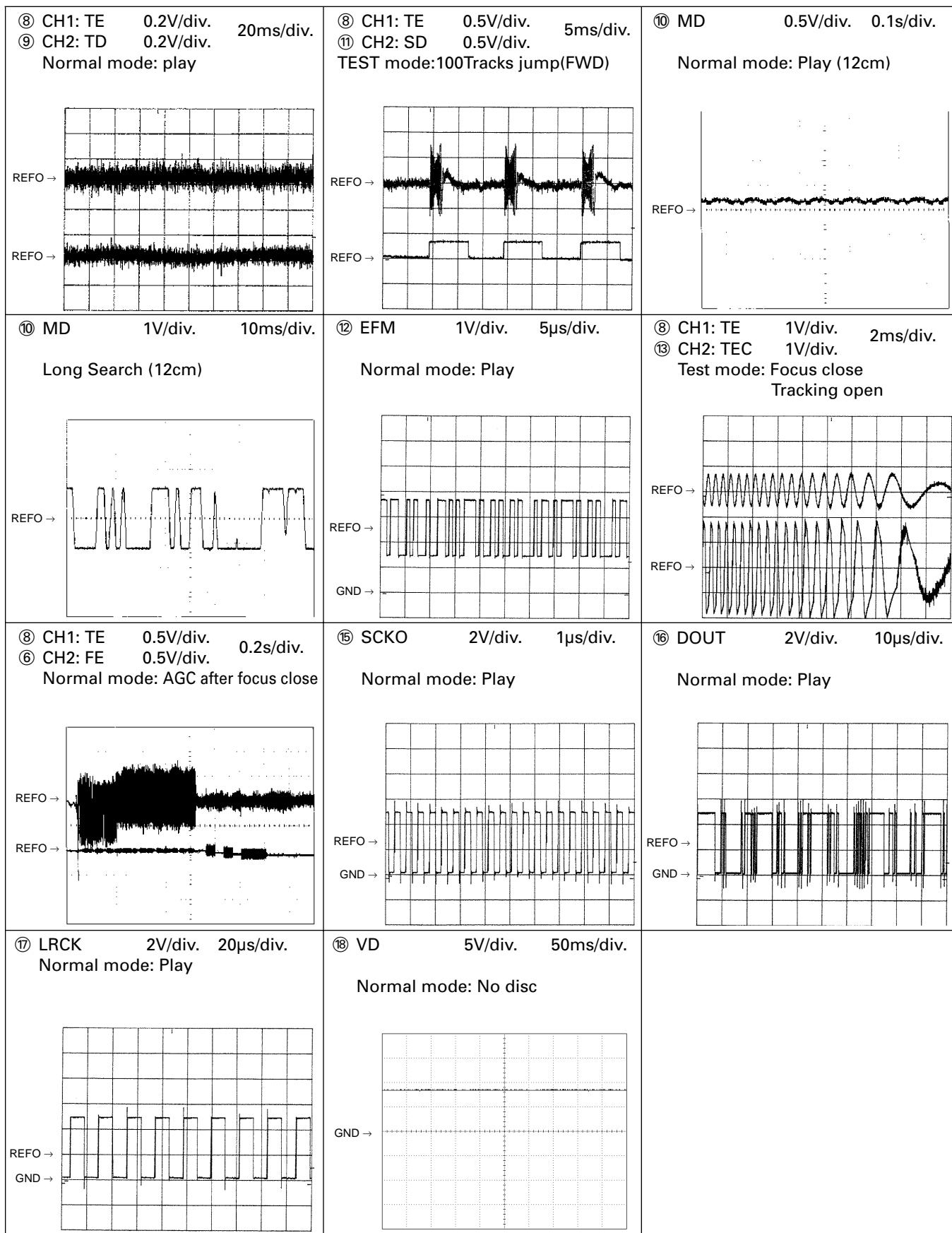
C

D

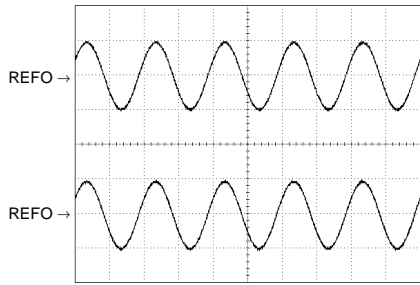
Note:1. The encircled numbers denote measuring pointes in the circuit diagram.
 2. Reference voltage
 REFO:2.5V

● Waveforms

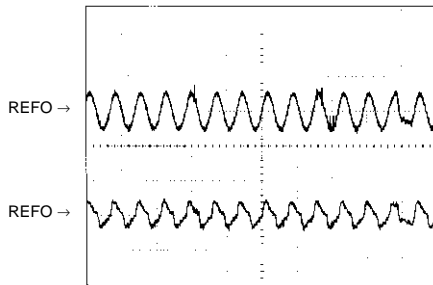




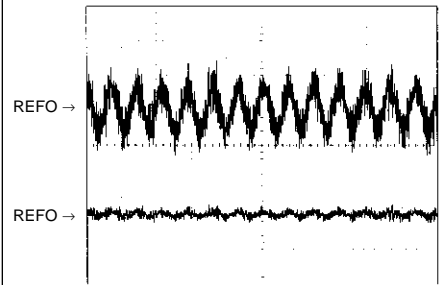
⑮ CH1: R OUT 2V/div. 500μs/div.
 ⑳ CH2: L OUT 2V/div.
 Normal mode: Play (1kHz 0dB)



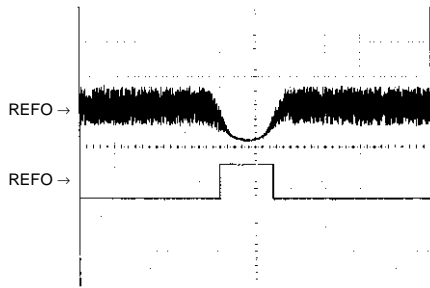
⑥ CH1: FE 0.2V/div. 1ms/div.
 ③ CH2: FD 0.5V/div.
 Normal mode: During AGC



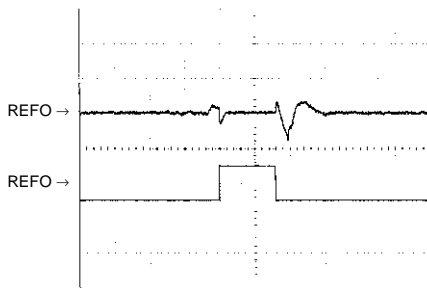
⑧ CH1: TE 0.2V/div. 1ms/div.
 ⑨ CH2: TD 0.5V/div.
 Normal mode: During AGC



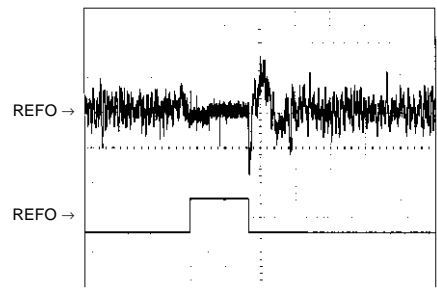
① CH1: RFI 1V/div. 0.5ms/div.
 ② CH2: HOLD 5V/div.
 Normal mode: The defect part passes 800μm(B.D)



③ CH1: FD 1V/div. 0.5ms/div.
 ② CH2: HOLD 5V/div.
 Normal mode: The defect part passes 800μm(B.D)

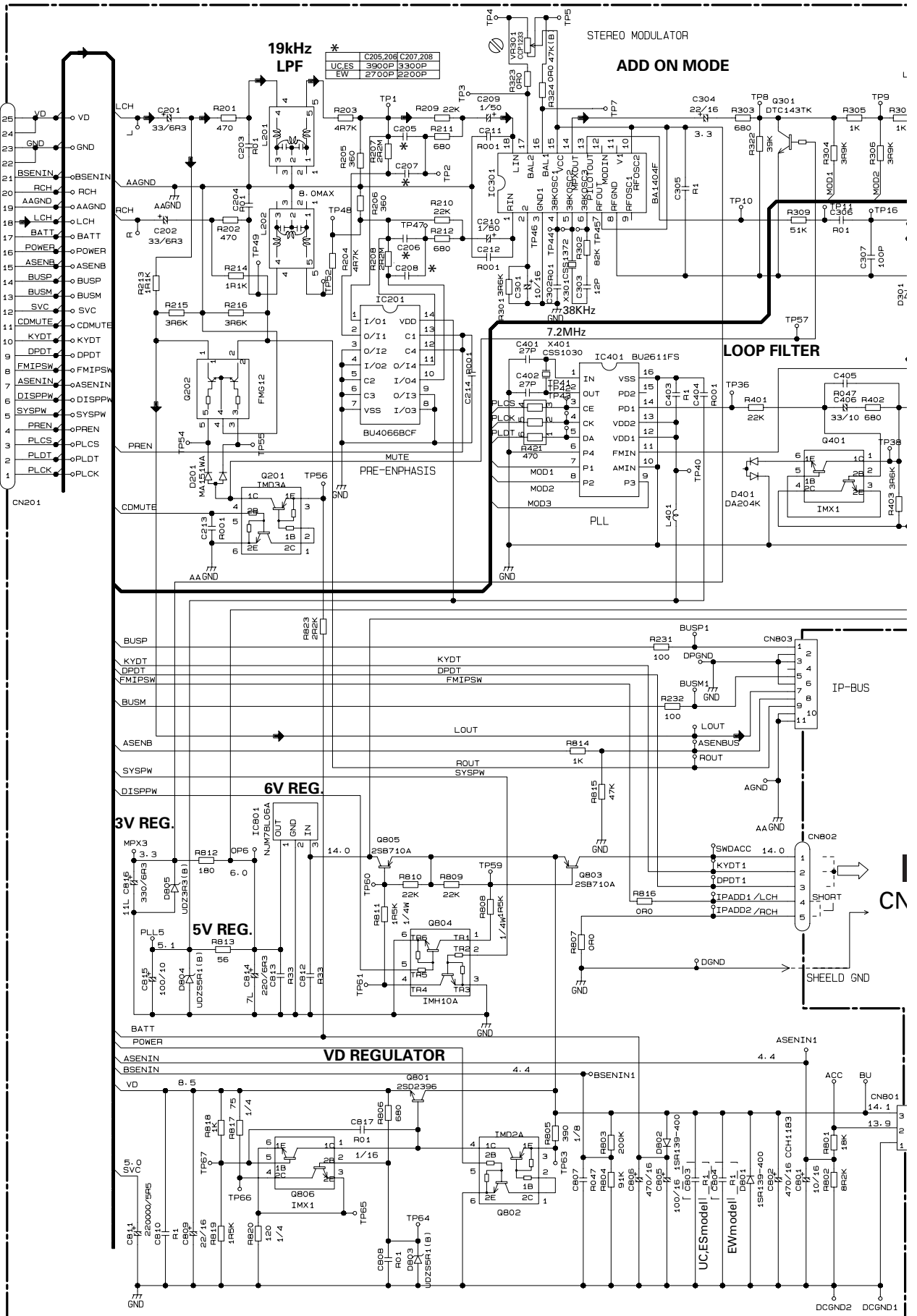


⑨ CH1: TD 0.1V/div. 0.5ms/div.
 ② CH2: HOLD 5V/div.
 Normal mode: The defect part passes 800μm(B.D)

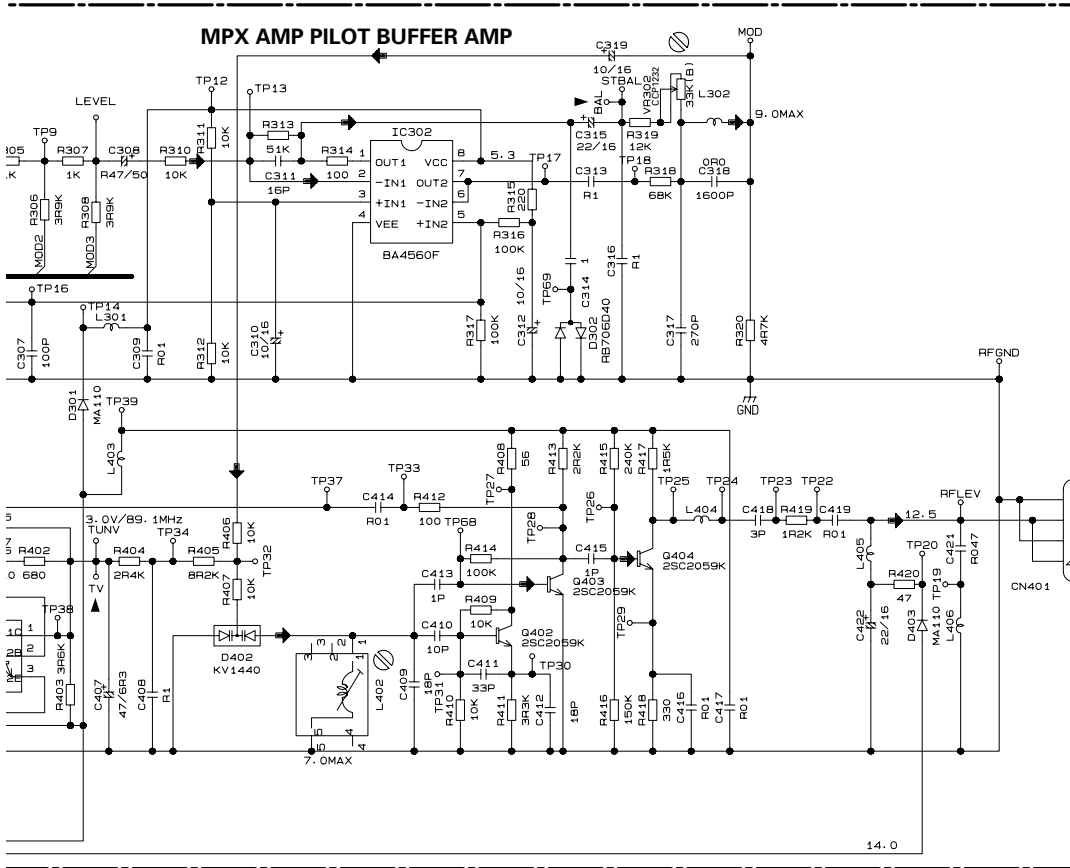


3.2 EXTENSION PCB

A CN701



B

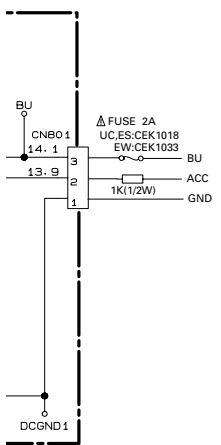


The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

3US

G
CN901

3ND



B EXTENSION UNIT

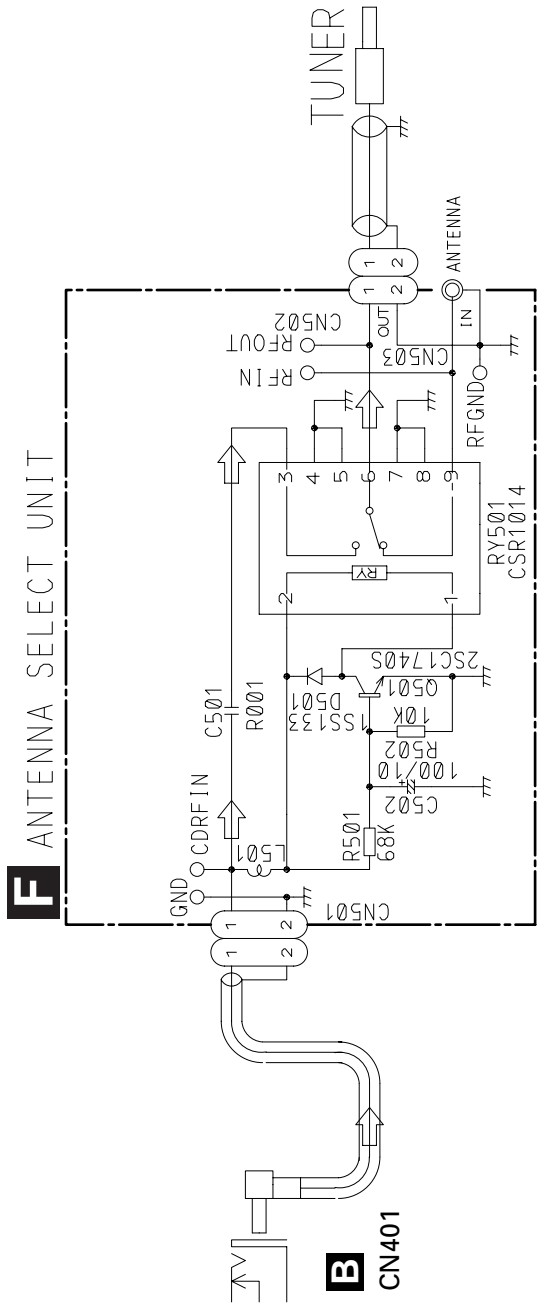
3.3 ANTENNA SELECT UNIT

A

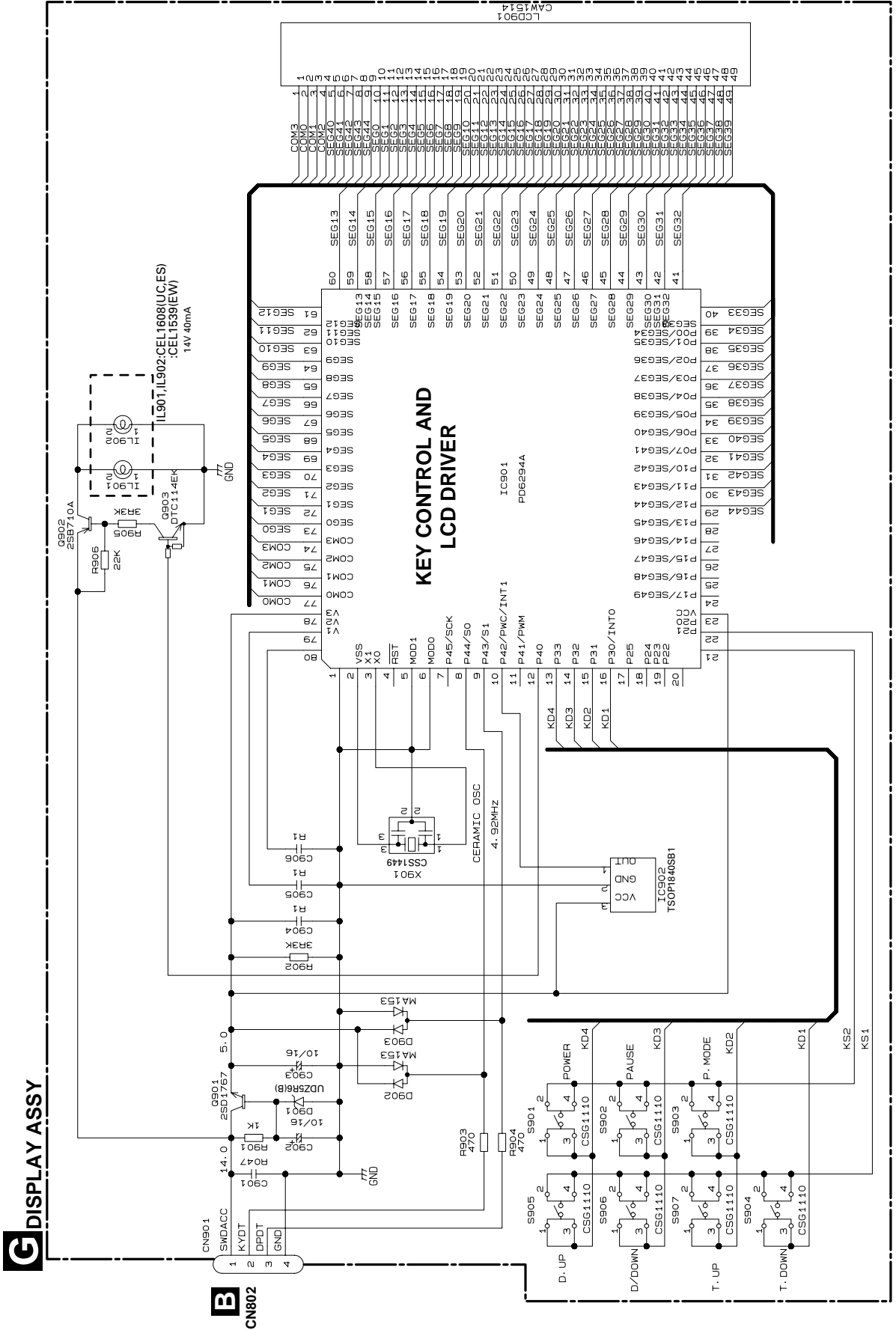
B

C

D



3.4 DISPLAY ASSY



A
B
C
D



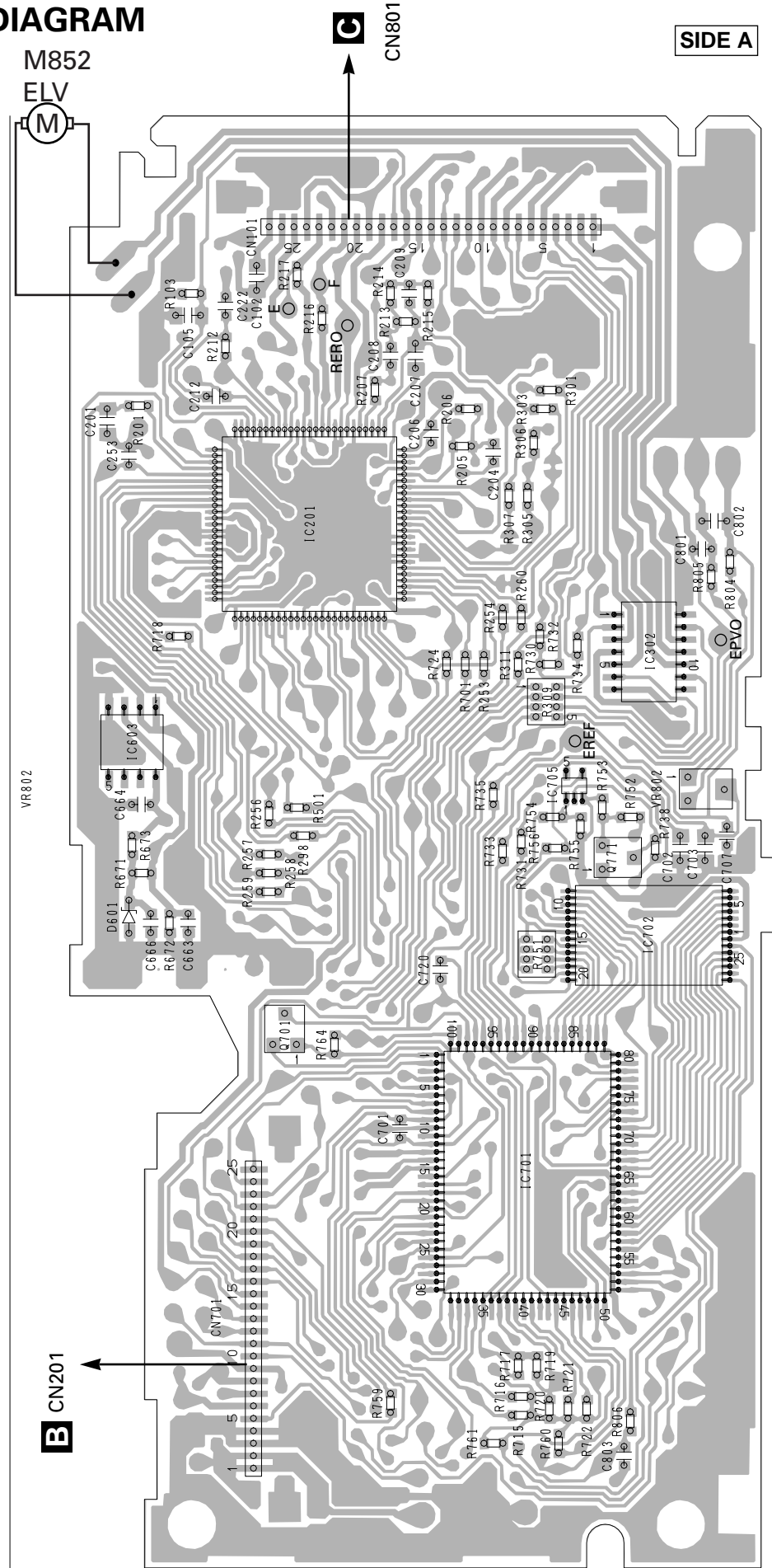
4. PCB CONNECTION DIAGRAM

4.1 CD CORE UNIT

NOTE FOR PCB DIAGRAMS

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.



SIDE A

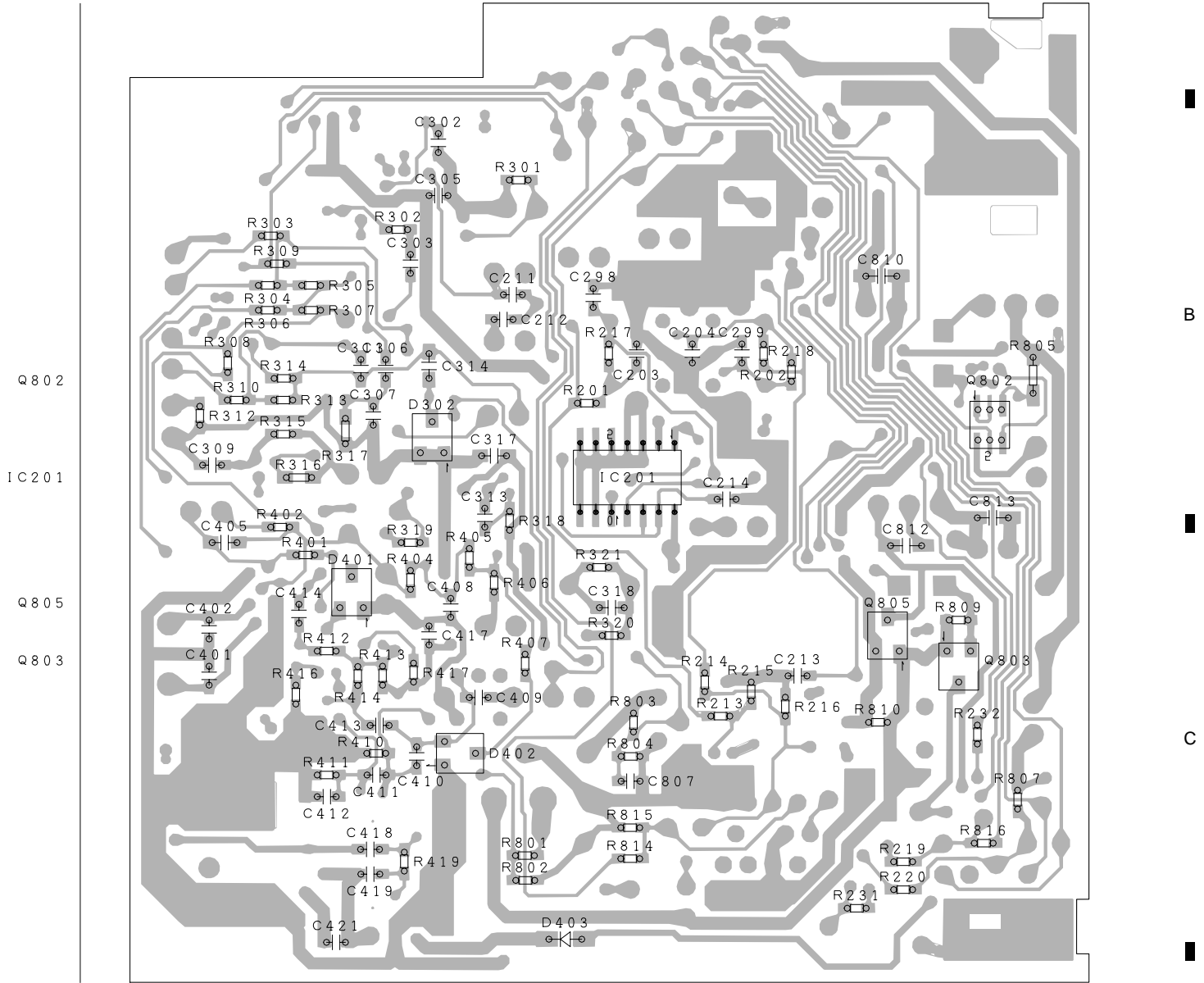
A CD CORE UNIT

B CN201

C CN801

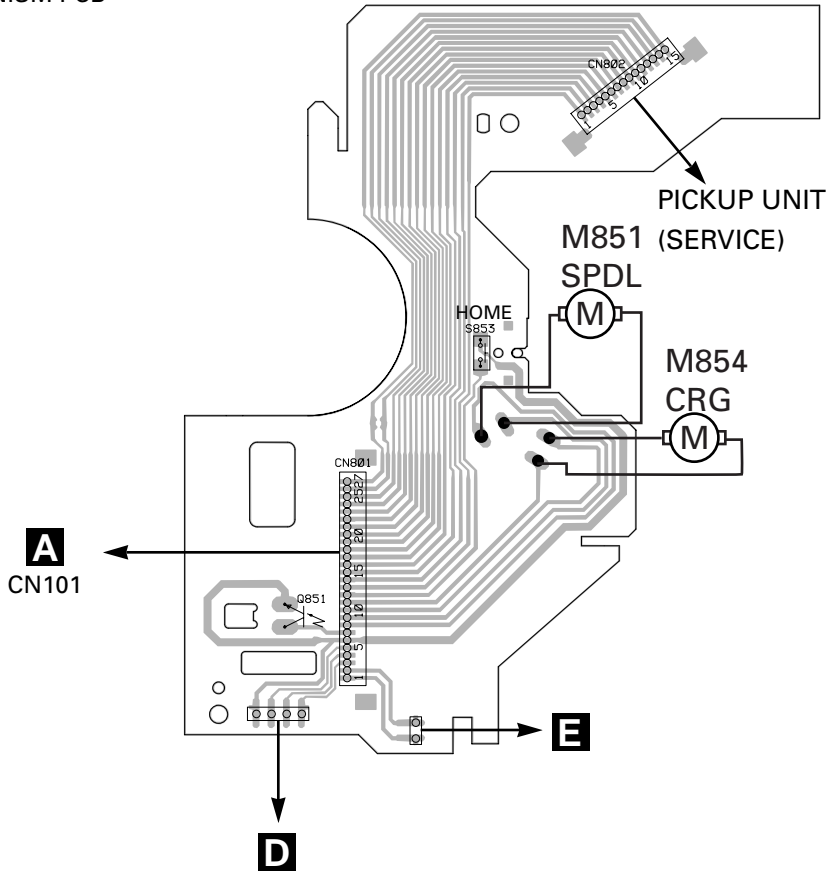
SIDE B

B EXTENSION UNIT



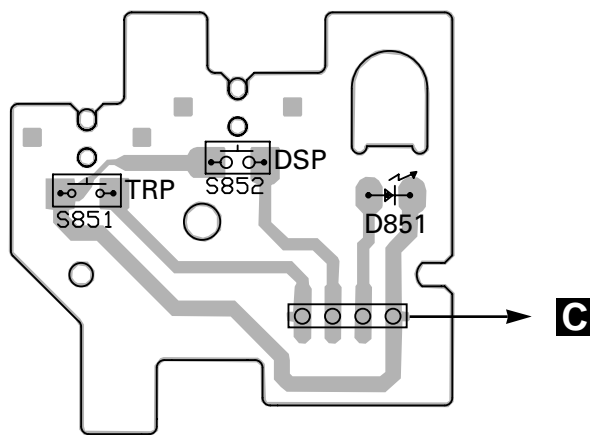
4.3 MECHANISM PCB

C MECHANISM PCB



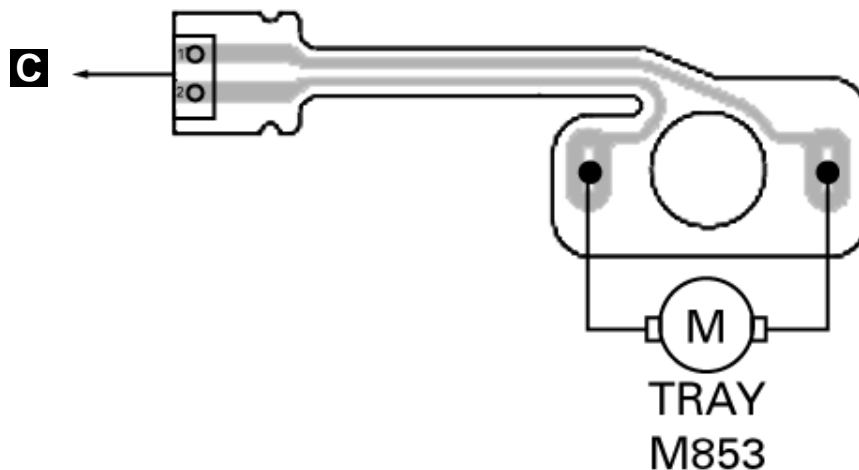
4.4 SWITCH PCB

D SWITCH PCB



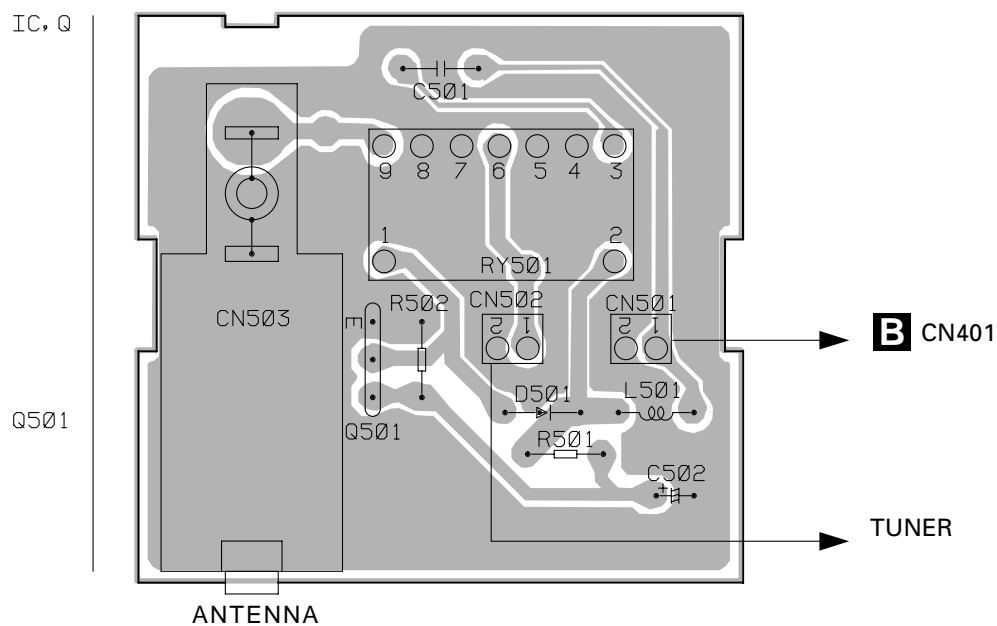
4.5 MOTOR PCB

E MOTOR PCB



4.6 ANTENNA SELECT UNIT

F ANTENNA SELECT UNIT



4.7 DISPLAY ASSY

SIDE A

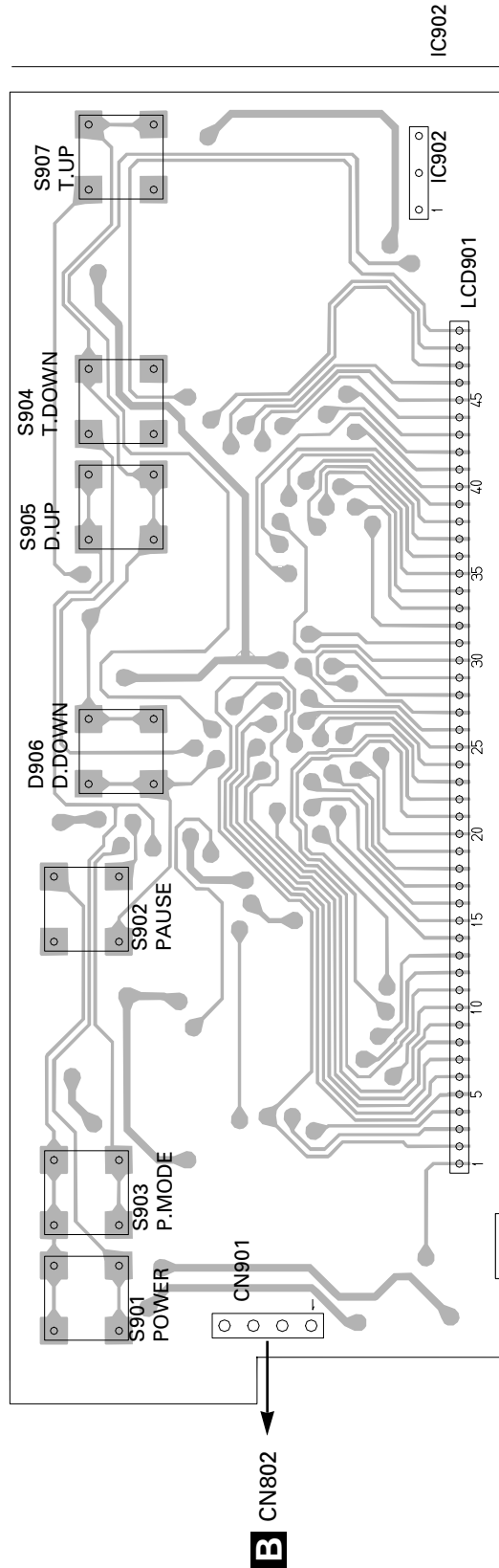
A

B

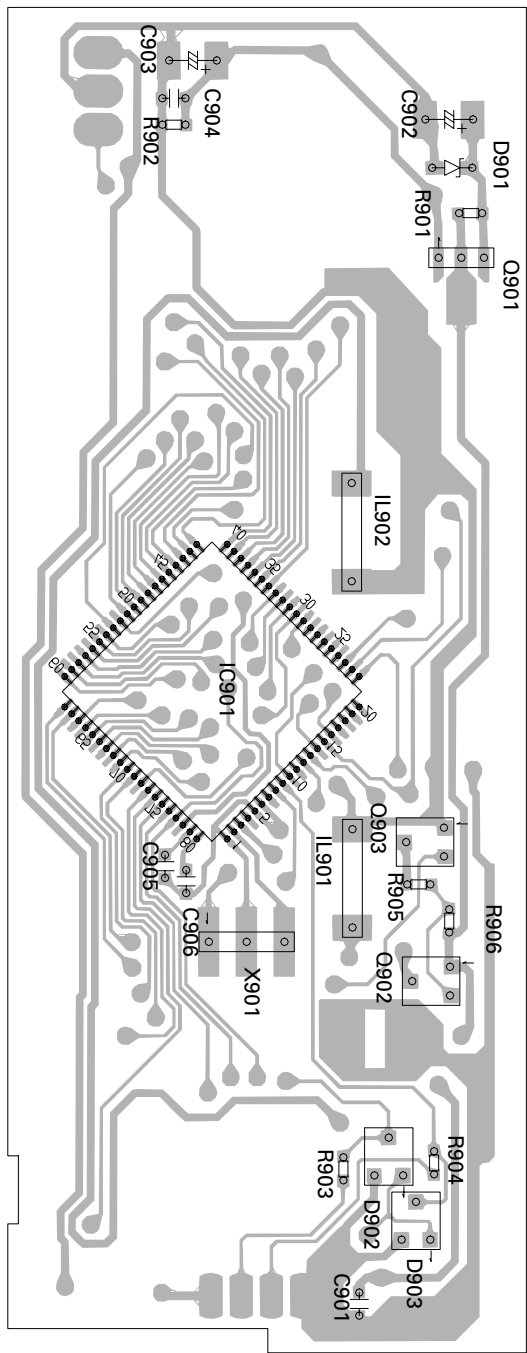
C

D

G DISPLAY ASSY



SIDE B



DISPLAY ASSY



Q901

Q903 Q902

IC901

A

B

C

D



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.
B	Unit Number : CWX2305(CDX-FM657/X1N/UC,ES)		R 206		RS1/16S361J
	Unit Name : Extension Unit		R 207		RS1/16S225J
			R 208		RS1/16S225J
			R 209		RS1/16S223J
			R 210		RS1/16S223J
MISCELLANEOUS					
IC 201	IC	BU4066BCF	R 211		RS1/16S681J
IC 301	IC	BA1404F	R 212		RS1/16S681J
IC 302	IC	BA4560F	R 213		RS1/16S112J
IC 401	IC	BU2611FS	R 214		RS1/16S112J
IC 801	IC	NJM78L06A	R 215		RS1/16S362J
Q 201	Transistor	IMD3A	R 216		RS1/16S362J
Q 202	Transistor	FMG12	R 231		RS1/16S101J
Q 301	Transistor	DTC143TK	R 232		RS1/16S101J
Q 401	Transistor	IMX1	R 301		RS1/16S362J
Q 402	Transistor	2SC2059K	R 302		RS1/16S823J
Q 403	Transistor	2SC2059K	R 303		RS1/16S681J
Q 404	Transistor	2SC2059K	R 304		RS1/16S392J
Q 801	Transistor	2SD2396	R 305		RS1/16S102J
Q 802	Transistor	IMD2A	R 306		RS1/16S392J
Q 803	Transistor	2SB710A	R 307		RS1/16S102J
Q 804	Transistor	IMH10A	R 308		RS1/16S392J
Q 805	Transistor	2SB710A	R 309		RS1/16S513J
Q 806	Transistor	IMX1	R 310		RS1/16S103J
D 201	Chip Diode	MA151WA	R 311		RS1/16S103J
D 301	Diode	MA110	R 312		RS1/16S103J
D 302	Diode	RB706D40	R 313		RS1/16S513J
D 401	Diode	DA204K	R 314		RS1/16S101J
D 402	Diode	KV1440	R 315		RS1/16S221J
D 403	Diode	MA110	R 316		RS1/10S104J
D 801	Diode	1SR139-400	R 317		RS1/10S104J
D 802	Diode	1SR139-400	R 318		RS1/16S683J
D 803	Diode	UDZS5R1(B)	R 319		RS1/16S123J
D 804	Diode	UDZS5R1(B)	R 320		RS1/16S472J
D 805	Diode	UDZ3R3(B)	R 322		RS1/16S393J
L 201	Filter	CTF1333	R 323		RS1/16S0R0J
L 202	Filter	CTF1333	R 324		RS1/16S0R0J
L 301	Inductor	LCTB2R2K2125	R 401		RS1/16S223J
L 302	Inductor	CTF1302	R 402		RS1/16S681J
L 401	Inductor	LCTB2R2K2125	R 403		RS1/16S362J
L 402	Coil	CTC1079	R 404		RS1/16S242J
L 403	Inductor	LCTB2R2K2125	R 405		RS1/16S822J
L 404	Inductor	LCTA1R0J3225	R 406		RS1/16S103J
L 405	Inductor	LCTA101J3225	R 407		RS1/16S103J
L 406	Inductor	LCTAR68J3225	R 408		RS1/16S560J
X 301	Radiator 38.000kHz	CSS1372	R 409		RS1/16S103J
X 401	Crystal Resonator 7.2MHz	CSS1030	R 410		RS1/16S103J
VR 301	Semi-fixed 47kΩ(B)	CCP1233	R 411		RS1/16S332J
VR 302	Semi-fixed 33kΩ(B)	CCP1232	R 412		RS1/16S101J
			R 413		RS1/16S222J
			R 414		RS1/16S104J
RESISTORS					
R 201		RS1/16S471J	R 415		RS1/16S244J
R 202		RS1/16S471J	R 416		RS1/16S154J
R 203		RS1/16S472J	R 417		RS1/16S152J
R 204		RS1/16S472J	R 418		RS1/16S331J
R 205		RS1/16S361J	R 419		RS1/16S122J

====Circuit Symbol and No.====Part Name	Part No.	====Circuit Symbol and No.====Part Name	Part No.
R 420	RS1/16S470J	C 404	CKSRYP102K50
R 421	RA3C471J	C 405	CKSQYB473K16
R 801	RS1/16S183J	C 406	CEALNP330M10
R 802	RS1/16S822J	C 407	CEAL470M6R3
R 803	RS1/16S204J	C 408	CKSRYP104K16
R 804	RS1/16S913J	C 409	CCSRCH180J50
R 805	RS1/8S391J	C 410	CCSRCH100D50
R 806	RS1/16S681J	C 411	CCSRCH330J50
R 807	RS1/16S0R0J	C 412	CCSRCH180J50
R 808	RS1/4S152J	C 413	CCSRCK1R0C50
R 809	RS1/16S223J	C 414	CKSRYP103K50
R 810	RS1/16S223J	C 415	CCSRCK1R0C50
R 811	RS1/4S152J	C 416	CKSRYP103K50
R 812	RS1/16S181J	C 417	CKSRYP103K50
R 813	RS1/16S560J	C 418	CCSRCJ3R0C50
R 814	RS1/16S102J	C 419	CKSRYP103K50
R 815	RS1/16S473J	C 421	CKSRYP473K16
R 816	RS1/16S0R0J	C 422	CEAL220M16
R 817	RS1/4S750J	C 801	CEAL100M16
R 818	RS1/16S102J	C 802	470µF/16V
R 819	RS1/16S152J	C 803	(UC,ES model)
R 820	RS1/4S121J	C 804	(EW model)
R 823	RS1/10S222J	C 805	
		C 806	470µF/16V
		C 807	
		C 808	
		C 809	
		C 810	
		C 811	0.22F/5.5V
		C 812	
		C 813	
		C 814	
		C 815	
		C 816	
		C 817	
		A	Unit Number : CWX2273
			Unit Name : CD Core Unit
MISCELLANEOUS			
		IC 201	IC UPD63710GC
		IC 202	IC BA05FP
		IC 301	IC BA5986FM
		IC 302	IC LB1836M
		IC 603	IC BA4560F
		IC 604	IC BA4560F
		IC 701	IC PD5513A
		IC 702	IC (SRM2B256SLTMX70)
		IC 703	IC GGC1257
		IC 704	IC HA12187FP
		IC 705	IC PAJ002A
		Q 101	IC TC7SH32FU
		Q 701	Transistor 2SB1132
		Q 770	Transistor DTA144EK
		Q 771	Transistor 2SB1184F5
			2SC2412K
		D 201	Diode 1SR154-400
		D 601	Diode UDZ7R5(B)
		D 730	Diode 1SS356
		D 770	Diode 1SS355
		X 202	Ceramic Resonator 16.93MHz CSS1456
		X 701	Ceramic Resonator 10.00MHz CSS1476
		S 801	Push Switch(EJECT) CSG1076
		S 802	Push Switch(RESET) CSG1076
		S 803	Spring Switch(MAG) CSN1044
		VR 802	Semi-fixed 1kΩ(B) CCP1338
CAPACITORS			
C 201	CEAL330M6R3		
C 202	CEAL330M6R3		
C 203	CKSRYP103K50		
C 204	CKSRYP103K50		
C 205	(UC,ES model) CKSRYP392K50		
C 205	(EW model) CKSRYP272K50		
C 206	(UC,ES model) CKSRYP392K50		
C 206	(EW model) CKSRYP272K50		
C 207	(UC,ES model) CKSRYP332K50		
C 207	(EW model) CKSRYP222K50		
C 208	(UC,ES model) CKSRYP332K50		
C 208	(EW model) CKSRYP222K50		
C 209	CEAL1R0M50		
C 210	CEAL1R0M50		
C 211	CKSRYP102K50		
C 212	CKSRYP102K50		
C 213	CKSRYP102K50		
C 214	CKSRYP102K50		
C 301	CEAL100M16		
C 302	CKSRYP103K50		
C 303	CCSRCH120J50		
C 304	CEAL220M16		
C 305	CKSRYP104K16		
C 306	CKSRYP103K50		
C 307	CCSRCH101J50		
C 308	CEALR47M50		
C 309	CKSRYP103K50		
C 310	CEAL100M16		
C 311	CCSRCH160J50		
C 312	CEAL100M16		
C 313	CKSRYP104K16		
C 314	CKSQYB105K16		
C 315	CEAL220M16		
C 316	CKSRYP104K16		
C 317	CCSQCH271J50		
C 318	CCSQCH162J50		
C 319	CEAL100M16		
C 401	CCSRCH270J50		
C 402	CCSRCH270J50		
C 403	CKSRYP104K16		

====Circuit Symbol and No.====Part Name	Part No.	====Circuit Symbol and No.====Part Name	Part No.
RESISTORS		R 719	RS1/16S0R0J
		R 721	RS1/16S222J
R 101	RS1/8S120J	R 722	RS1/16S222J
R 102	RS1/8S100J	R 724	RS1/16S681J
R 103	RS1/16S222J	R 725	RS1/16S222J
R 201	RS1/16S104J		
R 202	RS1/16S0R0J	R 726	RS1/16S104J
		R 727	RS1/16S513J
R 205	RS1/16S103J	R 729	RS1/16S473J
R 206	RS1/16S393J	R 730	RS1/16S473J
R 207	RS1/16S182J	R 731	RS1/16S222J
R 208	RS1/16S304J		
R 212	RS1/16S0R0J	R 732	RS1/16S683J
		R 733	RS1/16S222J
R 213	RS1/16S103J	R 734	RS1/16S473J
R 214	RS1/16S103J	R 735	RS1/16S222J
R 215	RS1/16S123J	R 736	RS1/16S103J
R 216	RS1/16S273J		
R 217	RS1/16S273J	R 737	RS1/16S433J
		R 738	RS1/16S104J
R 253	RS1/16S681J	R 739	RS1/8S2R0J
R 254	RS1/16S681J	R 740	RS1/8S2R0J
R 256	RS1/16S681J	R 741	RS1/16S102J
R 257	RS1/16S681J		
R 258	RS1/16S681J	R 742	RS1/16S104J
		R 743	RS1/16S104J
R 259	RS1/16S102J	R 744	RS1/16S223J
R 260	RS1/16S681J	R 747	RS1/16S472J
R 298	RS1/16S681J	R 750	RA4C473J
R 301	RS1/16S103J		
R 302	RS1/16S153J	R 751	RA4C473J
		R 752	RN1/16SE3602D
R 303	RS1/16S103J	R 753	RN1/16SE6801D
R 304	RS1/16S153J	R 754	RS1/16S221J
R 305	RS1/16S103J	R 755	RS1/16S104J
R 306	RS1/16S752J		
R 307	RS1/16S103J	R 756	RS1/16S221J
		R 759	RS1/16S472J
R 308	RS1/16S752J	R 760	RS1/16S104J
R 309	RA4C332J	R 761	RS1/16S104J
R 311	RS1/16S102J	R 764	RS1/16S473J
R 501	RS1/16S102J		
R 651	RSK1/16S153J	R 765	RS1/16S471J
		R 766	RS1/16S471J
R 652	RSK1/16S153J	R 767	RS1/16S471J
R 653	RSK1/16S153J	R 801	RS1/10S221J
R 654	RSK1/16S153J	R 802	RS1/10S271J
R 659	RSK1/16S123J		
R 660	RSK1/16S123J	R 804	RS1/16S562J
		R 805	RS1/16S562J
R 661	RSK1/16S123J	R 806	RS1/16S102J
R 662	RSK1/16S123J		
R 663	RSK1/16S103J	CAPACITORS	
R 664	RSK1/16S103J	C 101	CKSRYB102K50
R 665	RSK1/16S103J	C 102	CKSQYB104K25
		C 103	CEV101M6R3
R 666	RSK1/16S103J	C 104	CEV470M6R3
R 669	RS1/16S101J	C 105	CKSQYB334K16
R 670	RS1/16S101J		
R 671	RS1/16S752J	C 106	CKSQYB334K16
R 672	RS1/16S103J	C 107	CKSQYB334K16
		C 201	CKSQYB104K25
R 673	RS1/16S271J	C 202	CEV101M6R3
R 701	RS1/16S681J	C 203	CKSQYB104K25
R 702	RS1/16S102J		
R 703	RS1/16S222J	C 204	CKSRYB332K50
R 704	RS1/16S104J	C 205	CKSQYB104K25
		C 206	CKSRYB392K50
R 705	RS1/16S104J	C 207	CKSQYB224K16
R 706	RS1/16S222J	C 208	CCSRCH270J50
R 707	RS1/16S104J		
R 709	RS1/16S104J	C 209	CCSRCJ3R0C50
R 710	RS1/16S473J	C 210	CCSRCH221J50
		C 211	CCSRCH101J50
R 713	RS1/16S473J	C 212	CKSRYB682K50
R 715	RS1/16S473J	C 213	CKSQYB104K25
R 716	RS1/16S103J		
R 717	RS1/16S473J		
R 718	RS1/16S681J		

====Circuit Symbol and No.====Part Name	Part No.
C 215	CKSQYB104K25
C 216	CKSQYB104K25
C 217	CKSQYB104K25
C 218	CKSQYB104K25
C 220	CKSQYB104K25
C 253	CKSRYP471K50
C 271	CEV101M6R3
C 272	CCH1300
C 273	CKSQYB334K16
C 301	CEV101M10
C 302	CKSQYB224K16
C 651	CCSRCH391J50
C 652	CCSRCH391J50
C 653	CCSRCH181J50
C 654	CCSRCH181J50
C 655	CCSRCH181J50
C 656	CCSRCH181J50
C 661	CKSQYB104K25
C 664	CKSRYP103K25
C 665	CEV470M6R3
C 666	CKSRYP103K25
C 702	CKSQYB473K16
C 703	CKSQYB473K16
C 707	CKSRYP103K25
C 708	CKSQYB104K25
C 710	CKSRYP103K25
C 711	CKSRYP102K50
C 712	CKSRYP102K50
C 714	CKSQYB104K25
C 715	CSZST220M16
C 717	CKSRYP103K25
C 718	CKSRYP103K25
C 719	CKSRYP102K50
C 720	CKSRYP102K50
C 721	CKSRYP103K25
C 722	CKSRYP103K25
C 723	CKSRYP103K25
C 801	CKSRYP103K25
C 802	CKSQYB104K25
C 803	CKSRYP103K25

G Unit Number : CXB3248(CDX-FM657/X1N/UC,ES)
 CXB3247(CDX-FM657/X1N/EW)
 Unit Name : Display Assy

MISCELLANEOUS

IC 901	IC	PD6294A
IC 902	IC	TSOP1840SB1
Q 901	Transistor	2SD1767
Q 902	Transistor	2SB710A
Q 903	Transistor	DTC114EK
D 901	Diode	UDZS5R6(B)
D 902	Diode	MA153
D 903	Diode	MA153
X 901	Ceramic Resonator 4.9162MHz	CSS1449
S 901	Switch	CSG1110
S 902	Switch	CSG1110
S 903	Switch	CSG1110
S 904	Switch	CSG1110
S 905	Switch	CSG1110
S 906	Switch	CSG1110

====Circuit Symbol and No.====Part Name	Part No.	
S 907	Switch	CSG1110
IL 901	Lamp(UC,ES model)14V 40mA	CEL1608
IL 901	Lamp(EW model)14V 40mA	CEL1539
IL 902	Lamp(UC,ES model)14V 40mA	CEL1608
IL 902	Lamp(EW model)14V 40mA	CEL1539

LCD 901 LCD CAW1514

RESISTORS

R 901	RS1/16S102J
R 902	RS1/16S332J
R 903	RS1/16S471J
R 904	RS1/16S471J
R 905	RS1/16S332J
R 906	RS1/16S223J

CAPACITORS

C 901	CKSRYP473K16
C 902	CSZSR100M16
C 903	CSZSR100M16
C 904	CKSRYP104K16
C 905	CKSRYP104K16

C 906 CKSRYP104K16

F Unit Number : CWX2200
 Unit Name : Antenna Select Unit

MISCELLANEOUS

Q 501	Transistor	2SC1740S
D 501	Diode	1SS133
L 501	Ferri-Inductor	LAU4R7K
RY 501	Relay	CSR1014

RESISTORS

R 501	RD1/4PU683J
R 502	RD1/4PU103J

CAPACITORS

C 501	CKCYB102K50
C 502	CEAL101M10

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(DSP)	CSN1051
S 852	Spring Switch(TAP)	CSN1052

E Unit Number :
 Unit Name : Motor PCB

M 853	Motor(TRAY)	CXB3005
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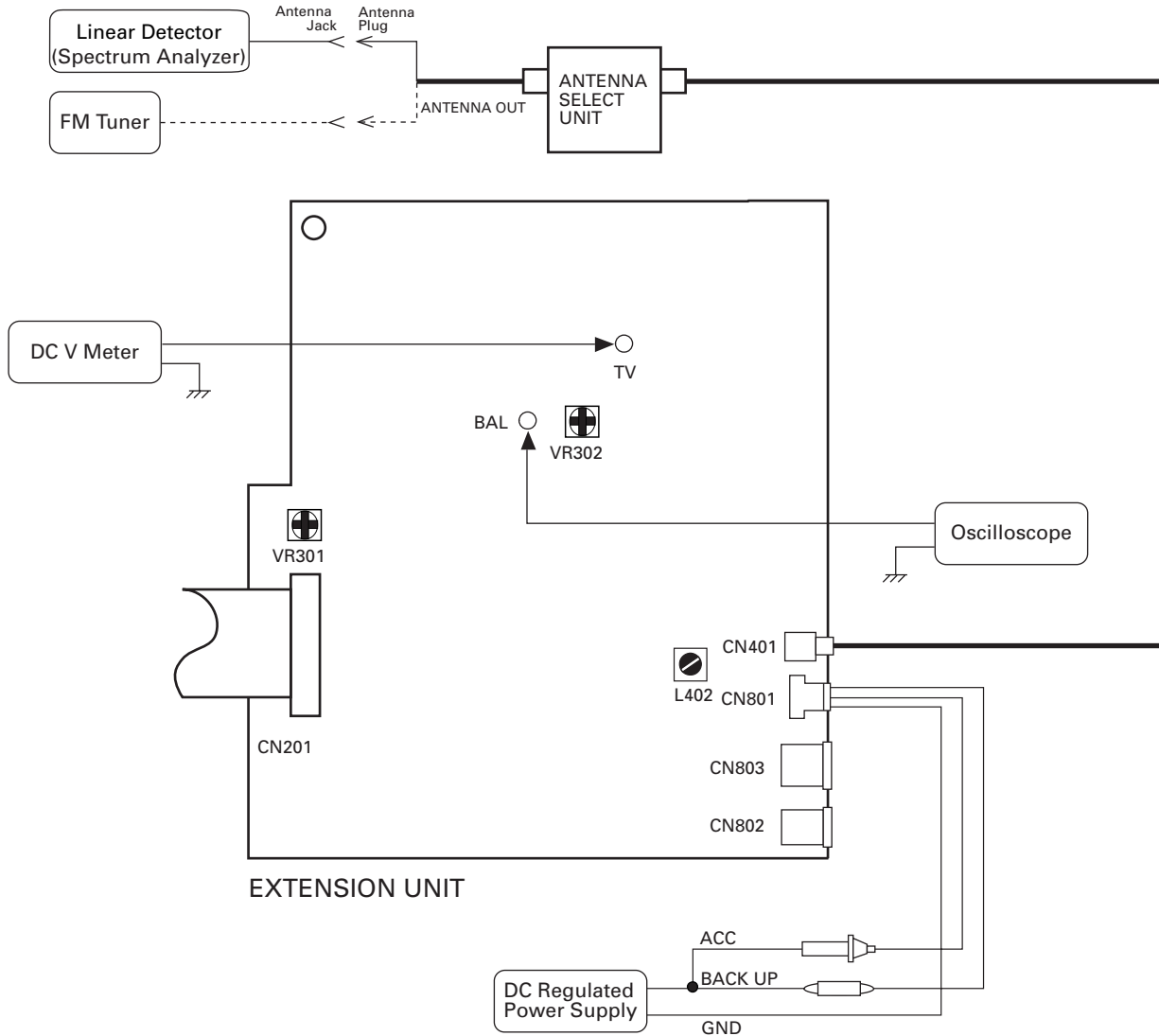
Miscellaneous Parts List

M 851	Pickup Unit(P8)(Service)	CXX1285
M 852	Motor(SPINDLE)	CXB3003
M 852	Motor(ELEVATION)	CXB3006
M 854	Motor(CARRIAGE)	CXB3004
VR 801	Volume 10k	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 :**

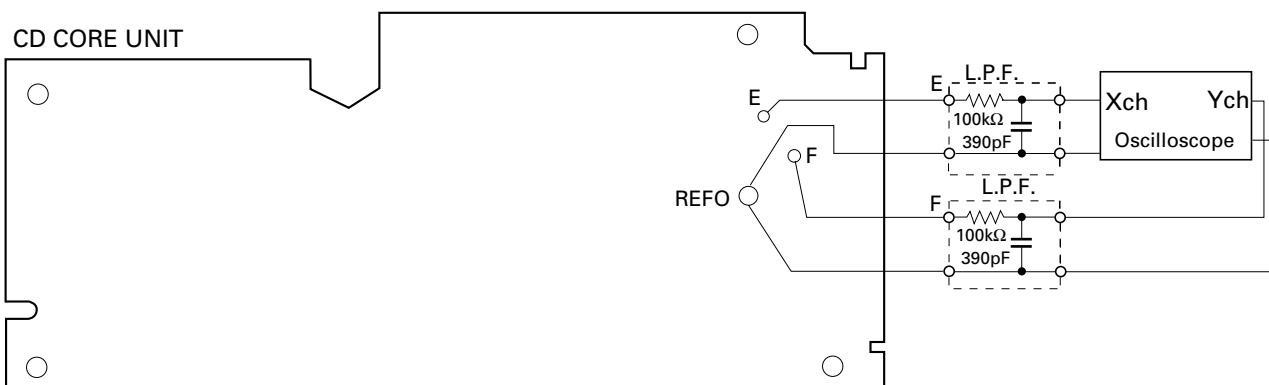
To check that the grating is within an acceptable range.

• **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 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 L.P.F. 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.

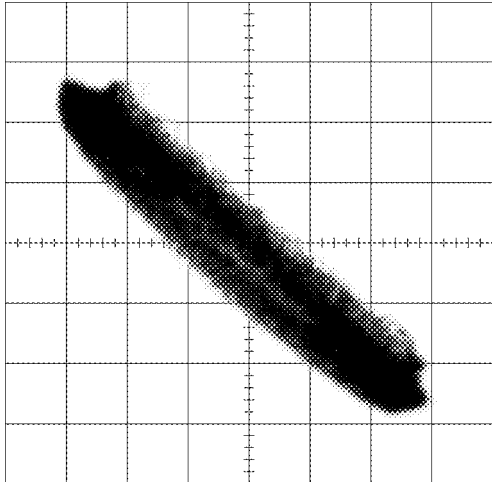
• **Hint**

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

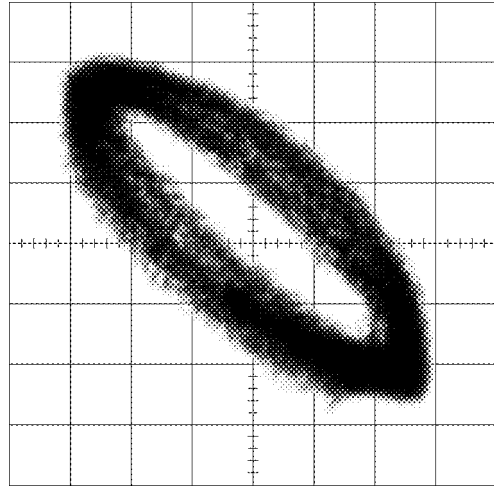
Grating waveform

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

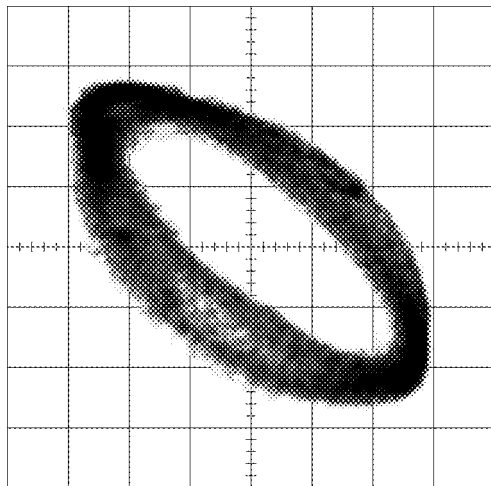
0°



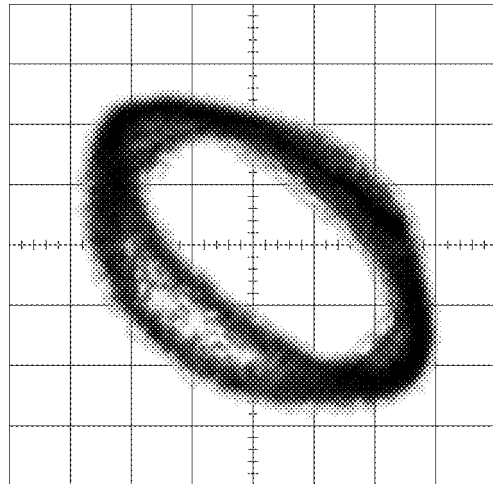
30°



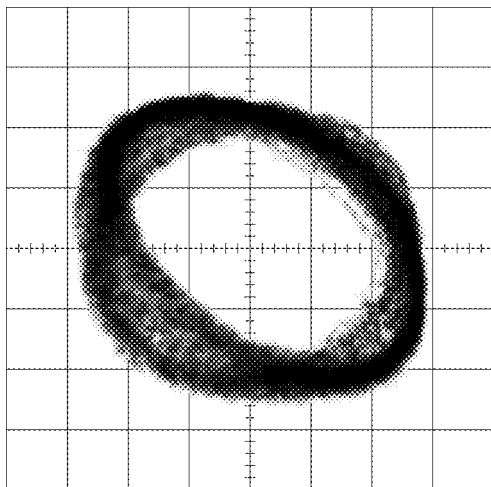
45°



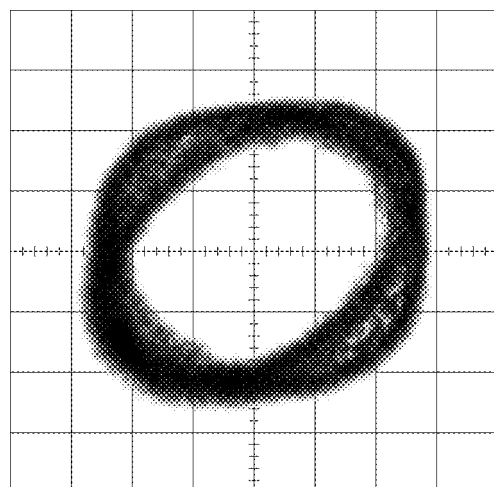
60°



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 :

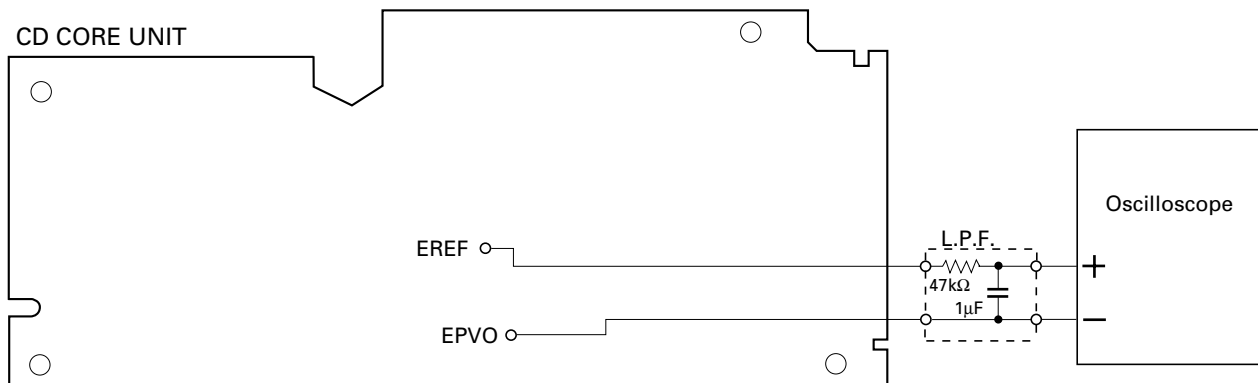
This mechanism detects the height of the stage using slide-variable resistance. To absorb dislocation of the stage height caused by differences in the mechanism and the CD core unit, adjustment must be made for each CD-mechanism module using a variable resistor. Normally, readjustment is not needed,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

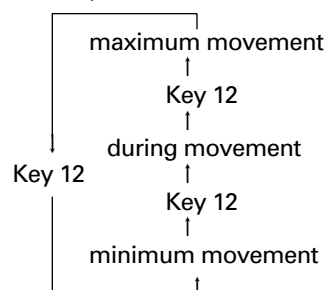
1. Enter Test mode, then select Multi-CD player.
2. Press key **7** to enter Mechanism Test mode.
3. Press key **12** twice to specify the amount of movement.

Examples of display

TRACK	FUNCTION
	1 2

TRACK	FUNCTION
72	00' 00"

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



TRACK	FUNCTION
72	00' 02"

TRACK	FUNCTION
72	00' 01"

TRACK	FUNCTION
72	00' 00"

Examples of display

4. Press key **9** to set ELV/TRAY mode to TRAY.

TRACK	FUNCTION
72	01' 02"

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

Release the clamp

6. Press key **9** to enter Elevation Move mode.

TRACK	FUNCTION
72	00' 02"

7. Use key **FF/REV** to operate elevation and set it 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 ± 10 mV.

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

TRACK	FUNCTION
72	00' 02"

10. Confirm operation of the mechanism.

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

TRACK	FUNCTION
	' "

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).

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:

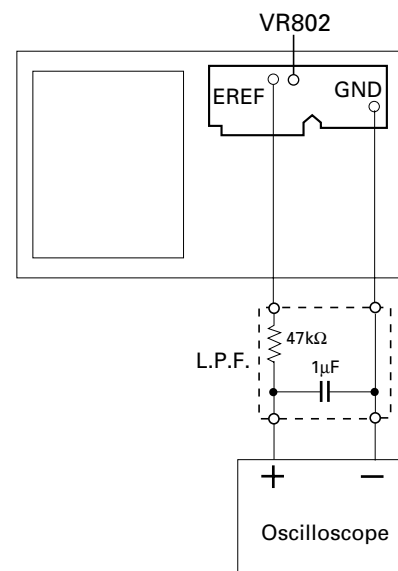
15. Press the **EJECT** switch.

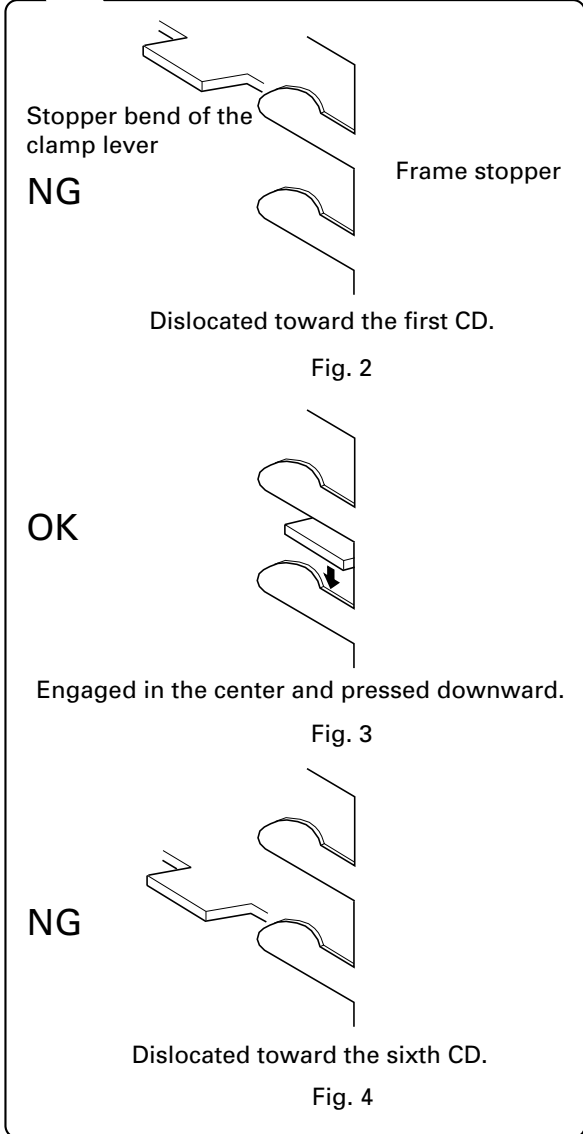
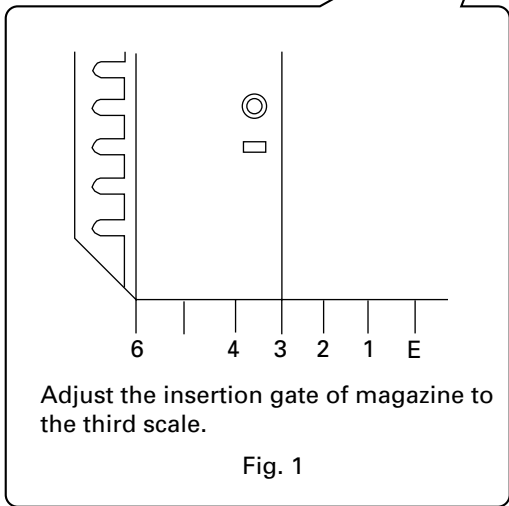
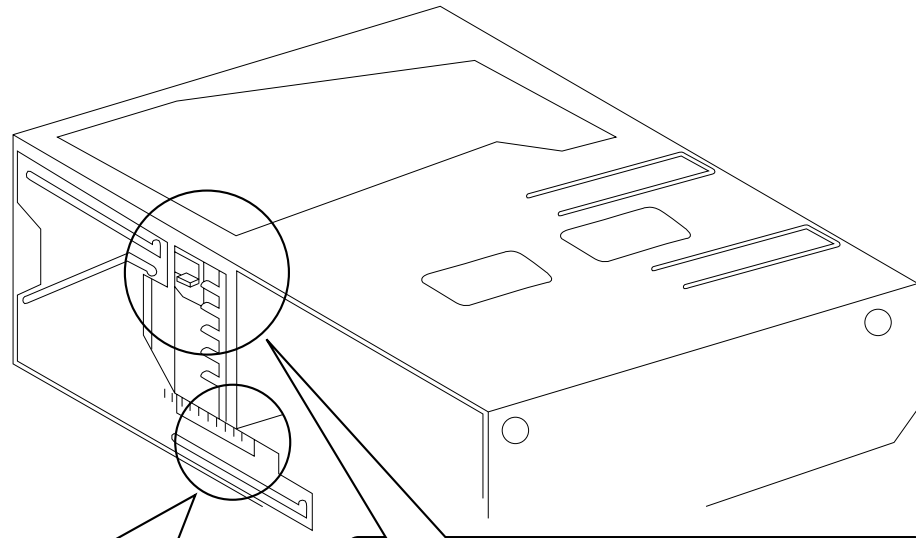
16. Once operation of the mechanism has stopped, turn the power OFF.

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

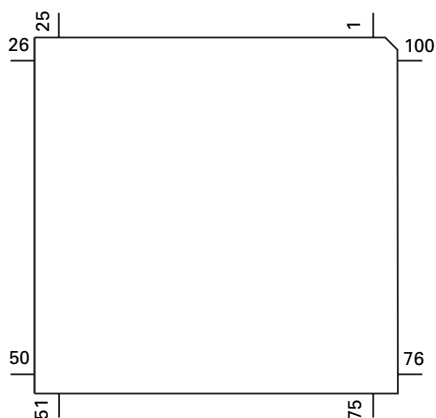
7.1.1 IC

● 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	T \overline SCK	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

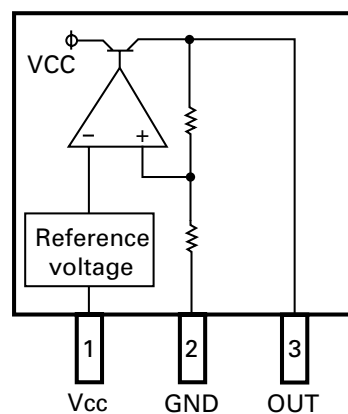
*UPD63710GC



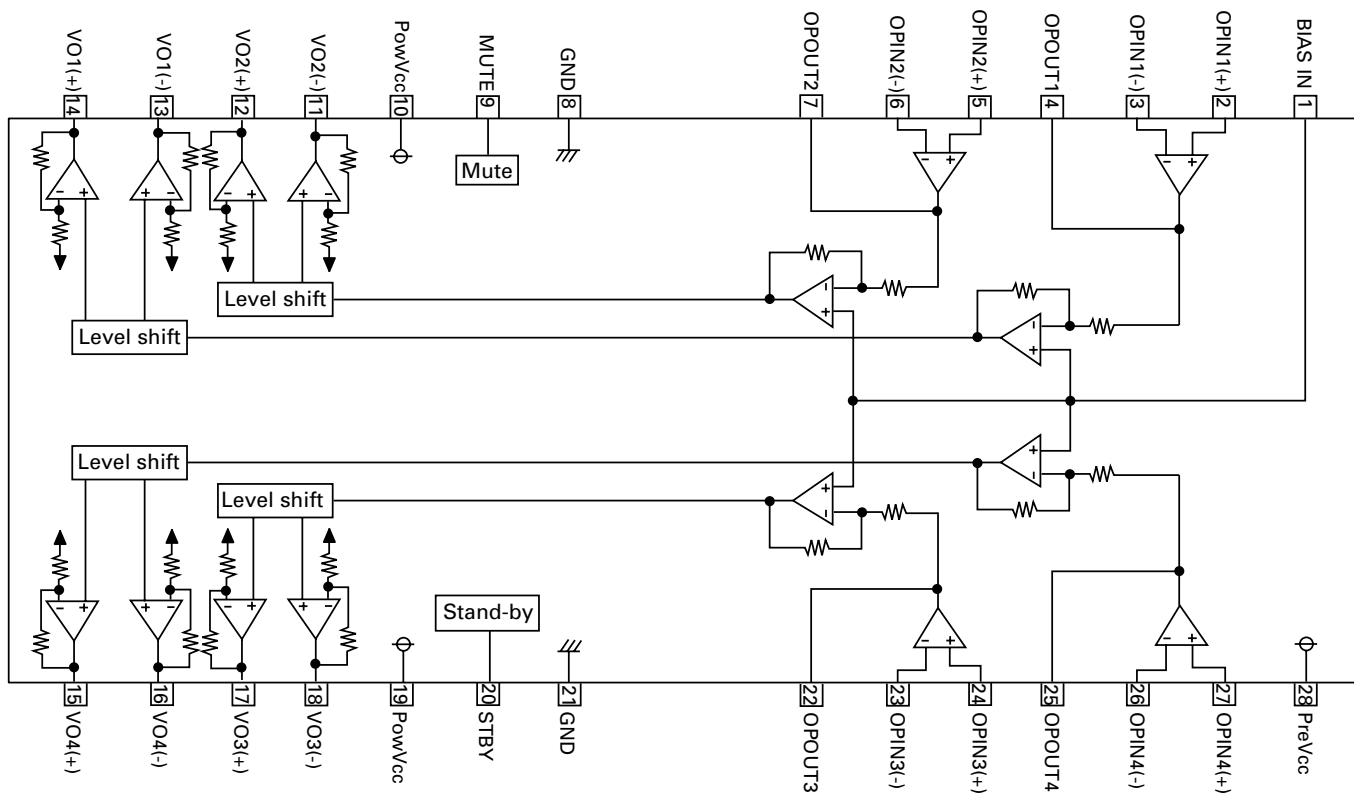
IC's marked by* are MOS type.

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

BA05FP



BA5986FM

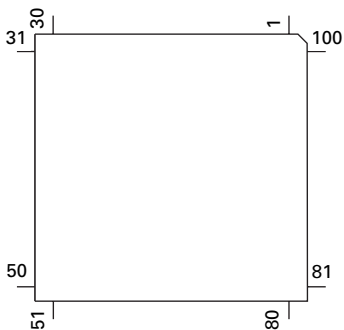


● Pin Functions (PD5513A)

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	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
11	CONT	O	C	Servo driver output control
12	RESET			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	DISPPW	O	C	Key/Display microcomputer supply control
24	CSEL	I		Compression select
25	SRAMSW	I		When there is SRAM, "H"
26	CCS	O	C	IP-BUS chip select
27	SIMUKE	I		Destination information input
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	DPDT	O	C	Display data output
32	KYDT	I		Key data input
33	FMIPSW	I		FM/IP BUS select switch
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
39-43	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
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	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

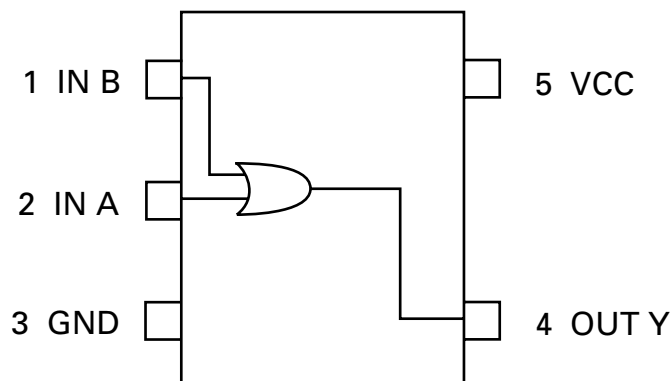
Pin No.	Pin Name	I/O	Format	Function and Operation
63	A7	O	C	SRAM address bus output
64	VSS			GND
65-68	A6-A3	O	C	SRAM address bus output
69	A10	O	C	SRAM address bus output
70	A2 & (EPSK)	O	C	SRAM address bus output and (E2PROM clock output)
71	A1 & (EPDI)	O/I	C	SRAM address bus output and (E2PROM data input)
72	A0 & (EPDO)	O	C	SRAM address bus output and (E2PROM data output)
73	ASENSFM	I		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	D0-D7	I/O	C	SRAM data bus
89	PREN	O	C	Preemphasis select output
90	PLCS	O	C	PLL chip select output
91	DSP	I		DISC detect timing input
92	DISK			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

*PD5513A



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

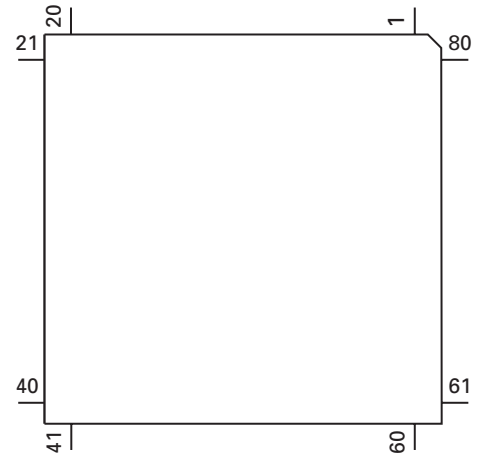
TC7SH32FU



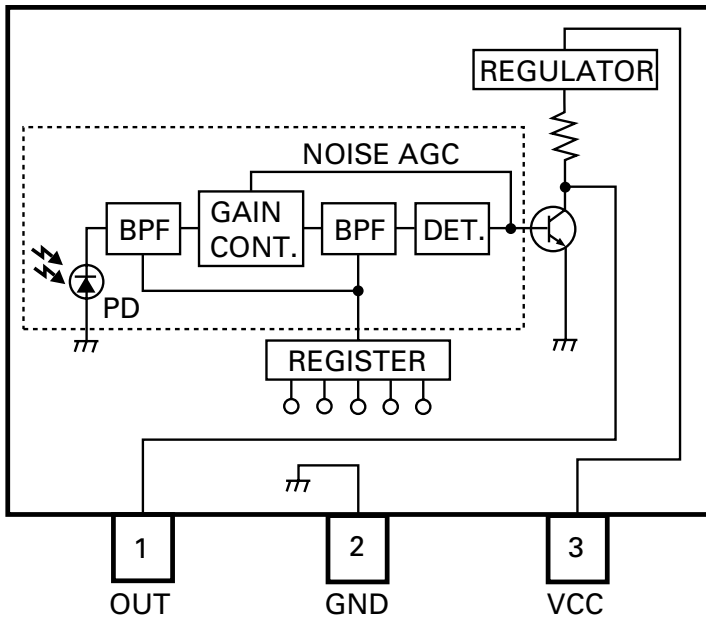
● Pin Functions (PD6294A)

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



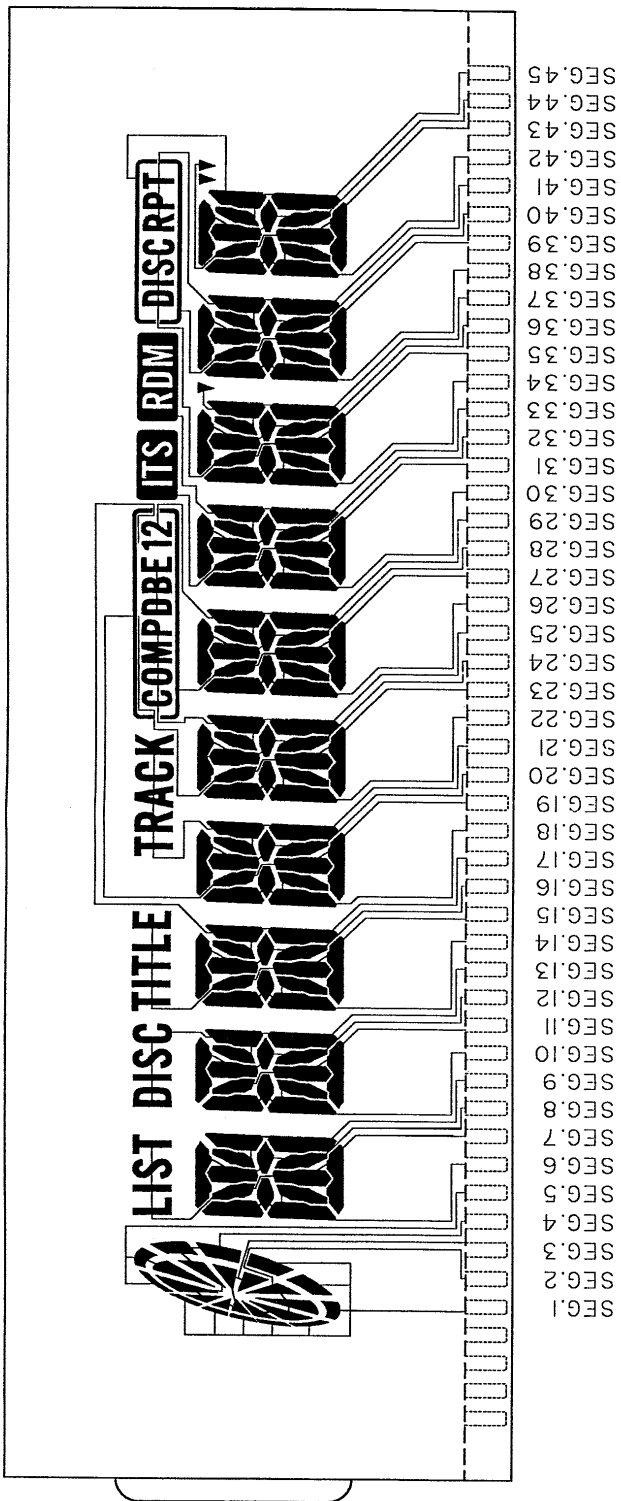
TSOP1840SB1



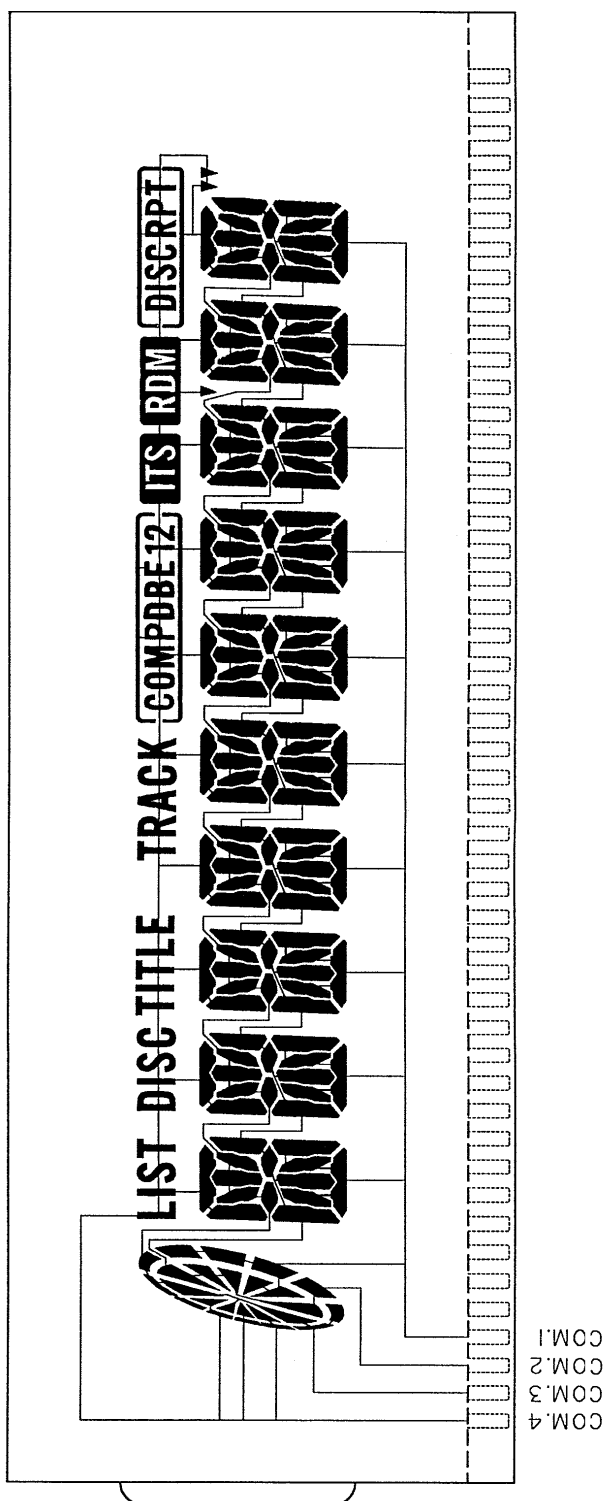
7.1.2 DISPLAY

● CAW1514

SEGMENT



COMMON



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).

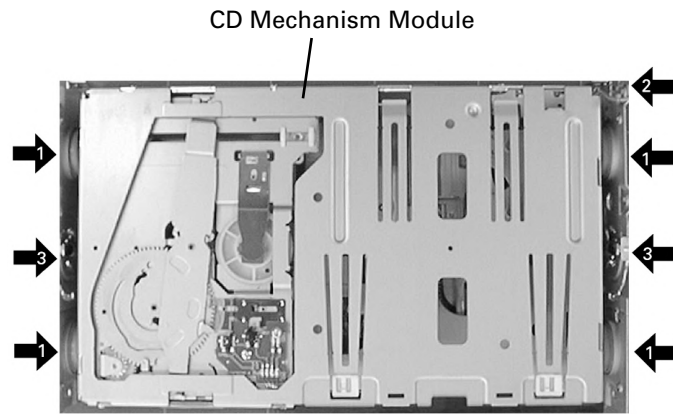


Fig.5

● 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).

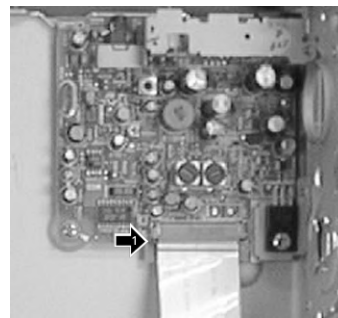
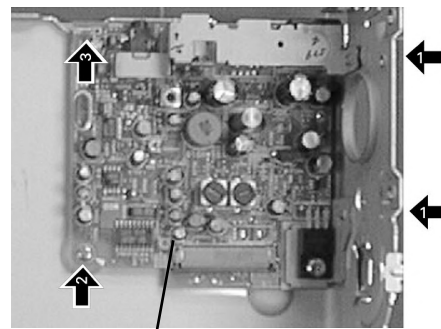


Fig.6

● Removing the Extension Unit(Fig.7)

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



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.

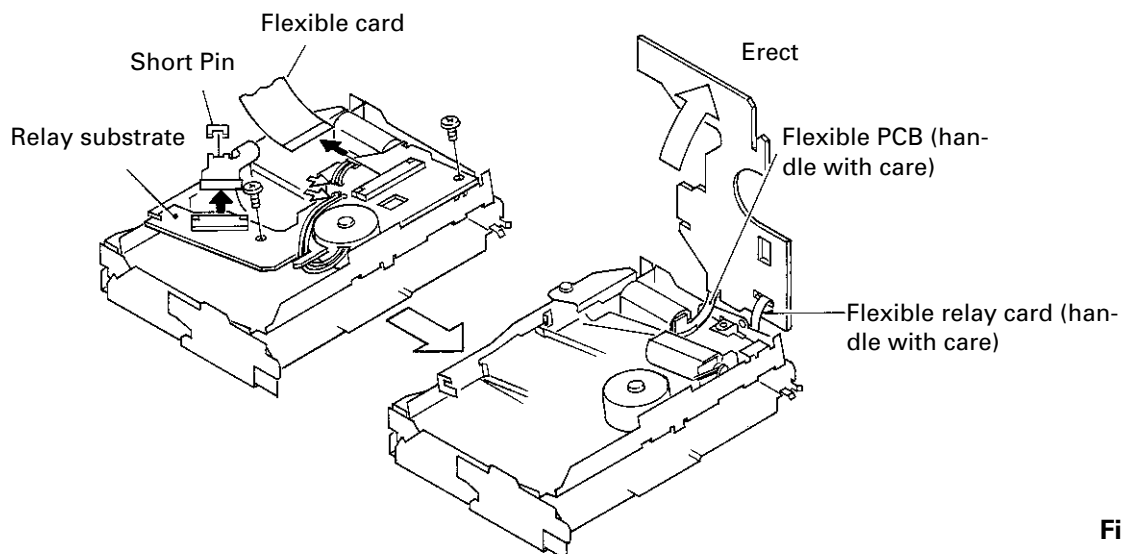


Fig.8

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).

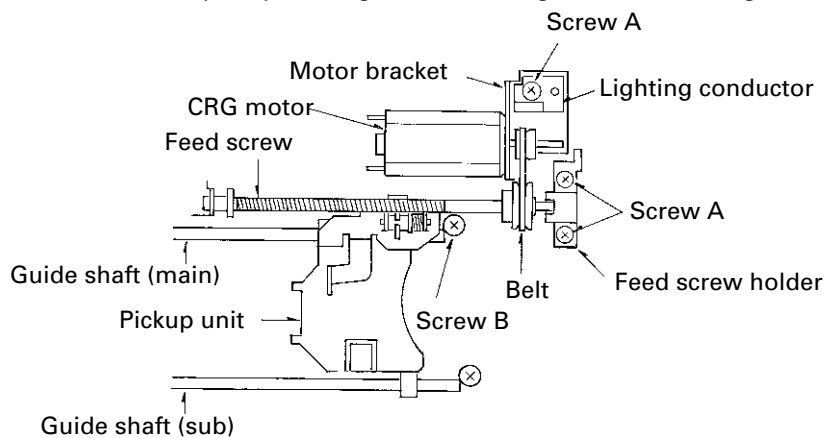


Fig.9

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.

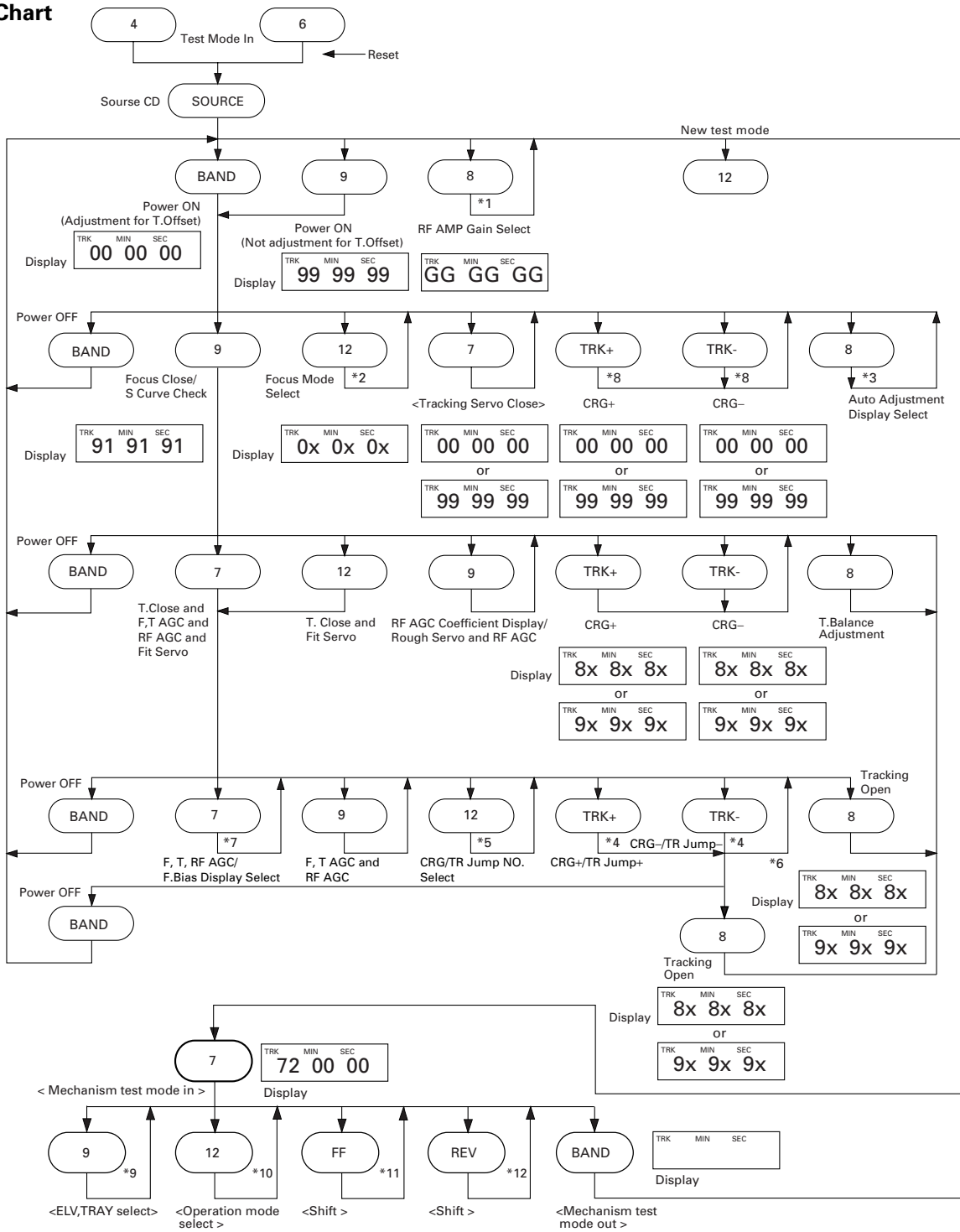
2) Test Mode

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

- Test mode starting procedure
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.

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

● Flow Chart



*1 → TYP → +6dB → +12dB
 Display 06 06 06 12 12 12

*2 → Focus Close → S Curve Check
 Display 00 00 00 01 01 01
 (99 99 99)

*3 → F.Offset Display → RF.Offset Display → F.Cansel Display

$$F.Cansel Value = \{Top Rank 8bit of Set Value (7F [H] to 80 [H]) + 128\} / 4$$
 = 63 [D] to (32 [D]) to 00 [D]

*4 Single TR/32TR/100TR

*5 → Single TR → 32TRK → 100TRK → CRG Move
 Display 9x(8x):91(81) 92(82) 93(83) 94(84)

*6 CRG Move, 100TR Jump Only

*7 → TRK, MIN, SEC → F.AGC Gain → T.AGC Gain → RF AGC Gain
 (F,T.AGC Gain = (Present Value/Initial Value) × 20)

*8 Voltage of CRG Motor = 2 [V]

*9 ELV motor select → TRAY motor select
 72 00 0x Display 72 10 0x

*10 8ms pulse drive → 24ms pulse drive → DC drive
 72 00 00 Display 72 00 01 72 00 02

48ms pulse drive → 100ms pulse drive → DC drive
 72 10 00 Display 72 10 01 72 10 02

*11 ELV select : ELV down (Disc 12 → 1)
 TRAY select : TRAY out

*12 ELV select : ELV up (Disc 1 → 12)
 TRAY select : TRAY in

● Error Messages

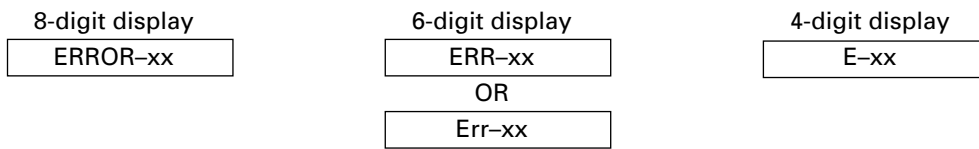
If a CD is not operative or stopped during operation due to an error, the error mode is turned on and cause(s) of the error is indicated with a corresponding number. This arrangement is intended at reducing nonsense calls from the users and also for facilitating trouble analysis and repair work in servicing.

(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

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.

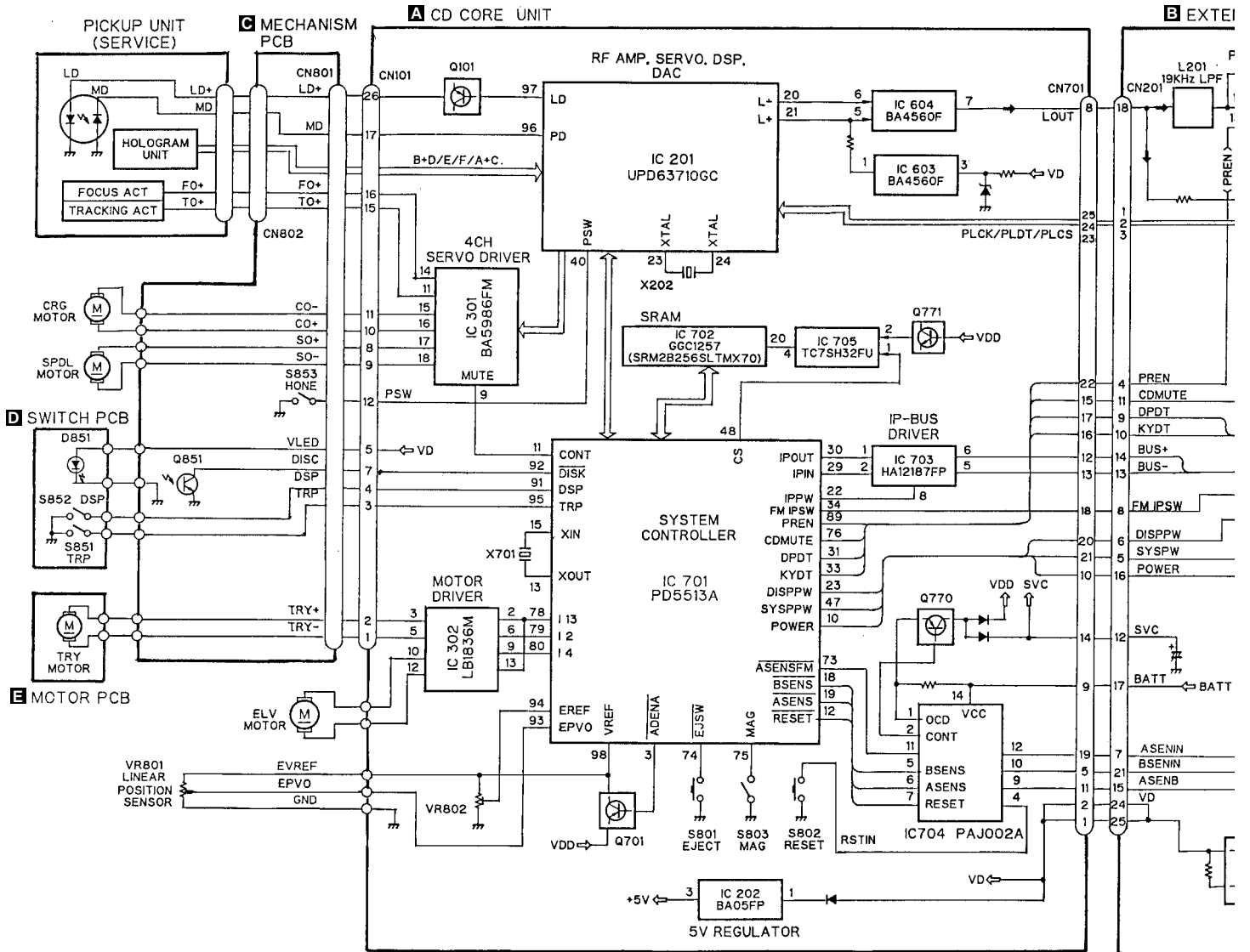
TRK No.	MIN.	SEC.
12	34'	56"

(B) Error No. display

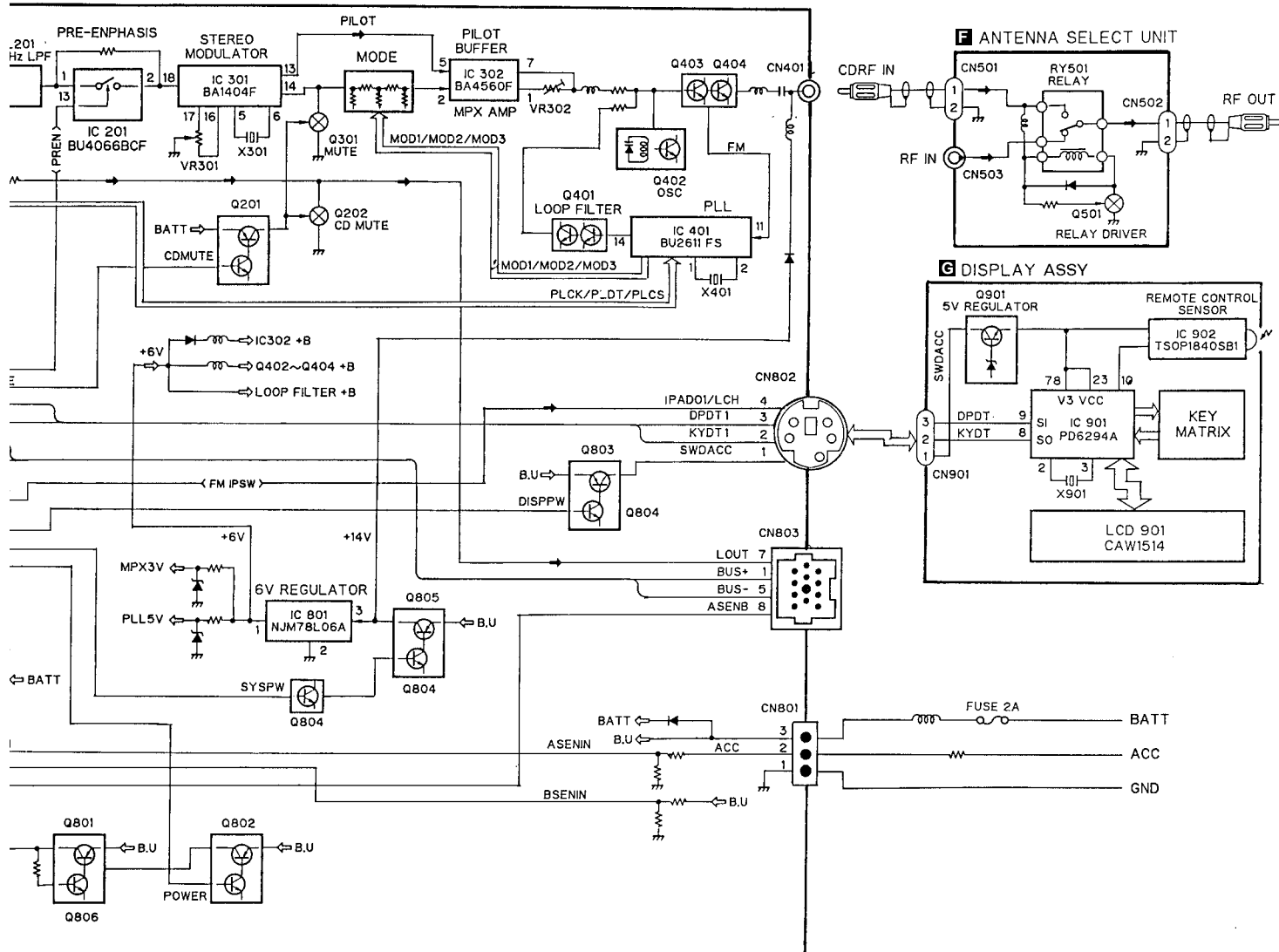
An example: Error #40 (Off focus is detected)

ERROR-40

7.3 BLOCK DIAGRAM

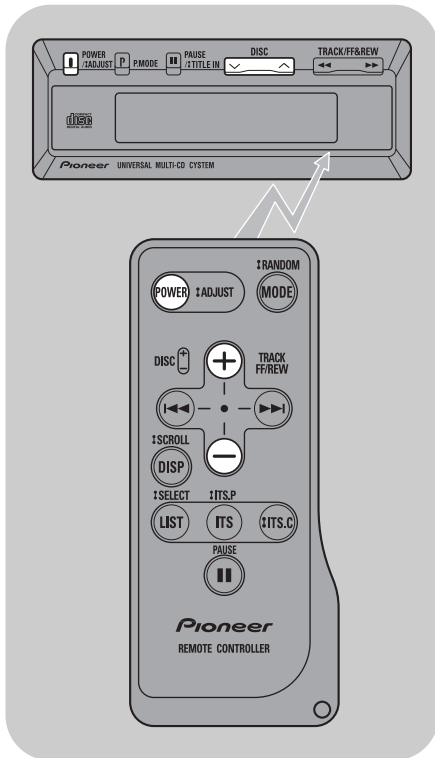


EXTENSION UNIT



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.



or



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

Disc Number Search



or



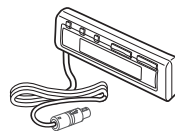
Disc Number

+ : increase the number.

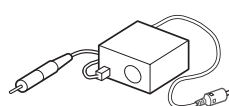
- : decrease the number.

Parts for connection

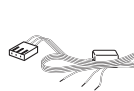
A



B



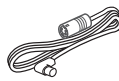
C



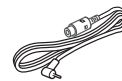
D

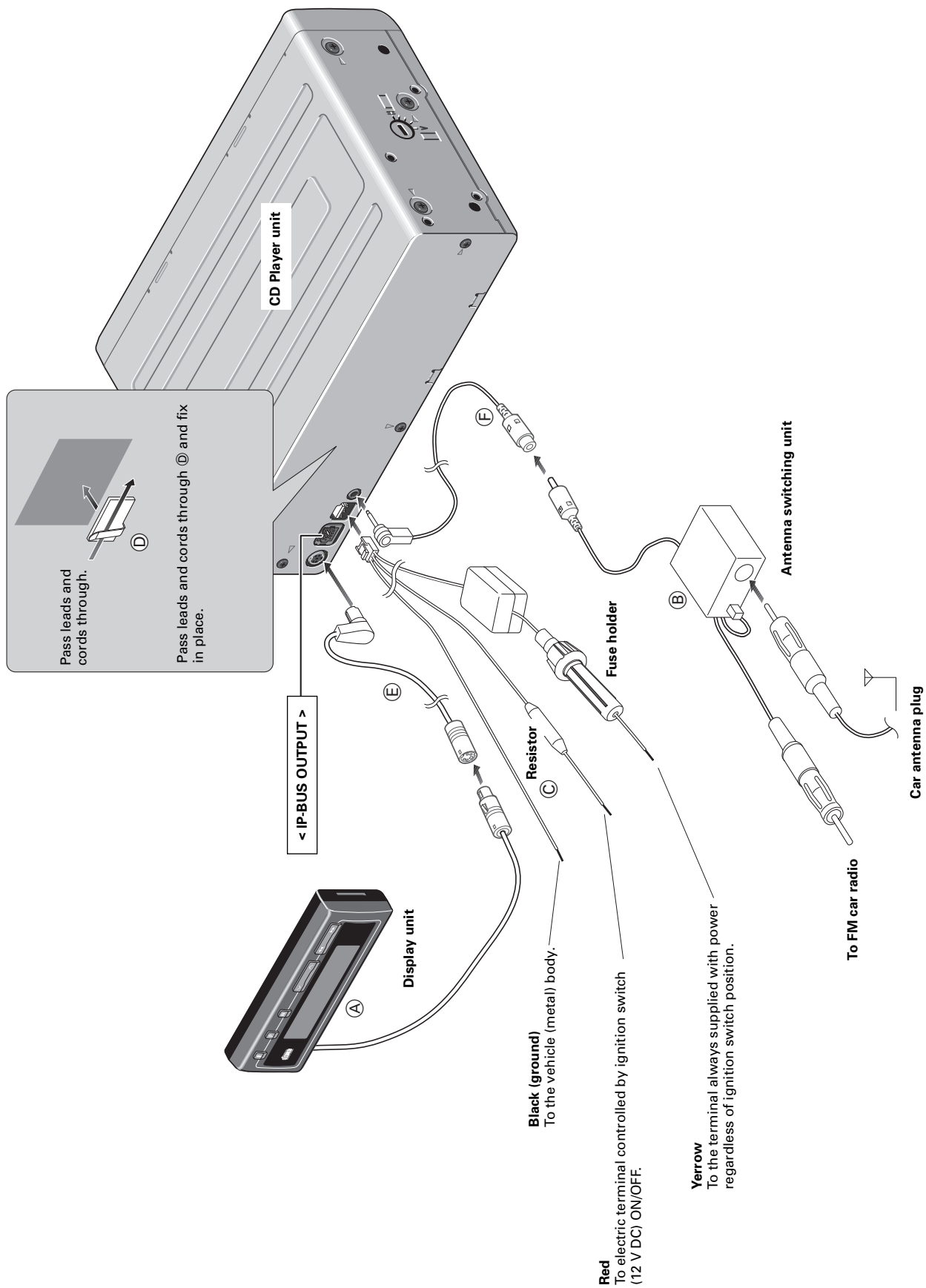


E



F





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]

Remote Controller unit

Power source
 Battery (CR2032)
 Weight (including battery)
 15 g (0.03 lbs)
 Dimensions
 39 (W) × 92 (H) × 6 (D) mm
 [1-9/16 (W) × 3-5/8 (H) × 1/4 (D) in]

Note:

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