Service Manual

ORDER NO.
CRT2321

UNIVERSAL MULTI-CD SYSTEM

CDX-FM653

X1N/UC

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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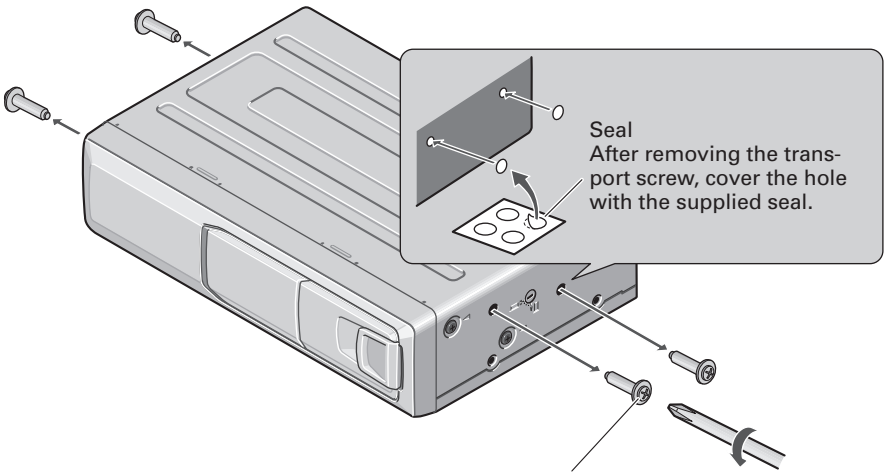
● **CD Player Service Precautions**

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

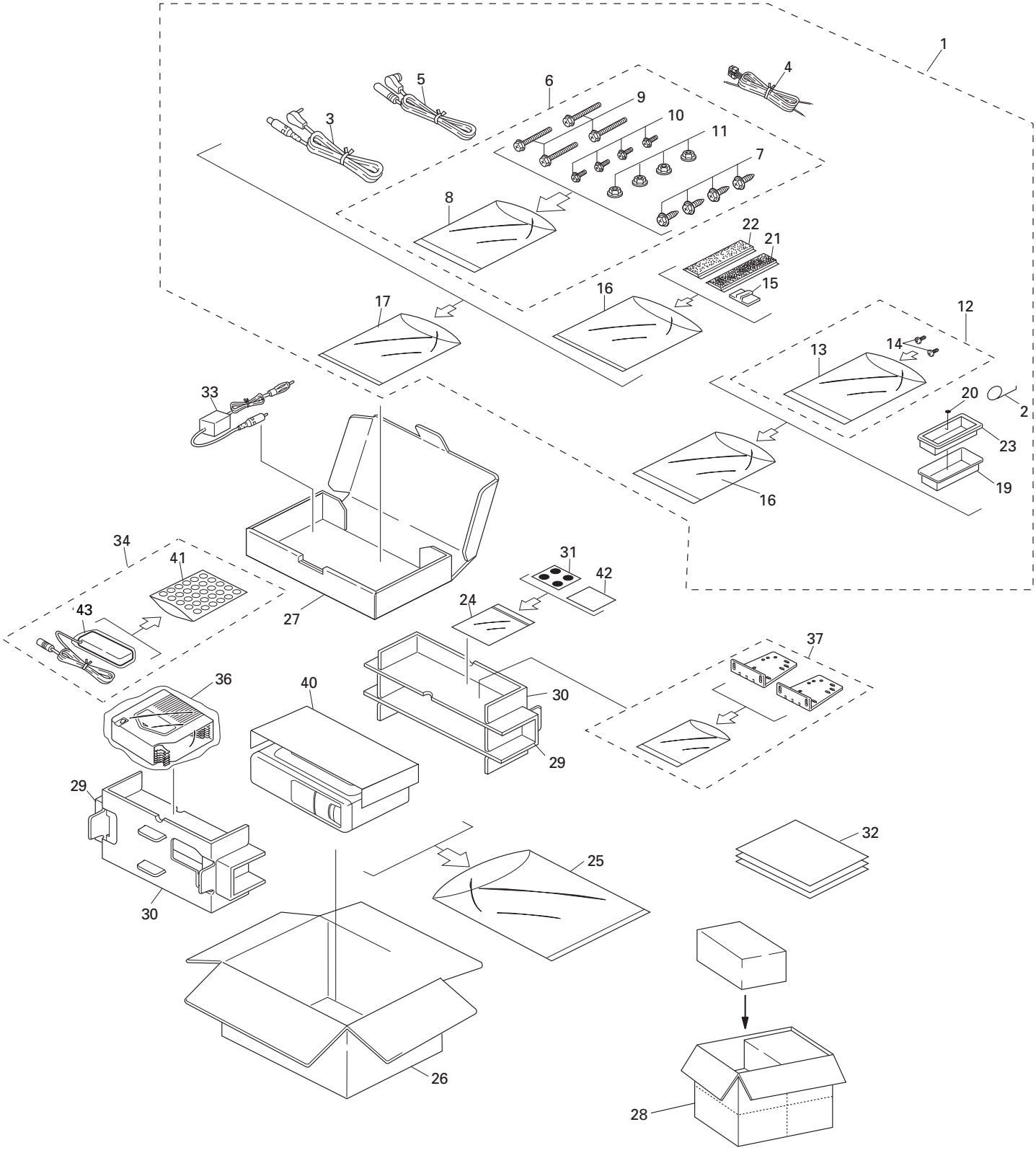
This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly 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.
	1	Accessory Assy	CEA2497
	2	Spring	CBH-865
	3	Cord	CDE4289
	4	Cord	CDE5812
	5	Cord	CDE5008
	6	Screw Assy	CEA1962
	7	Screw	CBA1295
*	8	Polyethylene Sheet	CNM5158
	9	Screw	HMB60P500FMC
	10	Screw	HMF40P080FZK
	11	Nut	NF60FMC
	12	Screw Assy	CEA1965
*	13	Polyethylene Bag	CEG-127
	14	Screw	IMS30P050FZK
	15	Clamper	CEF1010
*	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

Mark	No.	Description	Part No.
	31	Seal	CNM5599
	32-1	Installation Manual	CRD2886
	32-2	Owner's Manual	CRD2885
*	32-3	•••••	
	33	Antenna Select Assy	CWM6445
	34	Display Assy	CXB3249
	35	•••••	
	36	Magazine Assy	CXB4027
	37	Angle Assy	CXB3591
	38	•••••	
	39	•••••	
*	40	Caution Card	CRP1195
	41	Air Cushioned Bag	CEG1055
*	42	Caution Card	CRP1090
	43	Cover	CEG1062

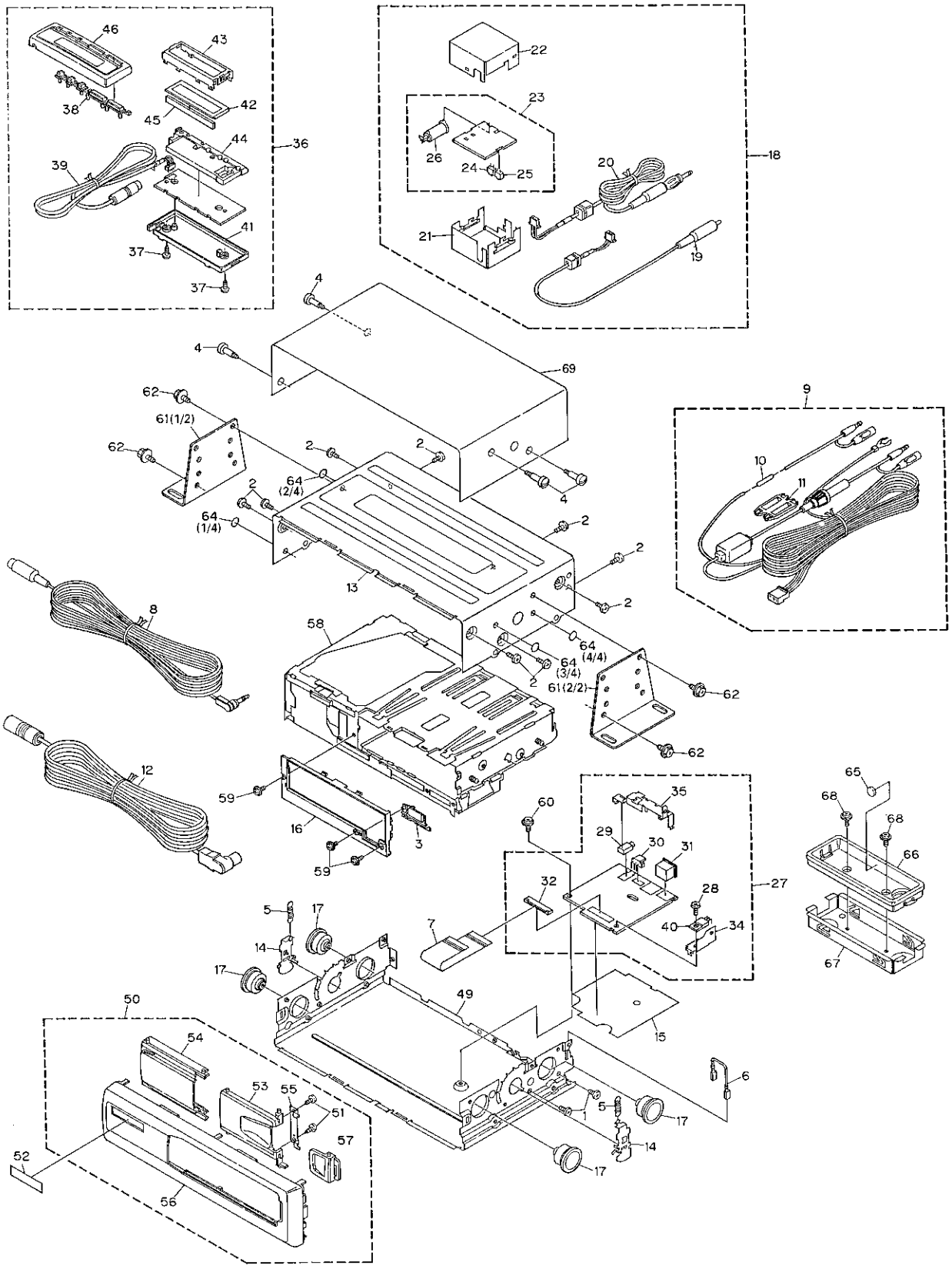
● Owner's Manual

Part No.	Language
CRD2885	English, French, Spanish

● Installation Manual

Part No.	Language
CRD2886	English, French, Spanish

2.2 EXTERIOR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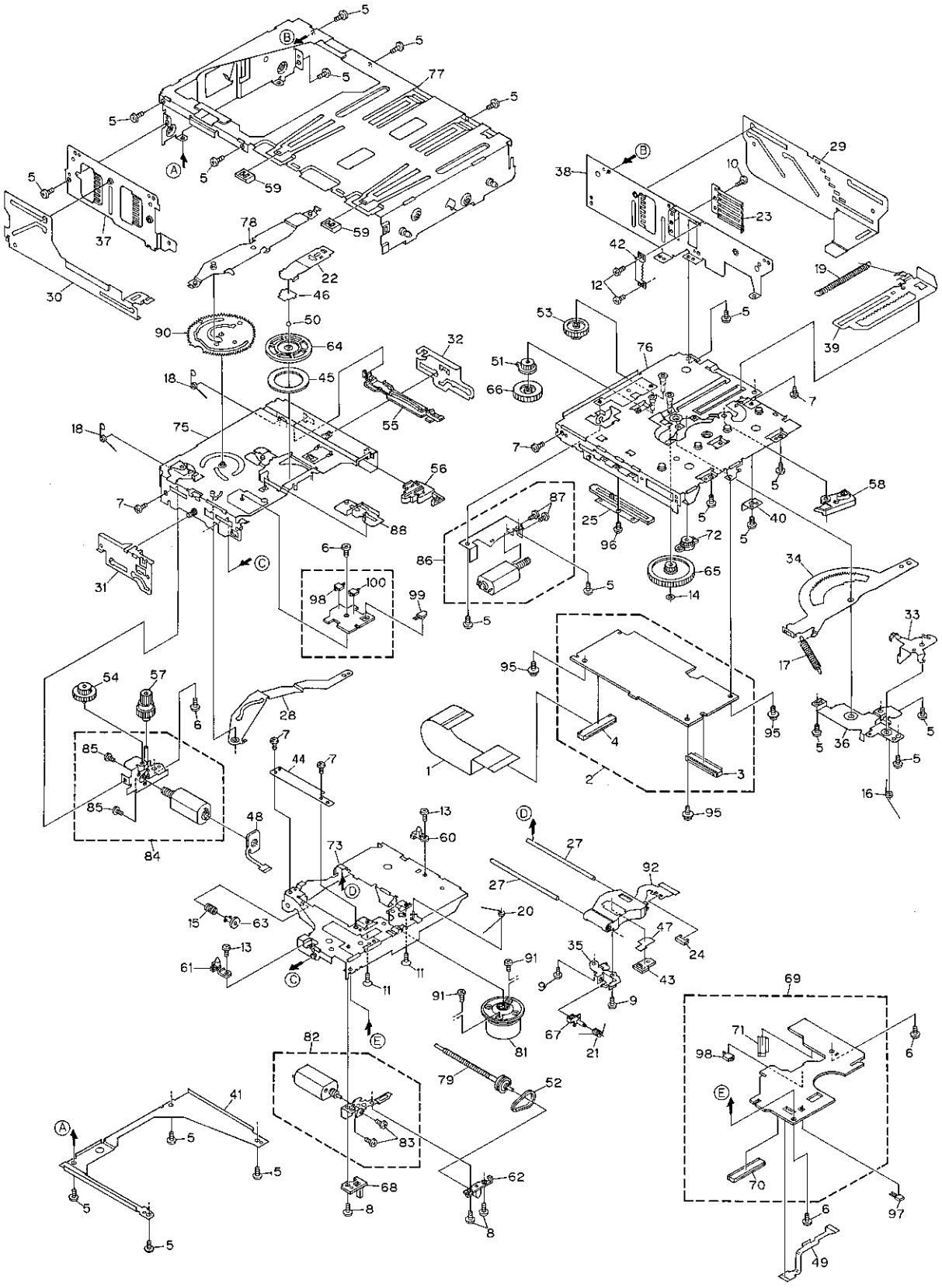
● EXTERIOR SECTION PARTS LIST

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

2.3 CD MECHANISM MODULE

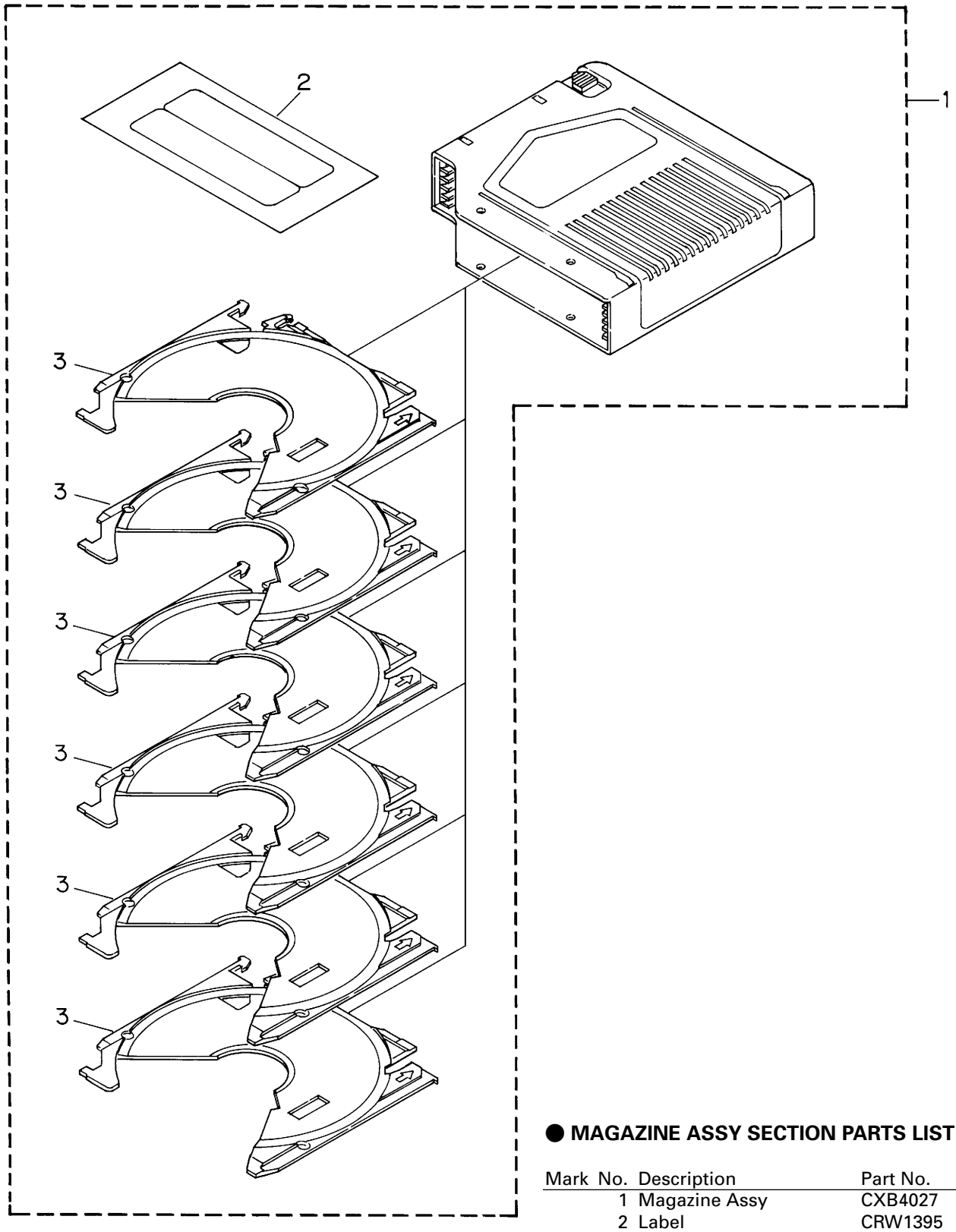


● CD MECHANISM MODULE SECTION PARTS LIST

Mark No.	Description	Part No.
1	Connector	CDE6069
2	CD Core Unit (C7)	CWX2279
3	Connector(CN701)	CKS1963
4	Connector(CN101)	CKS2272
5	Screw	BMZ20P025FMC
6	Screw	CBA1037
7	Screw	CBA1041
8	Screw	CBA1176
9	Screw	CBA1362
10	Screw	CBA1387
11	Screw	CBA1470
12	Screw	CBA1476
13	Screw	CBA1486
14	Washer	CBF1038
15	Spring	CBH2172
16	Spring	CBH2173
17	Spring	CBH2174
18	Spring	CBH2175
19	Spring	CBH2285
20	Spring	CBH2177
21	Spring	CBH2178
22	Spring	CBL1390
23	Spring	CBL1392
24	Short Pin	CBL1239
25	Volume(VR801)	CCW1023
26	•••••	
27	Shaft	CLA3304
28	Arm	CNC7901
29	Lever	CNC7902
30	Lever	CNC7904
31	Lever	CNC7905
32	Lever	CNC7906
33	Arm	CNC7908
34	Arm	CNC7909
35	Holder	CNC7911
36	Holder	CNC7912
37	Frame	CNC7917
38	Frame	CNC7918
39	Lever	CNC7919
40	Stopper	CNC7920
41	Frame	CNC7921
42	Bracket	CNC8354
43	Plate	CNC8375
44	Cover	CNC8434
45	Sheet	CNM6009
46	Spacer	CNM6146
47	Sheet	CNM6296
48	PCB	CNP5227
49	PCB	CNP5228
50	Ball	CNR1189
51	Gear	CNR1531
52	Belt	CNT1086
53	Gear	CNV5472
54	Gear	CNV5473
55	Rail	CNV5474
56	Lever	CNV5475
57	Gear	CNV5477
58	Arm	CNV5478
59	Holder	CNV5480
60	Guide	CNV5481
61	Guide	CNV5482
62	Holder	CNV5483
63	Holder	CNV5484
64	Clamper	CNV5485
65	Gear	CNV5486
66	Gear	CNV5562
67	Holder	CNV5563
68	Lighting Conductor	CNV5785
69	Mechanism PCB	CWX2303
70	Connector(CN801)	CKS1965
71	Connector(CN802)	CKS3486
72	Damper Unit	CXA7714
73	Chassis Unit	CXB2850
74	•••••	
75	Chassis Unit	CXB2851
76	Magazine Holder Unit	CXB2853
77	Frame Unit	CXB4426
78	Arm Unit	CXB2855
79	Screw Unit	CXB2857
80	•••••	
81	Motor Unit(M851)(SPINDLE)	CXB3003
82	Motor Unit(M854)(CARRIAGE)	CXB3004
83	Screw	JFZ20P025FMC
84	Motor Unit(M853)(TRAY)	CXB4421
85	Screw	JFZ20P025FMC
86	Motor Unit(M852)(ELV)	CXB3006
87	Screw	JFZ20P025FMC
88	Lever Unit	CXB3938
89	•••••	
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



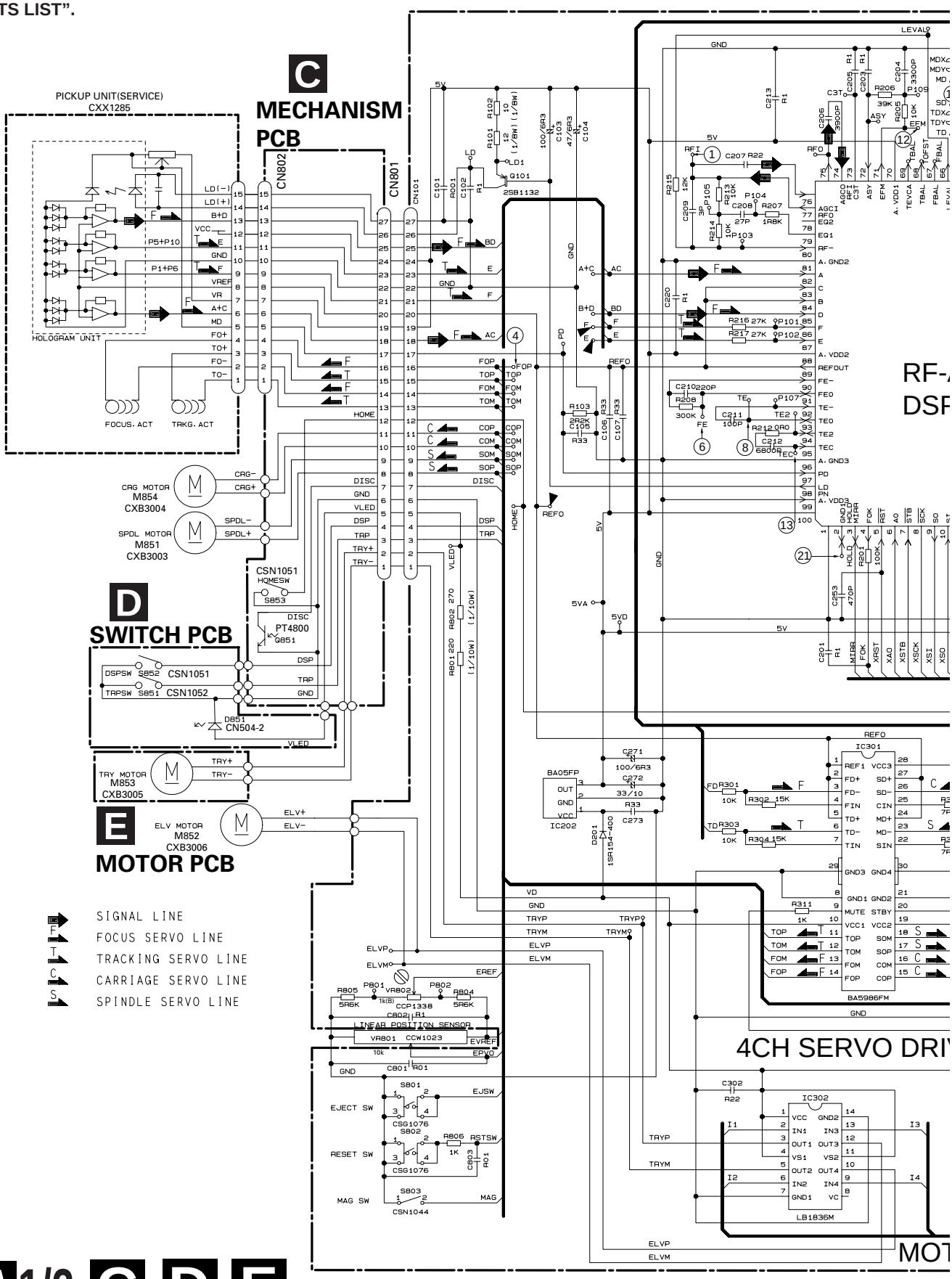
● MAGAZINE ASSY SECTION PARTS LIST

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

3. SCHEMATIC DIAGRAM

3.1 OVERALL CONNECTION DIAGRAM

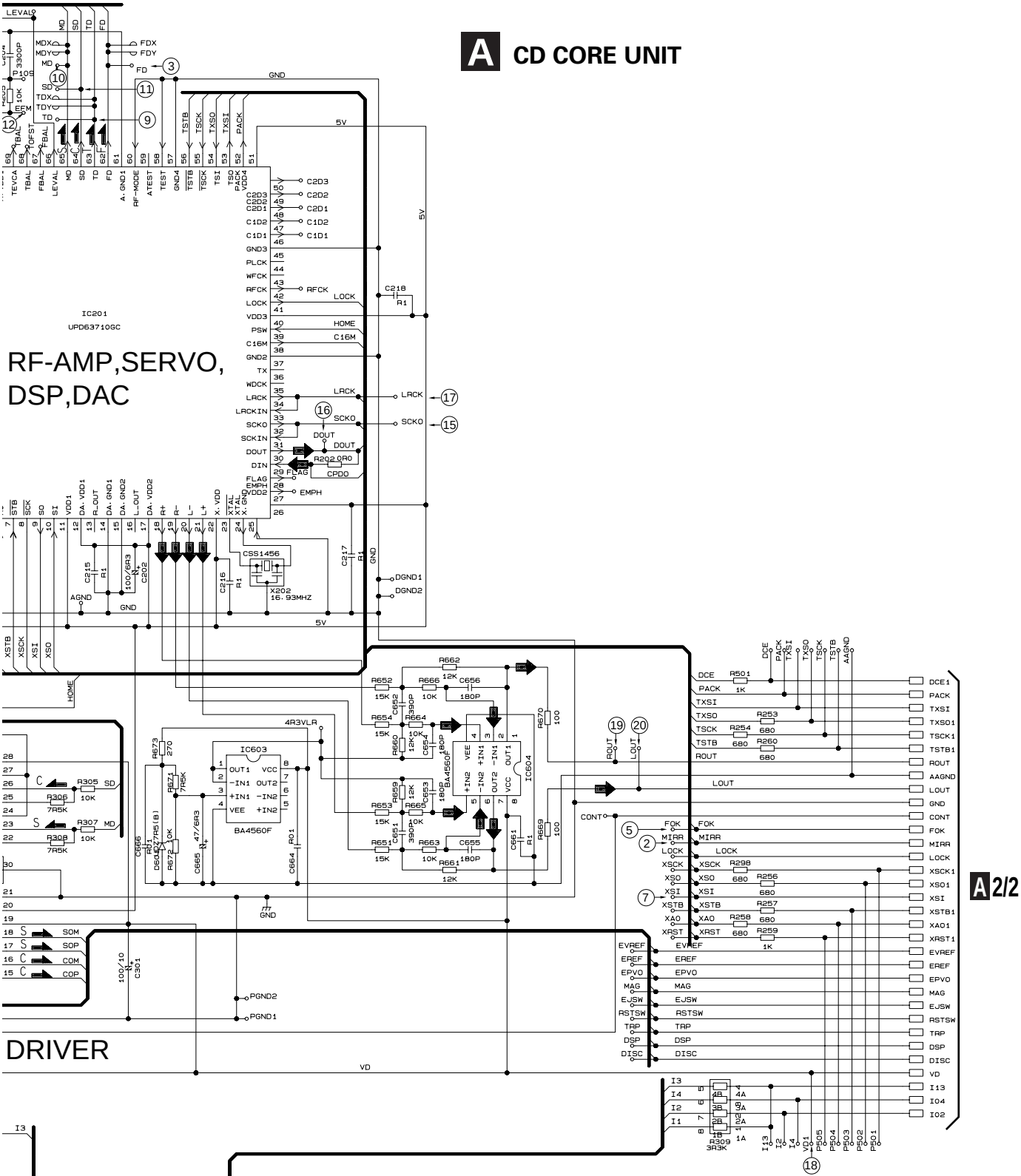
Note: When ordering service parts, be sure to refer to "EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".

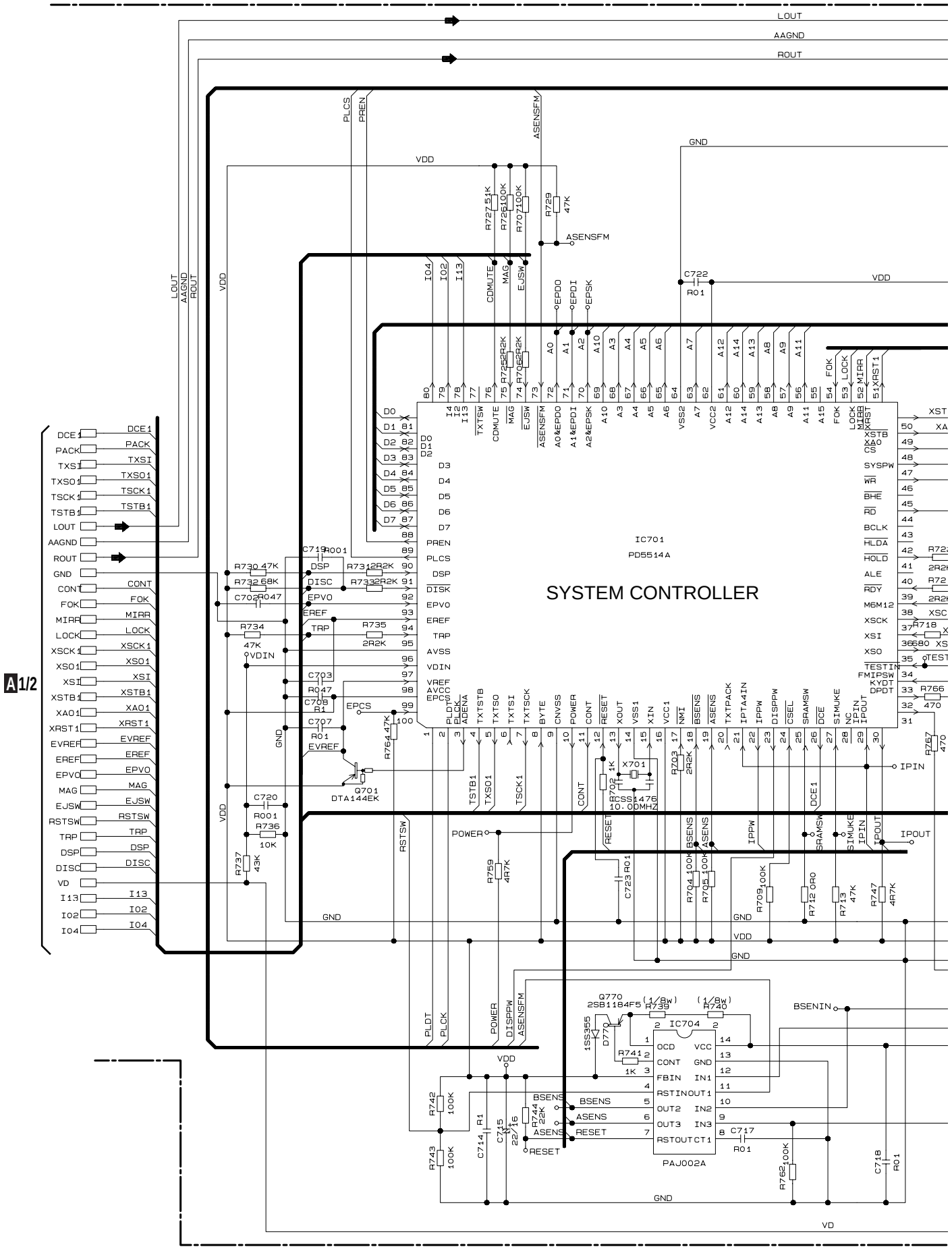


NOTE:
- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

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

A CD CORE UNIT




SYSTEM CONTROLLER
IC701
PD5514A
PAJ002A
IC704
Q701
DTA144EK
Q770
2SB1184F5
X701
16.9344MHz
LOUT
AAGND
ROUT
VDD
GND
ASENSFM
IPIN
IPOUT
BSENIN
POWER
RSTSW
PLDT
PLCK
DISPPW
RESET
BSENS
ASENS
SRAMSW
SIMUKE
DCE1
PACK
TXSI
TXSO1
TSCK1
TSTB1
CONT
FOK
MIRR
LOCK
XSCK1
XSO1
XSI
XSTB1
XAO1
XRST1
EVREF
EREF
EPVO
MAG
EJSW
RSTSW
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DSP
DISC
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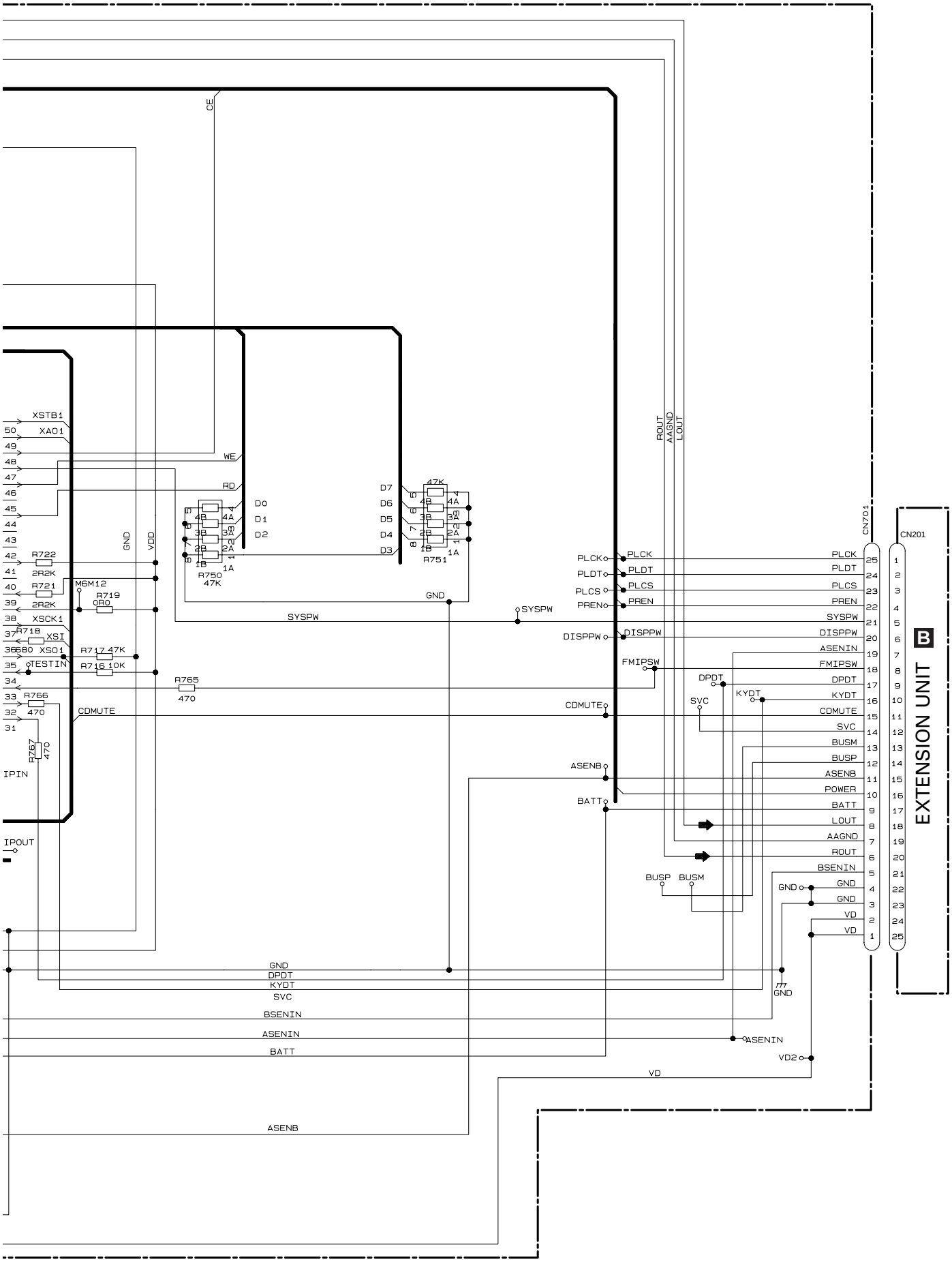
I13
I02
I04


CE
XSTB1
XA01
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RD
D0
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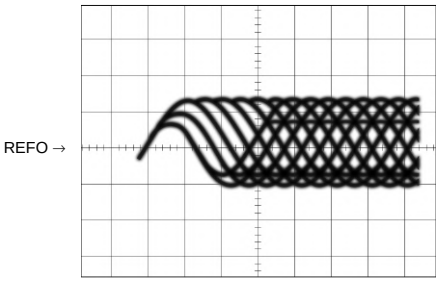
D3
D4
D5
D6
D7
R750 47K
R751 47K
R722 2R2K
R721 2R2K
R719 0R0
M6M12
R718 XSI
R717 47K
R716 10K
TESTIN
XSO1
XSCK1
R765 470
R766 470
R767 470
CDMUTE
IPIN
IPOUT
GND
VDD
SYSPW
ROUT
AAGND
LOUT
PLCK
PLDT
PLCS
PREN
DISPPW
FMIPSW
DPDT
KYDT
SVC
BUSM
BUSP
ASENB
POWER
BATT
ASENIN
BSENIN
VD
VD2
CN701
CN201
EXTENSION UNIT
B

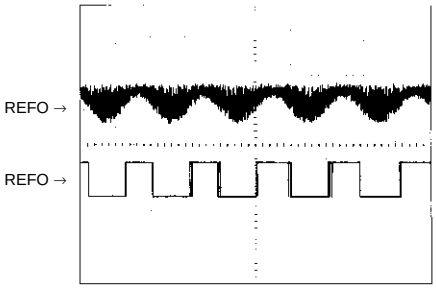
Note:1. The encircled numbers denote measuring pointes in the circuit diagram.
2. Reference voltage
REFO:2.5V

● Waveforms

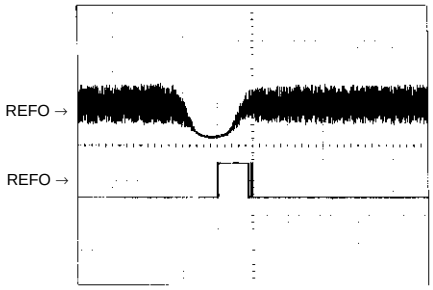
① RFI 0.5V/div. 0.5µs/div.
Normal mode: play



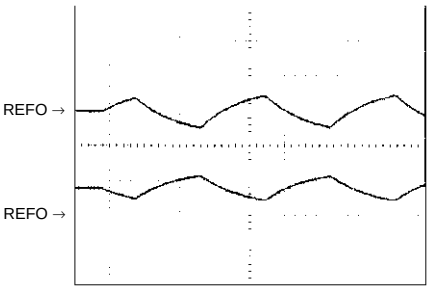
① CH1: RFI 1V/div. 0.5ms/div.
② CH2: MIRR 5V/div.
Test mode: Tracking open



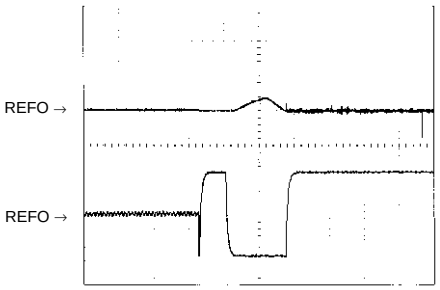
① CH1: RFI 1V/div. 0.5ms/div.
② CH2: MIRR 5V/div.
Normal mode: The defect part passes 800µm



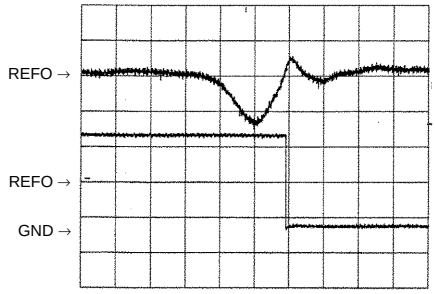
③ CH1: FD 0.5V/div. 0.2s/div.
④ CH2: FOR 2V/div.
Test mode: No disc, Focus close



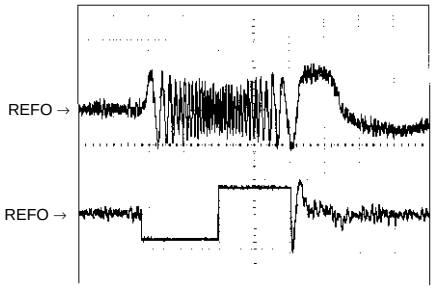
③ CH1: FD 0.5V/div. 0.2s/div.
⑤ CH2: FOK 2V/div.
Normal mode: Focus close



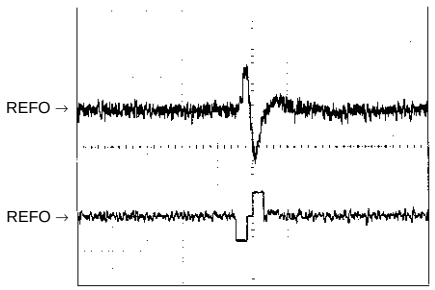
⑥ CH1: FE 0.5V/div. 1ms/div.
⑦ CH2: XSI 2V/div.
Normal mode: Focus close



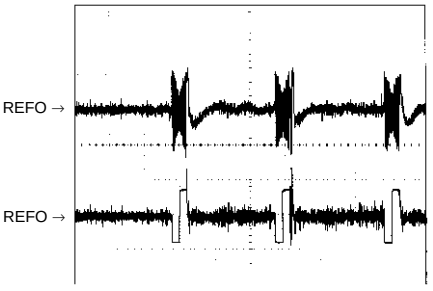
⑧ CH1: TE 0.5V/div. 0.5ms/div.
⑨ CH2: TD 0.5V/div.
Test mode: 32 tracks jump (REV)



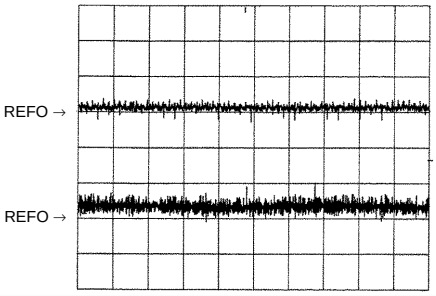
⑧ CH1: TE 0.5V/div. 0.5ms/div.
⑨ CH2: TD 0.5V/div.
Test mode: Single jump (REV)



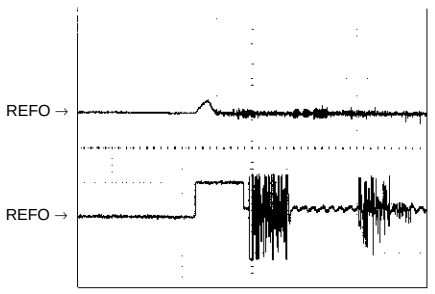
⑧ CH1: TE 0.5V/div. 5ms/div.
⑨ CH2: TD 0.5V/div.
Test mode: 100 tracks jump (REV)



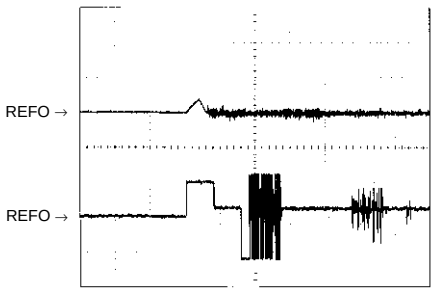
⑥ CH1: FE 0.1V/div. 20ms/div.
③ CH2: FD 0.2V/div.
Normal mode: Play



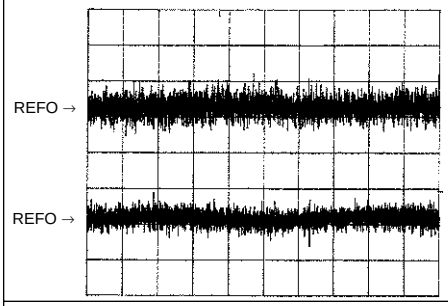
③ CH1: FD 0.5V/div. 0.5s/div.
⑩ CH2: MD 1V/div.
Normal mode: Focus close (12cm)



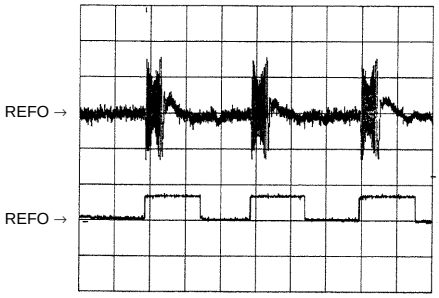
③ CH1: FD 0.5V/div. 0.5s/div.
⑩ CH2: MD 1V/div.
Normal mode: Focus close (8cm)



⑧ CH1: TE 0.2V/div. 20ms/div.
⑨ CH2: TD 0.2V/div.
Normal mode: play

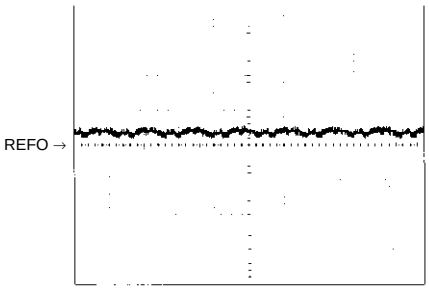


⑧ CH1: TE 0.5V/div. 5ms/div.
⑪ CH2: SD 0.5V/div.
TEST mode:100Tracks jump(FWD)



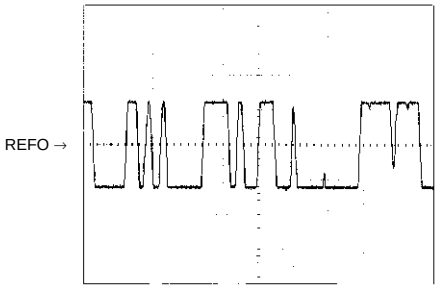
⑩ MD 0.5V/div. 0.1s/div.

Normal mode: Play (12cm)



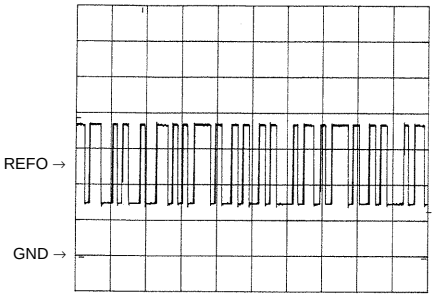
⑩ MD 1V/div. 10ms/div.

Long Search (12cm)

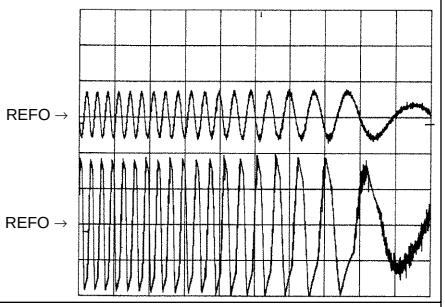


⑫ EFM 1V/div. 5µs/div.

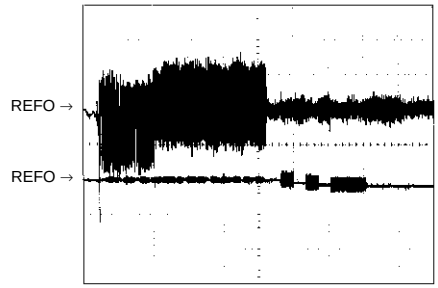
Normal mode: Play



⑧ CH1: TE 1V/div. 2ms/div.
⑬ CH2: TEC 1V/div.
Test mode: Focus close
Tracking open

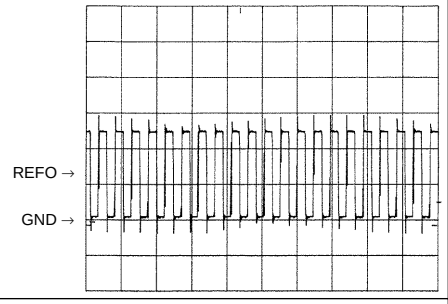


⑧ CH1: TE 0.5V/div. 0.2s/div.
⑥ CH2: FE 0.5V/div.
Normal mode: AGC after focus close



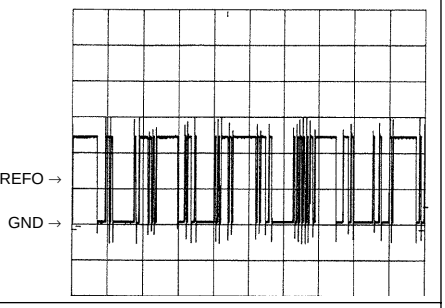
⑮ SCKO 2V/div. 1µs/div.

Normal mode: Play

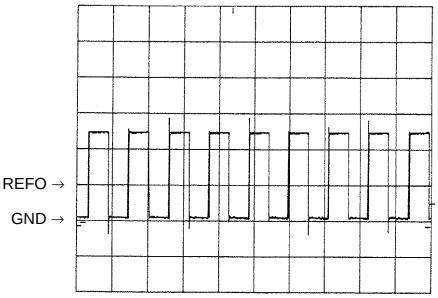


⑯ DOUT 2V/div. 10µs/div.

Normal mode: Play

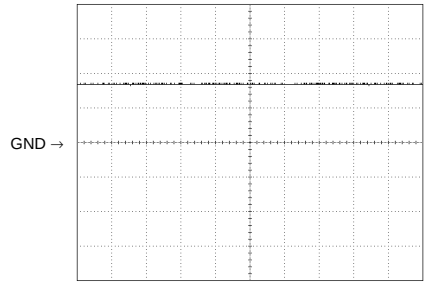


⑰ LRCK 2V/div. 20µs/div.
Normal mode: Play

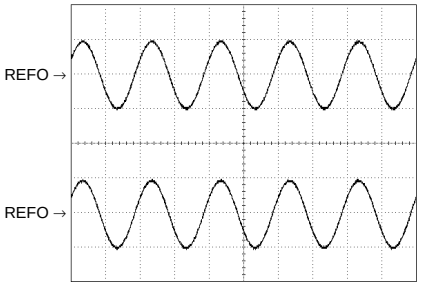


⑱ VD 5V/div. 50ms/div.

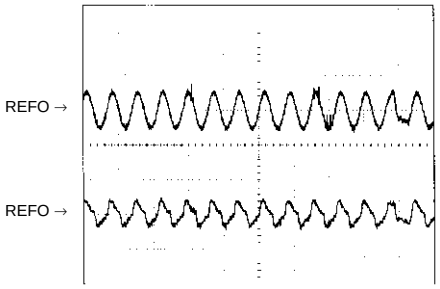
Normal mode: No disc



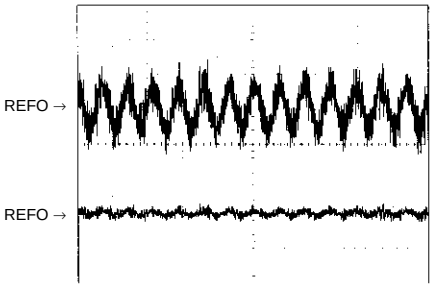
⑲ CH1: R OUT 2V/div.
⑳ CH2: L OUT 2V/div.
500µs/div.
Normal mode: Play (1kHz 0dB)



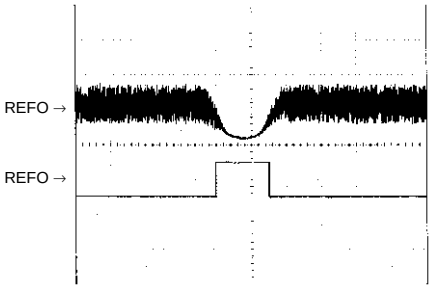
⑥ CH1: FE 0.2V/div.
③ CH2: FD 0.5V/div.
1ms/div.
Normal mode: During AGC



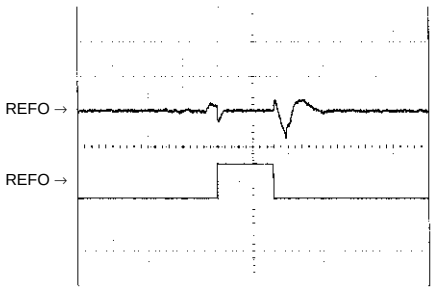
⑧ CH1: TE 0.2V/div.
⑨ CH2: TD 0.5V/div.
1ms/div.
Normal mode: During AGC



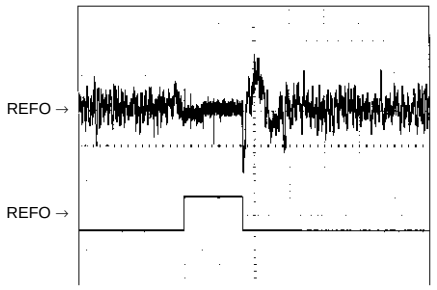
① CH1: RFI 1V/div.
㉑ CH2: HOLD 5V/div.
0.5ms/div.
Normal mode: The defect part passes 800µm(B.D)



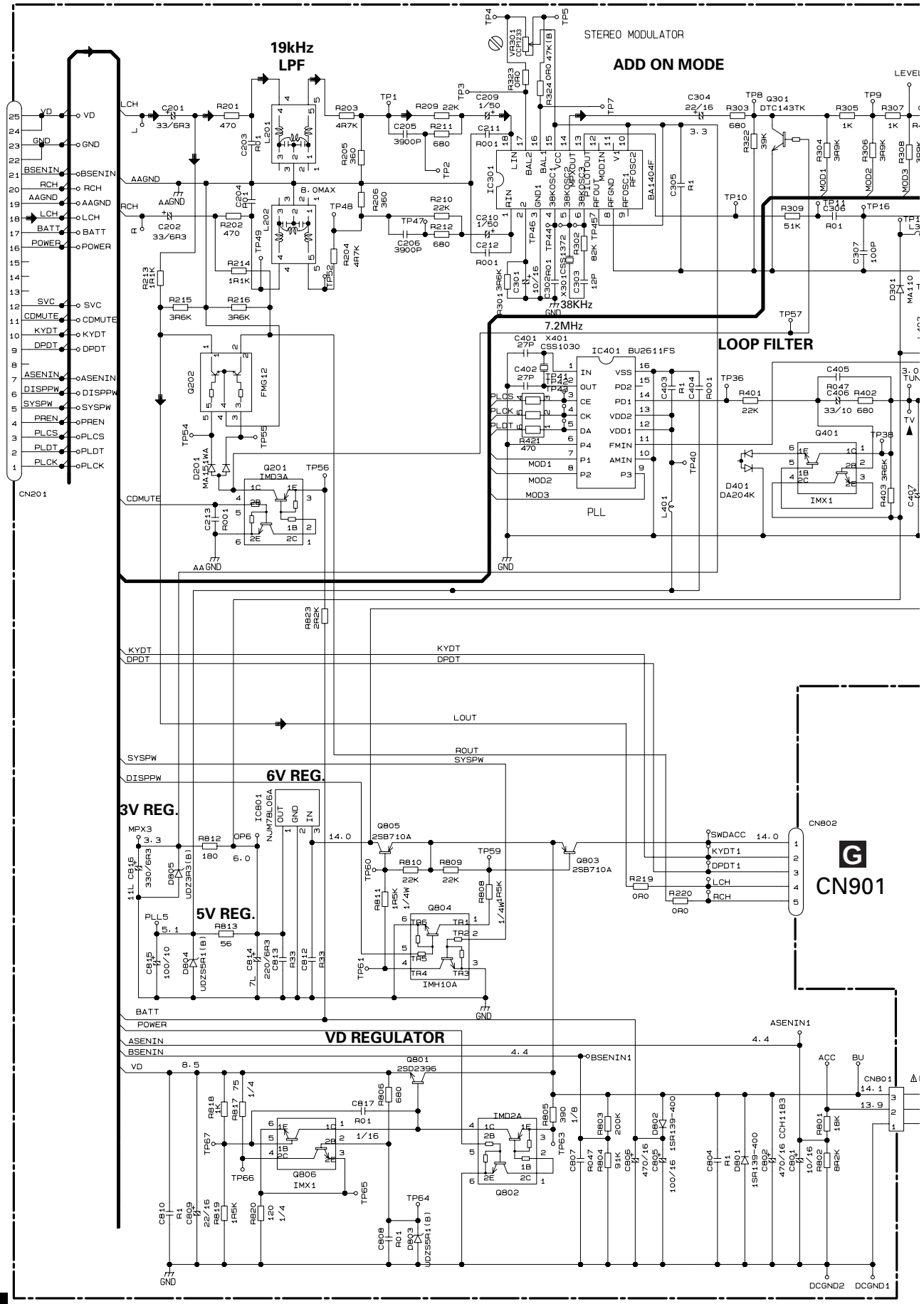
③ CH1: FD 1V/div.
㉑ CH2: HOLD 5V/div.
0.5ms/div.
Normal mode: The defect part passes 800µm(B.D)

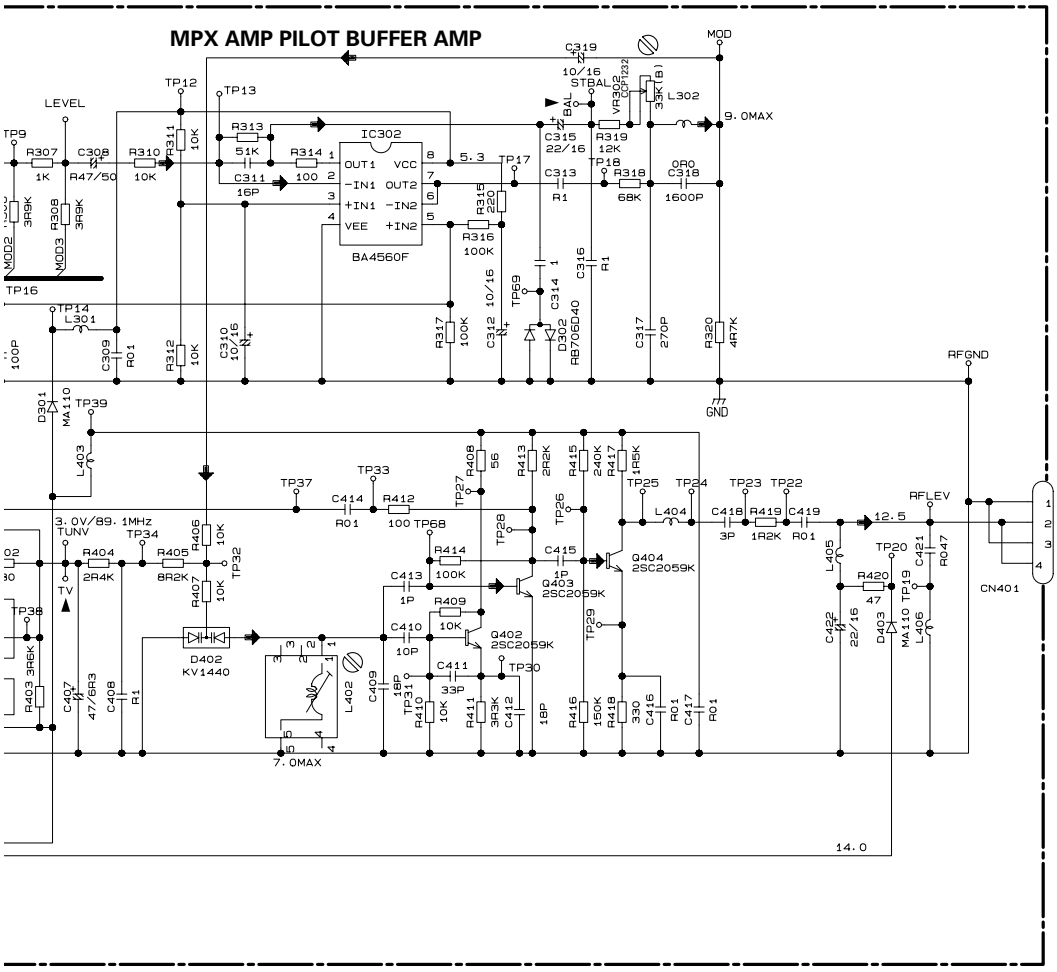


⑨ CH1: TD 0.1V/div.
㉑ CH2: HOLD 5V/div.
0.5ms/div.
Normal mode: The defect part passes 800µm(B.D)



3.2 EXTENSION UNIT

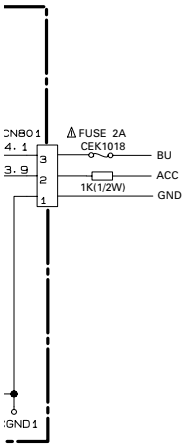




F

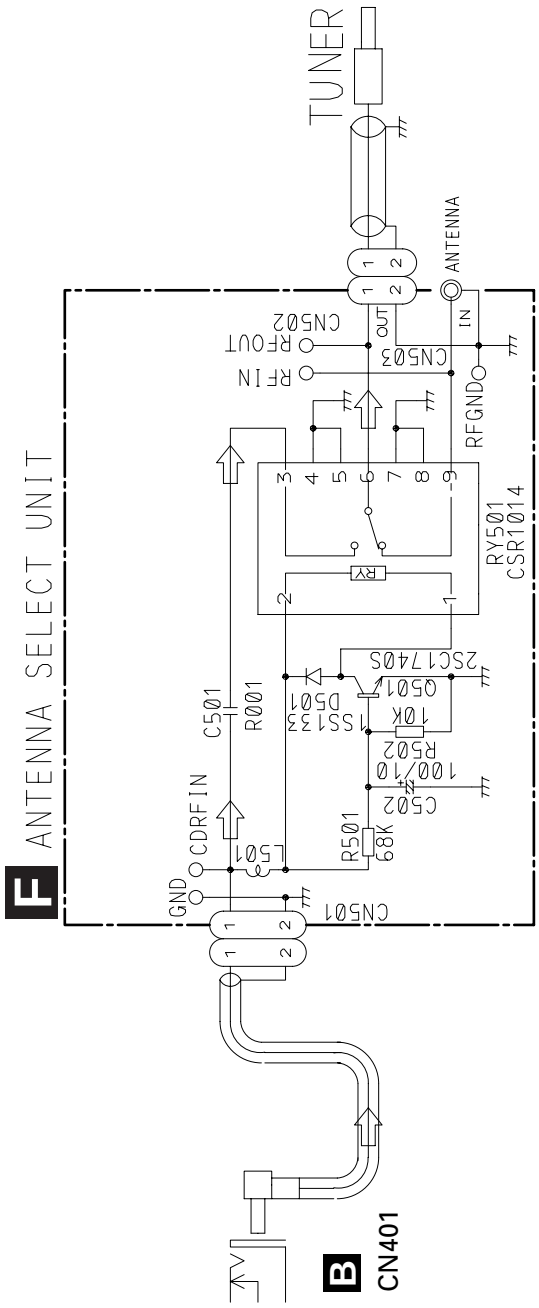
CN501

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

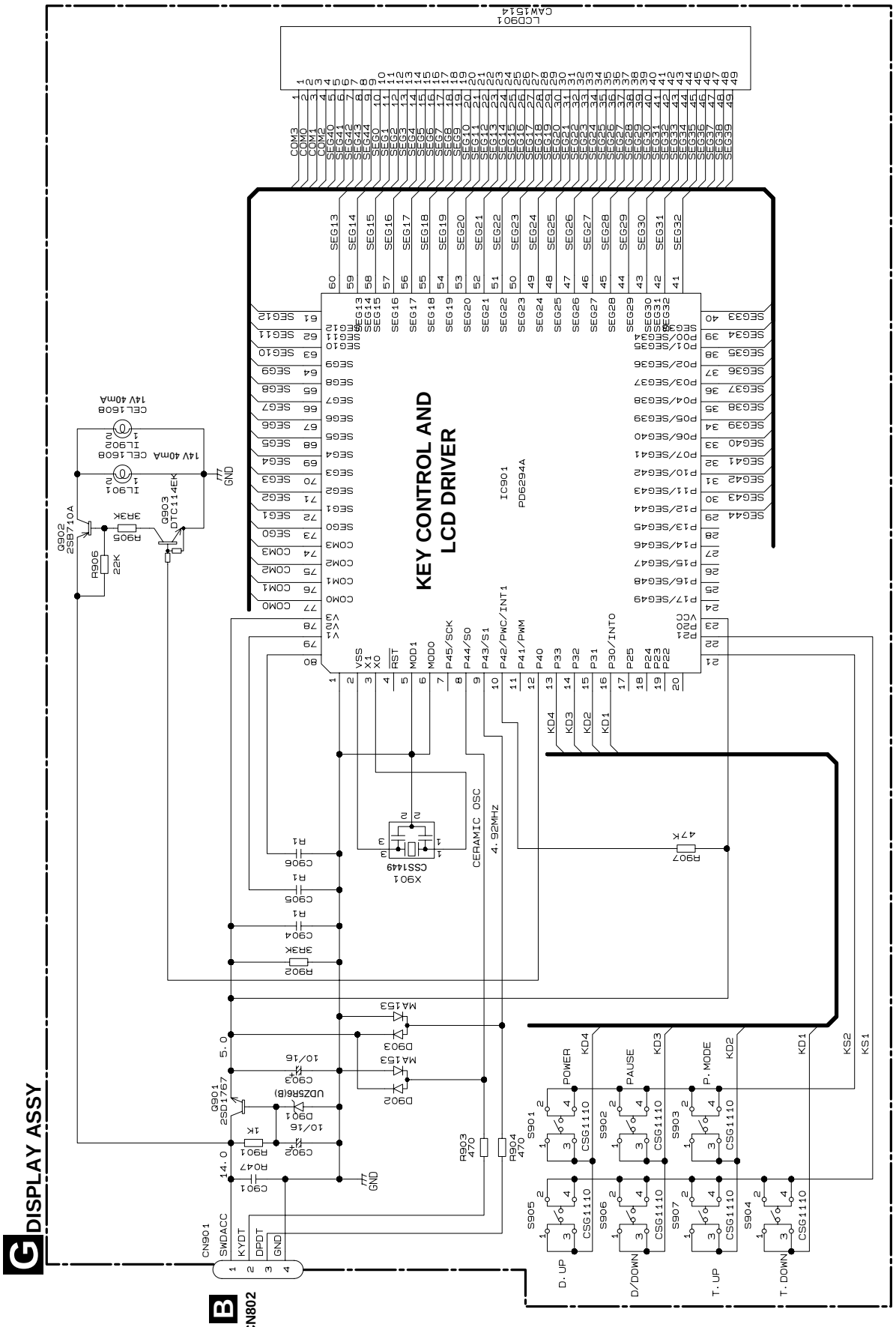


B EXTENSION UNIT

3.3 ANTENNA SELECT UNIT



3.4 DISPLAY ASSY

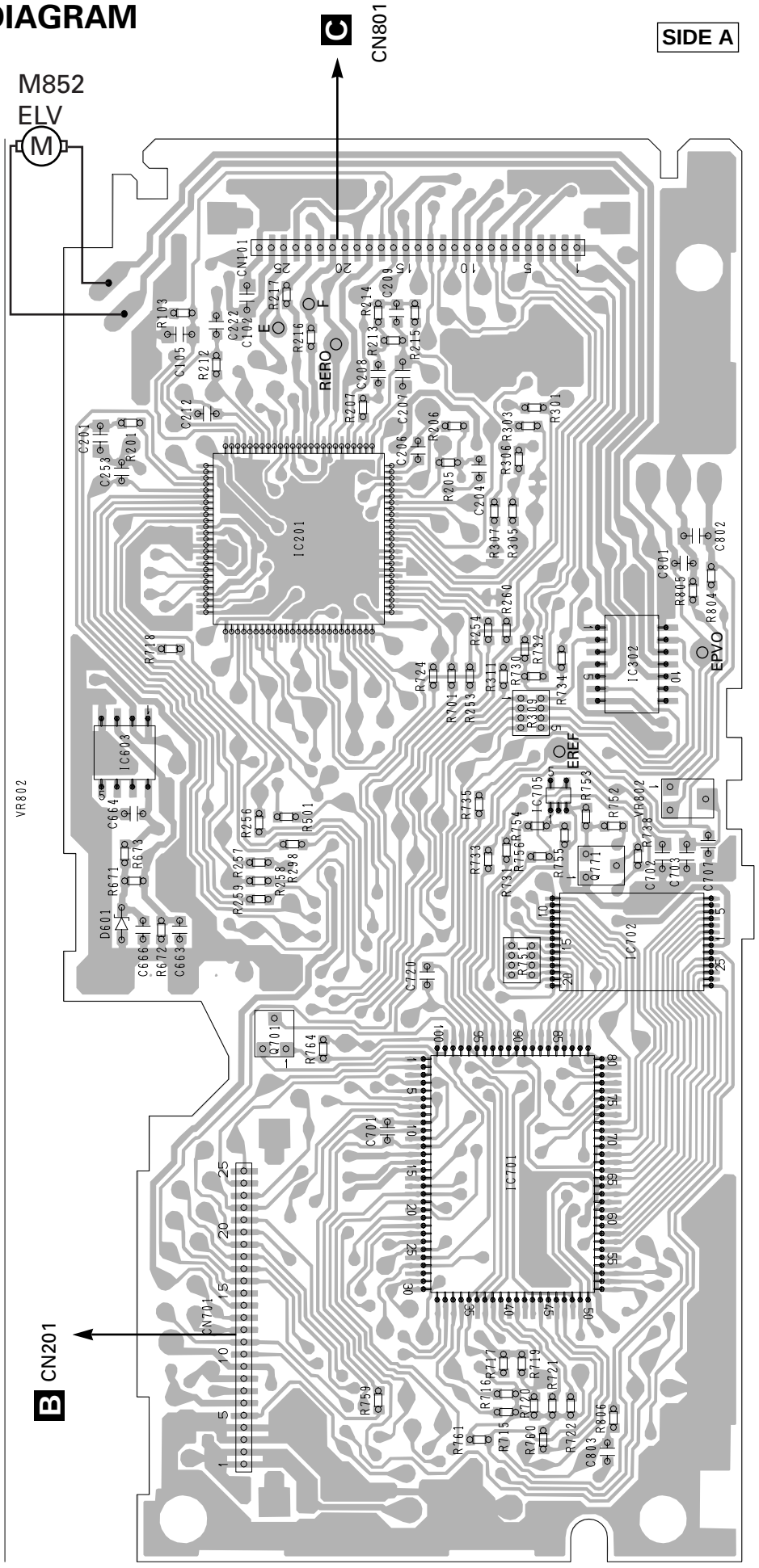


4. PCB CONNECTION DIAGRAM

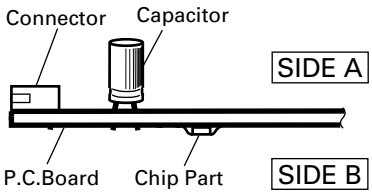
4.1 CD CORE UNIT

NOTE FOR PCB DIAGRAMS

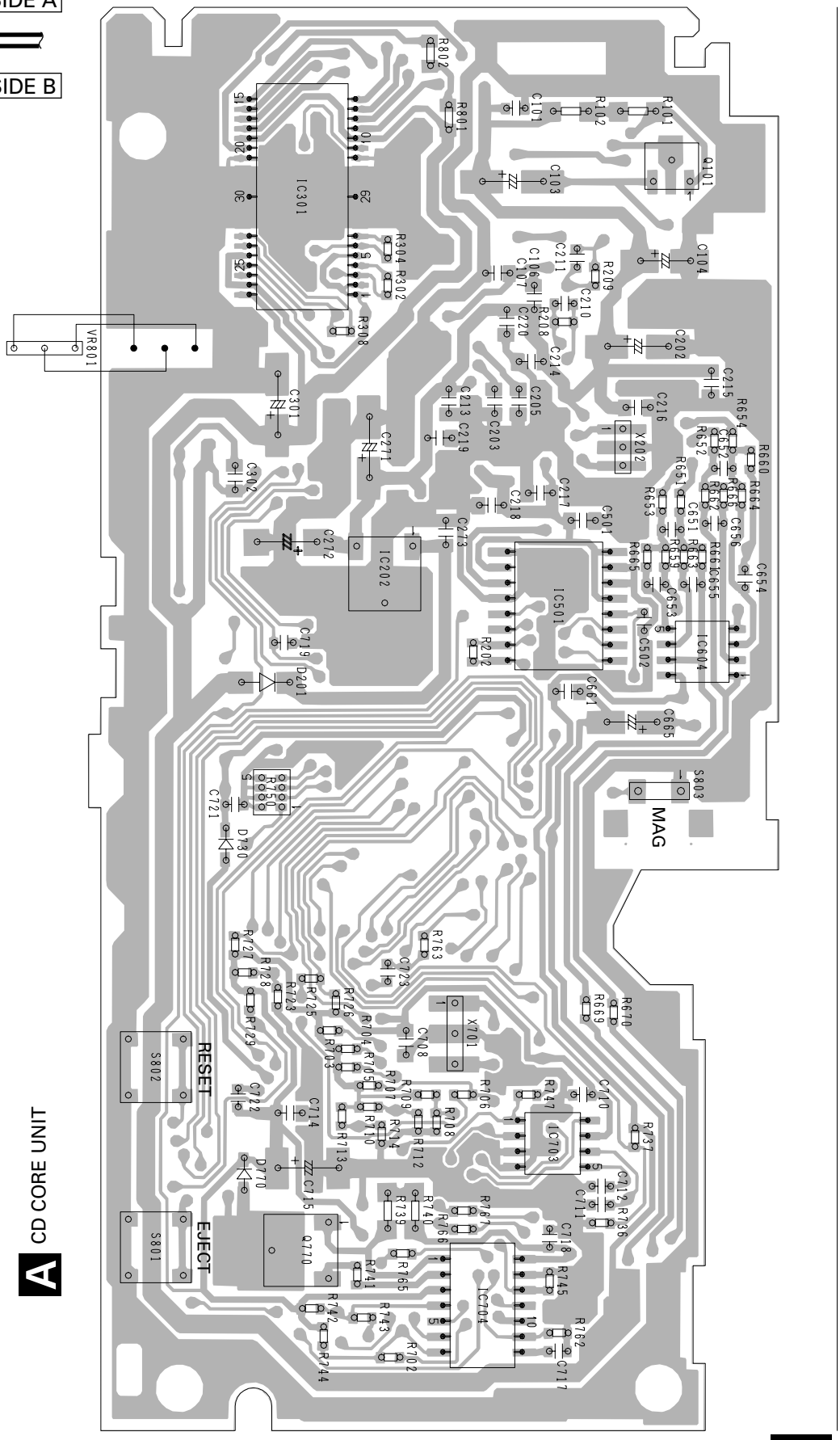
1. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.



2. Viewpoint of PCB diagrams

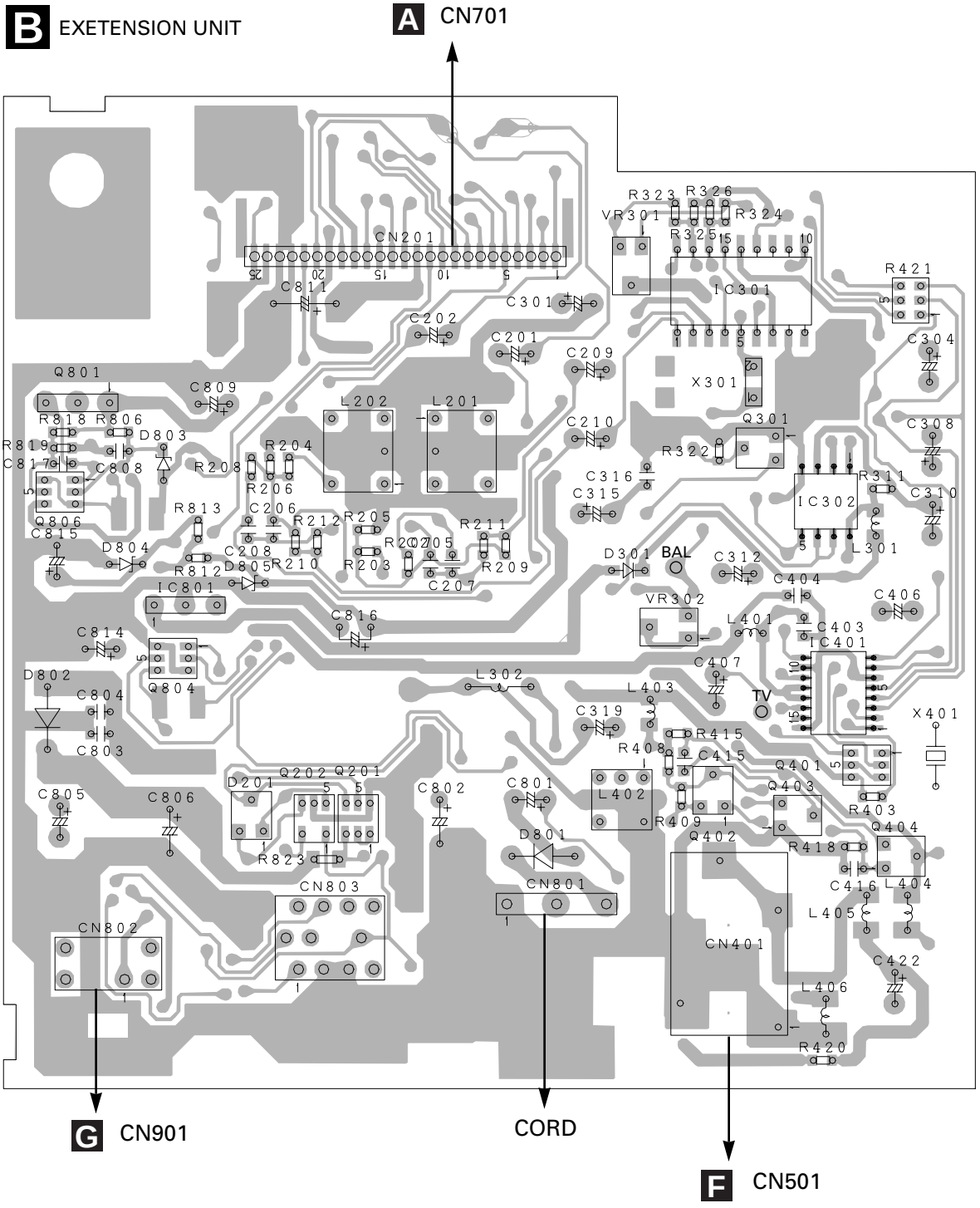


SIDE B



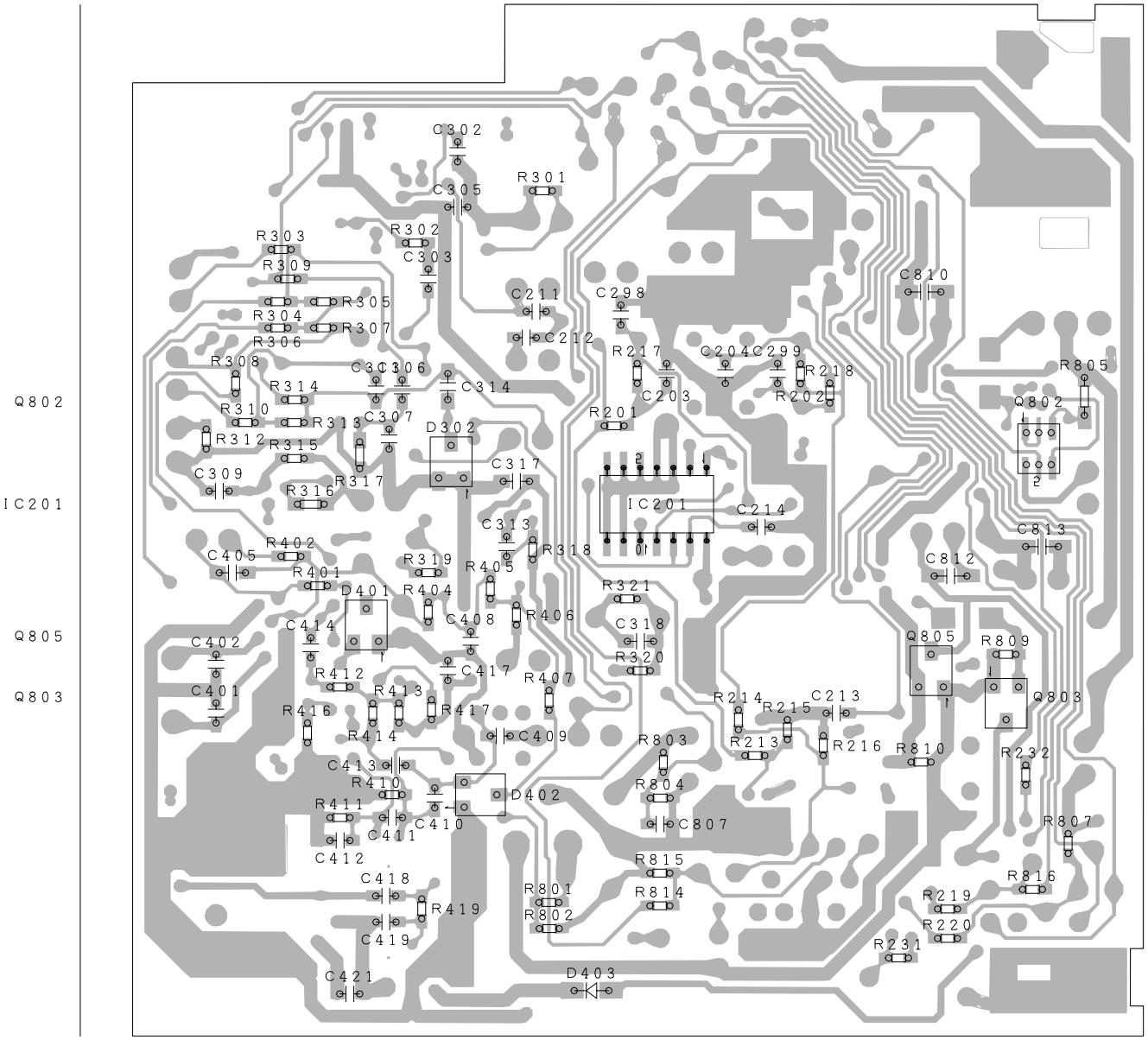
4.2 EXTENSION UNIT

SIDE A



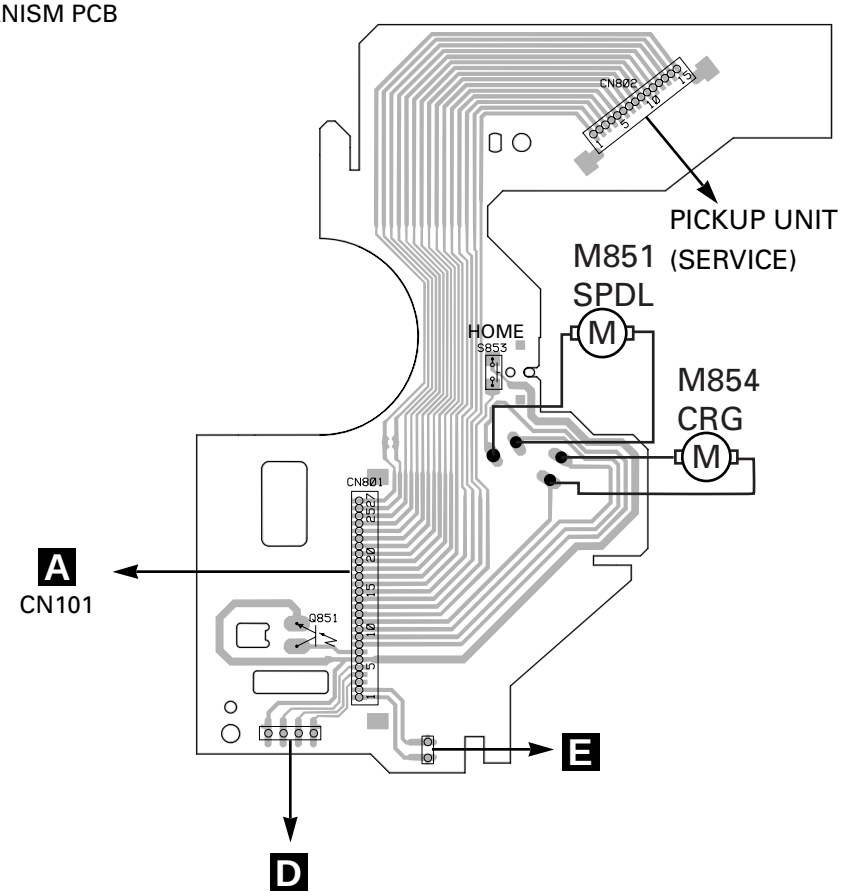
SIDE B

B EXETENSION UNIT



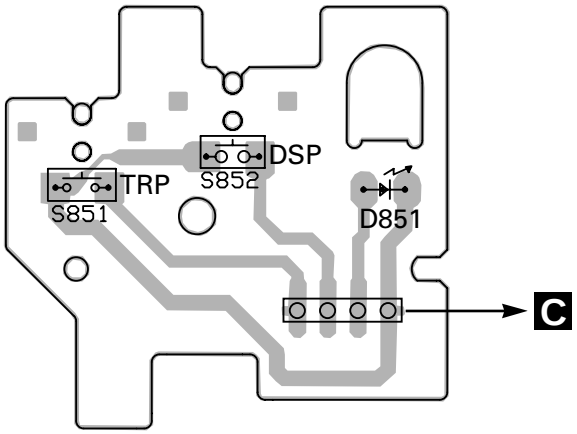
4.3 MECHANISM PCB

C MECHANISM PCB



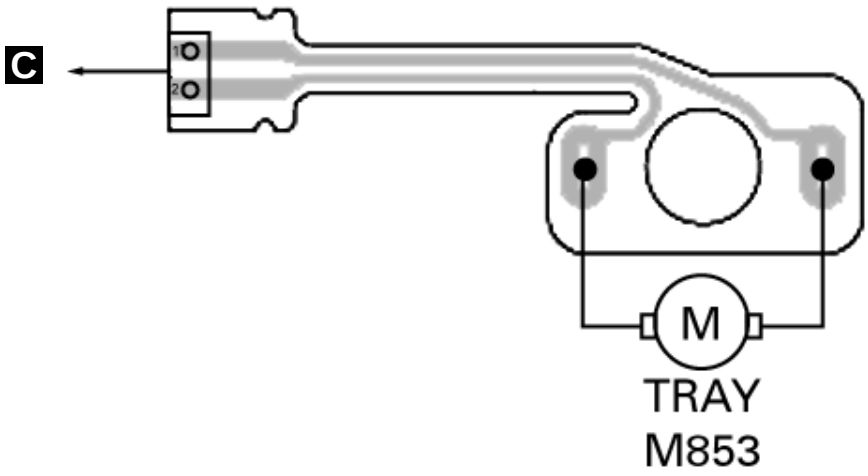
4.4 SWITCH PCB

D SWITCH PCB



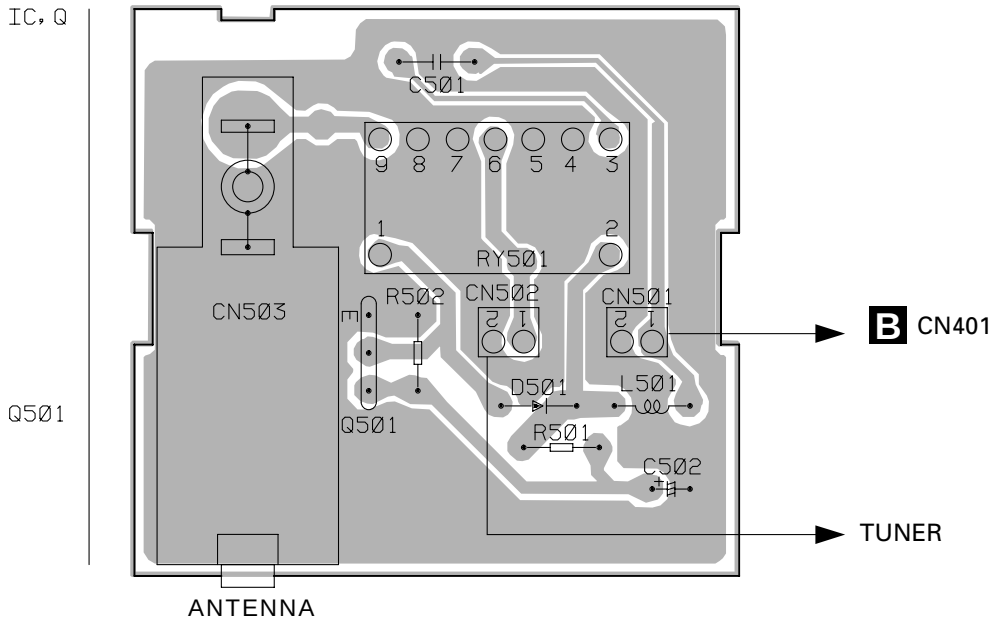
4.5 MOTOR PCB

E MOTOR PCB



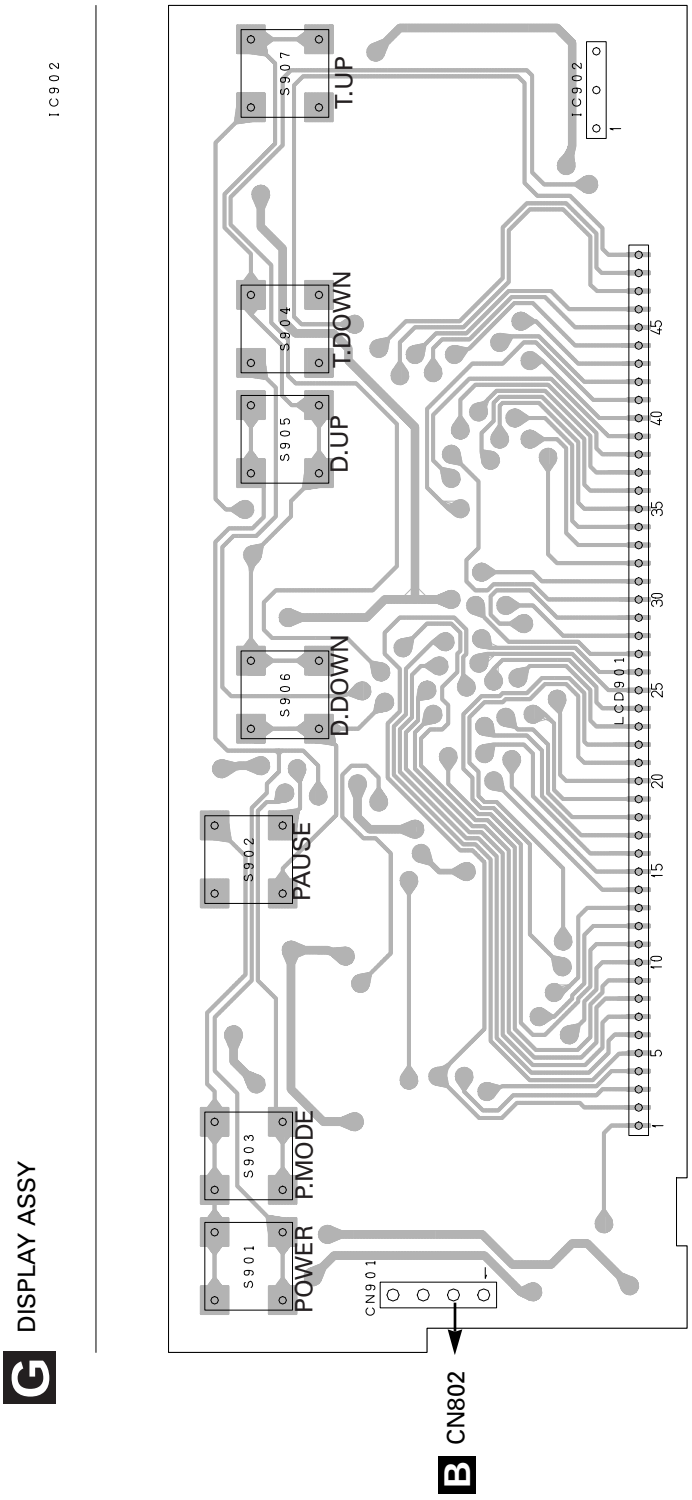
4.6 ANTENNA SELECT UNIT

F ANTENNA SELECT UNIT

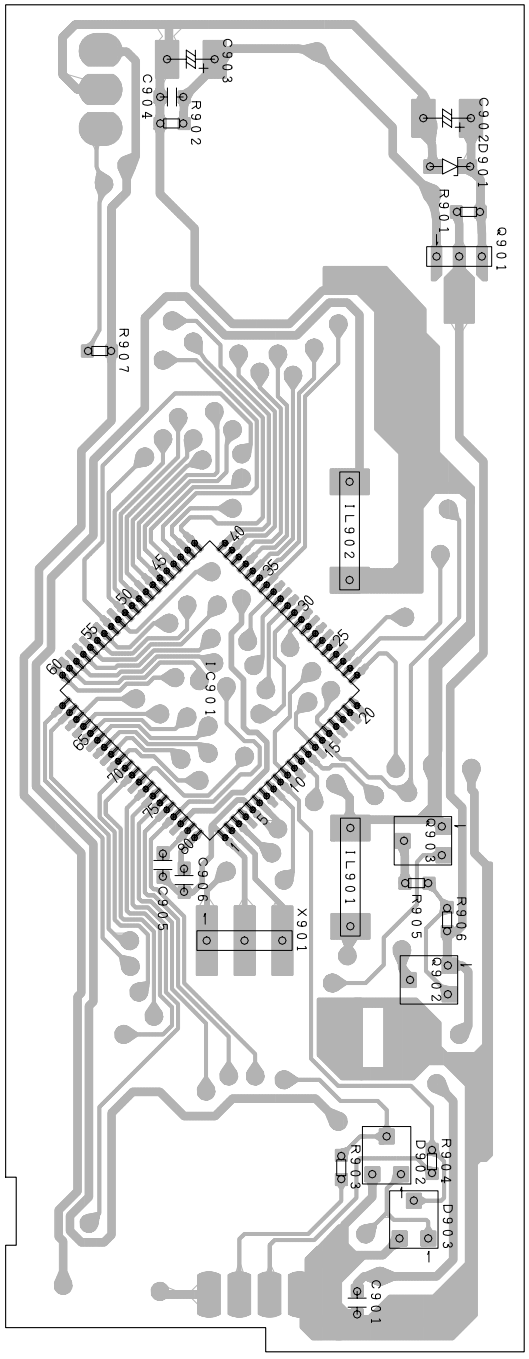


4.7 DISPLAY ASSY

SIDE A



SIDE B



G DISPLAY ASSY

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.....

A Unit Number : CWX2279
Unit Name : CD Core Unit

MISCELLANEOUS

=====Circuit Symbol and No.		===Part Name	Part No.
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	PD5514A
IC	704	IC	PAJ002A
Q	101	Transistor	2SB1132
Q	701	Transistor	DTA144EK
Q	770	Transistor	2SB1184F5
D	201	Diode	1SR154-400
D	601	Diode	UDZ7R5(B)
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

RESISTORS

=====Circuit Symbol and No.		===Part Name	Part No.
R	101		RS1/8S120J
R	102		RS1/8S100J
R	103		RS1/16S222J
R	201		RS1/16S104J
R	202		RS1/16S0R0J
R	205		RS1/16S103J
R	206		RS1/16S393J
R	207		RS1/16S182J
R	208		RS1/16S304J
R	212		RS1/16S0R0J
R	213		RS1/16S103J
R	214		RS1/16S103J
R	215		RS1/16S123J
R	216		RS1/16S273J
R	217		RS1/16S273J
R	253		RS1/16S681J
R	254		RS1/16S681J
R	256		RS1/16S681J
R	257		RS1/16S681J
R	258		RS1/16S681J
R	259		RS1/16S102J
R	260		RS1/16S681J
R	298		RS1/16S681J
R	301		RS1/16S103J
R	302		RS1/16S153J
R	303		RS1/16S103J
R	304		RS1/16S153J
R	305		RS1/16S103J
R	306		RS1/16S752J
R	307		RS1/16S103J
R	308		RS1/16S752J
R	309		RA4C332J
R	311		RS1/16S102J
R	501		RS1/16S102J
R	651		RSK1/16S153J
R	652		RSK1/16S153J
R	653		RSK1/16S153J
R	654		RSK1/16S153J
R	659		RSK1/16S123J
R	660		RSK1/16S123J
R	661		RSK1/16S123J
R	662		RSK1/16S123J
R	663		RSK1/16S103J
R	664		RSK1/16S103J
R	665		RSK1/16S103J
R	666		RSK1/16S103J
R	669		RS1/16S101J
R	670		RS1/16S101J
R	671		RS1/16S752J
R	672		RS1/16S103J
R	673		RS1/16S271J
R	702		RS1/16S102J
R	703		RS1/16S222J
R	704		RS1/16S104J
R	705		RS1/16S104J
R	706		RS1/16S222J
R	707		RS1/16S104J
R	709		RS1/16S104J
R	712		RS1/16S0R0J
R	713		RS1/16S473J
R	716		RS1/16S103J
R	717		RS1/16S473J
R	718		RS1/16S681J
R	719		RS1/16S0R0J
R	721		RS1/16S222J
R	722		RS1/16S222J
R	725		RS1/16S222J
R	726		RS1/16S104J
R	727		RS1/16S513J
R	729		RS1/16S473J
R	730		RS1/16S473J
R	731		RS1/16S222J
R	732		RS1/16S683J
R	733		RS1/16S222J
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.
R	741		RS1/16S102J
R	742		RS1/16S104J
R	743		RS1/16S104J
R	744		RS1/16S223J
R	747		RS1/16S472J
R	750		RA4C473J
R	751		RA4C473J
R	759		RS1/16S472J
R	762		RS1/16S104J
R	764		RS1/16S473J
R	765		RS1/16S471J
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

C	101		CKSRYB102K50
C	102		CKSQYB104K25
C	103		CEV101M6R3
C	104		CEV470M6R3
C	105		CKSQYB334K16
C	106		CKSQYB334K16
C	107		CKSQYB334K16
C	201		CKSQYB104K25
C	202		CEV101M6R3
C	203		CKSQYB104K25
C	204		CKSRYB332K50
C	205		CKSQYB104K25
C	206		CKSRYB392K50
C	207		CKSQYB224K16
C	208		CCSRCH270J50
C	209		CCSRCJ3R0C50
C	210		CCSRCH221J50
C	211		CCSRCH101J50
C	212		CKSRYB682K50
C	213		CKSQYB104K25
C	215		CKSQYB104K25
C	216		CKSQYB104K25
C	217		CKSQYB104K25
C	218		CKSQYB104K25
C	220		CKSQYB104K25
C	253		CKSRYB471K50
C	271		CEV101M6R3
C	272	33µF/10V	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		CKSRYB103K25
C	665		CEV470M6R3
C	666		CKSRYB103K25
C	702		CKSQYB473K16
C	703		CKSQYB473K16
C	707		CKSRYB103K25
C	708		CKSQYB104K25

=====Circuit Symbol and No.	===	Part Name	Part No.
C	714		CKSQYB104K25
C	715		CSZST220M16
C	717		CKSRYB103K25
C	718		CKSRYB103K25
C	719		CKSRYB102K50
C	720		CKSRYB102K50
C	722		CKSRYB103K25
C	723		CKSRYB103K25
C	801		CKSRYB103K25
C	802		CKSQYB104K25
C	803		CKSRYB103K25

B Unit Number : CWX2312
Unit Name : Extension Unit

MISCELLANEOUS

IC	301	IC	BA1404F
IC	302	IC	BA4560F
IC	401	IC	BU2611FS
IC	801	IC	NJM78L06A
Q	201	Transistor	IMD3A
Q	202	Transistor	FMG12
Q	301	Transistor	DTC143TK
Q	401	Transistor	IMX1
Q	402	Transistor	2SC2059K
Q	403	Transistor	2SC2059K
Q	404	Transistor	2SC2059K
Q	801	Transistor	2SD2396
Q	802	Transistor	IMD2A
Q	803	Transistor	2SB710A
Q	804	Transistor	IMH10A
Q	805	Transistor	2SB710A
Q	806	Transistor	IMX1
D	201	Chip Diode	MA151WA
D	301	Diode	MA110
D	302	Diode	RB706D40
D	401	Diode	DA204K
D	402	Diode	KV1440
D	403	Diode	MA110
D	801	Diode	ERA15-02VH
D	802	Diode	ERA15-02VH
D	803	Diode	UDZS5R1(B)
D	804	Diode	UDZS5R1(B)
D	805	Diode	UDZ3R3(B)
L	201	Filter	CTF1333
L	202	Filter	CTF1333
L	301	Inductor	LCTB2R2K2125
L	302	Inductor	CTF1302
L	401	Inductor	LCTB2R2K2125
L	402	Coil	CTC1079
L	403	Inductor	LCTB2R2K2125
L	404	Inductor	LCTA1R0J3225
L	405	Inductor	LCTA101J3225
L	406	Inductor	LCTAR68J3225
X	301	Radiator 38.000kHz	CSS1372
X	401	Crystal Resonator 7.2MHz	CSS1030
VR	301	Semi-fixed 47kΩ(B)	CCP1233
VR	302	Semi-fixed 33kΩ(B)	CCP1232

RESISTORS

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.
R	206		RS1/16S361J
R	209		RS1/16S223J
R	210		RS1/16S223J
R	211		RS1/16S681J
R	212		RS1/16S681J
R	213		RS1/16S112J
R	214		RS1/16S112J
R	215		RS1/16S362J
R	216		RS1/16S362J
R	219		RS1/16S0R0J
R	220		RS1/16S0R0J
R	301		RS1/16S362J
R	302		RS1/16S823J
R	303		RS1/16S681J
R	304		RS1/16S392J
R	305		RS1/16S102J
R	306		RS1/16S392J
R	307		RS1/16S102J
R	308		RS1/16S392J
R	309		RS1/16S513J
R	310		RS1/16S103J
R	311		RS1/16S103J
R	312		RS1/16S103J
R	313		RS1/16S513J
R	314		RS1/16S101J
R	315		RS1/16S221J
R	316		RS1/10S104J
R	317		RS1/10S104J
R	318		RS1/16S683J
R	319		RS1/16S123J
R	320		RS1/16S472J
R	322		RS1/16S393J
R	323		RS1/16S0R0J
R	324		RS1/16S0R0J
R	401		RS1/16S223J
R	402		RS1/16S681J
R	403		RS1/16S362J
R	404		RS1/16S242J
R	405		RS1/16S822J
R	406		RS1/16S103J
R	407		RS1/16S103J
R	408		RS1/16S560J
R	409		RS1/16S103J
R	410		RS1/16S103J
R	411		RS1/16S332J
R	412		RS1/16S101J
R	413		RS1/16S222J
R	414		RS1/16S104J
R	415		RS1/16S244J
R	416		RS1/16S154J
R	417		RS1/16S152J
R	418		RS1/16S331J
R	419		RS1/16S122J
R	420		RS1/16S470J
R	421		RA3C471J
R	801		RS1/16S183J
R	802		RS1/16S822J
R	803		RS1/16S204J
R	804		RS1/16S913J
R	805		RS1/8S391J
R	806		RS1/16S681J
R	808		RS1/4S152J
R	809		RS1/16S223J
R	810		RS1/16S223J
R	811		RS1/4S152J
R	812		RS1/16S181J
R	813		RS1/16S560J
R	817		RS1/4S750J
R	818		RS1/16S102J
R	819		RS1/16S152J
R	820		RS1/4S121J
R	823		RS1/10S222J

CAPACITORS

=====Circuit Symbol and No.		===Part Name	Part No.
C	201		CEAL330M6R3
C	202		CEAL330M6R3
C	203		CKSRYB103K50
C	204		CKSRYB103K50
C	205		CKSRYB392K50
C	206		CKSRYB392K50
C	209		CEAL1R0M50
C	210		CEAL1R0M50
C	211		CKSRYB102K50
C	212		CKSRYB102K50
C	213		CKSRYB102K50
C	214		CKSRYB102K50
C	301		CEAL100M16
C	302		CKSRYB103K50
C	303		CCSRCH120J50
C	304		CEAL220M16
C	305		CKSRYB104K16
C	306		CKSRYB103K50
C	307		CCSRCH101J50
C	308		CEALR47M50
C	309		CKSRYB103K50
C	310		CEAL100M16
C	311		CCSRCH160J50
C	312		CEAL100M16
C	313		CKSRYB104K16
C	314		CKSQYB105K16
C	315		CEAL220M16
C	316		CKSRYB104K16
C	317		CCSQCH271J50
C	318		CCSQCH162J50
C	319		CEAL100M16
C	401		CCSRCH270J50
C	402		CCSRCH270J50
C	403		CKSRYB104K16
C	404		CKSRYB102K50
C	405		CKSQYB473K16
C	406		CEALNP330M10
C	407		CEAL470M6R3
C	408		CKSRYB104K16
C	409		CCSRCH180J50
C	410		CCSRCH100D50
C	411		CCSRCH330J50
C	412		CCSRCH180J50
C	413		CCSRCK1R0C50
C	414		CKSRYB103K50
C	415		CCSRCK1R0C50
C	416		CKSRYB103K50
C	417		CKSRYB103K50
C	418		CCSRCJ3R0C50
C	419		CKSRYB103K50
C	421		CKSRYB473K16
C	422		CEAL220M16
C	801		CEAL100M16
C	802	470µF/16V	CCH1183
C	803		CKSRYB104K16

=====Circuit Symbol and No.	===	Part Name	Part No.
C	805		CEJA101M16
C	806	470µF/16V	CCH1183
C	807		CKSRYB473K16
C	808		CKSRYB103K50
C	809		CEAL220M16
C	810		CKSQYB104K16
C	812		CKSQYB334K16
C	813		CKSQYB334K16
C	814		CEJA221M6R3
C	815		CEJA101M10
C	816		CEAS331M6R3
C	817		CKSRYB103K50

G Unit Number : CXB3249
Unit Name : Display Assy

MISCELLANEOUS

IC	901	IC	PD6294A
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 4.9152MHz	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
S	907	Switch	CSG1110
IL	901	Lamp 14V 40mA	CEL1608
IL	902	Lamp 14V 40mA	CEL1608
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
R	907		RS1/16S473J

CAPACITORS

C	901		CKSRYB473K16
C	902		CSZSR100M16
C	903		CSZSR100M16
C	904		CKSRYB104K16
C	905		CKSRYB104K16
C	906		CKSRYB104K16

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

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

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

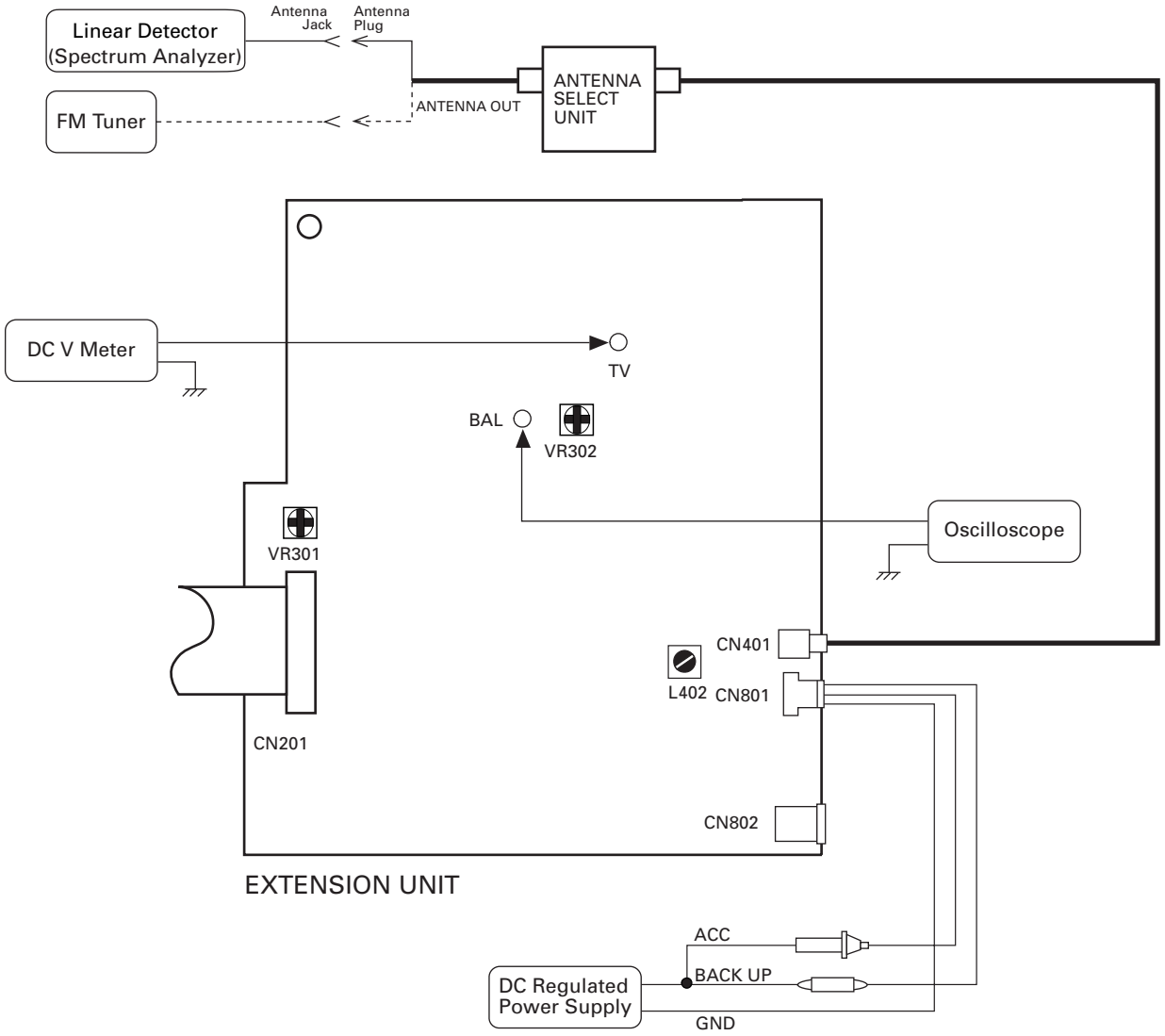
Miscellaneous Parts List

		Pickup Unit(P8)(Service)	CXX1285
M	851	Motor(SPINDLE)	CXB3003
M	852	Motor(ELEVATION)	CXB3006
M	854	Motor(CARRIAGE)	CXB3004
VR	801	Volume 10kΩ	CCW1023

6. ADJUSTMENT

6.1 MODULATOR ADJUSTMENT

● Connection Diagram



● Adjustment

Note: When ajusting, 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**

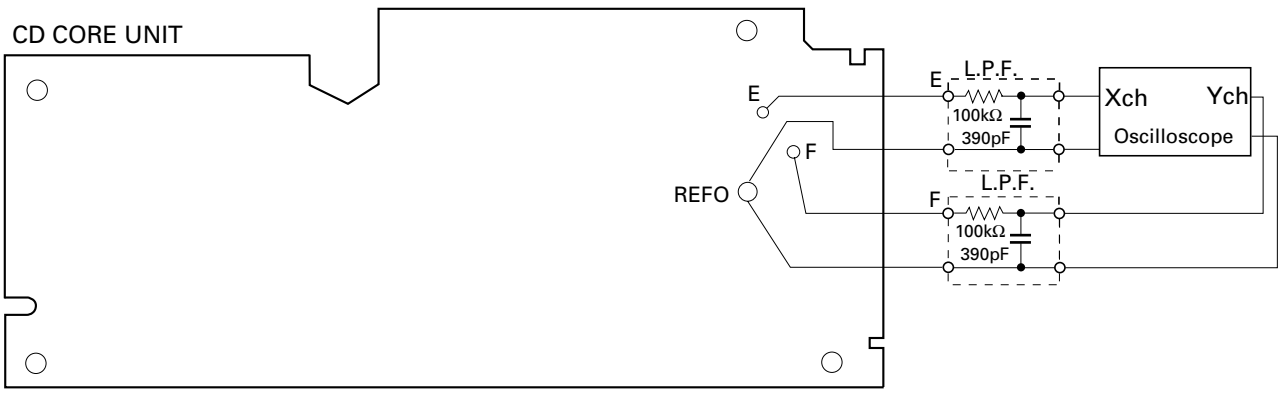
• **Note :**
CD mechanism modules the grating angle of the pickup unit cannot be adjusted after the pickup unit is changed. The pickup unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted pickup unit for the CD mechanism module. 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.

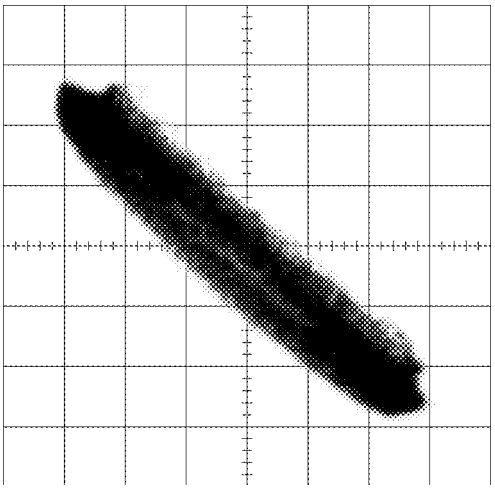
• **Note**
Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

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

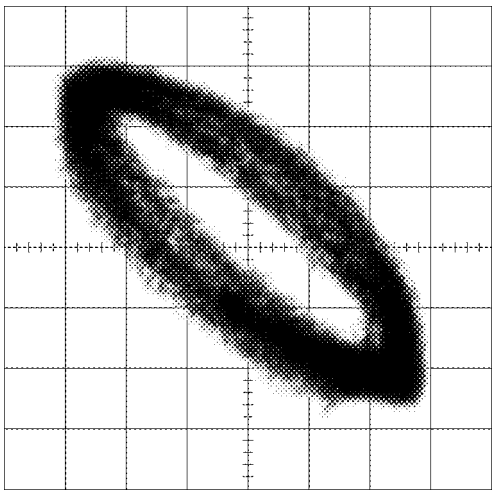
Grating waveform

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

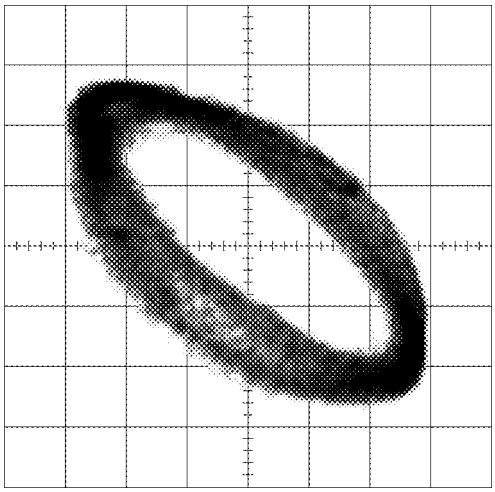
0˚



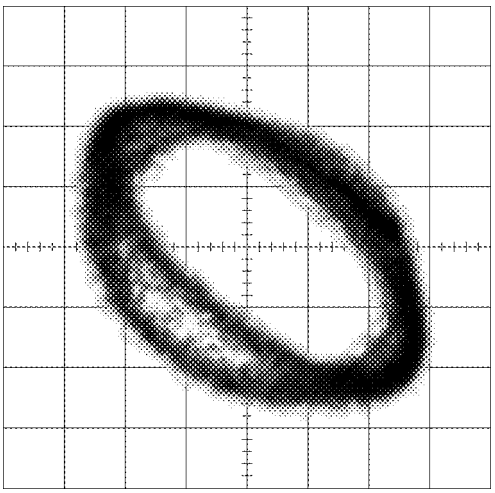
30˚



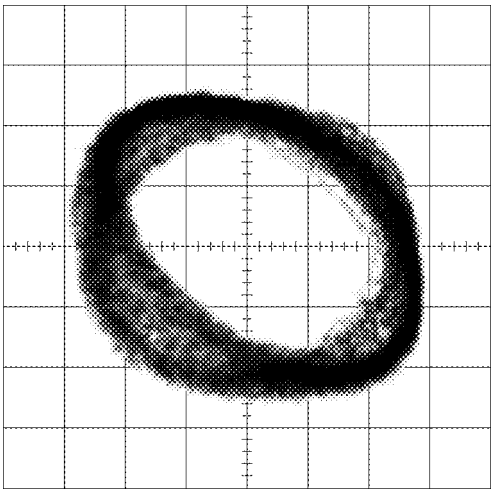
45˚



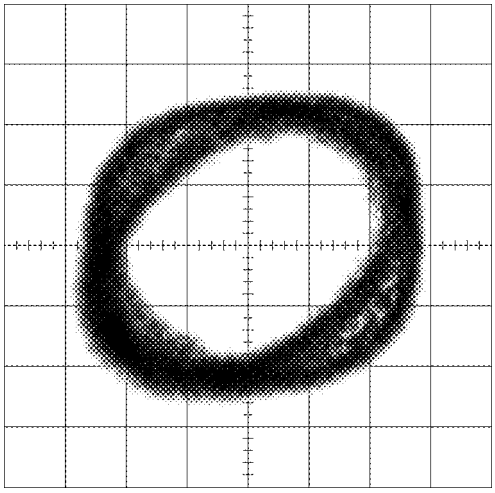
60˚



75˚



90˚



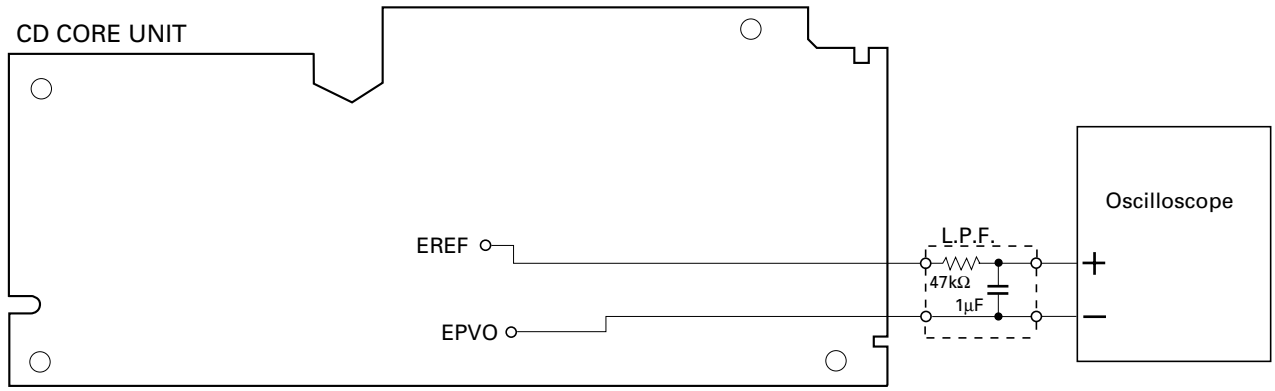
6.3 ADJUSTMENT OF ELEVATION WHEN THE CD CORE UNIT HAS BEEN REMOVED FOR MAINTENANCE

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

• **Note :**
This mechanisms is 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 Equlpment: 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**

Examples of display

1. Enter Test mode.

TRACK	FUNCTION
	' "

2. Press key **P.MODE** to enter Mechanism Test mode.

TRACK	FUNCTION
72	00' 00"

3. Press key **RANDOM** twice to specify the amount of movement.

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

maximum movement
↑
Key RANDOM
↑
during movement
↑
Key RANDOM
↑
minimum movement
↑
Key RANDOM

TRACK	FUNCTION
72	00' 02"

TRACK	FUNCTION
72	00' 01"

TRACK	FUNCTION
72	00' 00"

Examples of display

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

TRACK	FUNCTION
72	01' 02"

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

Release the clamp

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

TRACK	FUNCTION
72	00' 02"

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.

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.

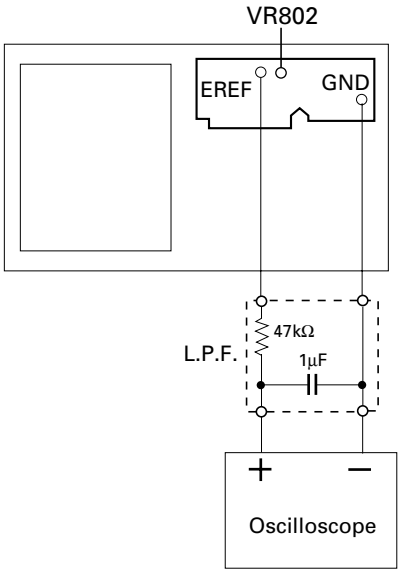
• If the stopper bend is dislocated, check the amount of dislocation by following steps 12 to 14.

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:

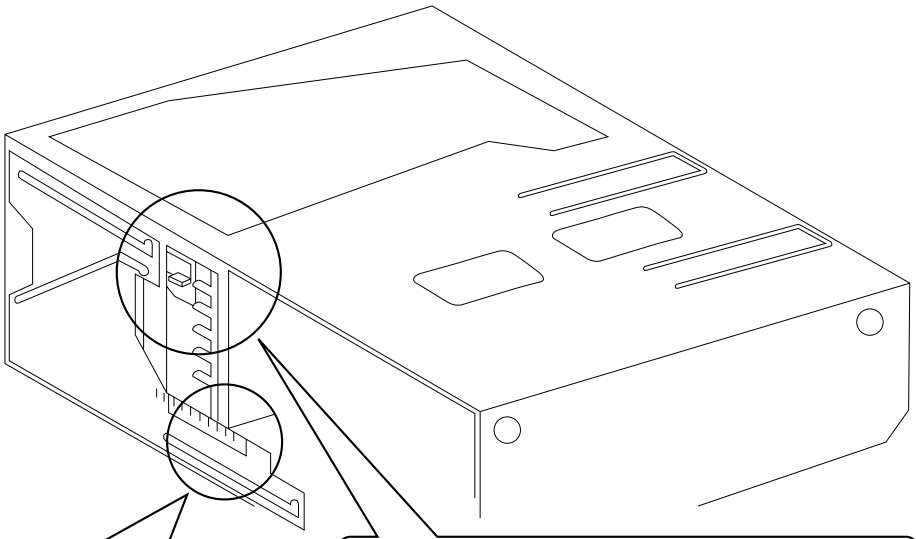
15. Press the **EJECT** switch.

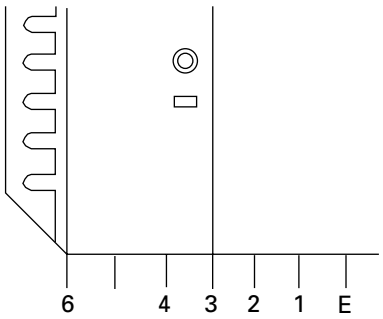
16. Once operation of the mechanism has stopped, turn the power OFF.

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.





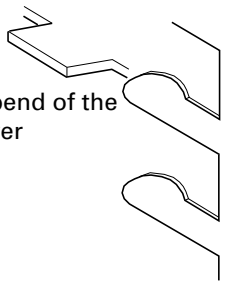
Adjust the insertion gate of magazine to the third scale.

Fig. 1

Stopper bend of the clamp lever

NG

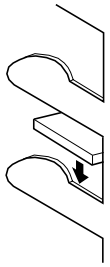
Frame stopper



Dislocated toward the first CD.

Fig. 2

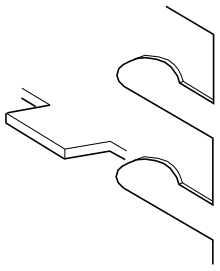
OK



Engaged in the center and pressed downward.

Fig. 3

NG



Dislocated toward the sixth CD.

Fig. 4

7. GENERAL INFORMATION

7.1 PARTS

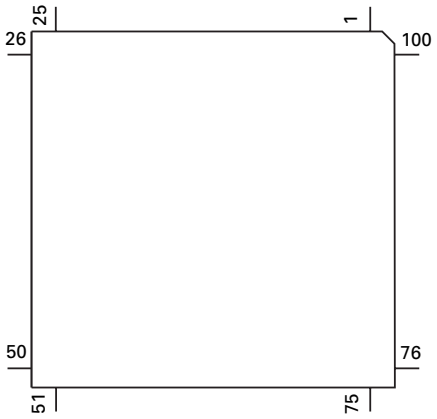
7.1.1 IC

● **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	$\overline{\text{RST}}$	I	Reset signal input
6	A0	I	Command/parameter identification signal input
7	$\overline{\text{STB}}$	I	Data strobe signal input
8	$\overline{\text{SCK}}$	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	$\overline{\text{XTAL}}$	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

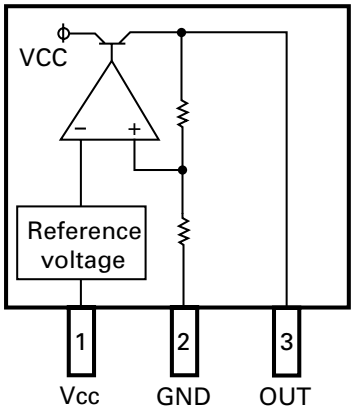
Pin No.	Pin Name	I/O	Function and Operation
52	PACK	O	CD-TEXT PACK synchronous signal
53	TSO	O	CD-TEXT data serial output
54	TSI	I	CD-TEXT control parameter serial input
55	$\overline{\text{TSCK}}$	I	CD-TEXT serial clock input
56	TSTB	I	CD-TEXT parameter strobe signal input
57	GND		Logic circuit GND
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

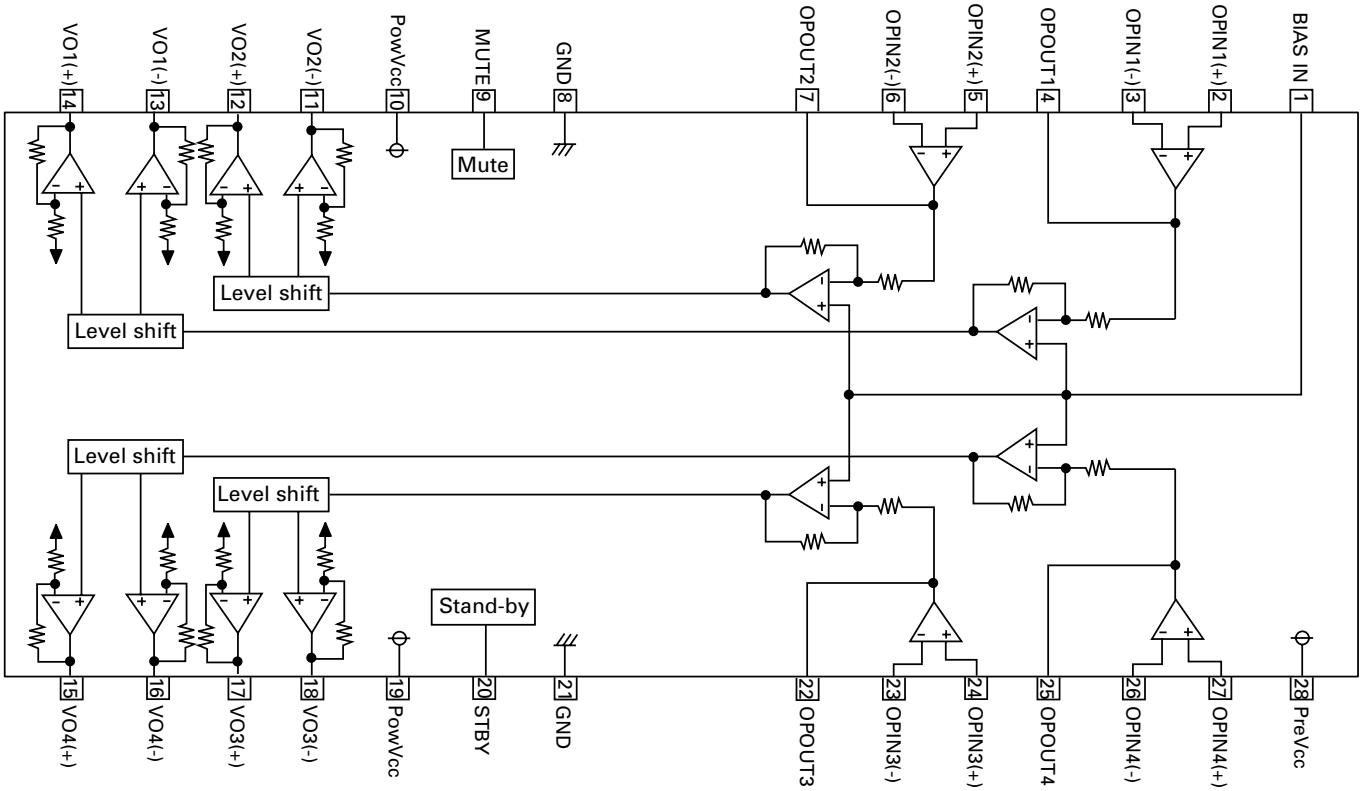


IC's marked by* are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

BA05FP



BA5986FM

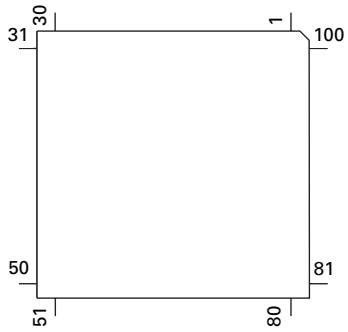


● **Pin Functions (PD5514A)**

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	$\overline{\text{ADENA}}$	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	$\overline{\text{RESET}}$	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	$\overline{\text{NMI}}$	I		Pull up
18	$\overline{\text{BSENS}}$	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	$\overline{\text{TESTIN}}$	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	$\overline{\text{CS}}$	O	C	SRAM chip select
49	XAO	O	C	CD LSI data discernment control signal output
50	$\overline{\text{XSTB}}$	O	C	CD LSI strobe output
51	$\overline{\text{XRST}}$	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	$\overline{\text{ASENSFM}}$	I		Select FM="ASENS"
74	$\overline{\text{EJSW}}$	I		Eject key switch interrupt input
75	$\overline{\text{MAG}}$	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	$\overline{\text{DISK}}$	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

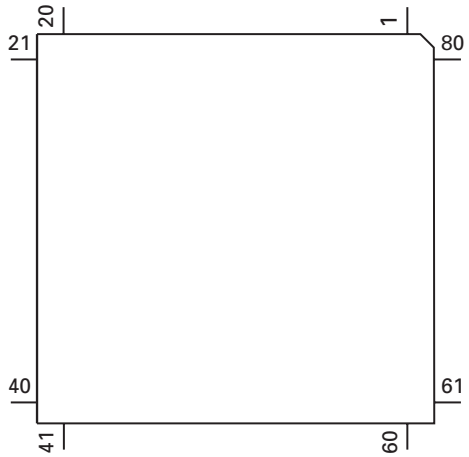


Format	Meaning
C	C MOS
NM	Middle resistivity N channel open drain

● **Pin Functions (PD6294A)**

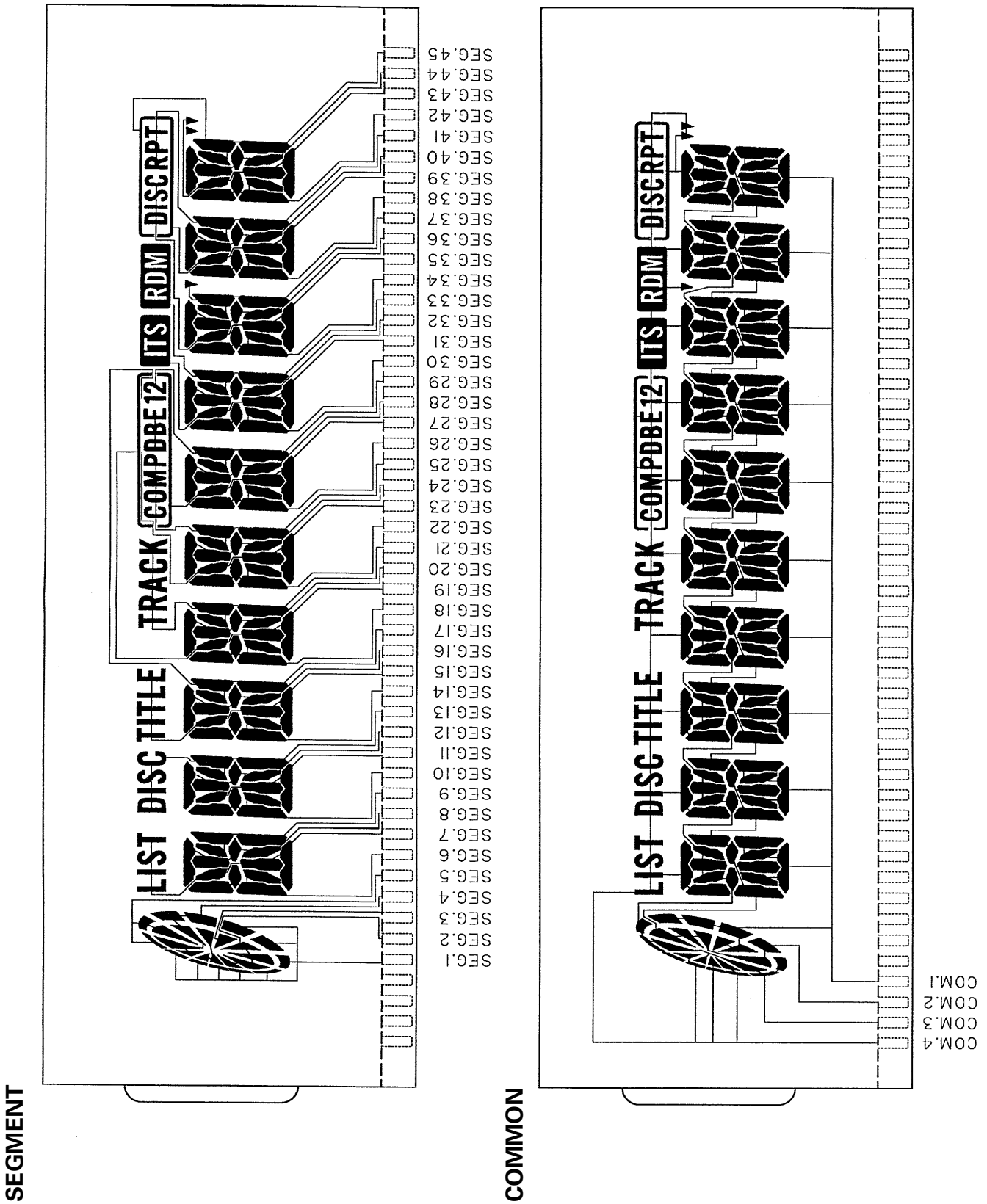
Pin No.	Pin Name	I/O	Function and Operation
1	VSS		GND
2	X1		Crystal oscillator connection pin
3	X0		Crystal oscillator connection pin
4	$\overline{\text{RST}}$	I	System reset
5,6	MODE1,0		GND
7	GRN/$\overline{\text{AMB}}$	O	GREEN/AMBER select output
8	SO	O	UART output
9	SI	I	UART output
10	$\overline{\text{REMIN}}$	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**



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).

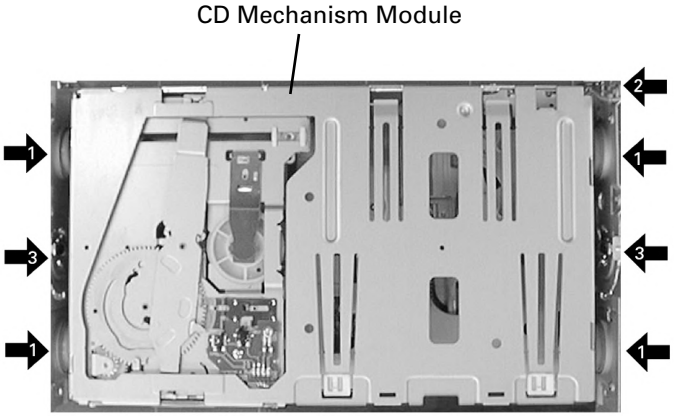


Fig.5

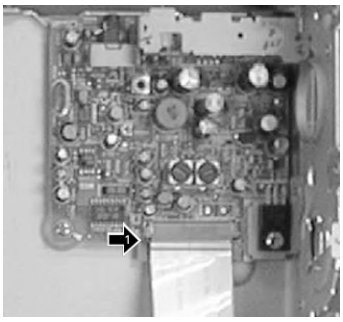


Fig.6

● **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.

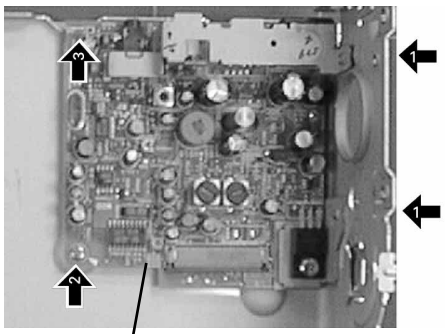


Fig.7

● 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.

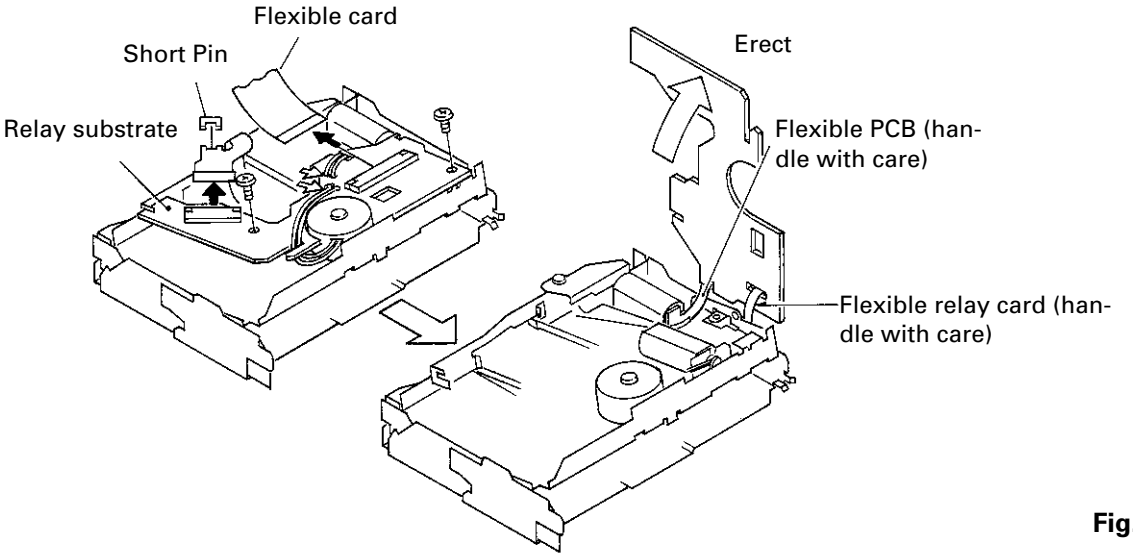


Fig.8

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).

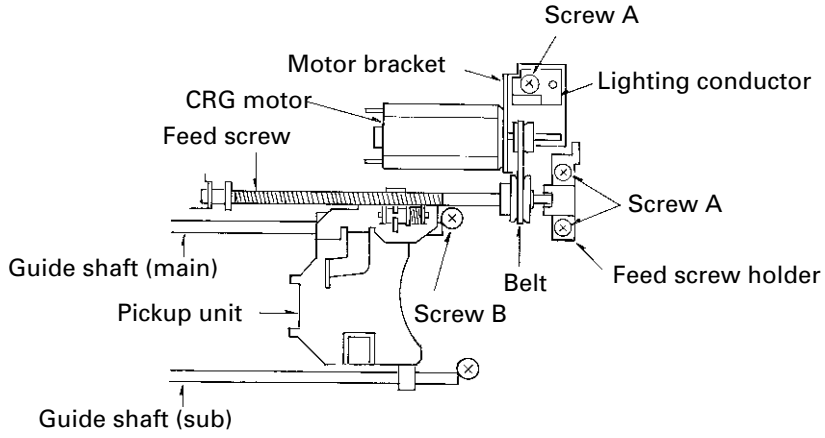


Fig.9

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.

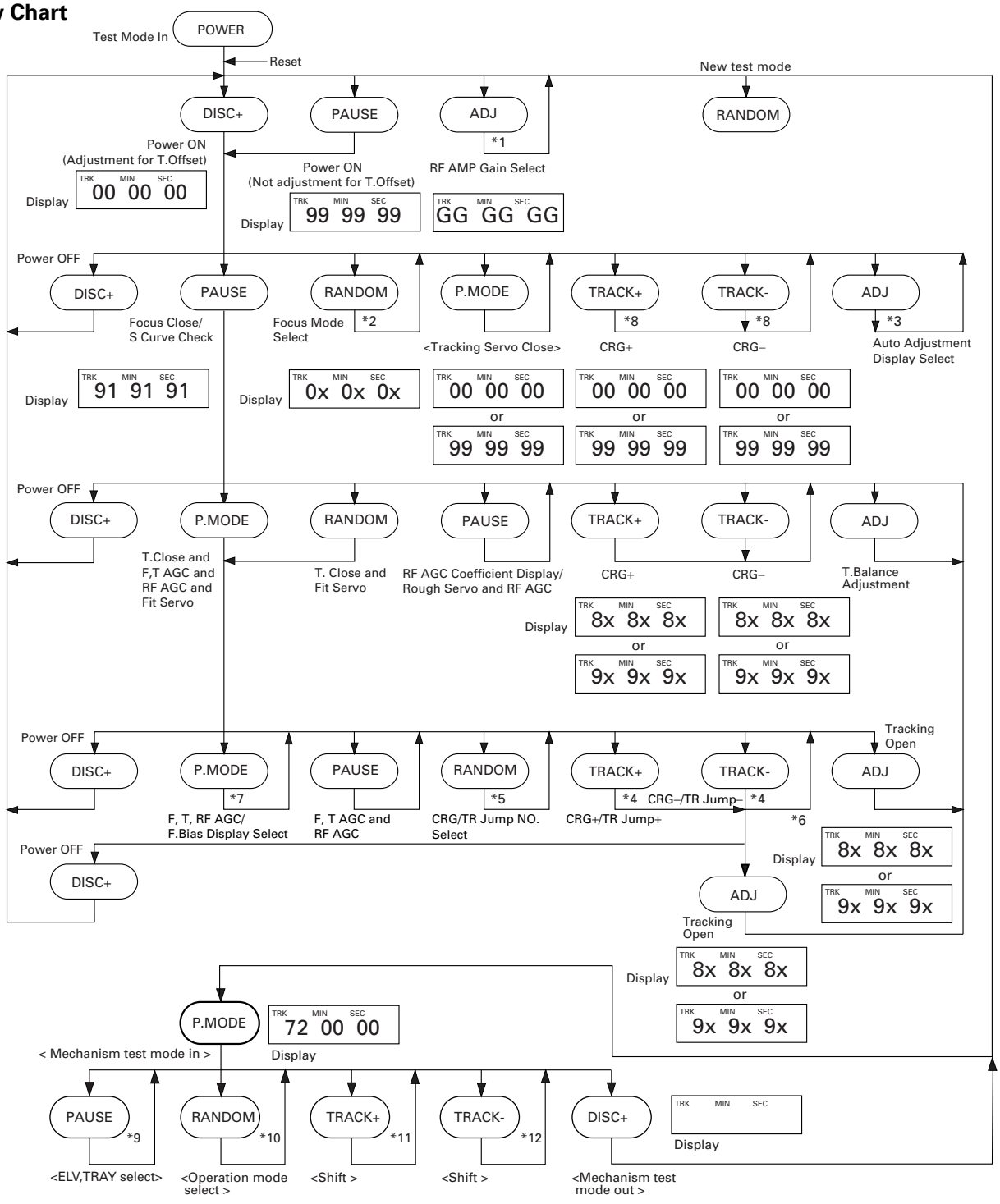
- If the ADJ or PAUSE key is pressed while focus search is in progress, immediately turn the power off (otherwise the actuator may be damaged due to the lens stuck).

- 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



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

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

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

F.Cancel 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 Display: Single TR → 32TRK → 100TRK → CRG Move → Single TR
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 → TRK, MIN, SEC

(F,T.AGC Gain = (Present Value/Initial Value) × 20)

*8 Voltage of CRG Motor = 2 [V]

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

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

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

*11 ELV select : ELV dowm (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) 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	Mecha-nism	An error upon ejection	MAG switch release time has time out. Elevation time out when eject.
60	Mecha-nism	An error while putting in and out the tray	Tray in / out time has time out. Tray is caught when put in.
70	Mecha-nism	An error upon elevation	Elevation time has time out.
80	Mecha-nism	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	Test mode		New test mode	
(Example)	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.

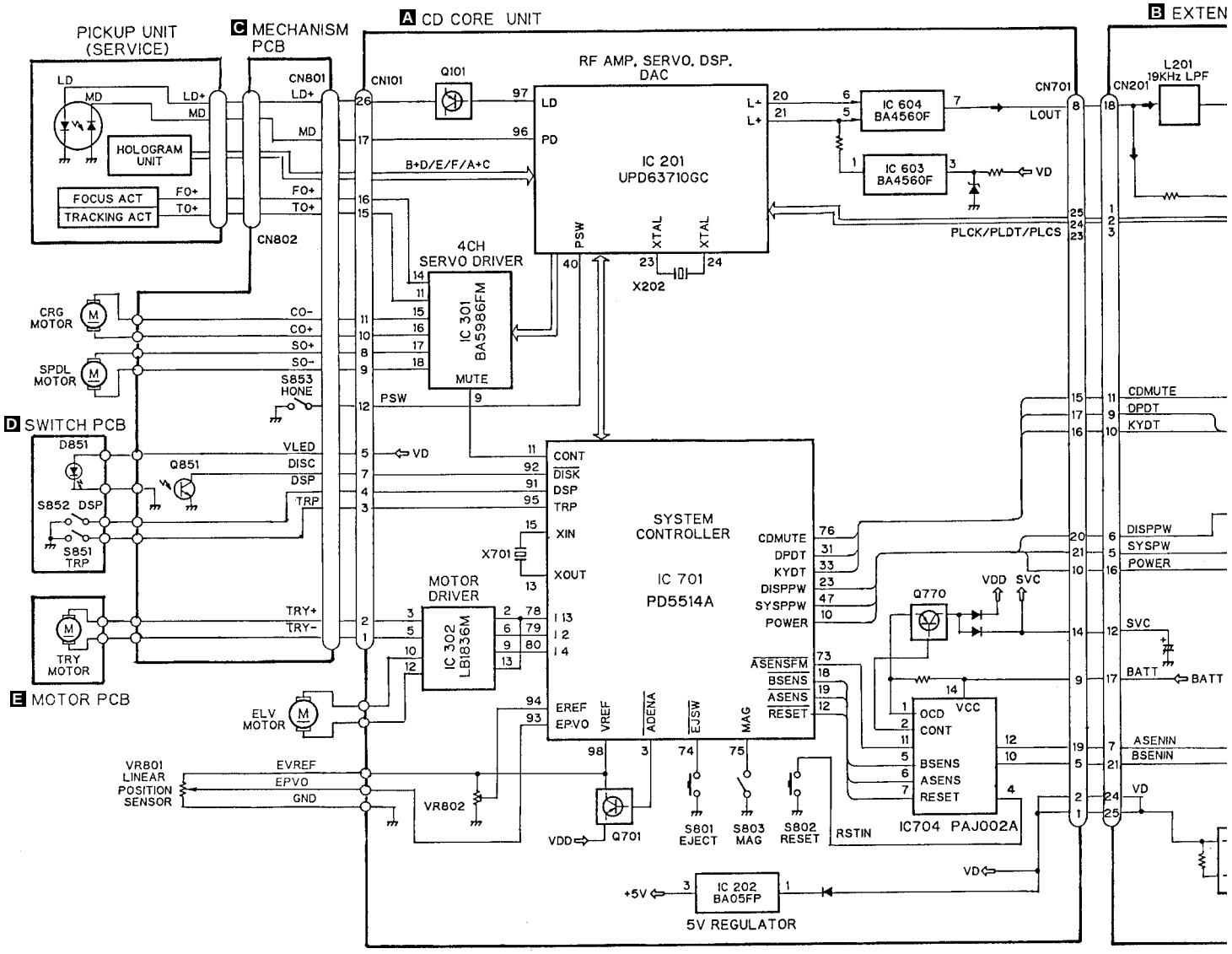
TRK No.	MIN.	SEC.
12	34'	56"

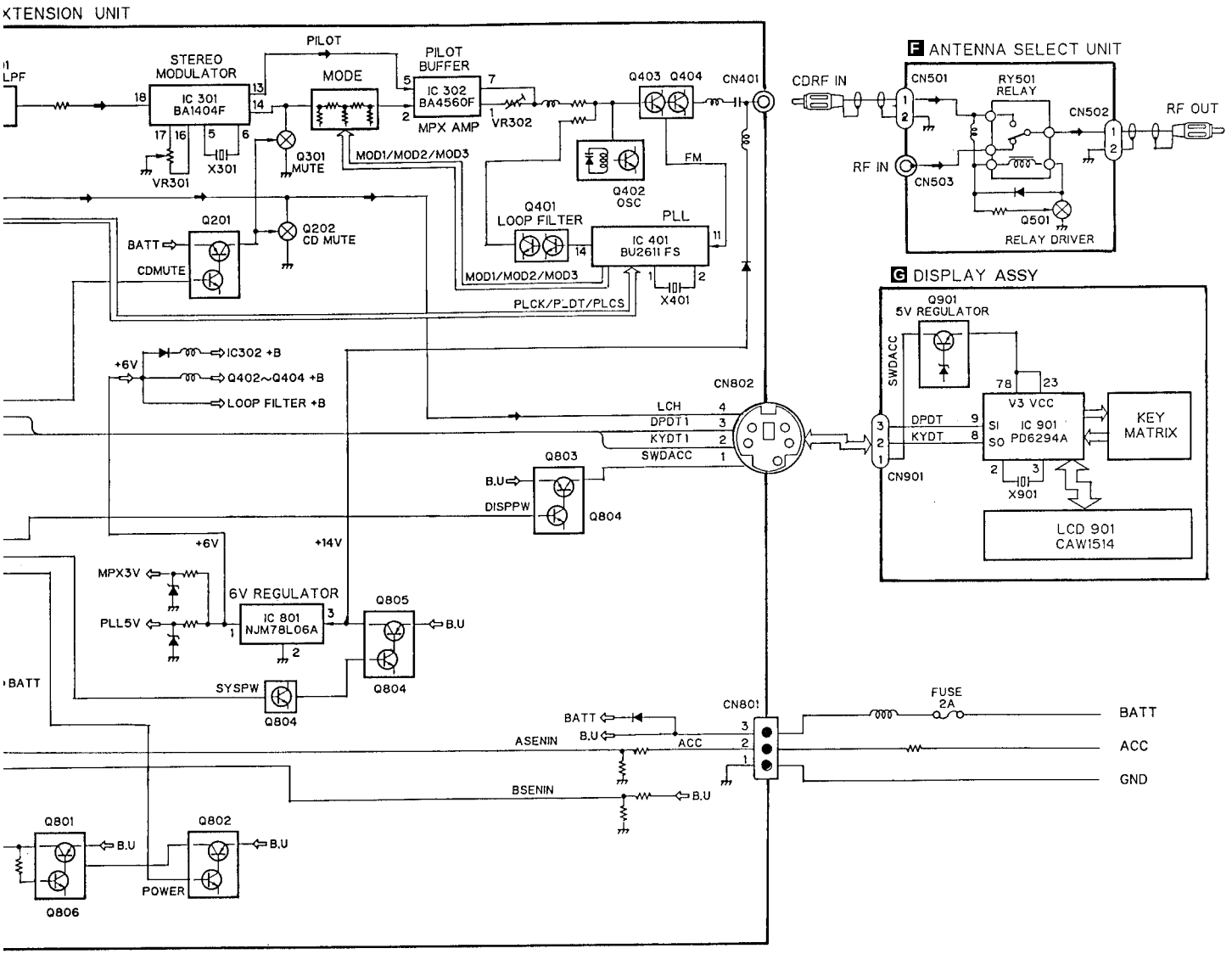
(B) Error No. display

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

ERROR-40

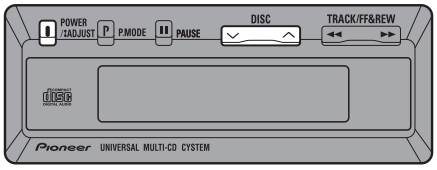
7.3 BLOCK DIAGRAM




XTENSION UNIT
LPF
STEREO MODULATOR
IC 301 BA1404F
PILOT
MODE
PILOT BUFFER
IC 302 BA4560F
MPX AMP
VR302
Q403 Q404
CN401
VR301
X301
Q301 MUTE
MOD1/MOD2/MOD3
Q402 OSC
FM
Q401 LOOP FILTER
PLL
IC 401 BU2611 FS
X401
Q201
BATT
CDMUTE
Q202 CD MUTE
PLCK/P_DT/PLCS
+6V
IC302 +B
Q402~Q404 +B
LOOP FILTER +B
CN802
LCH
DPDT1
KYDT1
SWDACC
Q803
B.U
DISPPW
Q804
+6V
+14V
MPX3V
PLL5V
6V REGULATOR
IC 801 NJM78L06A
Q805
SYSPW
Q804
BATT
CN801
ASENIN
BSENIN
ACC
FUSE 2A
BATT
ACC
GND
Q801
Q806
Q802
POWER
F ANTENNA SELECT UNIT
CDRF IN
CN501
RY501 RELAY
CN502
RF OUT
RF IN
CN503
Q501
RELAY DRIVER
G DISPLAY ASSY
Q901 5V REGULATOR
SWDACC
V3 VCC
DPDT
KYDT
SI
SO
IC 901 PD6294A
KEY MATRIX
CN901
X901
LCD 901 CAW1514

8. OPERATIONS AND SPECIFICATIONS

8.1 OPERATIONS



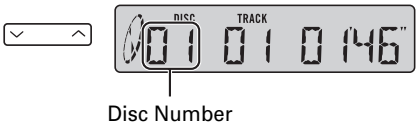
Start the CD player

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.

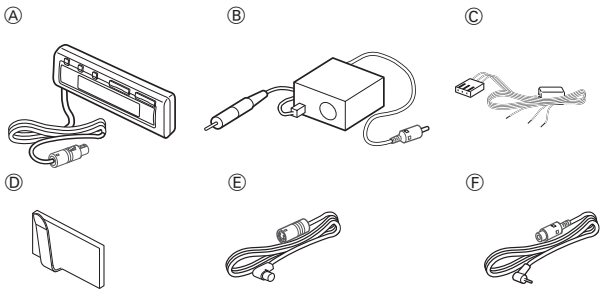
2. Press button to switch on and start the player.

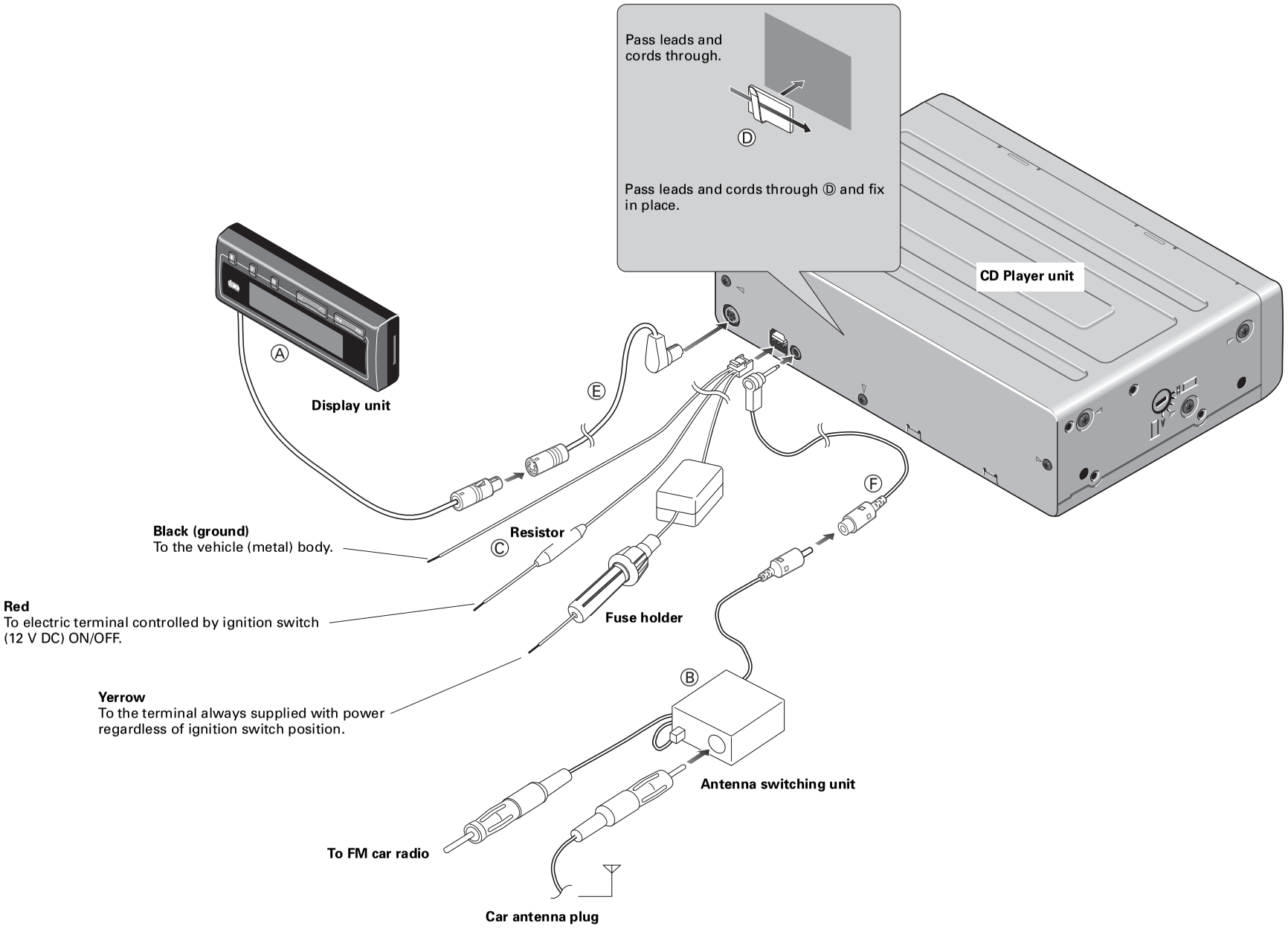
Disc Number Search



∧ : increase the number.
∨ : decrease the number.

Parts for connection




Pass leads and cords through.
Ⓓ
Pass leads and cords through Ⓓ and fix in place.
CD Player unit
Ⓐ
Display unit
Ⓔ
Ⓕ
Black (ground)
To the vehicle (metal) body.
Resistor
Ⓒ
Red
To electric terminal controlled by ignition switch (12 V DC) ON/OFF.
Fuse holder
Ⓑ
Yerrow
To the terminal always supplied with power regardless of ignition switch position.
Antenna switching unit
To FM car radio
Car antenna plug

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.