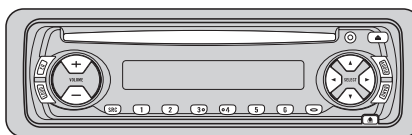


Service Manual

Pioneer

DEH-2350/X1M/ES



ORDER NO.
CRT2559

HIGH POWER CD PLAYER WITH FM/AM TUNER

DEH-2350

DEH-1350

X1M/ES

X1M/ES



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

Model No.	Order No.	Mech. Module	Remarks
CX-958	CRT2423	S8.1	CD Mech. Module:Circuit Description, Mech.Description, Disassembly

CONTENTS

1. SAFETY INFORMATION	2	7. GENERAL INFORMATION	39
2. EXPLODED VIEWS AND PARTS LIST	2	7.1 DIAGNOSIS	39
3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM	8	7.1.1 TEST MODE	39
4. PCB CONNECTION DIAGRAM	24	7.1.2 DISASSEMBLY	42
5. ELECTRICAL PARTS LIST	32	7.1.3 CONNECTOR FUNCTION DESCRIPTION	46
6. ADJUSTMENT.....	35	7.2 PARTS	47
		7.2.1 IC.....	47
		7.2.2 DISPLAY	54
		7.3 OPERATIONAL FLOW CHART	55
		8. OPERATIONS AND SPECIFICATIONS.....	56

PIONEER CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153-8654, Japan
PIONEER ELECTRONICS SERVICE INC. P.O.Box 1760, Long Beach, CA 90801-1760 U.S.A.
PIONEER EUROPE NV Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
PIONEER ELECTRONICS ASIACENTRE PTE.LTD. 253 Alexandra Road, #04-01, Singapore 159936

© PIONEER CORPORATION 2000

K-ZZA. OCT. 2000 Printed in Japan

● CD Player Service Precautions

1. For pickup unit(CXX1285) handling, please refer to "Disassembly"(see page 42).

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

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

3. Please check the grating after changing the service pickup unit(see page 37).

1. SAFETY INFORMATION

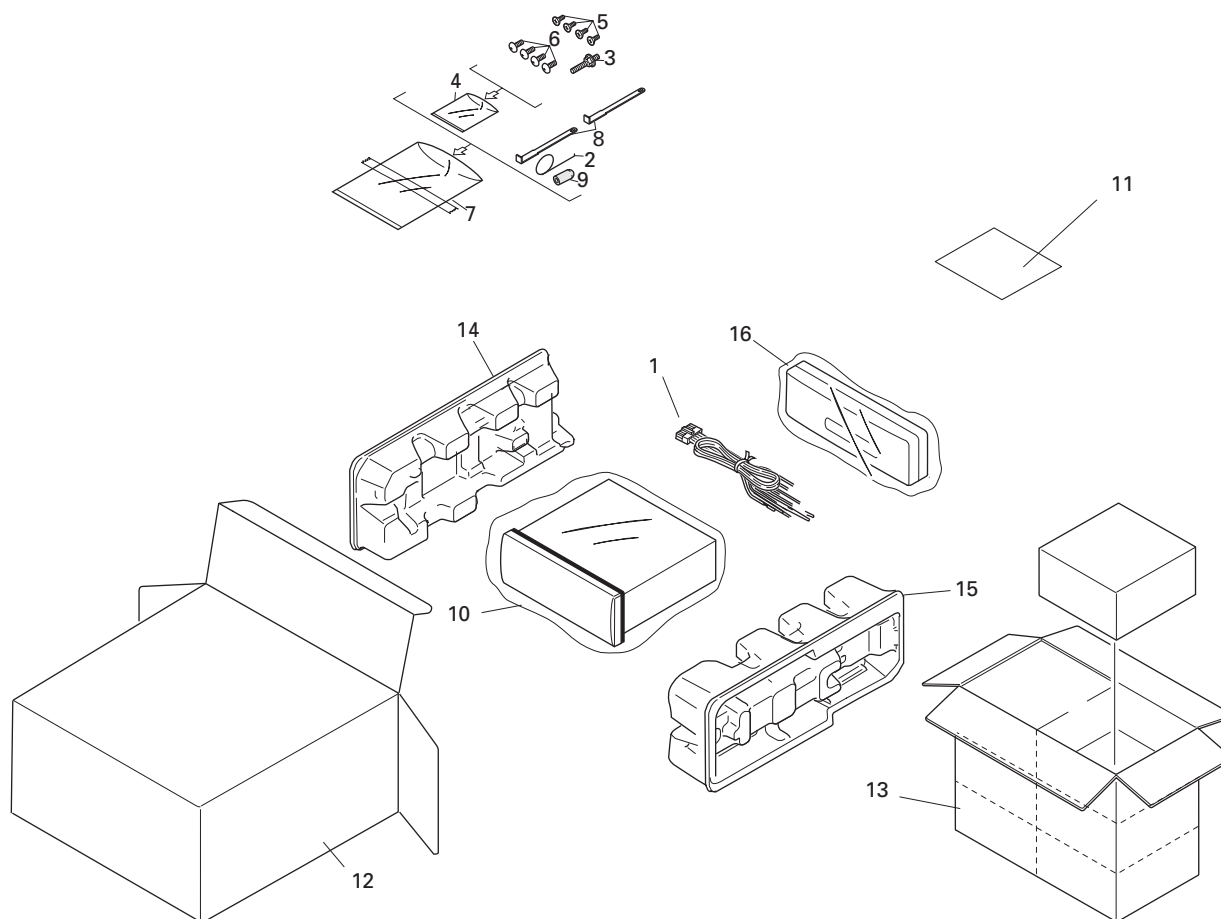
This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.

Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.

Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely; you should not risk trying to do so and refer the repair to a qualified service technician.

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.

(1) PACKING SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.
	1 Cord Assy	CDE6468	11-1	*****	
	2 Spring	CBH1650	11-2	Owner's Manual	CRD3281
	3 Screw	CBA1002	11-3	Installation Manual	CRD3283
*	4 Polyethylene Bag	CEG-127	12	Carton	See Contrast table(2)
	5 Screw	CRZ50P090FMC	13	Contain Box	See Contrast table(2)
	6 Screw	TRZ50P080FMC	14	Protector	CHP2346
*	7 Polyethylene Bag	CEG-158	15	Protector	CHP2347
	8 Handle	CNC5395	16	Case Assy	See Contrast table(2)
	9 Bush	CNV3930			
	10 Polyethylene Bag	CEG-162			

(2) CONTRAST TABLE

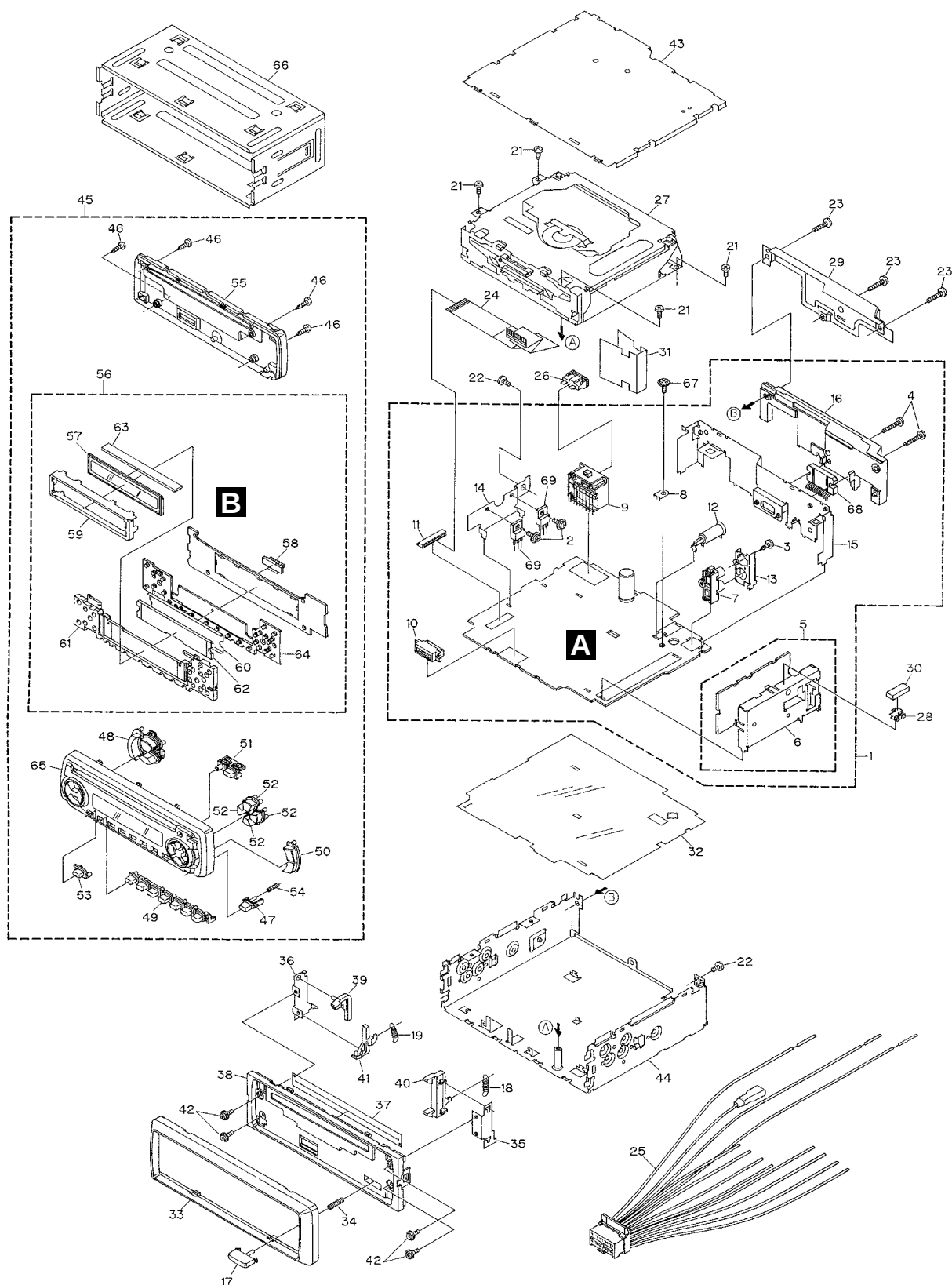
DEH-2350/X1M/ES and DEH-1350/X1M/ES are constructed the same except for the following:

Mark No.	Symbol and Description	Part No.	
		DEH-2350/X1M/ES	DEH-1350/X1M/ES
12	Carton	CHG4150	CHG4157
13	Contain Box	CHL4150	CHL4157
16	Case Assy	CXB3520	Not used

● Owner's Manual, Installation Manual

Model	Part No.	Language
DEH-2350/X1M/ES	CRD3281	English, Spanish, Portuguese(B), Chinese, Arabic
DEH-1350/X1M/ES	CRD3283	

2.2 EXTERIOR



(1) EXTERIOR SECTION PARTS LIST

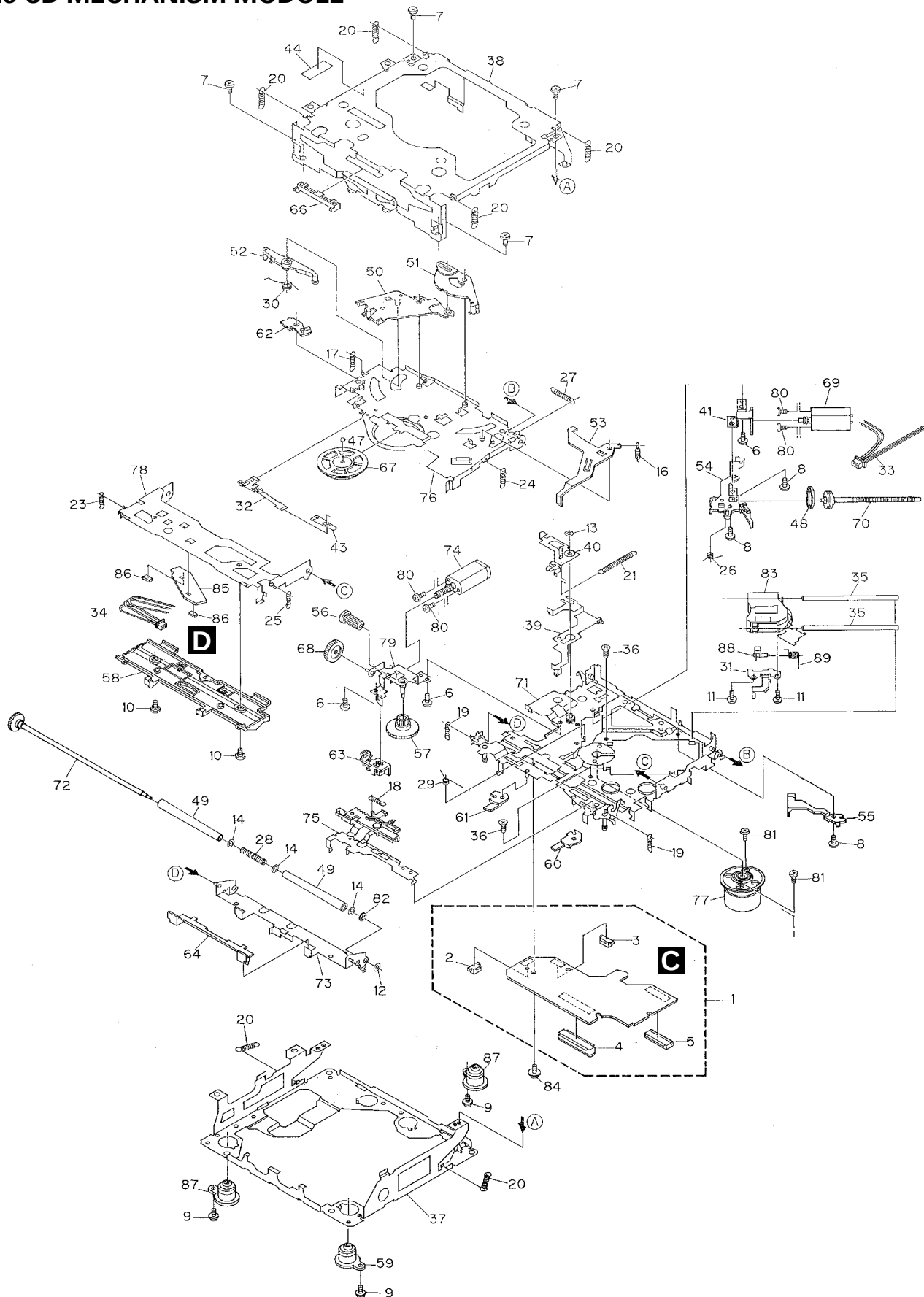
Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Tuner Amp Unit	See Contrast table(2)	36	Holder	CNC8042
2	Screw	ASZ26P080FMC	37	Cover	CNM6276
3	Screw	BPZ26P080FMC	38	Panel	CNS5355
4	Screw	BSZ26P160FMC	39	Arm	CNV4692
5	FM/AM Tuner Unit	CWE1563	40	Arm	CNV4728
6	Holder	CNC8815	41	Arm	CNV5576
7	Pin Jack(CN301)	CKB1041	42	Screw	IMS20P030FZK
8	Terminal(CN403)	CKF1059	43	Case Unit	CXB4033
9	Plug(CN901)	CKM1330	44	Chassis Unit	CXB4625
10	Connector(CN601)	CKS3581	45	Detach Grille Assy	See Contrast table(2)
11	Connector(CN605)	CKS3838	46	Screw	BPZ20P100FZK
12	Antenna Jack(CN402)	CKX1056	47	Button(DETACH)	CAC5789
13	Holder	CNC8041	48	Button(+/-, EQ, LD)	CAC6821
14	Holder	CNC8043	49	Button(1-6, CLK)	CAC6822
15	Holder	CNC9128	50	Button(A, B)	CAC6823
16	Heat Sink	CNR1589	51	Button(EJECT/BSM)	CAC6824
17	Button	CAC4836	52	Button(CROSS)	CAC6825
18	Spring	CBH1835	53	Button(SOURCE)	CAC6851
19	Spring	CBH2208	54	Spring	CBH2210
20			55	Cover	CNS6114
21	Screw	BSZ26P060FMC	56	Keyboard Unit	See Contrast table(2)
22	Screw	BSZ30P060FMC	57	LCD	See Contrast table(2)
23	Screw	BSZ30P120FMC	58	Connector(CN1801)	CKS3580
24	Cable	CDE6160	59	Holder	CNC9078
25	Cord Assy	CDE6468	60	Sheet	CNM7057
26	Fuse(10A)	CEK1136	61	Lighting Conductor	CNV6475
27	CD Mechanism Module(S8.1)	CXK5203	62	Lighting Conductor	CNV6476
28	Holder	CNC5704	63	Rubber	CNV6477
29	Cover	CNC9127	64	Rubber	CNV6478
30	Cushion	CNM5210	65	Grille Unit	See Contrast table(2)
31	Insulator	CNM6224	66	Holder Unit	CXB6681
32	Insulator	CNM6386	67	Screw	ISS26P055FUC
33	Panel	CNS6344	68	IC(IC302)	PAL006A
34	Spring	CBH2367	69	Transistor(Q904, 981)	2SD2396
35	Bracket	CNC6791			

(2) CONTRAST TABLE

DEH-2350/X1M/ES and DEH-1350/X1M/ES are constructed the same except for the following:

Mark No.	Symbol and Description	Part No.	
		DEH-2350/X1M/ES	DEH-1350/X1M/ES
1	Tuner Amp Unit	CWM7293	CWM7297
45	Detach Grille Assy	CXB6146	CXB6150
56	Keyboard Unit	CWM7303	CWM7307
57	LCD	CAW1606	CAW1633
65	Grille Unit	CXB7182	CXB7186

2.3 CD MECHANISM MODULE



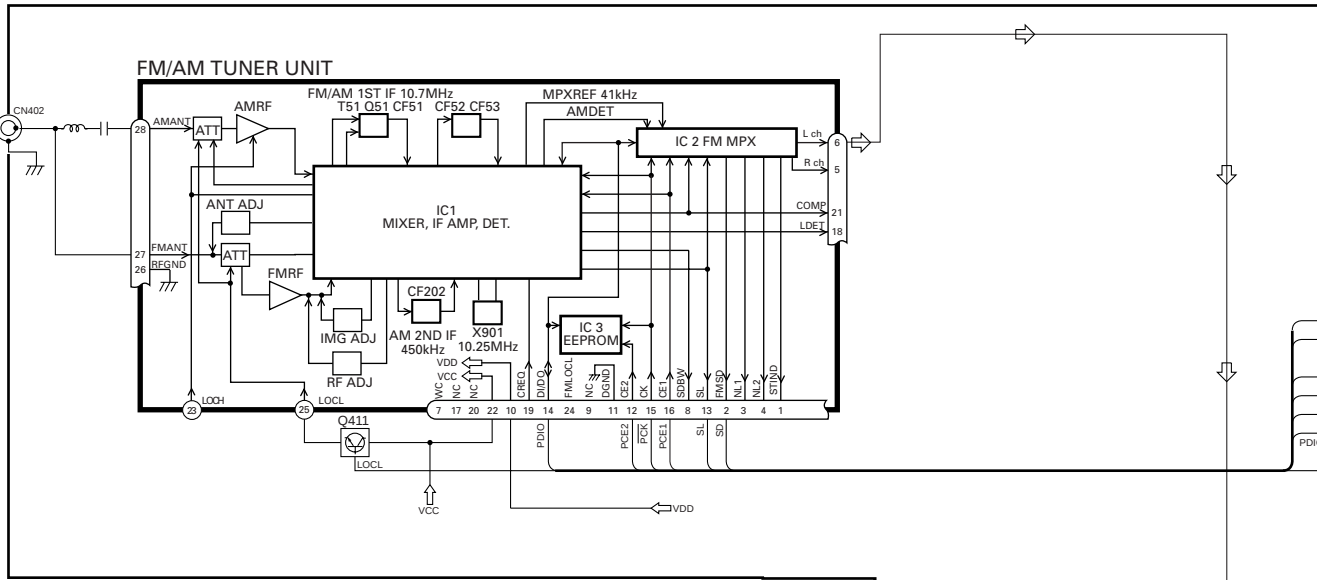
● CD MECHANISM MODULE SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Control Unit	CWX2411	46		
2	Connector(CN802)	CKS2192	47	Ball	CNR1189
3	Connector(CN801)	CKS2193	48	Belt	CNT1086
4	Connector(CN701)	CKS2773	49	Roller	CNV4509
5	Connector(CN101)	CKS3486	50	Arm	CNV6037
6	Screw	BMZ20P030FMC	51	Arm	CNV5247
7	Screw	BSZ20P040FMC	52	Arm	CNV5248
8	Screw(M2x3)	CBA1077	53	Arm	CNV5249
9	Screw(M2x5)	EBA1028	54	Guide	CNV5254
10	Screw	CBA1243	55	Guide	CNV5255
11	Screw(M2x4)	CBA1362	56	Gear	CNV5257
12	Washer	CBF1037	57	Gear	CNV5256
13	Washer	CBF1038	58	Guide	CNV6272
14	Washer	CBF1060	59	Damper	CNV6174
15			60	Arm	CNV6096
16	Spring	CBH2079	61	Arm	CNV6031
17	Spring	CBH2117	62	Arm	CNV6211
18	Spring	CBH2314	63	Guide	CNV6012
19	Spring	CBH2110	64	Guide	CNV5510
20	Spring	CBH2282	65		
21	Spring	CBH2318	66	Guide	CNV5751
22			67	Clamper	CNV6013
23	Spring	CBH2324	68	Gear	CNV5813
24	Spring	CBH2118	69	Motor Unit(M1)	CXB2190
25	Spring	CBH2161	70	Screw Unit	CXB5892
26	Spring	CBH2163	71	Chassis Unit	CXB4797
27	Spring	CBH2189	72	Gear Unit	CXB4728
28	Spring	CBH2377	73	Arm Unit	CXB5753
29	Spring	CBH2260	74	Motor Unit(M2)	CXB2195
30	Spring	CBH2262	75	Lever Unit	CXB4730
31	Bracket	CNC8568	76	Arm Unit	CXB4731
32	Spring	CBL1369	77	Motor Unit(M3)	CXB2562
33	Connector	CDE5531	78	Arm Unit	CXB4732
34	Connector	CDE5532	79	Bracket Unit	CXB4795
35	Shaft	CLA3894	80	Screw	JFZ20P025FMC
36	Screw(M2.6x6)	CBA1458	81	Screw	JGZ17P025FZK
37	Frame	CNC8565	82	Washer	YE20FUC
38	Frame	CNC8749	83	Pickup Unit(Service)(P8)	CXX1285
39	Lever	CNC9265	84	Screw	IMS26P030FMC
40	Arm	CNC8663	* 85	PCB	CNX2982
41	Bracket	CNC8567	86	Photo-transistor(Q1, 2)	CPT230SX-TU
42			87	Damper	CNV6175
43	Spacer	CNM3315	88	Rack	CNV6014
44	Sheet	CNM6659	89	Spring	CBH2315
45					

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

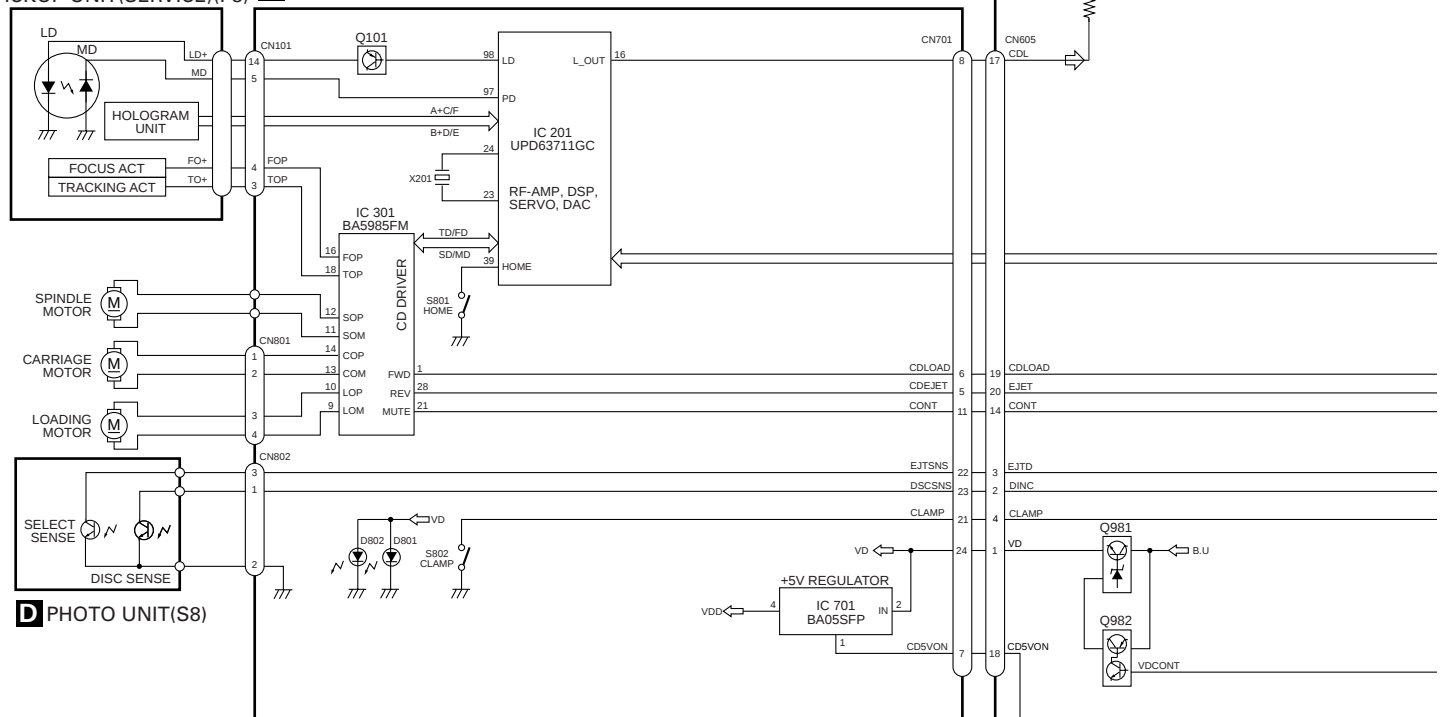
3.1 BLOCK DIAGRAM

A TUNER AMP UNIT

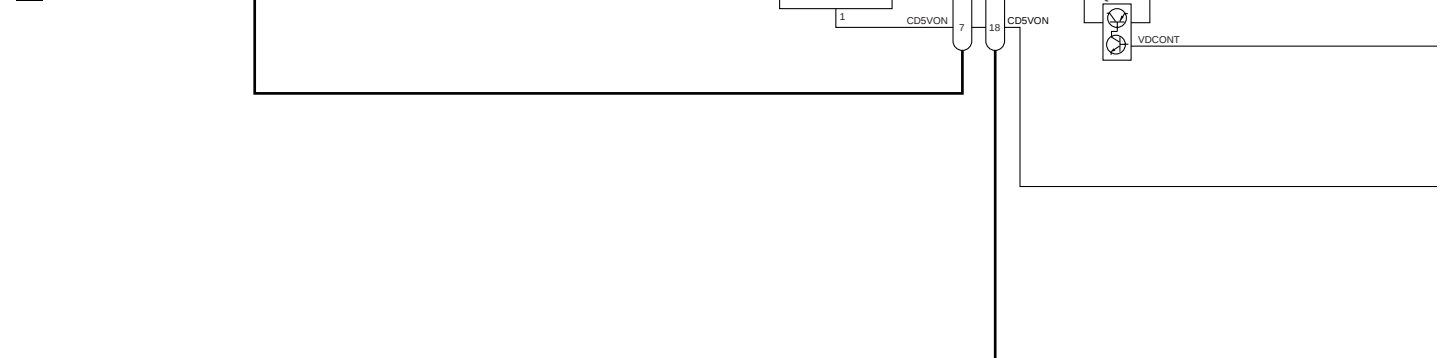


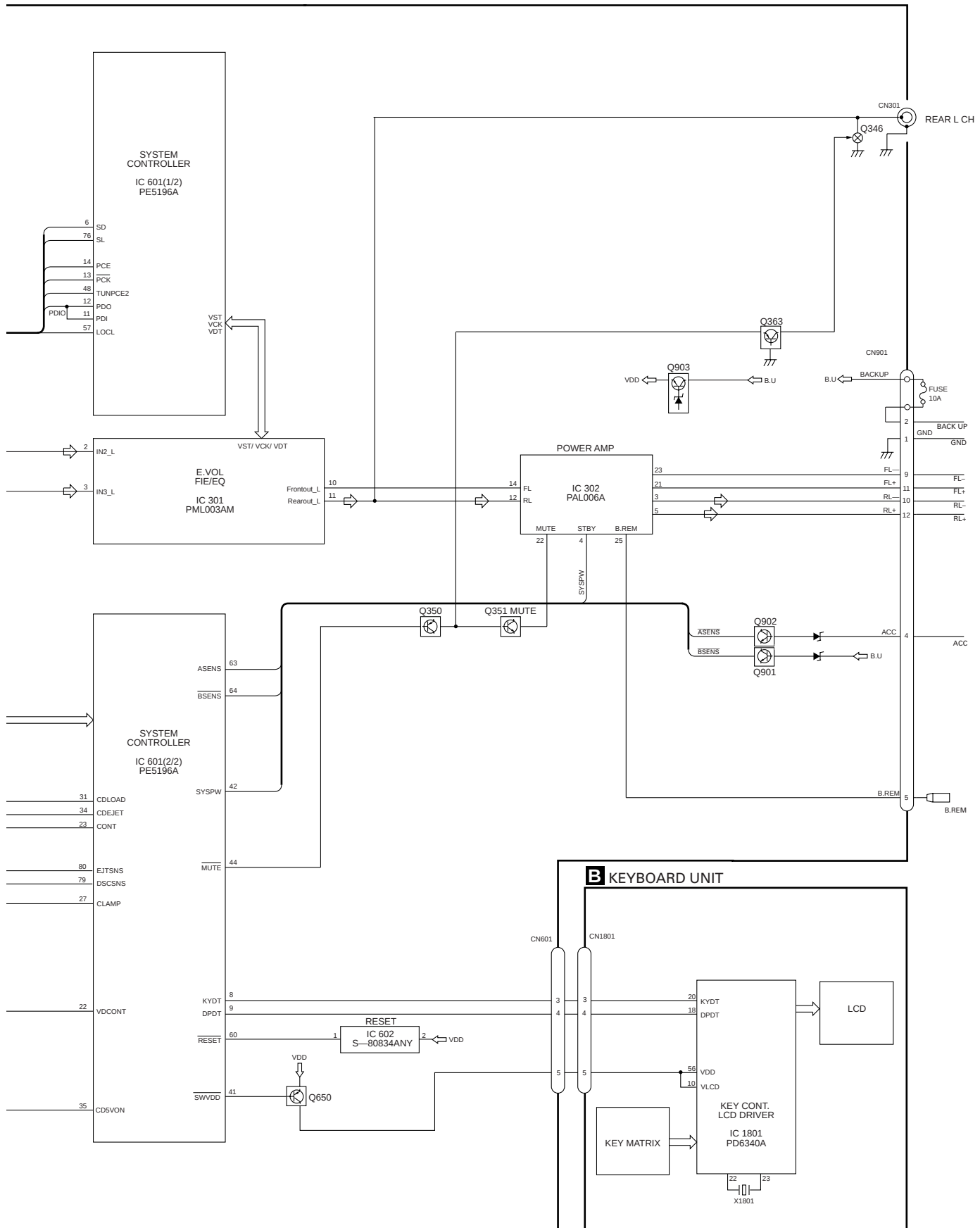
B PICKUP UNIT(SERVICE)(P8)

C CONTROL UNIT



D PHOTO UNIT(S8)





A

B

C

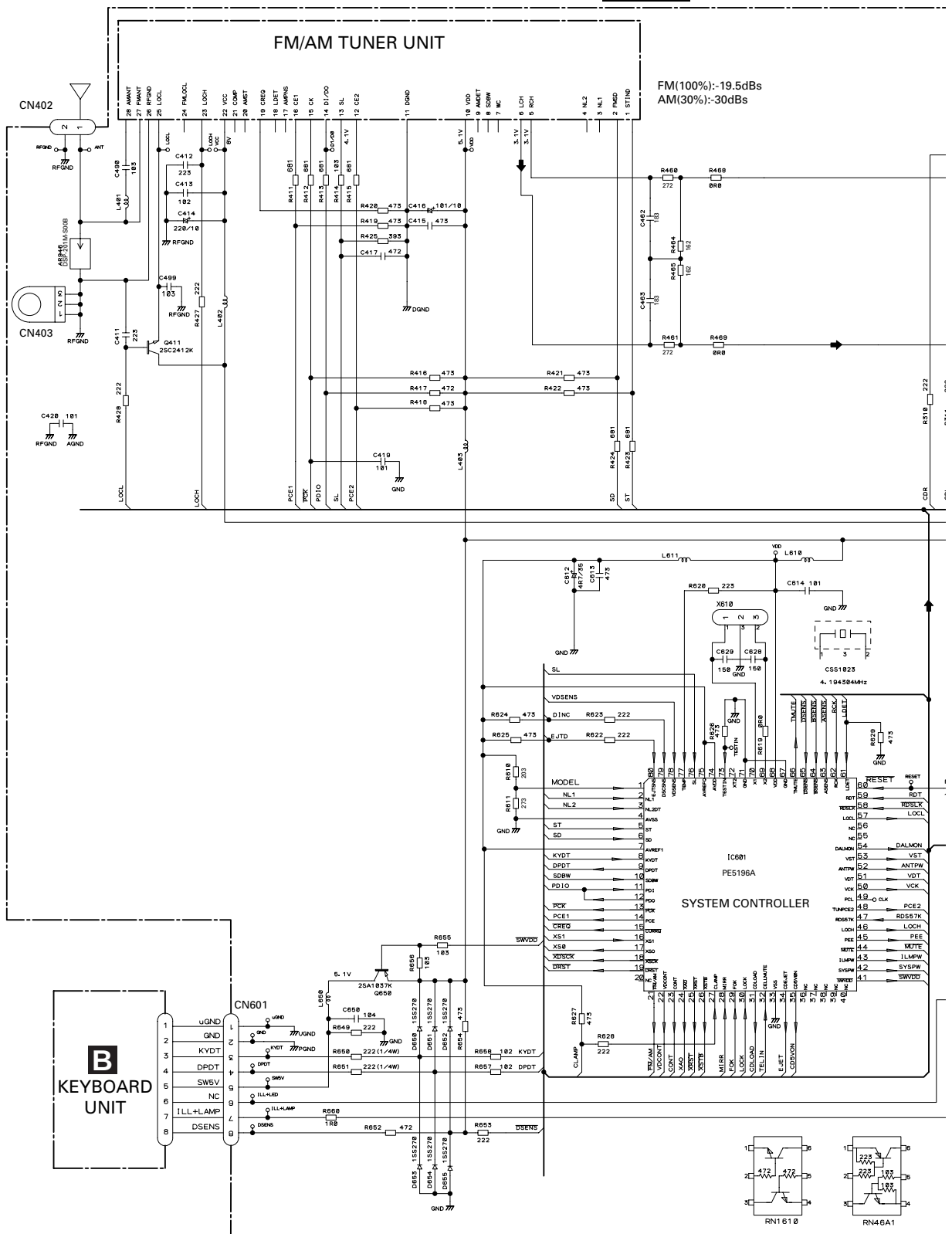
D

3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

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

A TUNER AMP UNIT

A-a

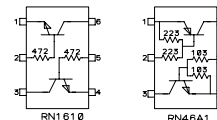


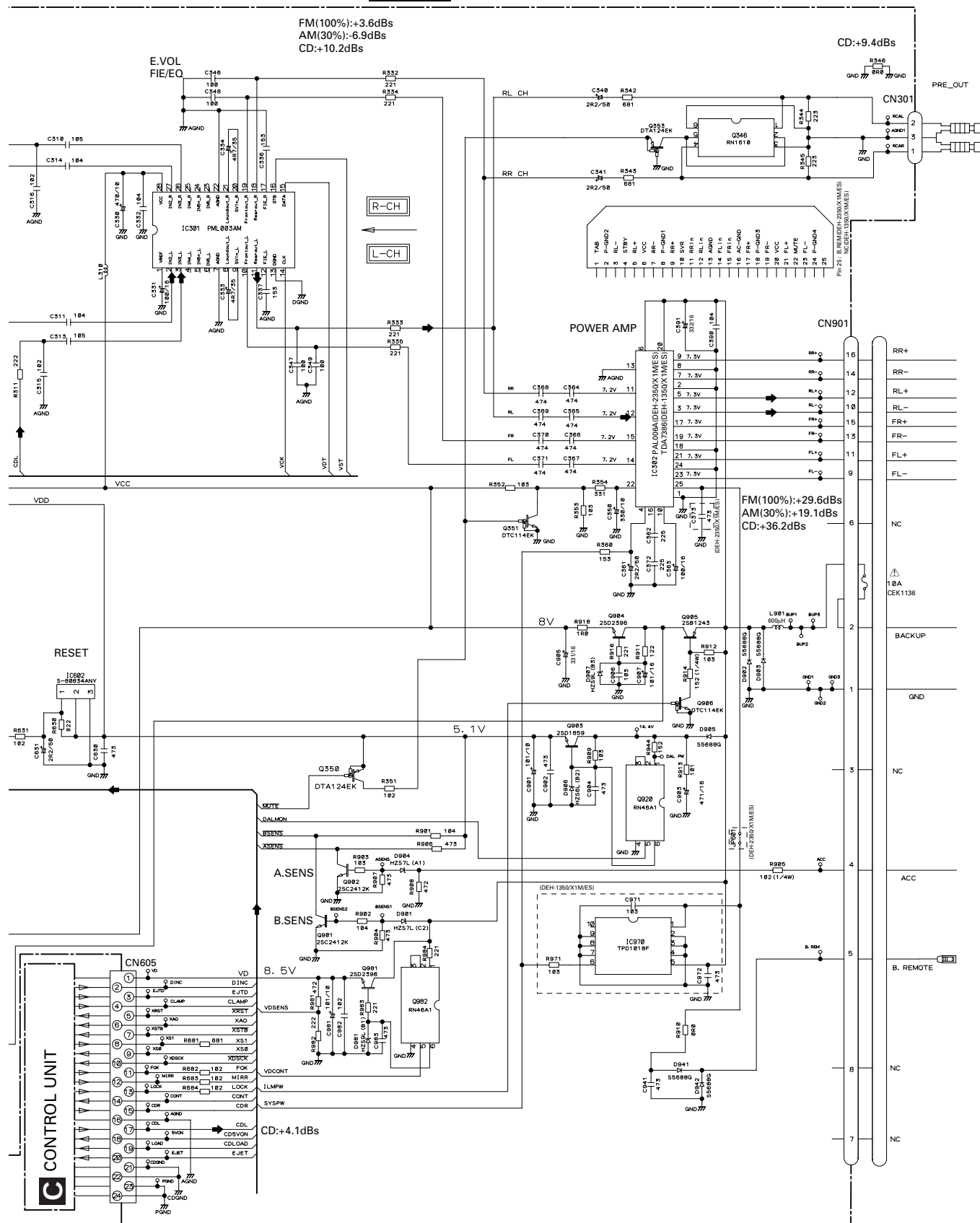
NOTE:
 (R) Symbol indicates a resistor.
 No differentiation is made between chip resistors and discrete resistors.
 (C) Symbol indicates a capacitor.
 No differentiation is made between chip capacitors and discrete capacitors.
 The Δ mark found on some component parts indicates the importance of the safety factor of the part.
 Therefore, when replacing, be sure to use parts of identical designation.

For resistors and capacitors in the circuit diagrams, their resistance values or capacitance values are expressed in codes:

Code	Practical value
123	12k ohms
103	10k ohms

Code	Practical value
103	0.01 μ F
101/10	100 μ F/10V

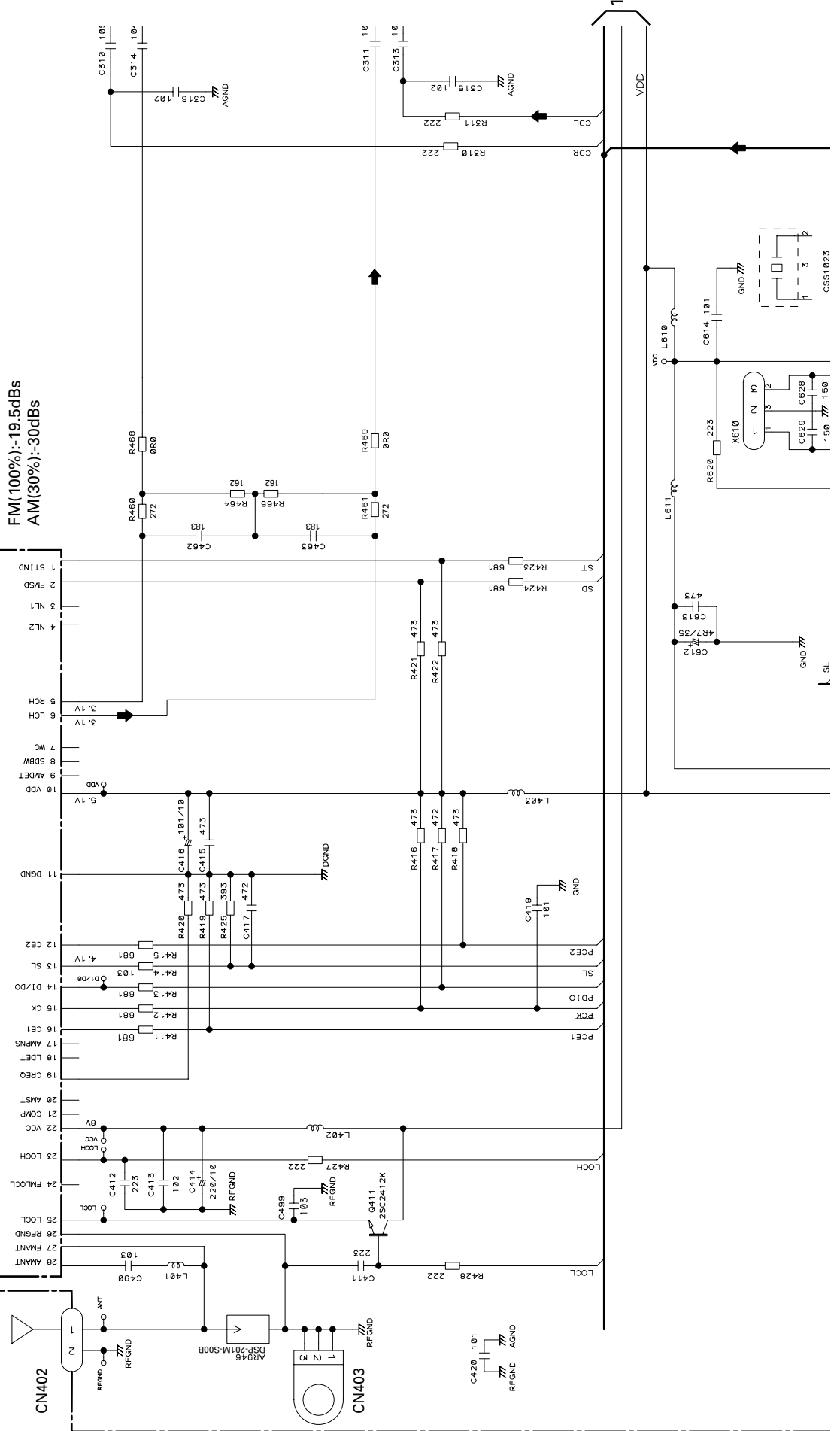


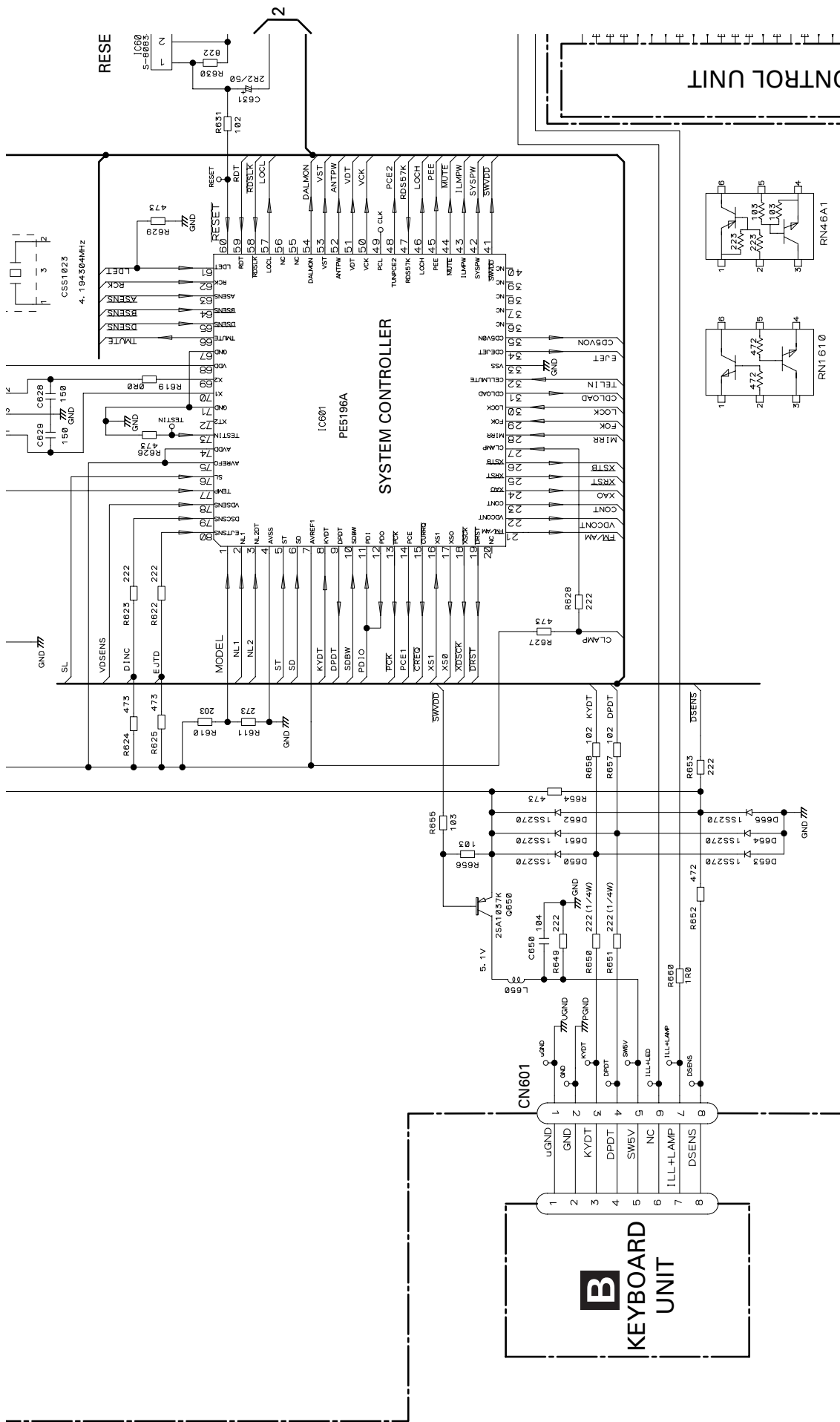


TUNER AMP UNIT

FM/AM TUNER UNIT

FM(100%):-19.5dBs
AM(30%):-30dBs





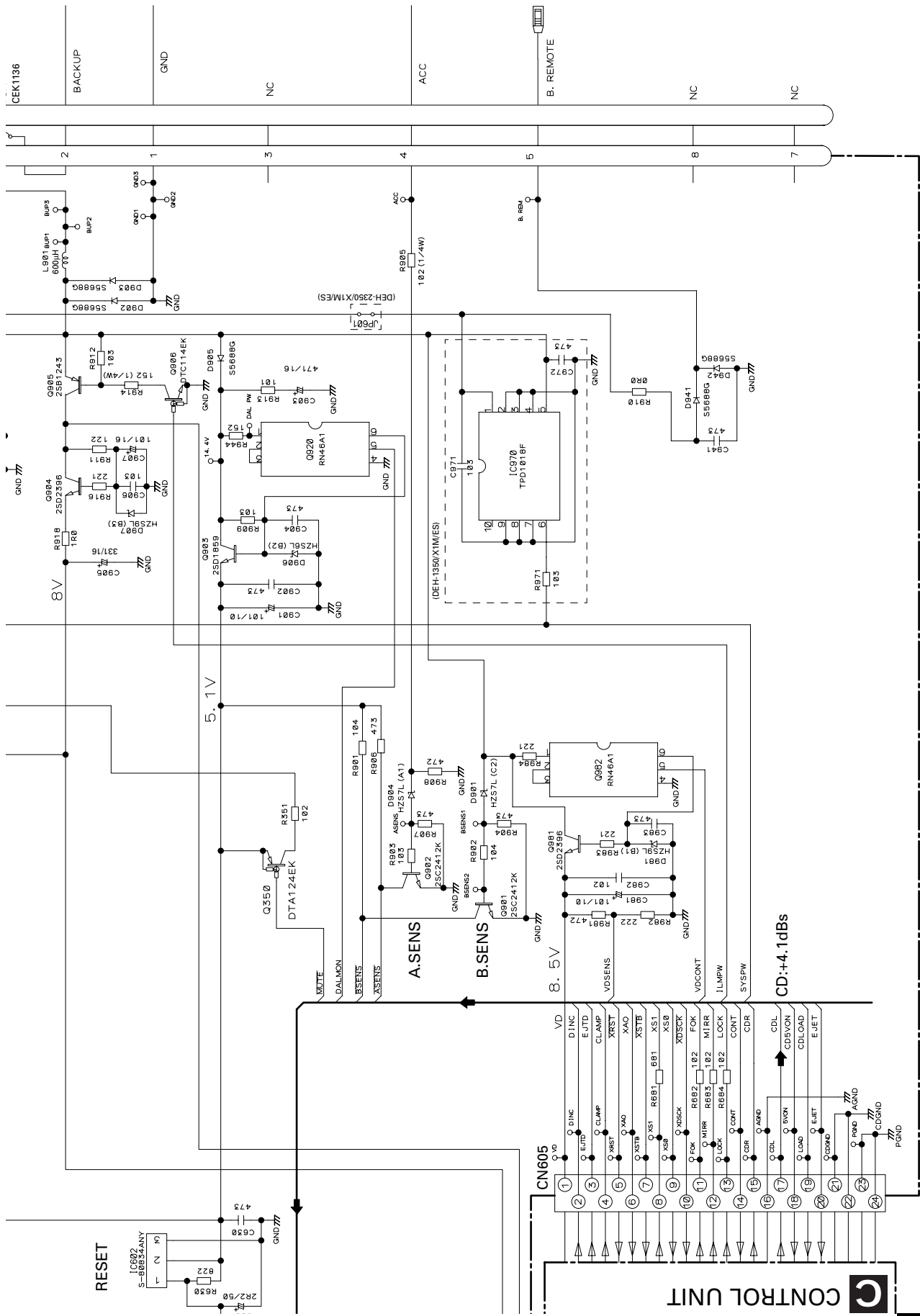
For resistors and capacitors in the circuit diagrams, their resistance values or capacitance values are expressed in codes:

Ex. *Resistors	Code	Practical value
	123	12k ohms
	103	10k ohms
*Capacitors	Code	Practical value
	103	0.01µF
	101/10	100µF/10V

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.

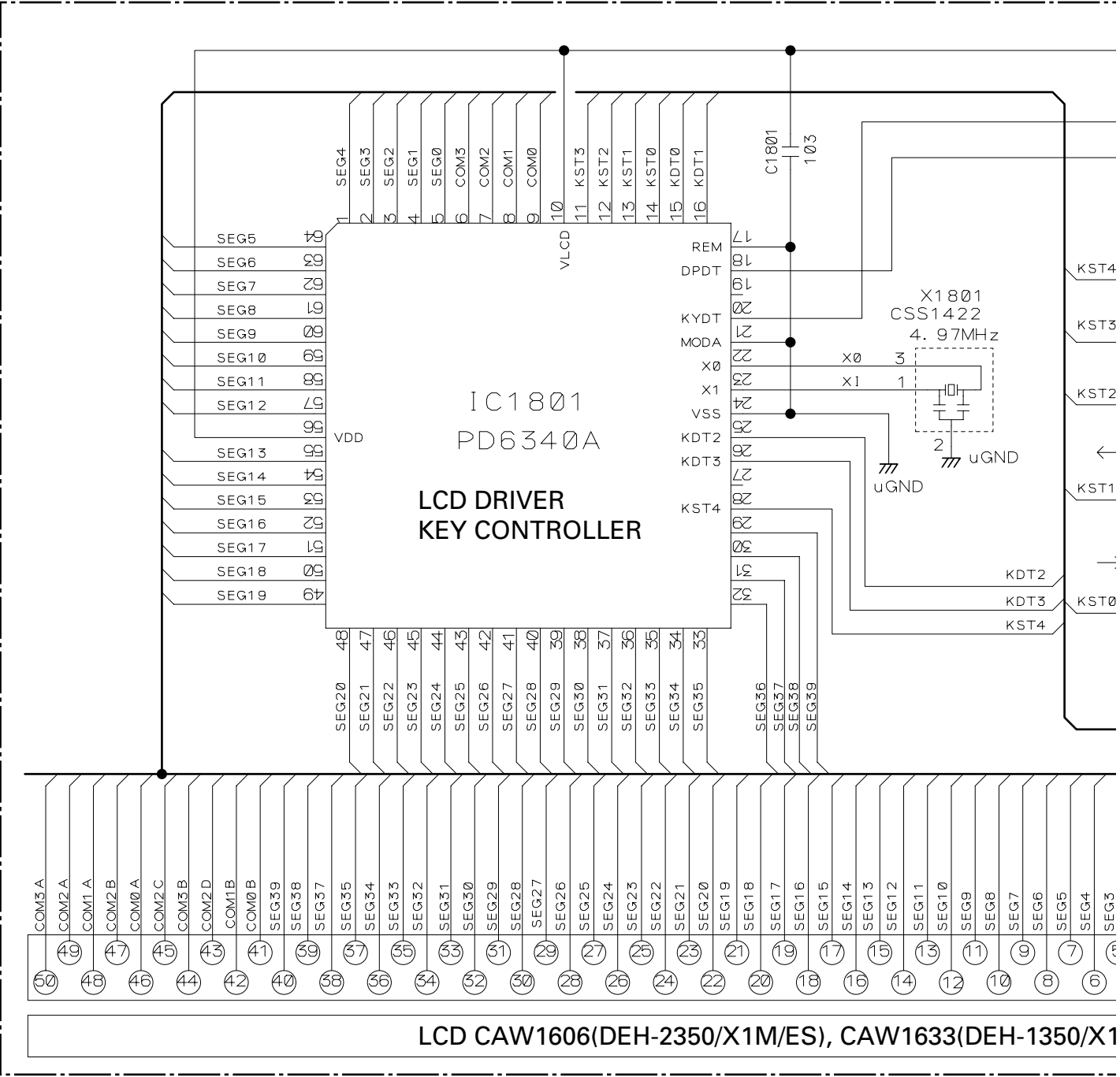
The Δ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

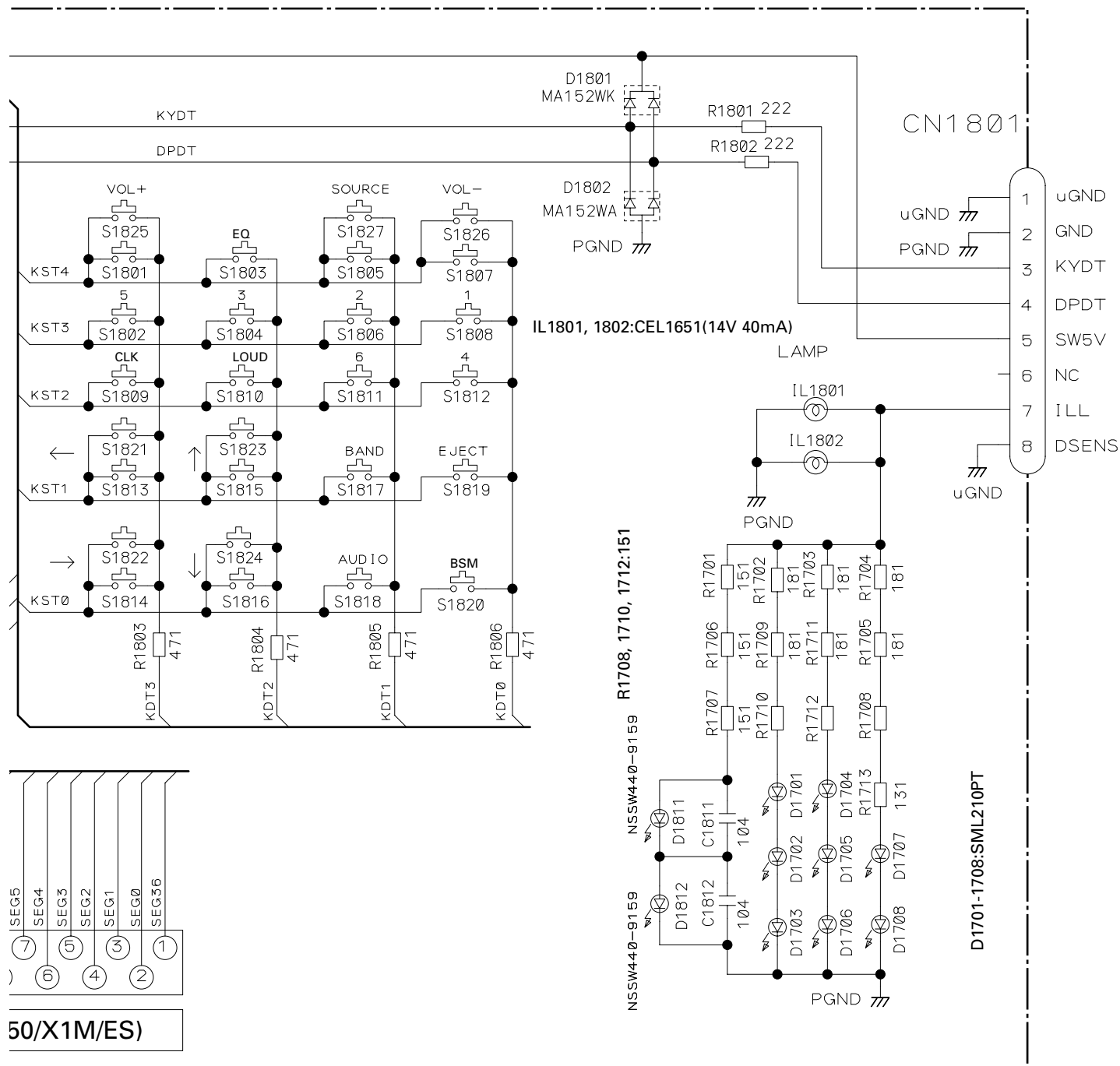
A-a A-b



3.3 KEYBOARD UNIT

B KEYBOARD UNIT





A

B

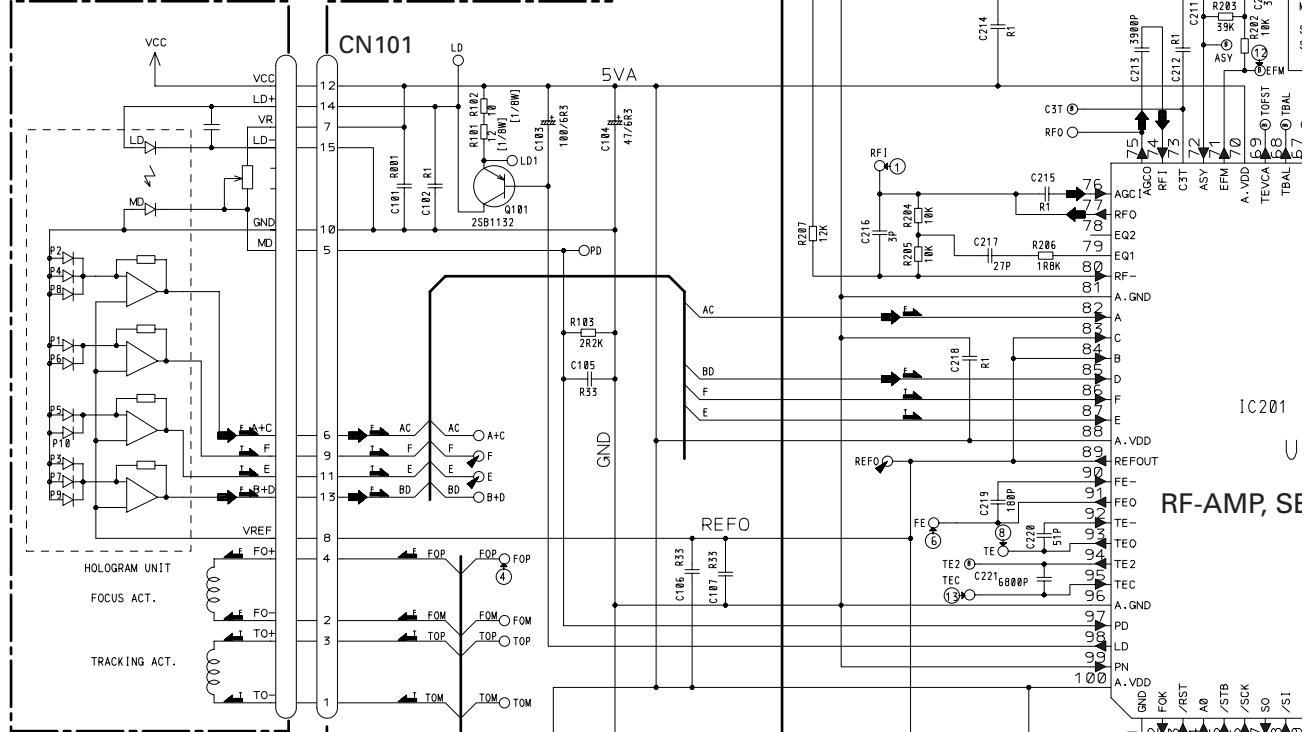
C

D

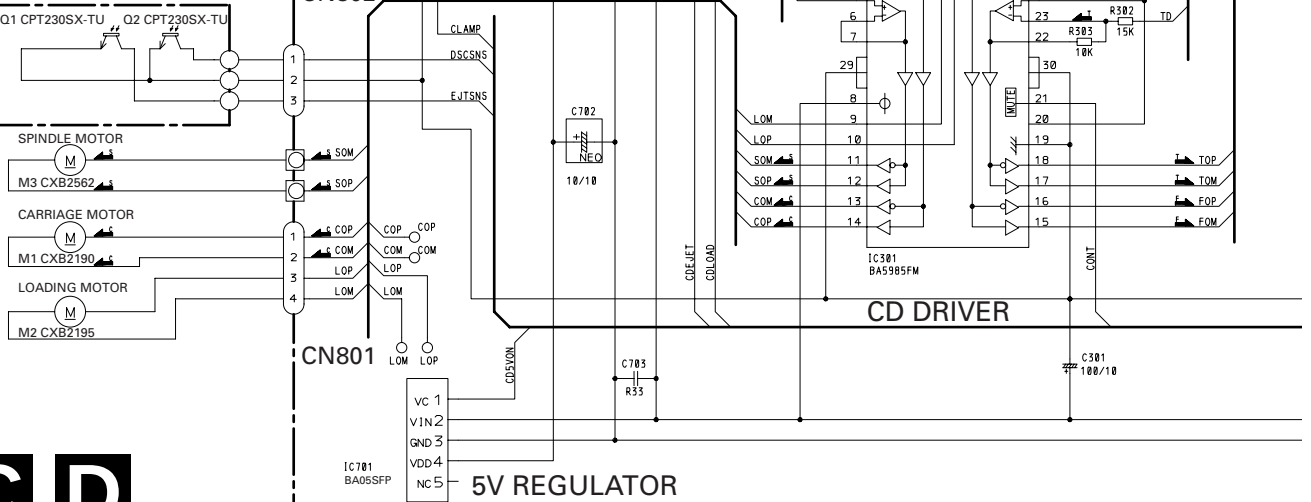
3.4 CD MECHANISM MODULE

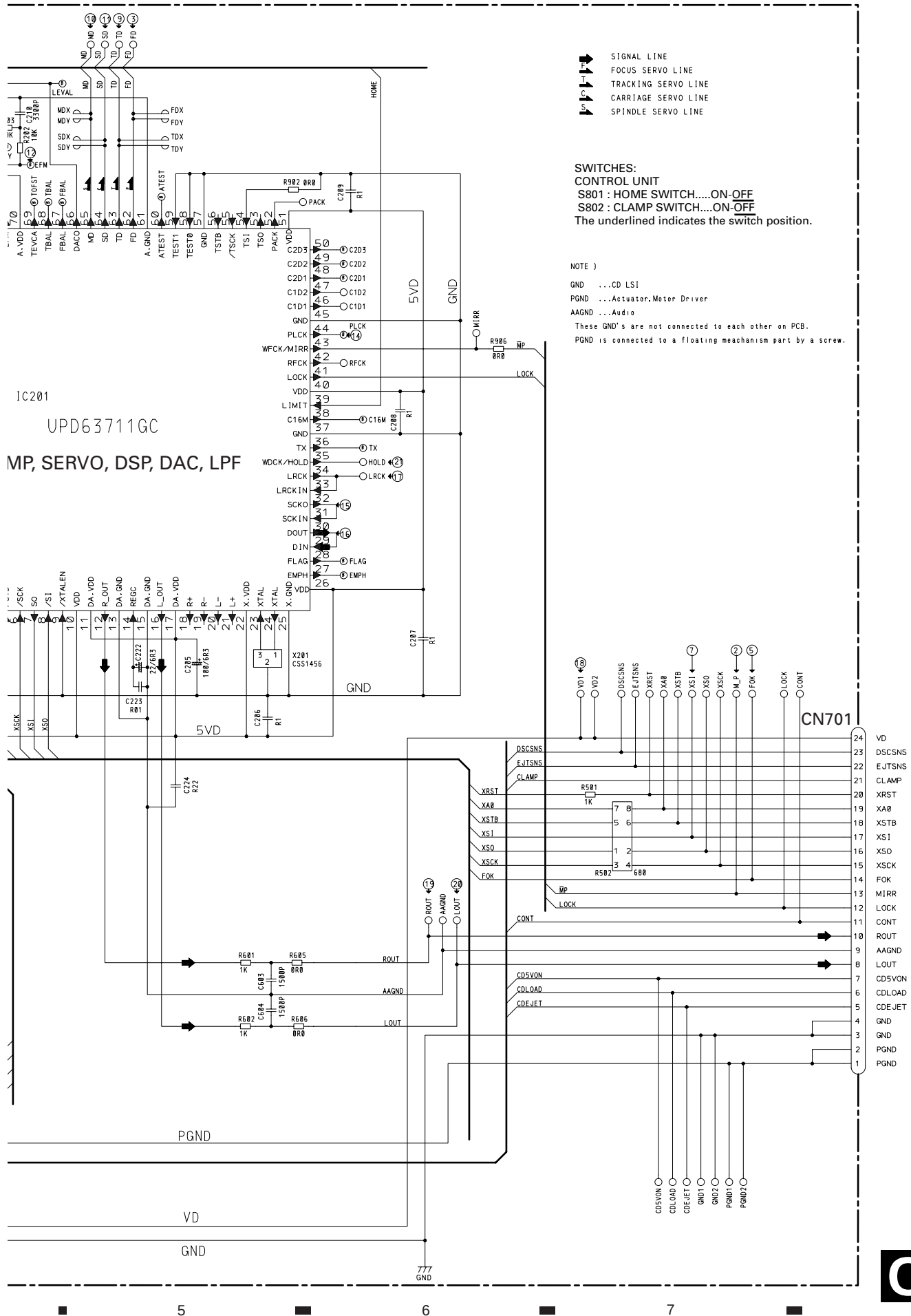
C CONTROL UNIT

PICKUP UNIT
(SERVICE)(P8)



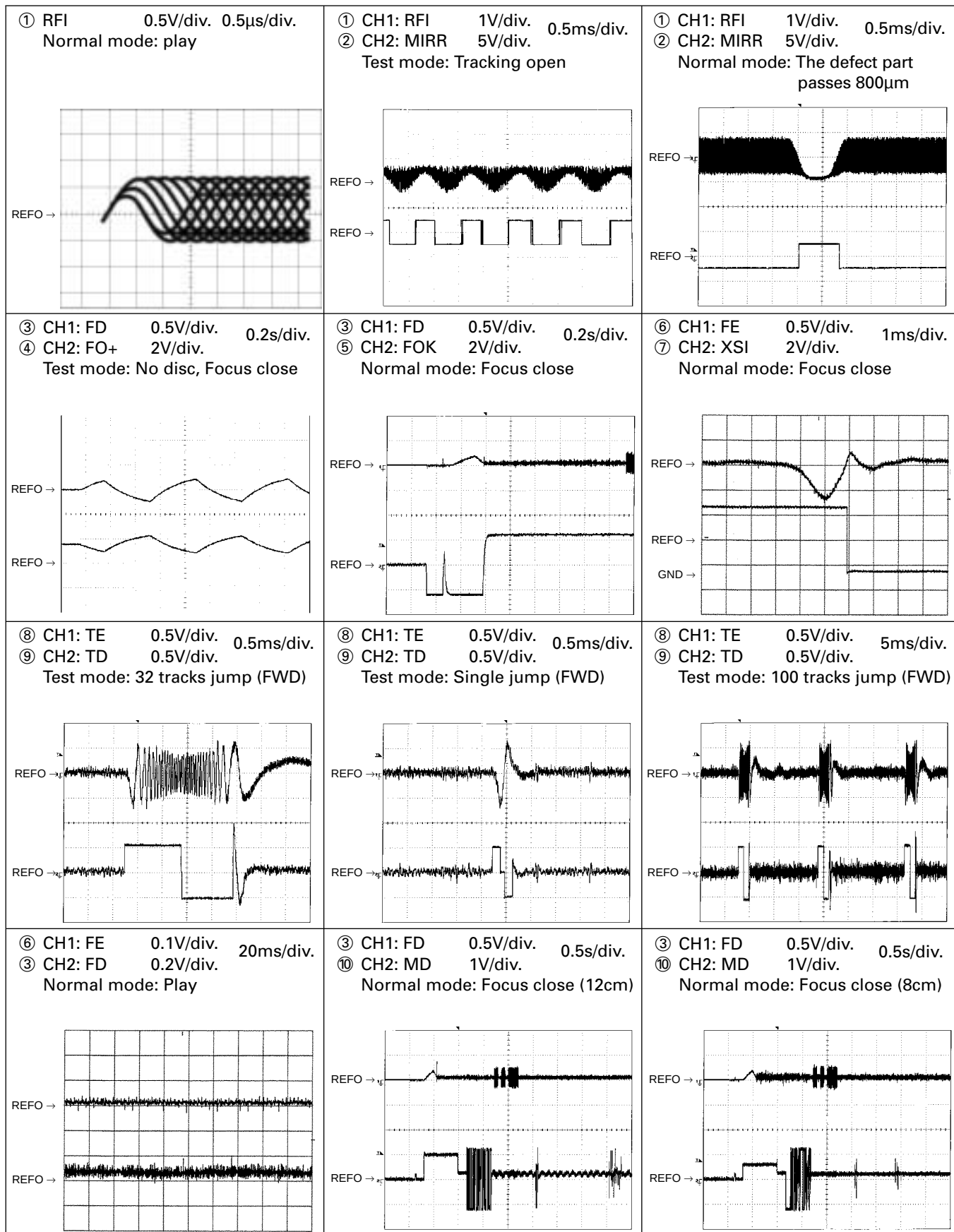
D PHOTO UNIT(S8)

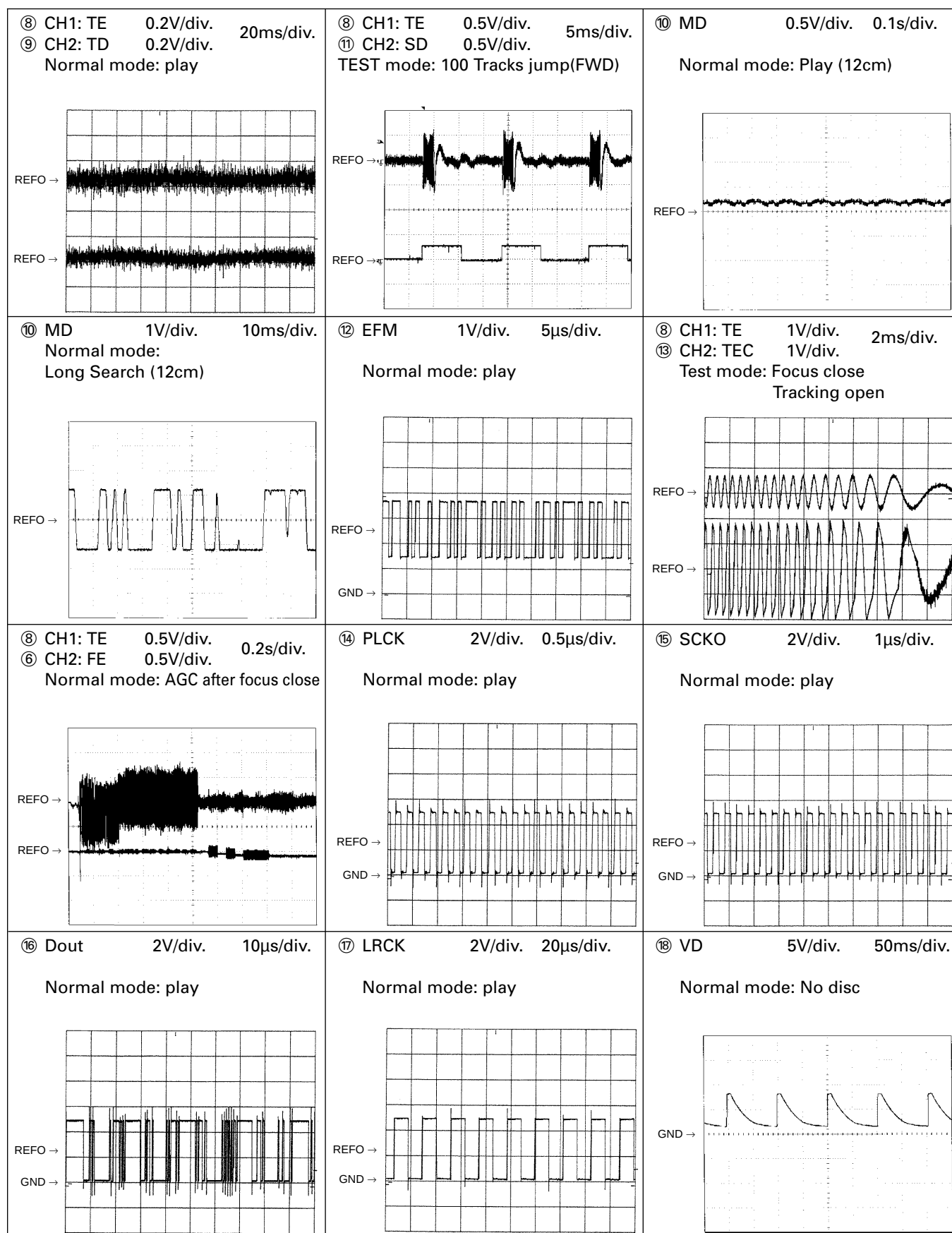




Note:1. The encircled numbers denote measuring pointes in the circuit diagram.
2. Reference voltage
REFO:2.5V

● Waveforms





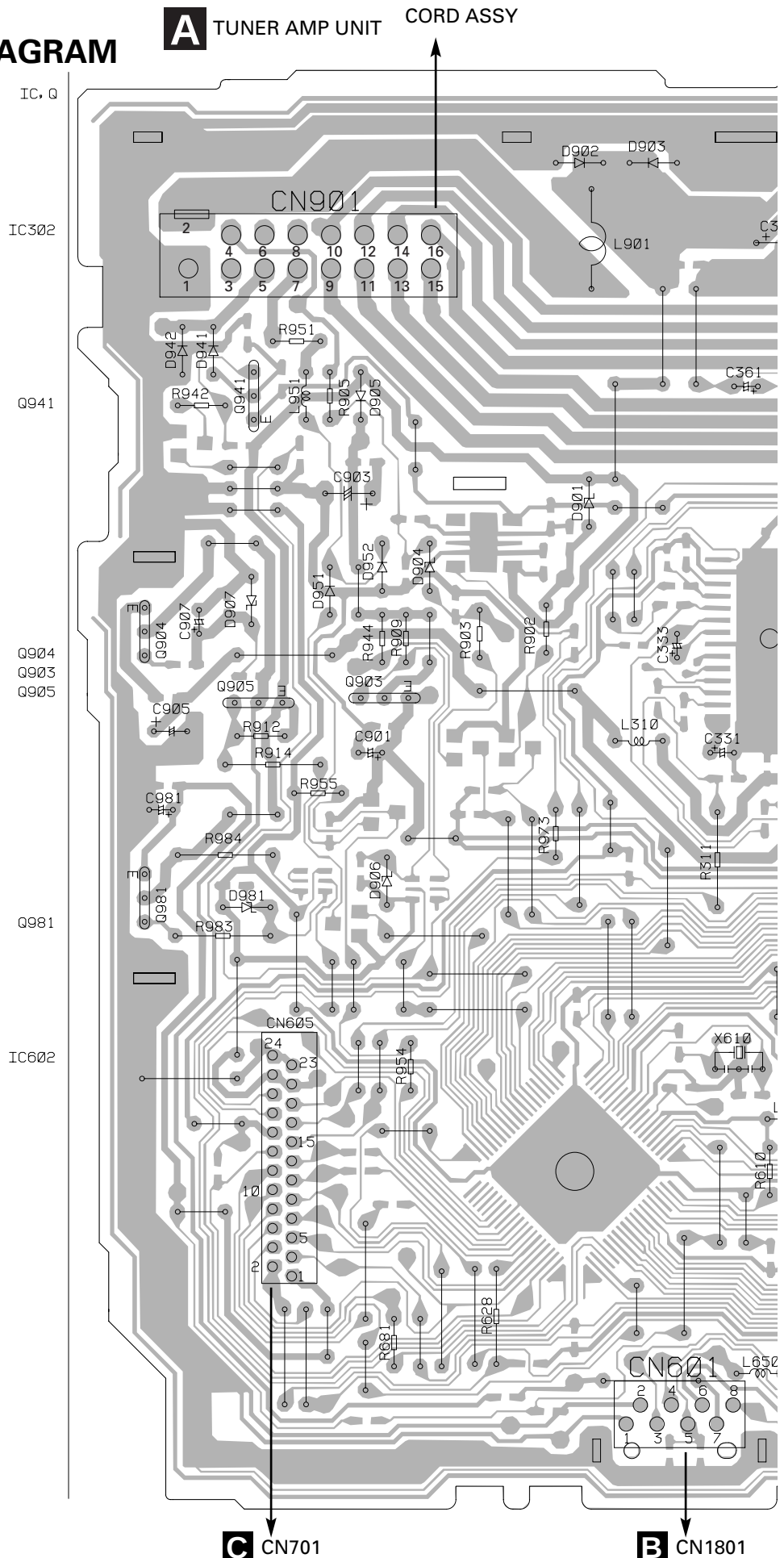
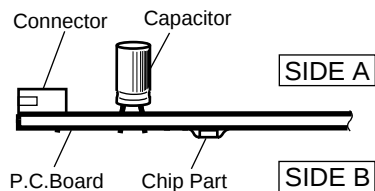
⑮ CH1: R OUT 1V/div. 0.2ms/div. ⑯ CH2: L OUT 1V/div. Normal mode: Play (1kHz 0dB)	⑥ CH1: FE 0.2V/div. 1ms/div. ③ CH2: FD 0.5V/div. Normal mode: During AGC	⑧ CH1: TE 0.2V/div. 1ms/div. ⑨ CH2: TD 0.5V/div. Normal mode: During AGC
① CH1: RFI 1V/div. 0.5ms/div. ② CH2: HOLD 5V/div. Normal mode: The defect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

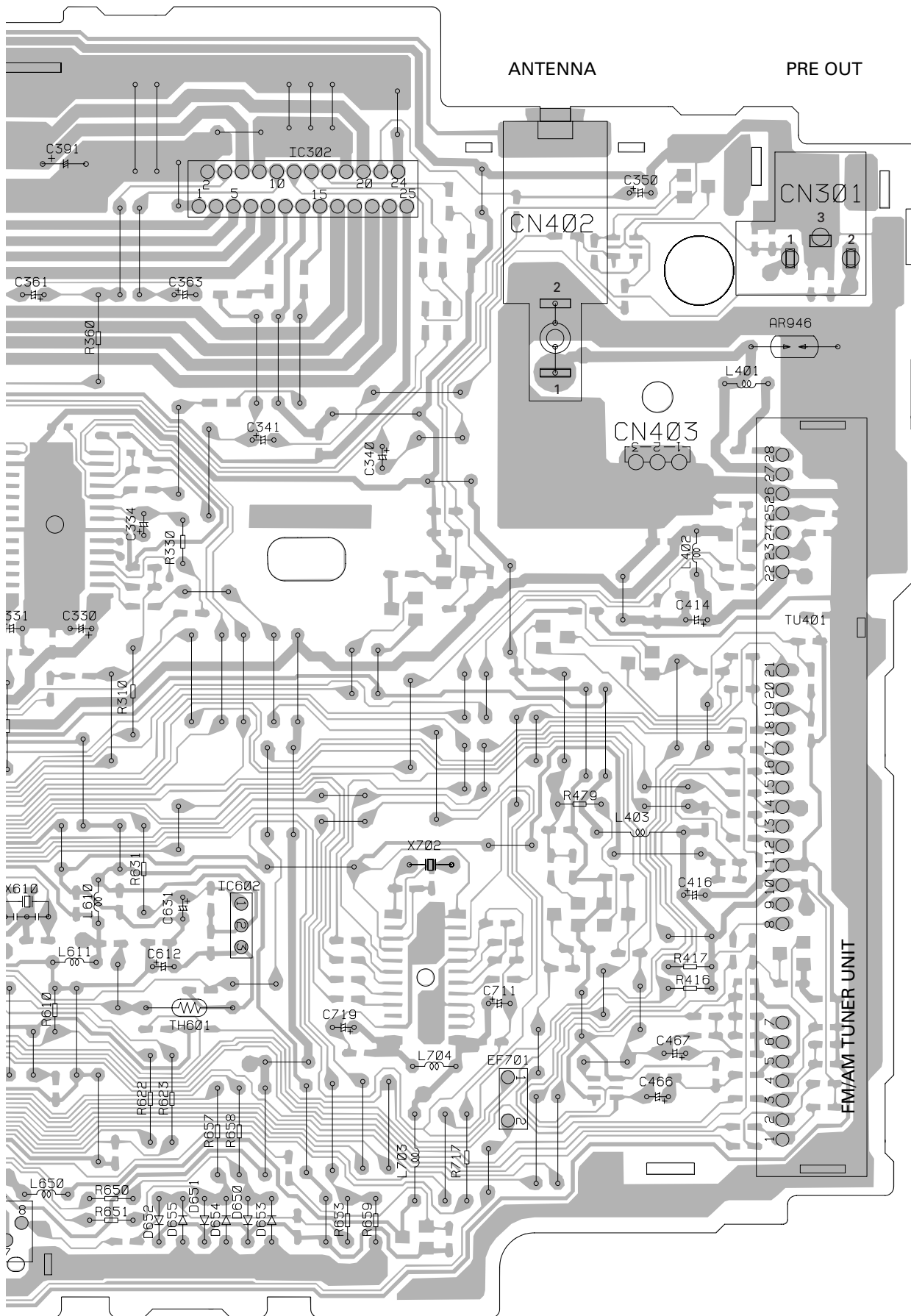
4. PCB CONNECTION DIAGRAM

4.1 TUNER AMP UNIT

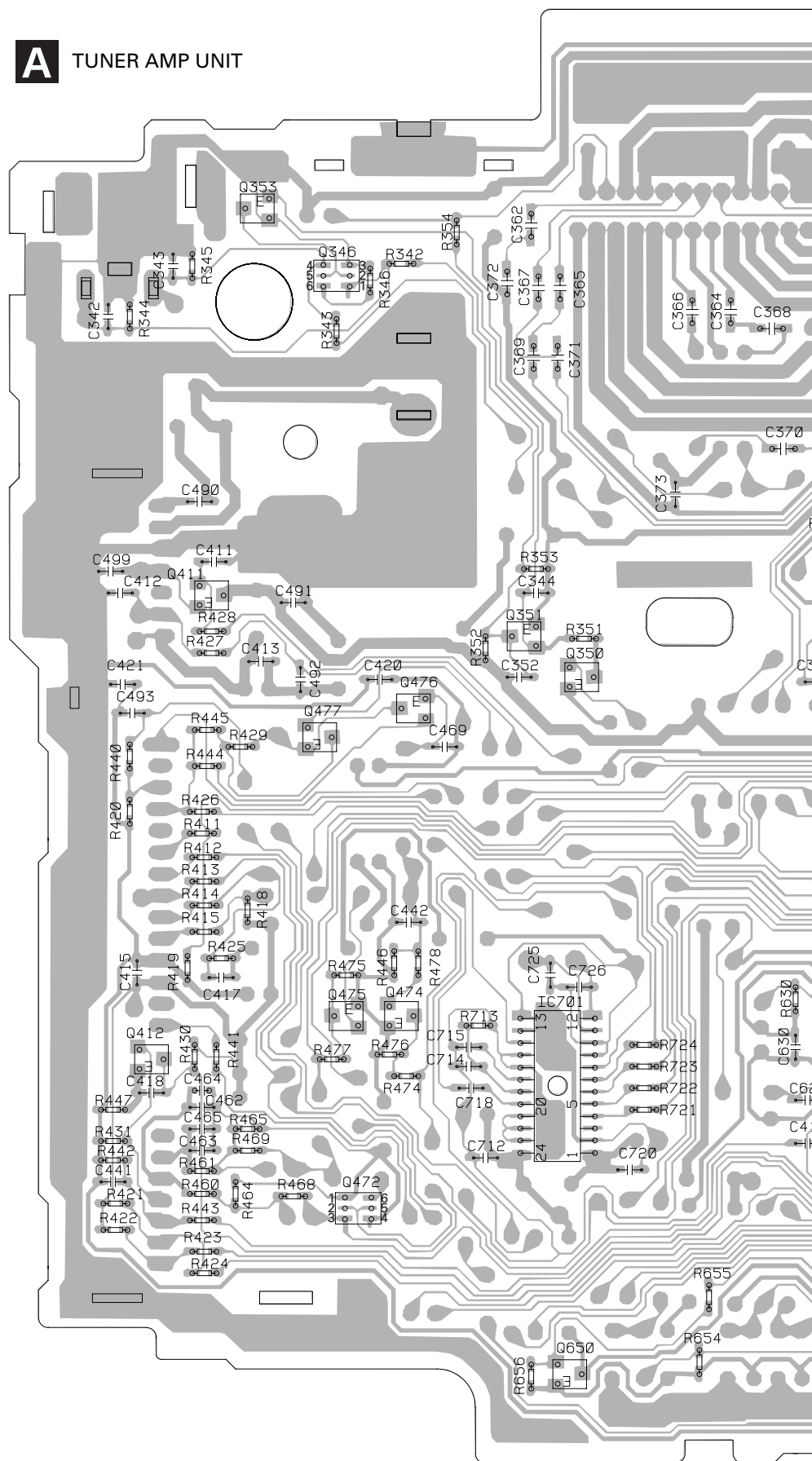
NOTE FOR PCB DIAGRAMS

- 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





A

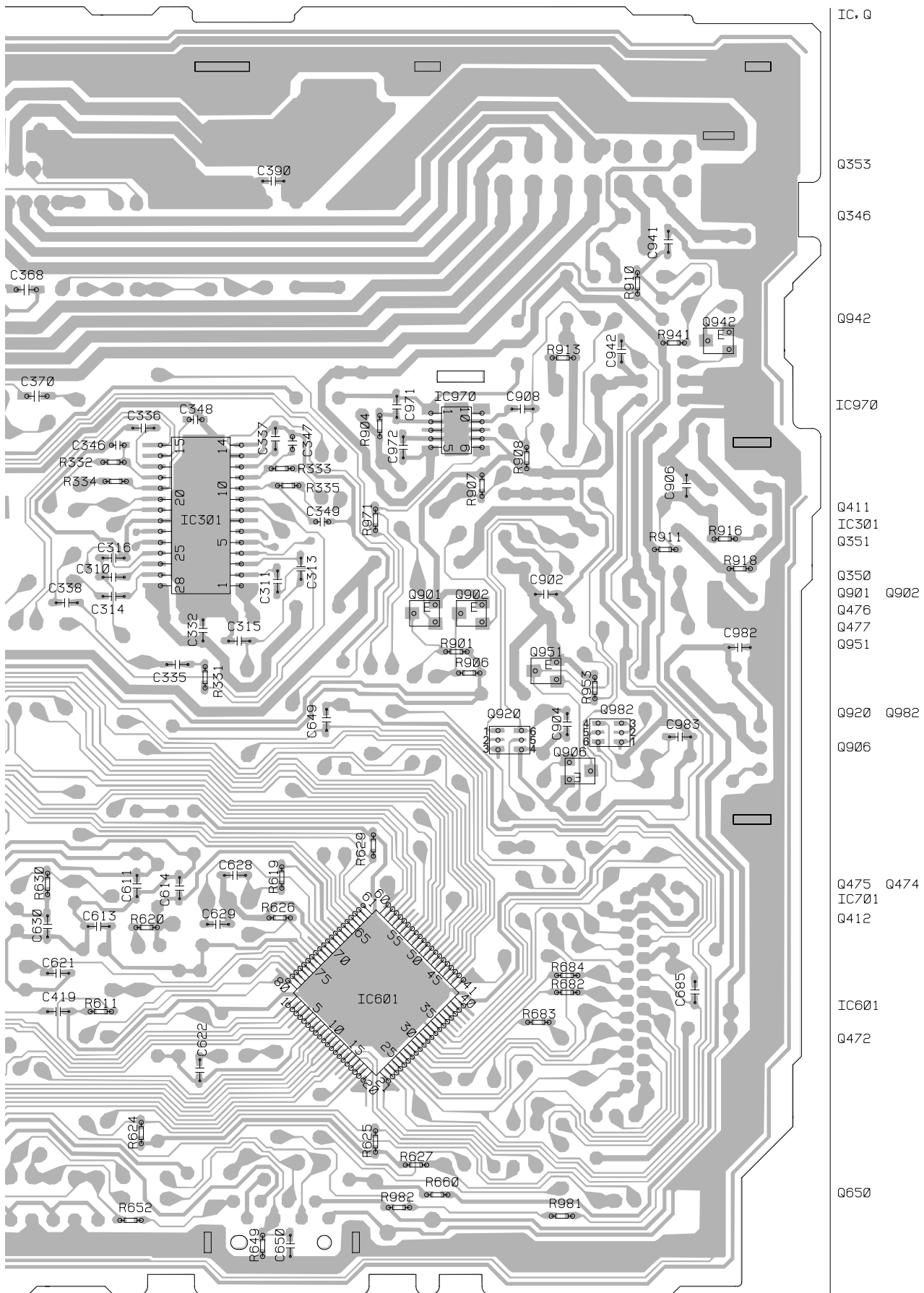


B

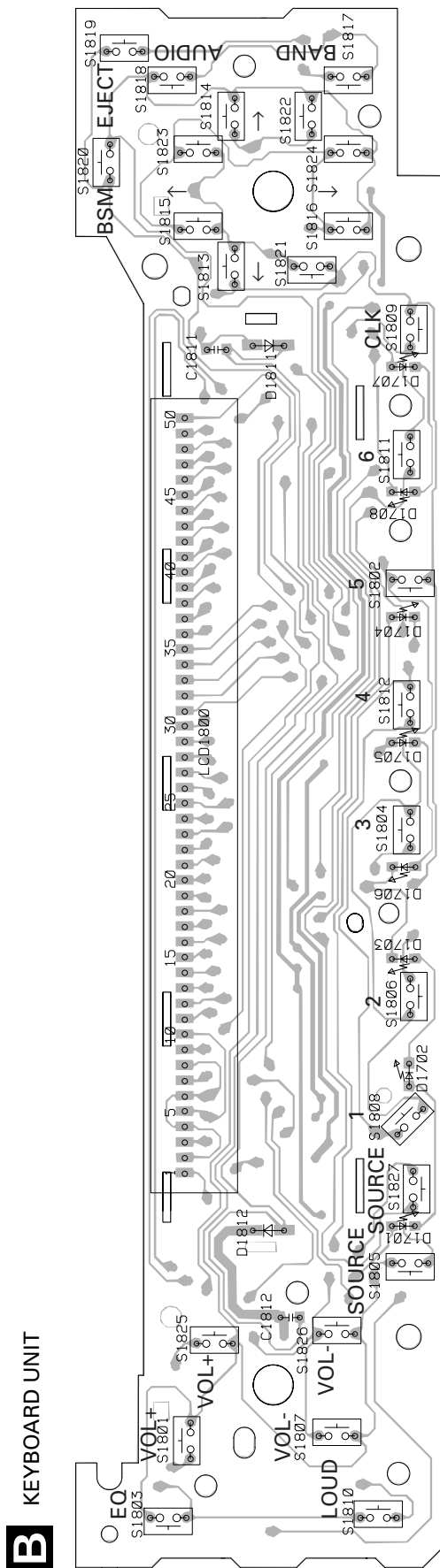
C

D

FRONT

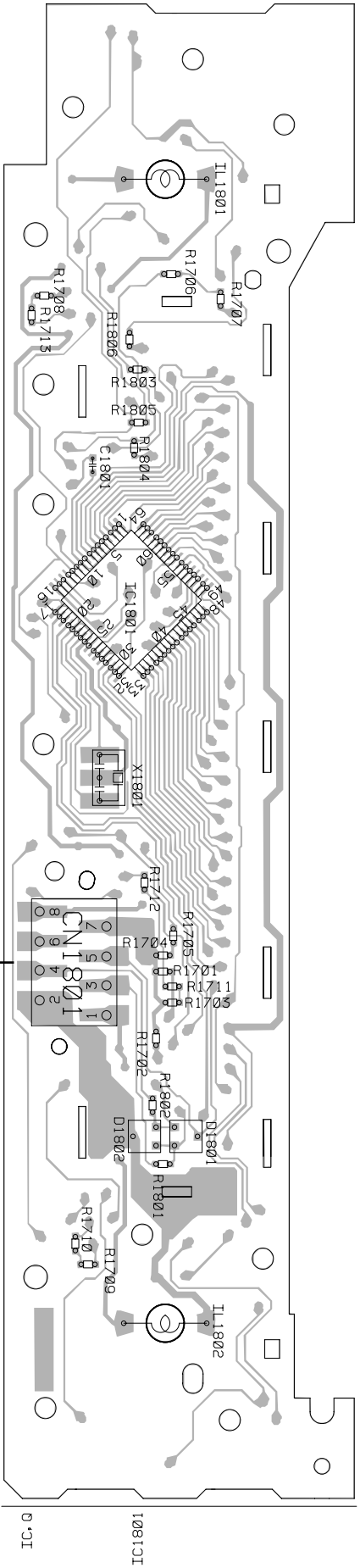


4.2 KEYBOARD UNIT



SIDE A

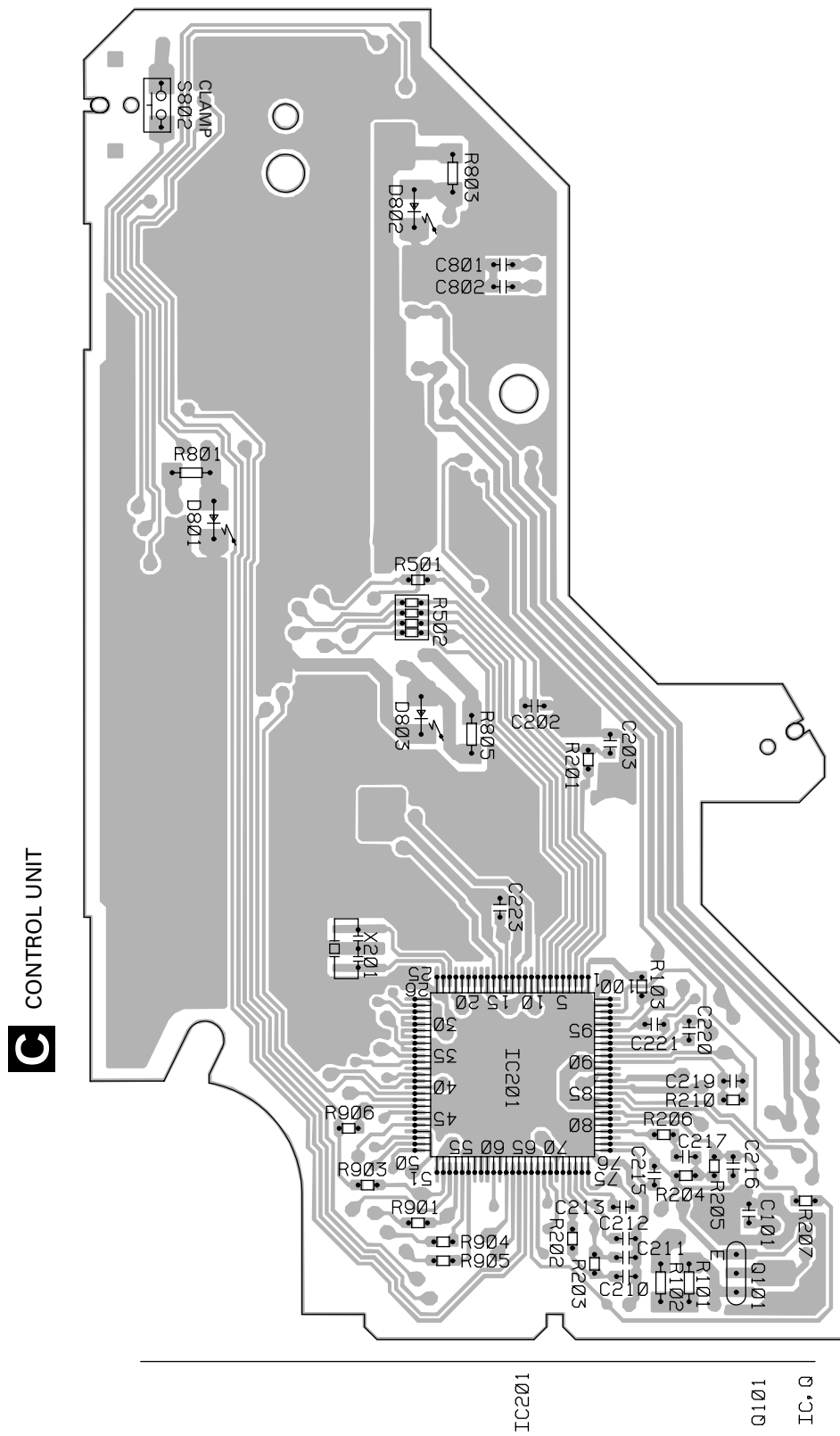
SIDE B



A CN601

B KEYBOARD UNIT

SIDE A



5. ELECTRICAL PARTS LIST

NOTES:

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

Chip Resistor

RS1/OS○○○○J,RS1/○○S○○○○J

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

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

====Circuit Symbol and No.====Part Name	Part No.	====Circuit Symbol and No.====Part Name	Part No.
A Unit Number : CWM7293(DEH-2350/X1M/ES) : CWM7297(DEH-1350/X1M/ES) Unit Name : Tuner Amp Unit		RESISTORS	
MISCELLANEOUS		R 310	RD1/4PU222J
IC 301 IC	PML003AM	R 311	RD1/4PU222J
IC 302 IC(DEH-2350/X1M/ES)	PAL006A	R 332	RS1/16S221J
IC 302 IC(DEH-1350/X1M/ES)	TDA7386	R 333	RS1/16S221J
IC 601 IC	PE5196A	R 334	RS1/16S221J
IC 602 IC	S-80834ANY	R 335	RS1/16S221J
IC 970 IC(DEH-1350/X1M/ES)	TPD1018F	R 342	RS1/16S681J
Q 346 Transistor	RN1610	R 343	RS1/16S681J
Q 350 Transistor	DTA124EK	R 344	RS1/16S223J
Q 351 Transistor	DTC114EK	R 345	RS1/16S223J
Q 353 Transistor	DTA124EK	R 346	RS1/16S0R0J
Q 411 Transistor	2SC2412K	R 351	RS1/16S102J
Q 650 Transistor	2SA1037K	R 352	RS1/16S103J
Q 901 Transistor	2SC2412K	R 353	RS1/16S103J
Q 902 Transistor	2SC2412K	R 354	RS1/16S331J
Q 903 Transistor	2SD1859	R 360	RD1/4PU153J
Q 904 Transistor	2SD2396	R 411	RS1/16S681J
Q 905 Transistor	2SB1243	R 412	RS1/16S681J
Q 906 Transistor	DTC114EK	R 413	RS1/16S681J
Q 920 Transistor	RN46A1	R 414	RS1/16S103J
Q 981 Transistor	2SD2396	R 415	RS1/16S681J
Q 982 Transistor	RN46A1	R 416	RD1/4PU473J
D 650 Diode	1SS270	R 417	RD1/4PU472J
D 651 Diode	1SS270	R 418	RS1/16S473J
D 652 Diode	1SS270	R 419	RS1/16S473J
D 653 Diode	1SS270	R 420	RS1/16S473J
D 654 Diode	1SS270	R 421	RS1/16S473J
D 655 Diode	1SS270	R 422	RS1/16S681J
D 901 Diode	HZS7L(C2)	R 423	RS1/16S681J
D 902 Diode	S5688G	R 424	RS1/16S393J
D 903 Diode	S5688G	R 425	RS1/16S222J
D 904 Diode	HZS7L(A1)	R 427	RS1/16S222J
D 905 Diode	S5688G	R 428	RS1/16S222J
D 906 Diode	HZS6L(B2)	R 460	RS1/16S272J
D 907 Diode	HZS9L(B3)	R 461	RS1/16S162J
D 941 Diode	S5688G	R 464	RS1/16S162J
D 942 Diode	S5688G	R 465	RS1/16S0R0J
D 981 Diode	HZS9L(B1)	R 466	RS1/16S0R0J
L 310 Ferri-Inductor	LAU1R0M	R 468	RS1/16S0R0J
L 401 Ferri-Inductor	LAU4R7K	R 469	RD1/4PU203J
L 402 Ferri-Inductor	LAU2R2K	R 610	RS1/16S273J
L 403 Inductor	LAU100K	R 611	RS1/16S0R0J
L 610 Ferri-Inductor	LAU101K	R 619	RS1/16S223J
L 611 Ferri-Inductor	LAU2R2K	R 620	RD1/4PU222J
L 650 Ferri-Inductor	LAU2R2K	R 621	RD1/4PU222J
L 901 Choke Coil 600μH	CTH1221	R 622	RS1/16S473J
X 610 Crystal Resonator 4.194304MHz	CSS1023	R 623	RS1/16S473J
AR 946 Arrester	DSP-201M-S00B	R 624	RS1/16S473J
FM/AM Tuner Unit	CWE1563	R 625	RS1/16S473J
		R 626	RS1/16S473J
		R 627	RS1/16S473J
		R 628	RD1/4PU222J

====Circuit Symbol and No.==Part Name	Part No.	====Circuit Symbol and No.==Part Name	Part No.
R 629	RS1/16S473J	C 366	CKSQYB474K16
R 630	RS1/16S822J	C 367	CKSQYB474K16
R 631	RD1/4PU102J	C 368	CKSQYB474K16
R 649	RS1/16S222J	C 369	CKSQYB474K16
R 650	RD1/4PU222J	C 370	CKSQYB474K16
R 651	RD1/4PU222J	C 371	CKSQYB474K16
R 652	RS1/16S472J	C 372	CKSQYB225K10
R 653	RD1/4PU222J	C 373	(DEH-2350/X1M/ES) CKSRYB473K25
R 654	RS1/16S473J	C 390	CKSRYB104K16
R 655	RS1/16S103J	C 391	3300μF/16V CCH1368
R 656	RS1/16S103J	C 411	CKSRYB223K25
R 657	RD1/4PU102J	C 412	CKSRYB223K25
R 658	RD1/4PU102J	C 413	CKSRYB102K50
R 660	RS1/16S1R0J	C 414	CEJA220M10
R 681	RD1/4PU681J	C 415	CKSRYB473K16
R 682	RS1/16S102J	C 416	CEAL101M10
R 683	RS1/16S102J	C 417	CKSRYB472K50
R 684	RS1/16S102J	C 419	CCSRCH101J50
R 901	RS1/16S104J	C 420	CCSRCH101J50
R 902	RD1/4PU104J	C 462	CKSRYB183K25
R 903	RD1/4PU103J	C 463	CKSRYB183K25
R 904	RS1/16S473J	C 490	CKSQYB103K50
R 905	RD1/4PU102J	C 499	CKSRYB103K50
R 906	RS1/16S473J	C 612	CEJA4R7M35
R 907	RS1/16S473J	C 613	CKSRYB473K16
R 908	RS1/16S472J	C 614	CCSRCH101J50
R 909	RD1/4PU103J	C 628	CCSRCH150J50
R 910	RS1/16S0R0J	C 629	CCSRCH150J50
R 911	RS1/16S122J	C 630	CKSRYB473K16
R 912	RD1/4PU103J	C 631	CEAL2R2M50
R 913	RS1/16S101J	C 650	CKSRYB104K16
R 914	RD1/4PU152J	C 901	CEJA101M10
R 916	RS1/16S221J	C 902	CKSRYB473K16
R 918	RS1/16S1R0J	C 903	CCH1331
R 944	RD1/4PU152J	C 904	CKSRYB473K16
R 971	(DEH-1350/X1M/ES) RS1/16S103J	C 905	330μF/16V CCH1326
R 981	RS1/16S472J	C 906	CKSRYB103K50
R 982	RS1/16S222J	C 907	CEJA101M16
R 983	RD1/4PU221J	C 941	CKSRYB473K16
R 984	RD1/4PU221J	C 971	(DEH-1350/X1M/ES) CKSRYB103K50
CAPACITORS		C 972	(DEH-1350/X1M/ES) CKSRYB473K16
C 310	CKSRYB105K6R3	C 981	CEJA101M10
C 311	CKSRYB104K16	C 982	CKSRYB102K50
C 313	CKSRYB105K6R3	C 983	CKSRYB473K16
C 314	CKSRYB104K16	B Unit Number : CWM7303(DEH-2350/X1M/ES) : CWM7307(DEH-1350/X1M/ES)	
C 315	CKSRYB102K50		
C 316	CKSRYB102K50	Unit Name : Keyboard Unit	
C 330	CEJA470M10	MISCELLANEOUS	
C 331	CEJA100M16	IC 1801	IC PD6340A
C 332	CKSRYB104K16	D 1701	LED SML210PT
C 333	CEJA4R7M35	D 1702	LED SML210PT
C 334	CEJA4R7M35	D 1703	LED SML210PT
C 336	CKSRYB153K25	D 1704	LED SML210PT
C 337	CKSRYB153K25	D 1705	LED SML210PT
C 340	CEAL2R2M50	D 1706	LED SML210PT
C 341	CEJA2R2M50	D 1707	LED SML210PT
C 346	CCSRCH100D50	D 1708	LED SML210PT
C 347	CCSRCH100D50	D 1801	Diode MA152WK
C 348	CCSRCH100D50	D 1802	Diode MA152WA
C 349	CCSRCH100D50	D 1811	LED NSSW440-9159
C 350	CEJA330M10	D 1812	LED NSSW440-9159
C 361	CEJA2R2M50	X 1801	Ceramic Resonator 4.97MHz CSS1422
C 362	CKSQYB225K10	IL 1801	Lamp 14V 40mA CEL1651
C 363	CEJA100M16	IL 1802	Lamp 14V 40mA LCD(DEH-2350/X1M/ES)
C 364	CKSQYB474K16		LCD(DEH-1350/X1M/ES) CAW1606
C 365	CKSQYB474K16		CAW1633

D Unit Number :
Unit Name : Photo Unit(S8)

6. ADJUSTMENT

6.1 CD ADJUSTMENT

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 loading and eject operations is performed by means of a photo transistor in this unit. Consequently, if the inside of the unit is exposed to a strong light source when the outer casing is removed for repairs or adjustment, the following malfunctions may occur.

*During PLAY, even if the eject button is pressed, the disc will not be ejected and the unit will remain in the PLAY mode.

*The unit will not load a disc.

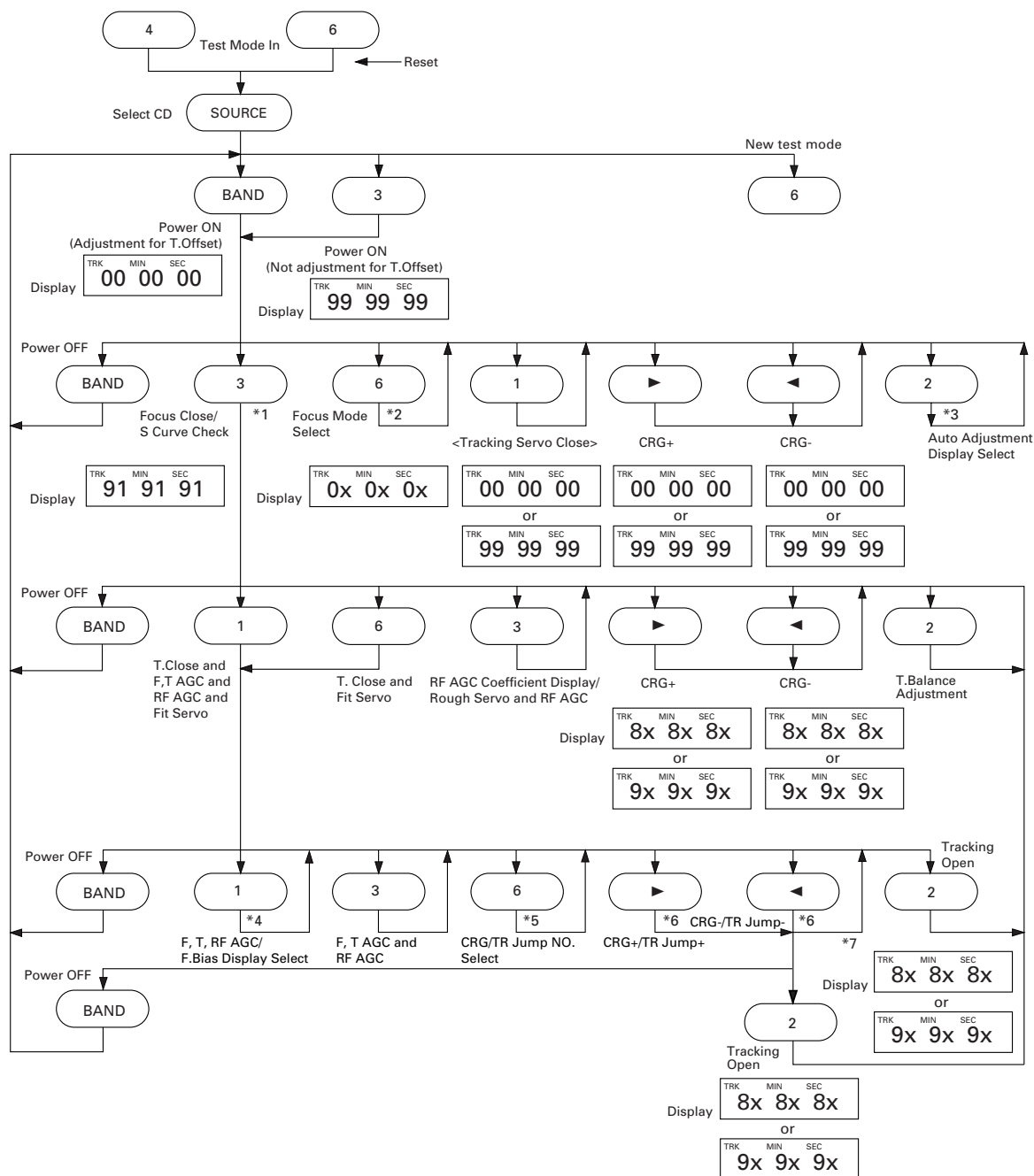
When the unit malfunctions this way, either re-position the light source, move the unit or cover the photo transistor.

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.
- After pressing the EJECT key, do not press any other key until the disk is completely ejected.
- If the ► or ◀ key is pressed while focus search is in progress, immediately turn the power off (otherwise the actuator may be damaged due to adhesion of the lenses).
- 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 "1TR", and the automatic adjustment value to the initial value.

Flow Chart



*1 "00", "99"→Focus Close / "01"→S.Curve

*6 1TR/4TR/10TR/32TR/100TR

*2 → Focus Close 00(99) → S.Curve 01 → LD Off 02

*7 CRG Move,100TR Jump

*3 → F.Cancel → T.Offset → The original display

*4 → TRK, MIN, SEC → F.AGC Gain → T.AGC Gain → F.Bias

*5 → 1TR 91(81) → 4TR 92(82) → 10TR 93(83) → 32TR 94(84) → 100TR 95(85) → CRG Move 96(86)

6.2 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT

• Note :

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

• Purpose :

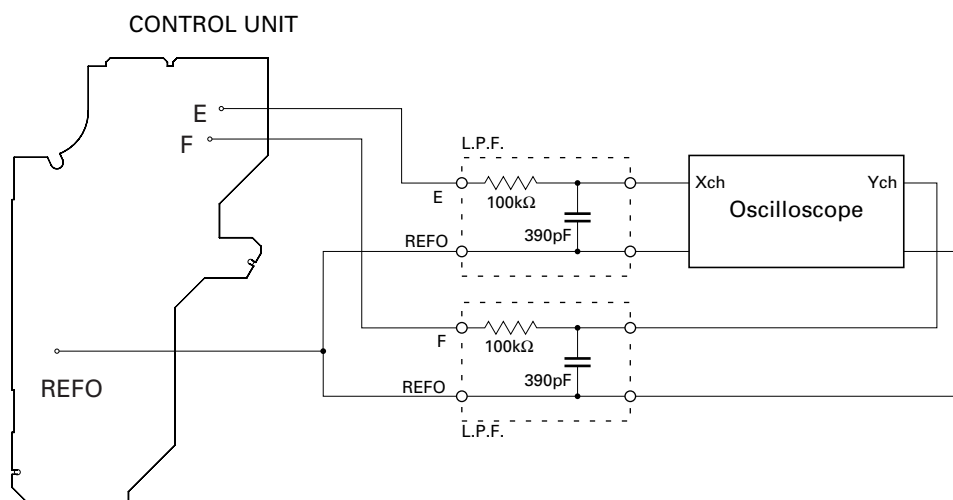
To check that the grating is within an acceptable range when the PU unit is changed.

• 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 taking a long time for track searching.

• Method :

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



• Checking Procedure

1. In test mode, load the disc and switch the 5V regulator on.
2. Using the ► and ◄ buttons, move the PU unit to the innermost track.
3. Press key 3 to close focus, the display should read "91". Press key 2 to implement the tracking balance adjustment the display should now read "81". Press key 3 2 times. The display will change, returning to "81" on the fourth press.
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 PU 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

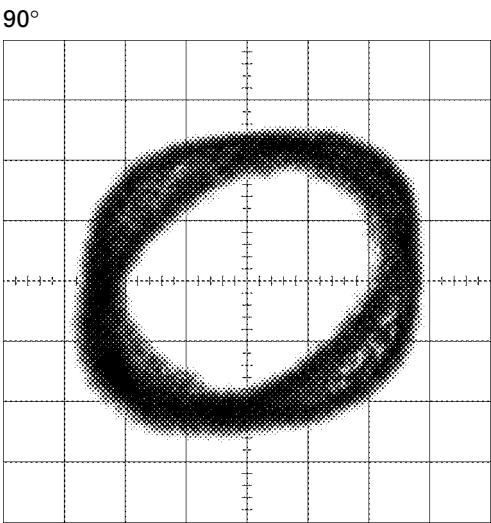
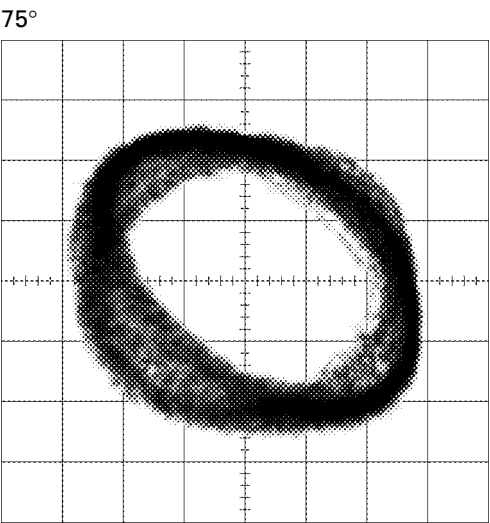
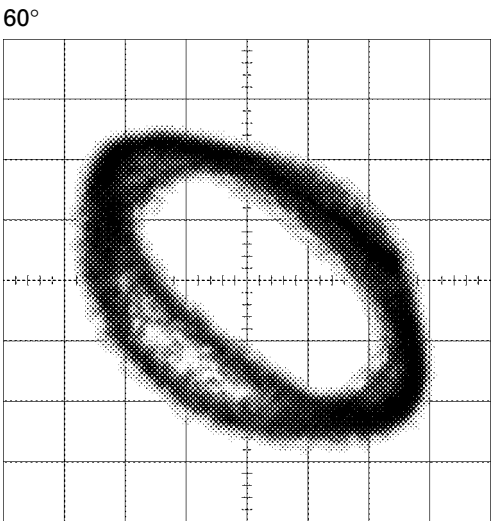
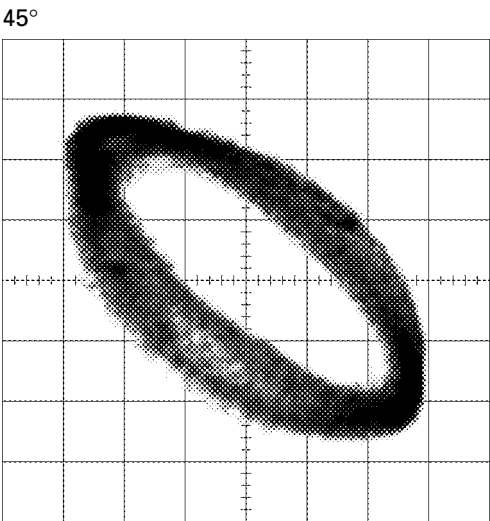
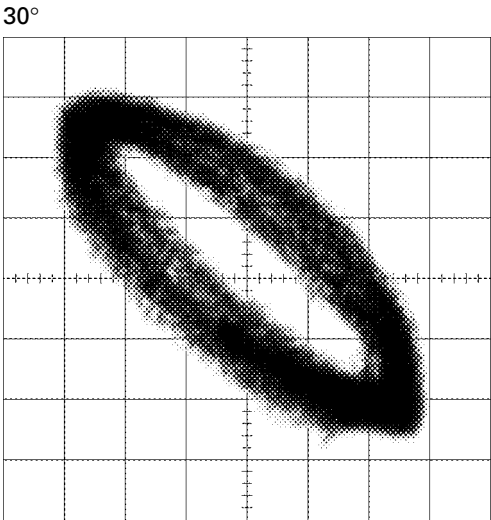
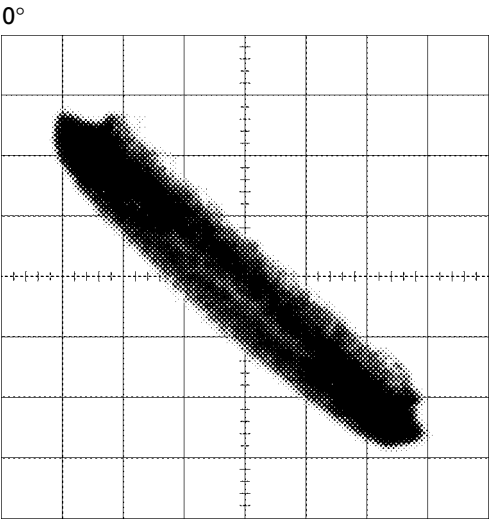
Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

• Hint

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

Grating waveform

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



7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 TEST MODE

● 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.

8-digit display	6-digit display	4-digit display
ERROR-xx	ERR-xx	E-xx
	OR	
	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).

Remarks: Mechanical errors are not displayed (because a CD is turned off in these errors).

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

S-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 key.
- ② Select S-CD for the source through the specified procedure including use of the [SOURCE] key, and inserting the disc. Then, press the [Jump Mode Selector] key while maintaining the regulator turned off.
- ③ After the above operations, the new test mode remains on irrespective of whether the S-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
▶	–	FWD-Kick	FF/TR+	–
◀	–	REV-Kick	REV/TR-	–
1	–	T.Close (AGC performed) /parameter display switching	Scan	–
2	–	T.BAL adjustment /T.Open	Mode	–
3	To power on (offset adjustment not performed)	F.Close/RF AGC/AGC	–	–
6	–	Mode switching /T.Close (no AGC)/Jump switching	Auto/Manu	–

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
01	Carriage move to home position started.	None
02	Carriage is moving toward inner diameter.	Specified 10 seconds has been passed or failure on home switch.
03	Carriage is moving toward outer diameter.	Specified 10 seconds has been passed or failure on home switch.
05	Carriage outer diameter feed (1 second) in progress.	None
11	Setup started.	None
12	Spindle rotation and focus search started.	None
13	Waiting for focus close (XSI=Low).	Specified focus search time has been passed.
14	Waiting for focus close (FOK=High). (After AGC)	Specified focus search time has been passed.
15	Waiting for focus close (FOK=High). (Before AGC)	Specified focus search time has been passed.
16	Rough AGC in progress.	Off focus.
17	Setup (1/2) before T balance adjustment is started.	Off focus.
18	Setup (2/2) before T balance adjustment is started.	Off focus.
24	T balance adjustment (1/2).	Off focus.
25	T balance adjustment (2/2).	Off focus.
26	Standing by after spindle rough servo is over.	Off focus.
27	Setup before RF AGC (first) is started.	Off focus.
28	RF AGC (first) in progress.	Off focus.
29	Setup before RF AGC (second) is started.	Off focus.
30	RF AGC (second) in progress.	Off focus.
31	Tracking close in progress.	Off focus.
32	Standing by after tracking is closed.	Off focus.
33	Focus AGC started.	Off focus.
34	Focus AGC in progress. Tracking AGC started.	Off focus.
35	Tracking AGC in progress. Spindle processes applicable servo.	Off focus.
36	Check of MIRR and LOCK pin. RF AGC in progress. CRG close in progress. Check of sub-code.	Off focus. Spindle not locked. Sub-code unreadable.

(5) Display Examples

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

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

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

The same as in the normal mode.

3) When a Protection Error Occurred

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

(A) Error occurrence timing display in absolute time.

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

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

(B) Error No. display

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

ERROR-40

7.1.2 DISASSEMBLY

● Removing the Case Unit (not shown)

1. Remove the Case Unit.

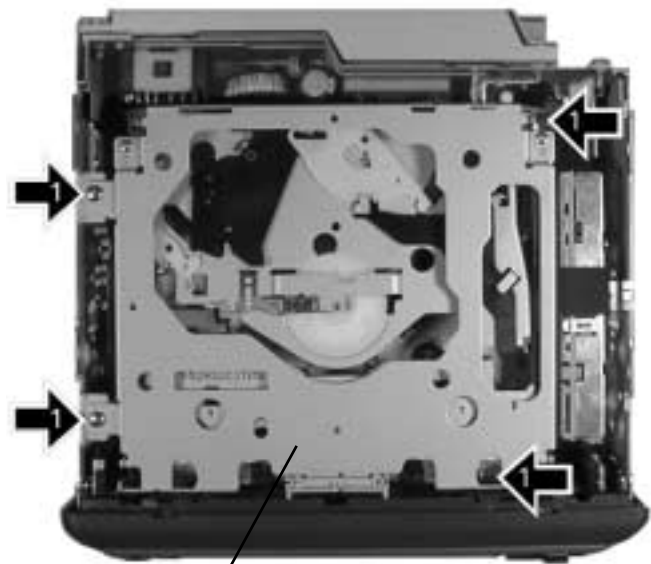
● Removing the CD Mechanism Module (Fig.1)

➡ 1 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module (not shown).

● Removing the Panel Assy (not shown)

1. Disconnect the two stoppers and then remove the Panel Assy.



CD Mechanism Module

Fig.1

● Removing the Tuner Amp Unit

➡ 1 Remove the three screws and then remove the Cover. (Fig.2)

➡ 2 Remove the two screws. (Fig.2)

➡ 3 Remove the screw. (Fig.3)

➡ 4 Straight the tabs at fore locations indicated and then remove the Tuner Amp Unit. (Fig.3)

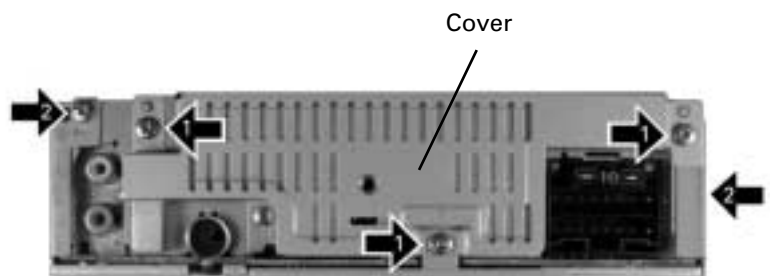
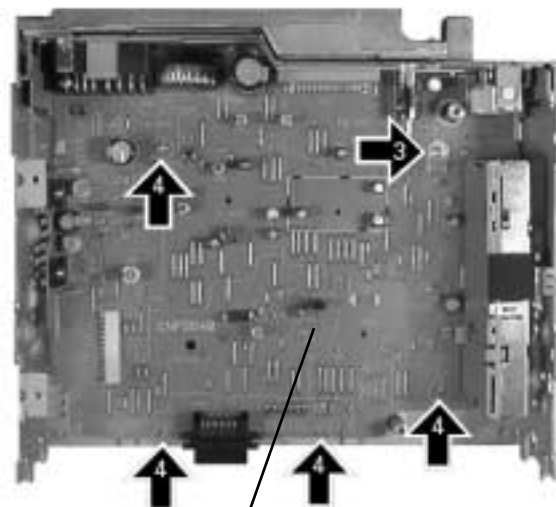


Fig.2

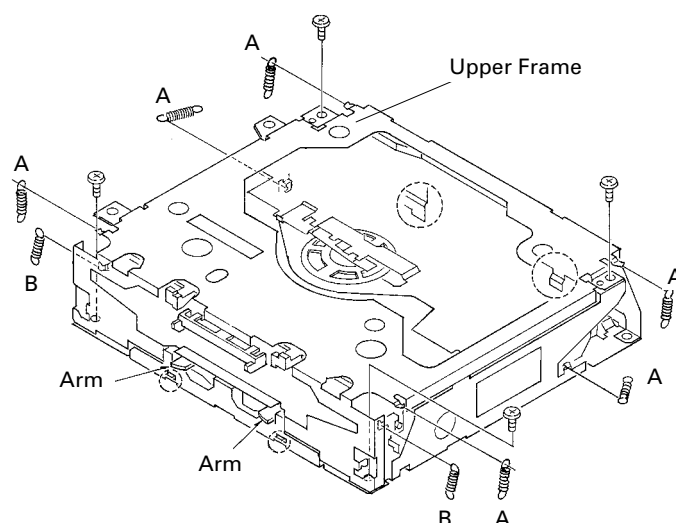


Tuner Amp Unit

Fig.3

● Removing the Upper Frame

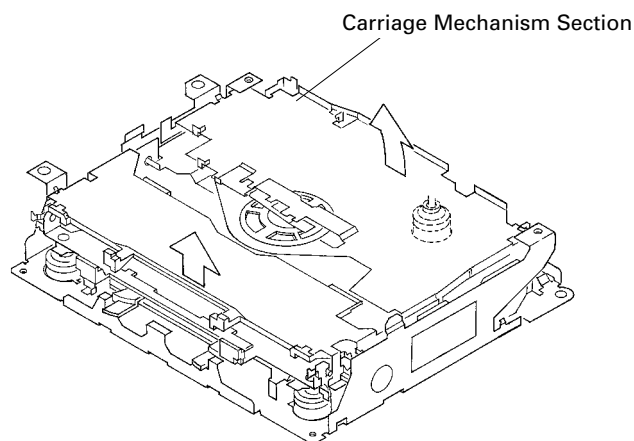
1. Remove six Springs A, two Springs B and four Screws.
2. Remove two Tabs situated on rear side of the Upper Frame, remove two Arms on the front side, then remove two Tabs on the front side.



● Removing the Carriage Mechanism

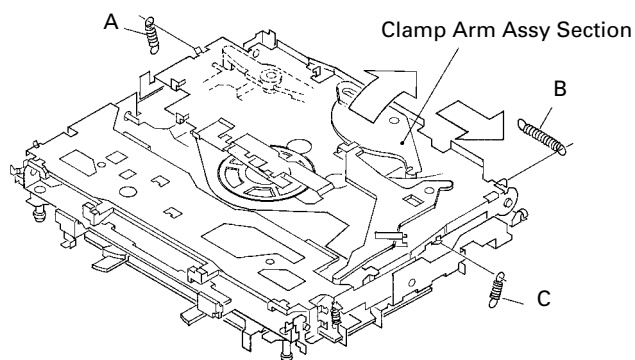
1. Disengage the Carriage Mechanism from the two dampers situated in the front side by driving it up, then disengage and remove the mechanism from the one damper by driving it up aslant into front side direction.

Note : When assembling the Carriage Mechanism, coat the dampers with alcohol prior to the assembly.



● Removing the Clamp Arm Assy

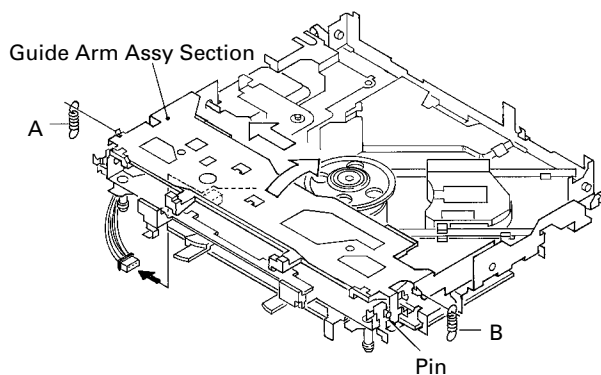
1. Remove a Spring A, a B and a Spring C.
2. Drive the Clamp Arm Assy up into rear side direction, then disengage the arm from its current position. Finally, drive the assembly approximately 45 degrees upward, then slide the assembly toward right side to remove it.



● Removing the Guide Arm Assy

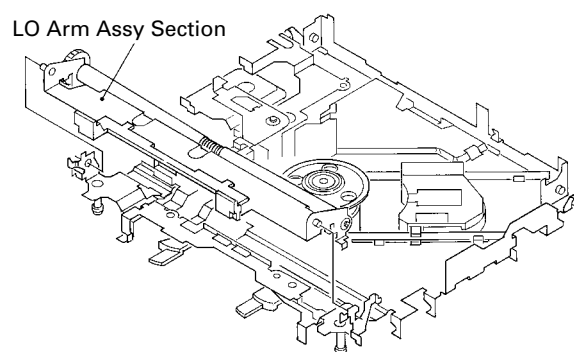
1. Remove a connector, a spring A and B
2. Drive the Guide Arm Assy up aslant into rear side direction, then remove it from a Pin. Finally, drive the assembly approximately 45 degrees upward, then slide the assembly toward left side to remove it.

Note : When assembling the guide arm assembly, route the cord inside the assembly. In this operation, care must be exercised so that cord may be caught by the gear.



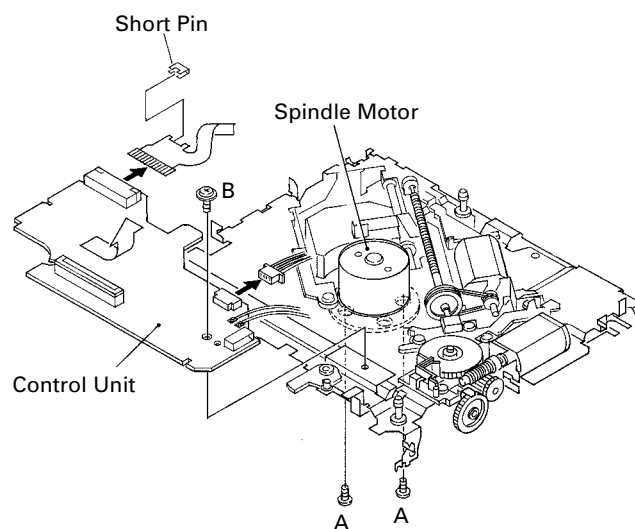
● Removing the LO Arm Assy

1. Remove two Pins to dismount the LO Arm Assy.



● Removing the Control Unit and the Spindle Motor

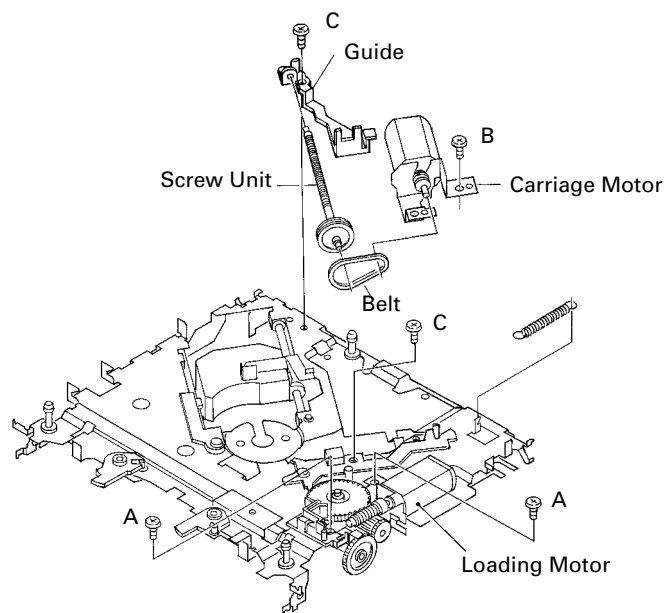
1. Remove from the connector after mounting the short pin on the flexible PCB of the pickup unit.
2. Remove two Soldered joints, then remove two Screws A.
3. Remove two connectors and a Screw B.
4. Disengage the Control Unit from two Tabs, then dismount the unit by sliding it toward left.
5. Dismount the Spindle Motor.



● Removing the Loading Motor and Carriage Motor

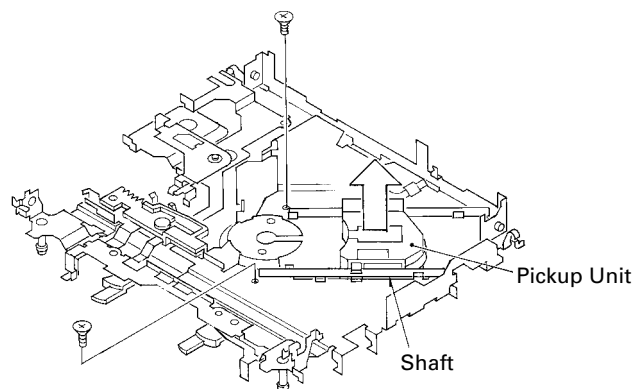
1. Remove the Spring and two Screws A.
2. Dismount the Loading Motor.
3. Remove the Belt, a Screw B, two Screws C, a Guide and a Screw Unit.
4. Dismount the Carriage Motor.

Note : When assembling the Belt, use care so that it may not be contaminated by grease.

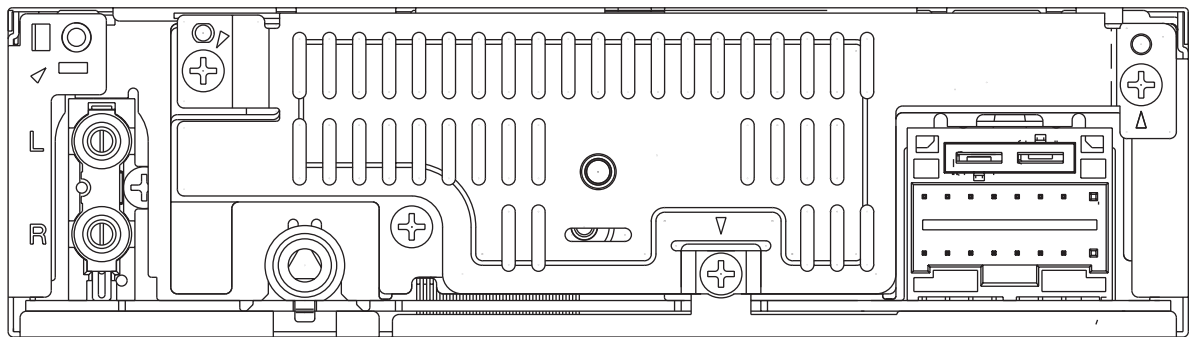


● Removing the Pickup Unit

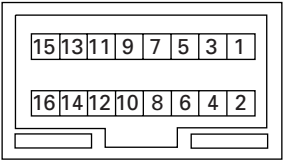
1. Remove two Screws and a Shaft.
2. Dismount the Pickup Unit.



7.1.3 CONNECTOR FUNCTION DESCRIPTION



PRE OUT ANTENNA



- 1. BACK UP
- 2. GND
- 3. NC
- 4. ACC
- 5. B.REM
- 6. NC
- 7. NC
- 8. NC
- 9. FL-
- 10. RL-
- 11. FL+
- 12. RL+
- 13. FR-
- 14. RR-
- 15. FR+
- 16. RR+

7.2 PARTS

7.2.1 IC

● Pin Functions(PE5196A)

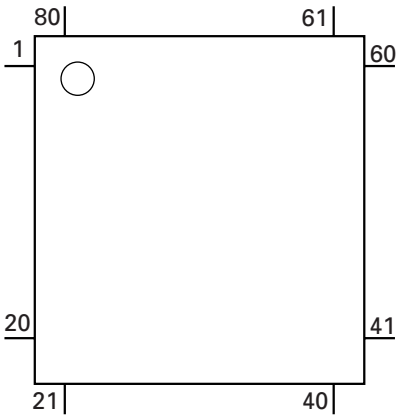
Pin No.	Pin Name	I/O	Format	Function and Operation
1	MODEL1	I		Model select input
2	NL1	I		Noise level input
3	NL2DT	I		Noise level input 2
4	AVSS			AVSS
5	ST	I		Stereo input
6	SD	I		SD signal input
7	AREF1			AVREF1
8	KYDT	I		Key data input
9	DPDT	O	C	Key data output
10	SDBW	I		SDBW input
11	TUNPDI	I		PLL IC data input
12	TUNPDO	O	C	PLL IC data output
13	TUNPCK	O	C	PLL IC clock output
14	TUNPCE	O	C	PLL IC chip enable output
15	CURRO	O	C	Tuner voltage FIX output
16	XSI	I	C	CD LSI serial data input(TSI)
17	XSO	O	C	CD LSI serial data output(TSO)
18	XSCK	O	C	CD LSI serial clock output(TSCK)
19	DRST	O	C	RDS decoder reset output
20	ADPW	O	C	A/D converter power output
21	FM/AM	O	C	Tuner power supply control output
22	VDCONT	O	C	VD power supply control output
23	CONT	O	C	Servo driver power control output
24	XAO	O	C	CD LSI command / data control output
25	XRST	O	C	CD LSI reset control output
26	XSTB	O	C	CD LSI strobe output
27	CLAMP	I		Disc clamp sense input
28	MIRR	I		Mirror detection input
29	FOK	I		Focus OK signal input
30	LOCK	I		Spindle lock detector input
31	CDLOAD	O		LOAD motor loading control output
32	TELIN	I		Cellular mute input
33	VSS			VSS
34	CDEJECT	O		LOAD motor eject control output
35	CD5VON	O	C	CD +5V power supply control output
36-39	NC			Not used
40	RECIEVE	O	C	RDS decoder receiving output
41	SWVDD	O	C	Grille microcomputer power supply control output
42	SYSPW	O	C	System power supply control output
43	ILMPW	O	C	Illumination power output
44	MUTE	O	C	Mute output
45	PEE	O	C	Beep tone output
46	LOCH	O	C	LOCH output
47	RDS57K	I		57kHzBP-OUT sense input
48	TUNPCE2	O	C	EEPROM chip enable output
49	PCL	O	C	Test mode clock adjustment output
50	VCK	O	C	Clock output for electronic volume
51	VDT	O	C	Data output for electronic volume
52	ANTPW	O		Antenna power output
53	VST	O		Strobe pulse output for electronic volume
54	DALMON	O		Stand-by output
55,56	NC			Not used
57	LOCL	O		LOCL output
58	RDSLK	I		RDSLK input

Pin No.	Pin Name	I/O	Format	Function and Operation
59	RDT	I		RDS data input
60	RESET			Reset
61	LDET	I		PLL lock detection input
62	RCK	I		RDS clock input
63	ASENS	I		ACC power sense input
64	BSENS	I		Back up power sense input
65	DSENS	I		Grille detach sense input
66	TMUTE	O	C	Tuner mute output
67	NC			Not used
68	VDD			VDD
69	X2			Crystal oscillator connection pin
70	X1			Crystal oscillator connection pin
71	IC(VPP)			IC(VPP)
72	NC			Not used
73	TESTIN	I		Test program mode input
74	AVDD			AVDD
75	AVREF0			AVREF0
76	SL	I		Signal level input
77	TEMP	I		Temperature detection input
78	VDSSENS	I		VD power supply sense input
79	DINC	I		Disc detection input
80	EJTD	I		Disc eject position detect input

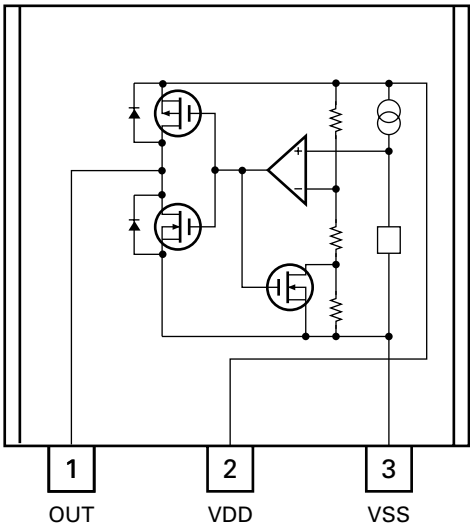
Output Format	Meaning
C	C MOS output

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

*PE5196A



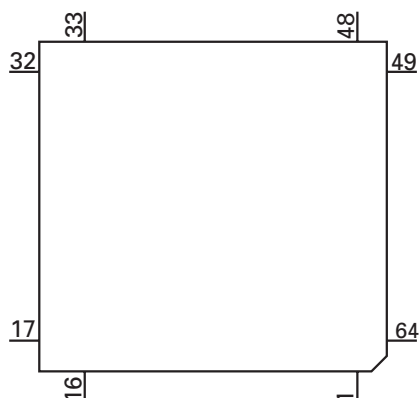
S-80834ANY



● Pin Functions (PD6340A)

Pin No.	Pin Name	I/O	Function and Operation
1-5	SEG4-0	O	LCD segment output
6-9	COM3-0	O	LCD common output
10	VLCD		LCD drive power supply
11-14	KST3-0	O	Key strobe output
15,16	KDT0,1	I	Key data input (analogue input)
17	REM	I	Remote control reception
18	DPDT	I	Display data input
19	NC		Not used
20	KYDT	O	Key data output
21	MODA		GND
22	X0		Crystal oscillator connection pin
23	X1		Crystal oscillator connection pin
24	VSS		GND
25,26	KDT2,3	I	Key data input
27	NC		Not used
28	KST4	O	Key strobe output
29-32	NC		Not used
33-55	SEG35-13	O	LCD segment output
56	VDD		Power supply
57-64	SEG12-5	O	LCD segment output

*PD6340A

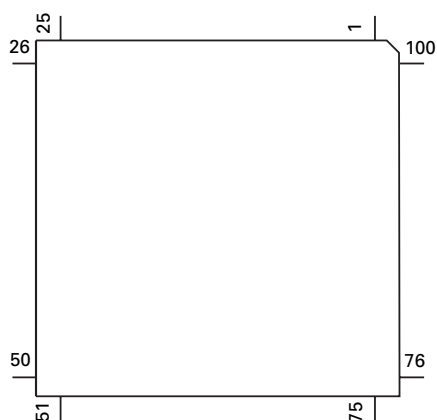


● Pin Functions (UPD63711GC)

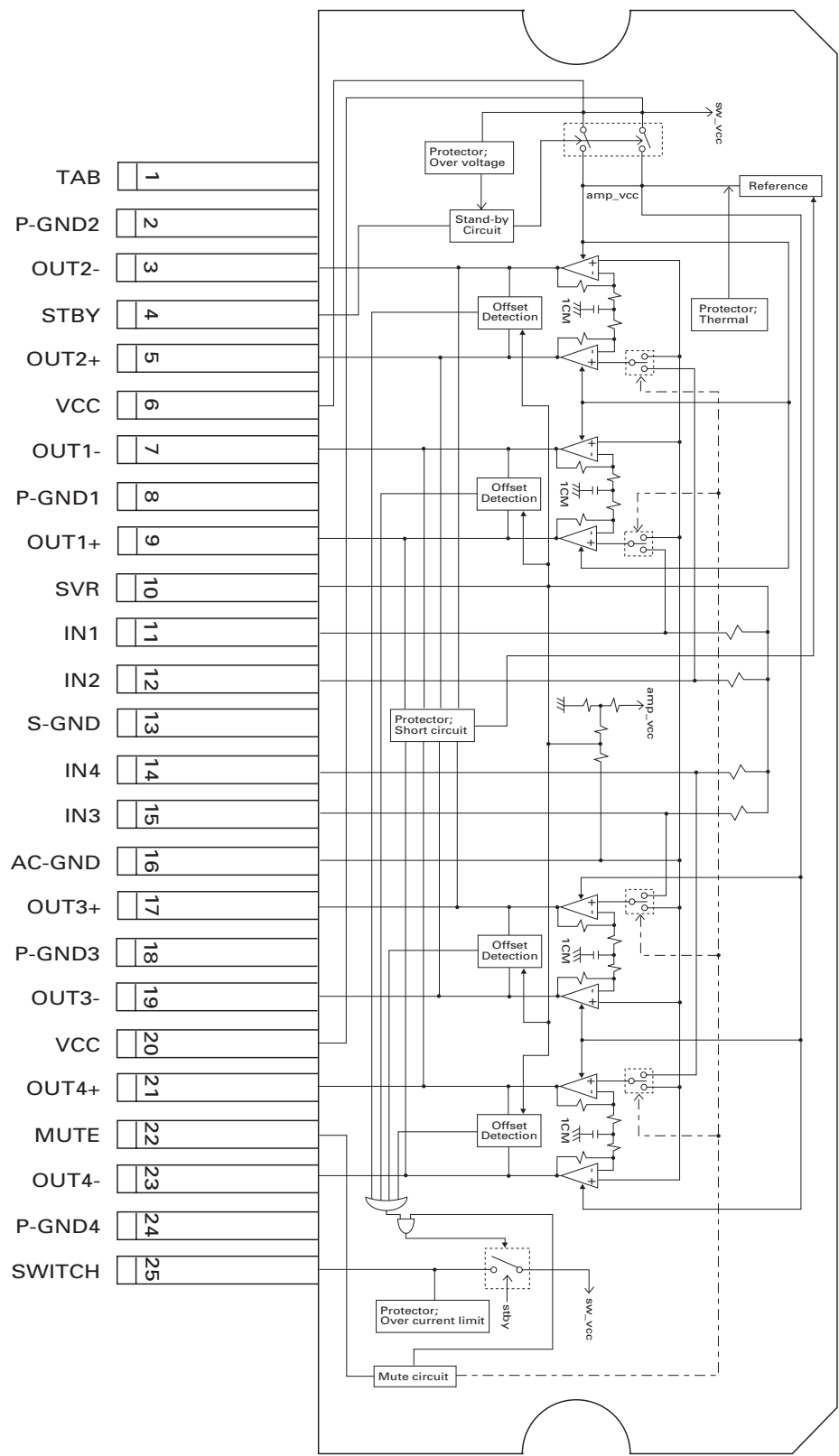
Pin No.	Pin Name	I/O	Function and Operation
1	D.GND		Logic circuit GND
2	RFOK	O	RFOK signal output
3	RST	I	Reset signal input
4	A0	I	Command/parameter identification signal input
5	STB	I	Data strobe signal input
6	SCK	I	Clock signal input for serial data input/output
7	SO	O	Serial data and status signal output
8	SI	I	Serial data input
9	XTALEN	I	Crystal oscillation control pin
10	D.VDD		Positive power supply terminal to logic circuit
11	DA.VDD		Positive power supply terminal to D/A converter
12	R_OUT	O	Right channel audio output signal
13	DA.GND		D/A converter GND
14	REGC	I	The outside putting capacitor connection pin for SCF regulator
15	DA.GND		D/A converter GND
16	L_OUT	O	Left channel audio output signal
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	I	Crystal oscillator connect pin
24	XTAL	O	Crystal oscillator connect pin
25	X.GND		Crystal oscillation circuit GND
26	D.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	HOLD	O	Defect detection output
36	TX	O	Digital audio interface data output
37	D.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	D.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	MIRR	O	MIRR output
44	PLCK	O	Monitor pin of bit clock
45	D.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	D.VDD		Positive power supply terminal to logic circuit
52	PACK	O	CD-TEXT PACK synchronous signal
53	TSO	O	CD-TEXT data serial output
54	TSI	I	CD-TEXT control parameter serial input
55	TSCK	I	CD-TEXT serial clock input
56	TSTB	I	CD-TEXT parameter strobe signal input
57	D.GND		Logic circuit GND

Pin No.	Pin Name	I/O	Function and Operation
58	TEST0	I	Test pin
59	TEST1	I	Test pin
60	ATEST	O	Test pin
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	DAC0	O	DAC output for adjustment
67	DAC1	O	DAC output for adjustment
68	DAC2	O	DAC output for adjustment
69	DAC3	O	DAC output for adjustment
70	A.VDD		Positive 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	O	Focus error amplifier output
92	TE-	I	Tracking error amplifier inverted input
93	TEO	O	Tracking error amplifier output
94	TE2	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

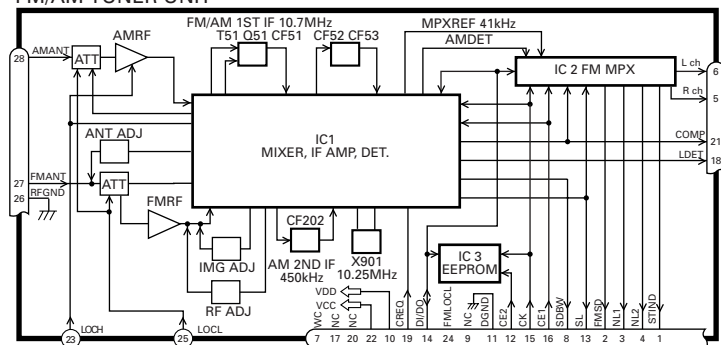
*UPD63711GC



PAL006A



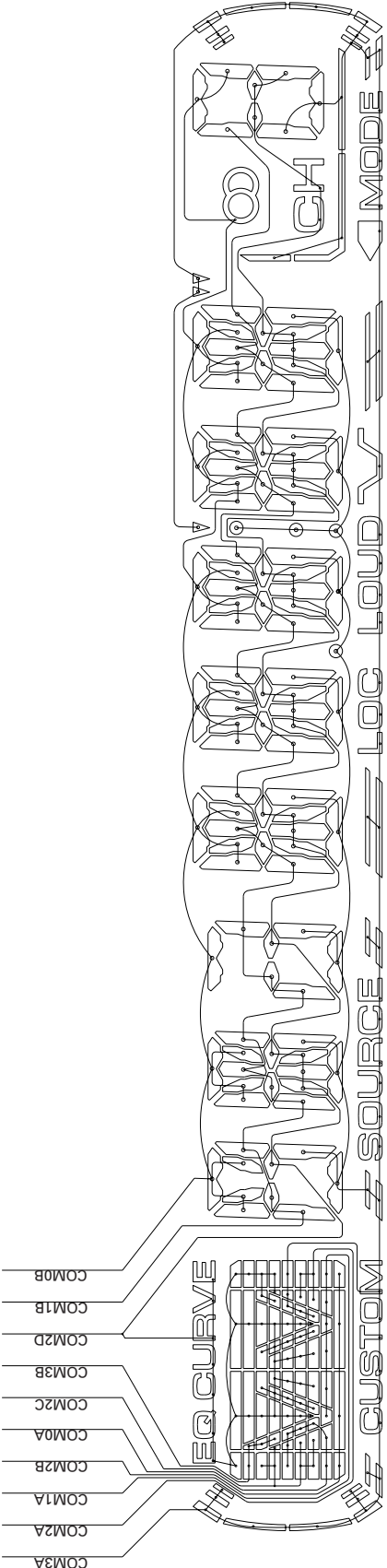
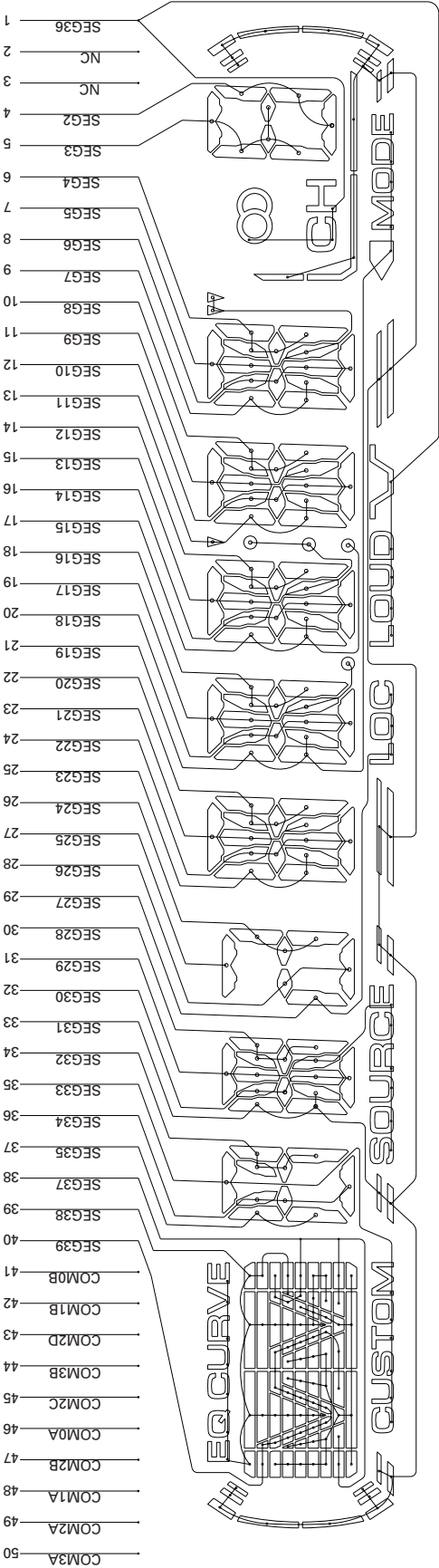
FM/AM TUNER UNIT



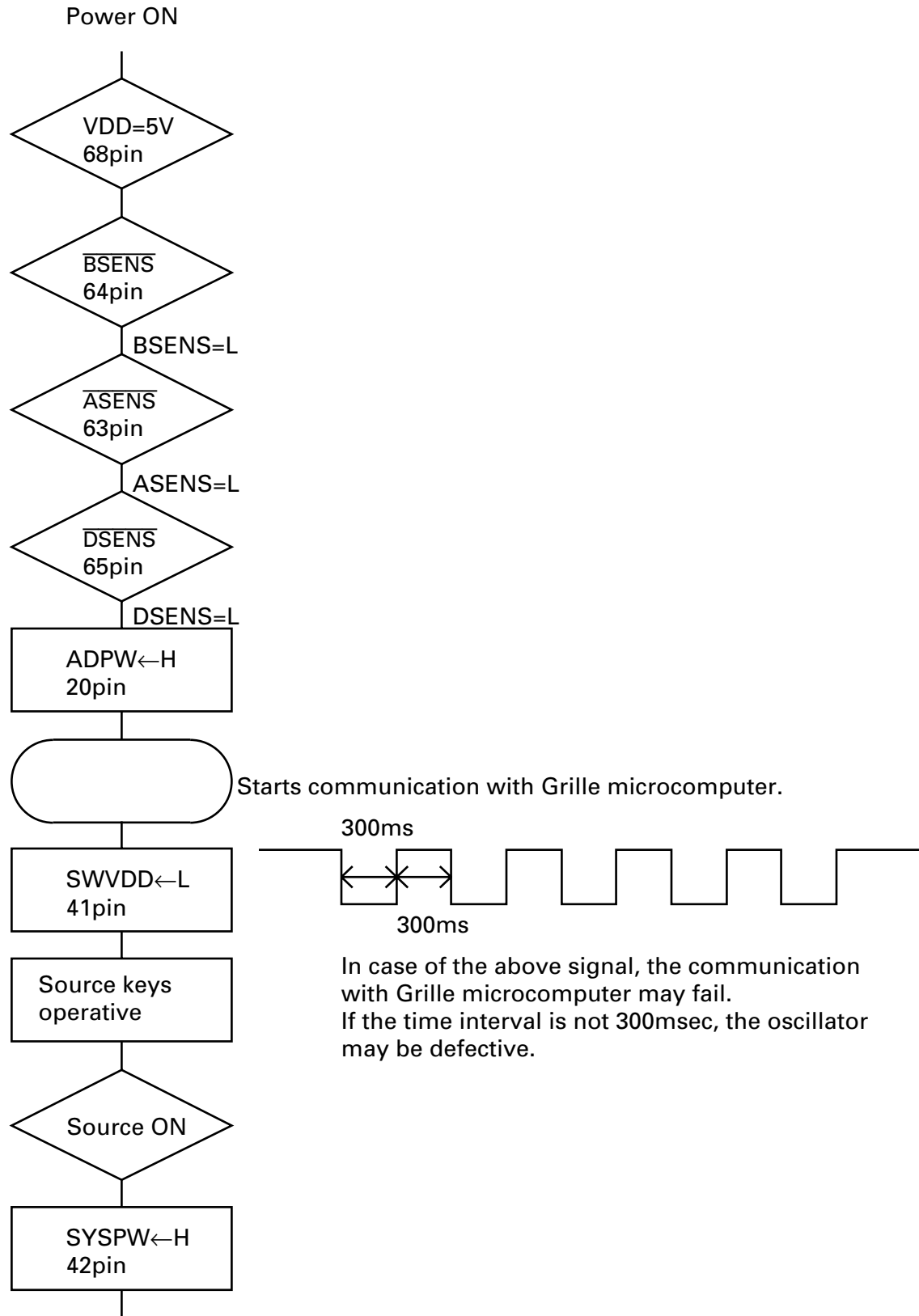
No.	Symbol	I/O	Explain	
1	STIND	O	stereo indicator	"Low" when the FM stereo signals are received. To be pulled up to the "VDD" at 47k Ω .
2	FMSD	O	FM station detector	"High" when signals are received. To be pulled up to the "VDD" at 47k Ω . Meanwhile, 10k Ω should be used when taking diver FIX trigger from here and "High: 0.9VDD or more" and "Low: 250mV or less". (Should satisfy the diver IC specifications)
3	NL1	O	noise level-1	"High" when noise is received. Output for the RDS. GND at 47k Ω //1,800pF.
4	NL2	O	noise level-2	"High" when noise is received. Output for the RDS. GND at 36k Ω //330pF.
5	Rch	O	R channel output	FM stereo "R-ch" signal output or AM audio output. Add the specified di-emphasis constant.
6	Lch	O	L channel output	FM stereo "L-ch" signal output or AM audio output. Add the specified di-emphasis constant.
7	WC		write control	EEPROM write control. Writing permissible at "Low". Normally open.
8	SDBW	O	SD bandwidth	SD bandwidth signal output. For detection of detuning data for the RDS.
9	NC			Not used
10	VDD		power supply	Power supply pin for the digital section. D.C. 5V +/- 0.25V. Be careful about overlapping noise in the logic section.
11	DGND		digital ground	Grounding for the digital section.
12	CE2	I	chip enable-2	EEPROM chip enable. Active a "Low" To be pulled up to the "VDD" at 47k Ω
13	SL	I/O	signal level	Received FM/AM signal level (strength) output. Connect the specified load resistor and capacitor (10k Ω + 39k Ω //4,700pF)
14	DI/DO	I/O	data input/ data output	Data input/Data output To be pulled up to the "VDD" at 47k Ω
15	CK	I	clock	Clock input To be pulled up to the "VDD" at 47k Ω
16	CE1	I	chip enable-1	AF-RF chip enable. Active at "High" To be grounded at 47k Ω
17	NC			Not used
18	LDET	O	lock detector	Active at "Low". To be pulled up to the "VDD" at 47k Ω
19	CREQ	I	current request	Active at "Low". To be grounded at 47k Ω
20	NC			Not used
21	COMP	O	composite signal	FM composite signal output. r out < 100 Ω
22	VCC		power supply	Analog section power supply pin.D.C.8.4V +/- 0.3V
23	LOCH	I	local high	FM local high pin. When seeking local high, apply 5V together with "LOCL".
24	FMLOCL	I	FM local low	FM local low pin. When seeking local low, apply 5V to the base of the NPN transistor with which the specified resistor is being connected to the emitter. Keep it open in case of ordinary marketed models.
25	LOCL	I	local low	FM/AM local low pin. When seeking local low, apply 5V to the base of the NPN transistor. Since this pin is exclusive for AM when the FMLOCL is in use, do not drive it under FM.
26	RFGND		RF ground	Grounding for the antenna section.
27	FMANT	I	FM antenna input	FM antenna input. 75 Ω . Serge absorber (DSP-201M-S00B) is necessary.
28	AMANT	I	AM antenna input	AM antenna input. High impedance. Connect to the antenna through an L (LAU type) of 4.7 μ H.To cope with the power transmission line hums, insert a series circuit consisting of an L (a coil of about 100mH) + R (a resistor of 470 Ω to 2.2k Ω) between the GND.

7.2.2 DISPLAY

● CAW1606(DEH-2350/X1M/ES), CAW1633(DEH-1350/X1M/ES)



7.3 OPERATIONAL FLOW CHART



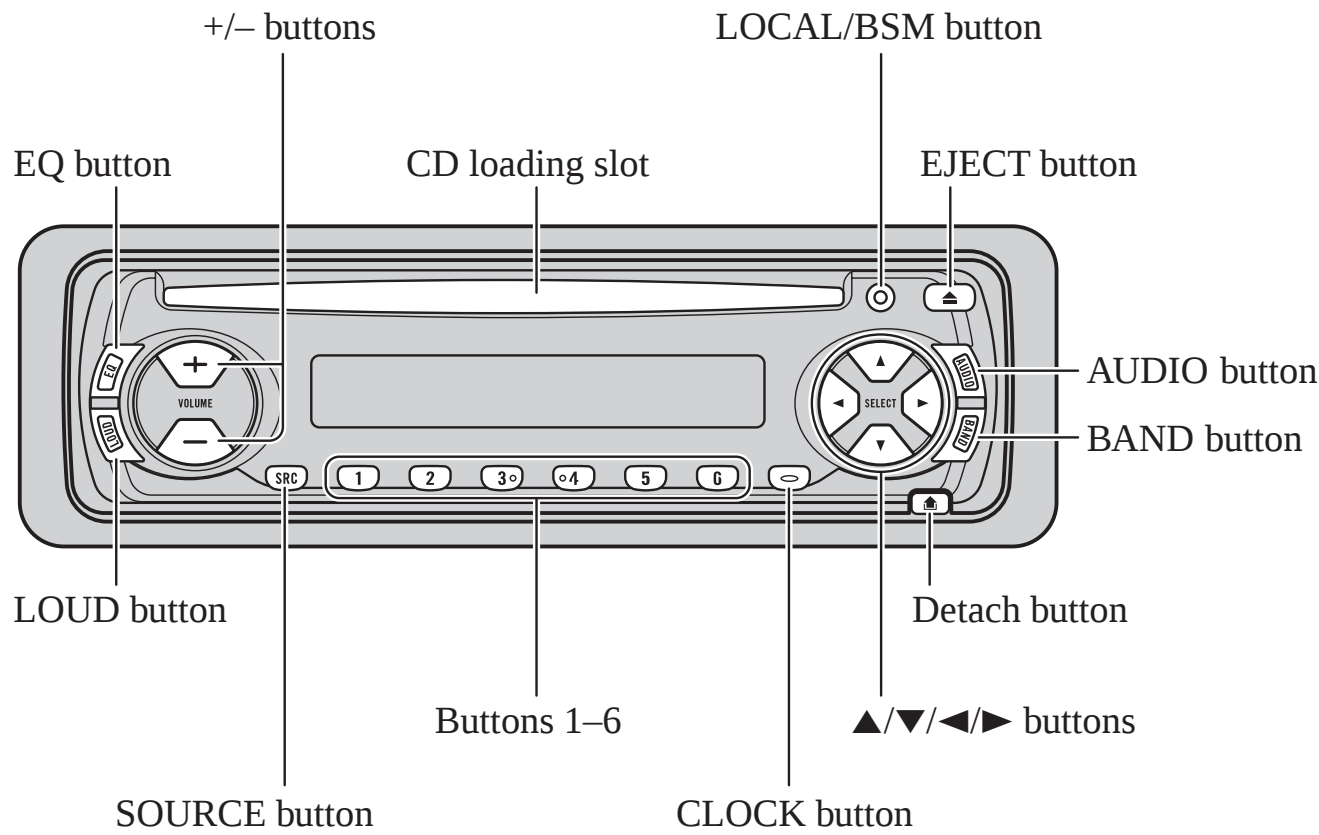
Completes power-on operation.(After that, proceed to each source operation.)

8. OPERATIONS AND SPECIFICATIONS

8.1 OPERATIONS

Key Finder

Head Unit



Basic Operation

To Listen to Music

The following explains the initial operations required before you can listen to music.

Note:

- Loading a disc in this product.

1. Select the desired source (e.g. Tuner).



Each press changes the Source ...

Each press of the SOURCE button selects the desired source in the following order:

Built-in CD player → Tuner

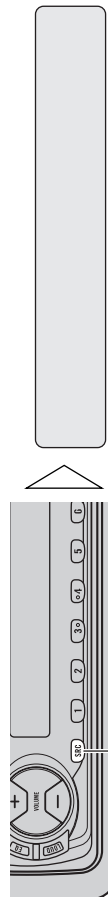
Note:

- When no disc is set in this product, built-in CD player source will not change.
- When this product's blue/white lead is connected to the car's Auto-antenna relay control terminal, the car's Auto-antenna extends when this product's source is switched ON. To retract the antenna, switch the source OFF.

2. Raise or lower the volume.



3. Turn the source OFF.



Hold for 1 second

Basic Operation of Tuner

Reset the AM tuning step from 9 kHz (the factory preset step) to 10 kHz when using the tuner in North, Central or South America.

Manual and Seek Tuning

- You can select the tuning method by changing the length of time you press the ◀/▶ button.

Manual Tuning (step by step)	0.5 seconds or less
Seek Tuning	0.5 seconds or more

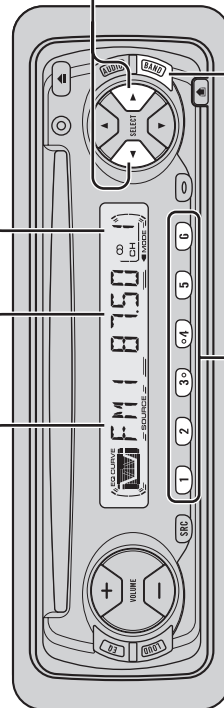
Note:

- If you continue pressing the button for longer than 0.5 seconds, you can skip broadcast stations. Seek Tuning starts as soon as you release the button.
- Stereo indicator "Ⓢ" lights when a stereo station is selected.

Frequency Indicator

Band Indicator

Preset Number Indicator



Preset Tuning

- You can memorize broadcast stations in buttons 1 through 6 for easy, one-touch station recall.

Preset station recall	2 seconds or less
Broadcast station preset memory	2 seconds or more

Note:

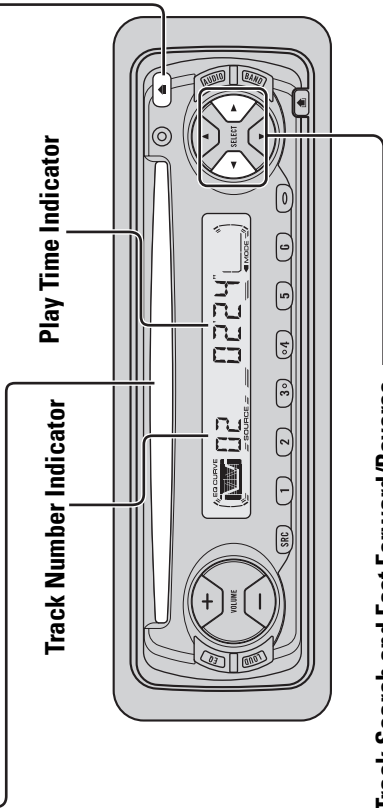
- Up to 18 FM stations (6 in FM1, FM2 and FM3) and 6 AM stations can be stored in memory.
- You can also use the ▲ or ▼ buttons to recall broadcast stations memorized in buttons 1 through 6.

FM1 → FM2
→ FM3 → AM

Eject

CD Loading Slot

- Note:**
- The built-in CD player plays one standard 12 cm or 8 cm (single) CD at a time. Do not use an adapter when playing 8 cm CD.
 - Don't insert any materials except for CD into CD loading slot.
- Note:**
- The CD function can be turned ON/OFF with the disc remaining in this product.
 - A disc left partially inserted after ejection may incur damage or fall out.



Track Search and Fast Forward/Reverse

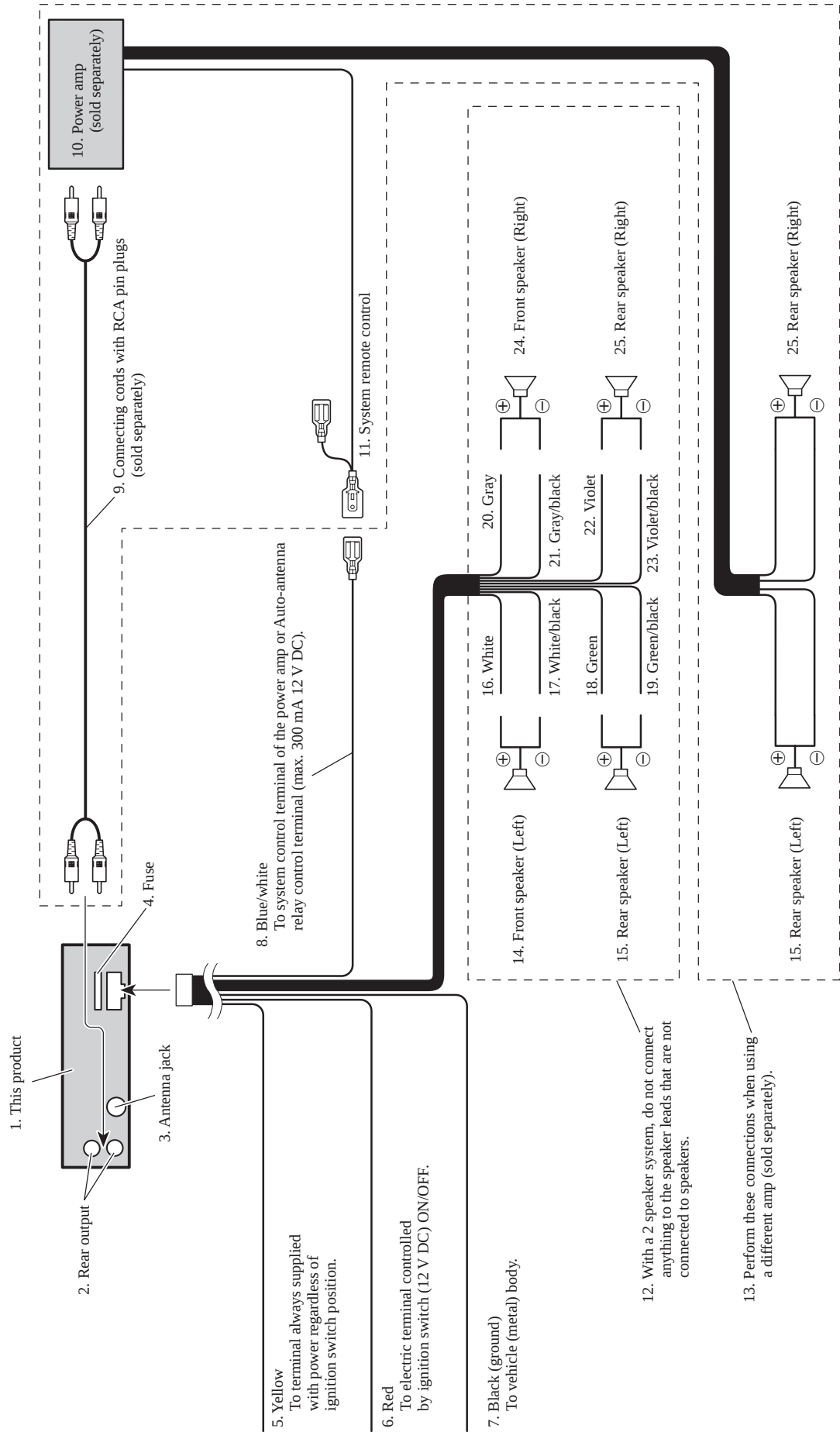
- You can select between Track Search or Fast Forward/Reverse by pressing the ◀/▶ button for a different length of time.

Track Search	0.5 seconds or less
Fast Forward/Reverse	Continue pressing

Note:

- If a disc cannot be inserted fully or playback fails, make sure the recorded side is down. Push the EJECT button and check the disc for damage before reinserting it.
- If a disc is inserted with the recorded side up, it will be ejected automatically after a few moments.
- If the built-in CD player cannot operate properly, an error message (such as "ERR-14") appears on the display. Refer to "Built-in CD Player's Error Message".

Connection Diagram



8.2 SPECIFICATIONS

General

Power source	 14.4 V DC (10.8 – 15.1 V allowable)
Grounding system	 Negative type
Max. current consumption	 10.0 A
Dimensions	
(DIN) (chassis)	 178 (W) × 50 (H) × 159 (D) mm
(nose)	 188 (W) × 58 (H) × 19 (D) mm
(D) (chassis)	 178 (W) × 50 (H) × 164 (D) mm
(nose)	 170 (W) × 48 (H) × 14 (D) mm
Weight	 1.4 kg
Electrode dark current	 6mA or less

Amplifier

Continuous power output is 22 W per channel min. into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD. (DEH-2350)	
Continuous power output is 20 W per channel min. into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD. (DEH-1350)	
Maximum power output	
(DEH-2350).....	50 W × 4
(DEH-1350).....	45 W × 4
Load impedance	 4 Ω (4 – 8 Ω allowable)
Preout maximum output	
level/output impedance	 2.2 V/1 kΩ
Equalizer (3-Band Equalizer)	
(Low)	 Level: ±12 dB
(Mid)	 Level: ±12 dB
(High)	 Level: ±12 dB
Loudness contour	
(Low)	 +3.5 dB (100 Hz), +3 dB (10 kHz)
(Mid)	 +10 dB (100 Hz), +6.5 dB (10 kHz)
(High)	 +11 dB (100 Hz), +11 dB (10 kHz)
	(volume: –30 dB)

CD player

System	 Compact disc audio system
Usable discs	 Compact disc
Signal format	 Sampling frequency: 44.1 kHz
	Number of quantization bits: 16; linear
Frequency characteristics	 5 – 20,000 Hz (±1 dB)
Signal-to-noise ratio	 94 dB (1 kHz) (IEC-A network)
Dynamic range	 92 dB (1 kHz)
Number of channels	 2 (stereo)

FM tuner

Frequency range	 87.5 – 108 MHz
Usable sensitivity	 9 dBf
	(0.8 μV/75 Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity	 15 dBf (1.5 μV/75 Ω, mono)
Signal-to-noise ratio	 70 dB (IEC-A network)
Distortion	 0.3% (at 65 dBf, 1 kHz, stereo)
Frequency response	 30 – 15,000 Hz (±3 dB)
Stereo separation	 40 dB (at 65 dBf, 1 kHz)

AM tuner

Frequency range	 531 – 1,602 kHz (9 kHz)
	530 – 1,640 kHz (10 kHz)
Usable sensitivity	 18 μV (S/N: 20 dB)
Selectivity	 50 dB (±9 kHz)
	50 dB (±10 kHz)

Note:

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