

CDP-CA70ES

SERVICE MANUAL

US Model
Canadian Model



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Model Name Using Similar Mechanism	NEW
CD Mechanism Type	CDM27I
Base Unit Name	BU-5BD25
Optical Pick-up Name	KSS-213B/S-N

SPECIFICATIONS

Compact Disc Player

Laser	Semiconductor laser ($\lambda = 780 \text{ nm}$) Emission duration: continuous
Laser output	Max 44.6 μW * * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up block with 7 mm aperture.
Frequency response	2 Hz to 20 kHz $\pm 0.3 \text{ dB}$
Signal-to-noise ratio	More than 117 dB
Dynamic range	More than 99 dB
Harmonic distortion	Less than 0.0025%
Channel separation	More than 110 dB

Output

	Jack type	Maximum output level	Load impedance
LINE OUT	Phono jacks	2V (at 50 k Ω)	Over 10 k Ω
DIGITAL OUT (OPTICAL)	Optical output connector	-18 dBm	Wave length: 660 nm
PHONES	Stereo phone jack	15 mW	32 Ω

General

Power requirements	120 V AC, 60 Hz
Power consumption	15W
Dimensions (approx.) (w/h/d)	430 \times 125 \times 400 mm (17 \times 5 \times 15 $\frac{3}{4}$ in.) incl. projecting parts
Mass (approx.)	6.4 kg (14 lbs 2 oz)

Supplied accessories

Audio cord (2 phono plugs-2 phono plugs) (1)
Remote commander (remote) (1)
R6(SIZE AA)batteries (2)

Design and specifications are subject to change without notice.

COMPACT DISC PLAYER

SONY®



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Laser component in this product is capable of emitting radiation exceeding the limit for Class 1.

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT MARKING is located on the rear exterior.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

Flexible Circuit Board Repairing

- Keep the temperature of soldering iron around 270°C during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

NOTES ON HANDLING THE OPTICAL PICK-UP BLOCK OR BASE UNIT

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body. During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.

The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective surface by the objective lens in the optical pick-up block. Therefore, when checking the laser diode emission, observe from more than 30 cm away from the objective lens.

SAFETY CHECK-OUT (US model only)

After correcting the original service problem, perform the following safety checks before releasing the set to the customer: Check the antenna terminals, metal trim, “metallized” knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 microamperes). Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers’ instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The “limit” indication is 0.75 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 2V AC range are suitable. (See Fig. A)

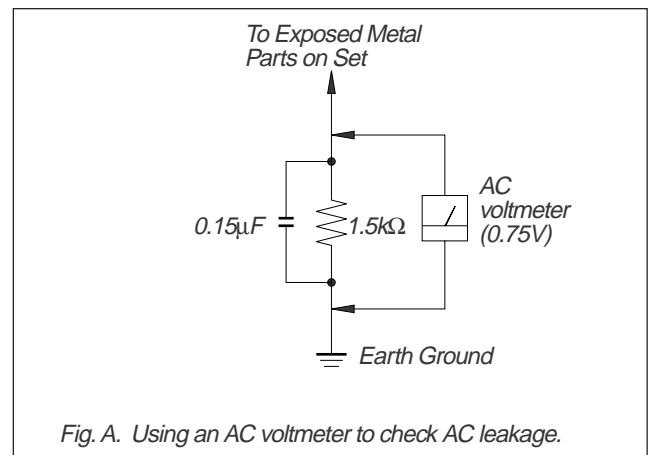


Fig. A. Using an AC voltmeter to check AC leakage.

SAFETY-RELATED COMPONENT WARNING!!

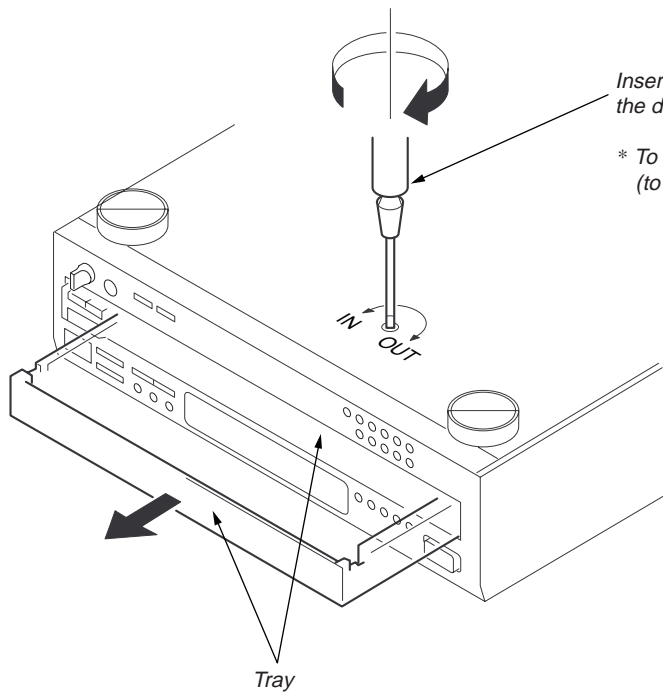
COMPONENTS IDENTIFIED BY MARK \triangle OR DOTTED LINE WITH MARK \triangle ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

LES COMPOSANTS IDENTIFIÉS PAR UNE MARQUE \triangle SUR LES DIAGRAMMES SCHÉMATIQUES ET LA LISTE DES PIÈCES SONT CRITIQUES POUR LA SÉCURITÉ DE FONCTIONNEMENT. NE REMPLACER CES COMPOSANTS QUE PAR DES PIÈCES SONY DONT LES NUMÉROS SONT DONNÉS DANS CE MANUEL OU DANS LES SUPPLÉMENTS PUBLIÉS PAR SONY.

SECTION 1 SERVICING NOTE

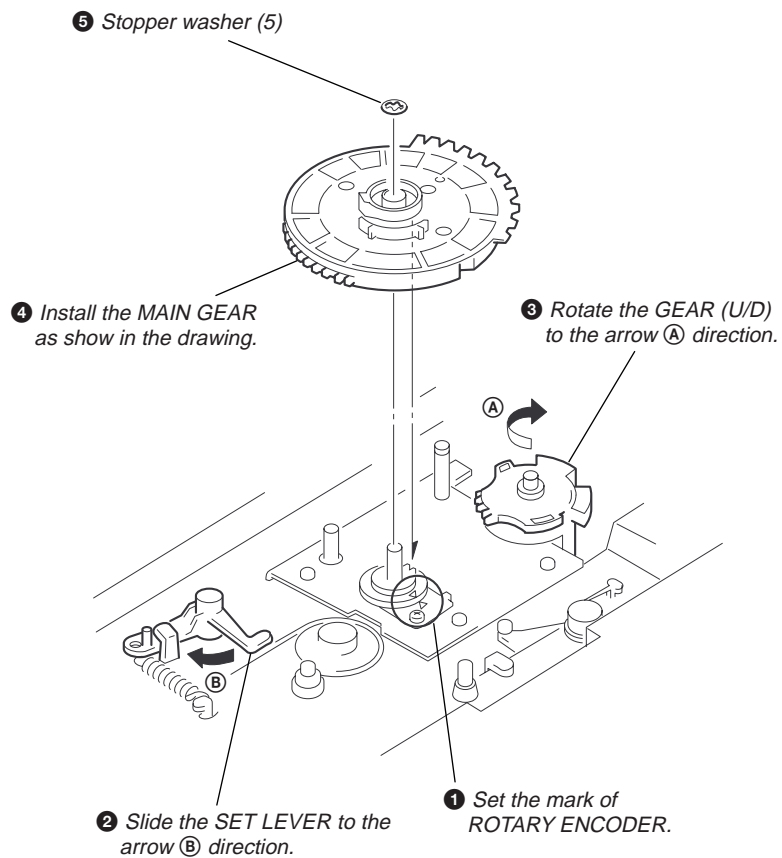
HOW TO OPEN THE DISC TRAY WHEN POWER SWITCH TURNS OFF



Insert a tapering driver into the aperture of the unit bottom, and turn in the direction of arrow (to OUT direction).

* To close the disc tray, turn driver in the reverse direction (to IN direction).

NOTE FOR MAIN GEAR INSTALLATION



SHIPMENT MODE

Performed when returning the unit to the customer.
Custom File Erases all custom files and initializes settings.

Procedure:

1. Remove the discs from all trays.
2. While pressing the DISC [2] button and [3] button, press the [I/O] button to turn ON the power.
3. "NO DISC" is displayed, indicating that the mode has ended.

NOTE: "NO DISC" may be displayed even if there are discs on the trays.

CD-TEXT TEST DISC

This unit is able to display the test data (character information) written in the CD on its fluorescent indicator tube. The CD-TEXT TEST DISC (TGCS-313:4-989-366-01) is used for checking the display. To check, perform the following procedure.

Checking Method:

1. Turn ON the power, set the disc on the disc table with the side labeled as "test disc" as the right side, close the front cover, and chuck the disc.
2. Press the [▶] button and play back the disc.
3. The following will be displayed on the fluorescent indicator tube.
Display : 1kHz/0 dB/ L&R
4. Press the [◀◀] and [▶▶] buttons to switch the track. The text data of each track will be displayed.
For details of the displayed contents for each track, refer to "Table 1 : CD-TEXT TEST DISC TEXT Data Contents" and "Table 2 : CD-TEXT TEST DISC Recorded Contents and Display".

Restrictions in CD-TEXT Display

In this unit, some special characters will not be displayed properly. These will be displayed as a space or a character resembling it. For details, refer to "Table 2 : CD-TEXT DISC Recorded Contents and Display".

Table 1 : CD-TEXT TEST DISC TEXT Data Contents (TRACKS No. 1 to 41:Normal Characters)

TRACK No.	Displayed Contents	TRACK No.	Displayed Contents
1	1kHz/0dB/L&R	22	1kHz/-90dB/L&R
2	20Hz/0dB/L&R	23	Infinity Zero w/o emphasis//L&R
3	40Hz/0dB/L&R	24	Infinity Zero with emphasis//L&R
4	100Hz/0dB/L&R	25	400Hz+7kHz(4:1)/0dB/L&R
5	200Hz/0dB/L&R	26	400Hz+7kHz(4:1)/-10dB/L&R
6	500Hz/0dB/L&R	27	19kHz+20kHz(1:1)/0dB/L&R
7	1kHz/0dB/L&R	28	19kHz+20kHz(1:1)/-10dB/L&R
8	5kHz/0dB/L&R	29	100Hz/0dB/L*
9	7kHz/0dB/L&R	30	1kHz/0dB/L*
10	10kHz/0dB/L&R	31	10kHz/0dB/L*
11	16kHz/0dB/L&R	32	20kHz/0dB/L*
12	18kHz/0dB/L&R	33	100Hz/0dB/R*
13	20kHz/0dB/L&R	34	1kHz/0dB/R*
14	1kHz/0dB/L&R	35	10kHz/0dB/R*
15	1kHz/-1dB/L&R	36	20kHz/0dB/R*
16	1kHz/-3dB/L&R	37	100Hz Squer Wave//L&R
17	1kHz/-6dB/L&R	38	1kHz Squer Wave//L&R
18	1kHz/-10dB/L&R	39	1kHz w/emphasis/-0.37dB/L&R
19	1kHz/-20dB/L&R	40	5kHz w/emphasis/-4.53dB/L&R
20	1kHz/-60dB/L&R	41	16kHz w/emphasis/-9.04dB/L&R
21	1kHz/-80dB/L&R		

* Other channel is infinity zero.

NOTE : The contents of Track No. 1 to 41 are the same as those of the current TEST DISC-their titles are displayed.

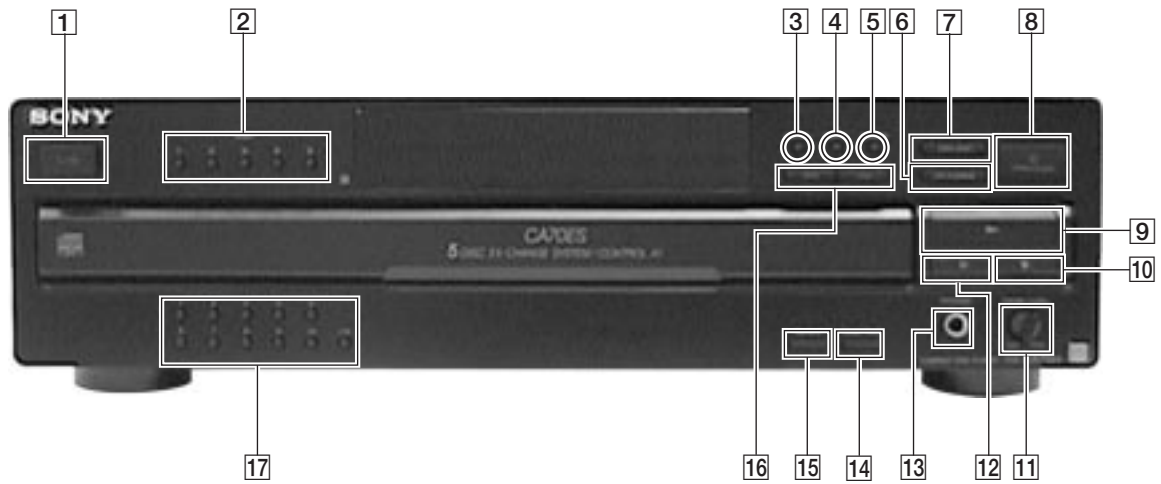
Table 2: CD-TEXT TEST DISC Recorded Contents and Display
(In this unit, some special characters cannot be displayed. This is not a fault.)

TRACK	Recorded contents	Display
42	! " # \$ % & ' (21h to 27h)1kHz 0dB L&R	0 dB L & R are not displayed
43	() * + , - . / (28h to 2Fh)	← All the same
44	0 1 2 3 4 5 6 7 (30h to 37h)	← All the same
45	8 9 : ; < = > ? (38h to 3Fh)	← All the same
46	@ A B C D E F G (40h to 47h)	← All the same
47	H I J K L M N O (48h to 4Fh)	← All the same
48	P Q R S T U V W (50h to 57h)	← All the same
49	X Y Z [\] ^ _ (58h to 5Fh)	X Y Z [\] ^ _ (58....
50	` a b c d e f g (60h to 67Fh)	a b c d e f g (60....
51	h i j k l m n o (68h to 6Fh)	← All the same
52	p q r s t u v w (70h to 77h)	← All the same
53	x y z { } ~ ■ (78h to 7Fh)	x y z { } ~ ■ (78....
54	■ i ¢ £ ¤ ¥ ¦ § (A0h to A7h) 8859-1	i ¢ £ ¥ ¦ § (A0.... ■ ¢ £ ¥ ¦ are not displayed
55	♪ © ª « ¬ ® ¯ (A8h to AFh)	¬ (A8.... ♪ © ª « ¬ ® ¯ are not displayed
56	• ± ² ³ ´ μ ¶ • (B0h to B7h)	± ´ μ ¶ (B0.... • ² ³ ¶ • are not displayed
57	† † ° » ¼ ½ ¾ ¿ (B8h to BFh)	¿ (B8.... † † ° » ¼ ½ ¾ are not displayed
58	À Á Â Ã Ä Å Æ Ç (C0h to C7h)	à á â ã ä å æ ç (C0....
59	È É Ê Ë Ì Í Î Ï (C8h to CFh)	è é ê ë ì í î ï (C8....
60	Ð Ñ Ò Ó Ô Õ Ö × (D0h to D7Fh)	D Ñ ò ó ô õ ö × (D0....
61	Ø Ù Ú Û Ü Ý Þ ß (D8h to DFh)	Ø ù ú û ü ý þ ß (D8.... Þ is not displayed
62	à á â ã ä å æ ç (E0h to E7h)	← All the same
63	è é ê ë ì í î ï (E8h to EFh)	← All the same
64	ð ñ ò ó ô õ ö ÷ (F0h to F7h)	ñ ò ó ô õ ö ÷ (F0.... ð is not displayed
65	ø ù ú û ü ý þ ÿ (F8h to FFh)	ø ù ú û ü ý þ ÿ (F8.... Þ is not displayed
66	No.66	← All the same
67	No.67	← All the same
to	to	to
99	No.99	← All the same

SECTION 2 GENERAL

Identifying the Parts

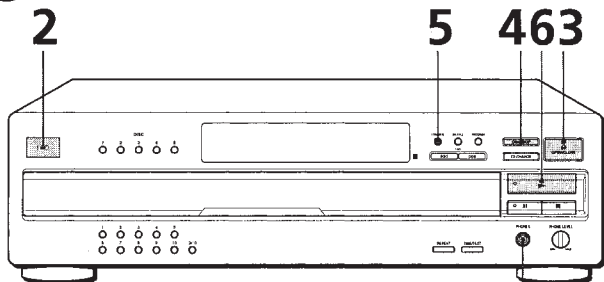
Front Panel



- 1** POWER (I/⏻) switch
- 2** DISC (1–5) buttons
- 3** CONTINUE button
- 4** SHUFFLE button
- 5** PROGRAM button
- 6** EX-CHANGE button
- 7** DISC SKIP button
- 8** ≡ OPEN/CLOSE button

- 9** ► (CD PLAY) button
- 10** ■ (CD STOP) button
- 11** PHONE LEVEL button
- 12** || (pause) button
- 13** PHONES jack
- 14** TIME/NEXT button
- 15** REPEAT button
- 16** AMS (⏮ ⏭) buttons
- 17** Numeric buttons

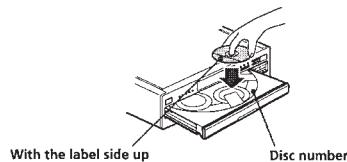
Playing a CD



Connect the headphones.

• See pages 4 – 5 for the hookup information.

- 1** Turn on the amplifier and select the CD player position so that you can listen to the sound from this player.
- 2** Press I/⏻ to turn on the player.
- 3** Press △ OPEN/CLOSE, and place a disc on the disc tray.



- 4** To place other discs, press DISC SKIP and place the discs in the order you want to play.
Each time you press the button, the disc tray turns and you can place the discs in the empty disc compartments. The player plays the disc in the loading position first.
- 5** Press CONTINUE to select ALL DISCS or 1 DISC Continuous Play mode.
Each time you press the CONTINUE button, "ALL DISCS" or "1 DISC" appears in the display.

When you select	The player plays
ALL DISCS	All discs in the player consecutively in the order of disc number
1 DISC	Only the disc you have selected

💡 You can select the disc you want to start playing first
Press one of the DISC 1 – 5 buttons.

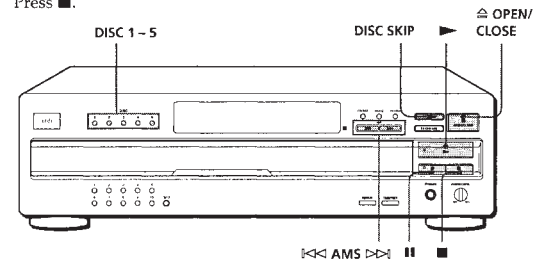
💡 You can adjust the output level to the amplifier [I] Press LINE OUT LEVEL +/- on the remote. You can reduce the output level up to -20 dB.
When you reduce the output level, "[LACK]" appears in the display.
The headphones volume will also change when you adjust the output level.

Note
If you press the LINE OUT LEVEL +/- buttons on the remote while recording, the recording level will change even when it is preset on the tape deck, etc.

- 6** Press ▶ (the indicator lights up green).
The disc tray closes and the player plays all the tracks once (Continuous Play). Adjust the volume on the amplifier.

To stop play

Press ■.



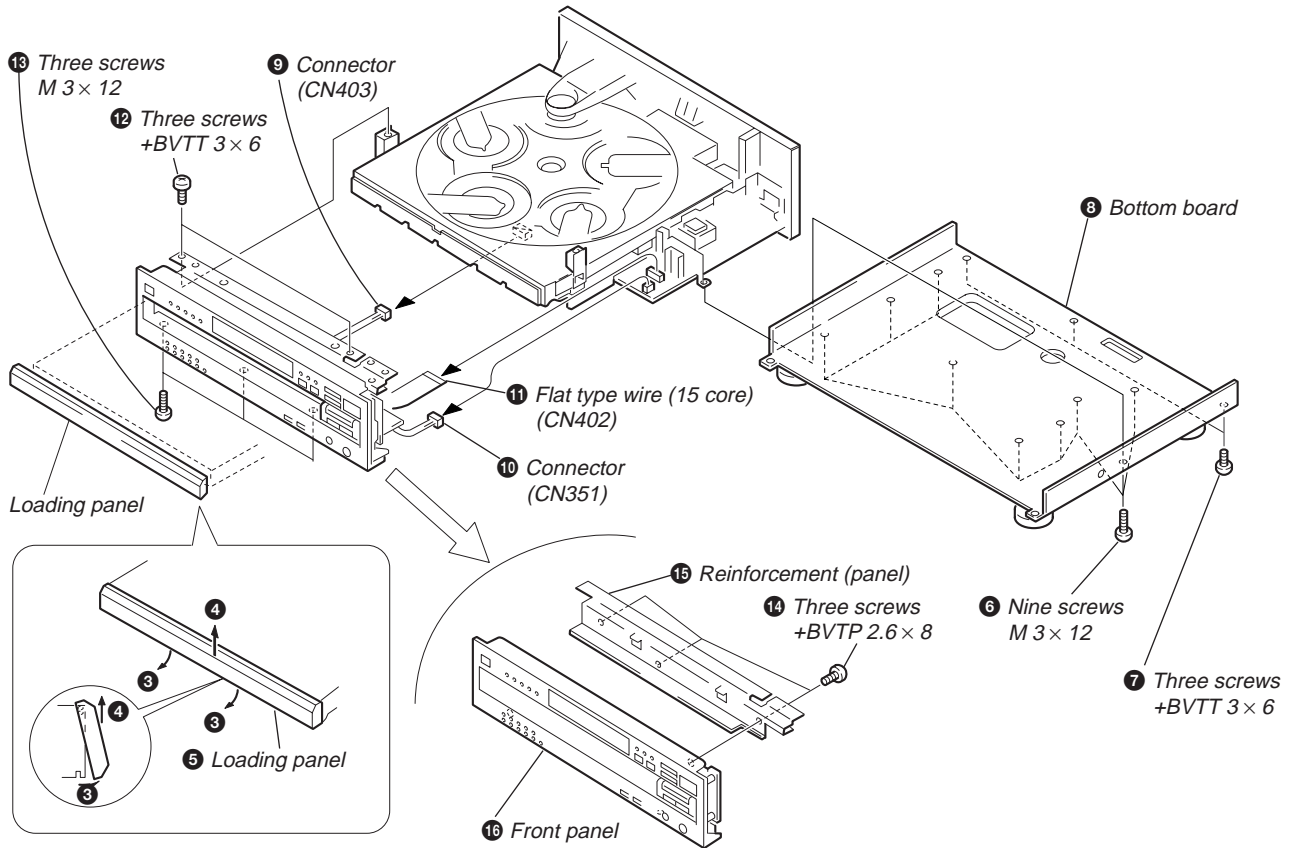
To	You need to
Pause	Press ■ (The indicator lights up orange.)
Resume play after pause	Press ■ or ▶
Go to the next track	Press ▷▶
Go back to the preceding track	Press ◁◁
Go to the next disc	Press DISC SKIP
Select a disc directly	Press DISC 1 – 5
Stop play and remove the CD	Press △ OPEN/CLOSE

SECTION 3 DISASSEMBLY

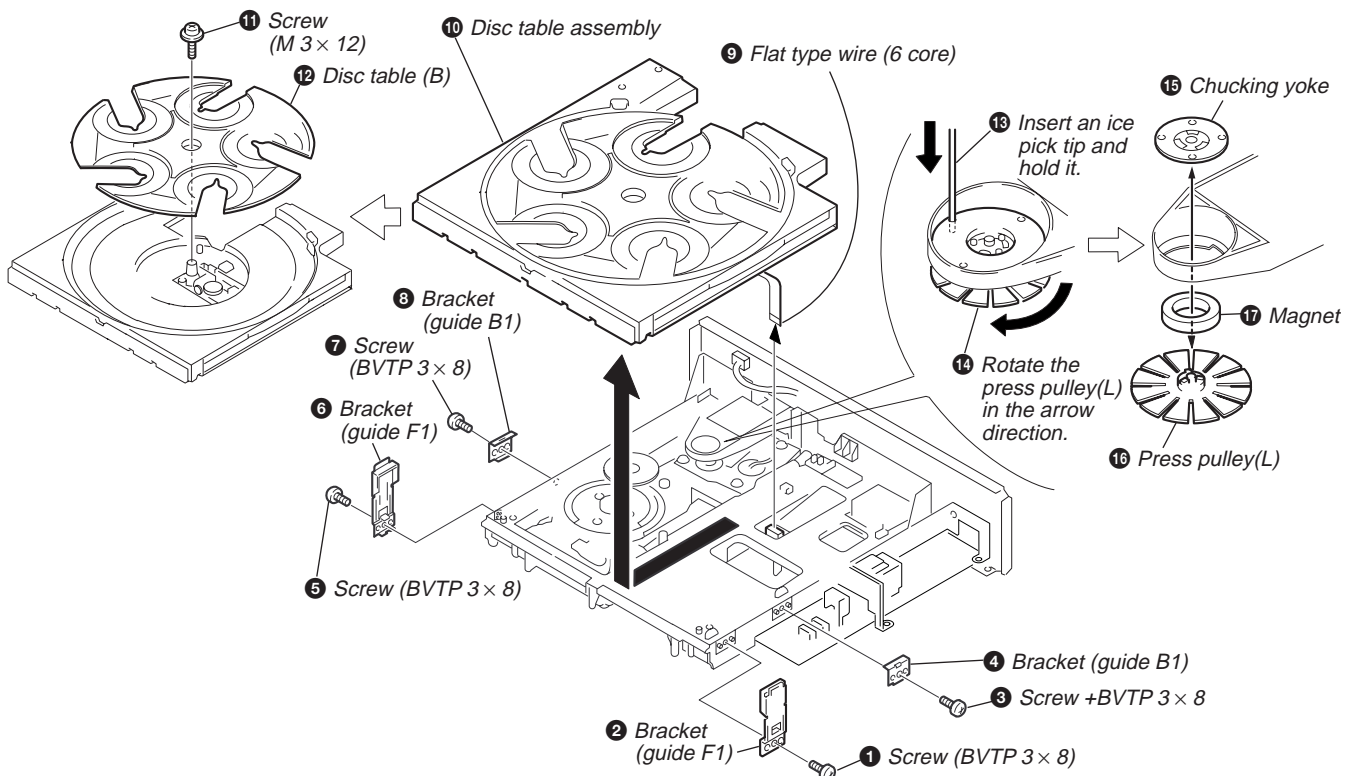
Note : Follow the disassembly procedure in the numerical order given.

3-1. FRONT PANEL

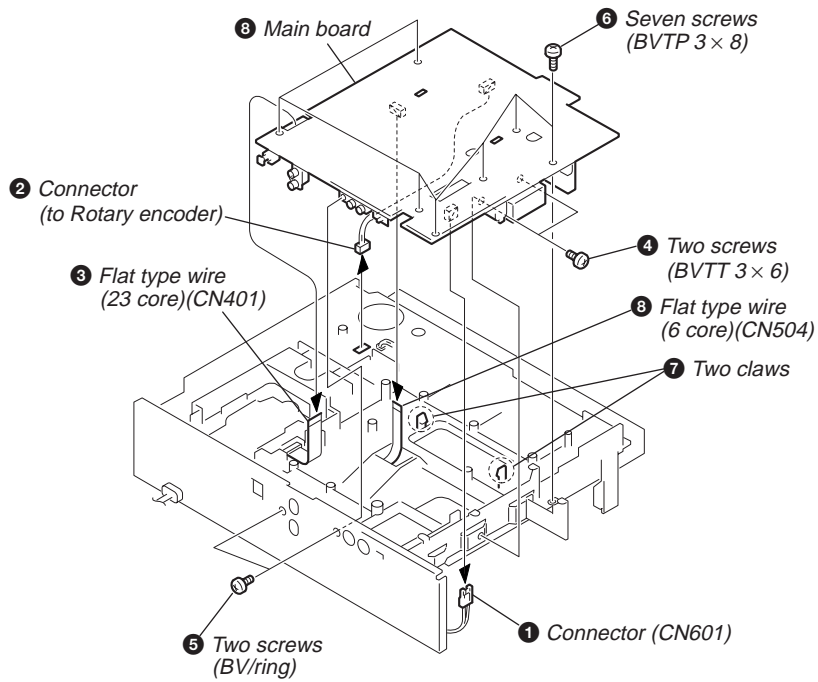
- 1 Remove top cover.
- 2 Eject the disc table referring to SERVICING NOTE (Page 4).



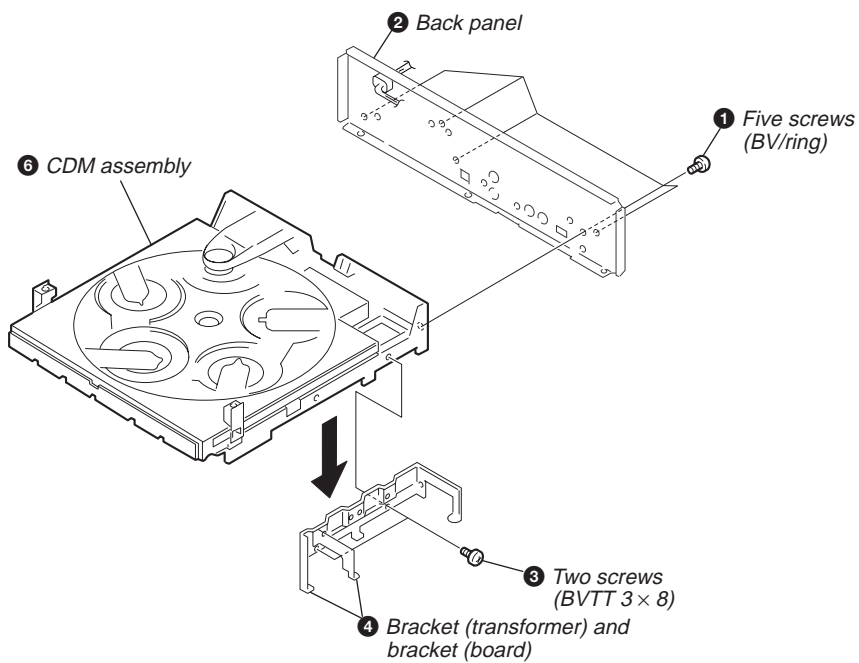
3-2. DISC TABLE ASSEMBLY AND DISC TABLE AND PRESS PULLEY



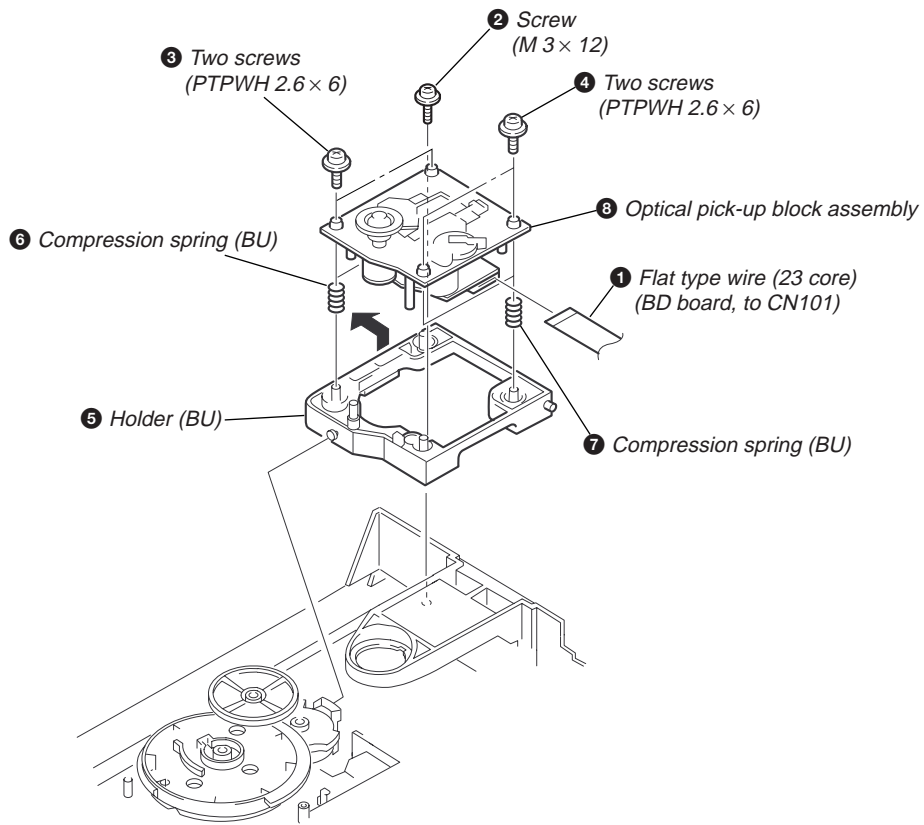
3-3. MAIN BOARD



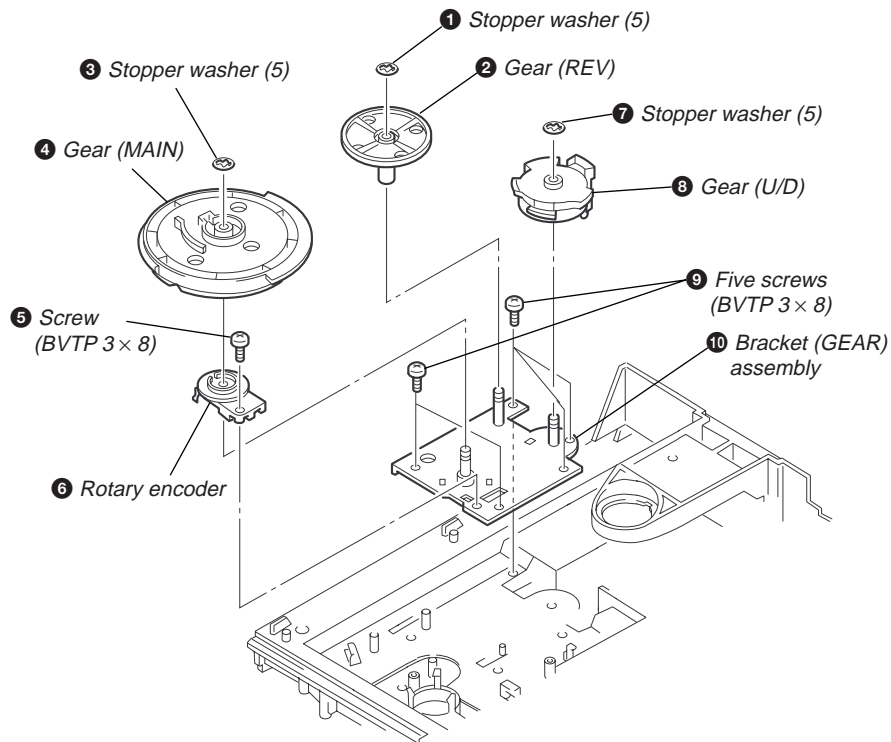
3-4. CDM ASSEMBLY



3-5. OPTICAL PICK-UP BLOCK ASSEMBLY





3-6. BRACKET (GEAR) ASSEMBLY



Note : As for the installation of the main gear, refer to “Note for MAIN GEAR installation” on page 4.

SECTION 4 TEST MODE

ADJ MODE


1. Chuck the CD first, and then turn OFF the power.
2. Short-circuit the test point (TP2:ADJ) of the main board and ground with a lead wire.
3. Press the  button to turn ON the power.
The CD is played back automatically and the ADJ mode is set.
4. To exit the mode, press the  button to turn OFF the power.

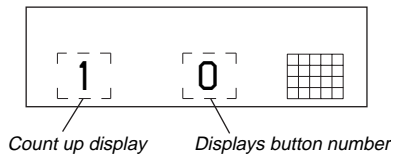
- Prohibits high speed search during accessing
- Ignores even if GFS becomes L

ADJ Mode Special Function Table

Button	Function
3	Tracking servo, sled servo OFF
8	Tracking servo, sled servo ON

FLUORESCENT INDICATOR TUBE, LED ALL LIT, AND KEY CHECK MODE

1. Short-circuit the test (TP1:AFADJ) of the main board and ground with a lead wire.
2. Press the  button to turn ON the power.
The whole fluorescent indicator tube lights up.
Nothing will be displayed when the SRAM is faulty or improperly soldered.
3. All buttons have individual button numbers.
When a button is pressed, the button number is counted up and displayed.









When remote controller signals are received, "RM **" will be displayed.

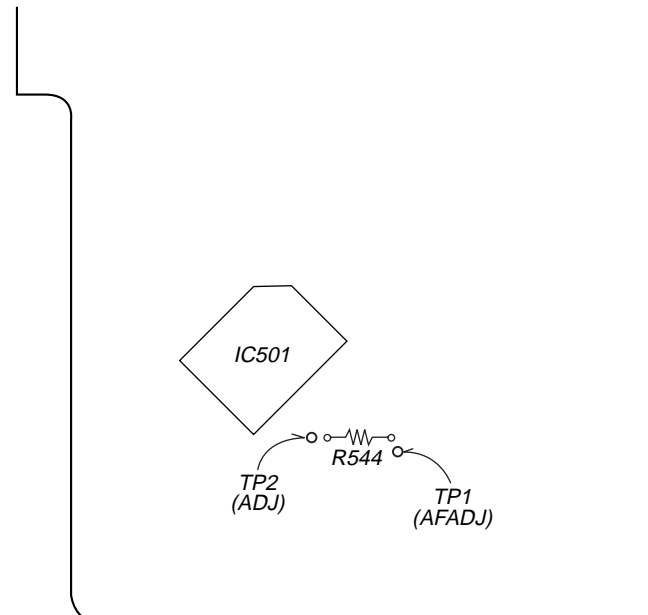
(* are the numbers corresponding to the remote controller keys.)
When using the remote controller, switch the COMMAND MODE switch to CD1.

4. To exit the mode, press the  button to turn OFF the power.

Buttons and Corresponding Button Numbers

Button	Button Number or Display
CONTINUE	18
SHUFFLE	17
PROGRAM	16
REPEAT	9
TIME/TEXT	8
DISC CHECK	30
DISC1	23
DISC2	22
DISC3	21
DISC4	20
DISC5	19
 (PLAY)	Partial lighting 1 (Grid check)
 (PAUSE)	28
 (STOP)	Partial lighting 2 (Segment check)
EX-CHANGE	24
DISC SKIP	25
 OPEN/CLOSE	All lit (LED lighting)
AMS 	30
AMS 	31
1	4
2	3
3	2
4	1
5	0
6	15
7	14
8	13
9	12
10	11
>10	10

[MAIN BOARD] – CONDUCTOR SIDE –



All lit

Partial lighting 1

↕ Light alternately

Partial lighting 2

Light alternately



↕ Light alternately

AGING MODE



This unit is equipped with an aging mode to check operations of the mechanism deck.

- When faults occur:
Aging stops, and the state when aging stopped is displayed on the fluorescent display tube.
- When no fault has occurred:
Aging is continued repeatedly.

Note: Do not use the test disc when performing aging.
Aging will not be performed properly if discs with tracks shorter than 4 seconds are used.

Aging method 1

(When using the aging mode remote controller (J-2501-123-A):

1. Set the COMMAND MODE switch to CD1.
2. Press the  button and turn ON the power.
3. Set discs on all trays.
(More than two discs if five are not available.)
4. Press the AGING START button of the aging remote controller.
5. Aging starts and the message shown in Fig. 1 is displayed on the fluorescent display tube.
6. To end, press the  button.

Aging method 2

(When no aging mode remote controller):






1. Press the  button and turn ON the power.
2. Set discs on all trays.
(More than two discs if five are not available.)
3. Press the  button,  button, and  button in this order together.
4. Aging starts and the message shown in Fig. 1 is displayed on the fluorescent display tube.
5. To end, press the  button.

Fig. 1 Aging Operations and Their Messages

Code No.	State	Display when Normal	Display when Abnormal
1	TOC reading	AGING 1	AGING NG1
2	Accessing last track	AGING 2	AGING NG2
3	Playing back last track (3 seconds)	Counter display	AGING NG3
4	EX-CHANGE (Tray opened while chucking)	AGING 4	AGING NG4
5	DISC SKIP (Disc tray rotated)	AGING 5	AGING NG5
6	CLOSE (Tray closed)	AGING 6	AGING NG6
7	Accessing first track	AGING 7	AGING NG7
8	Playing back first track (3 seconds)	Counter display	AGING NG8
9	OPEN (Tray opened)	AGING 9	AGING NG9
A	DISC SKIP (Disc tray rotated, and next disc was selected)	AGING A	AGING NGA
0	CLOSE (Tray closed)	AGING 0	AGING NG0

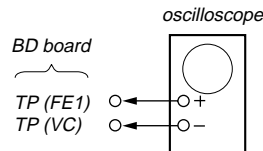
The discs are selected in the order of DISC 1 → DISC 2 → DISC 3 → DISC 4 → DISC 5 → DISC 1 → Empty trays are skipped.

SECTION 5 ELECTRICAL BLOCK CHECKING

Note:

1. CD Block is basically designed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use an oscilloscope with more than $10M\Omega$ impedance.
4. Clean the object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.

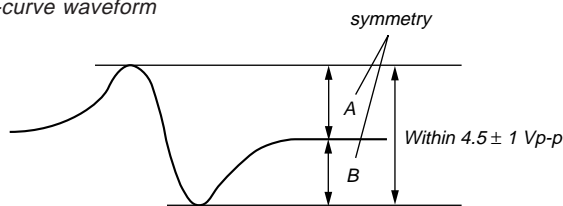
S Curve Check



Procedure :

1. Connect oscilloscope to test point TP (FE1) on BD board.
2. Connect between test point TP (FE1) and TP (VC) by lead wire.
3. Connect both ends of TP R151 of the BD board to the lead wire.
4. Turn ON the power.
5. Put disc (YEDS-18) in and actuate the focus search. (actuate the focus search when disc table is moving in and out.)
6. Check the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within 4.5 ± 1 Vp-p.

S-curve waveform

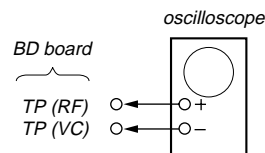


7. After check, remove the lead wire connected in step 2 and 3.

Note :

- Try to measure several times to make sure than the ratio of A : B or B : A is more than 10 : 7.
- Take sweep time as long as possible and light up the brightness to obtain best waveform.

RF Level Check



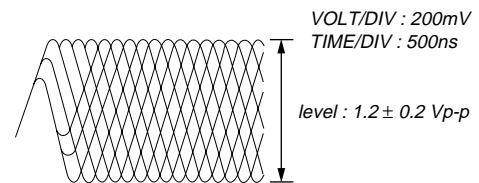
Procedure :

1. Connect oscilloscope to test point TP (RF) on BD board.
2. Turn ON the power.
3. Put disc (YEDS-18) in to play the number five track.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

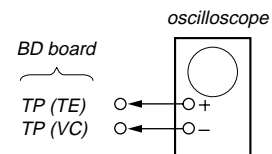
Note:

A clear RF signal waveform means that the shape “◇” can be clearly distinguished at the center of the waveform.

RF signal waveform



E-F Balance (1 Track Jump) Check (without general remote commander)

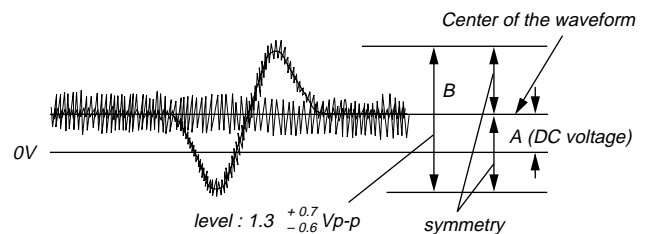


Procedure :

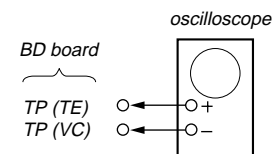
1. Connect oscilloscope to test point TP (TE) on BD board.
2. Turn ON the power.
3. Put disc (YEDS-18) in to play the number five track.
4. Press the [II] (Pause) button. (Becomes the 1 track jump mode)
5. Check the level B of the oscilloscope's waveform and the A (DC voltage) of the center of the Traverse waveform.

Confirm the following :

$$A/B \times 100 = \text{less than } \pm 22\%$$



1 track jump waveform



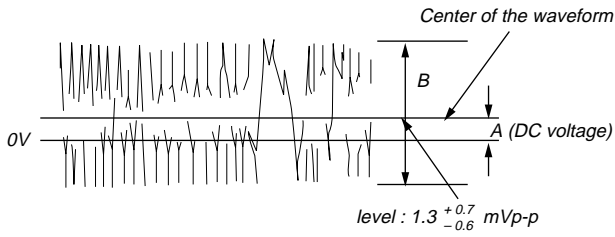
E-F Balance Check (With general remote commander)

Procedure :

1. Turn ON the power, put disc (YEDS-18), turn OFF the power.
2. Connect the test point TP2 (ADJ) on MAIN board to the ground with a lead wire.
3. Connect oscilloscope to test point TP (TE) on BD board.
4. Turn the Power switch on to set the ADJ mode, automatically play the number five track.
5. Press the [3] button. (The tracking servo and the sledding servo are turned OFF.)

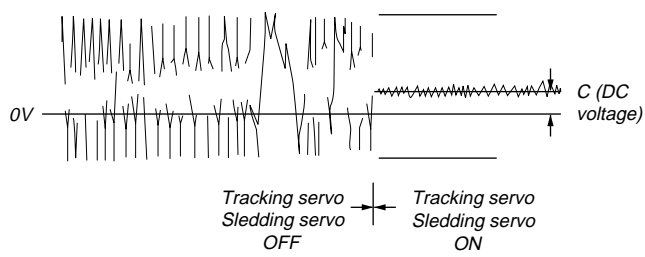
- Check the level B of the oscilloscope's waveform and the A (DC voltage) of the center of the Traverse waveform.
Confirm the following :
 $A/B \times 100 = \text{less than } \pm 22\%$

Traverse waveform



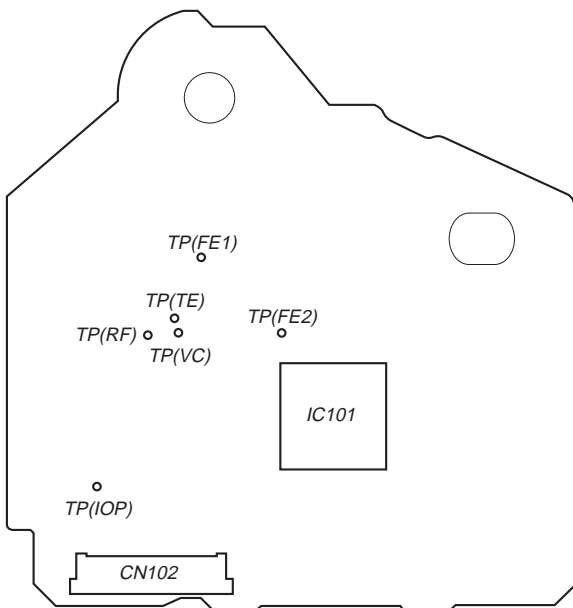
- Press the **8** button. (The tracking servo and sledding servo are turned ON.) Confirm the C (DC voltage) is almost equal to the A (DC voltage) is step 6.

Traverse waveform

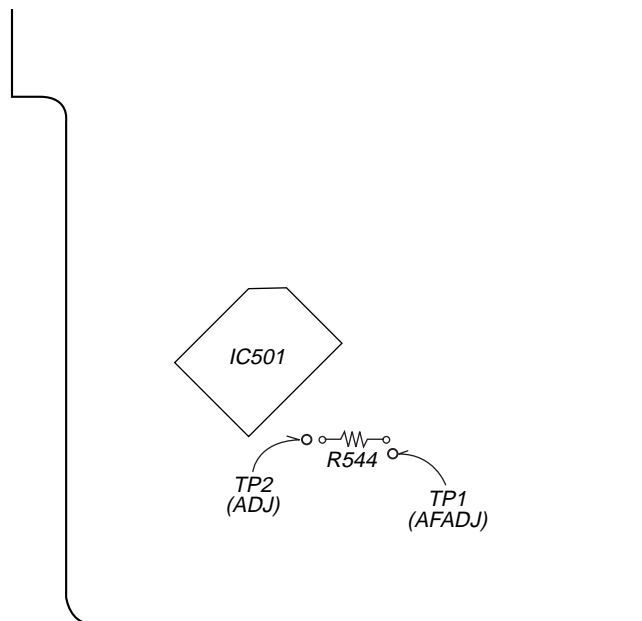


- Disconnect the lead wire of TP2 (ADJ) connected in step 2.

Adjustment Location :
[BD BOARD] – SIDE A –

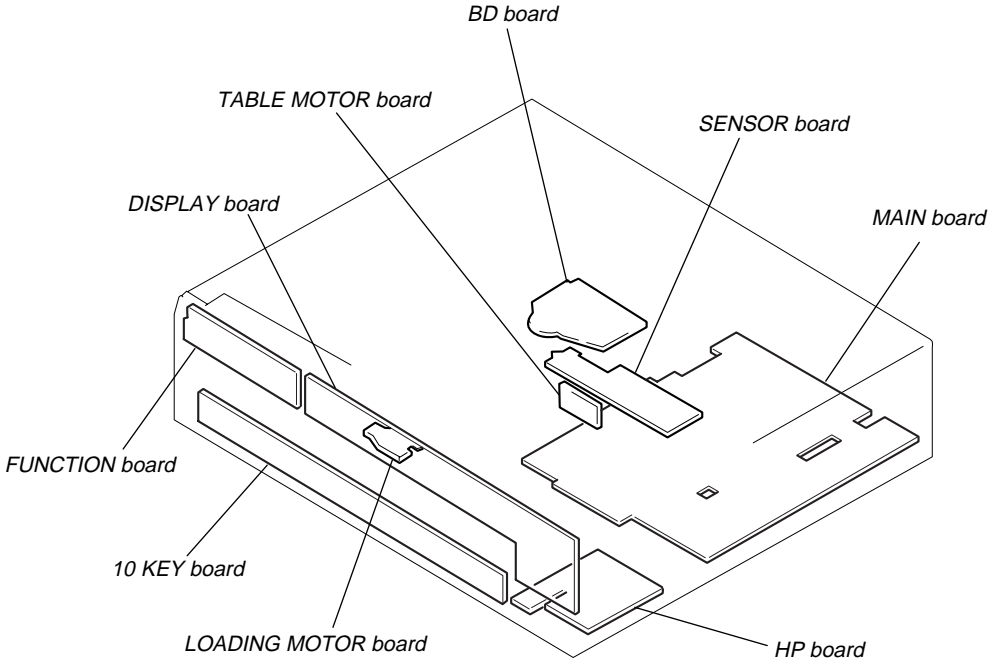


[MAIN BOARD] – CONDUCTOR SIDE –



SECTION 6 DIAGRAMS

6-1. CIRCUIT BOARDS LOCATION



THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this, the necessary note is printed in each block.)

For schematic diagrams.

Note:

- All capacitors are in μF unless otherwise noted. pF: μF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and $\frac{1}{4}\text{W}$ or less unless otherwise specified.
- \triangle : internal component.
- \square : panel designation

Note:

The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

Note:

Les composants identifiés par une marque \triangle sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- $\boxed{\text{B+}}$: B+ Line.
- $\boxed{\text{B-}}$: B- Line.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
no mark : PLAY
- * : Impossible to measure.
- Voltages are taken with a VOM (Input impedance 10 M Ω). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
 \Rightarrow : CD
 \Rightarrow : digital out

For printed wiring boards.

Note:

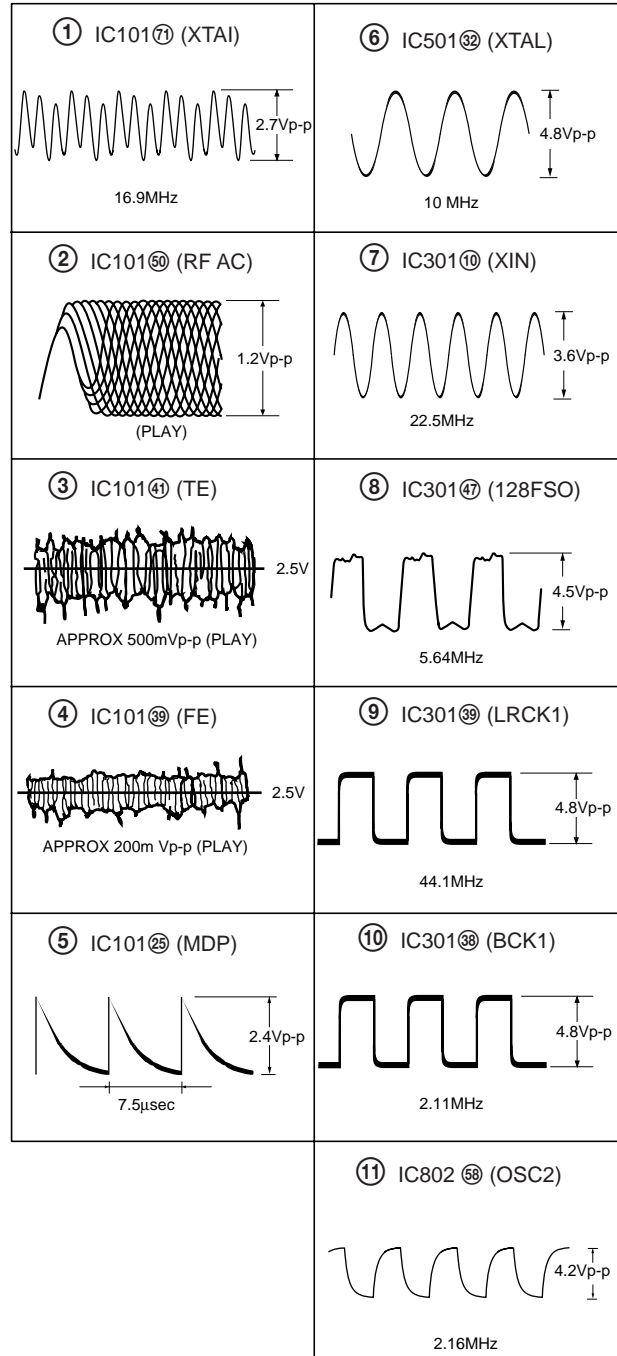
- \circ : parts extracted from the component side.
- Pattern : Pattern from the side which enables seeing.

• Indication of transistor

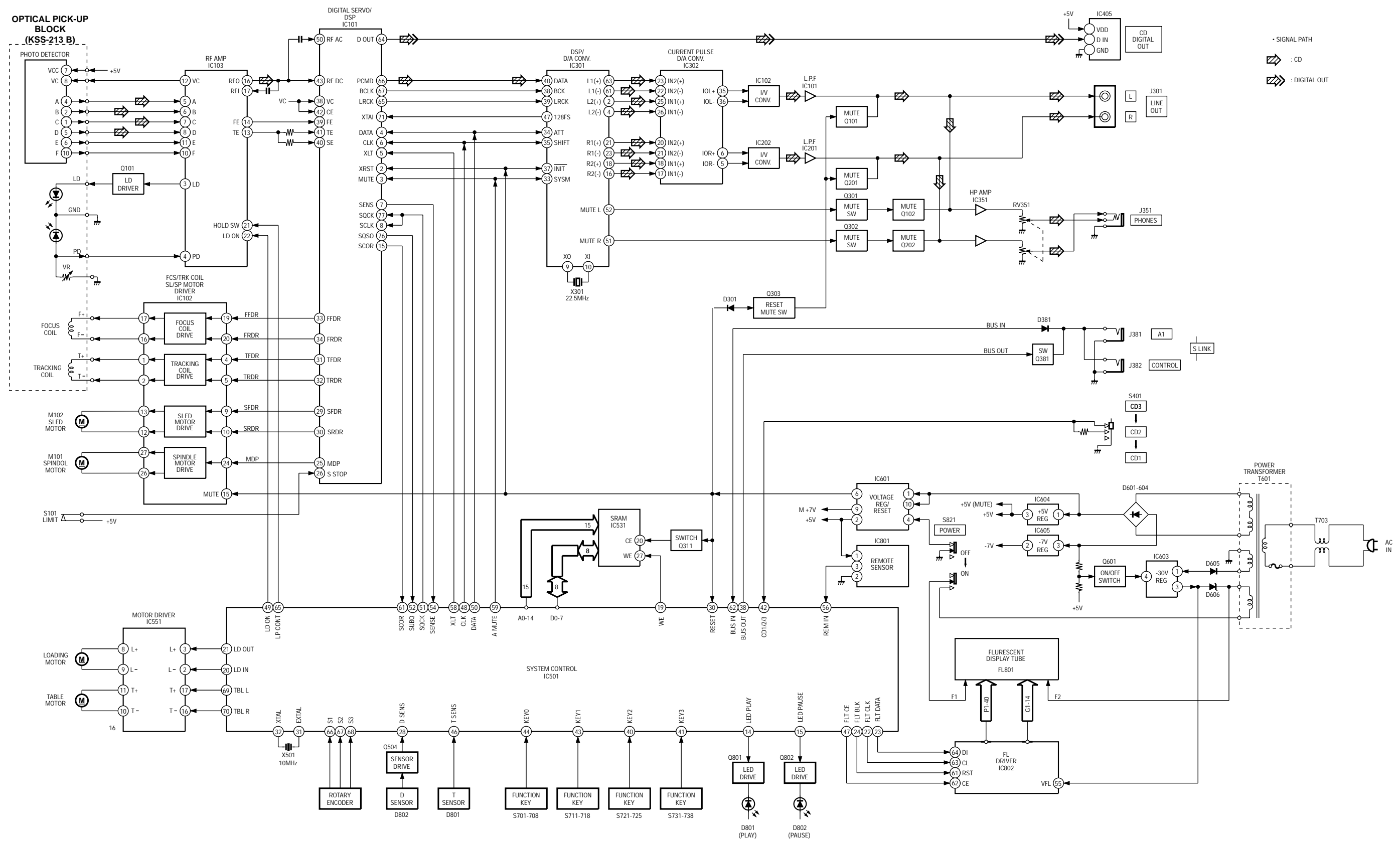


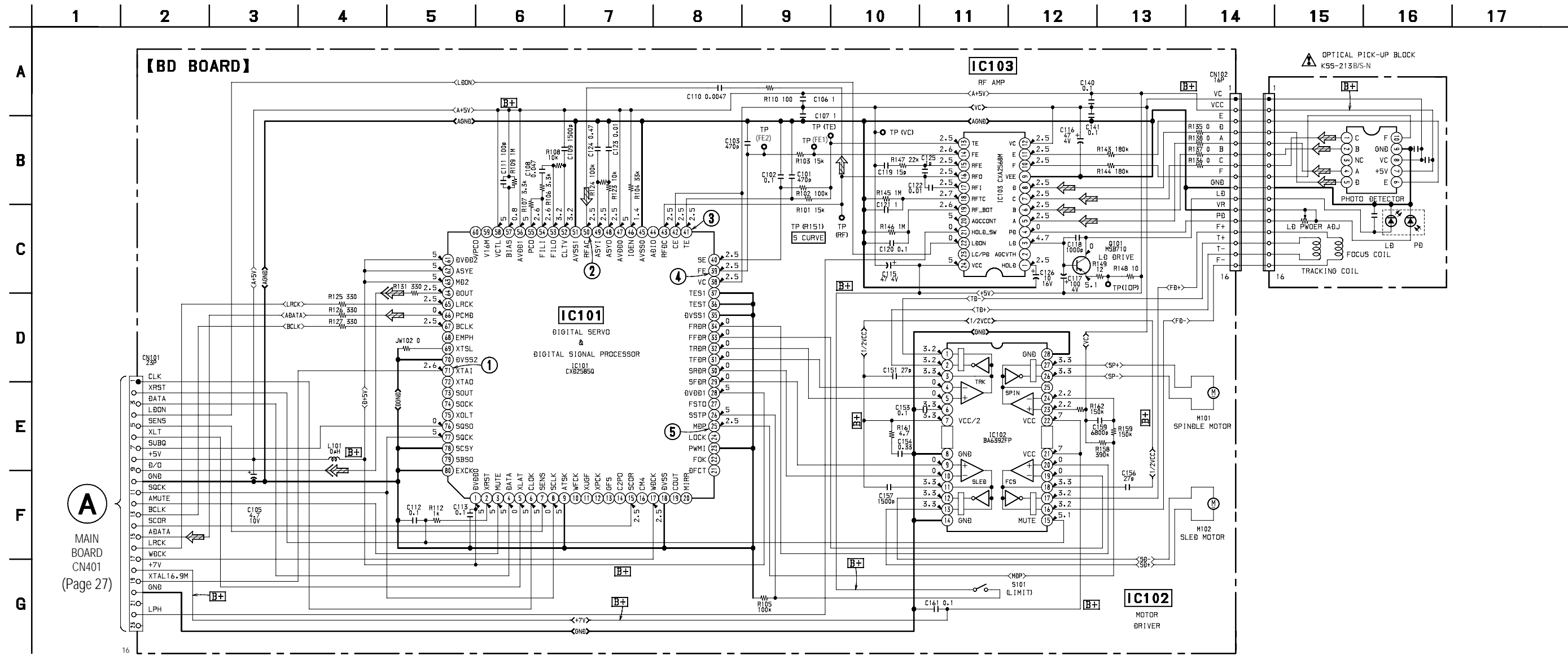
This is omitted

• Waveforms



6-2. BLOCK DIAGRAM



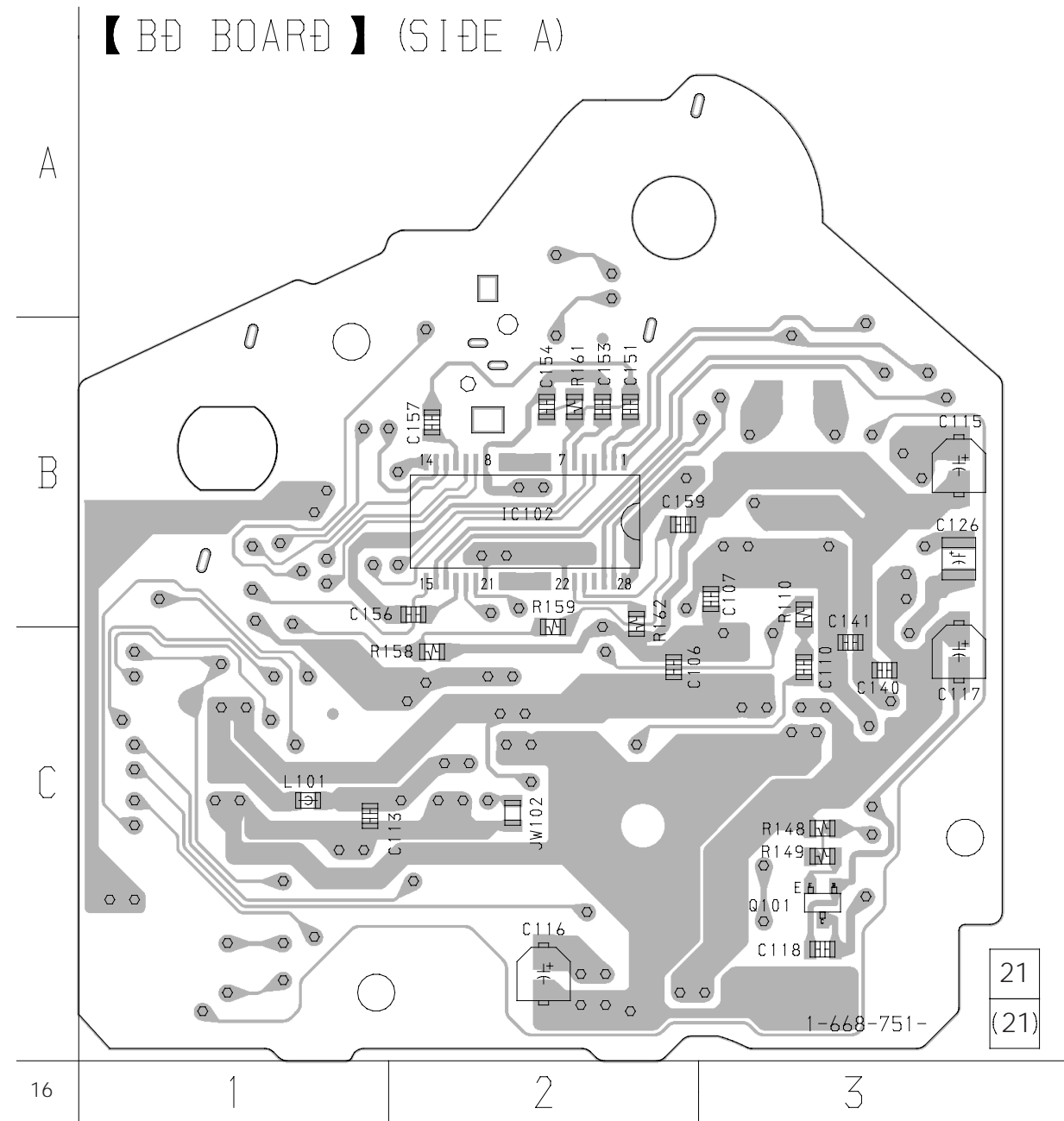


The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

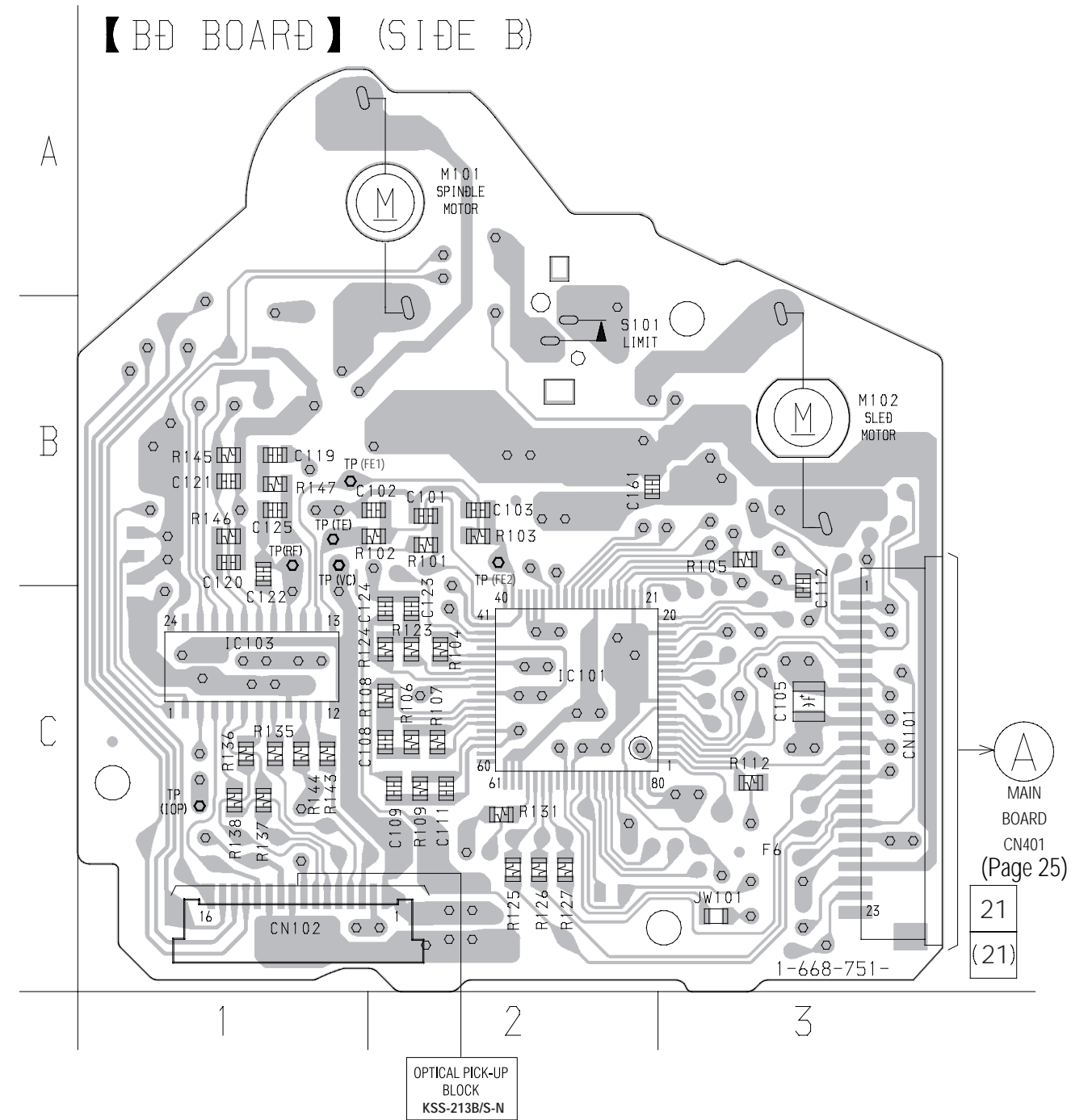
6-4. PRINTED WIRING BOARD BD SECTION

• See page 17 for Circuit Boards Location.



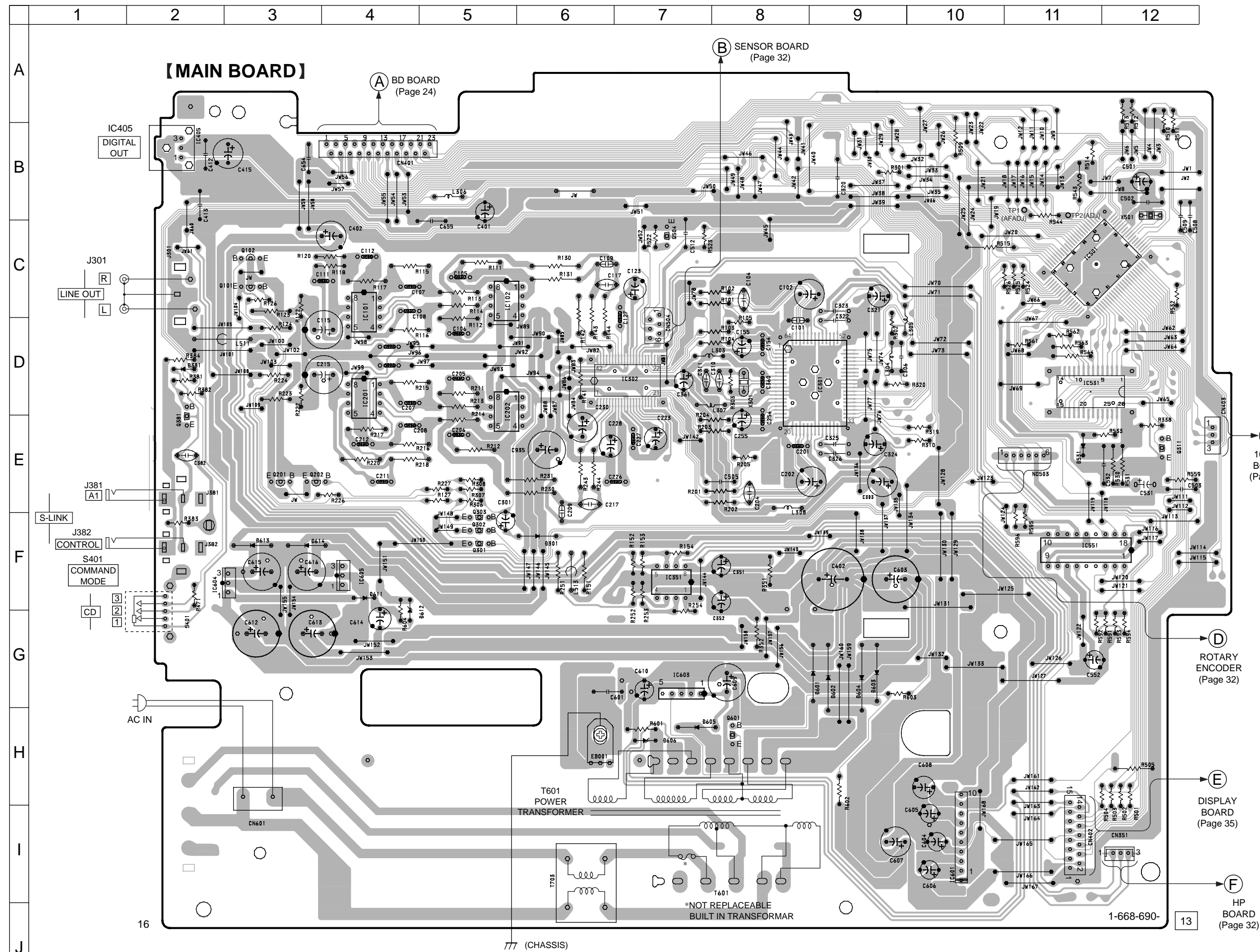
• Semiconductor Location

Ref. No.	Location
IC102	B-2
Q101	C-3



• Semiconductor Location

Ref. No.	Location
IC101	C-2
IC103	C-1



• Semiconductor Location

Ref. No.	Location
D301	F-6
D381	D-2
D531	E-11
D601	G-9
D602	G-9
D603	G-9
D604	G-9
D605	H-7
D606	H-7
D611	F-4
D612	G-4
D613	F-3
D614	F-3
IC101	C-4
IC102	C-5
IC201	D-4
IC202	D-5
IC301	D-9
IC302	D-7
IC351	F-7
IC405	B-2
IC501	C-11
IC531	D-11
IC551	F-11
IC601	I-10
IC603	G-7
IC604	F-3
IC605	F-4
Q101	C-3
Q102	C-3
Q201	E-3
Q202	E-3
Q301	F-4
Q302	F-4
Q303	F-4
Q311	E-12
Q381	E-2
Q504	C-7
Q601	H-8

A
B
C
D
E
F
G
H
I
J

1 2 3 4 5 6 7 8 9 10 11 12

【MAIN BOARD】

A BD BOARD (Page 24)

B SENSOR BOARD (Page 32)

C 10 KEY BOARD (Page 35)

D ROTARY ENCODER (Page 32)

E DISPLAY BOARD (Page 35)

F HP BOARD (Page 32)

16

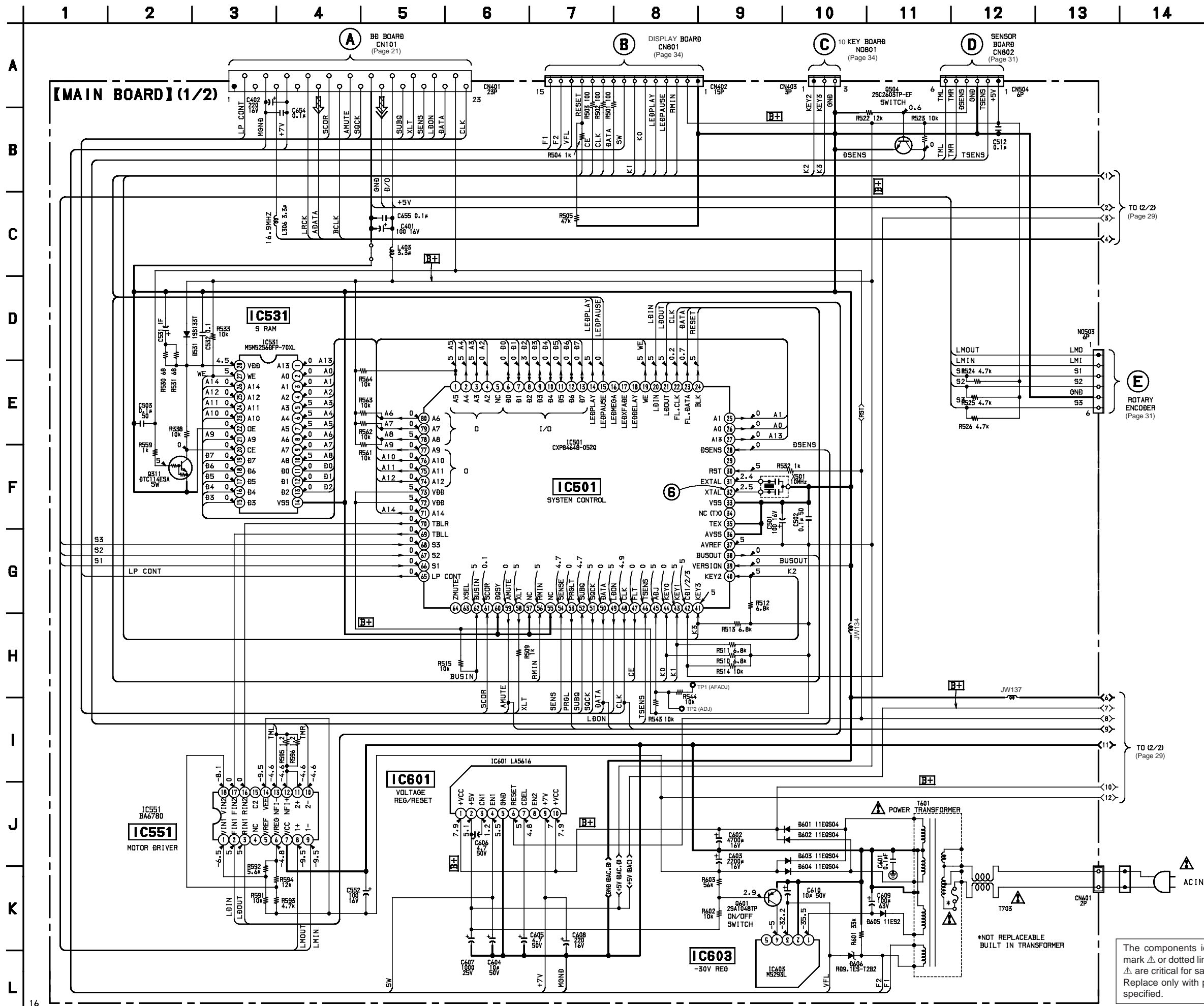
1-668-690-

13

777 (CHASSIS)

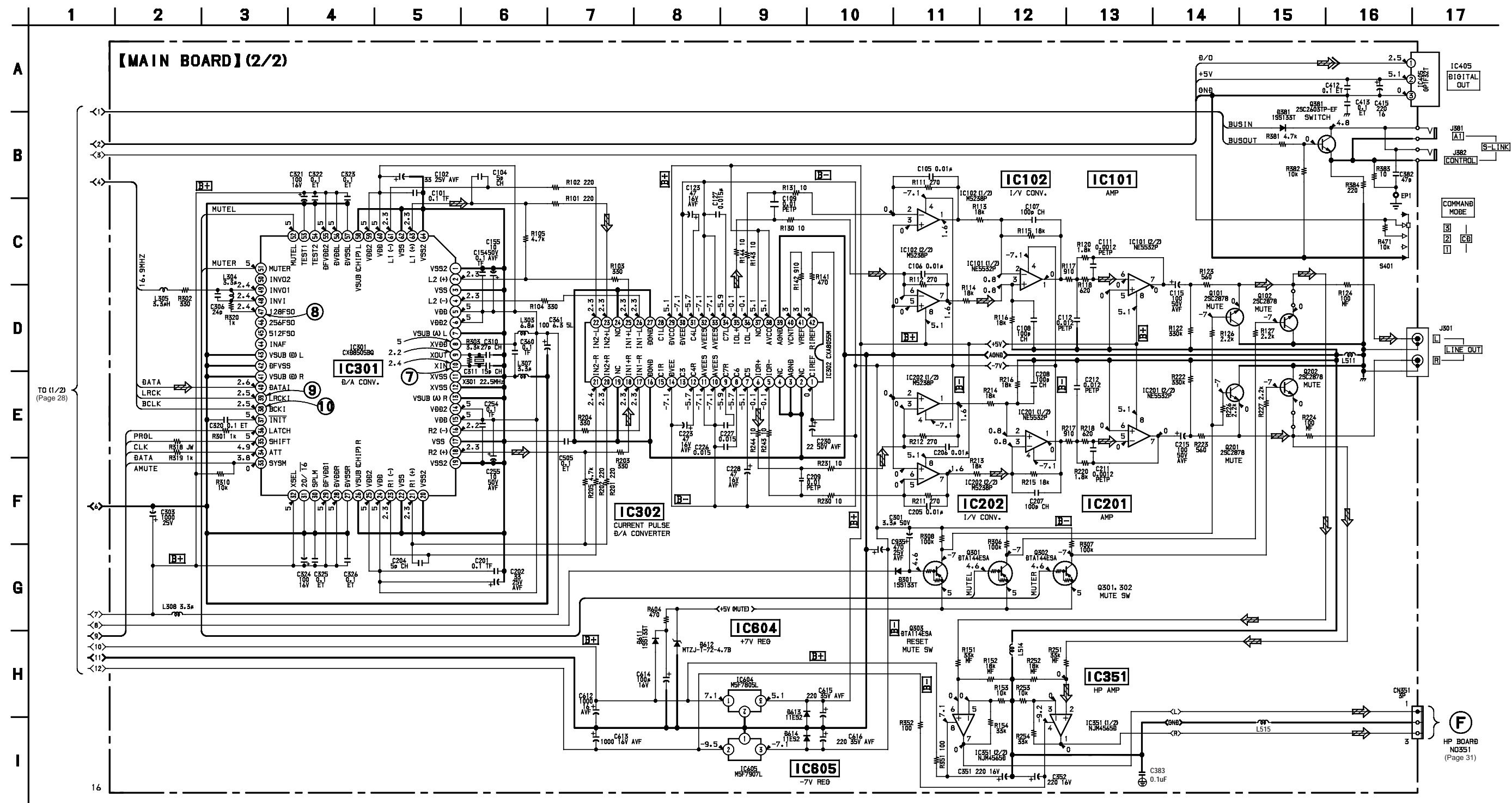
*NOT REPLACEABLE BUILT IN TRANSFORMER

6-6. SCHEMATIC DIAGRAM MAIN SECTION (1/2) • See page 38 for IC Block Diagrams. • See page 42 for IC Pin Function.

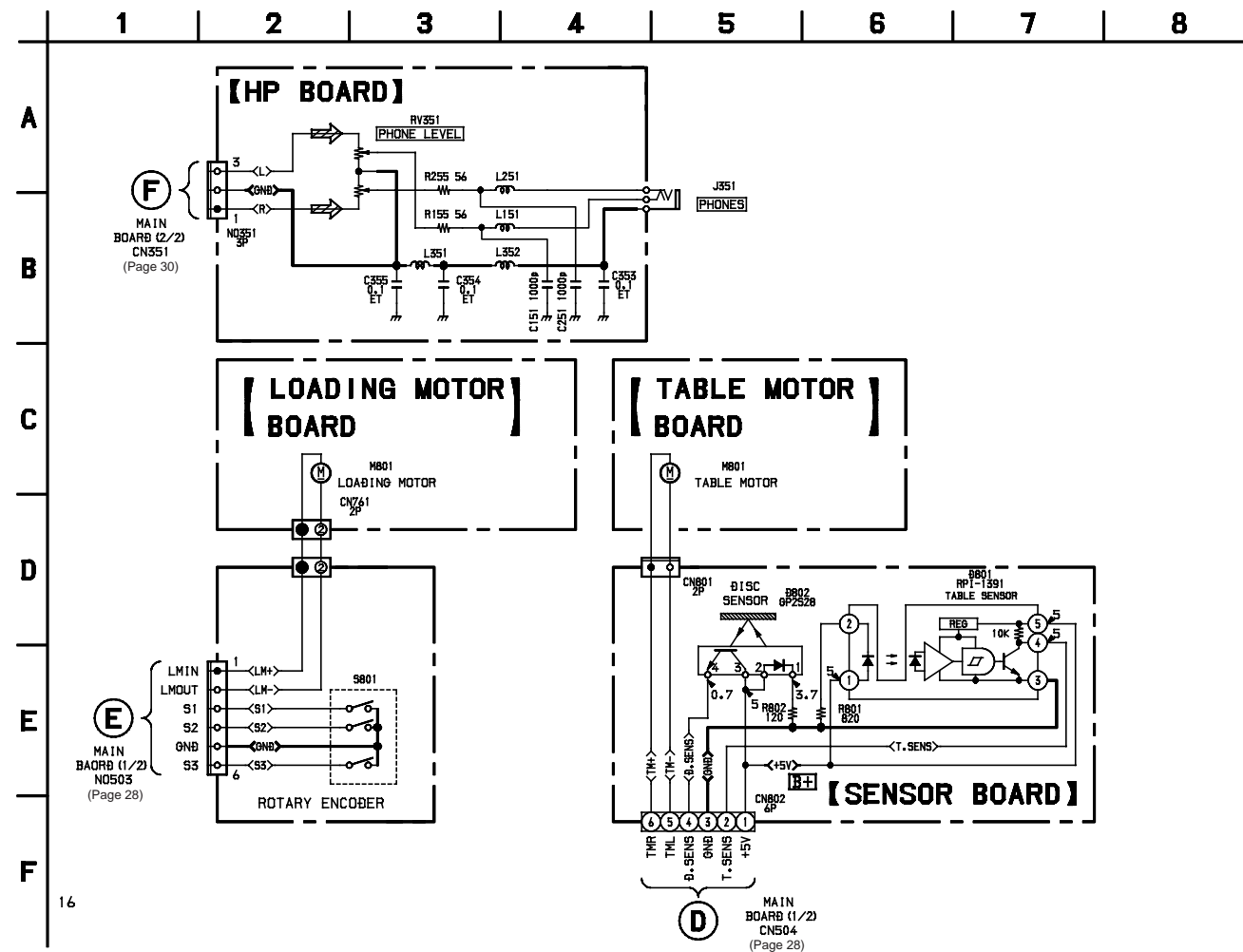


The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

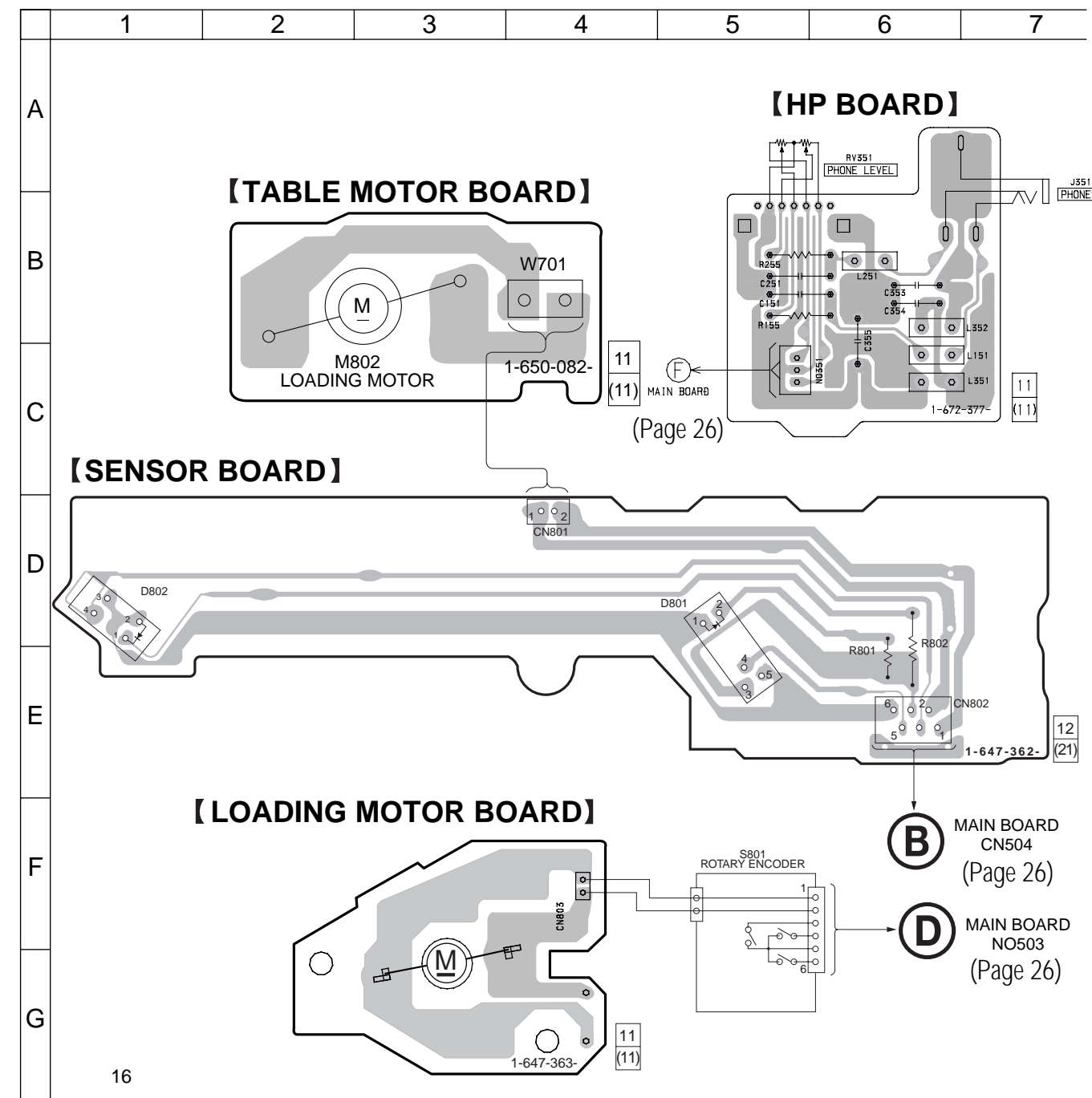


6-8. SCHEMATIC DIAGRAM HP SECTION



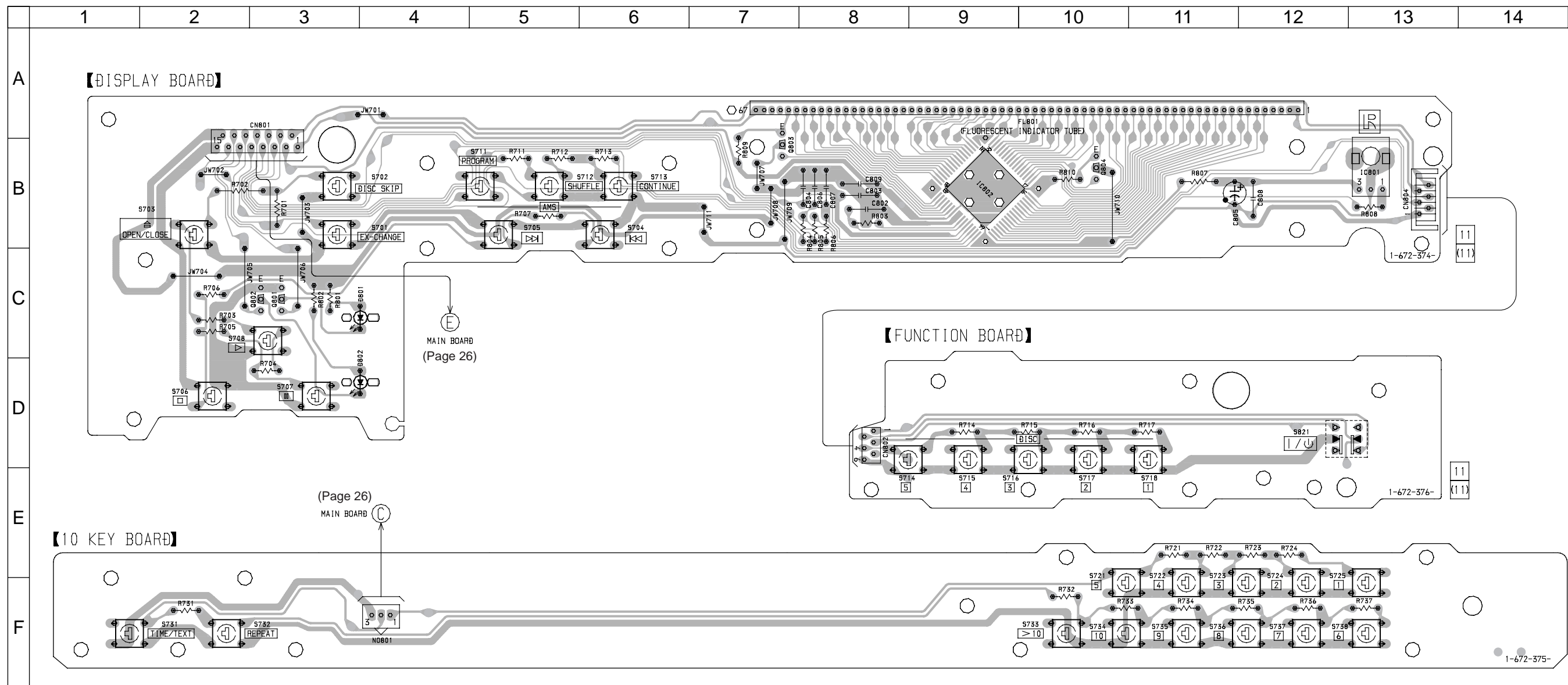
16

6-9. PRINTED WIRING BOARD HP SECTION • See page 17 for Circuit Boards Location.



16

6-11. PRINTED WIRING BOARD DISPLAY SECTION • See page 17 for Circuit Boards Location.



• Semiconductor Location

Ref. No.	Location
D801	C-3
D802	D-3
IC801	B-13
IC802	B-9
Q801	C-3
Q802	C-3
Q803	B-7
Q804	B-10

6-13. IC PIN FUNCTIONS

• IC101 DIGITAL SIGNAL PROCESSOR (CXD2585Q) (BD BOARD)

Pin No.	Pin Name	I/O	Function
1	DVDD	—	Digital power supply
2	XRST	I	System reset “L” : reset
3	MUTE	I	Muting input “H” : mute
4	DATA	I	Serial data input, supplied from CPU
5	XLAT	I	Latch input, supplied from CPU
6	CLOK	I	Serial data transfer clock input, supplied from CPU
7	SENS	O	SENS signal output to CPU
8	SCLK	I	SENS serial data read-out clock input
9	ATSK	I/O	Input pin for anti-shock (Connected to ground)
10	WFCK	O	WFCK output (Not used)
11	XUGF	O	Not used
12	XPCK	O	Not used
13	GFS	O	Not used
14	C2PO	O	Not used
15	SCOR	O	Sub-code sync output
16	CM4	O	4.2336 MHz output (Not used)
17	WDCK	O	Word clock output ($f = 2Fs$)
18	DVSS	—	Digital ground
19	COUT	I/O	Numbers of track counted signal input/output (Not used)
20	MIRR	I/O	Mirror signal input/output
21	DFCT	I/O	Defect signal input/output
22	FOK	I/O	Focus OK input/output
23	PWMI	I	Spindle motor external control input (Connected to ground)
24	LOCK	I/O	GFS is sampled by 460 Hz. H when GFS is H (Not used)
25	MDP	O	Output to control spindle motor servo
26	SSTP	I	Input signal to detect disc inner most track
27	FSTO	O	2/3 divider output of pin 71
28	DVDD1	—	Digital power supply
29	SFDR	O	Sled drive output
30	SRDR	O	Sled drive output
31	TFDR	O	Tracking drive output
32	TRDR	O	Tracking drive output
33	FFDR	O	Focus drive output
34	FRDR	O	Focus drive output
35	DVSS1	—	Digital ground
36	TEST	I	TEST pin connected normally to ground
37	TES1	I	TEST pin connected normally to ground
38	VC	I	Center voltage input pin
39	FE	I	Focus error signal input
40	SE	I	Sled error signal input

• Abbreviation

GFS : Guarded Frame Sync

Pin No.	Pin Name	I/O	Function
41	TE	I	Tracking error signal input
42	CE	I	Center servo analog input
43	RFDC	I	RF signal input
44	ADIO	O	Test pin (Not used)
45	AVSS0	—	Analog ground
46	IGEN	I	Stabilized current input for operational amplifiers
47	AVDD0	—	Analog power supply
48	ASYO	O	EFM full swing output
49	ASYI	I	Asymmetry compare voltage input
50	RFAC	I	EFM signal input
51	AVSS1	—	Analog ground
52	CLTV	I	Control voltage input for master VCO1
53	FILO	O	Filter output for master PLL
54	FILI	I	Filter input for master PLL
55	PCO	O	Charge-pump output for master PLL
56	AVDD1	—	Analog power supply
57	BIAS	I	Asymmetry circuit constant current input
58	VCTL	I	VCO2 control voltage input for wide band EFM PLL (Connected to VDD)
59	V16M	I/O	VCO2 oscillator input/output for wide band EFM PLL (Not used)
60	VPCO	O	Charge-pump output for wide band EFM PLL (Not used)
61	DVDD2	—	Digital power supply
62	ASYE	I	Asymmetry circuit ON/OFF input “L” OFF, “H” : ON (Connected to VDD)
63	MD2	I	Digital-out ON/OFF control input (Connected to VDD)
64	DOUT	O	Digital-out output pin
65	LRCK	O	D/A interface LR clock output ($f = F_s$)
66	PCMD	O	D/A interface serial data output
67	BCLK	O	D/A interface bit clock output
68	EMPH	O	Playback disc output in emphasis mode (Not used)
69	XTSL	I	X'tal selection input (Connected to ground)
70	DVSS2	—	Digital ground
71	XTAI	I	X'tal oscillator circuit input
72	XTAO	O	X'tal oscillator circuit output (Not used)
73	SOUT	O	Serial data output in servo block (Not used)
74	SOCK	O	Serial data read clock output in servo block (Not used)
75	XOLT	O	Serial data latch output in servo block (Not used)
76	SQSO	O	Sub-Q 80-bit and PCM peak level data output (CD text data output)
77	SQCK	I	Clock input for SQSO read-out
78	SCSY	I	Connected to ground
79	SBSO	O	Sub-P through Sub-W serial output (Not used)
80	EXCK	I	Clock input for SBSO read-out (Connected to ground)

- Abbreviation

EFM : Eight to Fourteen Modulation

PLL : Phase Locked Loop

• IC501 SYSTEM CONTROL (CXP84648-052Q) (MAIN BOARD)

Pin No.	Pin Name	I/O	Function
1	A5	O	SRAM address 5
2	A4	O	SRAM address 4
3	A3	O	SRAM address 3
4	A2	O	SRAM address 2
5	NC	—	Not used
6	D0	I/O	SRAM data 0
7	D1	I/O	SRAM data 1
8	D2	I/O	SRAM data 2
9	D3	I/O	SRAM data 3
10	D4	I/O	SRAM data 4
11	D5	I/O	SRAM data 5
12	D6	I/O	SRAM data 6
13	D7	I/O	SRAM data 7
14	PLAY_L	O	PLAY lamp
15	PAUSE_L	O	PAUSE lamp
16	LED MEGA	—	Not used
17	LED XFADE	—	Not used
18	LED DELAY	—	Not used
19	WE	O	SRAM enable
20	LODIN	I	Loading direction signal input
21	LODOUT	O	Loading direction signal output
22	FLCLK	O	Display clock
23	FLDATA	O	Display data
24	BLK	O	Display reset
25	A1	O	SRAM address 1
26	A0	O	SRAM address 0
27	A13	O	SRAM address 13
28	D_SENS	I	Disc exist/non-exist sensor
29	NC	—	Not used
30	RESET	I	Microprocessor reset
31	10MHz	—	Ceramic oscillator
32	10MHz	—	Ceramic oscillator
33	GND	—	Ground (0V)
34	NC	—	Not used
35	TEX	—	Ground (0V)
36	AVSS	—	Ground (0V)
37	AVREF	—	Reference voltage for AV converter. Fixed to VDD
38	BUSOUT	O	Control A1 output
39	VERSION	—	Ground (0V)
40	KEY2	I	Key input 2

Pin No.	Pin Name	I/O	Function
41	KEY3	I	Key input 3
42	CD123	I	Command mode switch
43	KEY1	I	Key input 1
44	KEY0	I	Key input 0
45	ADJ	I	ADJ input from keys and CDs
46	T_SENS	I	Table sensor
47	FLT	O	Display latch
48	CLK	O	Command clock
49	LDON	O	Laser diode ON
50	DATA	O	Command data
51	SQCLK	O	Sub-Q clock
52	SUBQ	I	Sub-Q data
53	PRGL	O	Digital filter latch
54	SENSE	I	Sense
55	NC	—	Not used
56	RMIN	I	Command latch
57	NC	—	Not used
58	XLT	O	Remote control signal input
59	AMUTE	O	Audio system mute
60	DQSY	—	Ground (0V)
61	SCOR	I	Sub-Q sync signal
62	BUSIN	I	Control-A input
63	XSEL	O	Not used
64	SMUTE	O	Not used
65	LP CONT	O	LP control output
66	S1	I	Rotary encoder S1 input
67	S2	I	Rotary encoder S2 input
68	S3	I	Rotary encoder S3 input
69	TBLL	O	Rotation direction of table-L
70	TBLR	O	Rotation direction of table-R
71	A14	O	SRAM address 14
72	+5V	—	Microprocessor power supply (5V)
73	+5V	—	Microprocessor power supply (5V)
74	A12	O	SRAM address 12
75	A11	O	SRAM address 11
76	A10	O	SRAM address 10
77	A9	O	SRAM address 9
78	A8	O	SRAM address 8
79	A7	O	SRAM address 7
80	A6	O	SRAM address 6

SECTION 7 EXPLODED VIEWS

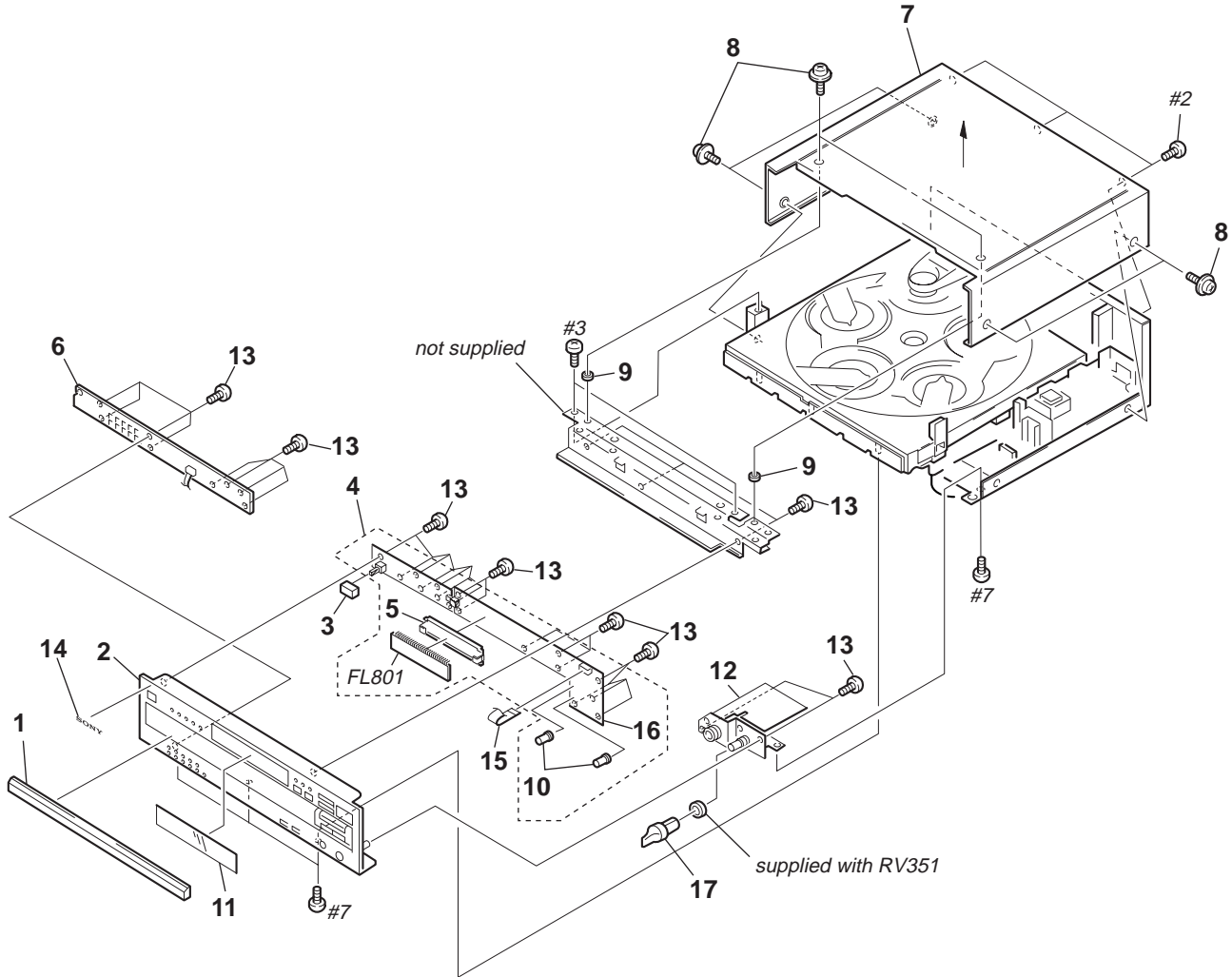
NOTE:

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked “*” are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list and accessories and packing materials are given in the last of this parts list.
- Abbreviation
CND : Canadian model

The components identified by mark \triangle or dotted line with mark \triangle are critical for safety. Replace only with part number specified.

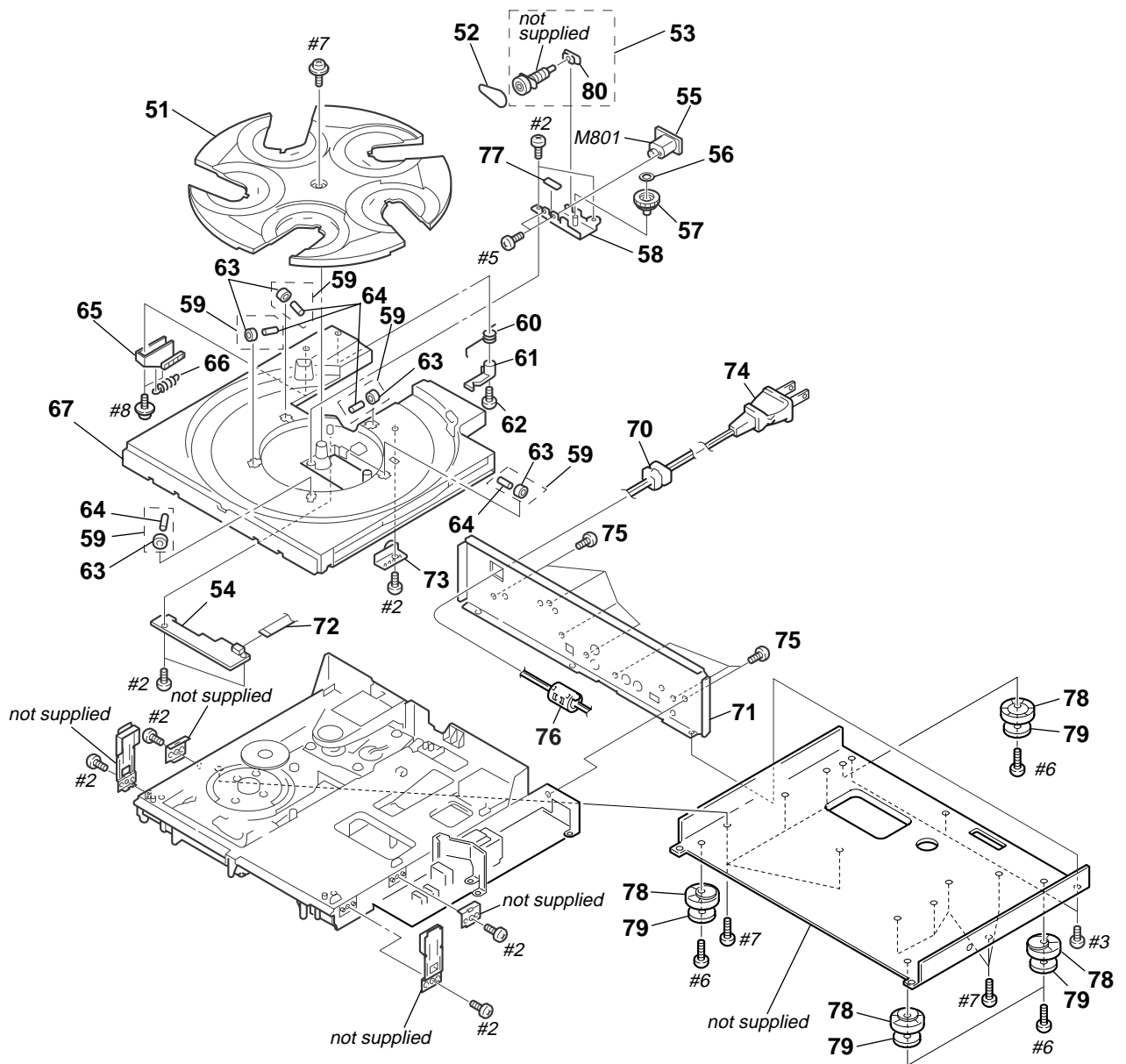
Les composants identifiés par une marque \triangle sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

7-1. FRONT PANEL AND CASE SECTION



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	4-999-508-11	PANEL, LOADING		10	3-362-478-11	HOLDER (T), LED	
2	X-4950-594-1	PANEL ASSY, FRONT		11	4-973-968-01	PLATE, INDICATION	
3	4-922-921-71	BUTTON (POWER)		12	1-672-377-11	HP BOARD	
4	1-672-376-11	FUNCTION BOARD		13	4-951-620-01	SCREW (2.6 x 8), +BVTP	
5	4-996-841-01	HOLDER (FL)		14	4-942-568-41	EMBLEM (NO.5), SONY	
6	1-672-375-11	10 KEY BOARD		15	1-769-456-11	WIRE (FLAT TYPE) (15 CORE)	
* 7	4-972-223-21	CASE		16	A-4724-543-A	DISPLAY BOARD, COMPLETE	
8	3-710-901-11	SCREW, TAPPING		17	4-950-189-01	KNOB (A) (VOL)	
9	4-949-302-81	WASHER		FL801	1-517-664-11	INDICATOR TUBE, FLUORESCENT	

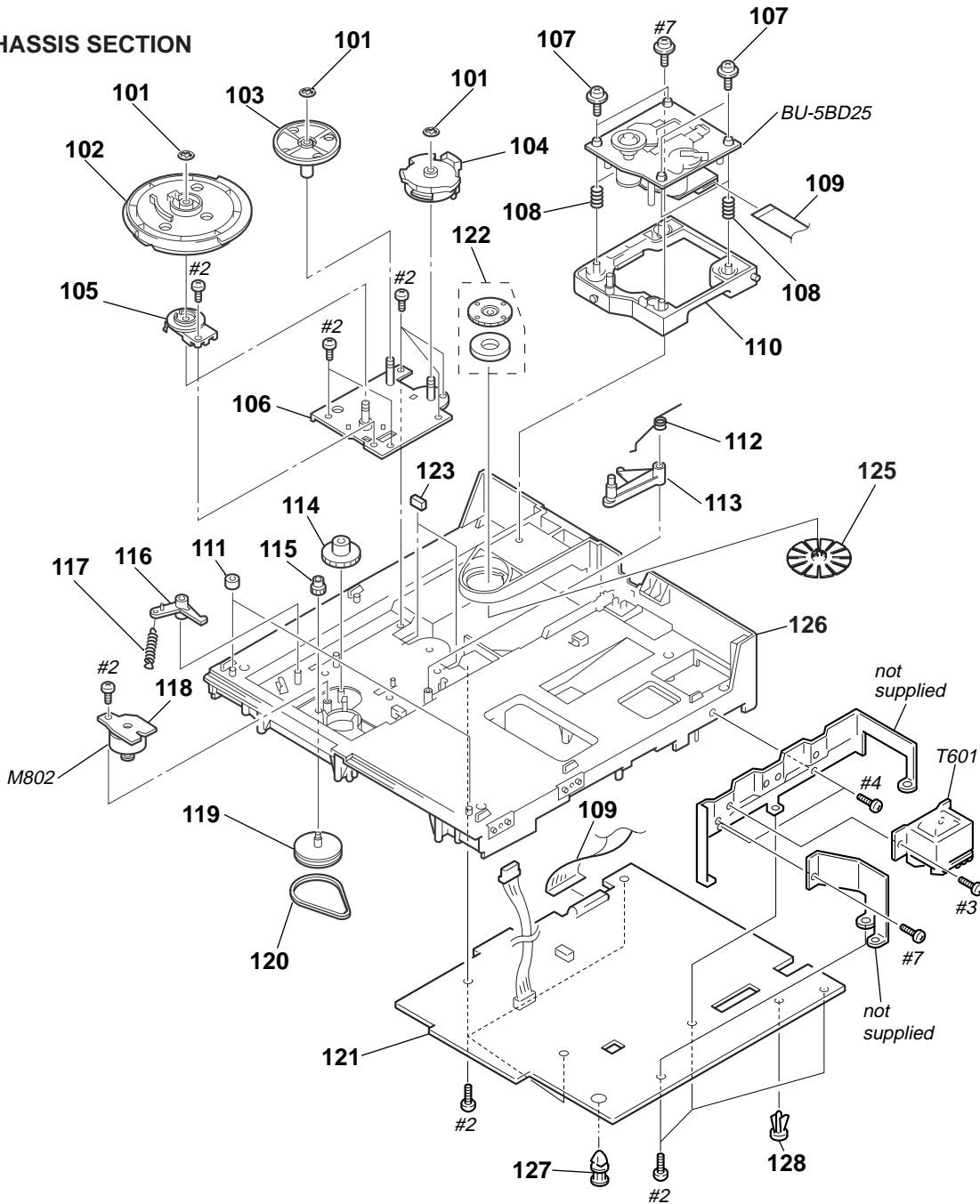
7-2. BACK PANEL AND DISC TABLE SECTION



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
* 51	4-957-299-41	TABLE (B), DISC		* 67	4-957-298-41	TABLE (A), DISC	
52	4-957-304-01	BELT (RM)		* 70	3-703-244-00	BUSHING (2104), CORD	
53	X-4943-479-1	GEAR (ROTARY A) ASSY		71	4-998-478-62	BACK, PANEL	
54	1-647-362-11	SENSOR BOARD		* 71	4-998-478-72	BACK, PANEL	
55	1-650-082-11	TABLE MOTOR BOARD		72	1-751-052-11	WIRE (FLAT TYPE) (6 CORE)	
56	3-325-697-21	WASHER		73	X-4944-129-1	BRACKET (ROLLER D) ASSY	
57	4-957-284-01	GEAR (ROTARY B)		△ 74	1-575-042-21	CORD, POWER(CND)	
58	X-4944-128-1	BRACKET (RM) ASSY		△ 74	1-783-531-31	CORD, POWER(US)	
* 59	X-4924-457-1	ROLLER ASSY		75	3-704-515-21	SCREW (BV/RING)	
60	4-957-293-11	SPRING (RACK RELEASE)		76	1-500-386-11	FILTER, CLAMP (FERRITE CORE)	
61	4-957-291-11	LEVER (RACK RELEASE)		* 77	4-957-295-11	CUSHION (RM)	
62	4-957-868-11	SCREW (+PTPWH 2.6 × 20)		78	4-970-123-01	FOOT (F50180S)	
63	4-988-162-01	ROLLER		79	4-970-124-01	CUSHION (F50180S)	
64	4-934-376-01	SHAFT (ROLLER)		* 80	4-957-278-01	BEARING (ROTARY A)	
65	4-957-292-11	SLIDER (RACK)		M801	A-4660-525-A	MOTOR ASSY, ROTARY	
66	4-957-294-11	SPRING (D.T), TENSION					

<p>The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.</p>	<p>Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.</p>
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7-3. CHASSIS SECTION

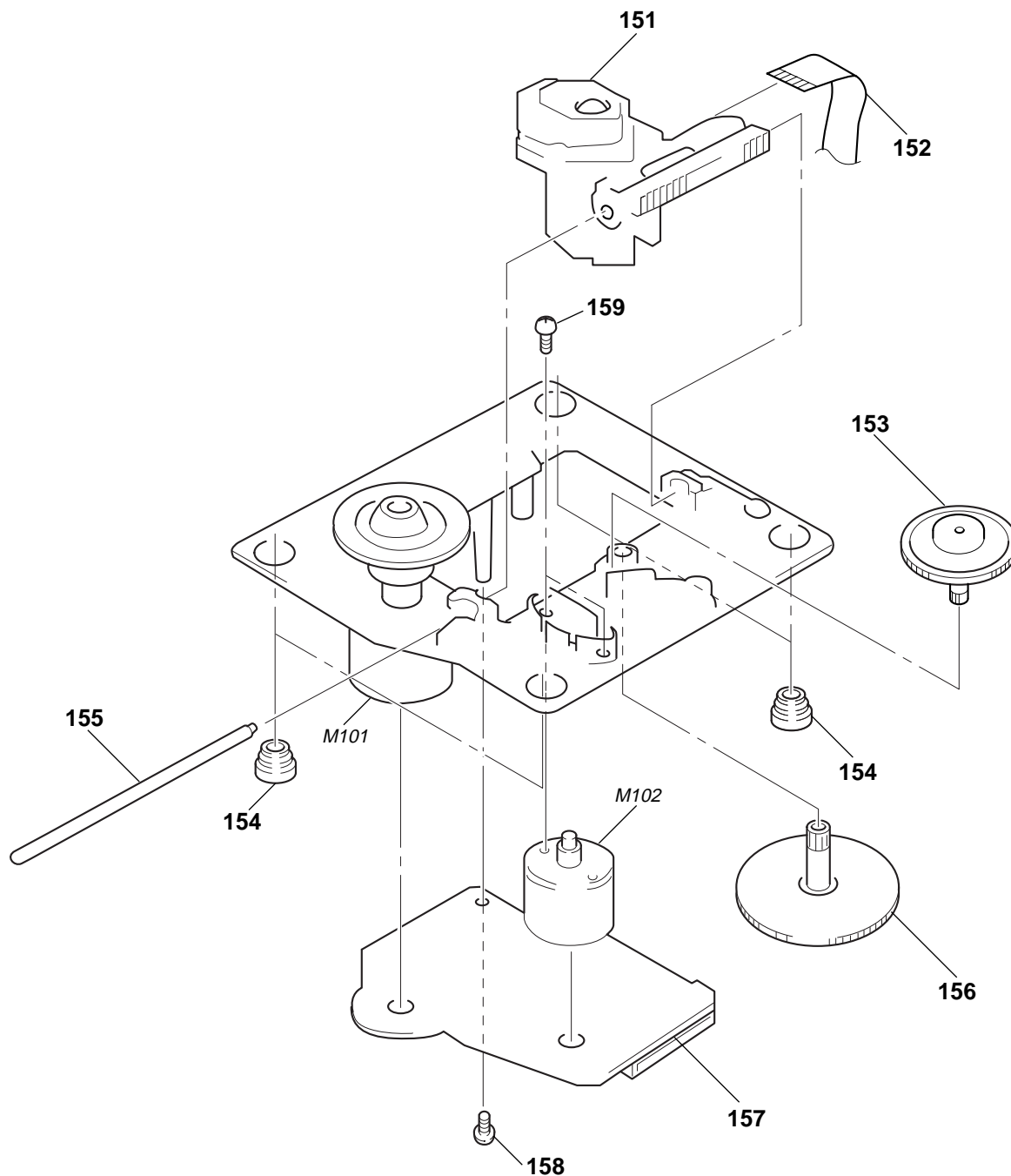


Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
101	4-957-283-11	WASHER (5), STOPPER		115	4-934-375-01	GEAR (LOADING B)	
102	4-957-288-01	GEAR (MAIN)		116	4-957-285-11	LEVER, SET	
103	4-957-287-01	GEAR (REV)		117	4-962-087-01	SPRING (S), TENSION	
104	4-957-286-11	GEAR (U/D)		118	1-647-363-11	LOADING MOTOR BOARD	
105	1-466-996-11	ENCODER, ROTARY		119	X-4941-529-1	PULLEY ASSY	
106	X-4944-127-1	BRACKET (GEAR) ASSY		120	4-944-490-01	BELT (TIMING)	
107	4-933-134-01	SCREW (+PTPWH M2.6 × 6)		121	A-4724-655-A	MAIN BOARD, COMPLETE	
108	4-948-503-01	SPRING (BU), COMPRESSION		122	1-452-925-21	MAGNET ASSY	
109	1-765-443-11	WIRE (FLAT TYPE) (23 CORE)		* 123	3-385-783-01	CUSHION, FOAM RUBBER	
* 110	4-957-289-12	HOLDER (BU)		125	4-993-142-21	PULLEY (L), PRESS	
* 111	4-951-619-01	CUSHION (A)		126	4-957-300-03	CHASSIS	
112	4-957-281-11	SPRING (LOCK LEVER)		127	3-682-057-01	SPACER (SMALL)	
113	4-957-279-11	LEVER, LOCK		128	3-531-576-11	RIVET	
114	4-957-303-01	GEAR (LOADING C)		M802	A-4604-847-A	MOTOR ASSY, LOADING	
				△ T601	1-429-499-11	TRANSFORMER, POWER	

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

7-4. BASE UNIT SECTION (BU-5BD25)



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
△ 151	8-848-379-31	DEVICE, OPTICAL KSS-213B/S-N		156	4-917-564-01	GEAR (P), FLATNESS	
152	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)		* 157	A-4724-002-A	BD (A) BOARD, COMPLETE	
153	4-917-567-01	GEAR (M)		159	3-713-786-51	SCREW +P 2×3	
154	4-951-940-01	INSULATOR (BU)		M101	X-4917-523-4	MOTOR ASSY(SPINDELE)	
155	4-917-565-01	SHAFT, SLED		M102	X-4917-504-1	MOTOR ASSY(SLED)	

<p>The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.</p>	<p>Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.</p>
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SECTION 8 ELECTRICAL PARTS LIST

NOTE:

When indicating parts by reference number, please include the board name.

The components identified by mark Δ or dotted line with mark Δ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- Abbreviation
CND : Canadian model

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
uF: μ F
- RESISTORS
All resistors are in ohms.
METAL: metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F: nonflammable
- COILS
uH: μ H
- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A..., uPA..., μ PA...,
uPB..., μ PB..., uPC..., μ PC...,
uPD..., μ PD...

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
	1-672-375-11	10 KEY BOARD *****					
		< RESISTOR >					
R721	1-249-415-11	CARBON 680	5% 1/4W F	C112	1-163-038-91	CERAMIC CHIP 0.1uF	25V
R722	1-249-417-11	CARBON 1K	5% 1/4W F	C113	1-163-038-91	CERAMIC CHIP 0.1uF	25V
R723	1-249-419-11	CARBON 1.5K	5% 1/4W F	C115	1-126-607-11	ELECT CHIP 47uF	20% 4V
R724	1-249-421-11	CARBON 2.2K	5% 1/4W F	C116	1-126-607-11	ELECT CHIP 47uF	20% 4V
R731	1-249-415-11	CARBON 680	5% 1/4W F	C117	1-126-209-11	ELECT CHIP 100uF	20% 4V
R732	1-249-417-11	CARBON 1K	5% 1/4W F	C118	1-163-275-11	CERAMIC CHIP 0.001uF	5% 50V
R733	1-249-419-11	CARBON 1.5K	5% 1/4W F	C119	1-163-231-11	CERAMIC CHIP 15PF	5% 50V
R734	1-249-421-11	CARBON 2.2K	5% 1/4W F	C120	1-164-004-11	CERAMIC CHIP 0.1uF	10% 25V
R735	1-247-843-11	CARBON 3.3K	5% 1/4W	C121	1-109-982-11	CERAMIC CHIP 1uF	10% 10V
R736	1-249-427-11	CARBON 6.8K	5% 1/4W F	C122	1-163-021-91	CERAMIC CHIP 0.01uF	10% 50V
R737	1-249-431-11	CARBON 15K	5% 1/4W	C123	1-163-021-91	CERAMIC CHIP 0.01uF	10% 50V
		< SWITCH >		C124	1-164-005-11	CERAMIC CHIP 0.47uF	25V
S721	1-554-303-21	SWITCH, TACTILE(5)		C125	1-163-217-11	CERAMIC CHIP 1PF	0.25PF 50V
S722	1-554-303-21	SWITCH, TACTILE(4)		C126	1-135-216-11	TANTALUM CHIP 10uF	20% 10V
S723	1-554-303-21	SWITCH, TACTILE(3)		C140	1-163-038-91	CERAMIC CHIP 0.1uF	25V
S724	1-554-303-21	SWITCH, TACTILE(2)		C141	1-163-038-91	CERAMIC CHIP 0.1uF	25V
S725	1-554-303-21	SWITCH, TACTILE(1)		C151	1-163-237-11	CERAMIC CHIP 27PF	5% 50V
S731	1-554-303-21	SWITCH, TACTILE(TIME/TEXT)		C153	1-163-038-91	CERAMIC CHIP 0.1uF	25V
S732	1-554-303-21	SWITCH, TACTILE(REPEAT)		C154	1-164-336-11	CERAMIC CHIP 0.33uF	25V
S733	1-554-303-21	SWITCH, TACTILE(>10)		C156	1-163-237-11	CERAMIC CHIP 27PF	5% 50V
S734	1-554-303-21	SWITCH, TACTILE(10)		C157	1-163-145-00	CERAMIC CHIP 0.0015uF	5% 50V
S735	1-554-303-21	SWITCH, TACTILE(9)		C159	1-163-019-00	CERAMIC CHIP 0.0068uF	10% 50V
S736	1-554-303-21	SWITCH, TACTILE(8)		C161	1-163-038-91	CERAMIC CHIP 0.1uF	25V
S737	1-554-303-21	SWITCH, TACTILE(7)				< CONNECTOR >	
S738	1-554-303-21	SWITCH, TACTILE(6)		CN101	1-770-072-11	CONNECTOR, (LIF(NON-ZIF))FFC23P	
		*****		CN102	1-770-014-11	CONNECTOR, FFC/FPC 16P	
*	A-4724-002-A	BD BOARD, COMPLETE *****		CN102	1-777-937-11	CONNECTOR, FFC/FPC 16P	
		< CAPACITOR >				< IC >	
C101	1-163-005-11	CERAMIC CHIP 470PF	10% 50V	IC101	8-752-389-34	IC CXD2585Q	
C102	1-163-038-91	CERAMIC CHIP 0.1uF	25V	IC102	8-759-455-91	IC BA6392FP-E2	
C103	1-163-005-11	CERAMIC CHIP 470PF	10% 50V	IC103	8-752-085-51	IC CXA2568M-T6	
C105	1-135-155-21	TANTALUM CHIP 4.7uF	10% 16V			< JUMPER RESISTOR >	
C106	1-164-346-11	CERAMIC CHIP 1uF	16V	JW102	1-216-295-91	SHORT 0	
C107	1-164-346-11	CERAMIC CHIP 1uF	16V			< COIL >	
C108	1-163-035-00	CERAMIC CHIP 0.047uF	50V	L101	1-414-234-22	INDUCTOR CHIP 0uH	
C109	1-163-145-00	CERAMIC CHIP 0.0015uF	5% 50V			< TRANSISTOR >	
C110	1-163-017-00	CERAMIC CHIP 0.0047uF	5% 50V	Q101	8-729-010-08	TRANSISTOR MSB710-R	
C111	1-163-251-11	CERAMIC CHIP 100PF	5% 50V			< RESISTOR >	
				R101	1-216-077-00	METAL CHIP 15K	5% 1/10W
				R102	1-216-097-91	RES,CHIP 100K	5% 1/10W
				R103	1-216-077-00	METAL CHIP 15K	5% 1/10W
				R104	1-216-085-00	METAL CHIP 33K	5% 1/10W
				R105	1-216-097-91	RES,CHIP 100K	5% 1/10W

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
R106	1-216-061-00	METAL CHIP	3.3K 5% 1/10W			< INDICATOR TUBE >	
R107	1-216-061-00	METAL CHIP	3.3K 5% 1/10W				
R108	1-216-073-00	METAL CHIP	10K 5% 1/10W				
R109	1-216-121-91	RES,CHIP	1M 5% 1/10W	FL801	1-517-664-11	INDICATOR TUBE, FLUORESCENT	
R110	1-216-025-91	RES,CHIP	100 5% 1/10W			< IC >	
R112	1-216-049-91	RES,CHIP	1K 5% 1/10W	IC801	8-759-459-86	IC NJL64H400A	
R123	1-216-073-00	METAL CHIP	10K 5% 1/10W	IC802	8-759-337-52	IC LC75721E	
R124	1-216-097-91	RES,CHIP	100K 5% 1/10W			< TRANSISTOR >	
R125	1-216-037-00	METAL CHIP	330 5% 1/10W				
R126	1-216-037-00	METAL CHIP	330 5% 1/10W	Q801	8-729-030-02	TRANSISTOR DTC144ESA	
R127	1-216-037-00	METAL CHIP	330 5% 1/10W	Q802	8-729-030-02	TRANSISTOR DTC144ESA	
R131	1-216-037-00	METAL CHIP	330 5% 1/10W	Q803	8-729-030-02	TRANSISTOR DTC144ESA	
R135	1-216-295-91	SHORT	0	Q804	8-729-030-02	TRANSISTOR DTC144ESA	
R136	1-216-295-91	SHORT	0			< RESISTOR >	
R137	1-216-295-91	SHORT	0	R701	1-249-415-11	CARBON 680 5% 1/4W F	
R138	1-216-295-91	SHORT	0	R702	1-249-417-11	CARBON 1K 5% 1/4W F	
R143	1-216-103-00	METAL CHIP	180K 5% 1/10W	R703	1-249-419-11	CARBON 1.5K 5% 1/4W F	
R144	1-216-103-00	METAL CHIP	180K 5% 1/10W	R704	1-249-421-11	CARBON 2.2K 5% 1/4W F	
R145	1-216-121-91	RES,CHIP	1M 5% 1/10W	R705	1-247-843-11	CARBON 3.3K 5% 1/4W	
R146	1-216-121-91	RES,CHIP	1M 5% 1/10W	R706	1-249-427-11	CARBON 6.8K 5% 1/4W F	
R147	1-216-081-00	METAL CHIP	22K 5% 1/10W	R707	1-249-431-11	CARBON 15K 5% 1/4W	
R148	1-216-001-00	METAL CHIP	10 5% 1/10W	R711	1-249-415-11	CARBON 680 5% 1/4W F	
R149	1-216-003-11	RES,CHIP	12 5% 1/10W	R712	1-249-417-11	CARBON 1K 5% 1/4W F	
R158	1-216-111-00	METAL CHIP	390K 5% 1/10W	R713	1-249-419-11	CARBON 1.5K 5% 1/4W F	
R159	1-216-101-00	METAL CHIP	150K 5% 1/10W	R801	1-249-406-11	CARBON 120 5% 1/4W F	
R161	1-216-308-00	METAL CHIP	4.7 5% 1/10W	R802	1-249-409-11	CARBON 220 5% 1/4W F	
R162	1-216-101-00	METAL CHIP	150K 5% 1/10W	R803	1-249-429-11	CARBON 10K 5% 1/4W	
		< SWITCH >		R804	1-247-807-31	CARBON 100 5% 1/4W	
S101	1-572-085-11	SWITCH, LEAF(LIMIT)		R805	1-247-807-31	CARBON 100 5% 1/4W	
*****				R806	1-247-807-31	CARBON 100 5% 1/4W	
	A-4724-543-A	DISPLAY BOARD, COMPLETE		R807	1-247-807-31	CARBON 100 5% 1/4W	
*****				R808	1-247-807-31	CARBON 100 5% 1/4W	
*	3-362-478-11	HOLDER (T), LED		R809	1-249-441-11	CARBON 100K 5% 1/4W	
*	4-996-841-01	HOLDER (FL)		R810	1-249-441-11	CARBON 100K 5% 1/4W	
		< CAPACITOR >				< SWITCH >	
C802	1-162-210-31	CERAMIC	30PF 5% 50V	S701	1-554-303-21	SWITCH, TACTILE(EX CHANGE)	
C803	1-164-159-11	CERAMIC	0.1uF 50V	S702	1-554-303-21	SWITCH, TACTILE(DISC SKIP)	
C804	1-164-159-11	CERAMIC	0.1uF 50V	S703	1-554-303-21	SWITCH, TACTILE(OPEN/CLOSE)	
C805	1-124-584-00	ELECT	100uF 20% 10V	S704	1-554-303-21	SWITCH, TACTILE(II<<<I)	
C806	1-162-282-31	CERAMIC	100PF 10% 50V	S705	1-554-303-21	SWITCH, TACTILE(>>>I)	
C807	1-162-282-31	CERAMIC	100PF 10% 50V	S706	1-554-303-21	SWITCH, TACTILE(■)	
C808	1-164-159-11	CERAMIC	0.1uF 50V	S707	1-554-303-21	SWITCH, TACTILE(■)	
C809	1-164-159-11	CERAMIC	0.1uF 50V	S708	1-554-303-21	SWITCH, TACTILE(PROGRAM)	
		< CONNECTOR >		S711	1-554-303-21	SWITCH, TACTILE(PROGRAM)	
CN801	1-695-338-11	PIN, CONNECTOR (PC BOARD) 15P		S712	1-554-303-21	SWITCH, TACTILE(SHUFFLE)	
CN804	1-750-195-11	CONNECTOR, BOARD TO BOARD 6P		S713	1-554-303-21	SWITCH, TACTILE(CONTINUE)	
		< LED >		*****			
D801	8-719-303-02	LED SEL2510C-D					
D802	8-719-301-52	LED SEL2810A-C					

FUNCTION	HP	LOADING MOTOR		MAIN
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Ref. No.	Part No.	Description	Remarks			
	1-672-376-11	FUNCTION BOARD *****				
		< CONNECTOR >				
CN802	1-750-186-11	CONNECTOR, BOARD TO BOARD 6P				
		< RESISTOR >				
R714	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R715	1-247-843-11	CARBON	3.3K	5%	1/4W	
R716	1-249-427-11	CARBON	6.8K	5%	1/4W	F
R717	1-249-431-11	CARBON	15K	5%	1/4W	
		< SWITCH >				
S714	1-554-303-21	SWITCH, TACTILE(5)				
S715	1-554-303-21	SWITCH, TACTILE(4)				
S716	1-554-303-21	SWITCH, TACTILE(3)				
S717	1-554-303-21	SWITCH, TACTILE(2)				
S718	1-554-303-21	SWITCH, TACTILE(1)				
S821	1-572-714-11	SWITCH, PUSH (I/O)				

	1-672-377-11	HP BOARD *****				
		< CAPACITOR >				
C151	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C251	1-162-294-31	CERAMIC	0.001uF	10%	50V	
C353	1-164-159-11	CERAMIC	0.1uF		50V	
C354	1-164-159-11	CERAMIC	0.1uF		50V	
C355	1-164-159-11	CERAMIC	0.1uF		50V	
		< JACK >				
J351	1-750-162-61	JACK (LARGE TYPE)(PHONES)				
		< COIL >				
L151	1-424-122-11	FILTER, NOISE				
L251	1-424-122-11	FILTER, NOISE				
L351	1-424-122-11	FILTER, NOISE				
L352	1-410-397-21	FERRITE BEAD INDUCTOR				
		< RESISTOR >				
R155	1-249-402-11	CARBON	56	5%	1/4W	F
R255	1-249-402-11	CARBON	56	5%	1/4W	F
		< VARIABLE RESISTOR >				
RV351	1-223-926-11	RES, VAR, CARBON 1K/1K(PHONE LEVEL)				

*	1-647-363-11	LOADING MOTOR BOARD *****				
		< MOTOR >				
M802	A-4604-847-A	MOTOR ASSY, LOADING				

Ref. No.	Part No.	Description	Remarks			
	A-4724-655-A	MAIN BOARD, COMPLETE *****				
	7-685-871-01	SCREW +BVTT 3 x 6 (S)				
		< CAPACITOR >				
C101	1-136-165-00	FILM	0.1uF	5%	50V	
C102	1-124-917-11	ELECT	33uF	20%	63V	
C104	1-102-942-00	CERAMIC	5.0PF		+ -0.5PF	50V
C105	1-130-483-00	MYLAR	0.01uF	5%	50V	
C106	1-130-483-00	MYLAR	0.01uF	5%	50V	
C107	1-102-973-00	CERAMIC	100PF	5%	50V	
C108	1-102-973-00	CERAMIC	100PF	5%	50V	
C109	1-130-483-00	MYLAR	0.01uF	5%	50V	
C111	1-106-343-00	MYLAR	1000PF	5%	200V	
C112	1-130-484-00	MYLAR	0.012uF	5%	50V	
C115	1-126-052-11	ELECT	100uF	20%	50V	
C117	1-136-153-00	FILM	0.01uF	5%	50V	
C123	1-124-724-11	ELECT	47uF	20%	16V	
C127	1-130-485-00	MYLAR	0.015uF	5%	50V	
C154	1-136-165-00	FILM	0.1uF	5%	50V	
C155	1-124-721-11	ELECT	10uF	20%	50V	
C201	1-136-165-00	FILM	0.1uF	5%	50V	
C202	1-124-917-11	ELECT	33uF	20%	63V	
C204	1-102-942-00	CERAMIC	5.0PF		+ -0.5PF	50V
C205	1-130-483-00	MYLAR	0.01uF	5%	50V	
C206	1-130-483-00	MYLAR	0.01uF	5%	50V	
C207	1-102-973-00	CERAMIC	100PF	5%	50V	
C208	1-102-973-00	CERAMIC	100PF	5%	50V	
C209	1-130-483-00	MYLAR	0.01uF	5%	50V	
C211	1-106-343-00	MYLAR	1000PF	5%	200V	
C212	1-130-484-00	MYLAR	0.012uF	5%	50V	
C215	1-126-052-11	ELECT	100uF	20%	50V	
C217	1-136-153-00	FILM	0.01uF	5%	50V	
C223	1-124-724-11	ELECT	47uF	20%	16V	
C226	1-130-485-00	MYLAR	0.015uF	5%	50V	
C227	1-130-485-00	MYLAR	0.015uF	5%	50V	
C228	1-124-724-11	ELECT	47uF	20%	16V	
C230	1-126-049-11	ELECT	22uF	20%	50V	
C254	1-136-165-00	FILM	0.1uF	5%	50V	
C255	1-124-721-11	ELECT	10uF	20%	50V	
C301	1-126-162-11	ELECT	3.3uF	20%	50V	
C303	1-126-942-61	ELECT	1000uF	20%	25V	
C306	1-162-208-31	CERAMIC	24PF	5%	50V	
C310	1-102-516-11	CERAMIC	27PF	5%	50V	
C311	1-102-951-00	CERAMIC	15PF	5%	50V	
C320	1-164-159-11	CERAMIC	0.1uF		50V	
C321	1-126-933-11	ELECT	100uF	20%	16V	
C322	1-164-159-11	CERAMIC	0.1uF		50V	
C323	1-164-159-11	CERAMIC	0.1uF		50V	
C324	1-126-933-11	ELECT	100uF	20%	16V	
C325	1-164-159-11	CERAMIC	0.1uF		50V	
C326	1-164-159-11	CERAMIC	0.1uF		50V	
C351	1-126-934-11	ELECT	220uF	20%	16V	
C352	1-126-934-11	ELECT	220uF	20%	16V	
C360	1-136-165-00	FILM	0.1uF	5%	50V	

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
C361	1-124-584-00	ELECT	100uF 20% 10V			< TERMINAL >	
C382	1-102-852-91	CERAMIC	47PF 5% 50V				
C383	1-164-159-11	CERAMIC	0.1uF 50V				
C401	1-126-933-11	ELECT	100uF 20% 16V	EB001	1-537-770-21	TERMINAL BOARD, GROUND	
C402	1-126-934-11	ELECT	220uF 20% 16V			< IC >	
C412	1-164-159-11	CERAMIC	0.1uF 50V	IC101	8-759-900-72	IC NE5532P	
C413	1-164-159-11	CERAMIC	0.1uF 50V	IC102	8-759-900-72	IC NE5532P	
C415	1-126-934-11	ELECT	220uF 20% 16V	IC201	8-759-900-72	IC NE5532P	
C501	1-126-933-11	ELECT	100uF 20% 16V	IC202	8-759-900-72	IC NE5532P	
C502	1-164-159-11	CERAMIC	0.1uF 50V	IC301	8-759-370-62	IC CXD8505BQ	
C503	1-164-159-11	CERAMIC	0.1uF 50V	IC302	8-759-361-58	IC CXA8055M	
C505	1-164-159-11	CERAMIC	0.1uF 50V	IC351	8-759-167-88	IC NJM4565D	
C508	1-162-294-31	CERAMIC	0.001uF 10% 50V	IC405	8-749-921-12	IC GP1F32T(DIGITAL OUT)	
C509	1-162-294-31	CERAMIC	0.001uF 10% 50V	IC501	8-752-903-29	IC CXP84648-052Q	
C512	1-164-159-11	CERAMIC	0.1uF 50V	IC531	8-759-463-99	IC M5M5256DFP-70XL	
C531	1-110-489-11	CAPACITOR	1F 5.5V	IC551	8-759-356-03	IC BA6780	
C532	1-164-159-11	CERAMIC	0.1uF 50V	IC601	8-759-330-29	IC LA5616	
C552	1-126-933-11	ELECT	100uF 20% 16V	IC603	8-759-633-42	IC M5293L	
C601	1-164-159-11	CERAMIC	0.1uF 50V	IC604	8-759-231-53	IC TA7805S	
C602	1-126-937-11	ELECT	4700uF 20% 16V	IC605	8-759-604-90	IC M5F7907L	
C603	1-126-768-11	ELECT	2200uF 20% 16V			< JACK >	
C604	1-126-059-11	ELECT	10uF 20% 50V				
C605	1-126-163-11	ELECT	4.7uF 20% 50V	J301	1-569-442-21	JACK, PIN 2P(LINE OUT)	
C606	1-126-163-11	ELECT	4.7uF 20% 50V	* J381	1-764-188-11	JACK (SMALL TYPE) (DIA. 3.5)(AI)	
C607	1-126-942-61	ELECT	1000uF 20% 25V	* J382	1-764-188-11	JACK (SMALL TYPE) (DIA. 3.5)(CONTROL)	
C608	1-126-934-11	ELECT	220uF 20% 16V			< JUMPER RESISTOR >	
C609	1-126-063-11	ELECT	100uF 20% 63V				
C610	1-126-059-11	ELECT	10uF 20% 50V	JW134	1-412-473-21	INDUCTOR 0UH	
C612	1-124-689-11	ELECT	1000uF 20% 16V	JW137	1-412-473-21	INDUCTOR 0UH	
C613	1-124-689-11	ELECT	1000uF 20% 16V			< COIL >	
C614	1-126-052-11	ELECT	100uF 20% 16V				
C615	1-126-969-11	ELECT	220uF 20% 35V	L303	1-410-507-11	INDUCTOR 6.8uH	
C616	1-126-969-11	ELECT	220uF 20% 35V	L304	1-410-503-11	INDUCTOR 3.3uH	
C654	1-164-159-11	CERAMIC	0.1uF 50V	L305	1-410-503-11	INDUCTOR 3.3uH	
C655	1-164-159-11	CERAMIC	0.1uF 50V	L306	1-410-503-11	INDUCTOR 3.3uH	
C935	1-124-701-51	ELECT	470uF 20% 25V	L307	1-410-503-11	INDUCTOR 3.3uH	
		< CONNECTOR >		L308	1-410-503-11	INDUCTOR 3.3uH	
CN351	1-506-468-11	PIN, CONNECTOR 3P		L514	1-410-397-21	FERRITE BEAD INDUCTOR	
CN401	1-750-640-11	CONNECTOR, FFC/FPC 23P		L515	1-410-397-21	FERRITE BEAD INDUCTOR	
CN402	1-695-338-11	PIN, CONNECTOR (PC BOARD) 15P				< TRANSISTOR >	
* CN403	1-568-941-11	PIN, CONNECTOR 3P		Q101	8-729-231-55	TRANSISTOR 2SC2878-AB	
* CN504	1-695-329-31	PIN, CONNECTOR (PC BOARD) 6P		Q102	8-729-231-55	TRANSISTOR 2SC2878-AB	
* CN601	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P		Q201	8-729-231-55	TRANSISTOR 2SC2878-AB	
		< DIODE >		Q202	8-729-231-55	TRANSISTOR 2SC2878-AB	
D301	8-719-911-19	DIODE 1SS119		Q301	8-729-029-56	TRANSISTOR DTA144ESA	
D381	8-719-911-19	DIODE 1SS119		Q302	8-729-029-56	TRANSISTOR DTA144ESA	
D531	8-719-911-19	DIODE 1SS119		Q303	8-729-029-21	TRANSISTOR DTA114ESA-TP	
D601	8-719-210-21	DIODE 11EQS04		Q311	8-729-030-02	TRANSISTOR DTC144ESA	
D602	8-719-210-21	DIODE 11EQS04		Q381	8-729-620-05	TRANSISTOR 2SC2603-EF	
D603	8-719-210-21	DIODE 11EQS04		Q504	8-729-620-05	TRANSISTOR 2SC2603-EF	
D604	8-719-210-21	DIODE 11EQS04		Q601	8-729-119-76	TRANSISTOR 2SA1175-HFE	
D605	8-719-024-99	DIODE 11ES2-NTA2B				< RESISTOR >	
D606	8-719-929-15	DIODE RD9.1ES-T2B2		R101	1-215-405-00	METAL 220 1% 1/4W	
D606	8-719-110-12	DIODE RD9.1ES-B1		R102	1-215-405-00	METAL 220 1% 1/4W	
D611	8-719-911-19	DIODE 1SS119		R103	1-215-409-00	METAL 330 1% 1/4W	
D612	8-719-921-40	DIODE MTZJ-4.7C		R104	1-215-409-00	METAL 330 1% 1/4W	
D613	8-719-024-99	DIODE 11ES2-NTA2B		R105	1-215-437-00	METAL 4.7K 1% 1/4W	
D614	8-719-024-99	DIODE 11ES2-NTA2B					

SENSOR

TABLE MOTOR

Ref. No.	Part No.	Description	Remarks
*	1-647-362-11	SENSOR BOARD *****	
		< CONNECTOR >	
CN801	1-573-383-11	PIN, CONNECTOR (PC BOARD) 2P	
CN802	1-750-243-11	SOCKET, CONNECTOR 6P	
		< DIODE >	
D801	8-749-924-18	DIODE PHOTO INTERRUPTER RPI-1391	
D802	8-749-924-30	DIODE PHOTO REFLECTOR GP2S28	
		< RESISTOR >	
R801	1-249-416-11	CARBON 820 5% 1/4W F	
R802	1-249-406-11	CARBON 120 5% 1/4W F	

*	1-650-082-11	TABLE MOTOR BOARD *****	
		< MOTOR >	
M801	A-4660-525-A	MOTOR ASSY, ROTARY	

MISCELLANEOUS *****			
15	1-769-456-11	WIRE (FLAT TYPE) (15 CORE)	
72	1-751-052-11	WIRE (FLAT TYPE) (6 CORE)	
△ 74	1-575-042-21	CORD, POWER (CND)	
△ 74	1-783-531-31	CORD, POWER (US)	
76	1-500-386-11	FILTER, CLAMP (FERRITE CORE)	
105	1-466-996-11	ENCODER, ROTARY	
109	1-765-443-11	WIRE (FLAT TYPE) (23 CORE)	
122	1-452-925-21	MAGNET ASSY	
152	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)	
△ 151	8-848-379-31	OPTICAL PICK-UP KSS-213B/S-N	
M101	X-4917-523-4	MOTOR ASSY(SPINDELE)	
M102	X-4917-504-1	MOTOR ASSY(SLED)	
M801	A-4660-525-A	MOTOR ASSY, ROTARY	
M802	A-4604-847-A	MOTOR ASSY, LOADING	
△ T601	1-429-499-11	TRANSFORMER, POWER	

Ref. No.	Part No.	Description	Remarks
		ACCESSORIES & PACKING MATERIALS *****	
	1-475-680-11	REMOTE COMMANDER (RM-DC80)	
	1-590-925-31	CORD, CONNECTION (AUDIO)	
	1-777-172-11	CORD, CONNECTION (CONTROL A1)(CND)	
	3-866-331-11	MANUAL, INSTRUCTION(ENGLISH,FRENCH)	
	3-866-670-11	MANUAL,COMMONNESS INSTRUCTION (ENGLISH)(US)	
	3-866-670-21	MANUAL,COMMONNESS INSTRUCTION (ENGLISH,FRENCH,GERMAN,SPANISH,DUTCH) (CND)	
	4-981-643-01	BATTERY, COVER(for RM-DC80)	

***** HARDWARE LIST *****			
#1	7-685-902-21	SCREW +PTPWH 2.6 × 8 (TYPE2)	
#2	7-685-646-79	SCREW +BVTP 3 × 8 TYPE2 N-S	
#3	7-685-871-01	SCREW +BVTT 3 × 6 (S)	
#4	7-685-872-09	SCREW +BVTT 3 × 8 (S)	
#5	7-621-772-00	SCREW +B 2 × 3	
#6	7-682-564-04	SCREW +P 4 × 14	
#7	7-685-648-79	SCREW (M3 × 12), TAPPING	

<p>The components identified by mark △ or dotted line with mark △ are critical for safety. Replace only with part number specified.</p>	<p>Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.</p>
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