

Service Manual

ORDER NO.
CRT3501

HIGH POWER CD/MP3/WMA PLAYER WITH FM/AM TUNER

DEH-27MP /XN/UC



This service manual should be used together with the following manual(s) listed below. For the parts numbers, adjustments, etc. which are not shown in this manual, refer to the following manual(s).

Model No.	Order No.	Mech. Module	Remarks
DEH-2750MP/XN/GS	CRT3396		
CX-3158	CRT3394	S10.1AAC	CD Mech. Module : Circuit Description, Mech. Description, Disassembly

SAFETY INFORMATION

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

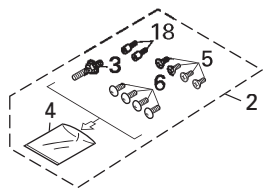
EXPLODED VIEWS AND PARTS LIST

PACKING(Page 8)

● PACKING SECTION PARTS LIST

* : Non spare part

Mark	No.	Description	DEH-2750MP/XN/GS	DEH-27MP/XN/UC
	1	Accessory Assy	CEA4850	CEA4610
	2	Screw Assy	CEA3849	CEA4611
	10	Polyethylene Bag	CEG-162	CEG1173
	11	Carton	CHG5434	CHG5578
	12	Contain Box	CHL5434	CHL5578
	15-1	Owner's Manual	CRD3939	CRD4001
	15-2	Installation Manual	CRD3940	CRD4002
*	15-4	Caution Card	Not used	CRP1294
*	15-5	Card	Not used	ARY1048
	16	Case Assy	CXB3520	Not used
	18	Screw	Not used	CBA1488



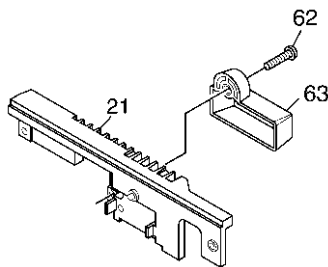
● Owner's Manual, Installation Manual

Part No.	Language
CRD4001	English, French, Spanish
CRD4002	English, French, Spanish

EXTERIOR(Page 10)

● EXTERIOR SECTION PARTS LIST

Mark	No.	Description	DEH-2750MP/XN/GS	DEH-27MP/XN/UC
	9	Tuner Amp Unit	CWM9693	CWN1393
	36	Screw	IMS20P030FZK	IMS20P030FTB
	38	Detach Grille Assy	CXC3748	CXC5516(Grille Assy)
	39	Screw	BPZ20P100FZK	BPZ20P100FTB
	56	Grille Unit	CXC3643	CXC5479
	61	Panel	YNS5045	CNS8046
	62	Screw	Not used	BMZ40P140FTC
	63	Holder	Not used	CNV7619

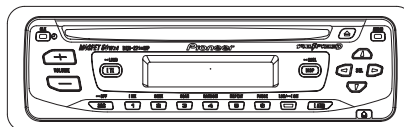


ELECTRICAL PARTS LIST(Page 42)

TUNER AMP UNIT

Circuit Symbol and No.	DEH-2750MP/XN/GS	DEH-27MP/XN/UC
IC601 IC	PE5447A	PE5523A
R151, 152	RD1/4PU471J	Not used
R153, 154	RS1/16S471J	RS1/16S0R0J
R353, 354	RS1/16S331J	RS1/16S821J

Service Manual



DEH-2790MP/XN/ID

ORDER NO.
CRT3396

HIGH POWER CD/MP3/WMA PLAYER WITH FM/AM TUNER

DEH-2790MP /XN/ID

DEH-2750MP /XN/GS

DEH-2770MP /XN/CS

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

Model No.	Order No.	Mech.Module	Remarks
CX-3158	CRT3394	S10.1AAC	CD Mech. Module : Circuit Description, Mech. Description, Disassembly



For details, refer to "Important Check Points for Good Servicing".

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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.

● **Service Precaution**



1. You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.
2. Before disassembling the unit, be sure to turn off the power. Unplugging and plugging the connectors during power-on mode may damage the ICs inside the unit.
3. To protect the pickup unit from electrostatic discharge during servicing, take an appropriate treatment (shorting-solder) by referring to "the DISASSEMBLY".
4. After replacing the pickup unit, be sure to check the grating.





DEH-2790MP/XN/ID

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[Important Check Points for Good Servicing]

In this manual, procedures that must be performed during repairs are marked with the below symbol. Please be sure to confirm and follow these procedures.

1. Product safety



Please conform to product regulations (such as safety and radiation regulations), and maintain a safe servicing environment by following the safety instructions described in this manual.

- ① Use specified parts for repair.

Use genuine parts. Be sure to use important parts for safety.

- ② Do not perform modifications without proper instructions.

Please follow the specified safety methods when modification (addition/change of parts) is required due to interferences such as radio/TV interference and foreign noise.

- ③ Make sure the soldering of repaired locations is properly performed.

When you solder while repairing, please be sure that there are no cold solder and other debris. Soldering should be finished with the proper quantity. (Refer to the example)

- ④ Make sure the screws are tightly fastened.

Please be sure that all screws are fastened, and that there are no loose screws.

- ⑤ Make sure each connectors are correctly inserted.

Please be sure that all connectors are inserted, and that there are no imperfect insertion.

- ⑥ Make sure the wiring cables are set to their original state.

Please replace the wiring and cables to the original state after repairs. In addition, be sure that there are no pinched wires, etc.

- ⑦ Make sure screws and soldering scraps do not remain inside the product.

Please check that neither solder debris nor screws remain inside the product.

- ⑧ There should be no semi-broken wires, scratches, melting, etc. on the coating of the power cord.

Damaged power cords may lead to fire accidents, so please be sure that there are no damages. If you find a damaged power cord, please exchange it with a suitable one.

- ⑨ There should be no spark traces or similar marks on the power plug.

When spark traces or similar marks are found on the power supply plug, please check the connection and advise on secure connections and suitable usage. Please exchange the power cord if necessary.

- ⑩ Safe environment should be secured during servicing.

When you perform repairs, please pay attention to static electricity, furniture, household articles, etc. in order to prevent injuries. Please pay attention to your surroundings and repair safely.

2. Adjustments



To keep the original performance of the products, optimum adjustments and confirmation of characteristics within specification. Adjustments should be performed in accordance with the procedures/instructions described in this manual.

3. Lubricants, Glues, and Replacement parts



Use grease and adhesives that are equal to the specified substance. Make sure the proper amount is applied.

4. Cleaning



For parts that require cleaning, such as optical pickups, tape deck heads, lenses and mirrors used in projection monitors, proper cleaning should be performed to restore their performances.

5. Shipping mode and Shipping screws



To protect products from damages or failures during transit, the shipping mode should be set or the shipping screws should be installed before shipment. Please be sure to follow this method especially if it is specified in this manual.

1 2 3 4

CONTENTS

- SAFETY INFORMATION 2
- 1. SPECIFICATIONS 5
- A 2. EXPLODED VIEWS AND PARTS LIST 8
 - 2.1 PACKING 8
 - 2.2 EXTERIOR 10
 - 2.3 CD MECHANISM MODULE 12
- 3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM 14
 - 3.1 BLOCK DIAGRAM 14
 - 3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE) 16
 - 3.3 KEYBOARD UNIT 22
 - 3.4 CD MECHANISM MODULE(GUIDE PAGE) 24
- B 4. PCB CONNECTION DIAGRAM 34
 - 4.1 TUNER AMP UNIT 34
 - 4.2 KEYBOARD UNIT 38
 - 4.3 CD CORE UNIT(S10.1) 40
- 5. ELECTRICAL PARTS LIST 42
- 6. ADJUSTMENT 46
 - 6.1 CD ADJUSTMENT 46
 - 6.2 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT 48
 - 6.3 ERROR MODE 50
 - 6.4 SYSTEM MICROCOMPUTER TEST PROGRAM 51
- 7. GENERAL INFORMATION 52
 - 7.1 DIAGNOSIS 52
 - 7.1.1 DISASSEMBLY 52
 - 7.1.2 CONNECTOR FUNCTION DESCRIPTION 55
 - 7.2 PARTS 56
 - C 7.2.1 IC 56
 - 7.2.2 DISPLAY 64
 - 7.3 OPERATIONAL FLOW CHART 65
 - 7.4 CLEANING 66
- 8. OPERATIONS 67

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DEH-2790MP/XN/ID

1. SPECIFICATIONS

● DEH-2790MP/XN/ID, DEH-2750MP/XN/GS

General

Rated power source 14.4 V DC
(allowable voltage range:
12.0 – 14.4 V DC)

Grounding system Negative type

Max. current consumption
..... 10.0 A

Dimensions (W × H × D):

Backup current 5 mA or less

DIN

Chassis 178 × 50 × 157 mm

Nose 188 × 58 × 18 mm

D

Chassis 178 × 50 × 162 mm

Nose 170 × 48 × 13 mm

Weight 1.3 kg

Audio

Continuous power output is 22 W per channel minimum into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.

Maximum power output 50 W × 4

Load impedance 4 Ω (4 – 8 Ω allowable)

Preout max output level/output impedance
..... 2.2 V/1 kΩ

Bass/Treble:

Bass

Frequency 100 Hz

Gain +12dB

Treble

Frequency 10 kHz

Gain ±12dB

Loudness contour

Low +7 dB (100 Hz), +4 dB (10 kHz)

High +10 dB (100 Hz), +6.5 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)

MP3 decoding format MPEG-1 & 2 Audio Layer 3

WMA decoding format Ver. 7, 7.1, 8, 9 (2ch audio)

WAV signal format Linear PCM & MS ADPCM

FM tuner

Frequency range 87.5 – 108.0 MHz

Usable sensitivity 8 dBf (0.7 μV/75 Ω, mono,
S/N: 30 dB)

50 dB quieting sensitivity 10 dBf (0.9 μV/75 Ω, mono)

Signal-to-noise ratio 75 dB (IEC-A network)

Distortion 0.3 % (at 65 dBf, 1 kHz,
stereo)

0.1 % (at 65 dBf, 1 kHz,
mono)

Frequency response 30 – 15,000 Hz (±3 dB)

Stereo separation 45 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)

Signal-to-noise ratio 65 dB (IEC-A network)

● DEH-2770MP/XN/CS

General

Rated power source 14.4 V DC
(allowable voltage range:
12.0 – 14.4 V DC)

Grounding system Negative type

Max. current consumption
..... 10.0 A

Backup current 5 mA or less

Dimensions (W × H × D):

DIN

Chassis 178 × 50 × 157 mm

Nose 188 × 58 × 18 mm

D

Chassis 178 × 50 × 162 mm

Nose 170 × 48 × 13 mm

Weight 1.3 kg

Audio

Continuous power output is 22 W per channel minimum into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.

Maximum power output 50 W × 4

Load impedance 4 Ω (4 – 8 Ω allowable)

Preout max output level/output impedance

..... 2.2 V/1 kΩ

Bass/Treble:

Bass

Frequency 100 Hz

Gain ±12dB

Treble

Frequency 10 kHz

Gain ±12dB

Loudness contour

Low +7 dB (100 Hz), +4 dB (10 kHz)

High +10 dB (100 Hz), +6.5 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)

MP3 decoding format MPEG-1 & 2 Audio Layer 3

WMA decoding format Ver. 7, 7.1, 8, 9 (2ch audio)

WAV signal format Linear PCM & MS ADPCM

FM tuner

Frequency range 87.5 – 108.0 MHz

Usable sensitivity 8 dBf (0.7 μV/75 Ω, mono,
S/N: 30 dB)

50 dB quieting sensitivity 10 dBf (0.9 μV/75 Ω, mono)

Signal-to-noise ratio 75 dB (IEC-A network)

Distortion 0.3 % (at 65 dBf, 1 kHz,
stereo)

0.1 % (at 65 dBf, 1 kHz,
mono)

Frequency response 30 – 15,000 Hz (+3 dB)

Stereo separation 45 dB (at 65 dBf, 1 kHz)

AM tuner

Frequency range 530 – 1,640 kHz (10 kHz)

Usable sensitivity 18 μV (S/N: 20 dB)

Signal-to-noise ratio 65 dB (IEC-A network)

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DEH-2790MP/XN/ID

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

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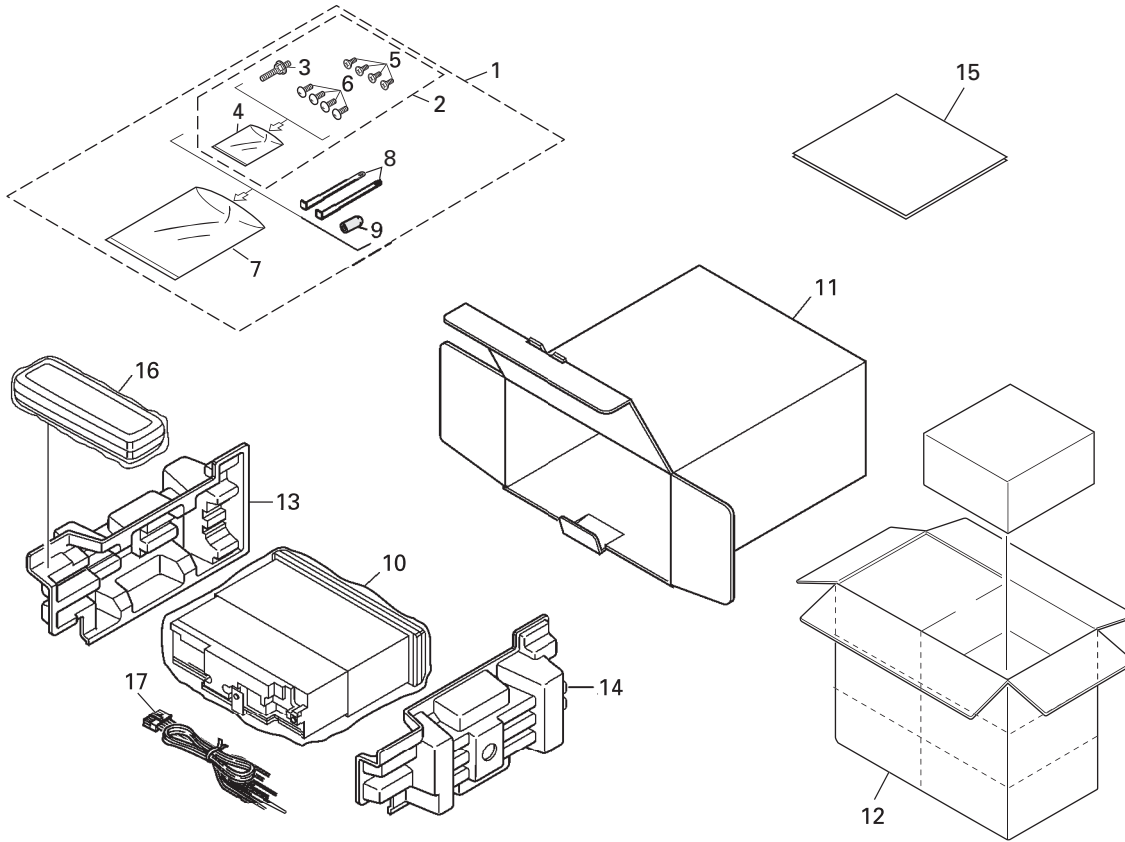
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2. EXPLODED VIEWS AND PARTS LIST

NOTES : • Parts marked by "*" are generally unavailable because they are not in our Master Spare Parts List.

- 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.
- Screw adjacent to  mark on the product are used for disassembly.
- For the applying amount of lubricants or glue, follow the instructions in this manual.
(In the case of no amount instructions, apply as you think it appropriate.)

2.1 PACKING



(1) PACKING SECTION PARTS LIST

<u>Mark No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Mark No.</u>	<u>Description</u>	<u>Part No.</u>
1	Accessory Assy	CEA4850			
2	Screw Assy	CEA3849	11	Carton	See Contrast table(2)
3	Screw	CBA1650	12	Contain Box	See Contrast table(2)
* 4	Polyethylene Bag	CEG-127	13	Protector	CHP2664
5	Screw	CRZ50P090FTC	14	Protector	CHP2868
			15-1	Owner's Manual	See Contrast table(2)
6	Screw	TRZ50P080FTC			
* 7	Polyethylene Bag	CEG-158	15-2	Installation Manual	See Contrast table(2)
8	Handle	CNC5395	15-3	Caution Card	CRP1310
9	Bush	CNV3930	16	Case Assy	CXB3520
10	Polyethylene Bag	CEG-162	17	Cord Assy	XDE7008

(2) CONTRAST TABLE

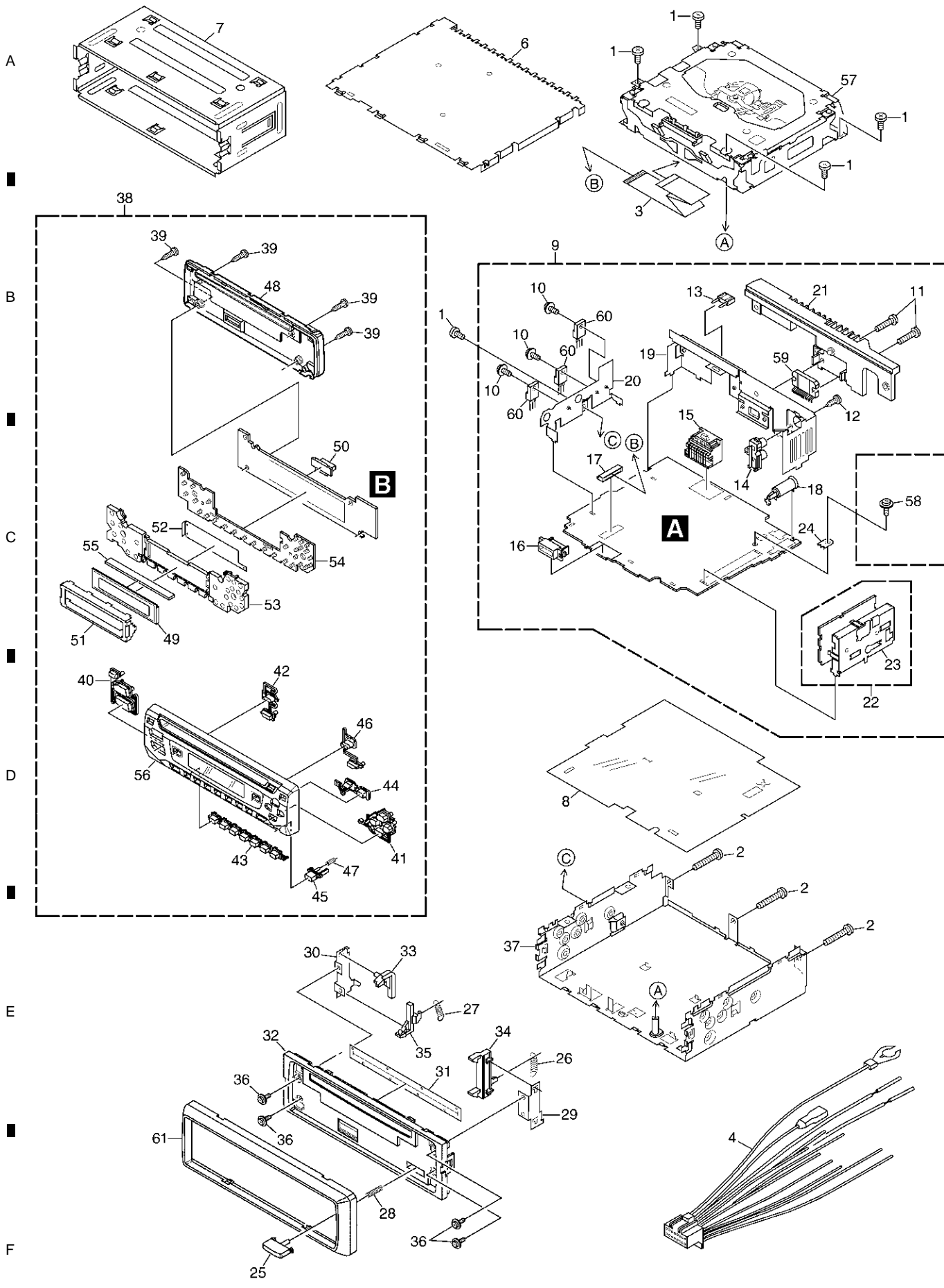
DEH-2790MP/XN/ID, DEH-2750MP/XN/GS and DEH-2770MP/XN/CS are constructed the same except for the following:

Mark	No.	Description	DEH-2790MP/XN/ID	DEH-2750MP/XN/GS	DEH-2770MP/XN/CS
	11	Carton	CHG5470	CHG5434	CHG5435
	12	Contain Box	CHL5470	CHL5434	CHL5435
	15-1	Owner's Manual	CRD3939	CRD3939	CRD3937
	15-2	Installation Manual	CRD3940	CRD3940	CRD3938

Owner's Manual,Installation Manual

Part No.	Language
CRD3939	English, Traditional Chinese, Arabic
CRD3940	English, Traditional Chinese, Arabic
CRD3937	English, Spanish, Portuguese(B)
CRD3938	English, Spanish, Portuguese(B)

2.2 EXTERIOR



(1) EXTERIOR SECTION PARTS LIST

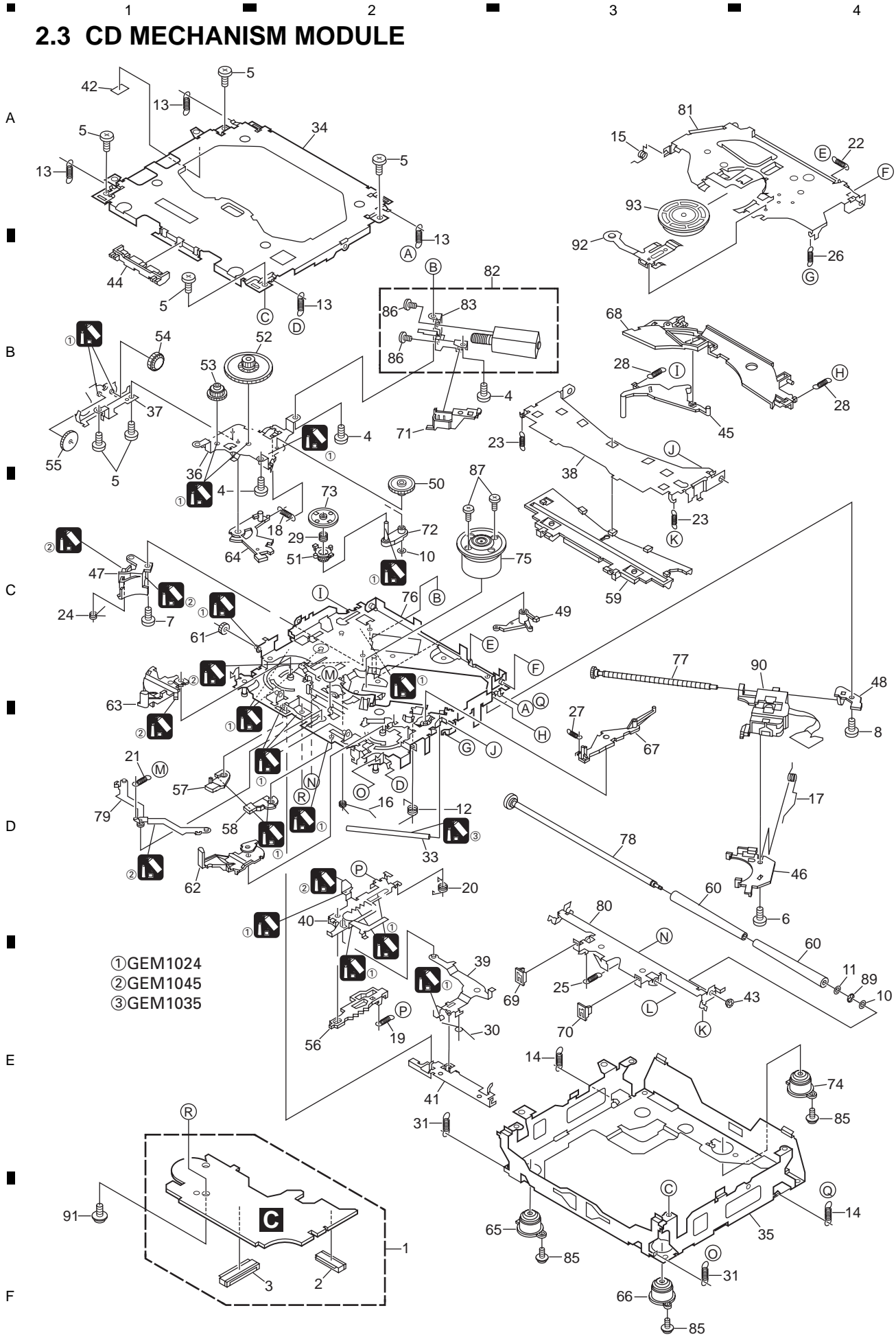
<u>Mark No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Mark No.</u>	<u>Description</u>	<u>Part No.</u>
1	Screw	BSZ26P060FTC	32	Panel	CNS8044
2	Screw	BSZ26P100FTC	33	Arm	CNV4692
3	Cable	CDE7703	34	Arm	CNV4728
4	Cord Assy	XDE7008	35	Arm	CNV5576
5	.....		36	Screw	IMS20P030FZK
6	Case	CNB2793	37	Chassis Unit	CXC3600
7	Holder	CNC8659	38	Detach Grille Assy	See Contrast table(2)
8	Insulator	CNM9145	39	Screw	BPZ20P100FZK
9	Tuner Amp Unit	See Contrast table(2)	40	Button(TA, VOLUME(+/-))	CAC8924
10	Screw	ASZ26P060FTC	41	Button(UP, DOWN, LEFT, RIGHT)	CAC8926
11	Screw	BMZ26P160FTC	42	Button(BTB, SOURCE)	CAC8927
12	Screw	BPZ26P080FTC	43	Button(1-6, LOCAL/BSM)	CAC8929
⚠ 13	Fuse(10A)	CEK1208	44	Button(EJECT, AUDIO)	CAC8930
14	Pin Jack(CN352)	CKB1059	45	Button(DETACH)	CAC8931
15	Plug(CN901)	CKM1376	46	Button(DISPLAY, BAND)	CAC8934
16	Connector(CN831)	CKS3581	47	Spring	CBH2210
17	Connector(CN651)	CKS3837	48	Cover	CNS8042
18	Antenna Jack(CN401)	CKX1056	49	LCD	CAW1848
19	Holder	CND2413	50	Connector(CN1801)	CKS3580
20	Holder	CND2414	51	Holder	CND2412
21	Heat Sink	CNR1762	52	Sheet	CNM9144
22	FM/AM Tuner Unit	CWE1912	53	Lighting Conductor	CNV8190
23	Holder	CND1054	54	Rubber	CNV8191
24	Terminal(CN402)	VNF1084	55	Connector	CNV8192
25	Button(DETACH)	CAC4836	56	Grille Unit	See Contrast table(2)
26	Spring	CBH1835	57	CD Mechanism Module(S10.1AACA)	CXK5663
27	Spring	CBH2208	58	Screw	ISS26P055FTC
28	Spring	CBH2367	59	IC(IC302)	PAL007A
29	Bracket	CNC6791	60	Transistor(Q911, 921, 991)	2SD2396
30	Holder	CNC8042	61	Panel	See Contrast table(2)
31	Cover	CNM6276			

(2) CONTRAST TABLE

DEH-2790MP/XN/ID, DEH-2750MP/XN/GS and DEH-2770MP/XN/CS are constructed the same except for the following:

Mark	No.	Description	DEH-2790MP/XN/ID	DEH-2750MP/XN/GS	DEH-2770MP/XN/CS
	9	Tuner Amp Unit	CWM9693	CWM9693	CWM9970
	38	Detach Grille Assy	CXC4395	CXC3748	CXC4391
	56	Grille Unit	CXC4239	CXC3643	CXC4236
	61	Panel	YNS5045	YNS5045	CNS8048

2.3 CD MECHANISM MODULE



- ① GEM1024
- ② GEM1045
- ③ GEM1035

CD MECHANISM MODULE SECTION PARTS LIST

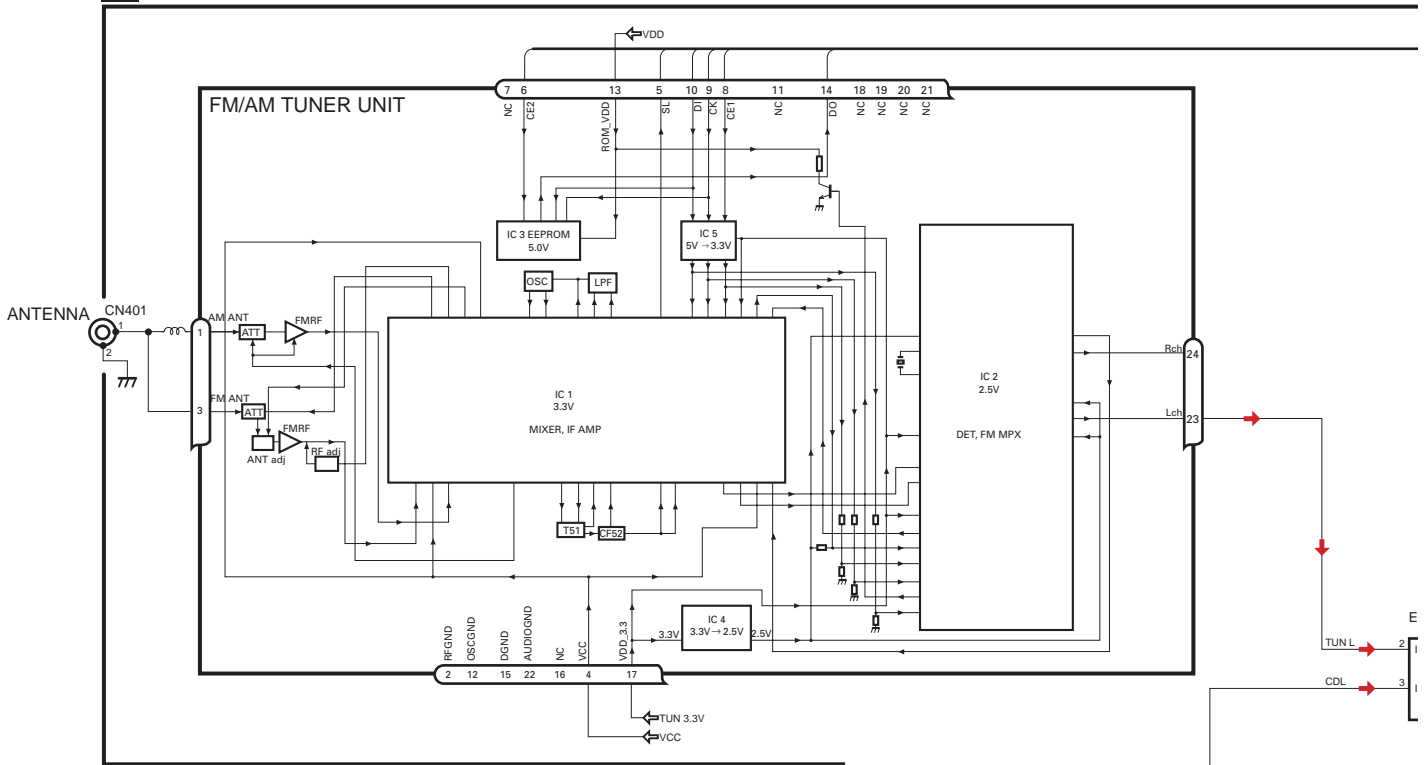
<u>Mark No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Mark No.</u>	<u>Description</u>	<u>Part No.</u>	
1	CD Core Unit(S10.1)	CWX3096	50	Gear	CNV8379	
2	Connector(CN101)	CKS4182				A
3	Connector(CN901)	CKS4017	51	Gear	CNV8380	
4	Screw	BMZ20P035FTC	52	Gear	CNV8381	
5	Screw	BSZ20P040FTC	53	Gear	CNV8382	
			54	Gear	CNV8383	
			55	Gear	CNV8384	
6	Screw(M2x4)	CBA1362				
7	Screw(M2x3)	CBA1824				
8	Screw(M2x3)	CBA1825	56	Rack	CNV8385	
9	.....		57	Arm	CNV8386	
10	Washer	CBF1038	58	Arm	CNV8387	
			59	Guide	CNV8388	
			60	Roller	CNV7218	B
11	Washer	CBF1060				
12	Spring	CBH2390				
13	Spring	CBH2606	61	Gear	CNV8389	
14	Spring	CBH2607	62	Arm	CNV8391	
15	Spring	CBH2608	63	Arm	CNV8390	
			64	Arm	CNV8392	
16	Spring	CBH2609	65	Damper	CNV7313	
17	Spring	CBH2610				
18	Spring	CBH2735	66	Damper	CNV7314	
19	Spring	CBH2612	67	Arm	CNV8394	
20	Spring	CBH2613	68	Arm	CNV8395	
			69	Guide	CNV8396	C
			70	Guide	CNV8397	
21	Spring	CBH2614				
22	Spring	CBH2615				
23	Spring	CBH2616	71	Holder	CNV8398	
24	Spring	CBH2617	72	Arm	CNV8402	
25	Spring	CBH2620	73	Gear	CNV8400	
			74	Damper	CNV7618	
26	Spring	CBH2621	75	Motor Unit(M1)	CXC4440	
27	Spring	CBH2641				
28	Spring	CBH2642	76	Chassis Unit	CXC2318	
29	Spring	CBH2643	77	Screw Unit	CXB8729	
30	Spring	CBH2659	78	Gear Unit	CXC2397	D
			79	Arm Unit	CXC2316	
			80	Arm	CND1896	
31	Spring	CBH2688				
32	.....				
33	Shaft	CLA4441	81	Arm	CND1894	
34	Frame	CNC9962	82	Motor Unit(M2)	CXB8933	
35	Frame	CNC9963	83	Bracket	CNC9985	
			84	.....	
36	Bracket	CND2712	85	Screw(M2x5)	EBA1028	
37	Bracket	CND1895				
38	Arm	CNC9968	86	Screw	JFZ20P020FTC	E
39	Arm	CND1909	87	Screw	JGZ17P022FTC	
40	Lever	CND2032	88	.....	
			89	Washer	YE20FTC	
41	Lever	CNC9984	90	Pickup Unit(P10)(Service)	CXX1641	
42	Sheet	CNM8134				
43	Collar	CNV7798	91	Screw	IMS26P030FTC	
44	Guide	CNV7799	92	Spring	CBL1635	
45	Arm	CNV8403	93	Clamper	CNV8372	
46	Rack	CNV8374				
47	Holder	CNV8376				F
48	Holder	CNV8377				
49	Arm	CNV8378				

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

3.1 BLOCK DIAGRAM

A

A TUNER AMP UNIT



B

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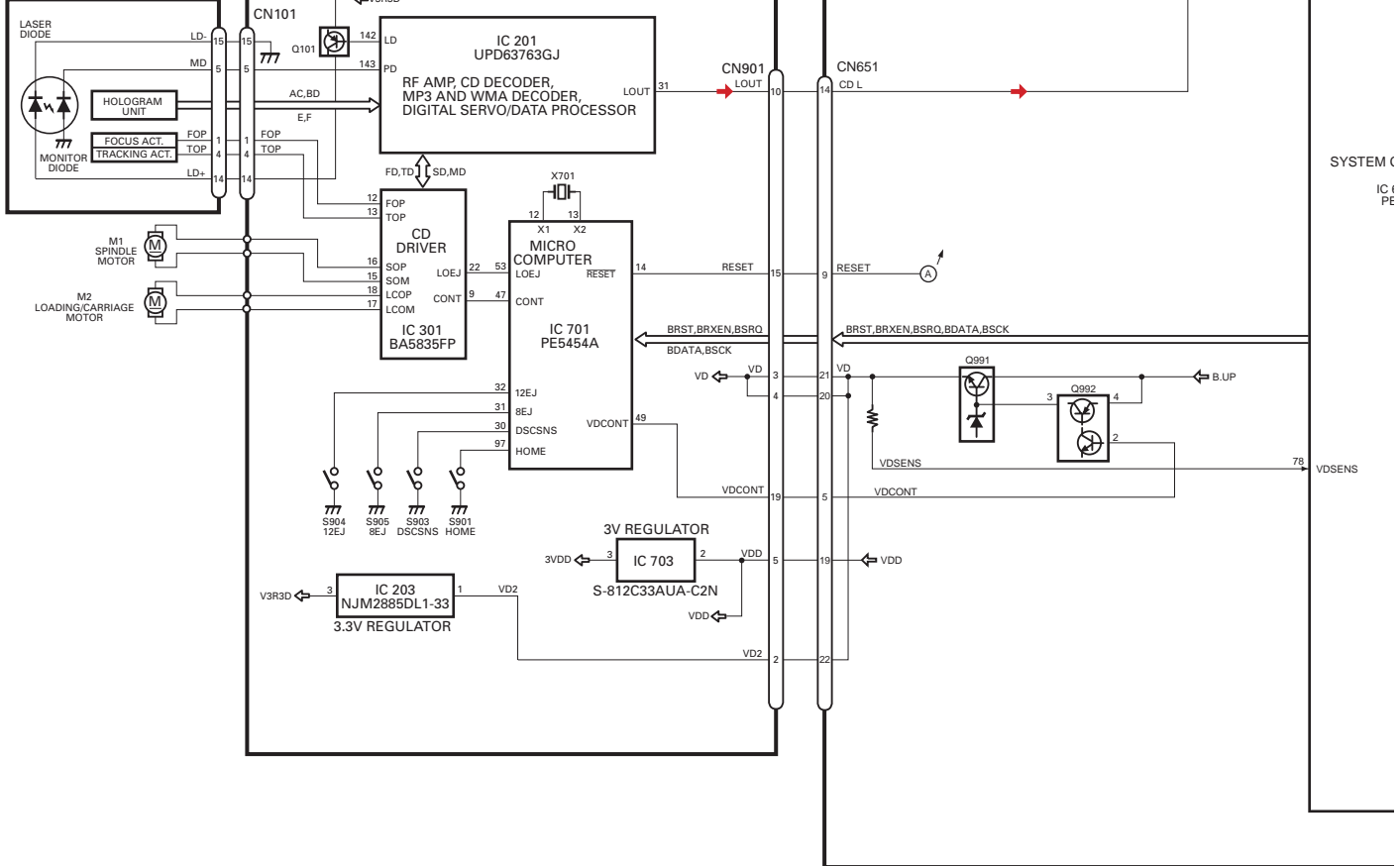
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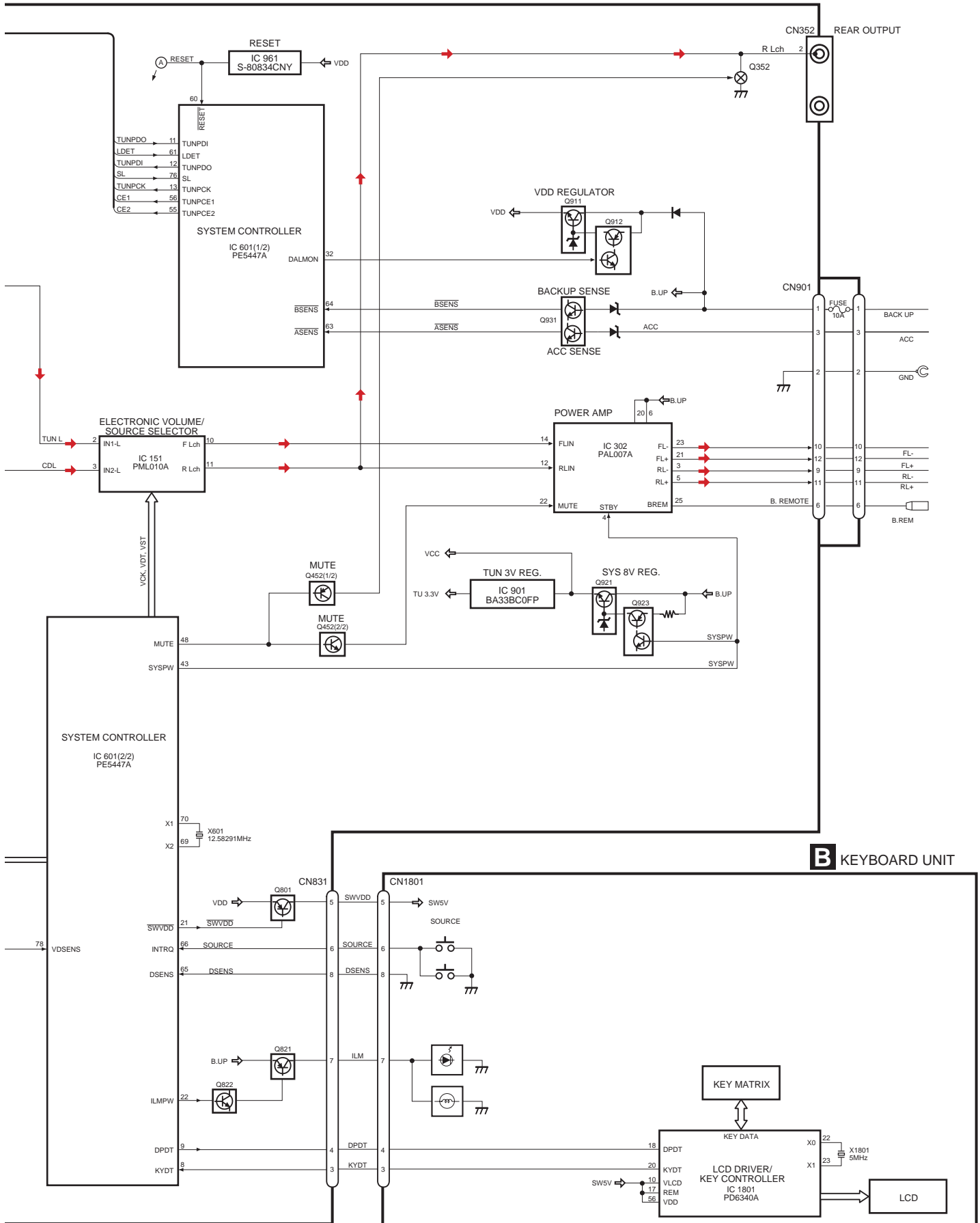
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C CD CORE UNIT(S10.1)

PICKUP UNIT (P10)(SERVICE)



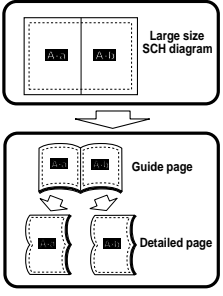
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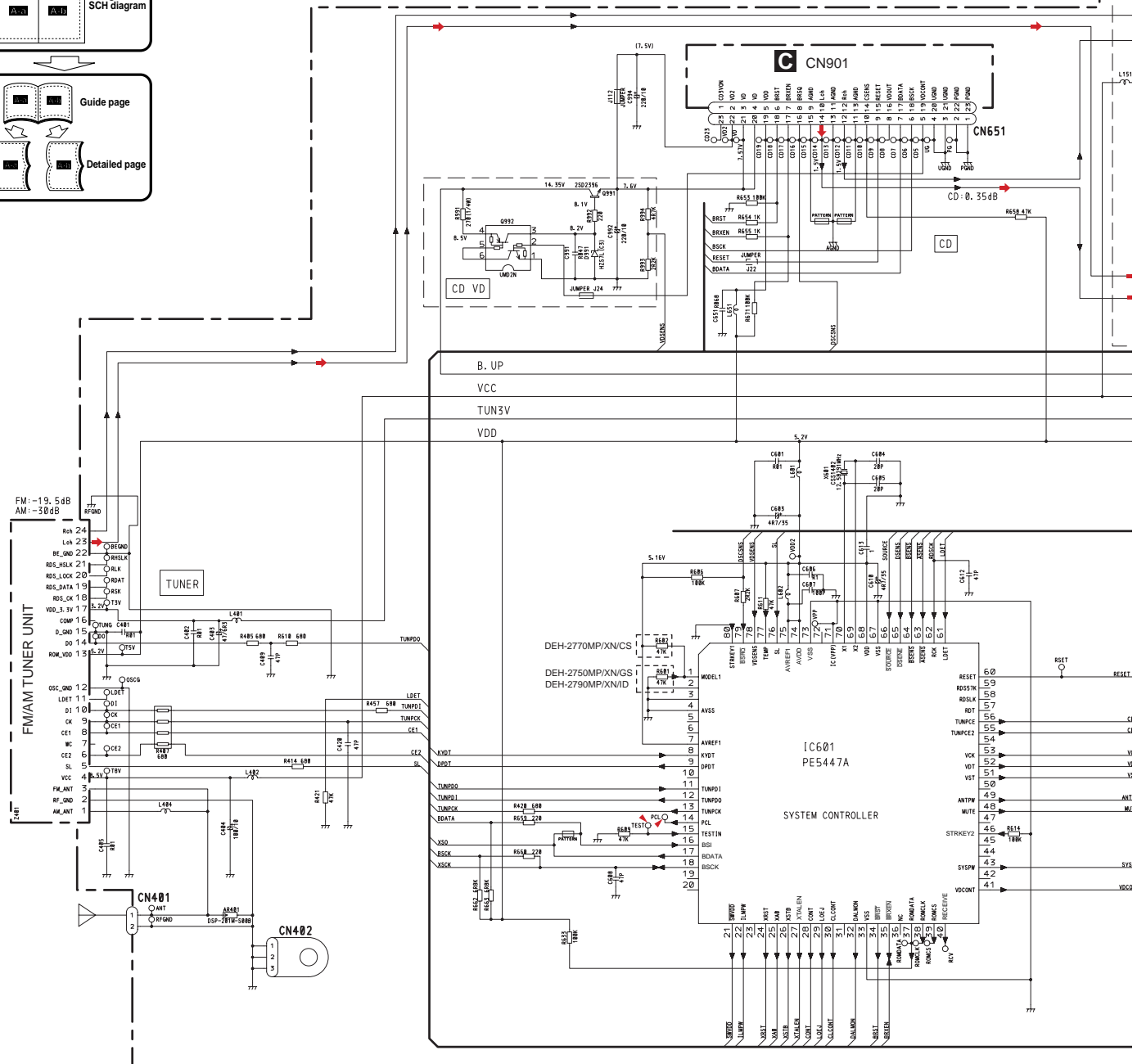
3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

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

A
B
C
D
E
F



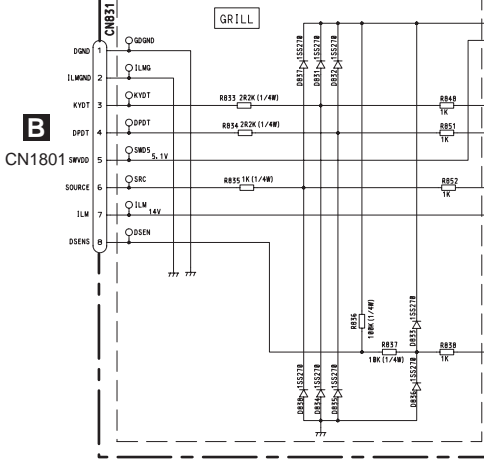
A-a



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

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

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

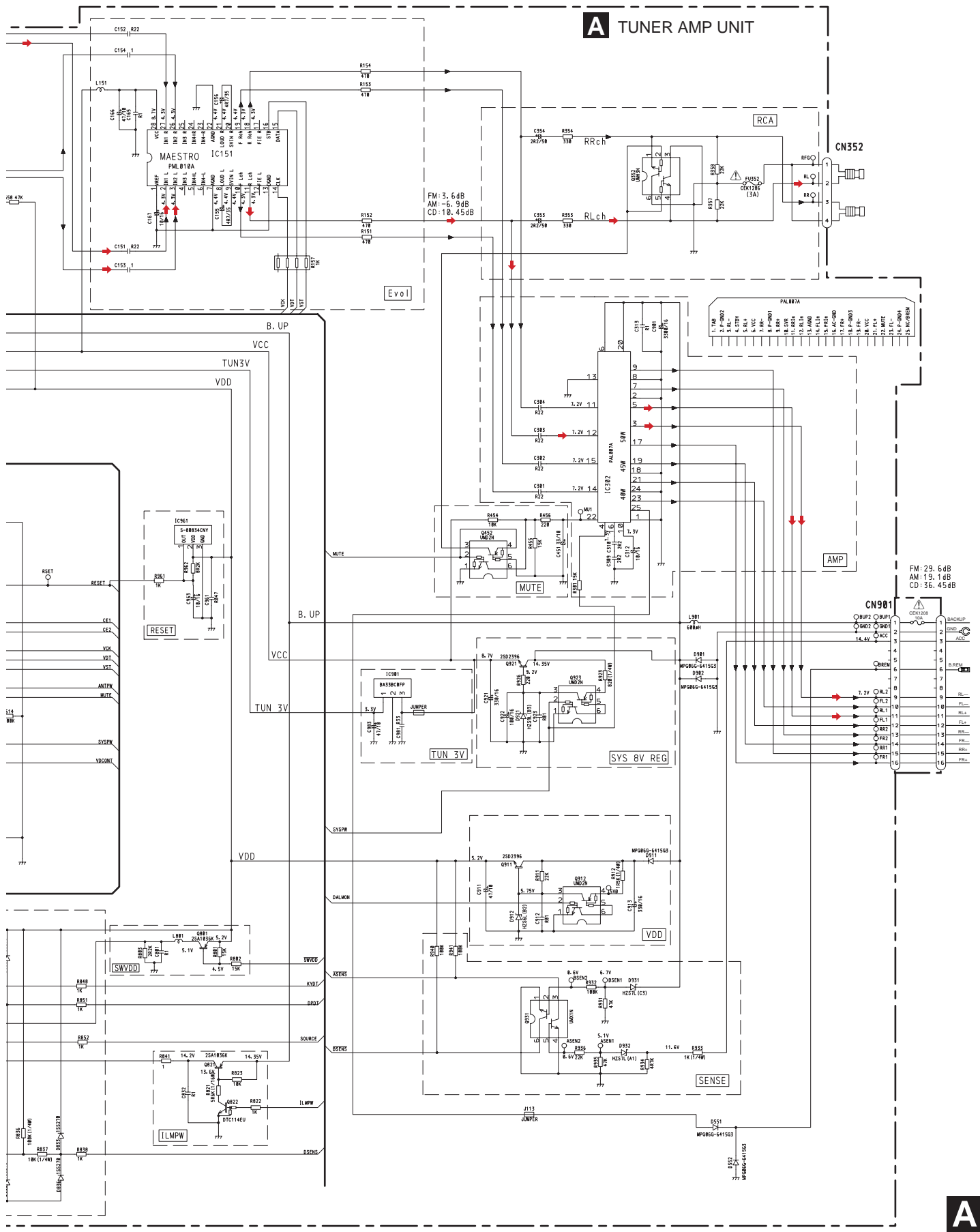


B

A

A-b

A TUNER AMP UNIT



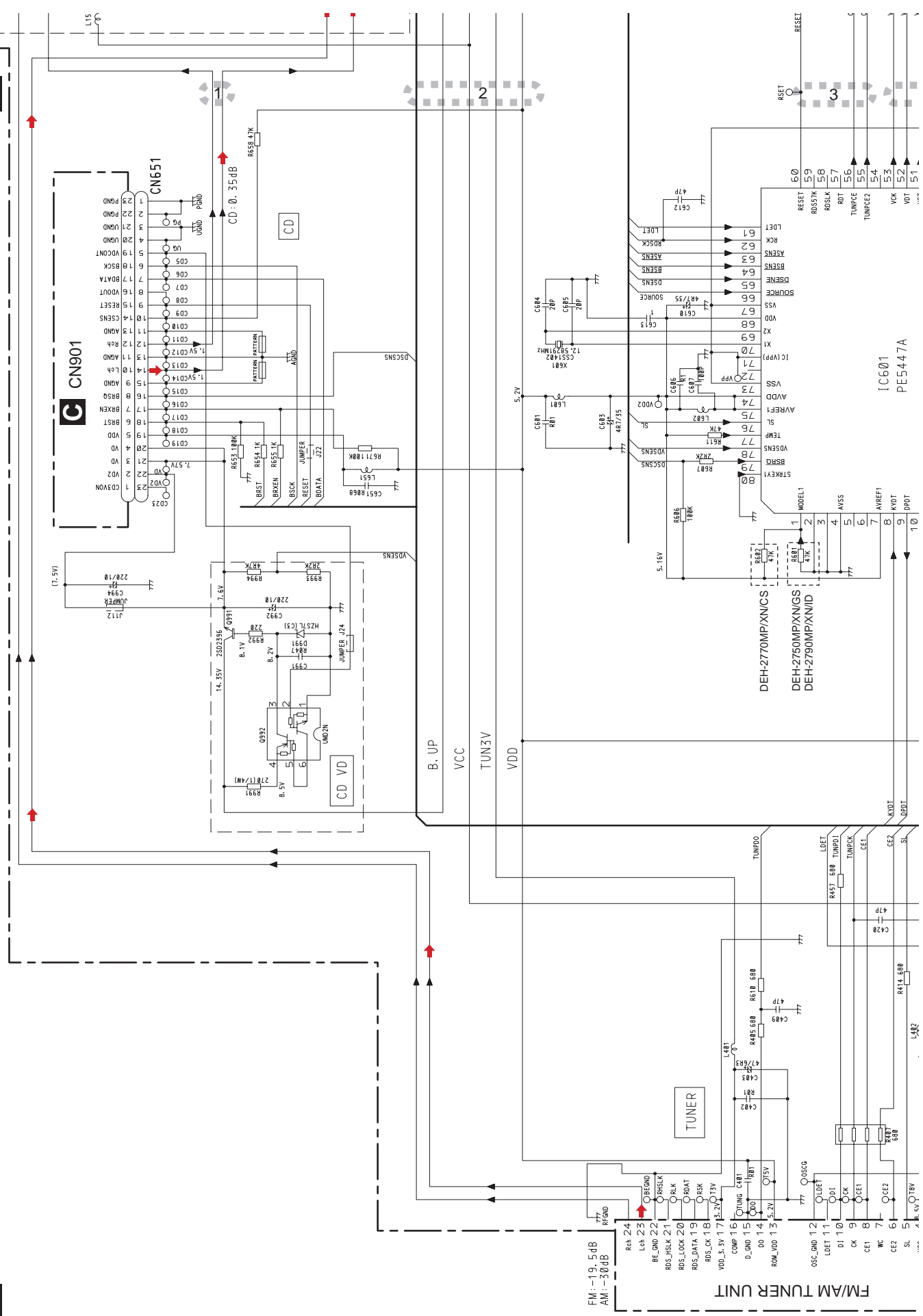
A
B
C
D
E
F

A-b

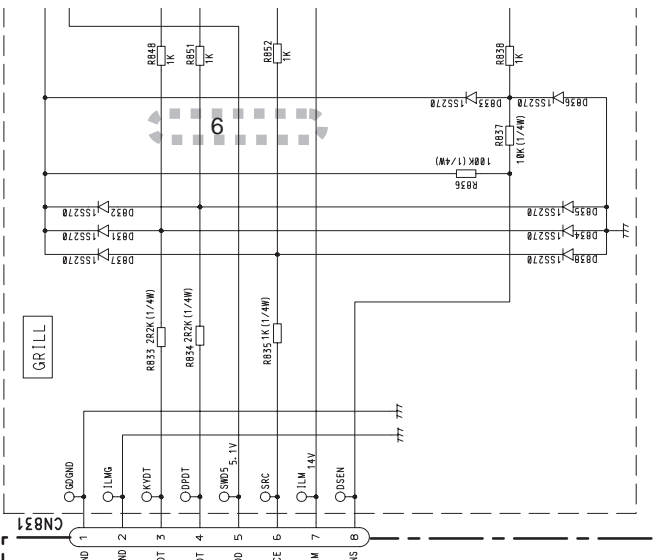
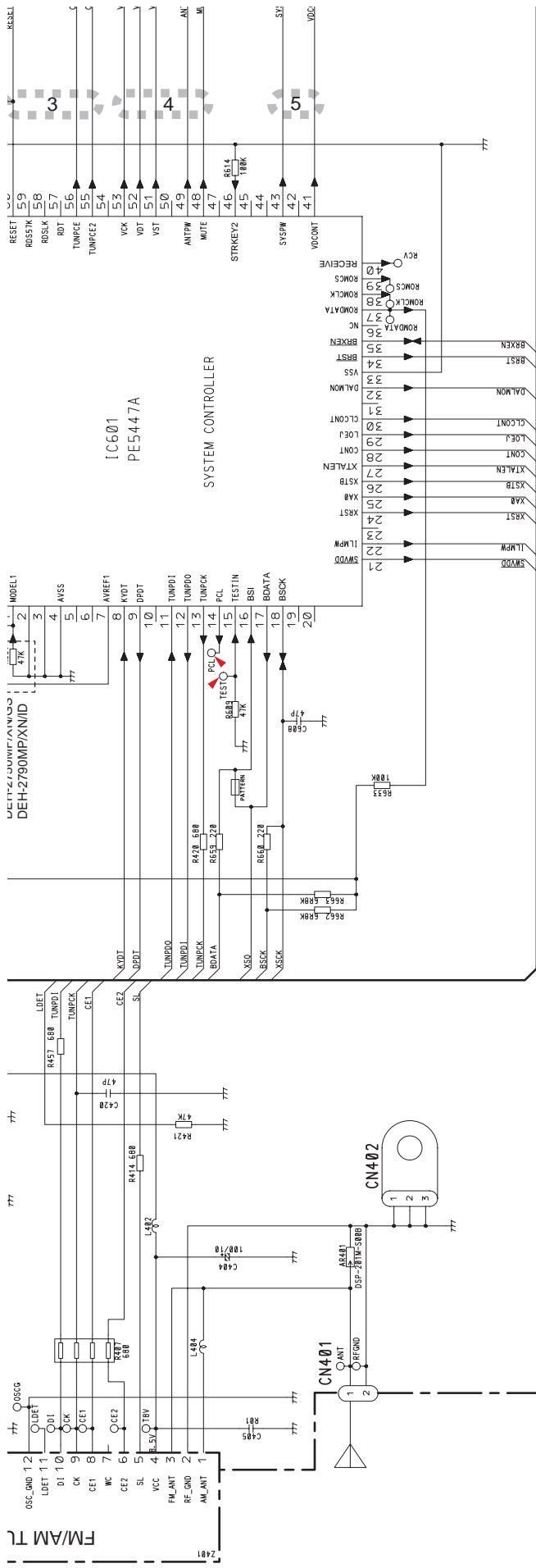
A-a

A-a

DEH-2790MP/XN/ID



1 2 3 4



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

B

C

D

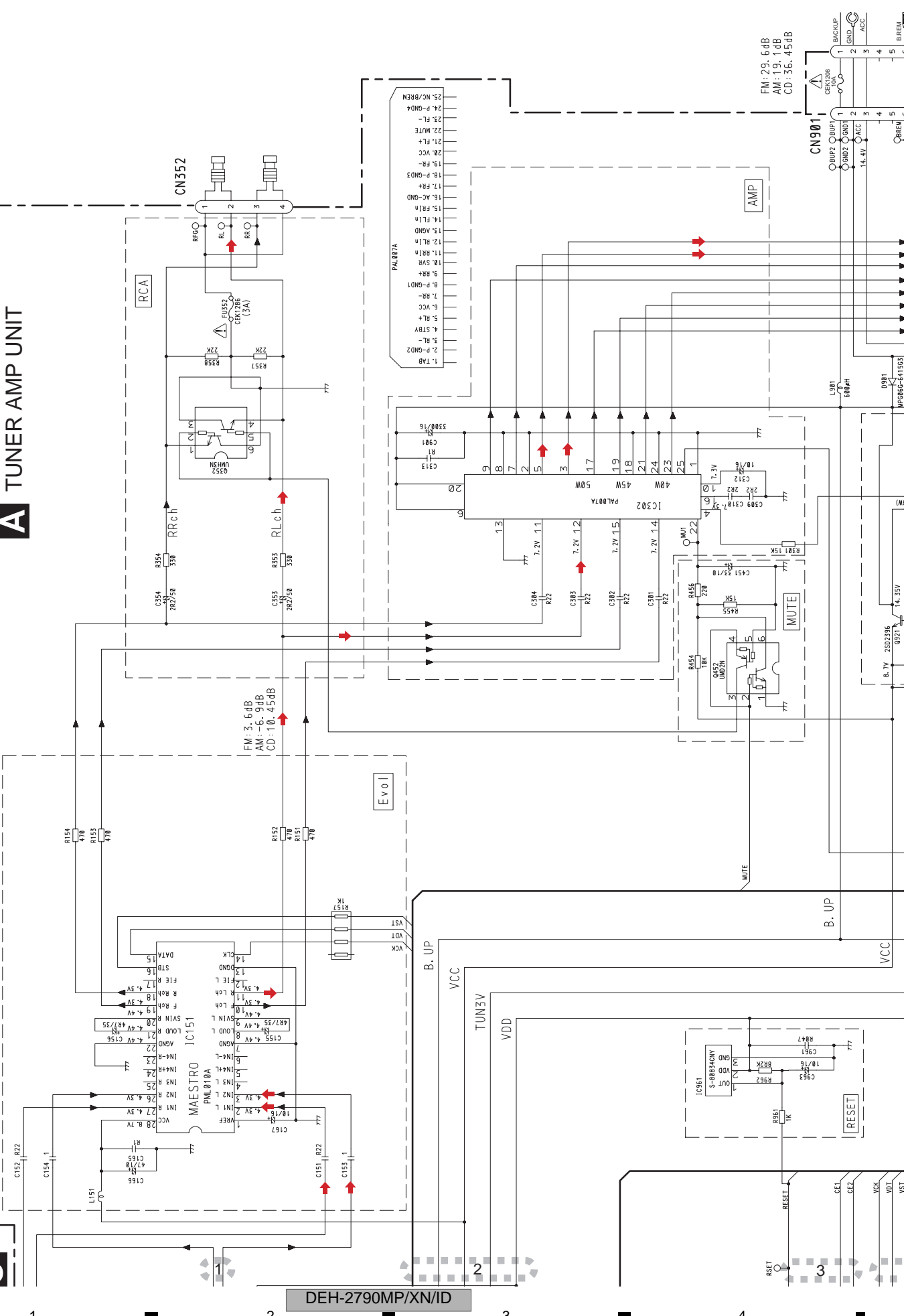
E

F

A TUNER AMP UNIT

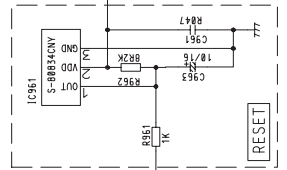
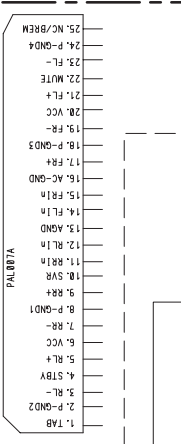
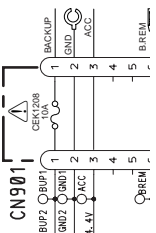
A-a

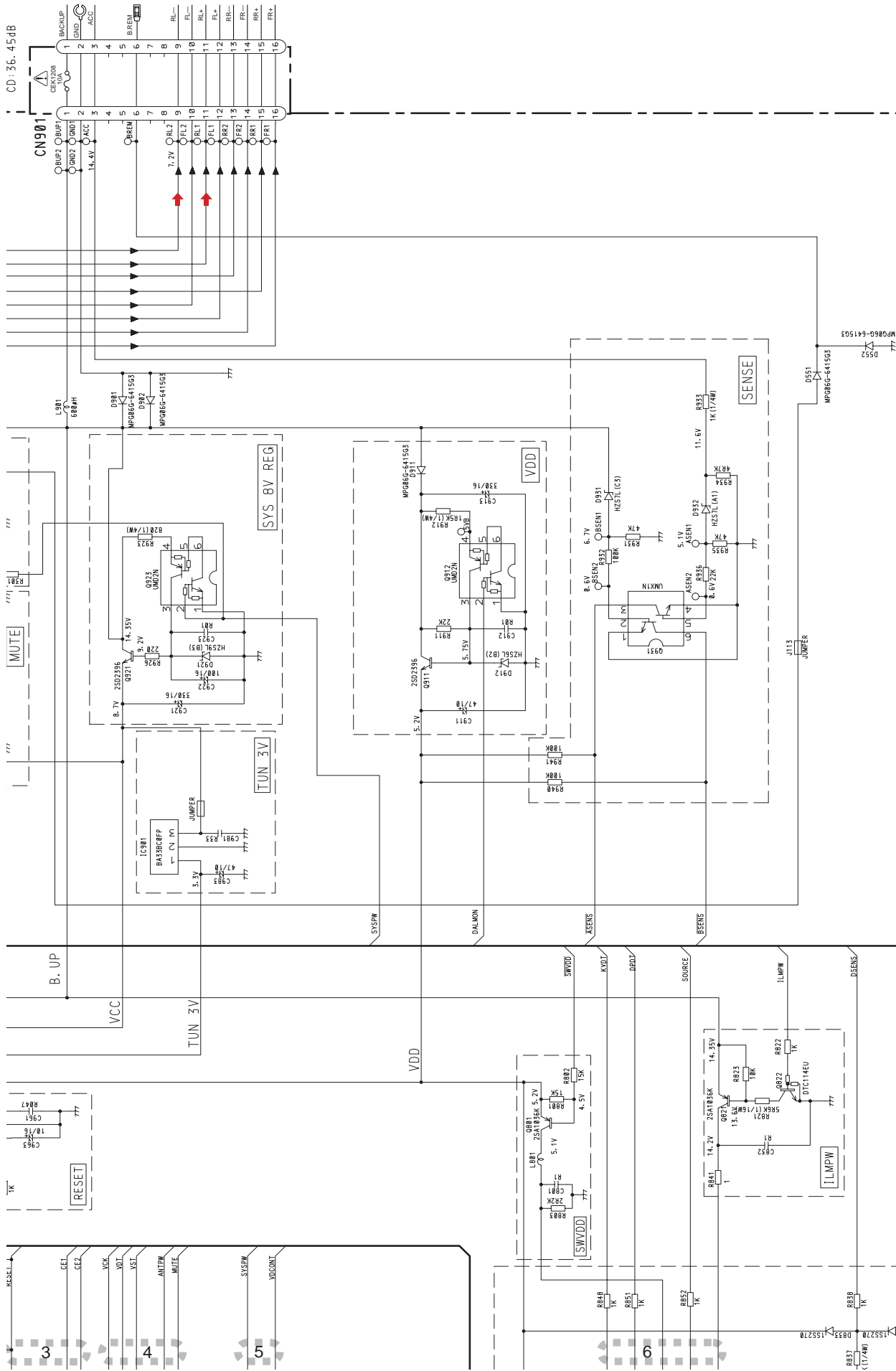
A-b



DEH-2790MP/XN/D

FM: 29.6dB
 AM: 19.1dB
 CD: 36.45dB





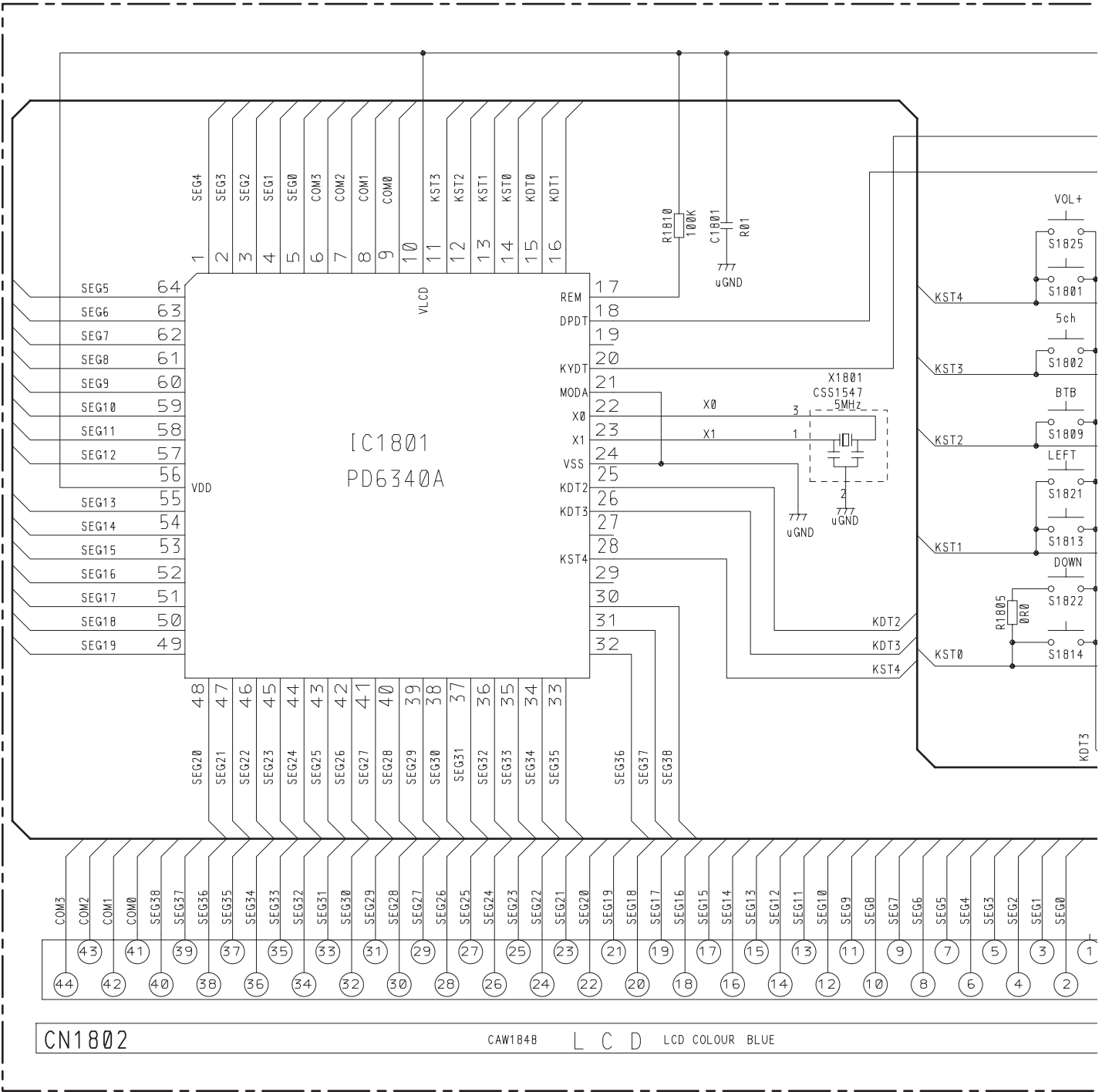
DEH-2790MP/XN/ID

A-a A-b

A-b

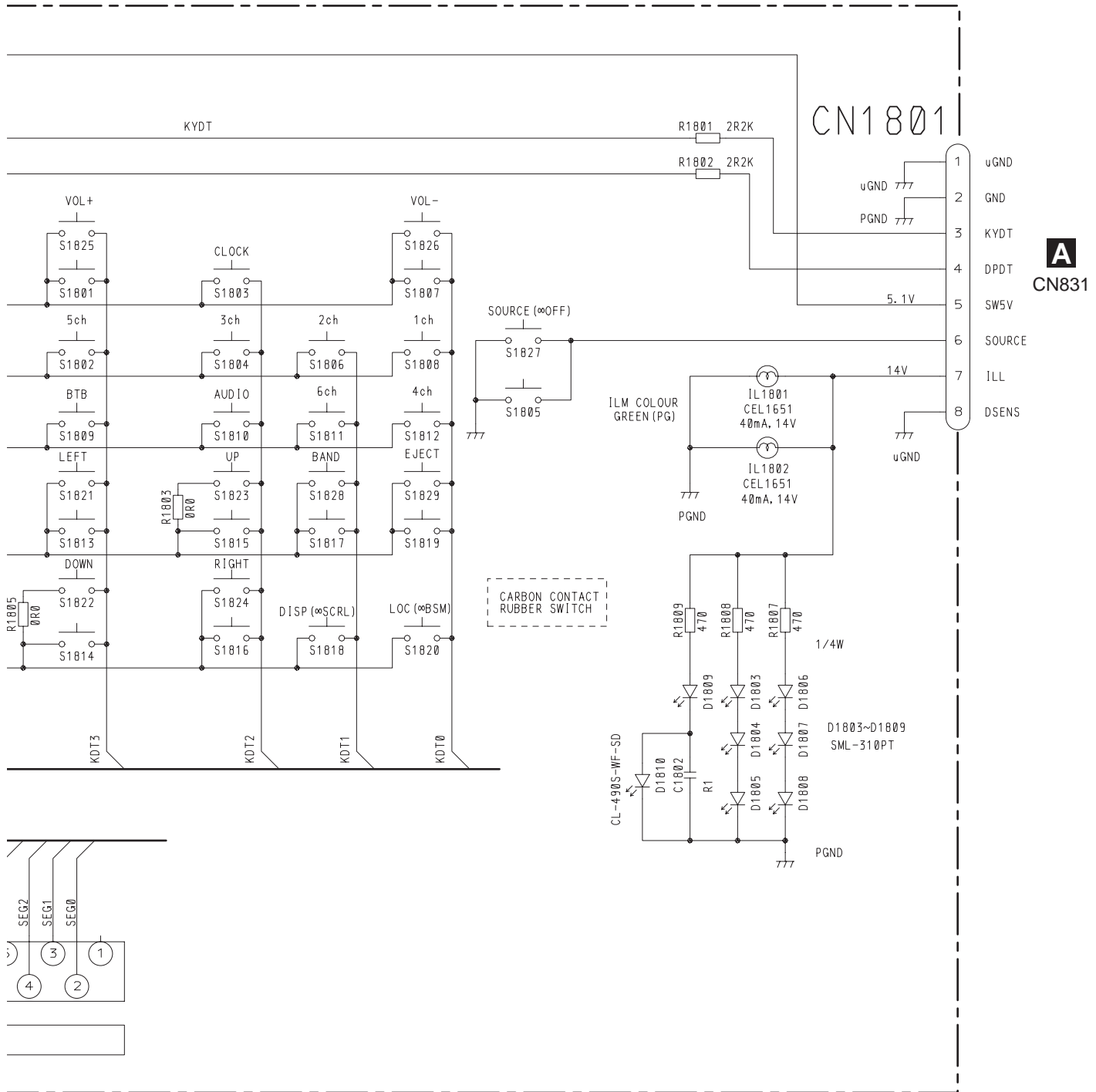
3.3 KEYBOARD UNIT

A
B
C
D
E
F



B

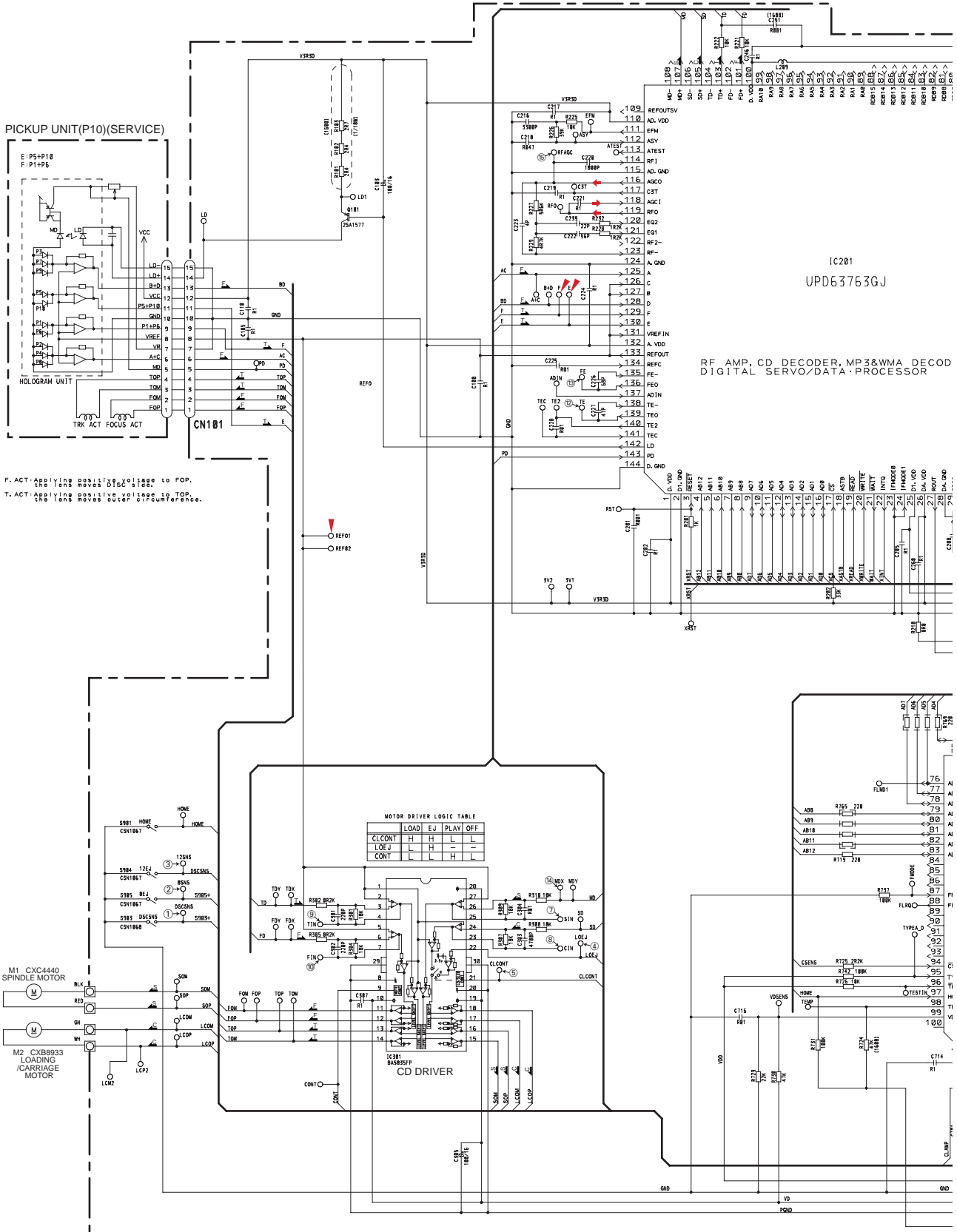
B KEYBOARD UNIT



A
B
C
D
E
F

3.4 CD MECHANISM MODULE(GUIDE PAGE)

C-a



F. ACT: Applying positive voltage to FOP.
 The lens moves DISC side.
 T. ACT: Applying positive voltage to TOP.
 The lens moves OUTER circumference.

	LOAD	EJ	PLAY	OFF
CLCONT	H	H	L	L
LOEJ	L	H	L	L
CONT	L	L	H	L

C-b

NOTE1) GND ... CD, LSI, RFAMP, CPU
 PGND ... Actuator, Motor Driver
 AGND ... Audio
 These GND's are not connected to each other on PCB.
 PGND is connected to a floating mechanism part by a screw.

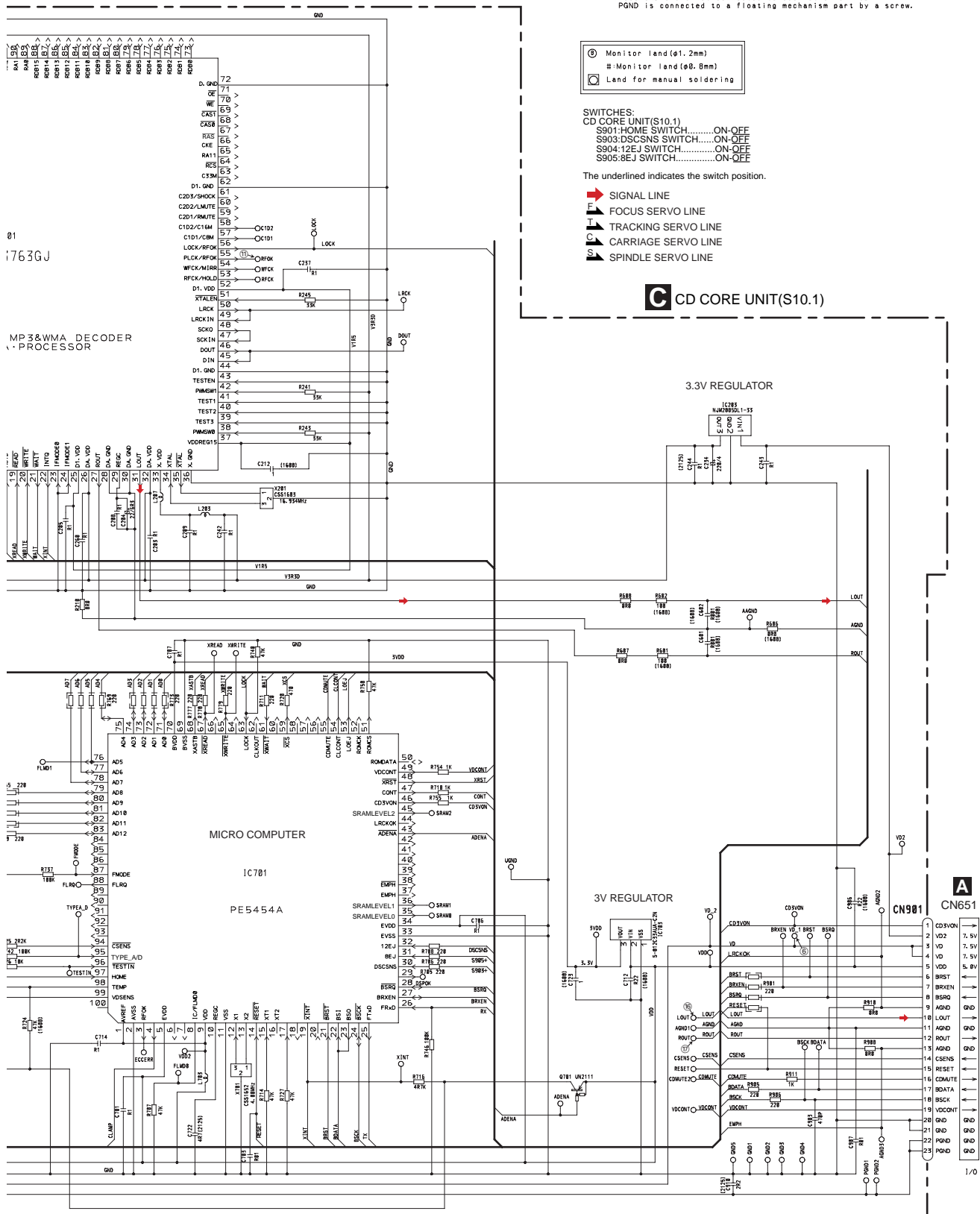
- ⊖ Monitor land (ø1.2mm)
- #-Monitor land (ø0.8mm)
- Land for manual soldering

SWITCHES:
 CD CORE UNIT(S10.1)
 S901:HOME SWITCH.....ON-OFF
 S903:DSCSNS SWITCH.....ON-OFF
 S904:12EJ SWITCH.....ON-OFF
 S905:8EJ SWITCH.....ON-OFF

The underlined indicates the switch position.

- ➔ SIGNAL LINE
- F FOCUS SERVO LINE
- ⏏ TRACKING SERVO LINE
- ⏏ CARRIAGE SERVO LINE
- S SPINDLE SERVO LINE

C CD CORE UNIT(S10.1)



A
B
C
D
E
F

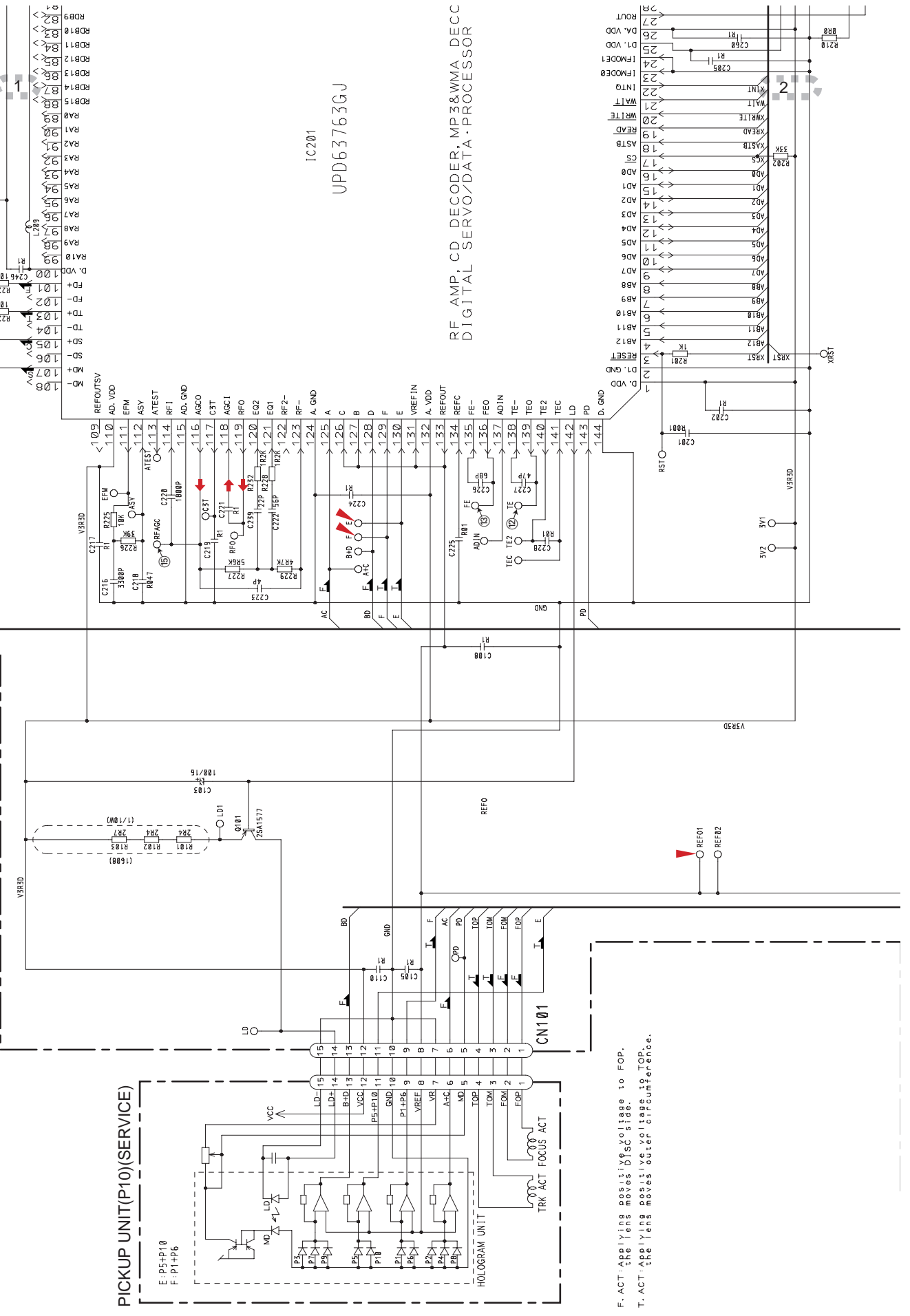
C

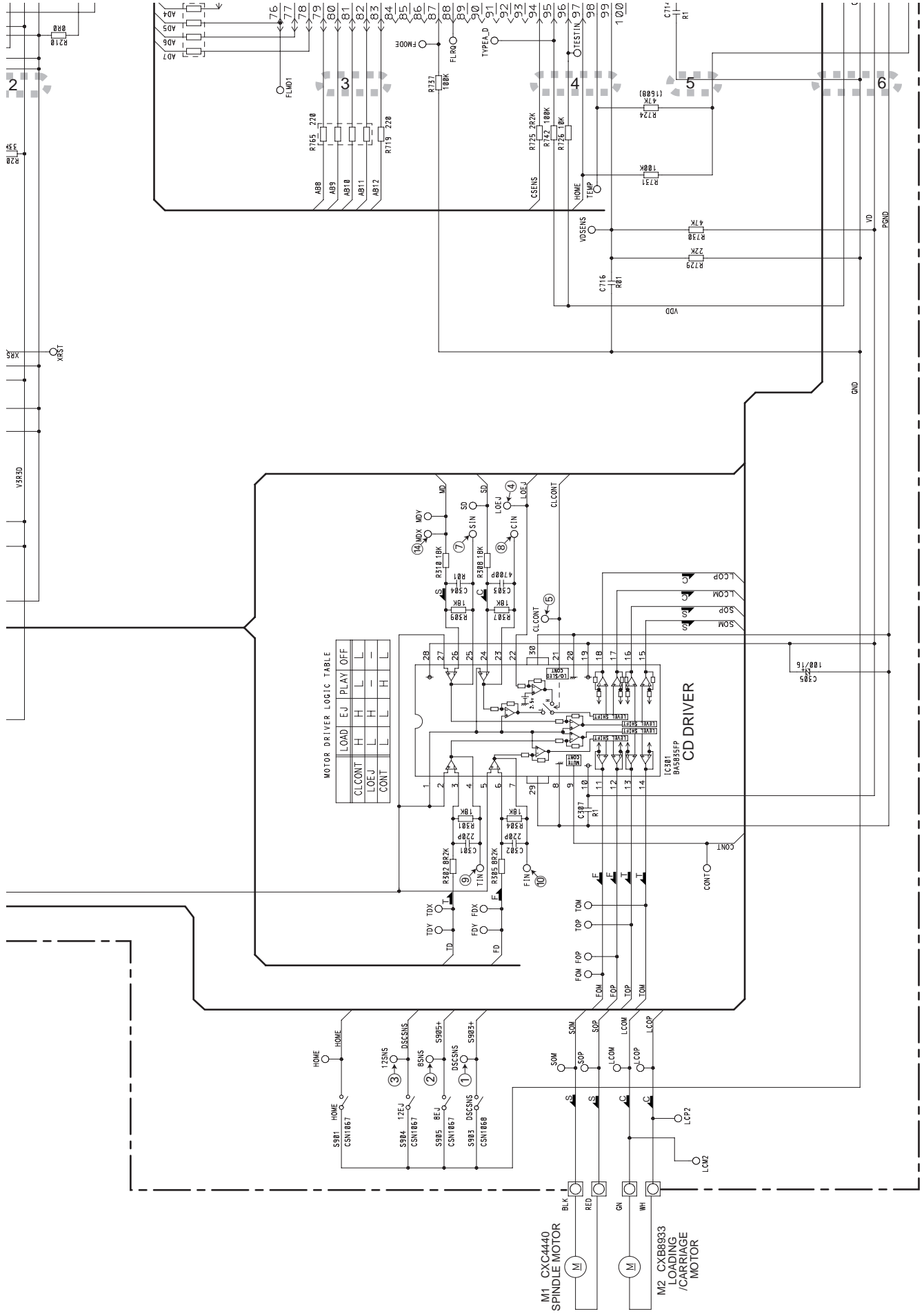
A B C D E F

C-b

C-a

C-a





DEH-2790MP/XN/ID

C-a

C-a C-b

C-b

5

6

7

8

5

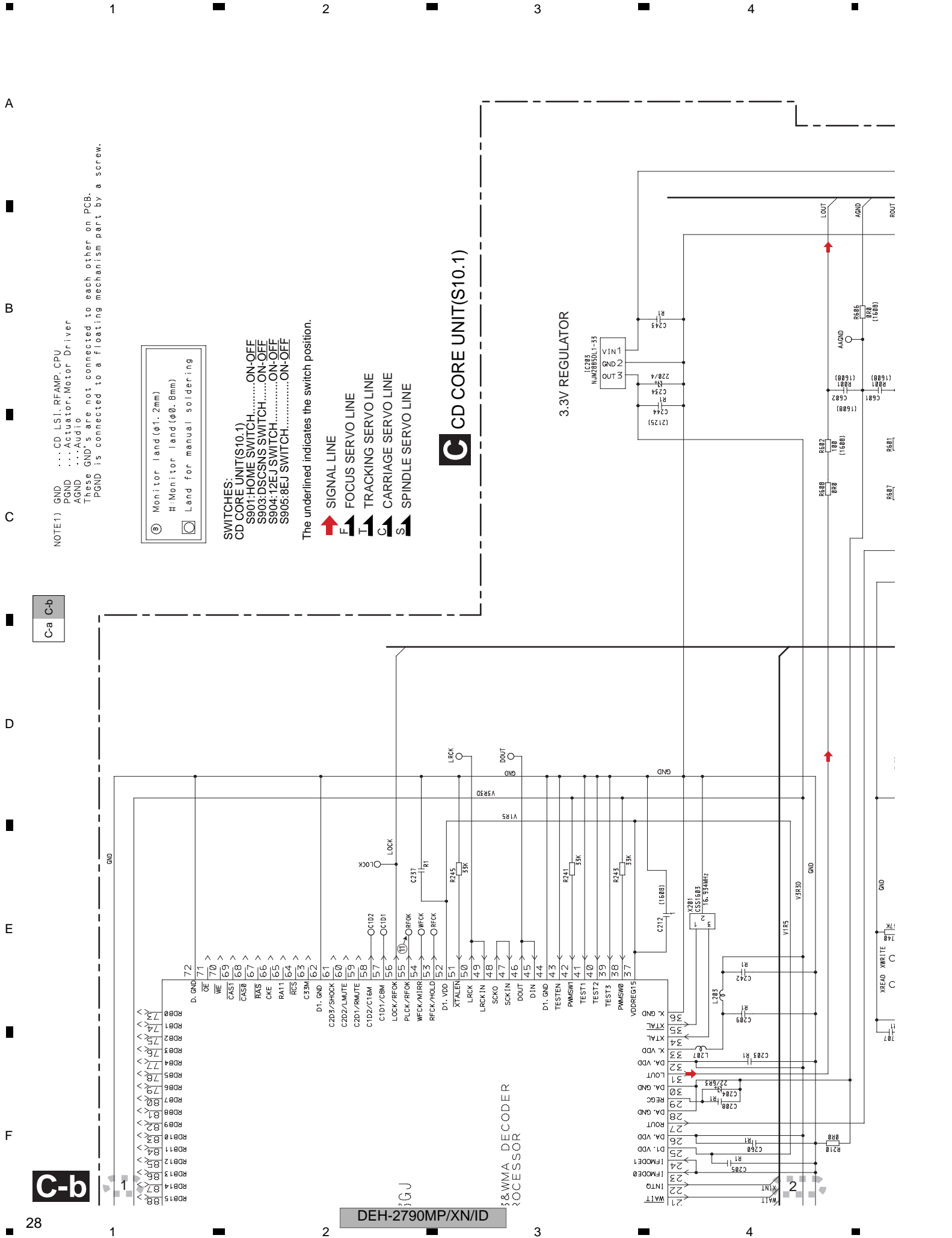
6

7

8

27

A B C D E F



NOTE1) GND ...CD LSI, RFAMP, CPU
 PGND ...Actuator, Motor Driver
 AGND ...Audio
 These GND's are not connected to each other on PCB.
 PGND is connected to a floating mechanism part by a screw.

- ⓑ Monitor land (φ1.2mm)
- ⓓ #: Monitor land (φ0.8mm)
- ⓔ Land for manual soldering

SWITCHES:
 CD CORE UNIT(S10.1)
 S901:HOME SWITCH.....ON-OFF
 S903:DSCSNS SWITCH.....ON-OFF
 S904:12EJ SWITCH.....ON-OFF
 S905:8EJ SWITCH.....ON-OFF

The underlined indicates the switch position.
 ↑ SIGNAL LINE
 F1 FOCUS SERVO LINE
 T1 TRACKING SERVO LINE
 C1 CARRIAGE SERVO LINE
 S1 SPINDLE SERVO LINE

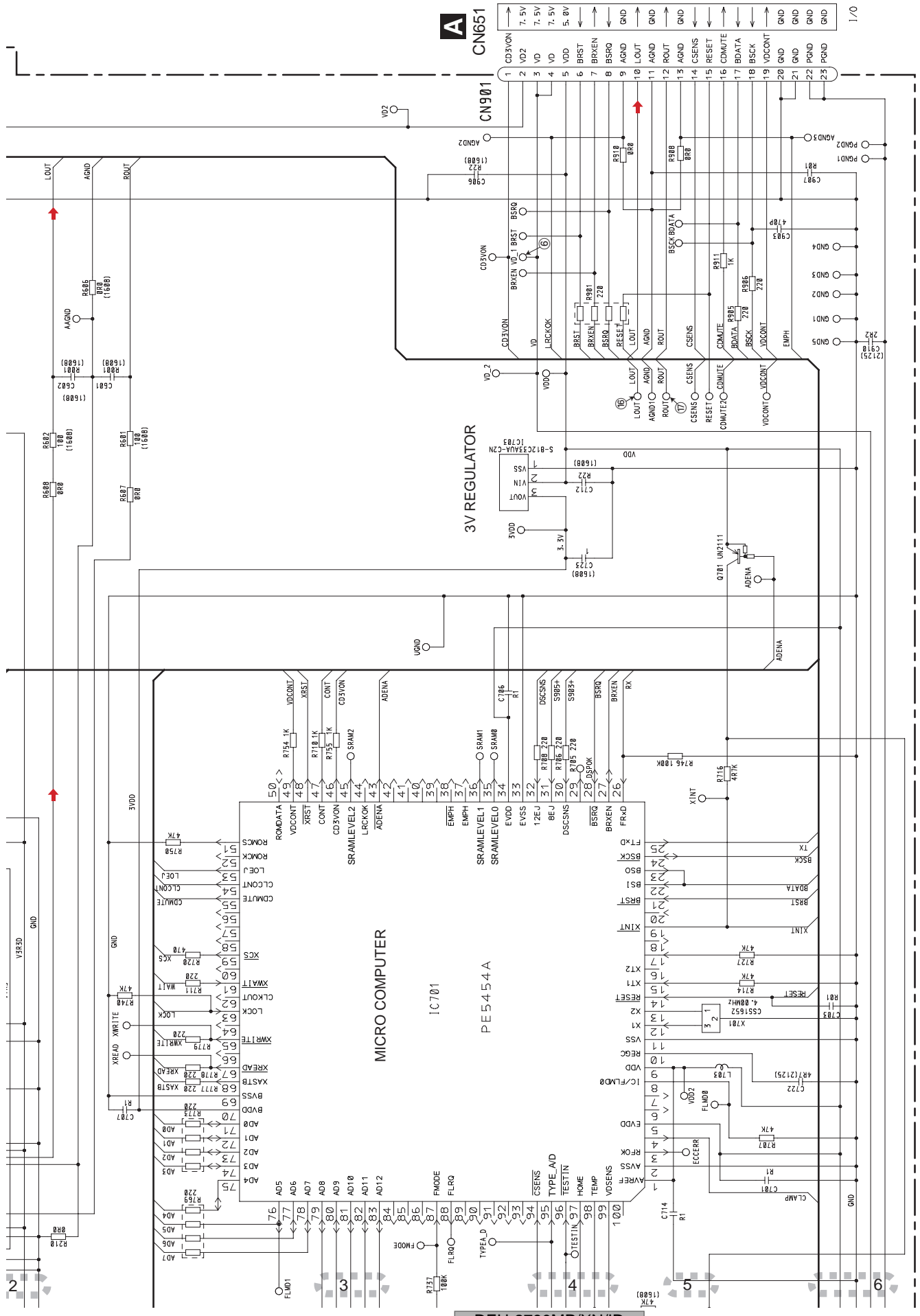
C CD CORE UNIT(S10.1)

3.3V REGULATOR

C-a C-b

C-b

DEH-2790MP/XN/ID



DEH-2790MP/XN/ID

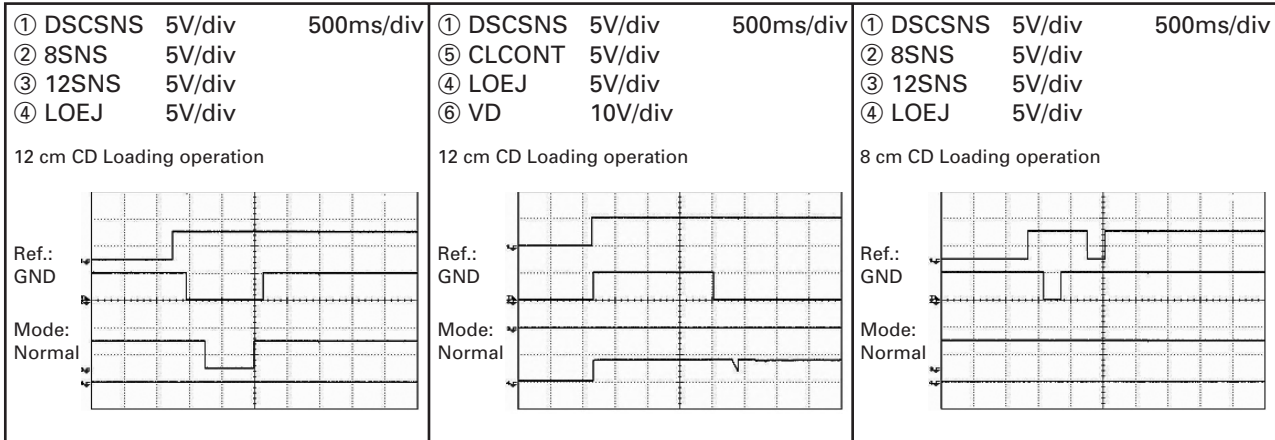
C-a C-b

C-b

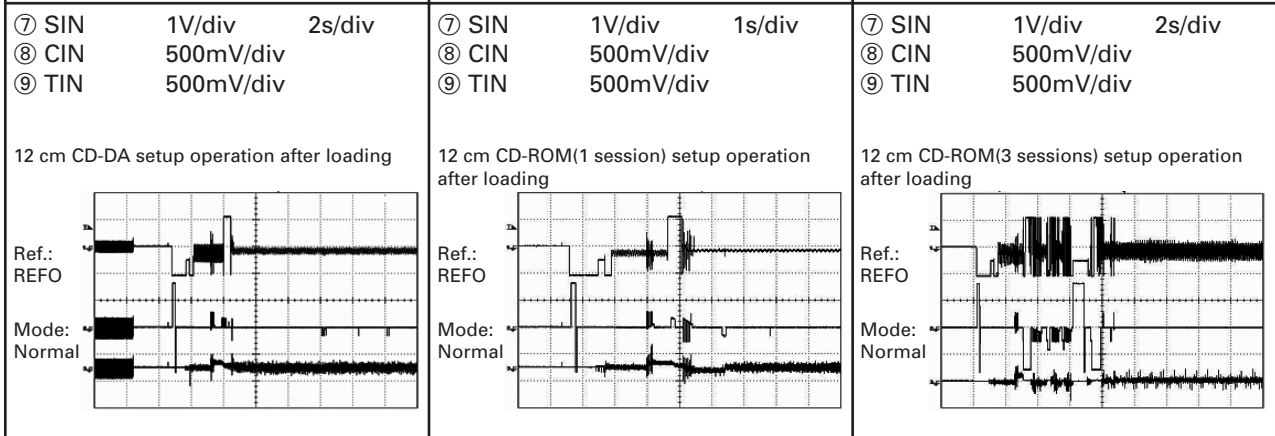
Waveforms

Note : 1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage REFO1(1.65V)

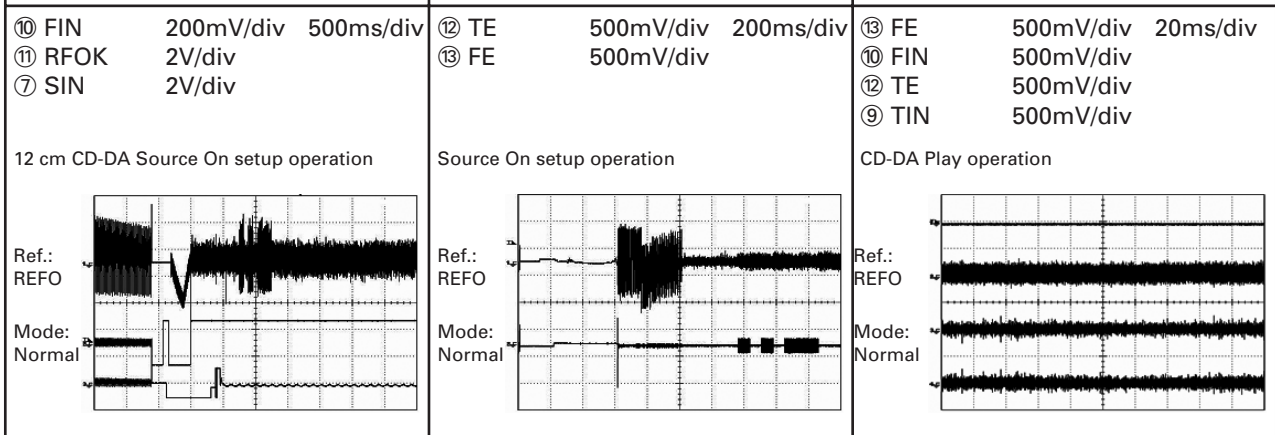
A



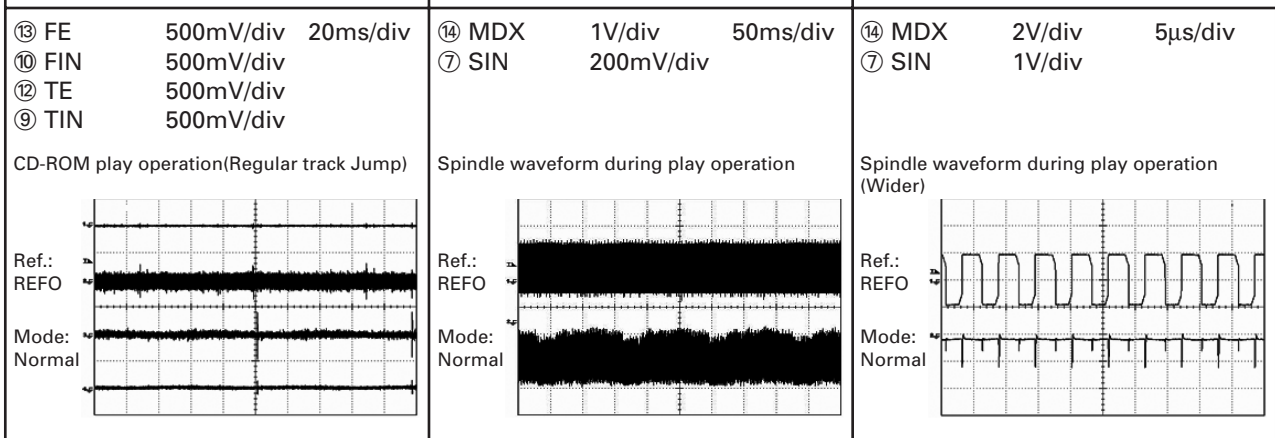
B



C

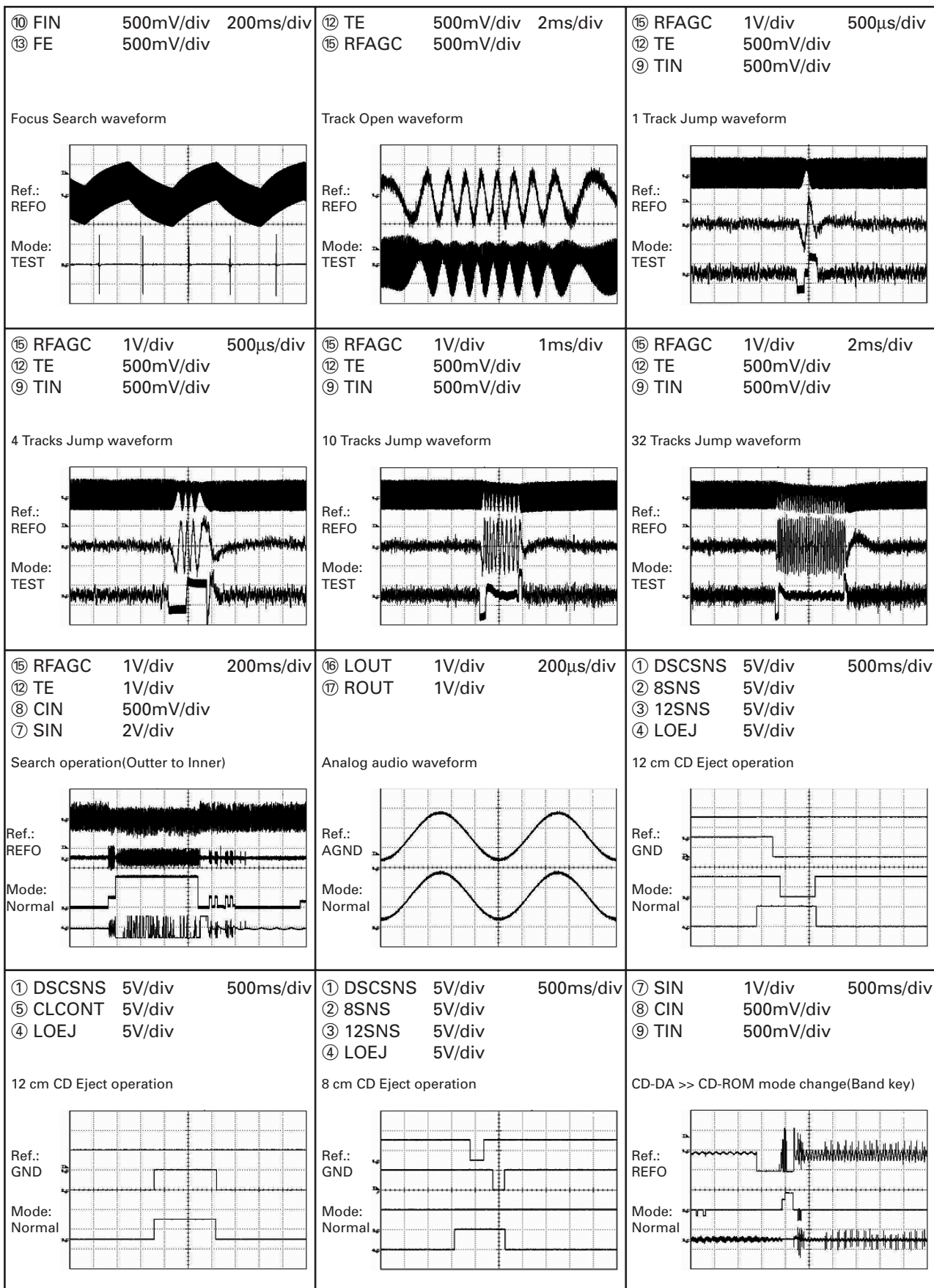


D



E

F



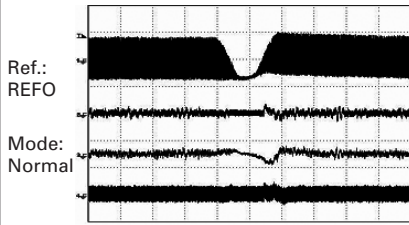
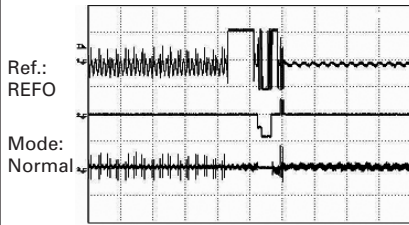
A

⑦ SIN 1V/div 500ms/div
 ⑧ CIN 500mV/div
 ⑨ TIN 500mV/div

⑮ RFAGC 1V/div 500μs/div
 ⑨ TIN 1V/div
 ⑫ TE 1V/div
 ⑩ FIN 1V/div

CD-ROM >> CD-DA mode change(Band key)

Black dot(800μm) during play



B

C

D

E

F

■

5

■

6

■

7

■

8

■

A

■

B

■

C

■

D

■

E

■

F

■

5

■

6

DEH-2790MP/XN/ID

■

7

■

8

■

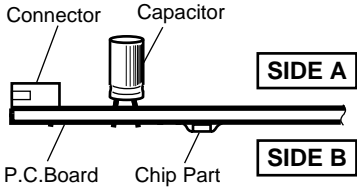
4. PCB CONNECTION DIAGRAM

4.1 TUNER AMP UNIT

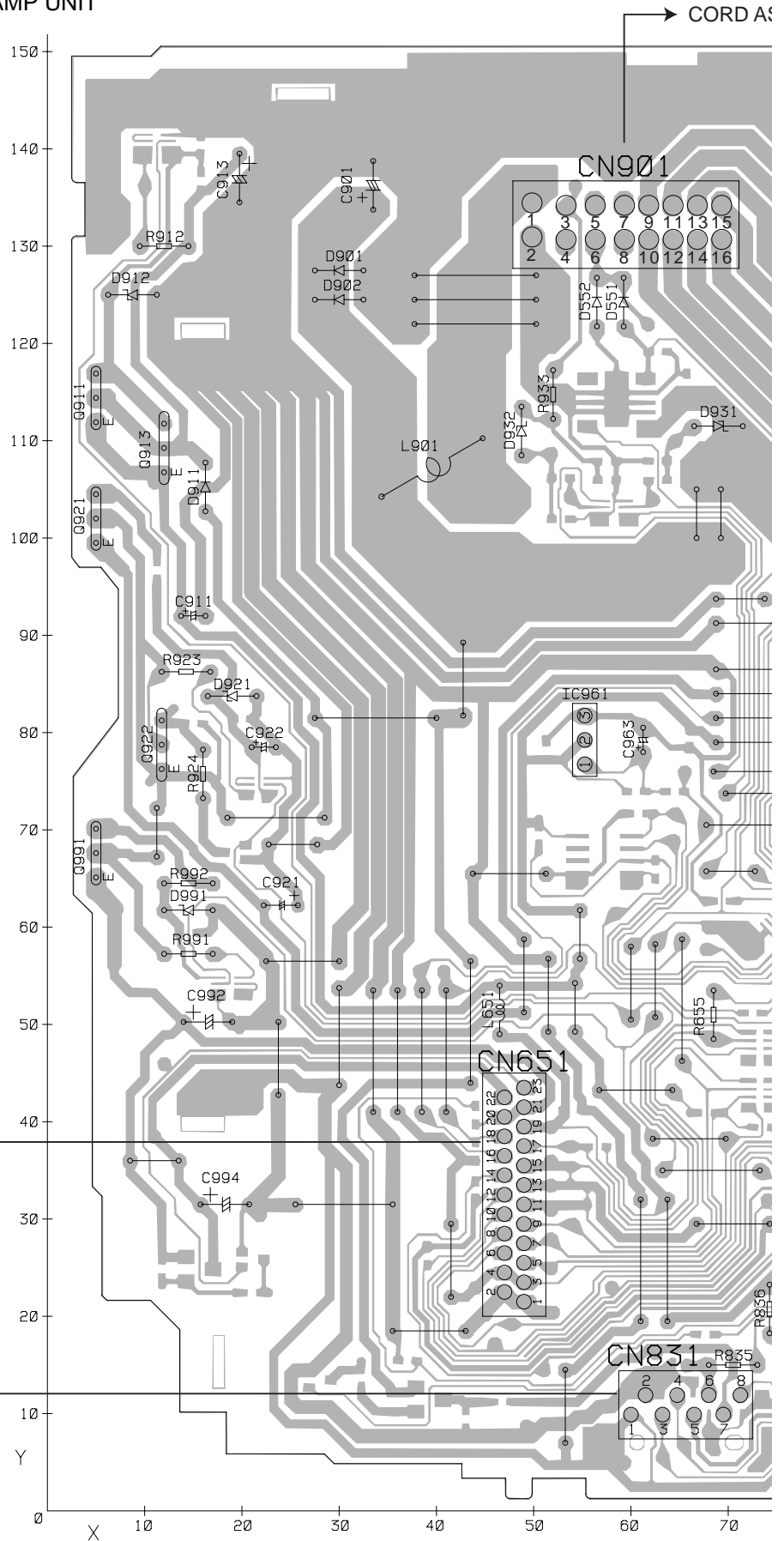
NOTE FOR PCB DIAGRAMS

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 TUNER AMP UNIT



C CN901 ←

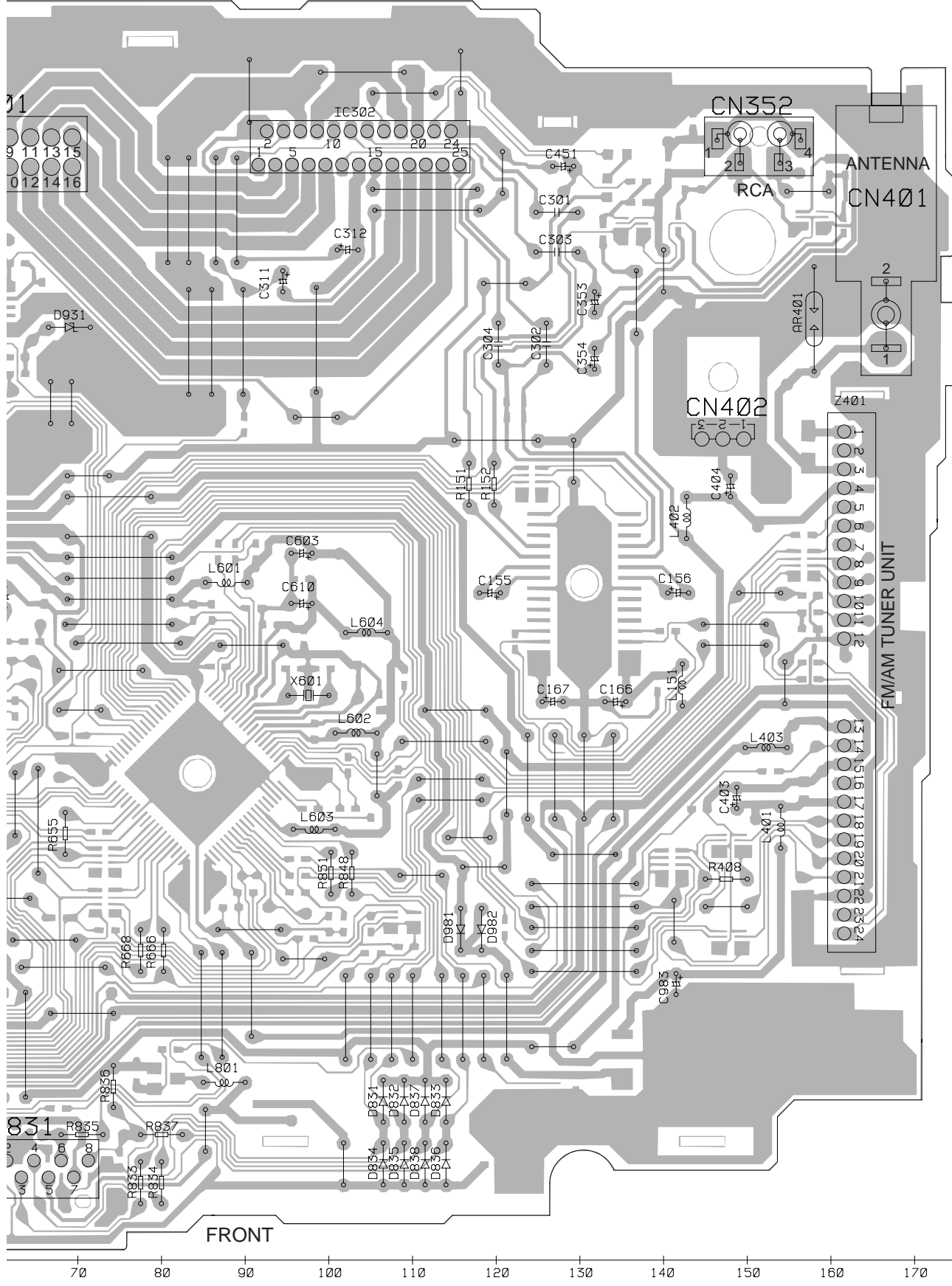
B CN1801 ←

A

SIDE A

A

→ CORD ASSY



B

C

D

E

F

A

DEH-2790MP/XN/ID

A

A TUNER AMP UNIT

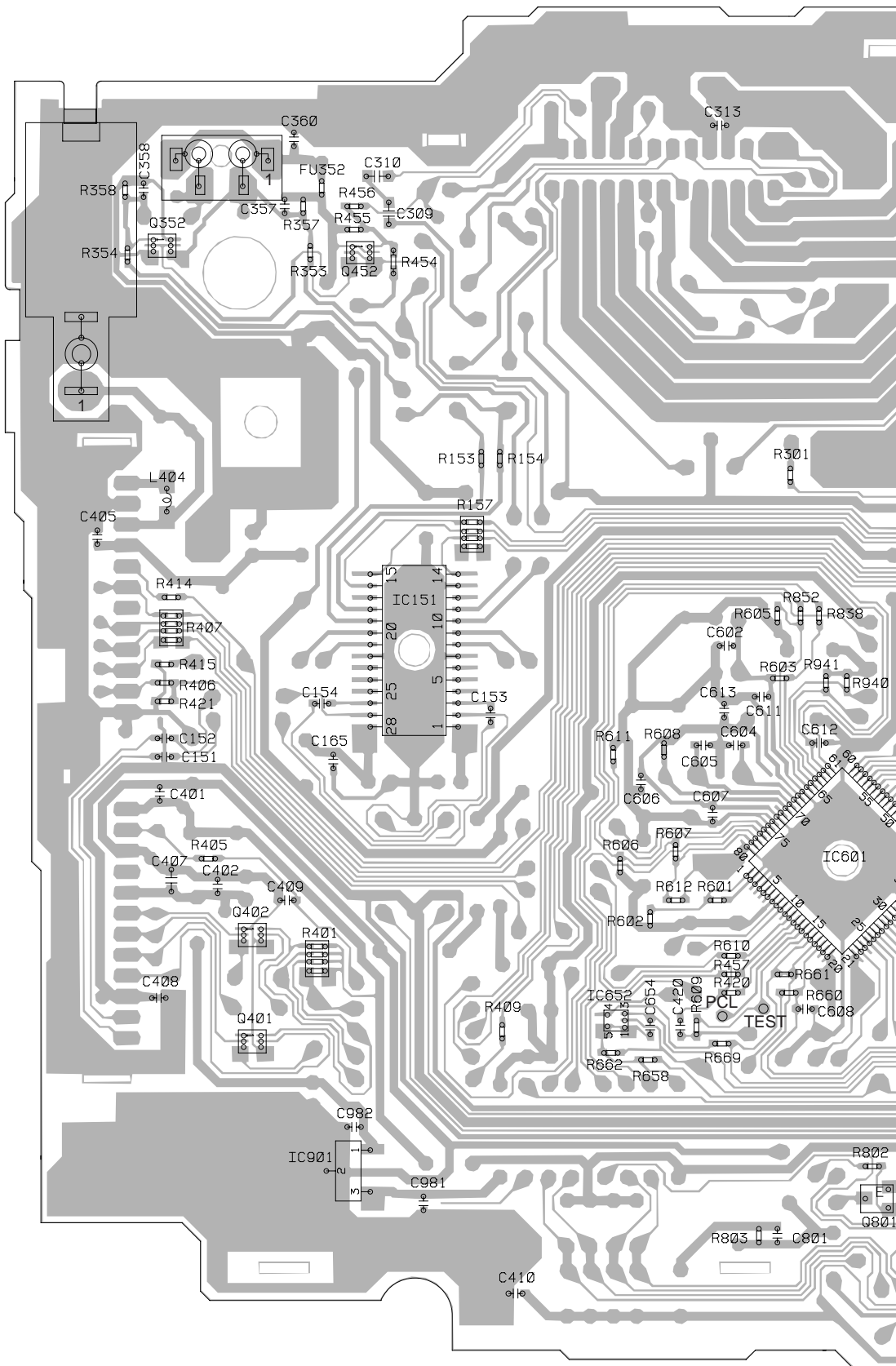
B

C

D

E

F

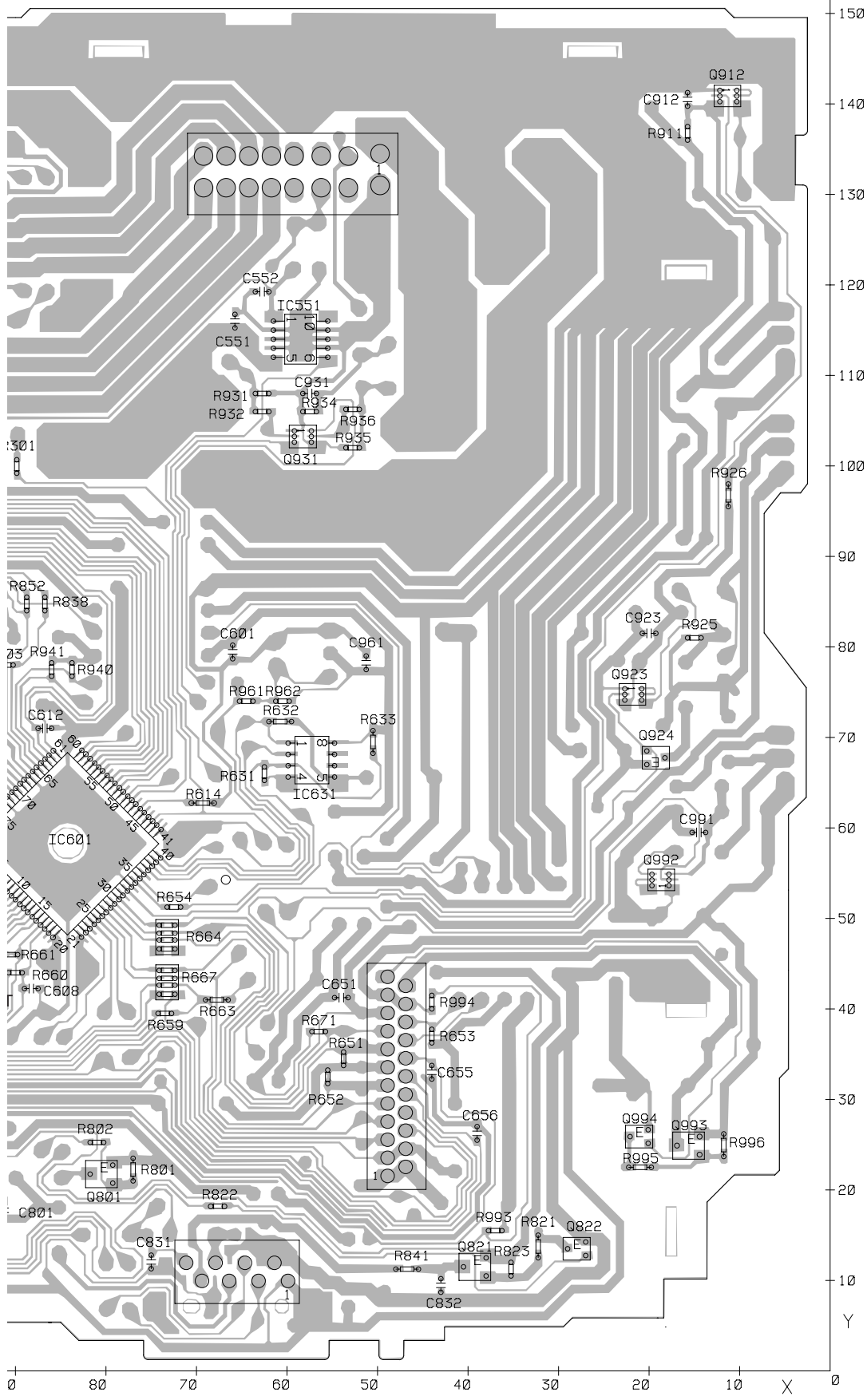


170 160 150 140 130 120 110 100 90 80



SIDE B

A
B
C
D
E
F



DEH-2790MP/XN/ID

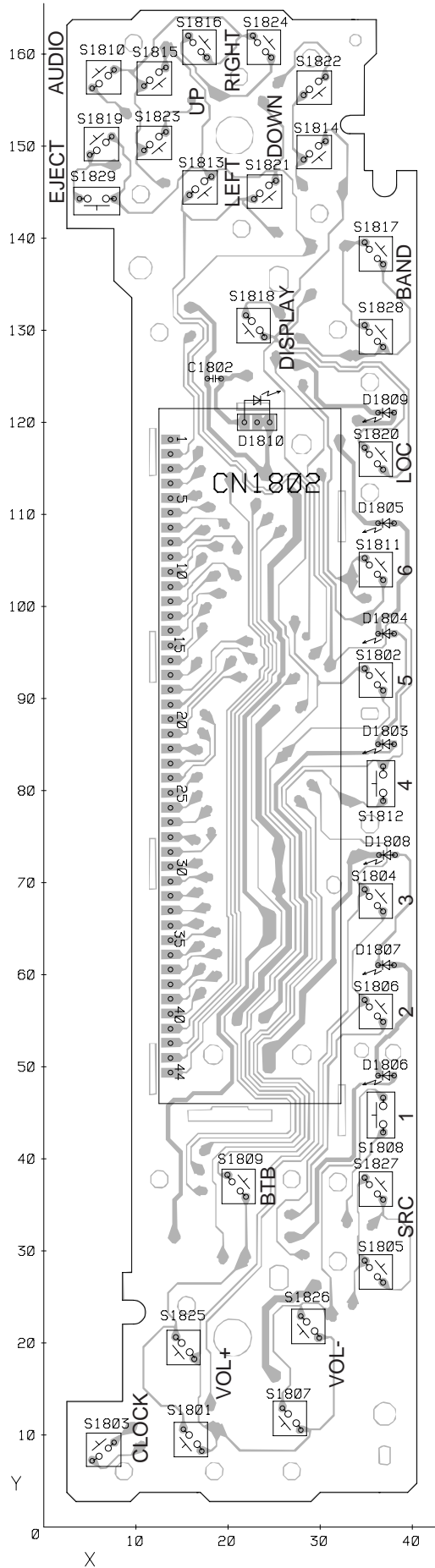
A

4.2 KEYBOARD UNIT

B KEYBOARD UNIT

SIDE A

A
B
C
D
E
F

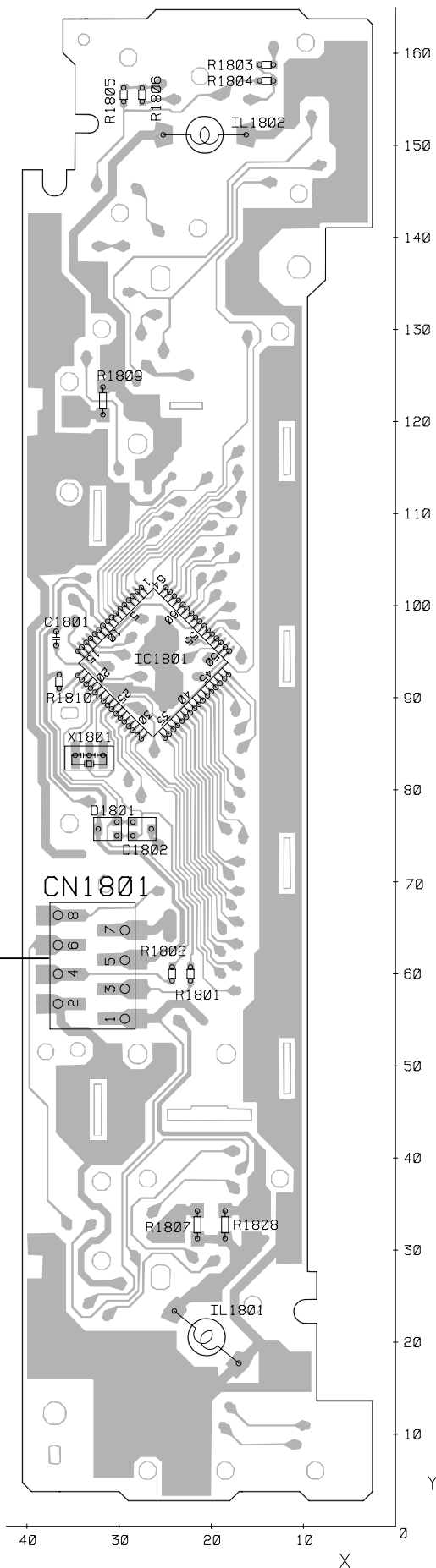


B

B KEYBOARD UNIT

SIDE B

A CN831



A
B
C
D
E
F

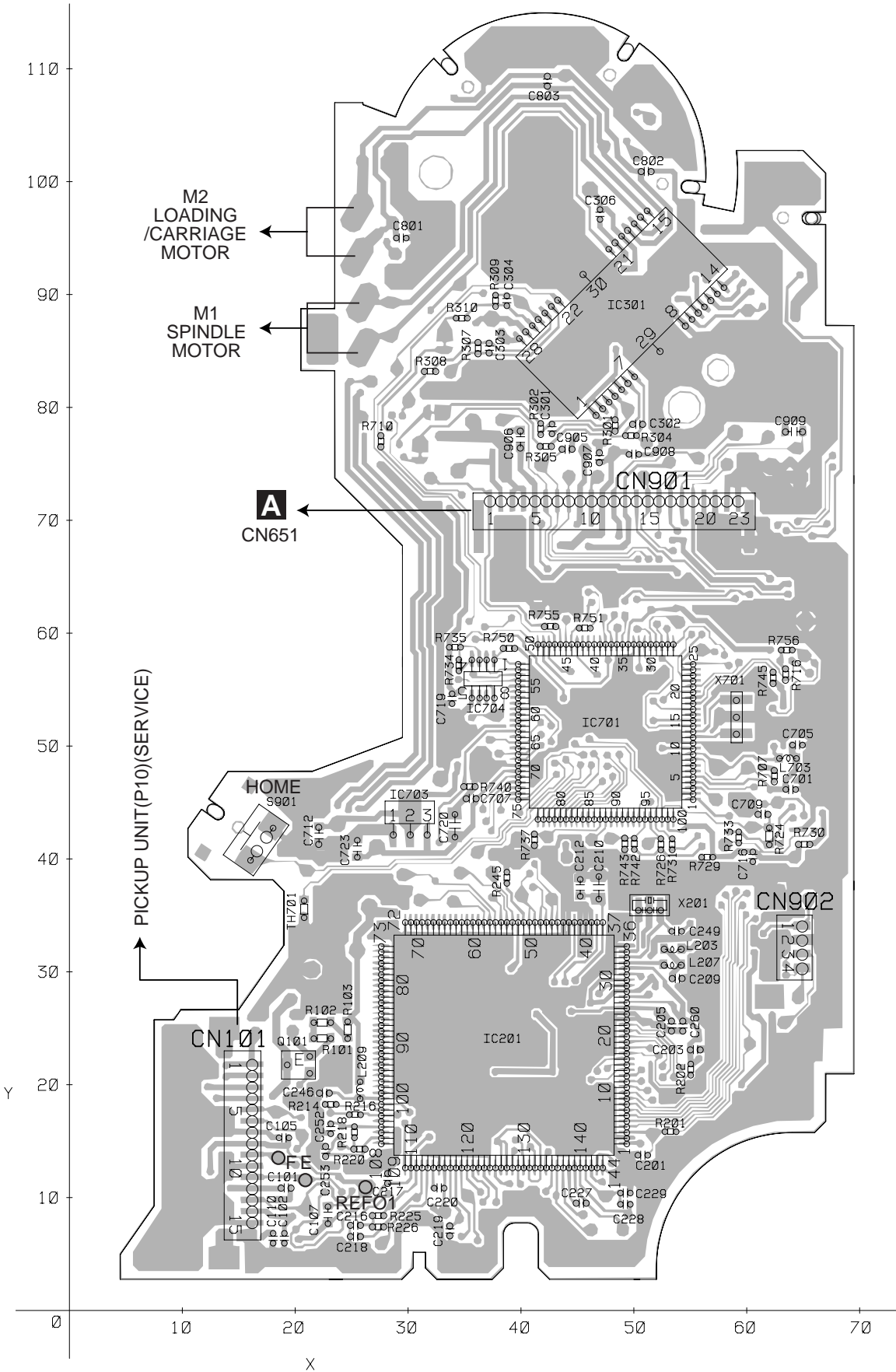
B

4.3 CD CORE UNIT(S10.1)

C CD CORE UNIT(S10.1)

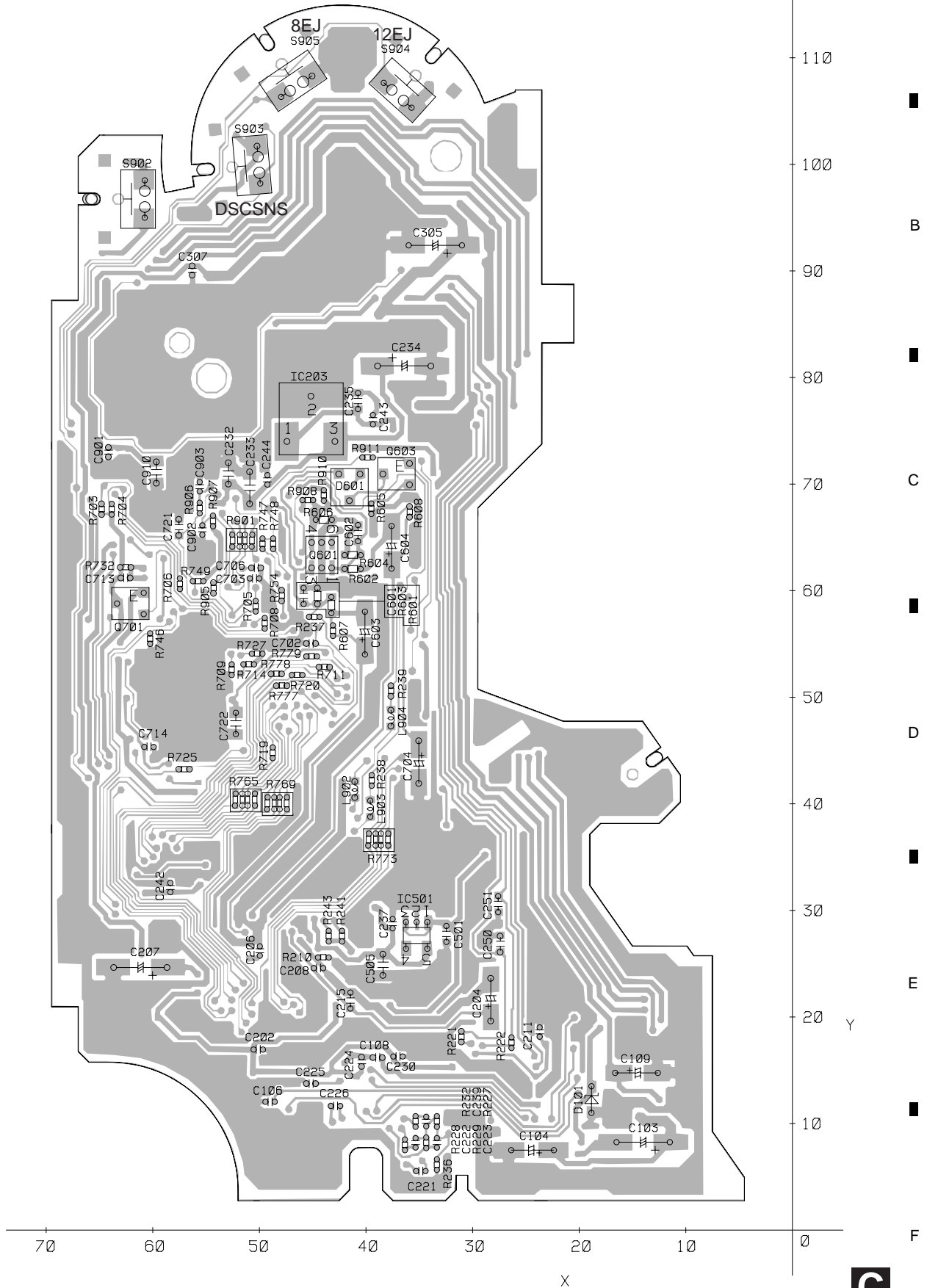
SIDE A

A
B
C
D
E
F



C CD CORE UNIT(S10.1)

SIDE B



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.....

- The \triangle 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.

Circuit Symbol and No. Part No. Circuit Symbol and No. Part No.

L 401	(A,154,54)	Inductor	LAU2R2K
L 402	(A,143,91)	Inductor	LAU2R2K
L 404	(B,157,97)	Inductor	LCTAW4R7J2520
L 601	(A,90,81)	Ferri-Inductor	LAU100K
L 602	(A,101,63)	Inductor	LAU2R2K
L 651	(A,47,54)	Ferri-Inductor	LAU100K
L 801	(A,90,21)	Inductor	LAU2R2K
L 901	(A,34,104)	Choke Coil 600μH	CTH1280
X 601	(A,100,68)	Radiator 12.58291MHz	CSS1402

\triangle FU352	(B,141,131)	Fuse 3A	CEK1286
AR401	(A,158,106)	Surge Protector	DSP-201M-S00B
\triangle		Fuse 10A	CEK1208
		FM/AM Tuner Unit	CWE1912

RESISTORS

R 151	(A,117,90)	RD1/4PU471J
R 152	(A,120,90)	RD1/4PU471J
R 153	(B,123,102)	RS1/16S471J
R 154	(B,121,102)	RS1/16S471J
R 157	(B,124,94)	RAB4C102J
R 301	(B,90,100)	RS1/16S153J
R 353	(B,142,124)	RS1/16S331J
R 354	(B,162,124)	RS1/16S331J
R 357	(B,143,129)	RS1/16S223J
R 358	(B,162,131)	RS1/16S223J
R 405	(B,153,59)	RS1/16S681J
R 407	(B,157,84)	RAB4C681J
R 414	(B,157,87)	RS1/16S681J
R 420	(B,96,44)	RS1/16S681J
R 421	(B,158,76)	RS1/16S473J
R 454	(B,133,123)	RS1/16S103J
R 455	(B,137,127)	RS1/16S153J
R 456	(B,137,129)	RS1/16S221J
R 457	(B,96,46)	RS1/16S681J
R 601	(B,98,54) (GS,ID)	RS1/16S473J
R 602	(B,105,52) (CS)	RS1/16S473J
R 606	(B,108,58)	RS1/16S104J
R 607	(B,102,59)	RS1/16S222J
R 609	(B,100,40)	RS1/16S473J
R 610	(B,96,48)	RS1/16S681J
R 611	(B,109,70)	RS1/16S473J
R 614	(B,69,63)	RS1/16S104J
R 633	(B,51,70)	RS1/16S104J
R 653	(B,44,37)	RS1/16S104J
R 654	(B,73,51)	RS1/16S102J
R 655	(A,69,54)	RD1/4PU102J

A

Unit Number:CWM9693(GS,ID)

Unit Number:CWM9970(CS)

Unit Name:Tuner Amp Unit

MISCELLANEOUS

IC 151	(B,131,81) IC	PML010A
IC 302	(A,92,131) IC	PAL007A
IC 601	(B,84,58) IC	PE5447A
IC 901	(B,140,25) IC	BA33BC0FP
IC 961	(A,55,77) IC	S-80834CNY

Q 352	(B,158,125) Transistor	UMH3N
Q 452	(B,136,124) Transistor	UMD2N
Q 801	(B,81,22) Transistor	2SA1036K
Q 821	(B,39,12) Transistor	2SA1036K
Q 822	(B,28,14) Transistor	DTC114EU

Q 911	(A,5,112) Transistor	2SD2396
Q 912	(B,11,141) Transistor	UMD2N
Q 921	(A,5,100) Transistor	2SD2396
Q 923	(B,22,75) Transistor	UMD2N
Q 931	(B,58,103) Transistor	UMX1N

Q 991	(A,5,65) Transistor	2SD2396
Q 992	(B,19,54) Transistor	UMD2N
D 551	(A,59,122) Diode	MPG06G-6415G3
D 552	(A,57,122) Diode	MPG06G-6415G3
D 831	(A,107,17) Diode	1SS270

D 832	(A,109,17) Diode	1SS270
D 833	(A,114,17) Diode	1SS270
D 834	(A,107,9) Diode	1SS270
D 835	(A,109,9) Diode	1SS270
D 836	(A,114,9) Diode	1SS270

D 837	(A,112,17) Diode	1SS270
D 838	(A,112,9) Diode	1SS270
D 901	(A,33,128) Diode	MPG06G-6415G3
D 902	(A,33,125) Diode	MPG06G-6415G3
D 911	(A,16,103) Diode	MPG06G-6415G3

D 912	(A,11,125) Diode	HZS6L(B2)
D 921	(A,22,84) Diode	HZS9L(B3)
D 931	(A,67,112) Diode	HZS7L(C3)
D 932	(A,49,109) Diode	HZS7L(A1)
D 991	(A,17,62) Diode	HZS7L(C3)

L 151	(A,142,66) Inductor	LAU2R2K
-------	---------------------	---------

<u>Circuit Symbol and No.</u>		<u>Part No.</u>	<u>Circuit Symbol and No.</u>		<u>Part No.</u>
R 658	(B,105,37)	RS1/16S473J	C 353	(A,132,116)	CEJQ2R2M50
R 659	(B,74,40)	RS1/16S221J	C 354	(A,132,107)	CEJQ2R2M50
R 660	(B,90,44)	RS1/16S221J	C 401	(B,158,66)	CKSRYB103K50
R 662	(B,109,38)	RS1/16S682J			
R 663	(B,68,41)	RS1/16S682J	C 402	(B,152,56)	CKSRYB103K50
R 671	(B,57,38)	RS1/16S104J	C 403	(A,149,54)	CEJQ470M6R3
R 801	(B,77,22)	RS1/16S153J	C 404	(A,148,91)	CEJQ101M10
R 802	(B,81,25)	RS1/16S153J	C 405	(B,165,93)	CKSRYB103K50
R 803	(B,93,18)	RS1/16S222J	C 409	(B,144,54)	CCSRCH470J50
R 821	(B,32,14)	RS1/16S562J	C 420	(B,102,40)	CCSRCH470J50
R 822	(B,68,18)	RS1/16S102J	C 451	(A,129,131)	CEJQ330M10
R 823	(B,35,11)	RS1/16S103J	C 601	(B,66,79)	CKSRYB103K50
R 833	(A,78,7)	RD1/4PU222J	C 603	(A,98,85)	CEJQ4R7M35
R 834	(A,80,7)	RD1/4PU222J	C 604	(B,96,71)	CCSRCH200J50
R 835	(A,68,15)	RD1/4PU102J	C 605	(B,99,71)	CCSRCH200J50
R 836	(A,74,18)	RD1/4PU104J	C 606	(B,106,67)	CKSRYB104K16
R 837	(A,78,15)	RD1/4PU103J	C 607	(B,98,63)	CCSRCH101J50
R 838	(B,87,85)	RS1/16S102J	C 608	(B,88,42)	CCSRCH470J50
R 841	(B,47,11)	RS1/16S1R0J	C 610	(A,98,79)	CEJQ4R7M35
R 848	(A,103,44)	RD1/4PU102J	C 613	(B,97,75)	CKSRYB105K6R3
R 851	(A,100,44)	RD1/4PU102J	C 651	(B,54,41)	CKSRYB683K16
R 852	(B,89,85)	RS1/16S102J	C 801	(B,91,18)	CKSRYB104K16
R 911	(B,16,137)	RS1/16S223J	C 832	(B,43,9)	CKSRYB104K16
R 912	(A,10,130)	RD1/4PU152J	C 901	(A,34,136)	CEAT332M16(P45)
R 923	(A,17,86)	RD1/4PU821J	C 911	(A,14,92)	CEJQ470M10
R 926	(B,11,97)	RS1/16S221J	C 912	(B,16,141)	CKSRYB103K50
R 931	(B,63,108)	RS1/16S473J	C 913	(A,20,140)	CEAT331M16
R 932	(B,63,106)	RS1/16S104J	C 921	(A,22,62) 330µF/16V	CCH1326
R 933	(A,52,112)	RD1/4PU102J	C 922	(A,21,79)	CEJQ101M16
R 934	(B,58,106)	RS1/16S472J	C 923	(B,20,82)	CKSRYB103K50
R 935	(B,53,102)	RS1/16S473J	C 961	(B,51,78)	CKSRYB473K50
R 936	(B,53,106)	RS1/16S223J	C 963	(A,61,78)	CEJQ100M16
R 940	(B,84,78)	RS1/16S104J	C 981	(B,130,21)	CKSRYB334K10
R 941	(B,86,78)	RS1/16S104J	C 983	(A,142,34)	CEJQ470M10
R 961	(B,65,74)	RS1/16S102J	C 991	(B,15,60)	CKSRYB473K50
R 962	(B,61,74)	RS1/16S822J	C 992	(A,14,50)	CEJQ221M10
R 991	(A,17,57)	RD1/4PU271J	C 994	(A,16,32)	CEJQ221M10
R 992	(A,12,65)	RD1/4PU221J			
R 993	(B,37,16)	RS1/16S222J			
R 994	(B,44,41)	RS1/16S472J			

CAPACITORS

C 151	(B,158,70)	CKSRYB224K10
C 152	(B,158,72)	CKSRYB224K10
C 153	(B,122,74)	CKSRYB105K6R3
C 154	(B,141,75)	CKSRYB105K6R3
C 155	(A,121,80)	CEJQ4R7M35
C 156	(A,141,80)	CEJQ4R7M35
C 165	(B,139,69)	CKSRYB104K16
C 166	(A,136,67)	CEJQ470M10
C 167	(A,126,67)	CEJQ100M16
C 301	(A,130,125)	CFTNA224J50
C 302	(A,126,107)	CFTNA224J50
C 303	(A,130,121)	CFTNA224J50
C 304	(A,120,107)	CFTNA224J50
C 309	(B,133,128)	CKSQYB225K10
C 310	(B,135,132)	CKSQYB225K10
C 312	(A,101,121)	CEJQ100M16
C 313	(B,98,138)	CKSRYB104K16

MISCELLANEOUS

IC 1801	(B,26,93) IC	PD6340A
D 1803	(A,37,84) LED	SML-310PT
D 1804	(A,37,96) LED	SML-310PT
D 1805	(A,37,108) LED	SML-310PT
D 1806	(A,37,48) LED	SML-310PT
D 1807	(A,37,60) LED	SML-310PT
D 1808	(A,37,72) LED	SML-310PT
D 1809	(A,37,120) LED	SML-310PT
D 1810	(A,23,119) LED	CL-490S-WF-SD
X 1801	(B,33,83) Ceramic Resonator 5.00MHz	CSS1547
IL 1801	(B,20,20) Lamp 40mA,14V	CEL1651
IL 1802	(B,20,150) Lamp 40mA,14V LCD	CEL1651 CAW1848

RESISTORS

R 1801	(B,22,59)	RS1/16S222J
R 1802	(B,24,59)	RS1/16S222J

B
Unit Number:
Unit Name:Keyboard Unit

Circuit Symbol and No.**Part No.****Circuit Symbol and No.****Part No.**

R 1803 (B,14,158) RS1/16S0R0J
 R 1805 (B,29,155) RS1/16S0R0J
 R 1807 (B,21,32) RS1/4SA471J

R 310 (A,35,88)
 R 601 (B,43,59)

RS1/16SS183J
 RS1/16S101J

A

R 1808 (B,18,32) RS1/4SA471J
 R 1809 (B,32,122) RS1/4SA471J
 R 1810 (B,36,91) RS1/16S104J

R 602 (B,41,62)
 R 606 (B,44,67)
 R 607 (B,43,56)
 R 608 (B,36,67)
 R 705 (B,50,59)

RS1/16S101J
 RS1/16S0R0J
 RS1/16SS0R0J
 RS1/16SS0R0J
 RS1/16SS221J

CAPACITORS

C 1801 (B,37,96) CKSRYB103K50
 C 1802 (A,18,124) CKSRYF104Z25

R 706 (B,57,61)
 R 707 (A,62,47)
 R 708 (B,50,57)
 R 710 (A,28,77)
 R 711 (B,44,53)

RS1/16SS221J
 RS1/16SS473J
 RS1/16SS221J
 RS1/16SS102J
 RS1/16SS221J

**Unit Number:CWX3096****Unit Name:CD Core Unit(S10.1)**

B

MISCELLANEOUS

IC 201 (A,39,24) IC UPD63763GJ
 IC 203 (B,45,78) IC NJM2885DL1-33
 IC 301 (A,49,88) IC BA5835FP
 IC 701 (A,48,51) IC PE5454A
 IC 703 (A,30,44) IC S-812C33AUA-C2N

R 725 (B,57,43)
 R 726 (A,52,41)
 R 727 (B,50,54)
 R 729 (A,57,40)
 R 730 (A,65,41)

RS1/16SS222J
 RS1/16SS103J
 RS1/16SS473J
 RS1/16SS223J
 RS1/16SS473J

C

Q 101 (A,20,22) Transistor 2SA1577
 Q 701 (B,62,59) Transistor UN2111
 L 203 (A,53,32) Inductor CTF1389
 L 207 (A,53,31) Inductor CTF1389
 L 209 (A,26,20) Inductor CTF1389

R 731 (A,53,41)
 R 737 (A,41,42)
 R 740 (A,35,46)
 R 742 (A,50,41)
 R 746 (B,60,56)

RS1/16SS104J
 RS1/16SS104J
 RS1/16SS473J
 RS1/16SS104J
 RS1/16SS104J

L 703 (A,64,49) Inductor CTF1389
 X 201 (A,51,35) Ceramic Resonator 16.934MHz CSS1603
 X 701 (A,59,53) Ceramic Resonator 4.00MHz CSS1652
 S 901 (A,15,43) Switch(HOME) CSN1067
 S 903 (B,53,100) Switch(DSCSNS) CSN1068

R 750 (A,39,59)
 R 754 (B,48,60)
 R 755 (A,43,61)
 R 765 (B,51,40)
 R 769 (B,48,40)

RS1/16SS473J
 RS1/16SS102J
 RS1/16SS102J
 RAB4CQ221J
 RAB4CQ221J

S 904 (B,35,108) Switch(12EJ) CSN1067
 S 905 (B,48,109) Switch(8EJ) CSN1067

R 773 (B,39,37)
 R 777 (B,48,51)
 R 778 (B,48,52)
 R 779 (B,45,54)
 R 901 (B,52,65)

RAB4CQ221J
 RS1/16SS221J
 RS1/16SS221J
 RS1/16SS221J
 RAB4CQ221J

D

RESISTORS

R 101 (A,22,24) RS1/10SR2R4J
 R 102 (A,22,26) RS1/10SR2R4J
 R 103 (A,25,25) RS1/10SR2R7J
 R 201 (A,53,16) RS1/16SS102J
 R 202 (A,55,21) RS1/16SS333J

R 905 (B,54,60)
 R 906 (B,56,68)
 R 908 (B,45,69)
 R 910 (B,44,69)
 R 911 (B,40,73)

RS1/16SS221J
 RS1/16SS221J
 RS1/16SS0R0J
 RS1/16SS0R0J
 RS1/16SS102J

R 221 (B,31,18) RS1/16SS103J
 R 222 (B,26,18) RS1/16SS103J
 R 225 (A,27,8) RS1/16SS103J
 R 226 (A,27,7) RS1/16SS393J
 R 227 (B,33,10) RS1/16SS562J

CAPACITORS

C 103 (B,14,8) 100µF/16V
 C 105 (A,19,15)
 C 108 (B,39,16)
 C 110 (A,18,6)
 C 201 (A,51,14)

CCH1504
 CKSSYB104K10
 CKSSYB104K10
 CKSSYB104K10
 CKSSYB102K50

E

R 228 (B,36,8) RS1/16SS122J
 R 229 (B,34,8) RS1/16SS472J
 R 232 (B,35,10) RS1/16SS122J
 R 241 (B,42,28) RS1/16SS333J
 R 243 (B,44,28) RS1/16SS333J

C 202 (B,50,17)
 C 203 (A,55,23)
 C 204 (B,28,22)
 C 205 (A,53,25)
 C 208 (B,44,25)

CKSSYB104K10
 CKSSYB104K10
 CEVW220M6R3
 CKSSYB104K10
 CKSSYB104K10

R 245 (A,39,38) RS1/16SS333J
 R 301 (A,48,78) RS1/16SS183J
 R 302 (A,42,78) RS1/16SS822J
 R 304 (A,50,78) RS1/16SS183J
 R 305 (A,42,77) RS1/16SS822J

C 209 (A,54,29)
 C 212 (A,45,37)
 C 216 (A,25,8)
 C 217 (A,28,12)
 C 218 (A,25,7)

CKSSYB104K10
 CKSRYB105K10
 CKSSYB332K50
 CKSSYB104K10
 CKSSYB473K10

F

R 307 (A,36,85) RS1/16SS183J
 R 308 (A,32,83) RS1/16SS183J
 R 309 (A,38,89) RS1/16SS183J

<u>Circuit Symbol and No.</u>		<u>Part No.</u>
C 219	(A,34,7)	CKSSYB104K10
C 220	(A,33,11)	CKSSYB182K50
C 221	(B,35,6)	CKSSYB104K10
C 222	(B,35,8)	CCSSCH560J50
C 223	(B,33,8)	CCSSCH4R0C50
C 224	(B,40,16)	CKSSYB104K10
C 225	(B,45,14)	CKSSYB103K16
C 226	(B,43,12)	CCSSCH680J50
C 227	(A,45,10)	CCSSCH470J50
C 228	(A,49,9)	CKSSYB103K16
C 234	(B,36,81)	CEVW221M4
C 237	(B,38,29)	CKSSYB104K10
C 239	(B,34,10)	CCSSCH220J50
C 242	(B,58,32)	CKSSYB104K10
C 243	(B,39,76)	CKSSYB104K10
C 244	(B,49,70)	CKSSYB104K10
C 246	(A,23,19)	CKSSYB104K10
C 251	(B,28,31)	CKSRYB102K50
C 260	(A,54,25)	CKSSYB104K10
C 301	(A,43,78)	CKSSYB221K50
C 302	(A,50,79)	CKSSYB221K50
C 303	(A,37,85)	CKSSYB472K25
C 304	(A,39,89)	CKSSYB103K16
C 305	(B,34,92)	CEVW101M16
C 307	(B,56,90)	CKSSYB104K10
C 601	(B,46,60)	CCSRCH102J50
C 602	(B,41,65)	CCSRCH102J50
C 701	(A,64,46)	CKSSYB104K10
C 703	(B,50,61)	CKSSYB103K16
C 706	(B,50,62)	CKSSYB104K10
C 707	(A,36,45)	CKSSYB104K10
C 712	(A,22,42)	CKSRYB224K16
C 714	(B,60,45)	CKSSYB104K10
C 716	(A,61,40)	CKSSYB103K16
C 722	(B,52,48)	CKSQYB475K6R3
C 723	(A,26,41)	CKSRYB105K10
C 903	(B,56,70)	CKSSYB471K50
C 906	(A,40,77)	CKSRYB224K16
C 907	(A,47,76)	CKSSYB103K16
C 910	(B,60,71)	CKSQYB225K10

Miscellaneous Parts List

	Pickup Unit(P10)(Service)	CXX1641
M 1	Motor Unit(SPINDLE)	CXC4440
M 2	Motor Unit(LOADING/CARRIAGE)	CXB8933

6. ADJUSTMENT

6.1 CD ADJUSTMENT

A

1) Cautions on adjustments

• In this product the single voltage (3.3V) is used for the regulator. The reference voltage is the REFO1 (1.65V) instead of the GND.

If you should mistakenly short the REFO1 with the GND during adjustment, accurate voltage will not be obtained, and the servo's misoperation will apply excessive shock to the pickup. To avoid such problems:

a. Do not mix up the REFO1 with the GND when connecting the (-) probe of measuring instruments.

B Especially on an oscilloscope, avoid connecting the (-) probe for CH1 to the GND.

b. In many cases, measuring instruments have the same potential as that for the (-) probe. Be sure to set the measuring instruments to the floating state.

c. If you have mistakenly connected the REFO1 to the GND, turn off the regulator or the power immediately.

• Before mounting and removing filters or leads for adjustment, be sure to turn off the regulator.

C • For stable circuit operation, keep the mechanism operating for about one minute or more after the regulator is turned on.

• In the test mode, any software protections will not work. Avoid applying any mechanical or electrical shock to the mechanism during adjustment.

• The RFI and RFO signals with a wide frequency range are easy to oscillate. When observing the signals, insert a resistor of 1k ohms in series.

D • The load and eject operation is not guaranteed with the mechanism upside down. If the mechanism is blocked due to mistaken eject operation, reset the product or turn off and on the ACC to restore it.

2) Test mode

This mode is used to adjust the CD mechanism module.

• To enter the test mode.

While pressing the 4 and 6 keys at the same time, reset.

• To exit from the test mode.

Turn off the ACC and back up.

Notes:

a. During ejection, do not press any other keys than the EJECT key until the loaded disc is ejected.

b. If you have pressed the (→) key or (←) key during focus search, turn off the power immediately to protect the actuator from damage caused by the lens stuck.

c. For the TR jump modes except 100TR, the track jump operation will continue even if the key is released.

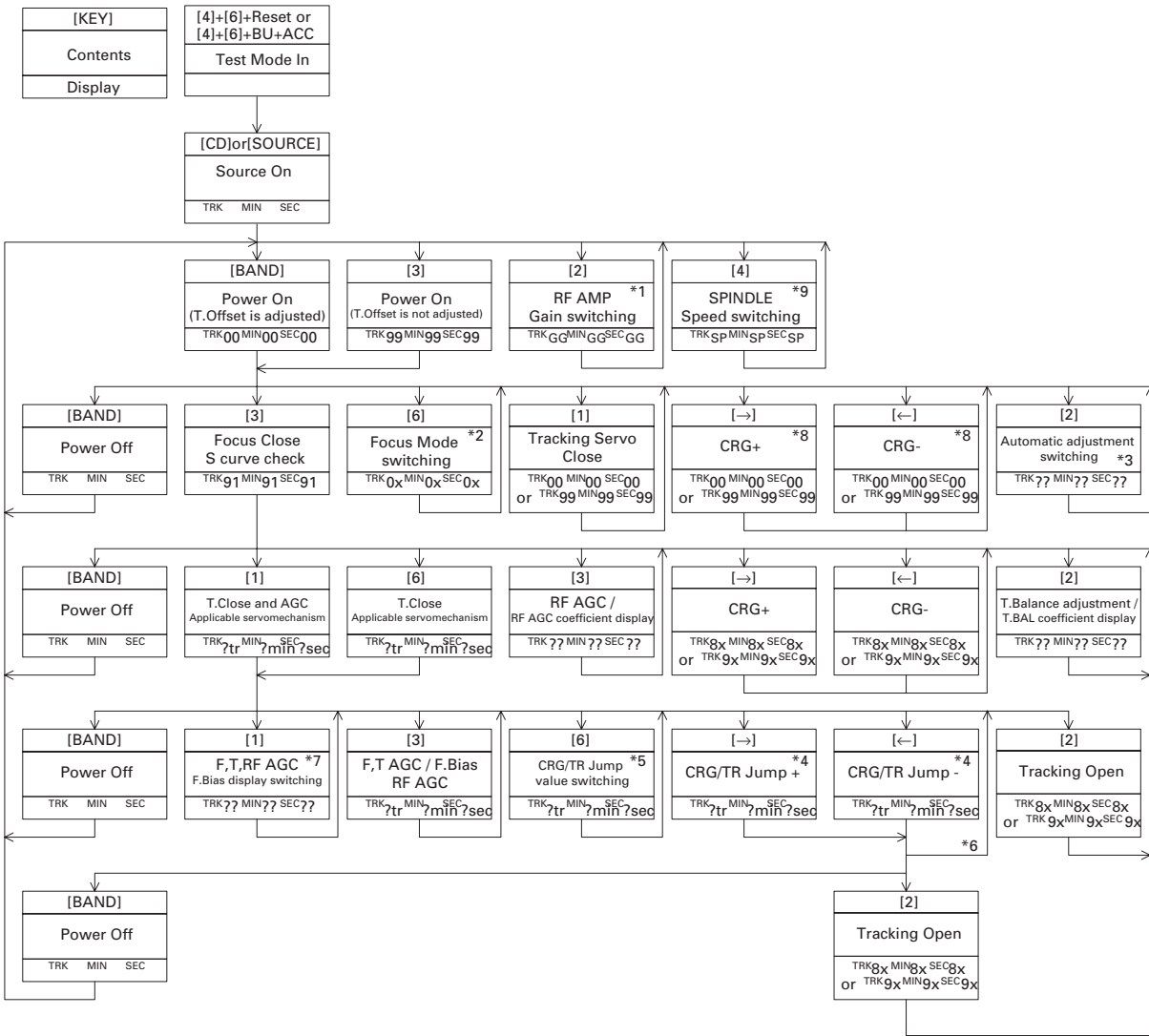
d. For the CRG move and 100TR jump modes, the tracking loop will be closed at the same time when the key is released.

e. When the power is turned off and on, the jump mode is reset to the single TR (91), the RF amp gain is set to 0dB, and the auto-adjustment values are reset to the default settings.

E

F

Flow Chart



- *1)

TYP	TRK	MIN	SEC	→	-6dB	TRK	06	MIN	06	SEC	06	→	-12dB	TRK	12	MIN	12	SEC	12
- *2) Focus Close → S.Curve check setting → F EQ measurement setting

TRK	00	MIN	00	SEC	00	→	TRK	01	MIN	01	SEC	01	→	TRK	02	MIN	02	SEC	02
(TRK	99	MIN	99	SEC	99)														
- *3) F.Offset Display → T.Offset Display → Switch to the order of the original display
- *4) 1TR / 32TR / 100TR
- *5) Single TR → 32TR → 100TR → CRG Move

9x(8x) :	91(81)	92(82)	93(83)	94(84)
----------	--------	--------	--------	--------
- *6) Only at the time of CRG move, 100TR jump
- *7) TRK/MIN/SEC → F.AGC → T.AGC → F Bias → RF AGC

[Key]	Operation
[KEY]	Test Mode
[BAND]	Power On / Off
[→]	CRG + / TR Jump + (Direction of the external surface)
[←]	CRG - / TR Jump - (Direction of the internal surface)
[1]	U.CLS and AGC and Applicable servomechanism / AGC, AGC display setting
[2]	RF Gain switching / Offset adjustment display / T.Balance adjustment / T.Open
[3]	Close, S.Curve / Rough Servo and RF AGC / F, T, RF AGC
[4]	SPDL 1X / 2X switching As for the double speed (2x), audio output cannot be supported.
[5]	Error Rate measurement 1st - ON : ERR count Beginning (30Sec) 2nd - ON : BER display data [%]
[6]	F.Mode switching / Tracking Close / CRG • TR Jump switching

*8) CRG motor voltage = 2[V]

*9) Applicability : A, B, C, D, E, F

TYP(1X)	TRK	MIN	SEC	→	2X	TRK	22	MIN	22	SEC	22	→	1X	TRK	11	MIN	11	SEC	11
---------	-----	-----	-----	---	----	-----	----	-----	----	-----	----	---	----	-----	----	-----	----	-----	----

Applicability : G

TYP(2X)	TRK	MIN	SEC	→	1X	TRK	11	MIN	11	SEC	11	→	2X	TRK	22	MIN	22	SEC	22
---------	-----	-----	-----	---	----	-----	----	-----	----	-----	----	---	----	-----	----	-----	----	-----	----

As for the double speed (2x), audio output cannot be supported

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 :

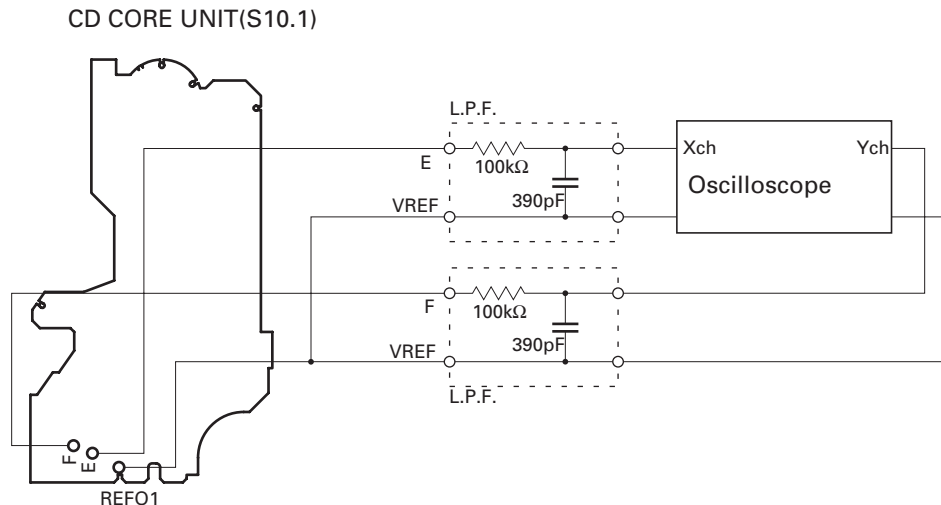
To check that the grating is within an acceptable range when the PU unit is changed.

• 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, REFO1 |
| • Disc | • TCD-782 |
| • Mode | • TEST MODE |



• Checking Procedure

1. In test mode, load the disc and switch the 3V 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. 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

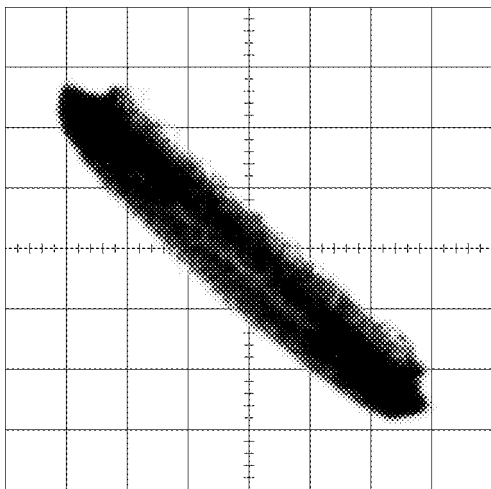
Reloading the disc changes the clamp position and may decrease the "wobble".

Grating waveform

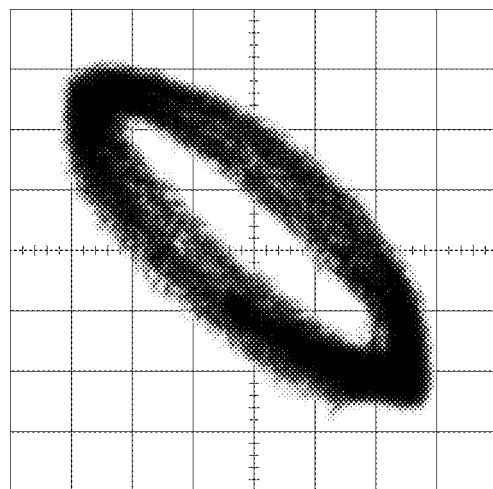
Ech → Xch 20mV/div, AC

Fch → Ych 20mV/div, AC

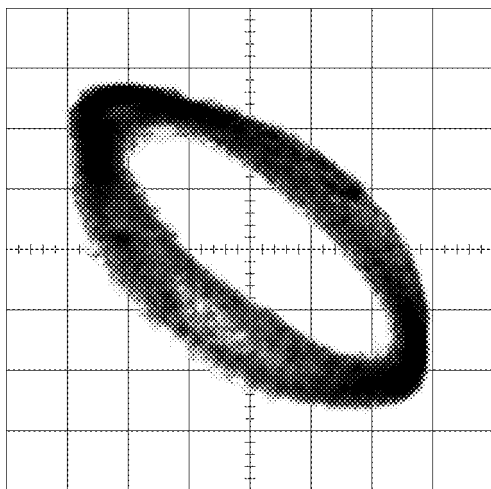
0°



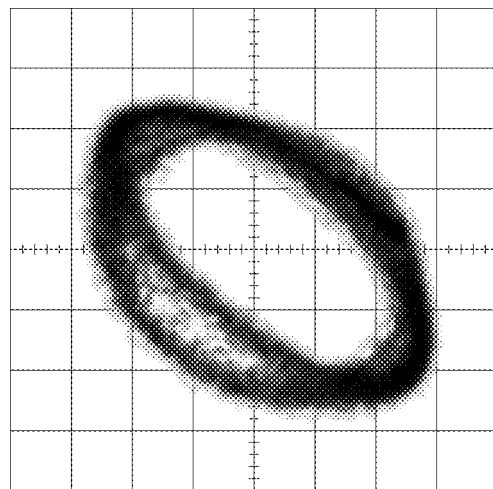
30°



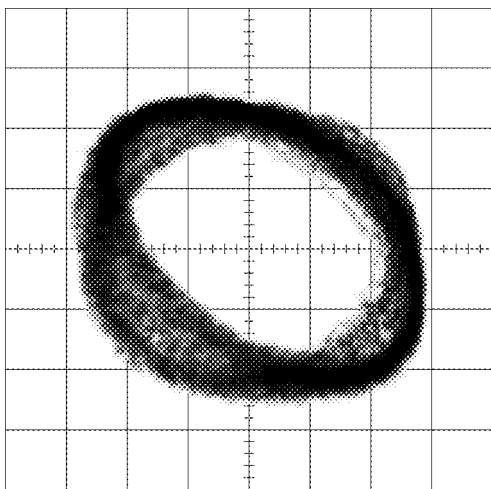
45°



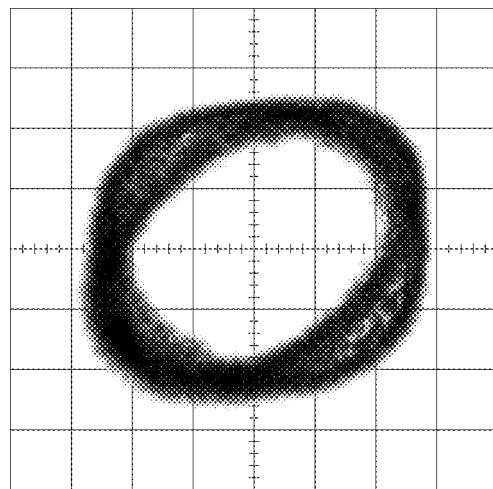
60°



75°



90°



A
B
C
D
E
F

6.3 ERROR MODE

● Error Messages

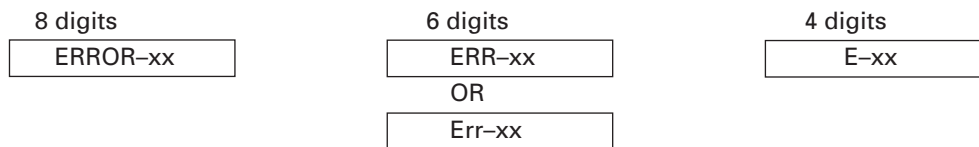
Error is displayed with number for Error cause when CD is inoperative or stops with Error during operation. The purpose is to reduce nonsense calls from users as well as to assist all related analysis and repair for defects at service station.

(1) Basic Display Method

1) When CSMOD (CD mode area for system) is SERRORM, Error code will be written in DMIN (minutes area for display), DSEC (seconds area for display). The same data shall be written in DMIN and DSEC. DTNO is blank as usual.

2) Display Example of Head Unit

The following is about LCD display ability. xx is Error number.



(2) Error Code List

No.	Classification	Contents	Details • Cause
10	Electricity	Carriage Home NG	CRG can't move to the inner. CRG can't move from the inner. → HOME SW failure, CRG movement failure.
11	Electricity	Focus Search NG	Focus can't be caught. → Back of Disc / Severe dirt and vibration.
12	Electricity	Spindle Lock NG Subcode NG RF-amp NG	Not spindle, lock. Wrong subcode (can't read). → Defective Spindle. Scratch and dirt on Disc. Intense vibration. The appropriate gain of the RF amp cannot be obtained. → Defective spindle. → Scratched or dirty disc. Severe vibration. Abnormal CD signals. → Blanc CD-R disc. Disc inserted upside down.
17	Electricity	Setup NG	AGC protection doesn't work, out of Focus soon. → Scratch on Disc/Severe dirt and vibration.
22	Disc	Impossible to play	There is no playable MP3 or WMA file present in a disc. → No MP3 or WMA file exists in a CD-ROM disc inserted.
23	Disc	File Format NG	Contents are stored in an incompatible file format. → The contents in a CD-ROM disc inserted are recorded in a file format other than ISO9660 Level-1 and 2.
30	Electricity	Search Time Out	Can't reach the target address. → Defective CRG/tracking, or scratch on Disc.
44	Disc	Impossible to play	There is no playable TRK No. present in a disc. → All TRK Nos. In a disc inserted are specified as a track which should be skipped, in the track skip information.
50	Mecha	Disc Load / Eject NG	Disc loading/ejection cannot be complete. → Foreign objects entered into the mechanism. Disc caught in between during loading/ejection.
A0	System	Power NG	Power supply (VD) isn't connected to the ground. → Defective SW transistor. Abnormal power (failed connector)

Note : Error doesn't display in mechanism only. (CD off causes mechanism off)

If TOC can't be read, error wouldn't occur, but mechanism still continues its operation.

The upper digits of error code is mainly classified by 3 kinds as follows:

1x: Setup related error, 3x: Search related error, Ax: Other errors.

6.4 SYSTEM MICROCOMPUTER TEST PROGRAM



● PCL Output

In the normal operation mode (with the detachable panel installed, the ACC switched ON, the standby mode cancelled), shift the TESTIN (Pin 15) terminal to H. The clock signal is output from the PCL terminal (Pin 14). The frequency of the clock signal is 786.432kHz that is one 16th of the fundamental frequency. The clock signal should be $786.432\text{kHz} \pm 31.5\text{Hz}$. If the clock signal is out of the range, the X'tal (X601) should be replaced with new one.

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 DISASSEMBLY

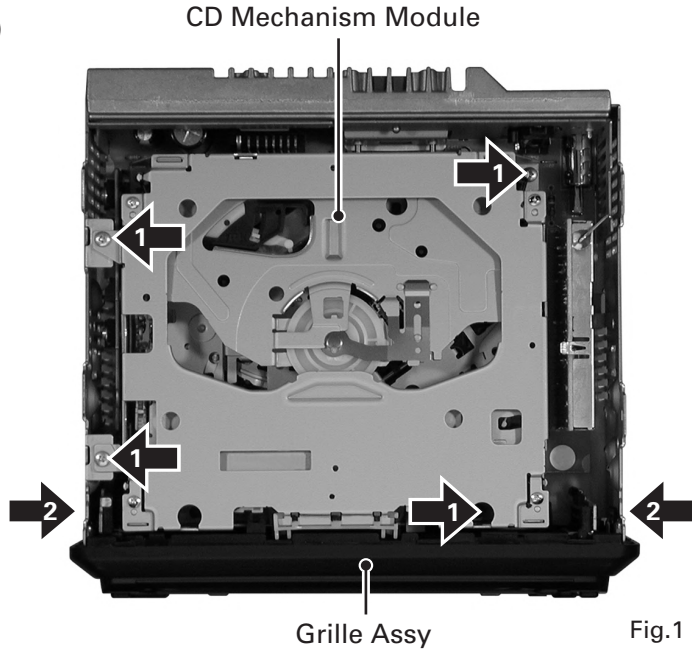
● Removing the Case (not shown)

1. Remove the Case.

● Removing the CD Mechanism Module (Fig.1)

1 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module.



● Removing the Grille Assy (Fig.1)

2 Release the two latches and then remove the Grille Assy.

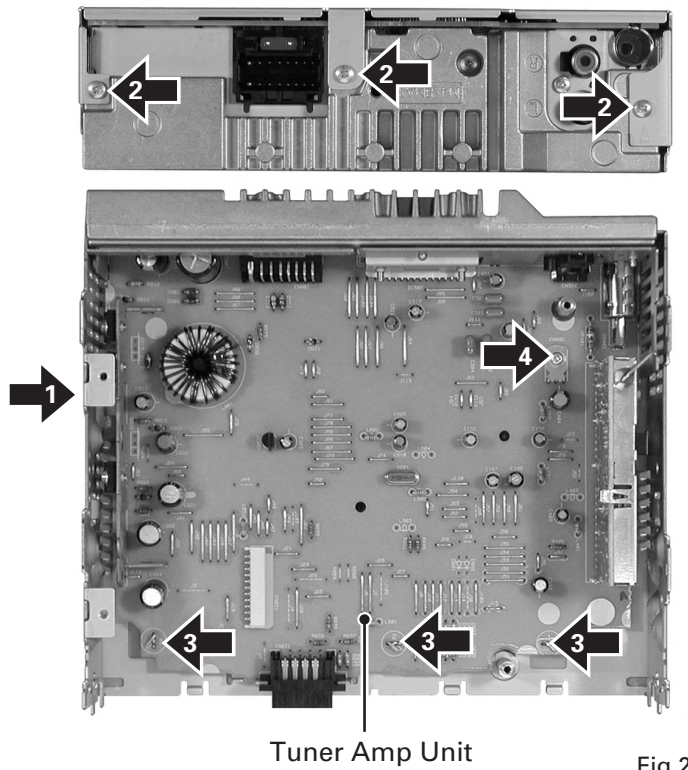
● Removing the Tuner Amp Unit (Fig.2)

1 Remove the screw.

2 Remove the three screws.

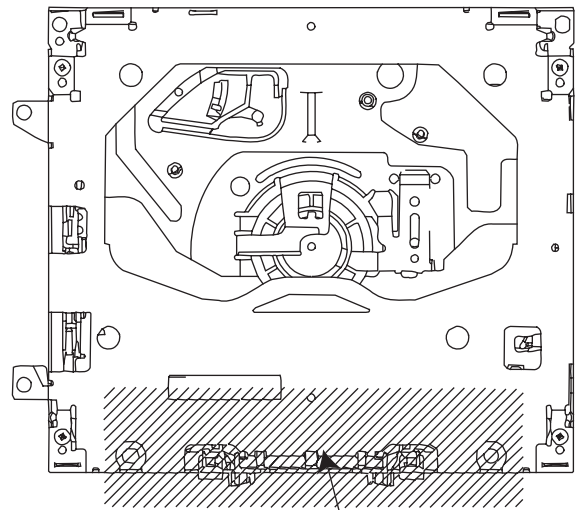
3 Straighten the tabs at three locations indicated.

4 Remove the screw and then remove the Tuner Amp Unit.



● How to hold the Mechanism Unit

1. Hold the top and bottom frame.
2. Do not squeeze top frame's front portion too tight, because it is fragile.

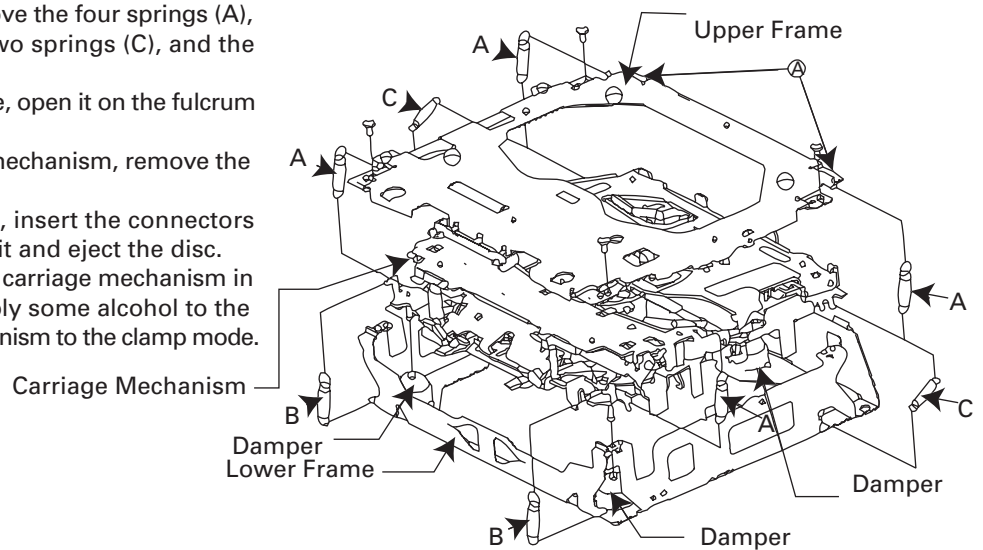


Do not squeeze.

● Removing the Upper and Lower Frames

1. With a disc clamped, remove the four springs (A), the two springs (B), the two springs (C), and the four screws.
2. To remove the upper frame, open it on the fulcrum A.
3. While lifting the carriage mechanism, remove the three dampers.
4. With the frames removed, insert the connectors coming from the main unit and eject the disc.

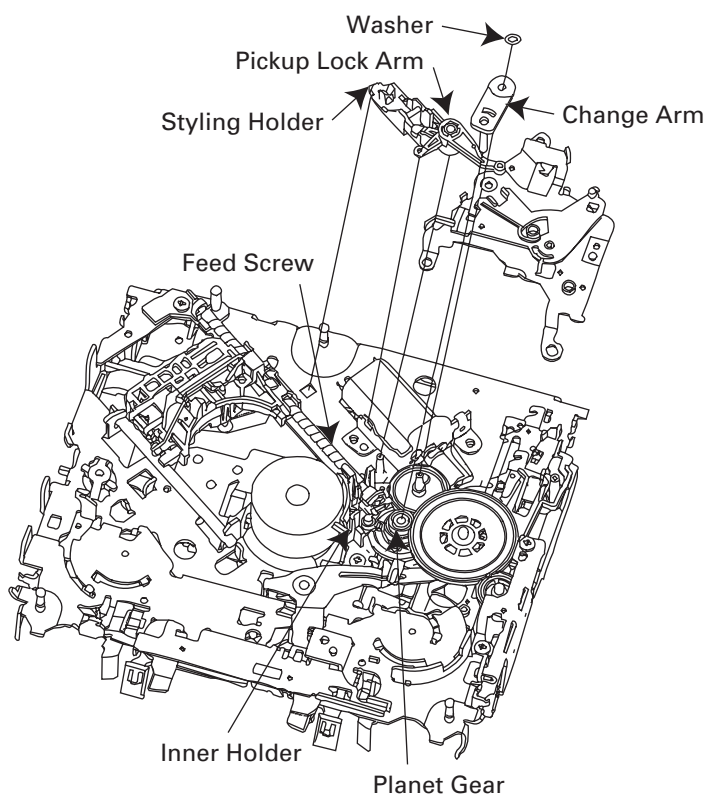
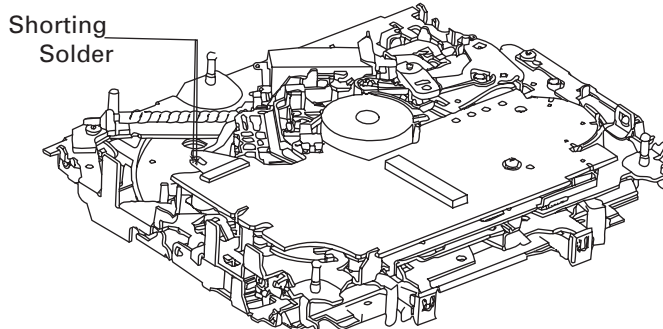
Caution: Before installing the carriage mechanism in the frames, be sure to apply some alcohol to the dampers and set the mechanism to the clamp mode.



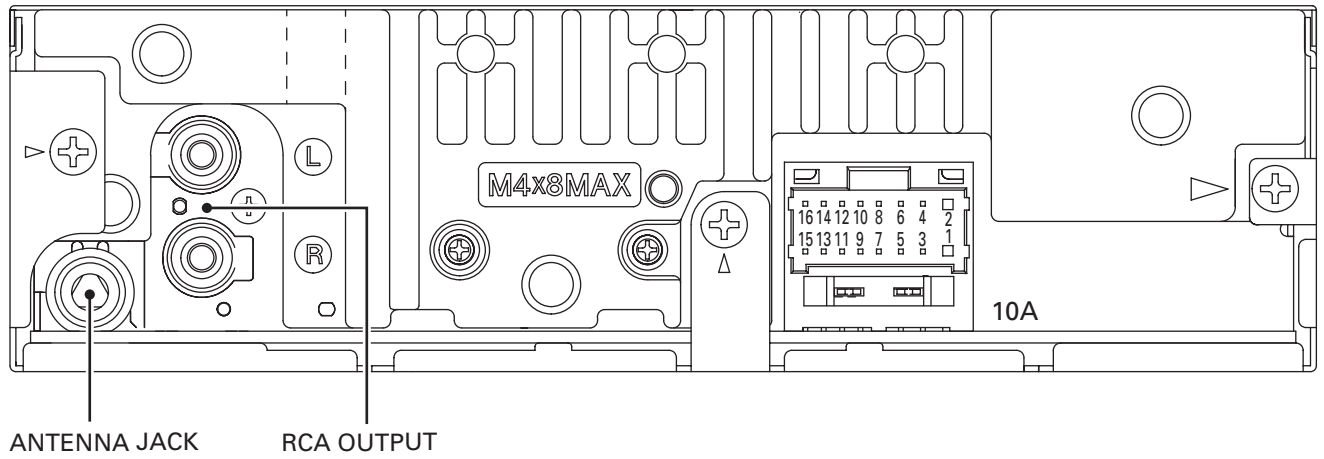
● Removing the Pickup Unit

1. Apply shorting solder to the Pickup flexible cable.
Disconnect the cable.
2. Set the mechanism to the clamp mode.
3. Remove the lead wires from the inner holder.
4. Remove the washer, styling holder, change arm, and pickup lock arm.
5. While releasing from the hook of the inner holder, lift the end of the feed screw.

Caution: In assembling, move the planet gear to the load/eject position before setting the feed screw in the inner holder.



7.1.2 CONNECTOR FUNCTION DESCRIPTION



Pin No.		Pin No.	
1	B.UP	9	RL-
2	GND	10	FL-
3	ACC	11	RL+
4	NC	12	FL+
5	NC	13	RR-
6	B.REM	14	FR-
7	NC	15	RR+
8	NC	16	FR+

7.2 PARTS

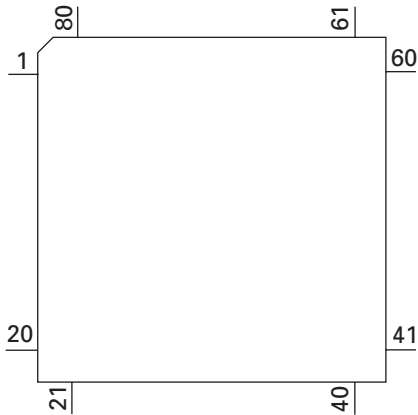
7.2.1 IC

● Pin Functions(PE5447A)

Pin No.	Pin Name	I/O	Function and Operation
1	MODEL1	I	Model select input
2, 3	NC		Not used
4	AVSS		GND
5, 6	NC		Not used
7	AVREF1		VDD
8	KYDT	I	Display microcomputer data input
9	DPDT	O	Display microcomputer communication data output
10	ADPW	O	A/D converter power supply output
11	TUNPDI	I	PLL data input
12	TUNPDO	O	PLL data output
13	TUNPCK	O	PLL clock output
14	PCL	O	Clock adjustment output
15	TESTIN	I	Test program input
16	BSI	I	P-BUS serial data input
17	BDATA	O	P-BUS serial data output
18	BCK	I/O	P-BUS serial clock input/output
19, 20	NC		Not used
21	SWVDD	O	Display microcomputer chip select output
22	ILMPW	O	Illumination power output
23	NC		Not used
24	XRST	O	CD LSI reset control output
25	XA0	O	CD LSI command data control output
26	XSTB	O	CD LSI strobe output
27	XTALEN	O	CD LSI ceramic oscillator oscillation output
28	CONT	O	Driver output
29	LOEJ	O	Load/eject output
30	CLCONT	O	Driver control output
31	NC		Not used
32	DALMON	O	Output for dark current reduction circuit
33	VSS		GND
34	BRST	O	B-PUS reset signal output
35	BRXEN	I/O	P-BUS reception enable signal input/output
36	NC		Not used
37	ROMDATA	O	ROM collection data output
38	ROMCLK	O	ROM collection clock output
39	ROMCS	O	ROM collection chip select output
40	RECEIVE	O	RDS decoder receiving output(Not used)
41	VDCONT	O	VD output
42	NC		Not used
43	SYSPW	O	System power output
44, 45	NC		Not used
46	STRKEY2	I	Wired remote control input
47	NC		Not used
48	MUTE	O	System mute output
49	ANTPW	O	Auto antenna control output
50	NC		Not used
51	VST	O	E.VOL strobe output
52	VDT	O	E.VOL data output
53	VCK	O	E.VOL clock output
54	NC		Not used
55	TUNPCE2	O	PLL chip enable output 2
56	TUNPCE	O	PLL chip enable output
57	RDT	I	RDS LK input(Not used)
58	RDSLK	I	RDS clock input(Not used)
59	RDS57K	I	RDS 57K input(Not used)
60	RESET		Reset
61	LDET	I	PLL lock detection input

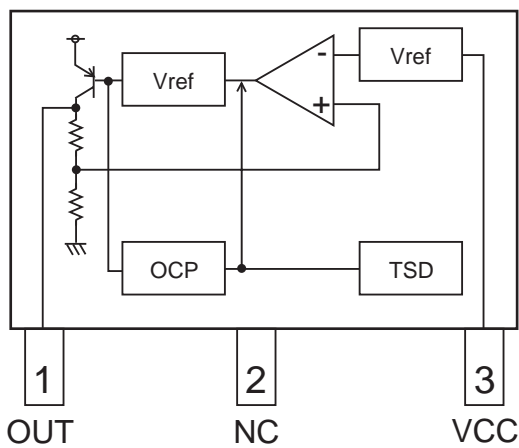
Pin No.	Pin Name	I/O	Function and Operation
62	RCK	I	RDS clock input
63	$\overline{\text{ASENS}}$	I	ACC sense input
64	$\overline{\text{BSENS}}$	I	Back up sense input
65	$\overline{\text{DSENS}}$	I	Grille detach sense input
66	$\overline{\text{SOURCE}}$	I	Source sense input
67	VSS		GND
68	VDD		VDD
69, 70	X2, 1		Crystal oscillator connection pin
71	IC(VPP)		GND
72	NC		Not used
73	VSS		VSS
74	AVDD		VDD
75	AVREF1		VDD
76	SL	I	Signal level input
77	TEMP	I	Temperature detection input
78	VDSSENS	I	VD power supply short circuit input
79	$\overline{\text{BSRQ}}$	I	P-BUS serial pole request input
80	STRKEY1	I	Wired remote control input(Not used)

* PE5447A



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

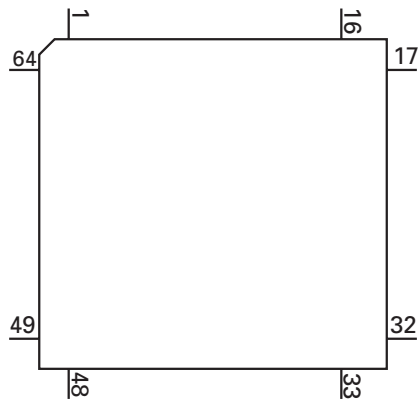
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● Pin Functions(PD6340A)

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	REW	I	Remote control reception input
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

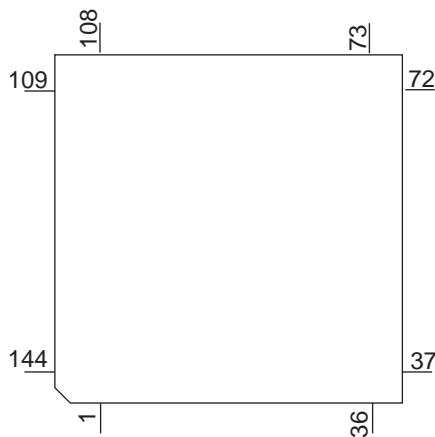


● Pin Functions(UPD63763GJ)

Pin No.	Pin Name	I/O	Function and Operation
1	D.VDD		Power supply for digital circuits
2	D1.GND		GND for 1.6V digital circuits
3	RESET	I	Input of reset
4-8	AB12-8	I	Address bus 12-8 from the microcomputer
9-16	AD7-0	I/O	Address/data bus 7-0 to the microcomputer
17	\overline{CS}	I	Chip selection
18	ASTB	I	Address strobe
19	\overline{READ}	I	Control signals(read)
20	\overline{WRITE}	I	Control signals(write)
21	WAIT	O	Control signals(wait)
22	INTQ	O	Interruption signals to the external microcomputer
23, 24	IFMODE0, 1	I	Switching the microcomputer I/F 0, 1
25	D1.VDD		Power supply for 1.6V digital circuits
26	DA.VDD		Power supply for DAC
27	ROUT	O	Output of audio for the right channel
28	DA.GND		GND for DAC
29	REGC		Connected to the capacitor for band gap
30	DA.GND		GND for DAC
31	LOUT	O	Output of audio for the left channel
32	DA.VDD		Power supply for DAC
33	X.VDD		Power supply for the crystal oscillator
34	XTAL	I	Connected to the crystal oscillator(16.9344MHz)
35	\overline{XTAL}	O	Connected to the crystal oscillator(16.9344MHz)
36	X.GND		Ground for the crystal oscillator
37	VDDREG15		Control of 1.6V regulator
38	PWMSW0	I	Setup 0 for PWM output(SD, MD)
39-41	TEST3-1	I	Connected to GND
42	PWMSW1	I	Setup 1 for PWM output(FD, TD)
43	TESTEN	I	Connected to GND
44	D1.GND		GND for 1.6V digital circuits
45	DIN	I	Input of audio data
46	DOUT	O	Output of audio data
47	SCKIN	I	Clock input for audio data
48	SCKO	O	Clock output for audio data
49	LRCKIN	I	Input of LRCK for audio data
50	LRCK	O	Output LRCK for audio data
51	\overline{XTALEN}	I	Permission to oscillate 16.9344MHz
52	D1.VDD		Power supply for 1.6V digital circuits
53	RFCK/HOLD	O	Output of RFCK/HOLD signal
54	WFCK/MIRR	O	Output of WFCK/MIRR signal
55	PLCK/RFOK	O	Output of PLCK/Output of RFOK
56	LOCK/RFOK	O	Output of LRCK/Output of RFOK
57	C1D1/C8M	O	Information on error correction/C8M : 8MHz
58	C1D2/C16M	O	Information on error correction/C16M : 16MHz
59	C2D1/RMUTE	O	Information on error correction/Mute for Rch
60	C2D2/LMUTE	O	Information on error correction/Mute for Lch
61	C2D3/SHOCK	O	Information on error correction/Detection of vibration
62	D1.GND		GND for 1.6V digital circuits
63	C33M	O	Output of 33.8688MHz(CLK for SDRAM)
64	\overline{RCS}	O	DRAM \overline{CS}
65	RA11	O	Output of DRAM address 11
66	(CKE)	O	Output of DRAM CKE
67	RAS	O	Output of DRAM RAS
68	$\overline{CAS0}$ (LDQM)	O	Output of DRAM lower \overline{CAS} (LDQM)
69	$\overline{CAS1}$ (UDQM)	O	Output of DRAM upper \overline{CAS} (UDQM)
70	\overline{WE}	O	Output of DRAM \overline{WE}
71	OE(CAS)	O	Output of DRAM OE(CAS)
72	D.GND		Ground for digital circuits
73-88	RDB0-15	I/O	Input/output of DRAM data0-15
89-99	RA0-10	O	Output of DRAM address0-10

Pin No.	Pin Name	I/O	Function and Operation
100	D.VDD		Power supply for digital circuits
101	FD+	O	Output of focus drive PWM +
102	FD-	O	Output of focus drive PWM -
103	TD+	O	Output of tracking drive PWM +
104	TD-	O	Output of tracking drive PWM -
105	SD+	O	Output of thread drive PWM +
106	SD-	O	Output of thread drive PWM -
107	MD+	O	Output of spindle drive PWM +
108	MD-	O	Output of spindle drive PWM -
109	REFOUTSV	O	REFOUT for servo
110	AD.VDD		Power supply for ADC
111	EFM	O	Output of EFM signals
112	ASY	I	Input of asymmetry
113	ATEST	O	Analog tests
114	RFI	I	Input of RF
115	AD.GND		Ground for the analog system
116	AGCO	O	Output of RF
117	C3T	O	Connection to the capacitor for detecting 3T
118	AGCI	I	Input of AGC
119	RFO	O	Output of RF(AGC)
120, 121	EQ2, 1	I	Equalizer 2, 1
122	RF2-	I	Reversal input of RF2
123	RF-	I	Reversal input of RF
124	A.GND		Ground for the analog system
125	A	I	Input of A
126	C	I	Input of C
127	B	I	Input of B
128	D	I	Input of D
129	F	I	Input of F
130	E	I	Input of E
131	VREFIN	I	Input of reference voltage
132	A.VDD		Power supply for the analog system
133	REFOUT	O	Output of reference voltage
134	REFC	I	Connected to the capacitor for output of REFOUT
135	FE-	I	Reversal input of FE
136	FEO	O	Output of FE
137	ADIN	I	Input of FE, TE A/D converter
138	TE-	I	Reversal input of TE
139	TEO	O	Output of TE
140	TE2	O	TE2
141	TEC	I	TEC
142	LD	O	Output of LD
143	PD	I	Input of PD
144	D.GND		Ground for digital circuits

* UPD63763GJ



● Pin Functions(PE5454A)

Pin No.	Pin Name	I/O	Format	Function and Operation
1	AVREF			A power supply Positive power supply(5V)
2	AVSS			A power supply GND
3	RFOK	O	C	Output of state of RFOK
4	NC			Not used
5	EVDD			E power supply Positive power supply
6, 7	NC			Not used
8	IC/FLMD0			IC : VSS direct connection/FLMOD0 : Pull-down
9	VDD			Positive power supply(5V)
10	REGC			Connected to the capacity stabilizing output of the regulator
11	VSS			GND
12	X1	I		Oscillator connection for mainclock
13	X2			Oscillator connection for mainclock
14	RESET	I		System reset input
15	XT1	I		Connected to the oscillator for subclock (connected to VSS via the resistor)
16	XT2			Connected to the oscillator for subclock(Open)
17	NC			Connected to EVDD or EVSS via the resistor
18	NC			Not used
19	XINT		C	CD LSI interruption signal input
20	NC			Connected to VSS via the resistor
21	BRST	I		P-Bus reset input
22	BSI	I		P-Bus serial data input
23	BSO	O	C	P-Bus serial data output
24	BSCK	I/O	/C	P-Bus serial clock input/output
25	FTXD	O	C	For flash rewriting(transmitted signal)
26	FRXD	I		For flash rewriting(received signal)
27	BRXEN	I/O	/C	It is possible to receive P-Bus
28	BSRQ	I/O	/C	P-Bus service request demand
29	NC			Not used
30	DSCSNS	I		Disc state sense input
31	8EJ(S905)	I		Input of detection of 8 cm disc ejection
32	12EJ(S904)	I		Input of detection of 12 cm disc ejection
33	EVSS			E power supply GND
34	EVDD			E power supply Positive power supply
35, 36	SRAMLEVEL0, 1	O	C	SRAM level meter output
37	EMPH	O	C	Emphasis information output
38	EMPH	O	C	Emphasis information output
39-42	NC			Not used
43	ADENA	O	C	A/D reference voltage supply control output
44	LRCKOK	O	C	(DOUT mute output)
45	SRAMLEVEL2	O	C	SRAM level meter output
46	CD3VON	O	C	CD +3.3V power supply control output
47	CONT	O	C	Servo driver power supply control output
48	XRST	O	C	CD LSI reset control output
49	VDCONT	O	C	VD power supply control output
50	ROMDATA	I/O	/C	E2PROM data input/output
51	ROMCS	O	C	E2PROM chip selection output
52	ROMCK	O	C	E2PROM clock output
53	LOEJ	O	C	The direction change output of LOAD/EJECT
54	CLCONT	O	C	Driver input change output
55	CDMUTE	O	C	CD mute control output
56-58	NC			Not used
59	XCS	O	C	CD LSI chip selection output
60	NC			Not used
61	XWAIT	I		CD LSI write control signal output
62	CLKOUT	O	C	Internal system clock output(Open)
63	LOCK	I		Spindle lock input
64	NC			Not used
65	XWRITE	O		CD LSI write control signal output
66	NC			Not used

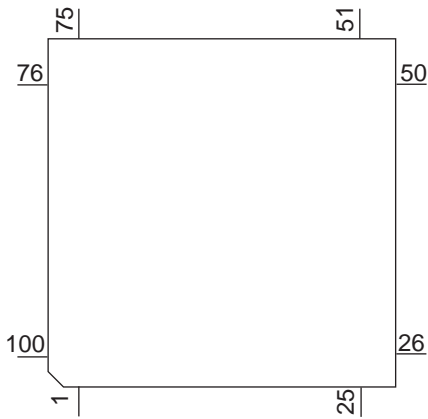
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Pin No.	Pin Name	I/O	Format	Function and Operation
67	XREAD	O		CD LSI read control signal output
68	XASTB	O		CD LSI address strobe output
69	BVSS			B power supply GND
70	BVDD			B power supply Positive power supply
71-83	AD0-12	I/O	/C	Address/data Bus 0-12
84-86	NC			Not used
87	FMODE	I		For flash rewriting Connected to VSS via the resistor
88	FLRQ	O	C	For flash rewriting
89-93	NC			Not used
94	CSENS	I		Flap closing sense input
95	TYPE_A/D	I		CD-DA analog/digital output change setup
96	TESTIN	I		Chip check test program starting input
97	HOME	I		Home SW sense input
98	TEMP			Temperature information sense input
99	VDSSENS			VD power supply short sense input
100	NC			Not used

B

* PE5454A

C

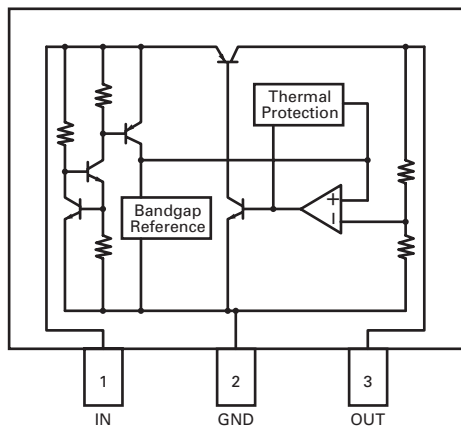


Format	Meaning
C	CMOS

D

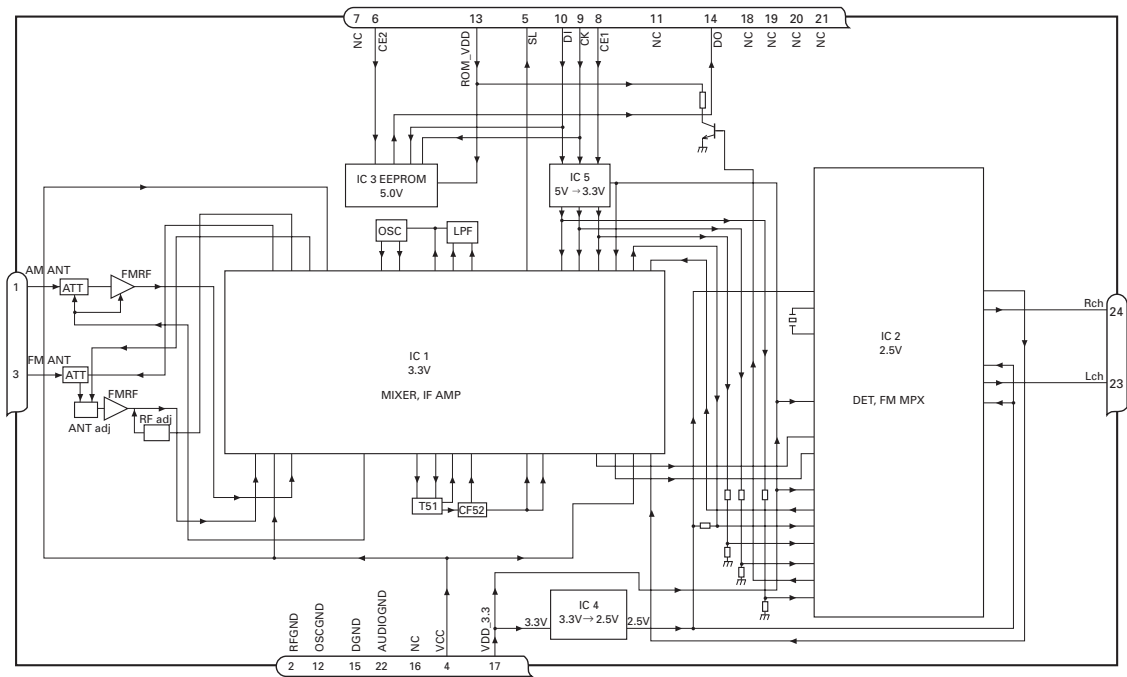
NJM2885DL1-33

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FM/AM Tuner Unit



No.	Symbol	I/O	Explain	
1	AMANT	I	AM antenna input	AM antenna input high impedance AMANT pin is connected with an all antenna by way of 4.7 μ H. (LAU type inductor) A series circuit including an inductor and a resistor is connected with RF ground for the countermeasure against the hum of power transmission line.
2	RFGND		RF ground	Ground of antenna block
3	FMANT	I	FM antenna input	Input of FM antenna 75 Ω Surge absorber(DSP-201M-S00B) is necessary.
4	VCC		power supply	The power supply for analog block. D.C 8.4V \pm 0.3V
5	SL	O	signal level	Output of FM/AM signals level
6	CE2	I	chip enable-2	Chip enable for EEPROM "Low" active
7	NC		non connection	Not used
8	CE1	I	chip enable-1	Chip enable for AF*RF "High" active
9	CK	I	clock	Clock
10	DI	I	data in	Data input
11	NC		non connection	Not used
12	OSCGND		osc ground	Ground of oscillator block
13	ROM_VDD		power supply	Power supply for EEPROM pin 13 is connected with a power supply of micro computer.
14	DO	O	data out	Data output
15	DGND		digital ground	Ground of digital block
16	NC		non connection	Not used
17	VDD_3.3		power supply	The power supply for digital block. 3.3V \pm 0.2V
18	NC		non connection	Not used
19	NC		non connection	Not used
20	NC		non connection	Not used
21	NC		non connection	Not used
22	AUDIOGND		audio ground	Ground of audio block
23	L ch	O	L channel output	FM stereo "L-ch" signal output or AM audio output
24	R ch	O	R channel output	FM stereo "R-ch" signal output or AM audio output

7.2.2 DISPLAY

● LCD(CAW1848)

A

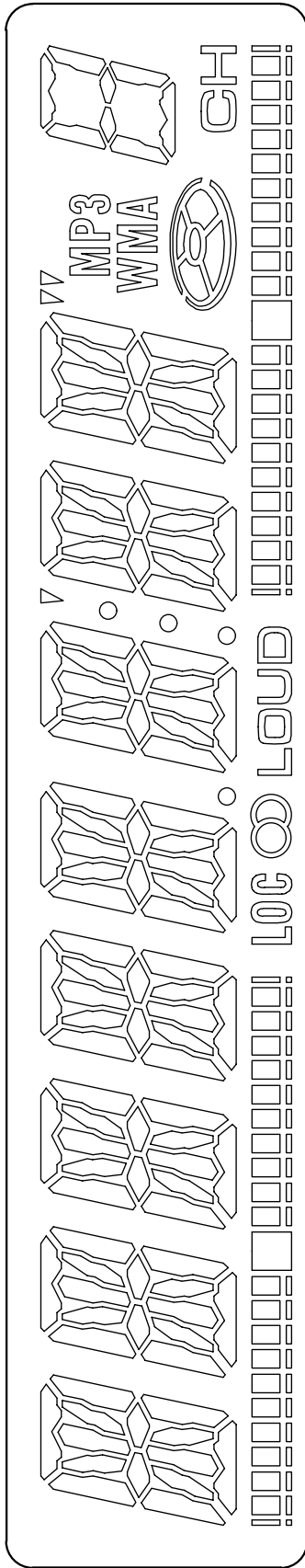
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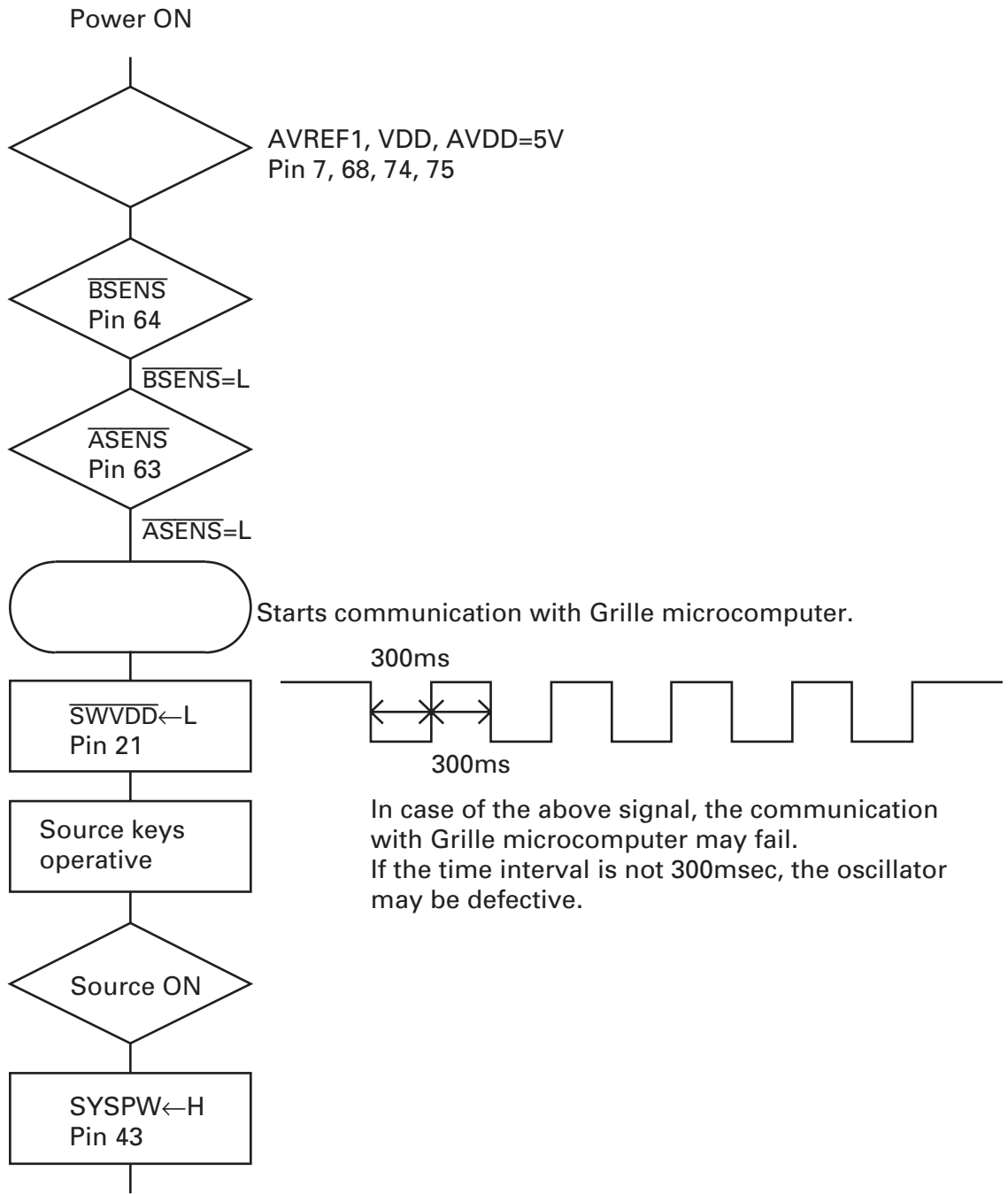
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F



7.3 OPERATIONAL FLOW CHART



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

7.4 CLEANING



A

Before shipping out the product, be sure to clean the following portions by using the prescribed cleaning tools:

Portions to be cleaned	Cleaning tools
CD pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

B

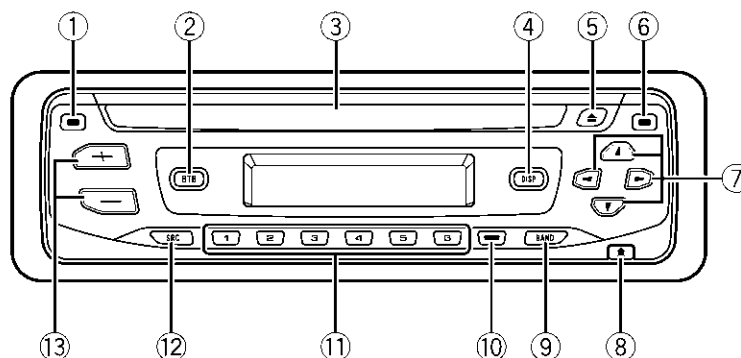
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8. OPERATIONS



Head unit

① CLOCK button

Press to change to the clock display.

② BTB button

Press to select various BTB (bass treble booster) setting.
Press and hold to turn loudness on or off.

③ Disc loading slot

Insert a disc to play.

④ DISPLAY button

Press to select different displays.

⑤ EJECT button

Press to eject a CD from your built-in CD player.

⑥ AUDIO button

Press to select various sound quality controls.

⑦ ▲/▼/◀/▶ buttons

Press to do manual seek tuning, fast forward, reverse and track search controls. Also used for controlling functions.

⑧ DETACH button

Press to remove the front panel from the head unit.

⑨ BAND button

Press to select among three FM bands and one AM band and to cancel the control mode of functions.

⑩ LOCAL/BSM button

Press to turn local function on or off.
Press and hold to turn BSM function on or off.


⑪ 1-6 buttons

Press for preset tuning.

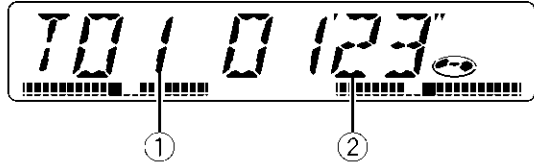
⑫ SOURCE button

This unit is turned on by selecting a source. Press to cycle through all the available sources.

⑬ VOLUME (+/-) buttons

Press to increase or decrease the volume. 

Playing a CD



① Track number indicator

Shows the track currently playing.

② Play time indicator

Shows the elapsed playing time of the current track.

1 Insert a CD into the CD loading slot.

Playback will automatically start.

- **Be sure to turn up the label side of a disc.**
- After a CD has been inserted, press **SOURCE** to select the built-in CD player.
- You can eject a CD by pressing **EJECT**.

2 Use **VOLUME** to adjust the sound level.

3 To perform fast forward or reverse, press and hold ◀ or ▶.

- If you select **ROUGH**, pressing and holding ◀ or ▶ enables you to search every 10 tracks in the current disc.

4 To skip back or forward to another track, press ◀ or ▶.

Pressing ▶ skips to the start of the next track. Pressing ◀ once skips to the start of the current track. Pressing again will skip to the previous track.



Notes

- 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 CDs.

- Do not insert anything other than a CD into the CD loading slot.
- If an error message such as **ERROR-11** is displayed. □

Repeating play

Repeat play lets you hear the same track over again.

● Press 5 repeatedly to turn repeat play on or off.

When repeat play is on, **RPT** appears in the display.

- If you perform track search or fast forward/reverse, repeat play is automatically cancelled. □

Playing tracks in a random order

Random play lets you play back tracks on the CD in a random order.

● Press 4 repeatedly to turn random play on or off.

When random play is on, **RDM** appears in the display. □

Scanning tracks of a CD

Scan play lets you hear the first 10 seconds of each track on the CD.

1 Press 3 to turn scan play on.

SCAN appears in the display. The first 10 seconds of each track is played.

2 When you find the desired track press 3 to turn scan play off.

- After scanning of a CD is finished, normal playback of the tracks will begin again. □

Pausing CD playback

Pause lets you temporarily stop playback of the CD.

- **Press 6 repeatedly to turn pause on or off.**

When pause is on, **PAUSE** appears in the display. □

A

B

C

D

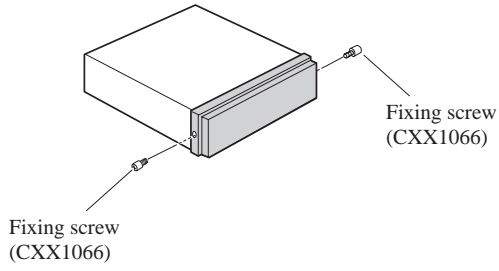
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About the fixing screws for the front panel

If you do not operate the Detaching and Replacing the Front Panel Function, use the supplied fixing screws and fix the front panel to this unit.

A



B

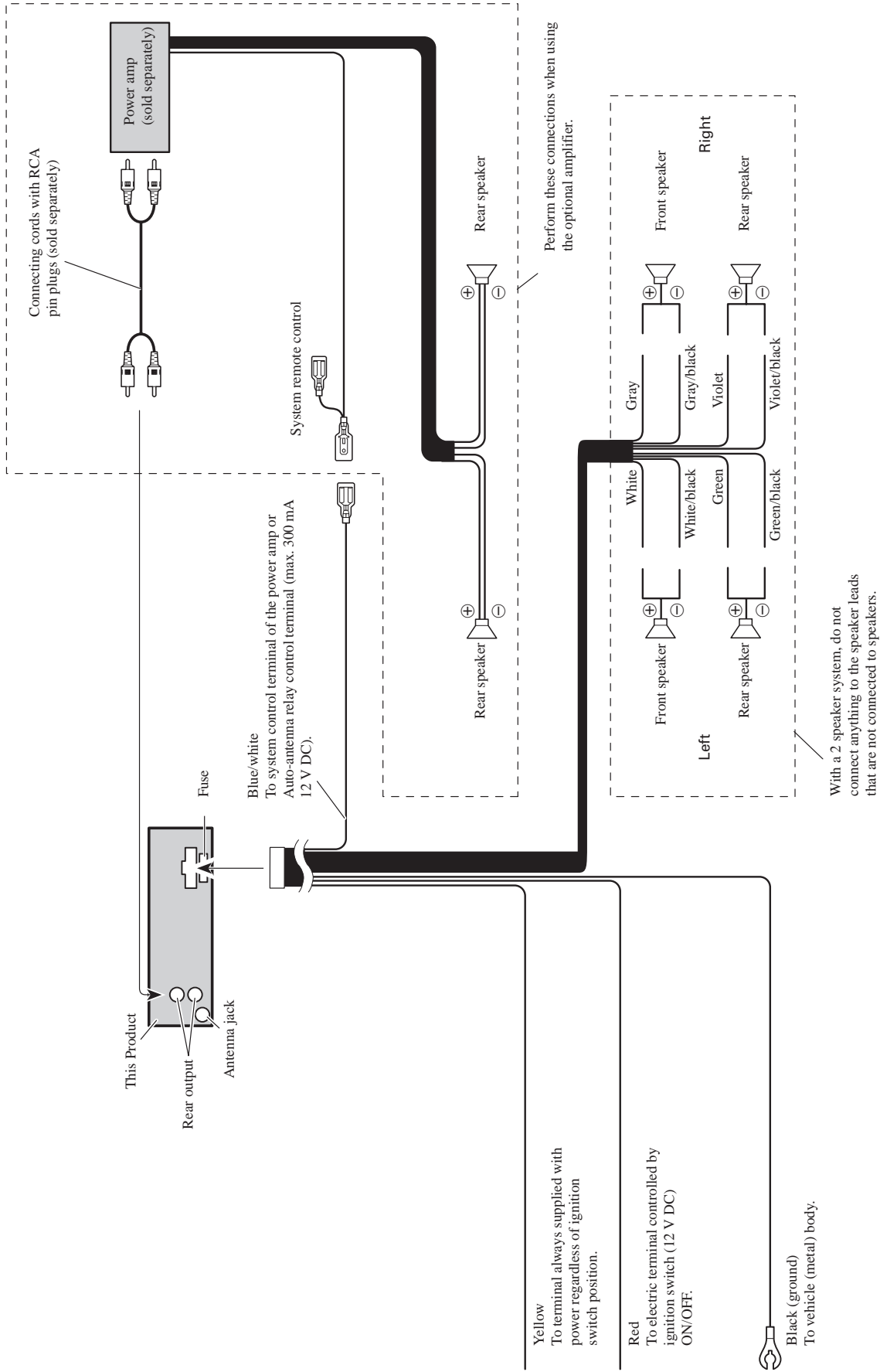
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D

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F

Connection Diagram



● Jigs List

Name	Jig No.	Remarks
Test Disc	TCD-782	Checking the grating
L.P.F.		Checking the grating (Two pieces)

A

B

C

D

E

F

Service Manual

ORDER NO.
CRT3394

CD MECHANISM MODULE(S10.1AAC)

CX-3158

- This service manual describes the operation of the CD mechanism module incorporated in models listed in the table below.
- When performing repairs use this manual together with the specific manual for model under repair.

Model	Service Manual	CD Mechanism Module
DEH-P770MP/XN/UC	CRT3333	CXK5617
DEH-P7700MP/XN/EW	CRT3334	CXK5663
DEH-P670MP/XN/UC	CRT3335	CXK5663
DEH-3730MP/XN/EW	CRT3395	CXK5663
DEH-3700MP/XN/EW		
DEH-2750MP/XN/GS	CRT3396	CXK5663
DEH-2790MP/XN/ID		
DEH-2770MP/XN/CS		
DEH-3700MP/XU/UC	CRT3397	CXK5668
DEH-4700MP/XU/EW	CRT3398	CXK5668
DEH-4700MPB/XU/EW		
DEH-3750MP/XU/GS	CRT3399	CXK5668
DEH-3770MP/XU/CS		CXK5669
DEH-3750MP/XU/CN		
DEH-P470MP/XM/UC	CRT3400	CXK5668
DEH-P4700MP/XM/UC		
DEH-P4750MP/XM/GS	CRT3401	CXK5668
DEH-P4790MP/XM/ID		
DEH-P4770MP/XM/CS		
DEH-P3700MP/XU/UC	CRT3402	CXK5668

CONTENTS

1. CIRCUIT DESCRIPTIONS	2
2. MECHANISM DESCRIPTIONS.....	19
3. DISASSEMBLY	21

1. CIRCUIT DESCRIPTIONS

Recently, most CD LSI's have included DAC, RF amplifier and other peripheral circuits, as well as the core circuit DSP. This series of mechanisms employ a multi-task LSI UPD63763GJ, which has CD-ROM decoder and MP3/WMA decoder in addition to the CD block as shown in the Fig.1.0.1. This enables to reproduce a CD-ROM where MP3/WMA data is recorded.

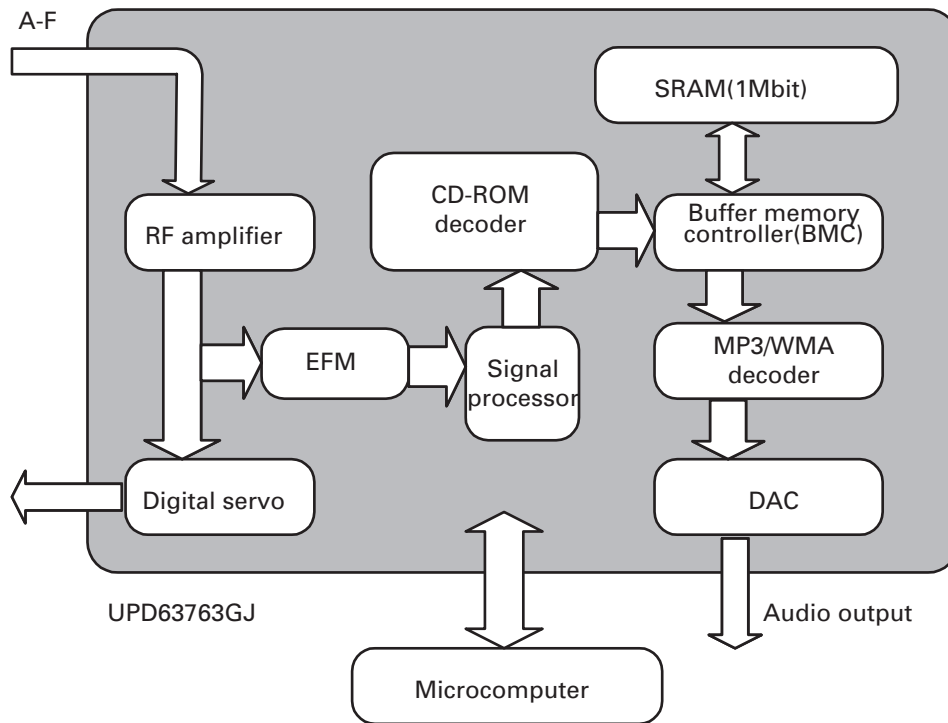


Fig.1.0.1 Block diagram of CD LSI UPD63763GJ

1.1 PREAMPLIFIER BLOCK (UPD63763GJ: IC201)

In the preamplifier block, the pickup output signals are processed to generate signals that are used for the next-stage blocks: the servo block, demodulator, and control.

After I/V-converted by the preamplifier with built-in photo detectors (inside the pickup), the signals are applied to the preamplifier block in the CD LSI UPD63763GJ (IC201). After added by the RF amplifier in this block, these signals are used to produce necessary signals such as RF, FE, TE, and TE zero-cross signals.

The CD LSI employs a single power supply system of +3.3V. Therefore, the REFO (1.65V) is used as the reference voltage both for this CD LSI and the pickup. The LSI produces the REFO signal by using the REFOUT via the buffer amplifier and outputs from the pin 133. All the measurements should be made based on this REFO.

Caution: Be careful not to short the REFO and GRD when measuring.

1.1.1 APC (Automatic Power Control)

A laser diode has extremely negative temperature characteristics in optical output at constant-current drive. To keep the output constant, the LD current is controlled by monitor diodes. This is called the APC circuit. The LD current is calculated at about 30mA, which is the voltage between LD1 and V3R3D divided by 7.5 (ohms).

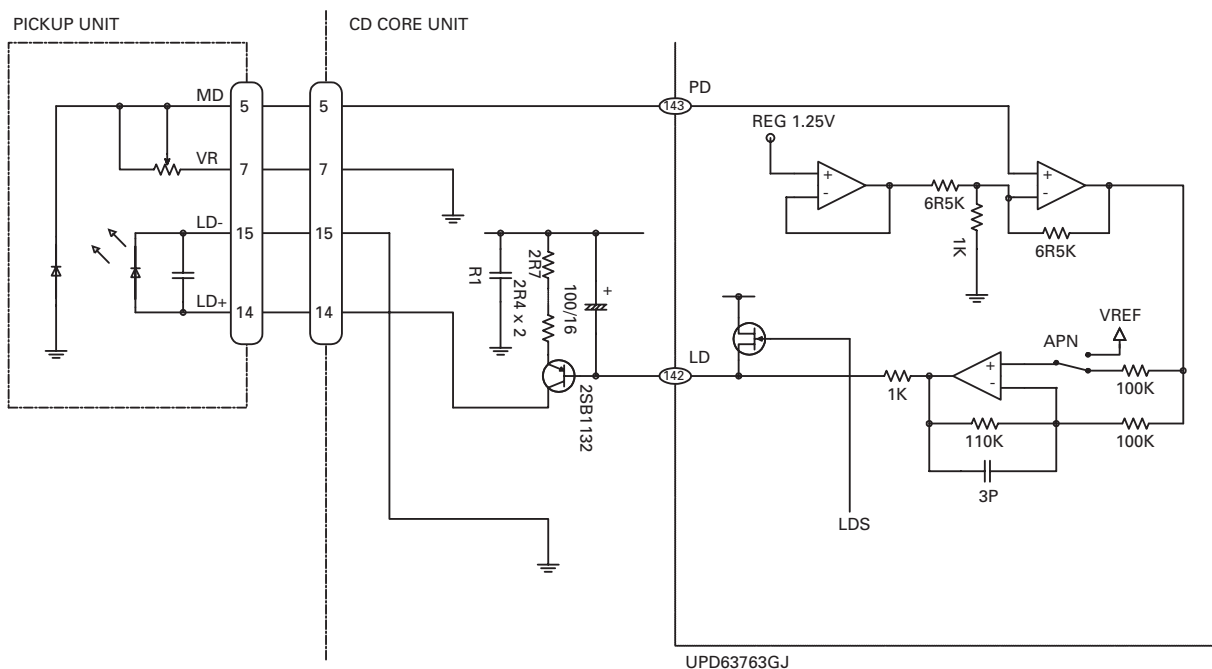


Fig. 1.1.1 APC

1.1.2 RF and RFAGC amplifiers

The photo-detector outputs (A + C) and (B + D) are added, amplified, and equalized inside this LSI, and then provided as the RF signal from the RFI terminal. The RF signal can be used for eye-pattern check.

The low frequency component of the RFO voltage is:

$$RFO = (A + B + C + D) \times 2$$

The RFO is used for the FOK generation circuit and RF offset adjustment circuit.

The RFI output from the pin 119 is A/C-coupled outside this LSI, and returned to the pin 118 of this LSI. The signal is amplified in the RFAGC amplifier to obtain the RFAGC signal. This LSI is equipped with the RFAGC auto-adjustment function as explained below. This function automatically controls the RFO level to keep at 1.5V by switching the feedback gain for the RFAGC amplifier.

The RFO signal is also used for the EFM, DFCT, MIRR, and RFAGC auto-adjustment circuits.

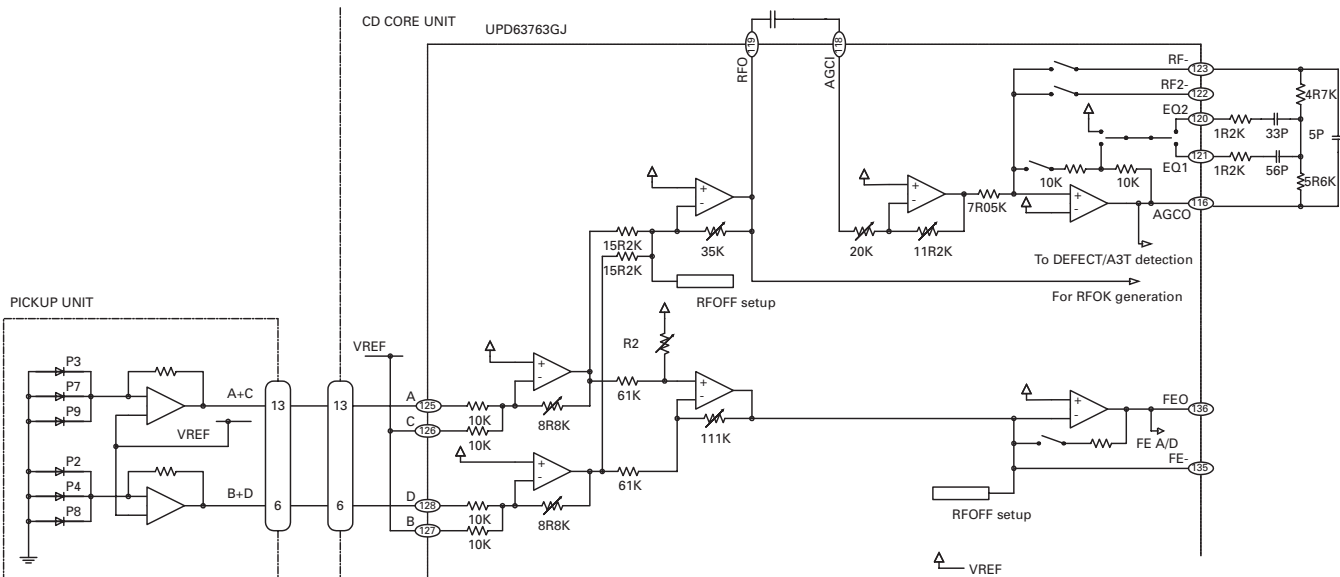


Fig. 1.1.2 RF/AGC/FE

1.1.3 Focus error amplifier

The photo-detector outputs (A + C) and (B + D) are applied to the differential amplifier and the error amplifier to obtain the (A + C - B - D) signal, which is then provided from the pin 91 as the FE signal.

The low frequency component of the FE voltage is:

$$\begin{aligned} FE &= (A + C - B - D) \times 8.8/10k \times 111k/61k \times 160k/72k \\ &= (A + C - B - D) \times 3.5 \end{aligned}$$

The FE output shows 1.5Vp-p S-shaped curve based on the REFO. For the next-stage amplifiers, the cutoff frequency is 14.6kHz.

1.1.4 RFOK

The RFOK circuit generates the RFOK signal, which indicates focus-close timing and focus-close status during the play mode, and outputs from the pin 55. This signal is shifted to "H" when the focus is closed and during the play mode.

The DC level of the RFI signal is peak-held in the digital block and compared with a certain threshold level to generate the RFOK signal. Therefore, even on a non-pit area or a mirror-surface area of a disc, the RFOK becomes "H" and the focus is closed.

This RFOK signal is also applied to the microcomputer via the low-pass filter as the FOK signal, which is used for protection and RF amplifier gain switching.

1.1.5 Tracking error amplifier

The photo-detector outputs E and F are applied to the differential amplifier and the error amplifier to obtain the (E - F) signal, and then provided from the pin 136 as the TE signal.

The low frequency component of the TE voltage is:

$$\begin{aligned} TEO &= (E - F) \times 63k/112k \times 160k/160k \times 181k/45.4k \times 160k/80k \\ &= (E - F) \times 4.48 \end{aligned}$$

The TE output provides the TE waveform of about 1.3Vp-p based on the REFO. For the next-stage amplifiers, the cut-off frequency is 21.1kHz.

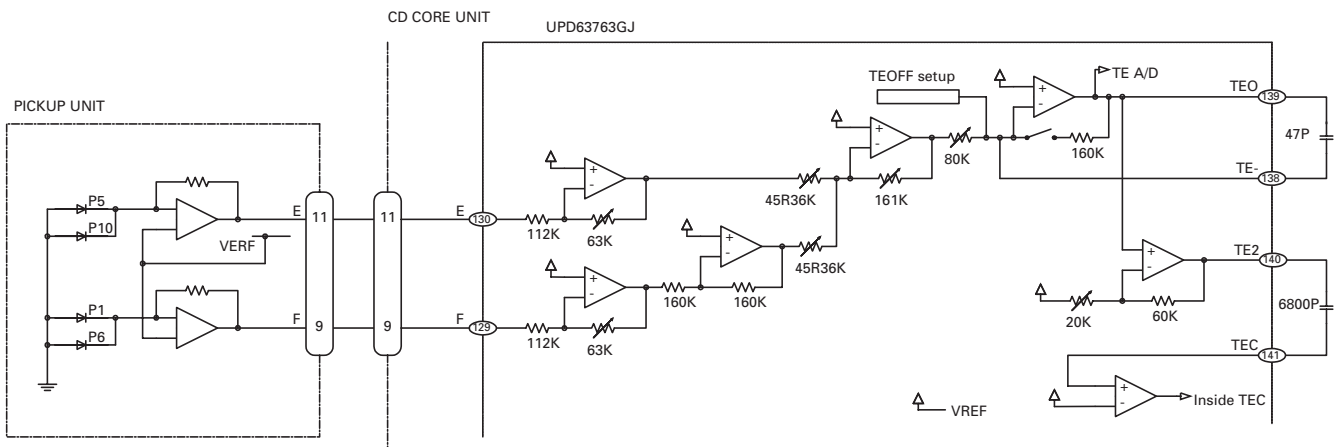


Fig. 1.1.3 TE

1.1.6 Tracking zero-cross amplifier

The tracking zero-cross signal (hereinafter TEC signal) is obtained by amplifying the TE signal 4 times, and used to detect the tracking-error zero-cross point.

By using the information on this point, the following two operations can be performed:

1. Track counting in the carriage move and track jump modes
2. Sensing the lens-moving direction at the moment of the tracking close (The sensing result is used for the tracking brake circuit as explained below.)

The frequency range of the TEC signal is between 300Hz and 20kHz.

TEC voltage = TE level x 4

The TEC level can be calculated at 4.62V. This level exceeds the D range of the operational amplifier, and the signal gets clipped. However, it can be ignored because the CD LSI only uses the signal at the zero-cross point.

1.1.7 EFM

The EFM circuit converts the RF signal into a digital signal expressed in binary digits 0 and 1. The AGCO output from the pin 116 is A/C-coupled in the peripheral circuit, fed back to the LSI from the pin 114, and sent to the EFM circuit inside the LSI.

On scratched or dirty discs, part of the RF signal recorded may be missing. On other discs, part of the RF signal recorded may be asymmetric, which was caused by dispersion in production quality. Such lack of information cannot be completely eliminated by this AC coupling process. Therefore, by utilizing the fifty-fifty occurrence ratio of binary digits (0 and 1) in the EFM signal, the EFM comparator reference voltage ASY is controlled, so that the comparator level always stays around the center of the RFO signal. The reference voltage ASY is made from the EFM comparator output via the low-pass filter. The EFM signal is put out from the pin 111.

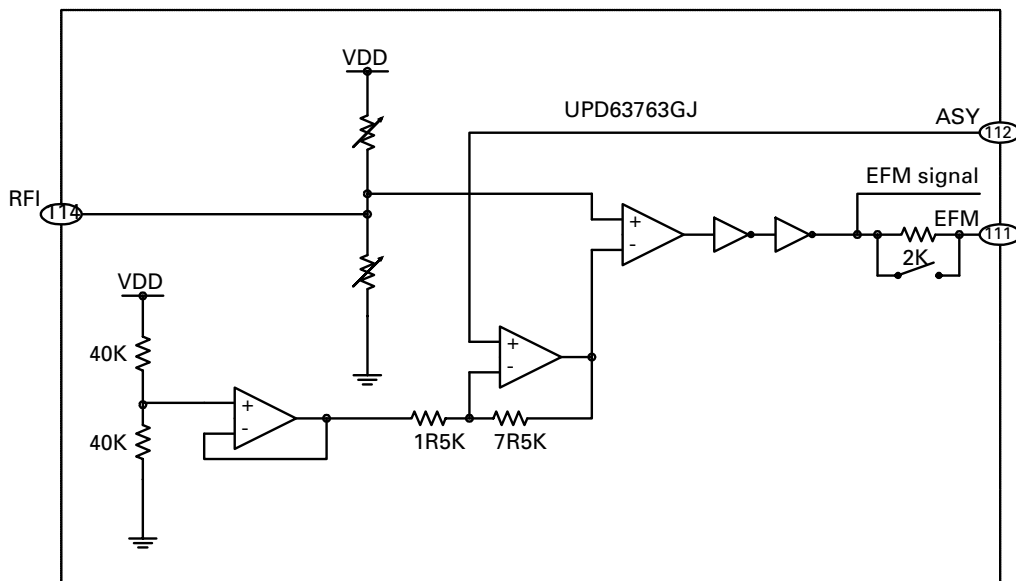


Fig. 1.1.4 EFM

1.2 SERVO BLOCK (UPD63763GJ: IC201)

The servo block controls the servo systems for error signal equalizing, in-focus, track jump and carriage move and so on. The DSP block is a signal-processing block, where data decoding, error correction, and compensation are performed.

After A/D-converted, the FE and TE signals (generated in the preamplifier block) are applied to the servo block and used to generate the drive signals for the focus, tracking, and carriage servos.

The EFM signal is decoded in the DSP block, and finally sent out as the audio signal after D/A-converted. In this decoding process, the spindle servo error signal is generated, supplied to the spindle servo block, and used to generate the spindle drive signal.

The drive signals for focus, tracking, carriage, and spindle servos (FD, TD, SD, and MD) are provided as PWM3 data, and then converted to the analog data by the low-pass filter embedded in the driver IC BA5835FP (IC301). These analog drive signals can be monitored by the FIN, TIN, CIN, and SIN signals respectively. Afterwards, the signals are amplified and applied to each servo's actuator and motor.

1.2.1 Focus servo system

In the focus servo system, the digital equalizer block works as its main equalizer. The figure 1.2.1 shows the block diagram of the focus servo system.

To close the focus loop circuit, the lens should be moved to within the in-focus range. While moving the lens up and down by using the focus search triangular signal, the system tries to find the in-focus point. In the meantime, the spindle motor rotation is kept at the prescribed one by using the kick mode.

The servo LSI monitors the FE and RFOK signals and automatically performs the focus close operations at an appropriate timing. The focus loop will close when the following three conditions are satisfied at the same time:

- 1) The lens moves toward the disc surface.
- 2) The RFOK signal is shifted to "H".
- 3) The FE signal is zero-crossed. At last, the FE signal comes to the zero level (or REFO).

When the focus loop is closed, the FSS bit is shifted from "H" to "L". The microcomputer starts monitoring the RFOK signal obtained through the low-pass filter 10msec after that.

If the RFOK signal is detected as "L", the microcomputer will take several actions including protection.

The timing chart for focus close operations is shown in fig. 1.2.2.

(This shows the case where the system fails focus close.)

In the test mode, the S-shaped curve, search voltage, and actual lens movement can be confirmed by pressing the focus close button when the focus mode selector displays 01.

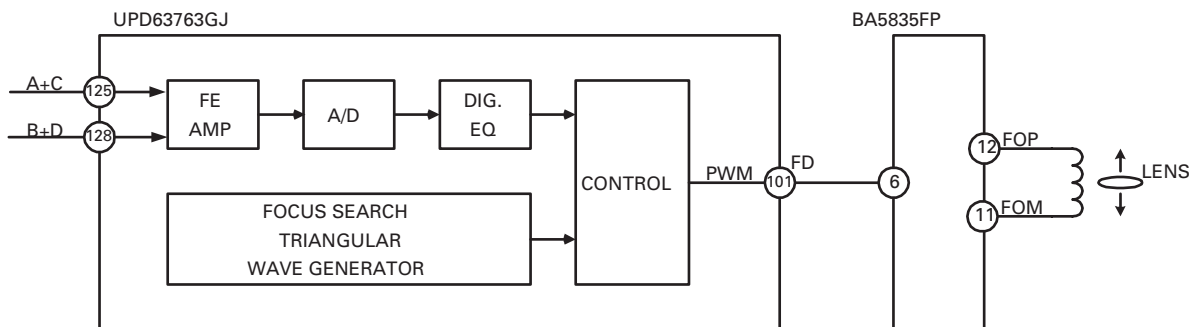
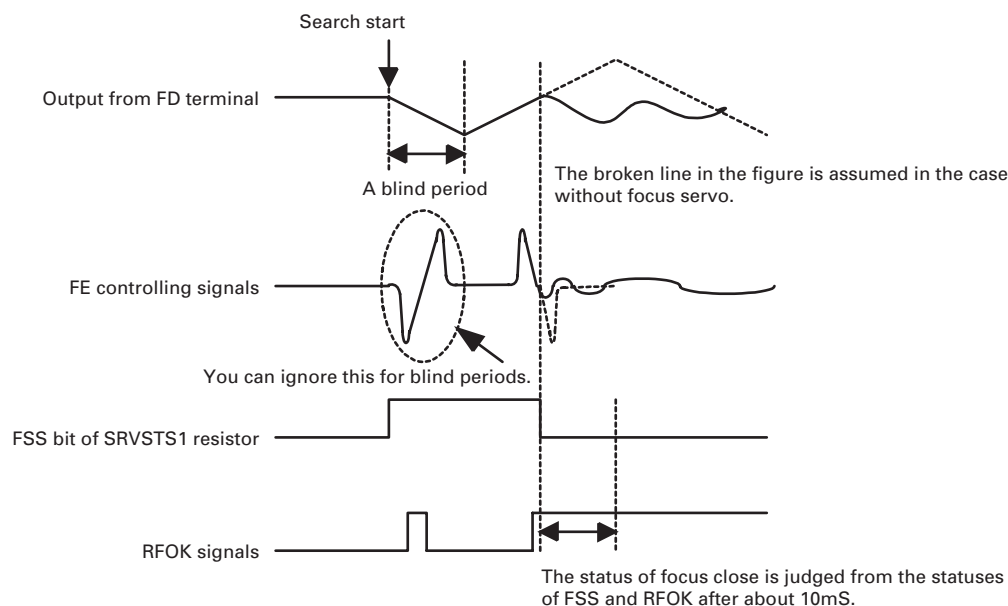


Fig. 1.2.1 Block diagram of the focus servo system

A



B

C

Fig. 1.2.2 Timing chart for focus close operations

1.2.2 Tracking servo system

In the tracking servo system, the digital equalizer block is used as its main equalizer. The figure 1.2.3 shows the block diagram of the tracking servo system.

(a) Track jump

Track jump operation is automatically performed by the auto-sequence function inside the LSI with a command from the microcomputer. In the search mode, the following track jump modes are available: 1, 4, and 100

In the test mode, 1, 32, and 32*3 track jump modes, and carriage move mode are available and can be switched by selecting the mode.

For track jumps, first, the microcomputer sets about half the number of tracks to be jumped as the target. (Ex. For 10 track jumps, it should be 5 or so.) Using the TEC signal, the microcomputer counts up tracks. When the counter reaches the target set by the microcomputer, a brake pulse is sent out to stop the lens. The pulse width is determined by the microcomputer. Then, the system closes the tracking loop and proceeds to the normal play. At this moment, to make it easier to close the tracking loop, the brake circuit is kept ON for 50msec after the brake pulse, and the tracking servo gain is increased.

In the normal operation mode, the FF/REW operation is realized by continuously repeating single jumps about 10 times faster than the normal single jump operation.

(b) Brake circuit

The brake circuit stabilizes the servo-loop close operation even under poor conditions, especially in the setting-up mode or track jump mode. This circuit detects the lens-moving direction and emits only the drive signal for the opposite direction to slow down the lens. Thus, this makes it easier to close the tracking servo loop. The off-track direction is detected from the phases of the TEC and MIRR signals.

F

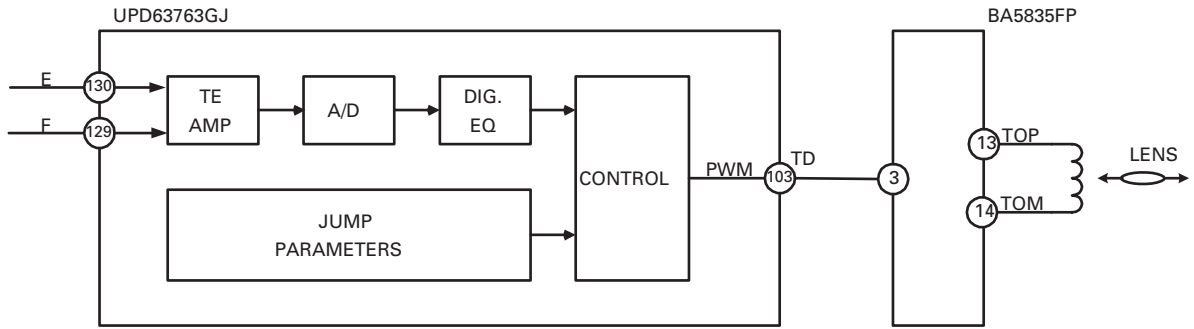


Fig. 1.2.3 Block diagram of the tracking servo system

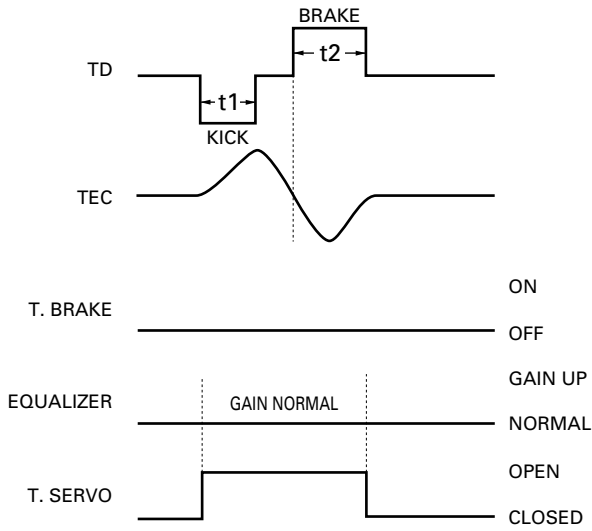


Fig. 1.2.4 Single-track jump

A

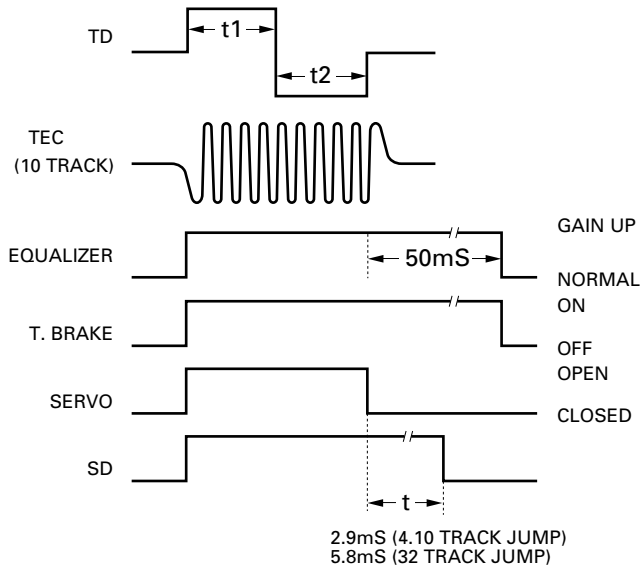
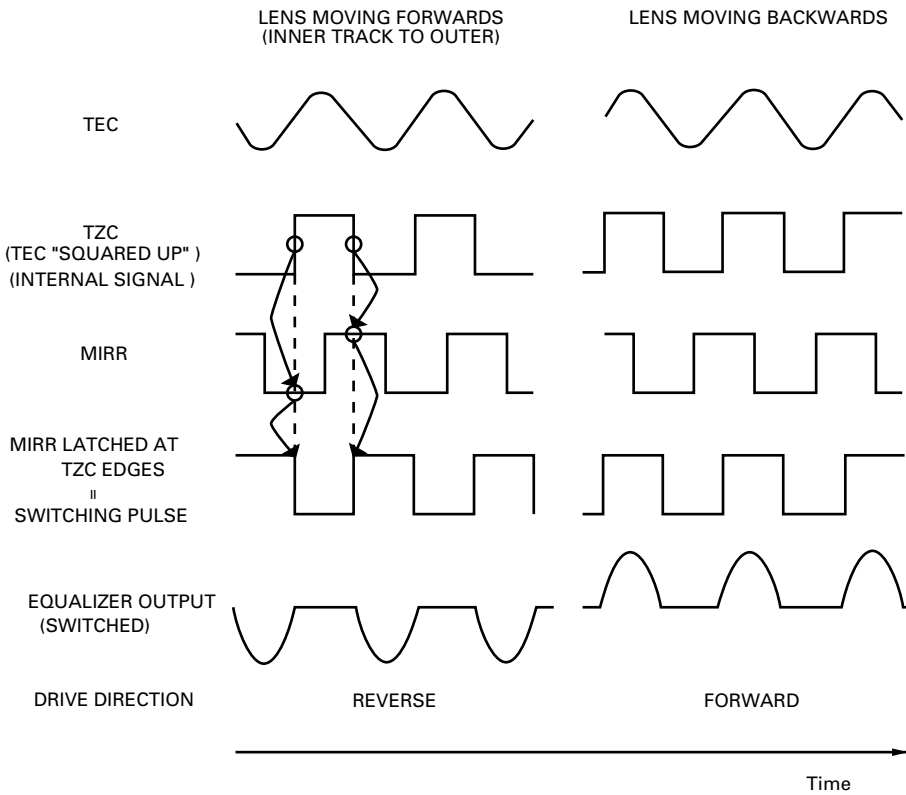


Fig. 1.2.5 Multi-track jump

C



Note : Equalizer output assumed to have same phase as TEC.

F

Fig. 1.2.6 Track brake

1.2.3 Carriage servo system

In the carriage servo system, the low frequency component from the tracking equalizer (the information on the lens position) is transferred to the carriage equalizer, where the gain is increased to a certain level, and then sent out from the LSI as the carriage drive signal. This signal is applied to the carriage motor via the driver IC.

During the play mode, when the lens offset reaches a certain level, it is necessary to move the pickup toward the FORWARD direction. The equalizer gain is adjusted so that the output over the carriage motor starting voltage is sent out in such a case. In actual operations, only when the equalizer output exceeds the threshold level preset in the servo LSI, the drive signal is sent out. This can reduce the consumption power.

With an eccentric disc loaded, before the whole pickup starts moving, the equalizer output may exceed the threshold level a few times. In this case, the drive signal applied from the LSI shows pulse-like waveforms.

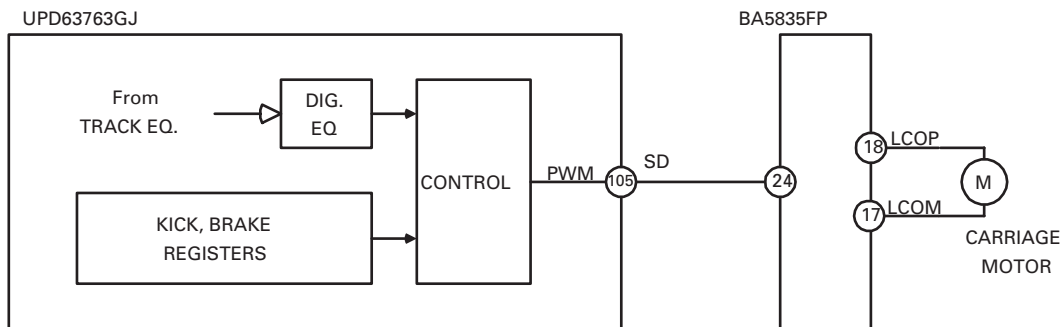


Fig. 1.2.7 Block diagram for the carriage servo block

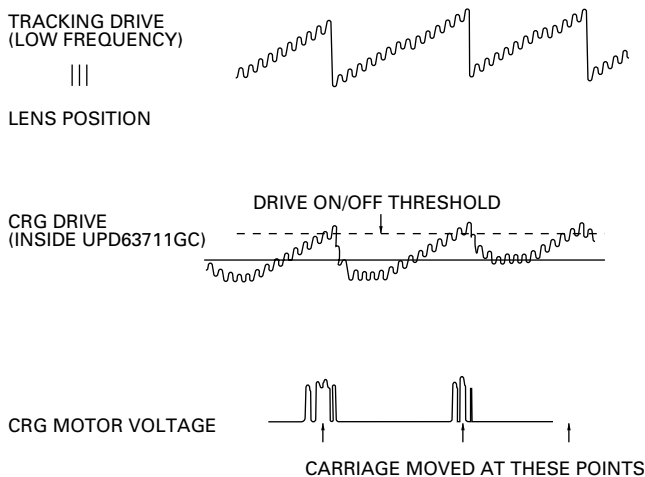


Fig. 1.2.8 Waveforms of the carriage signal

1.2.4 Spindle servo system

In the spindle servo system, the following seven modes are available:

1) Kick

Used to accelerate the disc rotation in the setting-up mode.

2) Offset

a. Used in the setting-up mode until the TBAL adjustment completes after the kick mode.

b. Used when the focus loop is unlocked during the play mode and until it is locked again.

In both cases, the mode is to keep the disc rotation near to the appropriate one.

3) Applicable servo

In the normal operation, the CLV servo mode is used.

The EFM demodulation block detects through WFCK/16 sampling whether or not the frame sync signal and the internal frame counter output are synchronized, and generates the status signal based on the sampling result, synchronized or non-synchronized. If eight consecutive "non-sync" signals are obtained, the system senses the status as "non-sync". If not, the system senses as "sync". In the applicable servo mode, the leading-in servo mode is automatically selected at the non-sync status, and the normal servo mode is at the sync status.

4) Brake

Used to stop the spindle motor.

In accordance with the microcomputer's command, the brake voltage is sent out from the servo LSI. At this moment, the EFM waveform is being monitored in this LSI. When the longest EFM pattern exceeds a certain cycle (or the rotation slows down enough), a flag is set inside the LSI, and the microcomputer switches off the brake voltage. If a flag is not set within a certain period, the microcomputer shifts the mode from the brake mode to the stop mode, and keeps this for a certain period. In the eject mode, after the mode is shifted to the stop mode and a certain period passes, the loaded disc is ejected.

5) Stop

Used when the power is turned on and during the eject mode. At this moment, the voltage through the spindle motor is 0V.

6) Rough servo

Used when the carriage is moved (or in the carriage move mode such as long search).

By obtaining the linear velocity from the EFM waveform, "H" or "L" is applied to the spindle equalizer. In the test mode, this mode is used for grating confirmation.

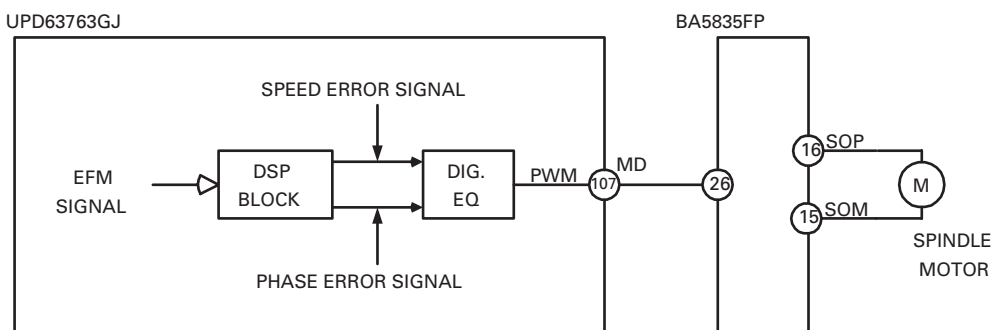


Fig.1.2.9 Block diagram of the spindle servo system

1.3 AUTOMATIC ADJUSTMENT FUNCTION

This system automatically handles the circuit adjustment inside the CD LSI. All adjustments are performed whenever a disc is inserted or the CD mode is selected by pressing the source key. Each adjustment will be explained below.

1.3.1 TE, FE, and RF offset auto-adjustment

This adjustment is made to adjust the offsets of the TE, FE, and RF amplifiers in the preamplifier block to their target values on the basis of the REFO when the power is turned on. (The target values for TE, FE, and RE offsets are 0V, 0V, and -0.8V respectively.)

<Adjusting procedures>

- 1) With the LD OFF status, the microcomputer reads each offset through the servo LSI.
- 2) The microcomputer calculates the voltages for correction from the measured values, and inputs the calculated results as the offset adjustment values.

1.3.2 Tracking balance (T.BAL) auto-adjustment

This adjustment is to equalize the pickup output offsets for E-ch and F-ch by changing the amplifier gain inside the LSI. Actually, the gain is adjusted so that the TE waveform becomes symmetrical on each side of the REFO.

<Adjusting procedures>

- 1) The focus loop is closed.
- 2) The lens is kicked in the radial direction to make certain that the TE waveform is generated.
- 3) The microcomputer reads the TE offset calculated in the LSI through the servo LSI.
- 4) The microcomputer takes either of the following steps depending on the calculated offset:
 - When the offset is 0, the adjustment completes.
 - When the offset is positive or negative, the amp gains for E-ch and F-ch should be changed.

The steps 2) to 4) are repeatedly taken until the offset becomes 0 or the repeating time reaches the limit frequency.

1.3.3 EF bias auto-adjustment

This adjustment obtains the best focus point during the play mode and maximizes the RFI level by utilizing the phase difference between the 3T level of the RF signal and that of the signal obtained when focus error disturbance is applied to the focus loop. At this moment, the auto-gain control (AGC), where focus error disturbance is applied to the focus and tracking loops, is also performed as explained below.

<Adjusting procedures>

- 1) The microcomputer transmits the command to apply disturbance component to the focus loop (inside the servo LSI).
- 2) In the LSI, the 3T-offset component of the RF signal is detected.
- 3) From the relation between the 3T detected component and the disturbance, the LSI obtains the volume and direction of the focus offset.
- 4) The microcomputer transmits the command and reads out the detecting result from the servo LSI.
- 5) The microcomputer calculates the necessary correction and inputs the result as the bias adjustment value to the servo LSI.

The adjusting steps are repeated a few times for higher adjustment accuracy as same as those for the AGC.

1.3.4 Focus and tracking AGC

This function automatically adjusts the focus and tracking servo loop gains.

<Adjusting procedures>

- 1) Disturbance component is applied to the servo loop.
 - 2) The error signals (FE and TE) are extracted through the band pass filter as the G1 and G2 signals.
 - 3) The microcomputer reads the G1 and G2 signals through the servo LSI.
 - 4) The microcomputer calculates the necessary correction and performs the loop gain adjustment inside the servo LSI.
- For higher adjustment accuracy, the above steps are repeated a few times.

1.3.5 RF level auto-adjustment (RFAGC)

This adjustment minimizes the dispersion of the RF level (RFO), which may be caused by disc-related errors, for more stable signal transmission by changing the amp gain between RFI and RFO.

<Adjusting procedures>

- 1) The microcomputer sends the command to the servo LSI to read out the output from the RF level detecting circuit inside the servo LSI.
- 2) The microcomputer calculates the appropriate amp gain by using the output read out to adjust the RFO level at the prescribed one.
- 3) The microcomputer sends the command to the servo LSI to adjust the amp gain into the calculated one.

This adjustment is automatically performed when:

- 1) During the setting-up mode, only the focus close operation ends.
- 2) Immediately before the setting-up ends (or right before the play mode starts)

1.3.6 Preamplifier gain adjustment

In this adjustment, when the reflected beams from disc surface are extremely weak (ex. when the lens is dirty, and a CD-RW is loaded), the whole gain in the RFAMP block (FE, TE, and RF amplifiers) is increased by +6dB or +12dB.

<Adjusting procedures>

When the system senses that the reflected beams from disc surface are extremely weak during the setting-up mode, the whole RFAMP gain is increased by +6dB or +12dB.

After the gain is changed, the setting-up mode is restarted.

1.3.7 Initial values in adjustment

All automatic adjustments immediately after inserting a disc are conducted from the initial value. Automatic adjustments by source change or ACC ON are conducted basically using the previous adjustment value as the initial value.

1.3.8 Adjustment result display

For some of the adjustments (FE and RF offset, FZD cancel, F and T gain, and RFAGC), the adjustment results can be displayed and confirmed in the test mode.

1) FE and RF offset

Reference coefficient = 32 ("32" indicates no adjustment required)

The display is expressed in the unit of about 32mV.

Ex. When the FE offset coefficient is 35:

$$35 - 32 = 3 \times 32\text{mV} = 96\text{mV}$$

This means that the correction is about +96mV, and the FE offset before adjustment is -96mV.

2) F and T gain adjustment

Reference coefficient for focus and tracking = 20

The displayed coefficient / the reference coefficient indicates the adjusted gain.

Ex. When the AGC coefficient is 40:

$$40/20 = 2 \text{ times (+6dB)}$$

That is, the gain was adjusted by +6dB.

(The original loop gain was half the target one. So, the whole gain was doubled.)

3) RF level adjustment (RFAGC)

Reference coefficient = 8

The coefficient 9 to 15 indicates increasing the RF level.

The coefficient 0 to 7 indicates decreasing the RF level.

When the coefficient display changes by 1, the gain changes by 0.7 to 1dB.

When the coefficient is 15, the gain is maximum or TYP + 7.9dB.

When the coefficient is 0, the gain is minimum or TYP - 4.6dB.

1.4 POWER SUPPLY AND LOADING BLOCK

The VD ($7.5 \pm 0.5V$), the VD2 ($7.5 \pm 0.5V$) and the VDD ($5.0 \pm 0.25V$), which are supplied from the main unit, are used for the power supply. In this system, the following four power-supply signals are available: the VD (for the drive system), the V3R3 obtained from the VD2 via the 3.3V regulator (for the control system: 3.3V), the VDD (for the microcomputer: 5V), and the 3VDD obtained from the VDD via the 3.3V regulator (for the microcomputer: 3.3V).

ON/OFF of other than Load/Eject of CD driver and 5V ON/OFF are controlled by "CONT" and "CD5VON", respectively, with microcomputer. Loading drive ON/OFF is not equipped with a control terminal, but the input signal "LOEJ" has an equivalent role. LCO output switches LOADING MODE and CARRIAGE MODE by "CLCONT."

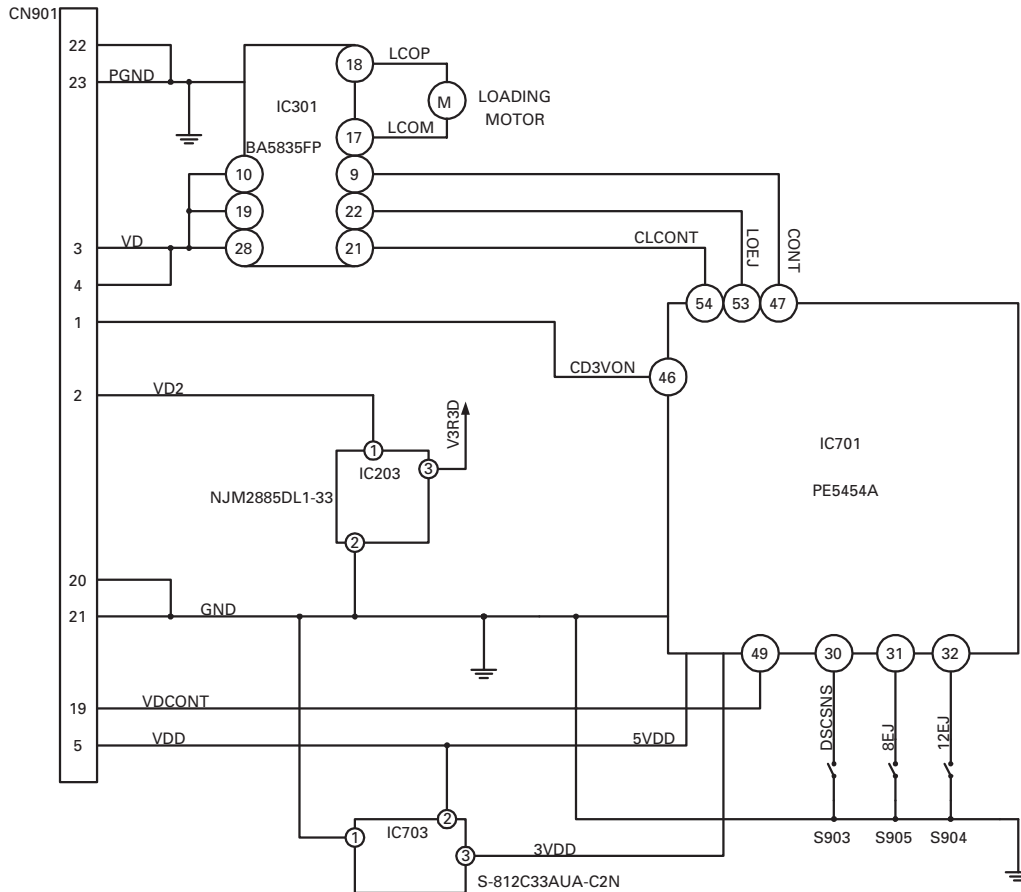


Fig. 1.4.1 Power supply/loading block

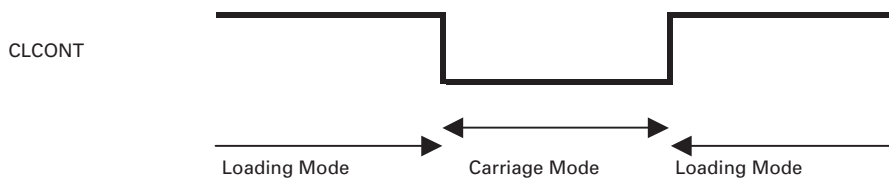


Fig. 1.4.2 Loading/carriage mode shift

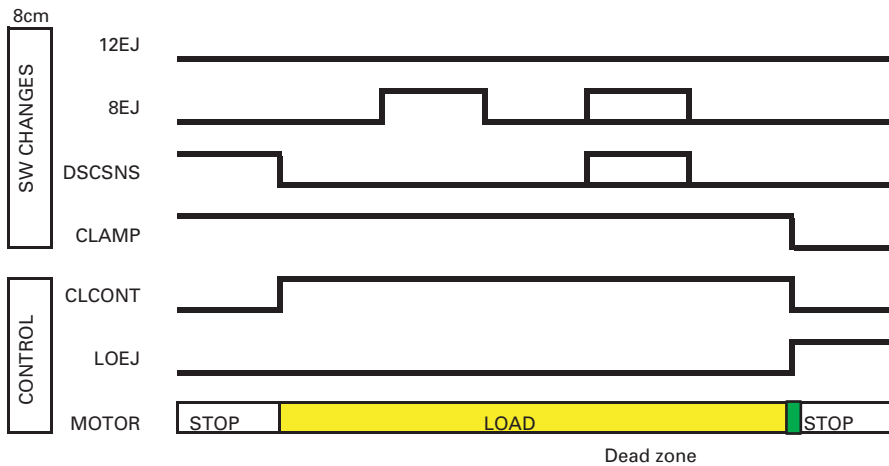
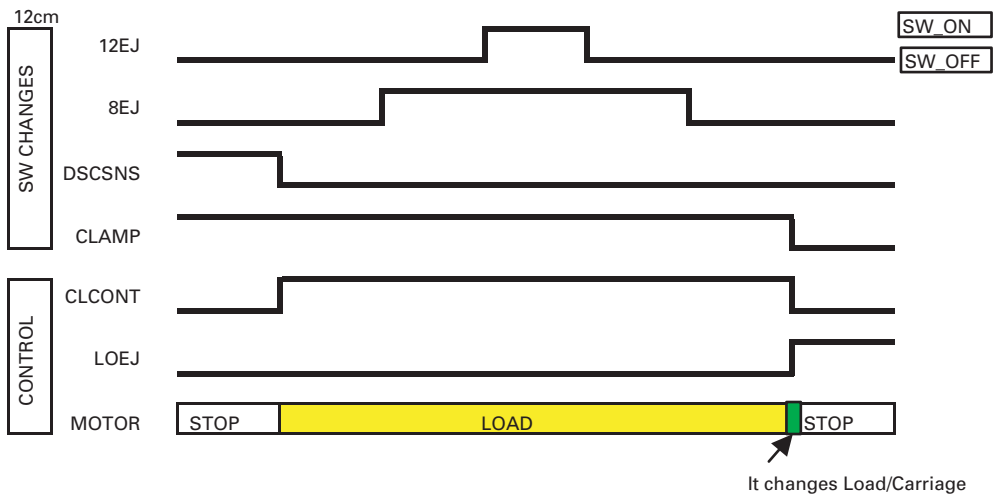
To control the load and eject operations, the clamp switch located in the mechanism unit and the three detecting switches located in the control unit are used. Depending on the combination of these switches' ON/OFF status, the DSCSNS voltage changes.

The microcomputer can detect the status (A to E) by observing the voltage at the A/D port. The disc size detection (8 or 12cm) is also performed through this status change. The DSCSNS status and the status change in the load and eject modes are shown in the figures 1.4.3 and 1.4.4 respectively.

Status	A	B	C	D	E
SW1(S903)	ON	OFF	OFF	OFF	ON
SW2(S905)	OFF	OFF	ON	ON	OFF
SW3(S904)	OFF	OFF	OFF	ON	OFF
SW4(S901)	OFF	OFF	OFF	OFF	ON
Mechanism state	With no disk				Clamp state

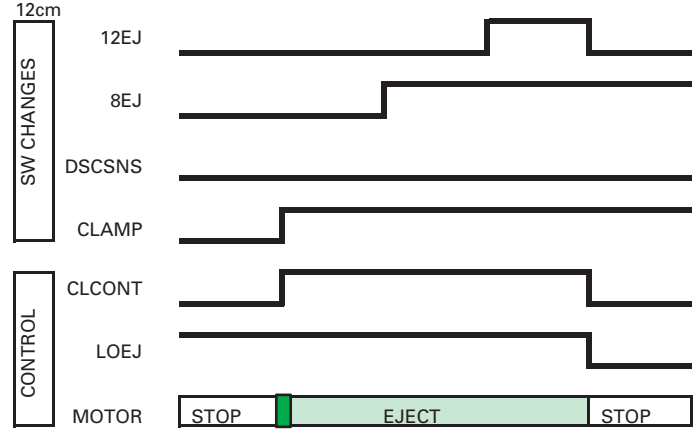
Fig.1.4.3 DSCSNS status

LOADING

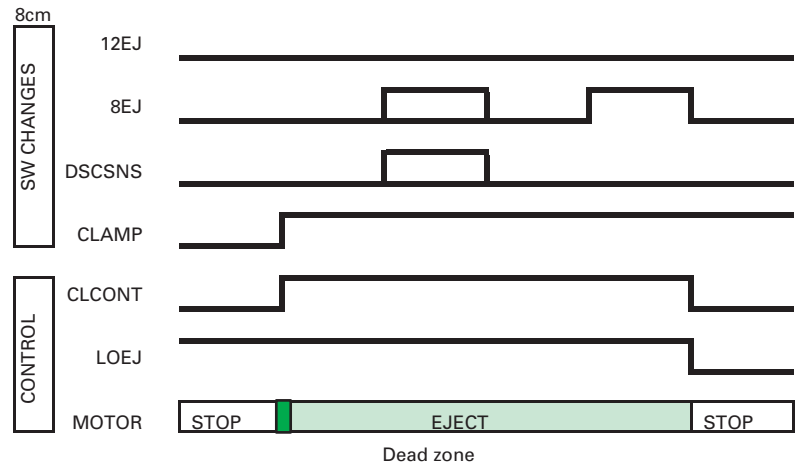


A

EJECT



B



C

D

Fig.1.4.4 Status change in LOAD and EJECT modes

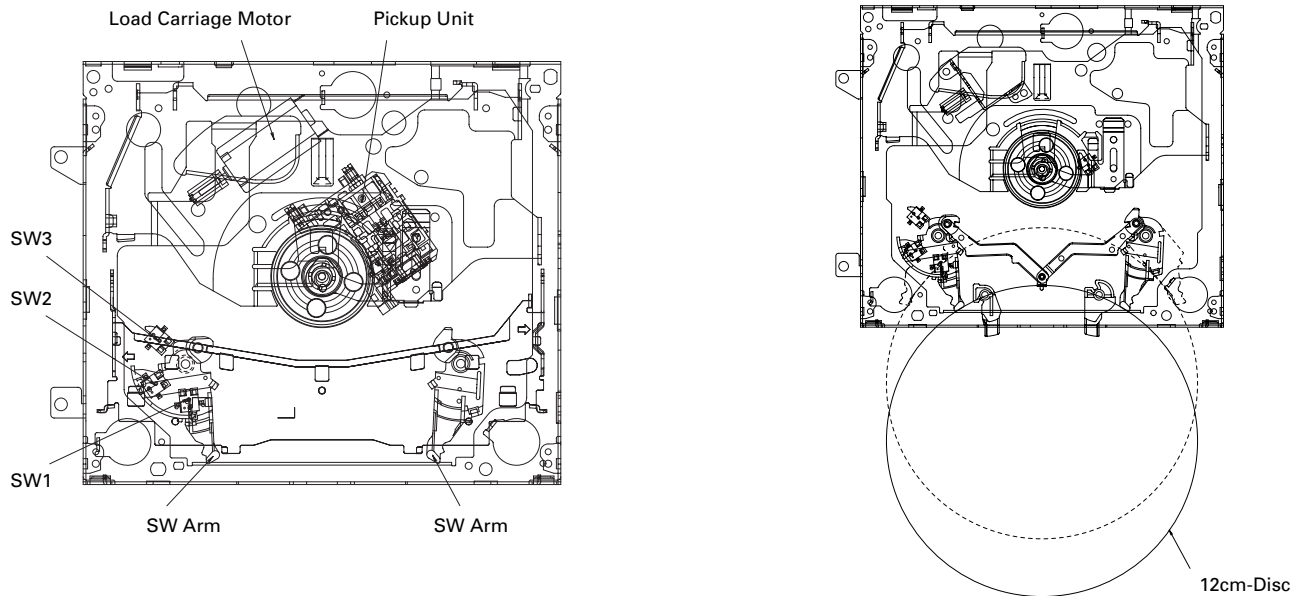
E

F

2. MECHANISM DESCRIPTIONS

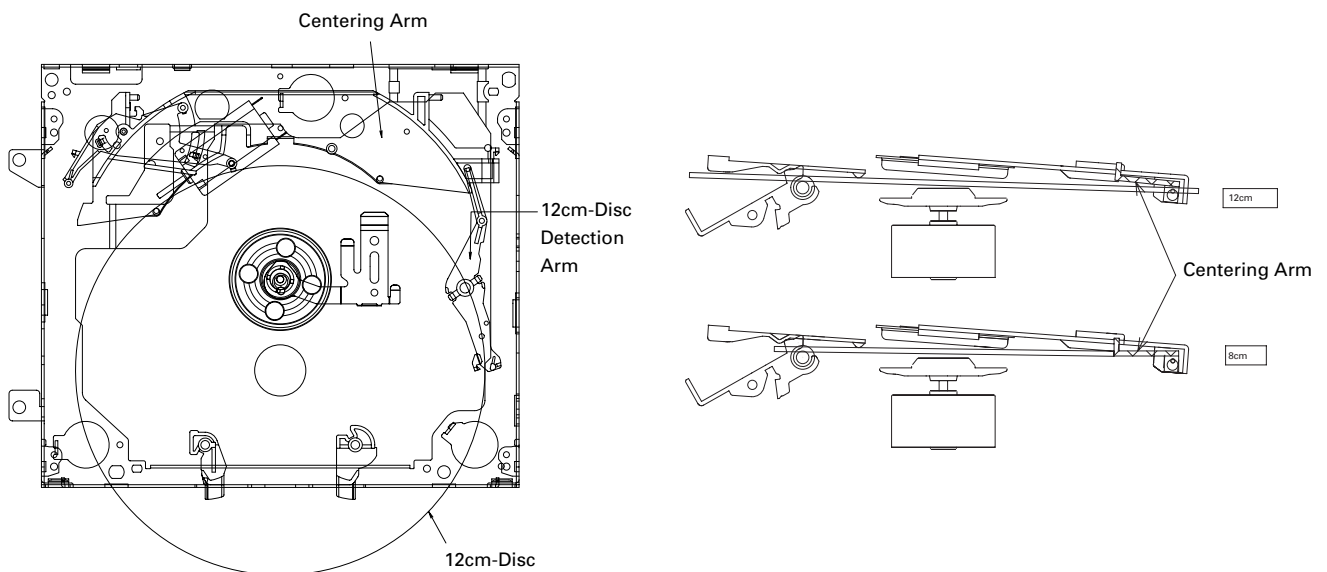
● Loading actions

1. When a disc is inserted, SW Arm L and R rotate. Due to the rotation of Arm L, SW1 is switched from ON to OFF and the Load Carriage Motor starts.
2. If the disc is 12cm-disc, when it is carried to the position shown with the dotted line in the drawing, SW 3 switches to ON due to such rotation of Arm. Then, the microcomputer judges that the disc is 12cm-disc.
3. In case of 8cm-disc, the disc cannot reach such dotted line position, and from such limitation of approach, the microcomputer judges that the disc is 8cm-disc and simply triggers clamp actions.
(Movement of SW Arm L and R are connected together. So, if pushing force is fed to only one arm, the distance between tow arms cannot be widened beyond the specific degree, because the coupling part is locked in such case.)



● Disc centering mechanism

1. In case of 12cm-disc, the 12cm-Disc Detection Arm rotates, and with such rotation, it raises the Centering Arms to retreat the arms from disc's trace. The disc passes through under the arms, and at the inner part, it is centered.
2. In case of 8cm-disc, it is just centered at the position where its edge touches the front portion of the Centering Arm.

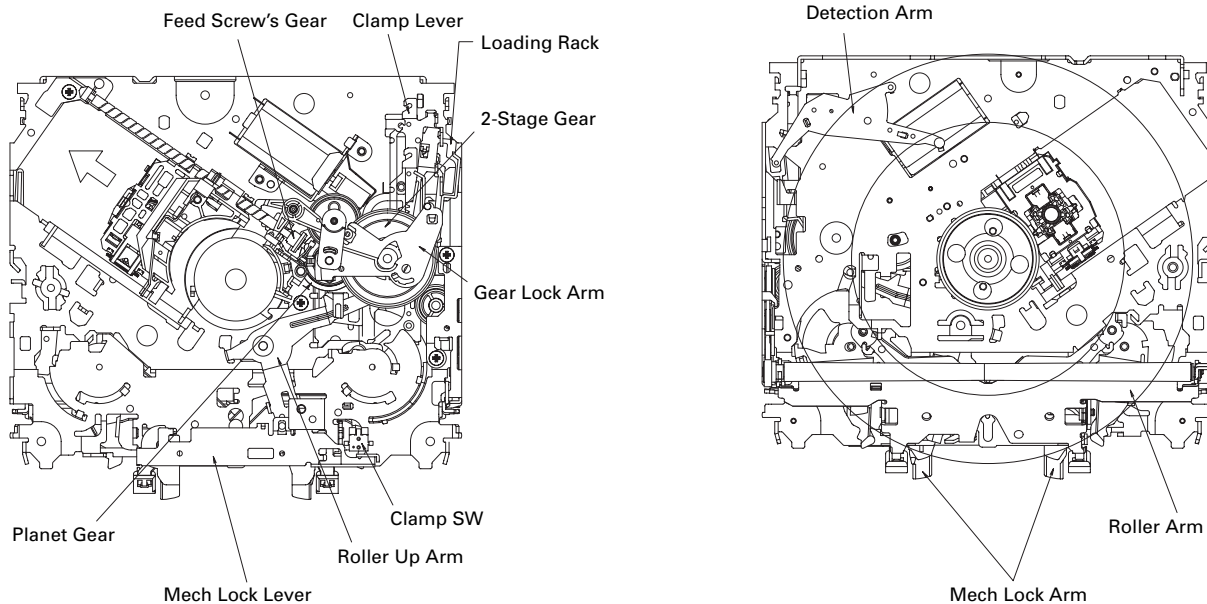


A

● Clamp actions

1. When an 8 or 12cm disc is placed on the center of the spindle, the detection arm starts moving.
2. The movement of the detection arm engages the loading rack with the 2-stage gear.
3. The clamp lever slides to lower the clamp arm. At this time, the roller up arm rotates to separate the roller arm from the disc. The roller arm moves the mech lock lever and turns the mech lock arm to release the mech lock. At the position where the clamp switch is turned off, the clamp operation ends.
4. After the clamp operation, the clamp lever moves to rotate the gear lock arm. The planet gear separates from the 2-stage gear to get engaged with the pickup feed screw's gear. Then the carriage operation will start.

B



C

● Eject actions

1. Eject actions start when the Pickup is fed to the position inner than "Home SW ON" point in the internal circumference of the circle, caused by backward rotation of the Load Carriage Motor. Eject actions follow the foregoing procedures (steps taken in loading, centering and clamping actions), but each action in those steps is performed in reversed manner.
2. In case of 12cm-disc, Eject is completed when SW3 completes its condition- transition of OFF → ON → OFF.
3. For 8cm-disc, Eject is completed when SW2 completes its condition-transition of OFF → ON → OFF.

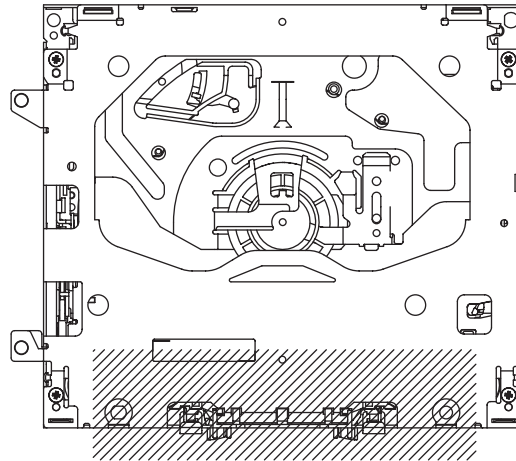
E

F

3. DISASSEMBLY

● How to hold the Mechanism Unit

1. Hold the top and bottom frame.
2. Do not squeeze top frame's front portion too tight, because it is fragile.

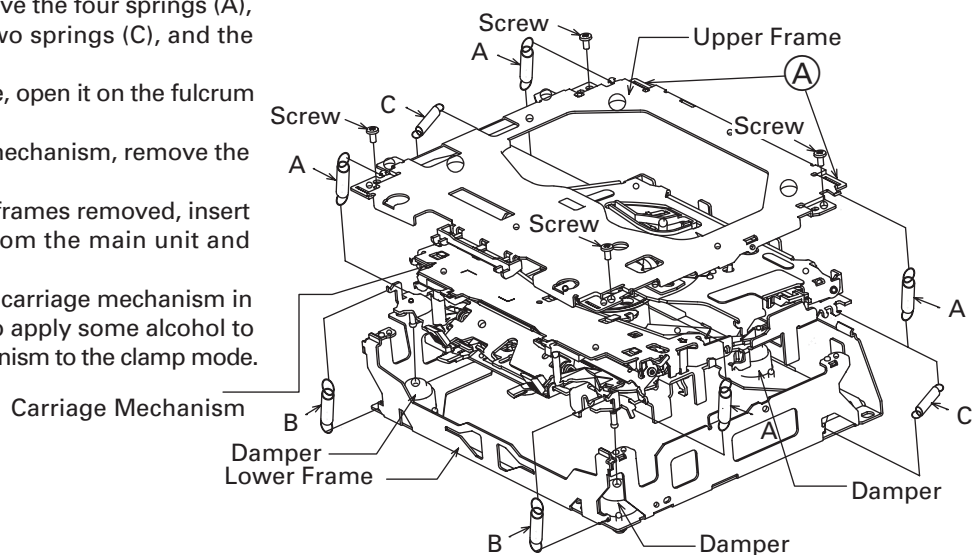


Do not squeeze.

● Removing the Upper and Lower Frames

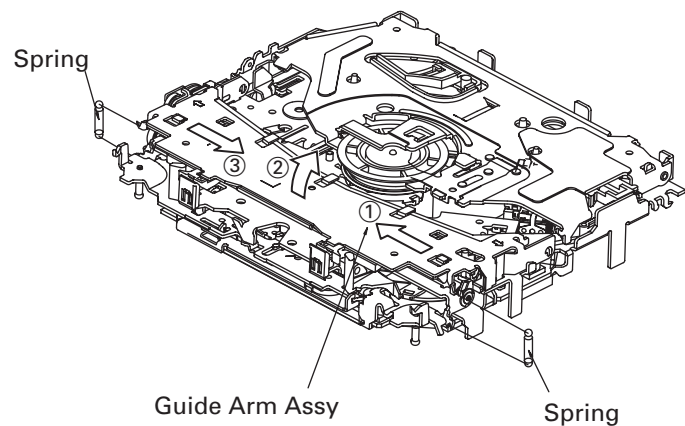
1. With a disc clamped, remove the four springs (A), the two springs (B), the two springs (C), and the four screws.
2. To remove the upper frame, open it on the fulcrum (A).
3. While lifting the carriage mechanism, remove the three dampers.
4. With the upper and lower frames removed, insert the connectors coming from the main unit and eject the disc.

Caution: Before installing the carriage mechanism in the lower frame, be sure to apply some alcohol to dampers and set the mechanism to the clamp mode.



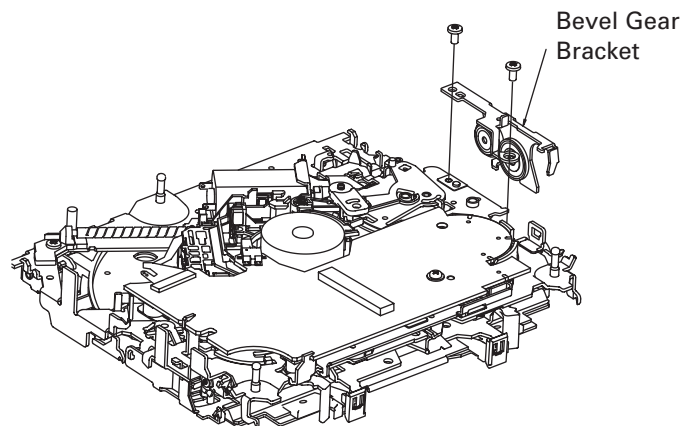
● Removing the Guide Arm Assy

1. Remove the upper and lower frames and set the mechanism to the clamp mode.
2. Remove the two springs.
3. Remove the two screws and bevel gear bracket. (See page 22.)
Note that the gears come off.
4. Slide the guide arm assy in the direction marked with the arrow ① and open it upwards.
5. At the angle of about 45 degrees, slide the guide arm assy in the direction marked with the arrow ③ to remove it.



A

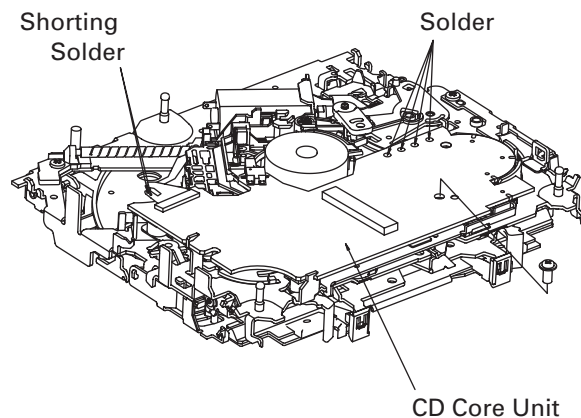
B



● Removing the CD Core Unit

1. Apply shorting solder to the Pickup flexible cable. Disconnect the cable.
2. Remove the solder from the four leads, and loosen the screw.
3. Remove the CD core unit.

Caution: When assembling the CD core unit, set the mechanism to the clamp mode to protect the switches from any damage.

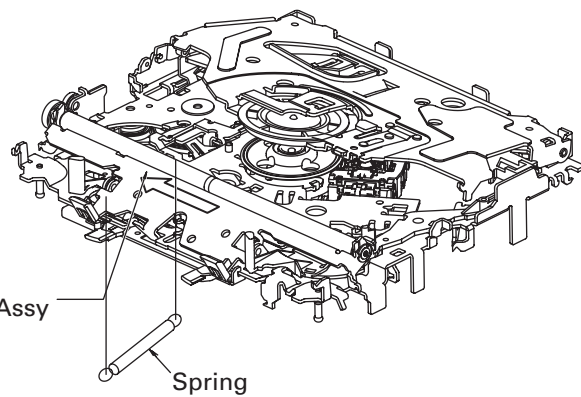


D

● Removing the Roller Arm Assy

1. Remove the guide arm assy and set the mechanism to the eject mode.
2. Remove the CD core unit. (You do not have to remove the solder from the four leads.)
3. Remove the spring.
4. Slide the roller arm assy in the direction marked with an arrow.

E

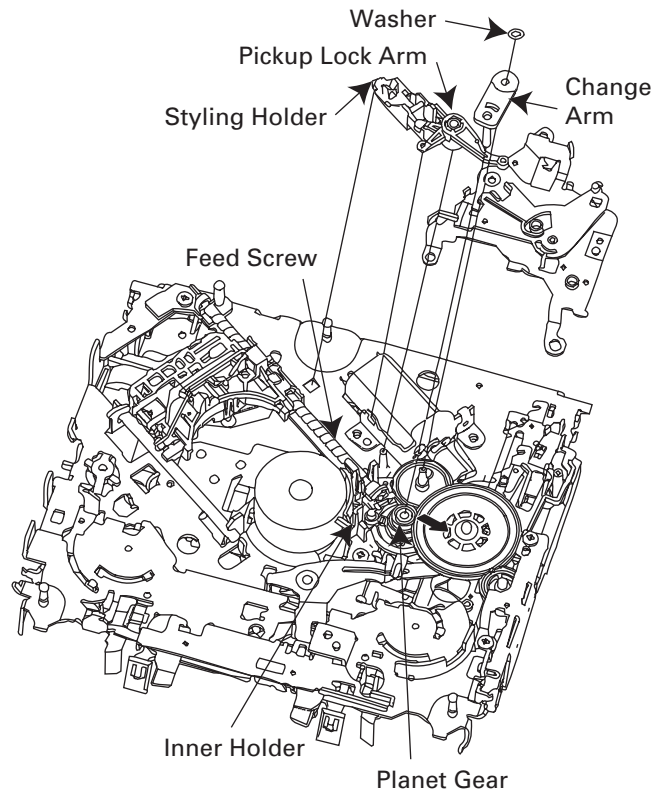


F

● Removing the Pickup Unit

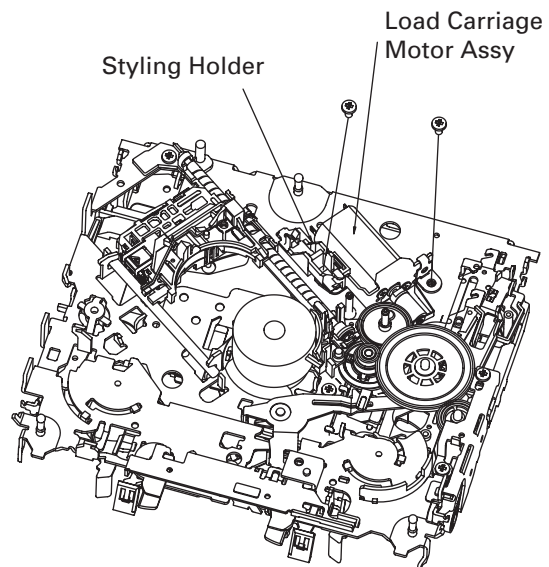
1. Set the mechanism to the clamp mode.
2. Remove the lead wires from the inner holder.
3. Remove the washer, styling holder, change arm, and pickup lock arm.
4. While releasing from the hook of the inner holder, lift the end of the feed screw.

Caution: In assembling, move the planet gear to the load/eject position before setting the feed screw in the inner holder.



● Removing the Load Carriage Motor Assy

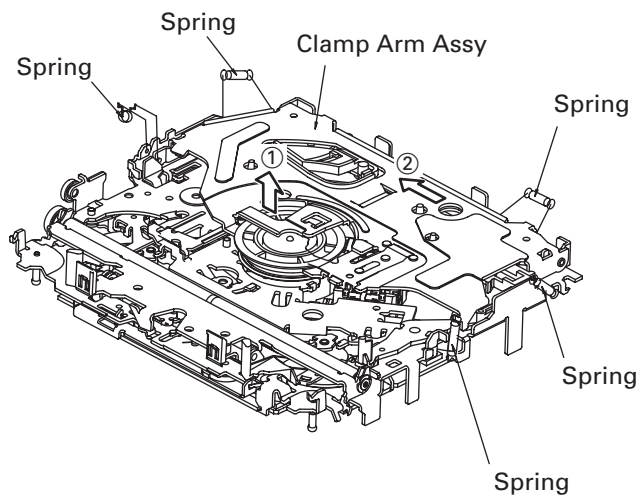
1. Release the leads from the styling holder and remove the holder.
2. Remove the two screws.
3. Remove the load carriage motor assy.



A

● **Removing the Clamp Arm Assy**

1. Remove the five springs.
2. While lifting the clamp arm assy, slide it in the direction marked with the arrow ② to remove it.

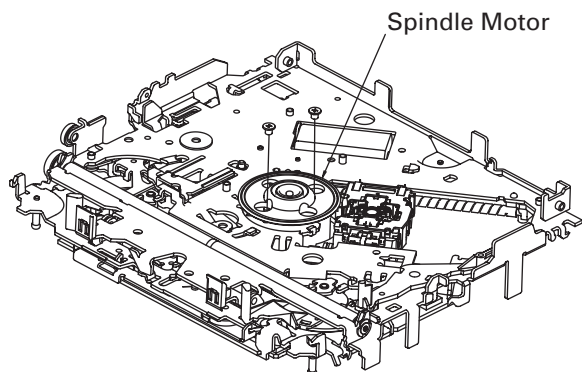


B

C

● **Removing the Spindle Motor**

1. Remove the two screws. Take off the spindle motor.



D

E

F