CDP-CA80ES

SERVICE MANUAL

US Model
AEP Model
E Model

Model Name Using Similar Mechanism	CDP-CA8ES
CD Mechanism Type	CDM27I
Base Unit Name	BU-5BD25
Optical Pick-up Name	KSS-213B/S-N

SPECIFICATIONS

Compact Disc Player

Laser	Semiconductor laser (λ = 780 nm) Emission duration: continuous
Laser output	Max 44.6 mW* * 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 ± 0.3 dB
Signal-to-noise ratio	More than 117 dB
Dynamic range	More the 99 dB
Harmonic distortion	Less than 0.0025%
Channel separation	More than 110dB

Output

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

General

Power requirements

Where purchased	Power requirements
USA	120 V AC, 60 Hz
Europe	220 V – 230 V AC, 50/60 Hz
Other countries	110 V – 120 V AC or 220 V – 240 V AC adjustable, 50/60 Hz

Power consumption	15W
Dimensions (approx.) (w/h/d)	430 × 125 × 400 mm (17 × 5 × 15 3/4 in.) incl. projecting parts
Mass (approx.)	7 kg (15 lbs 7 oz)

Supplied accessories

Audio cord (2 phono plugs–2 phono plugs) (1)
Remote commander (remote) (1)
Sony SUM-3 (NS) batteries (2)

Design and specifications are subject to change without notice.

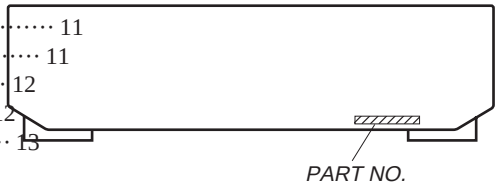
COMPACT DISC PLAYER

MICROFILM

SONY®

TABLE OF CONTENTS

MODEL IDENTIFICATION
— BACK PANEL —



PARTS No.	MODEL
4-998-478-0☐	US
4-998-478-2☐	E
4-998-478-4☐	SP
4-998-478-5☐	AEP

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

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

The following caution label is located inside of the unit.

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-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ 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.

SAFETY CHECK-OUT

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)

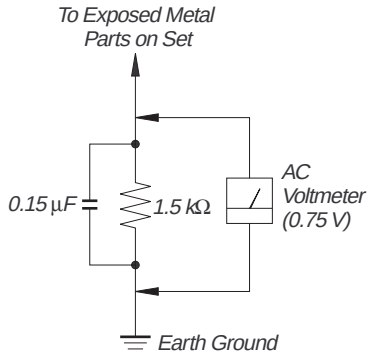
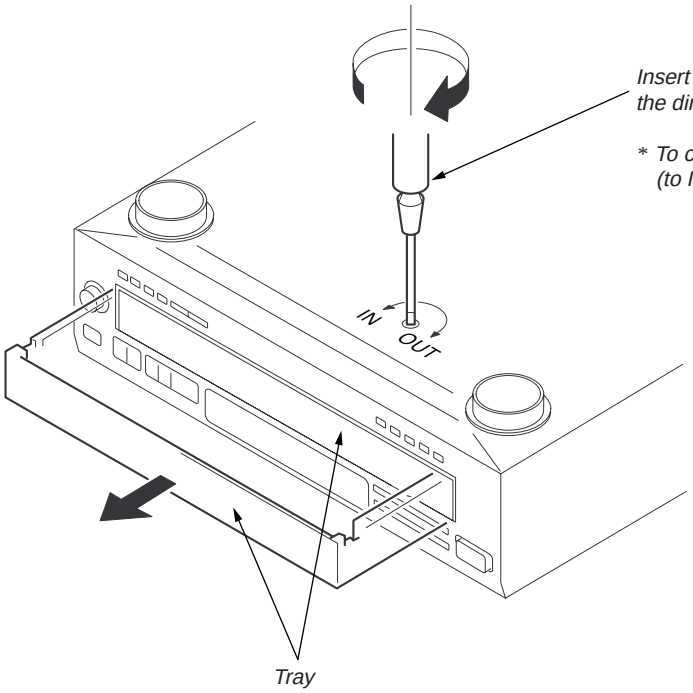


Fig. A. Using an AC voltmeter to check AC leakage.

SERVICING NOTE

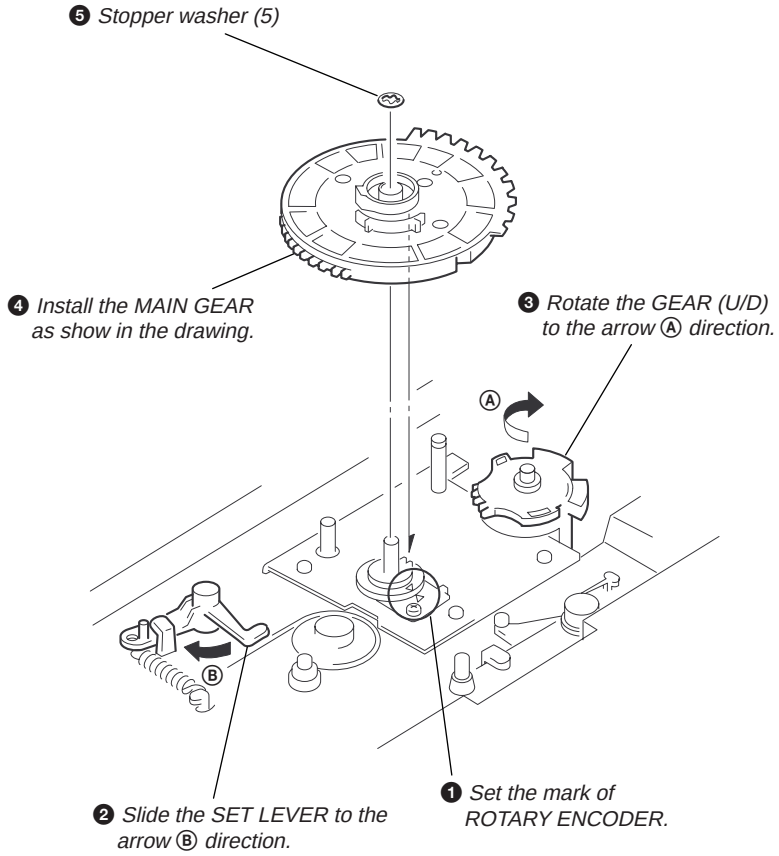
HOW TO OPEN THE DISC TRAY WHEN POWER SWITCH TURNS OFF



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/⏻] 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.

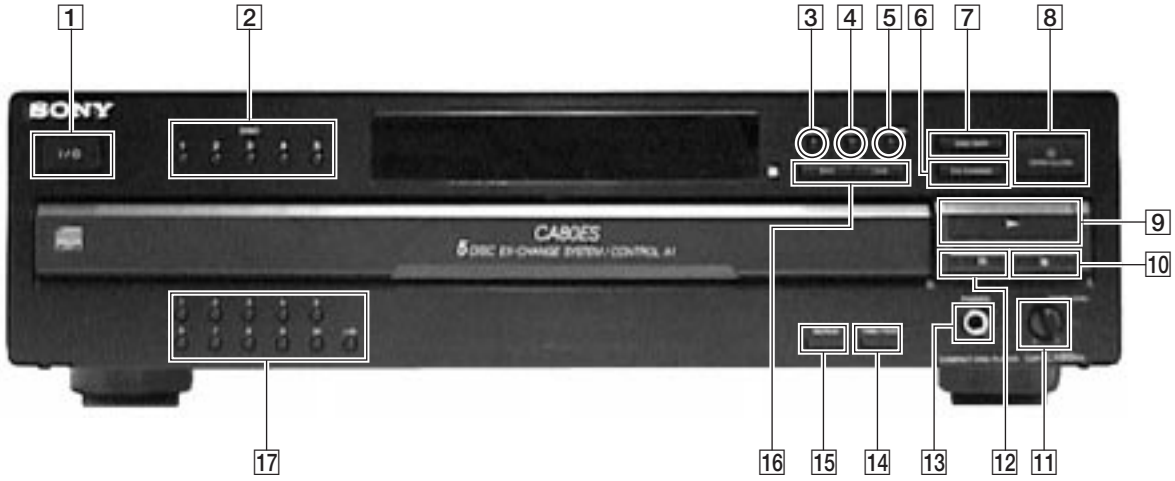
Table 2: CD-TEXT TEST DISC Recorded Contents and Display
(In this unit, some special characters cannot be displayed. This is no a fault.)

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 { l } ~ ▮ (78h to 7Fh)	x y z { l } ¯ ▮ (78····
54	▯ ¡ ¢ £ ¤ ¥ ¦ § (A0h to A7h) 8859-1	¡ ¤ § (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	† ¹ º » ¼ ½ ¾ ¿ (B8h to BFh)	¿ (B8···· † ¹ º » 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 O Ö × (D0····
61	Ø Ù Ú Û Ü Ý Þ ß (D8h to DFh)	Ø ù ú û ü Y 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 o ö ÷ (F0···ð is not displayed
65	ø ù ú û ü ý þ ÿ (F8h to FFh)	ø ù ú û ü y y (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 1
GENERAL

Identifying the Parts

Front Panel



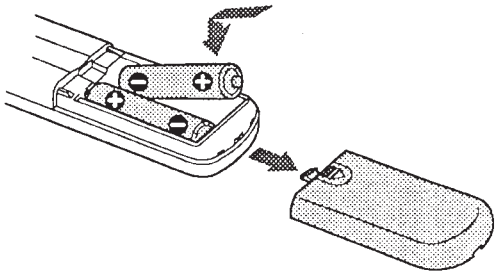
1 POWER (I/⏻) switch
2 DISC (1–5) buttons
3 CONTINUE button
4 SHUFFLE button
5 PROGRAM button
6 EX-CHANGE button
7 DISC SKIP button
8 ⏏ OPEN/CLOSE button
9 ► (CD PLAY) button
10 ■ (CD STOP) button
11 PHONE LEVEL button
12 ❚❚ (pause) button
13 PHONES jack
14 TIME/NEXT button
15 REPEAT button
16 AMS (⏮ ⏭) buttons
17 Numeric buttons

Unpacking

Check that you received the following items:
- Audio connecting cord (1)
- Remote commander (remote) (1)
- Sony SUM-3 (NS) batteries (2)

Inserting batteries into the remote

You can control the player using the supplied remote. Insert two size AA (R6) batteries by matching the + and – ends on the batteries to the diagram inside the battery compartment. When using the remote, point it at the remote sensor ▣ on the player.



When to replace batteries

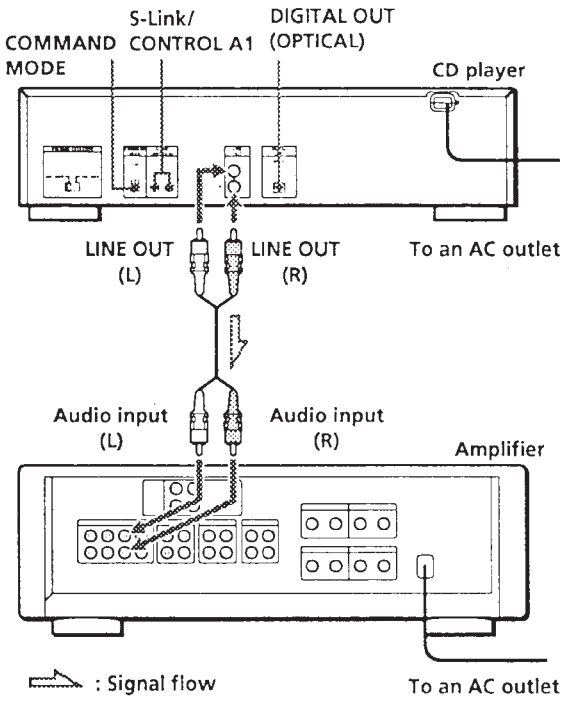
With normal use, the batteries should last for about six months. When the remote no longer operates the player, replace all the batteries with new ones.

Notes
- Do not leave the remote near an extremely hot or humid place.
- Do not drop any foreign object into the remote casing, particularly when replacing the batteries.
- Do not expose the remote sensor to direct sunlight or lighting apparatuses. Doing so may cause a malfunction.
- If you are not going to use the remote for an extended period of time, remove the batteries to avoid possible damage from battery leakage and corrosion.

Hooking Up the System

Overview

This section describes how to hook up the CD player to an amplifier. Be sure to turn off the power of each component before making the connections.

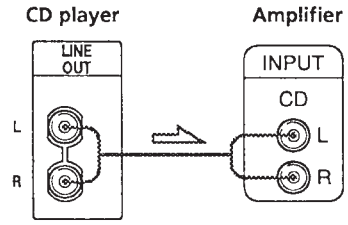


What cords will I need?

Audio cord (supplied) (1)

Hookups

When connecting an audio cord, be sure to match the color-coded cord to the appropriate jacks on the components: Red (right) to Red and White (left) to White. Be sure to make connections firmly to avoid hum and noise.



You can adjust the output level to the amplifier

Press LINE OUT LEVEL +/– on the remote. You can reduce the output level to –20 dB.

When you reduce the output level, " [FADE] " appears in the display.

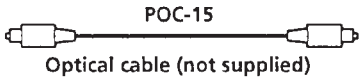
Note

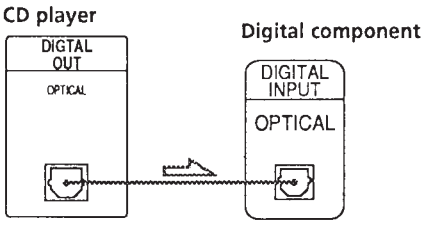
If you press the LINE OUT LEVEL +/– buttons on the remote while recording, the recording level will change even when it is preset on the tape deck, etc.

- **If you have a digital component such as a digital amplifier, D/A converter, DAT or MD**

  Connect the component via the DIGITAL OUT (OPTICAL) connector using the optical cable (not supplied). Take off the cap and plug in the optical cable.

  Note that you cannot use the fade in or out (page 16) functions when using this connection.





Note

When you connect via the DIGITAL OUT (OPTICAL) connector, noise may occur when you play CD software other than music, such as a CD-ROM.

If you have a Sony component with the CONTROL A1 jack

Connect the component via the CONTROL A1 jack. You can simplify the operation of audio systems composed of separate Sony components. For details, refer to the supplementary "S-Link™/CONTROL-A1 Control System" instructions.

When using another Sony CD player together with this player

You can make the supplied remote so that it is effective only for this player.

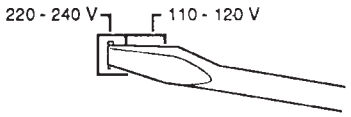
- When using a player equipped with the COMMAND MODE selector:

  Set the command mode selector of this player to CD1 (Factory preset position) and that of another player to CD2 or CD3. Then set the CD 1/2/3 switch on the remote supplied for each player accordingly.
- When using a player not equipped with the COMMAND MODE selector:

  The command mode of the player without the COMMAND MODE selector is set to CD 1. Set the COMMAND MODE selector of this player and the CD 1/2/3 switch on the remote to CD 2 or CD 3.

Setting the voltage selector (voltage selector equipped models only)

Check that the voltage selector on the rear panel of the player is set to the local power line voltage. If not, set the selector to the correct position using a screwdriver before connecting the AC power cord to a wall outlet.



Connecting the AC power cord

Connect the AC power cord to a wall outlet.

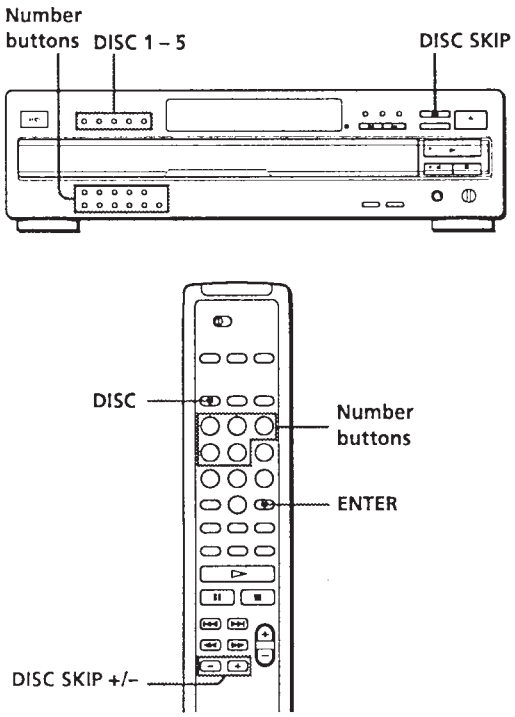
Transporting the player

Before transporting the player, follow the procedure below to return the internal mechanisms back to their original position.

1 Remove all the discs from the disc tray.
2 Press ⏏ OPEN/CLOSE to close the disc tray.
"–NO DISC–" appears in the display.
3 Wait for 10 seconds, then press I/⏻ to turn off the player.

Locating a Specific Disc

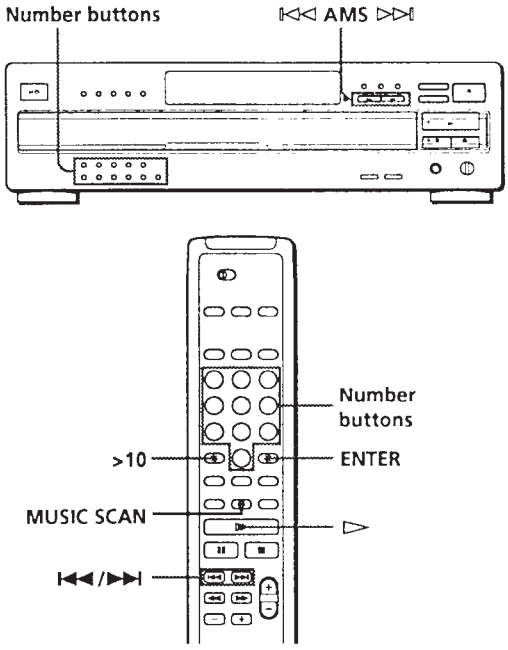
You can locate any disc before or while playing a disc.



To locate	Press
The next disc	DISC SKIP while playing a disc
The next or succeeding discs [i]	DISC SKIP + repeatedly until you find the disc
The current or preceding discs [i]	DISC SKIP – repeatedly until you find the disc
A specific disc directly	DISC 1 – 5. When using the remote, follow the procedure below. 1 Press DISC. 2 Press the number button of the disc. 3 Press ENTER.

Locating a Specific Track

You can quickly locate any track while playing a disc using the AMS (AMS: Automatic Music Sensor) button or number buttons on the remote.



To locate	You need to
The next or succeeding tracks	Press ⏮ AMS ⏭ until you find the track. When using the remote, press ⏭ repeatedly until you find the track.
The current or preceding tracks	Press ⏮ AMS ⏭ until you find the track. When using the remote, press ⏮ repeatedly until you find the track.
A specific track directly	Press the number button of the track
A track by scanning each track for 10 seconds [i] (Music Scan)	Press MUSIC SCAN on the remote before you start playing. When you find the track you want, press ▷ (the indicator lights up green) to start playing.

To directly locate a track numbered over 10

Press >10 first, then the corresponding number buttons. To enter "0," use button 10/0.

Example: To play track number 30
Press >10 first, then 3 and 10/0.

You can extend the playing time during Music Scan [i]

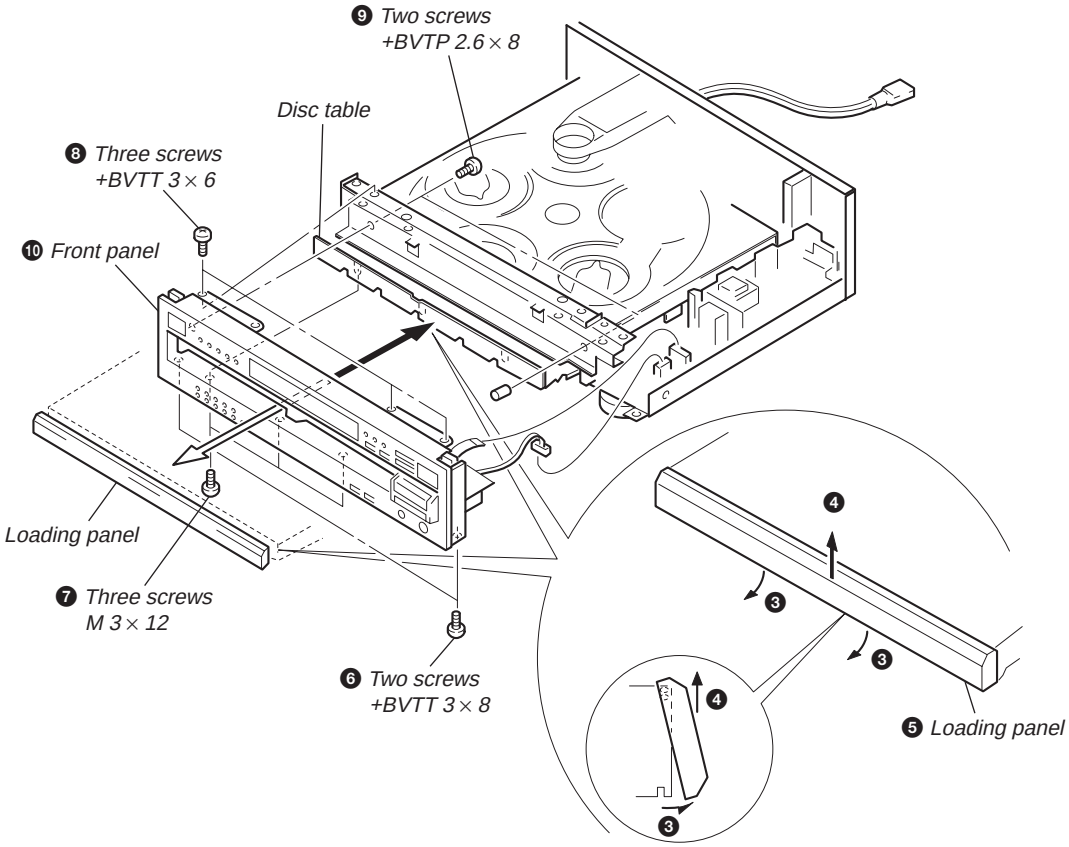
Press MUSIC SCAN repeatedly until the playing time you want (10, 20 or 30) appears in the display. Each time you press the button, the playing time changes cyclically.

SECTION 2
DISASSEMBLY

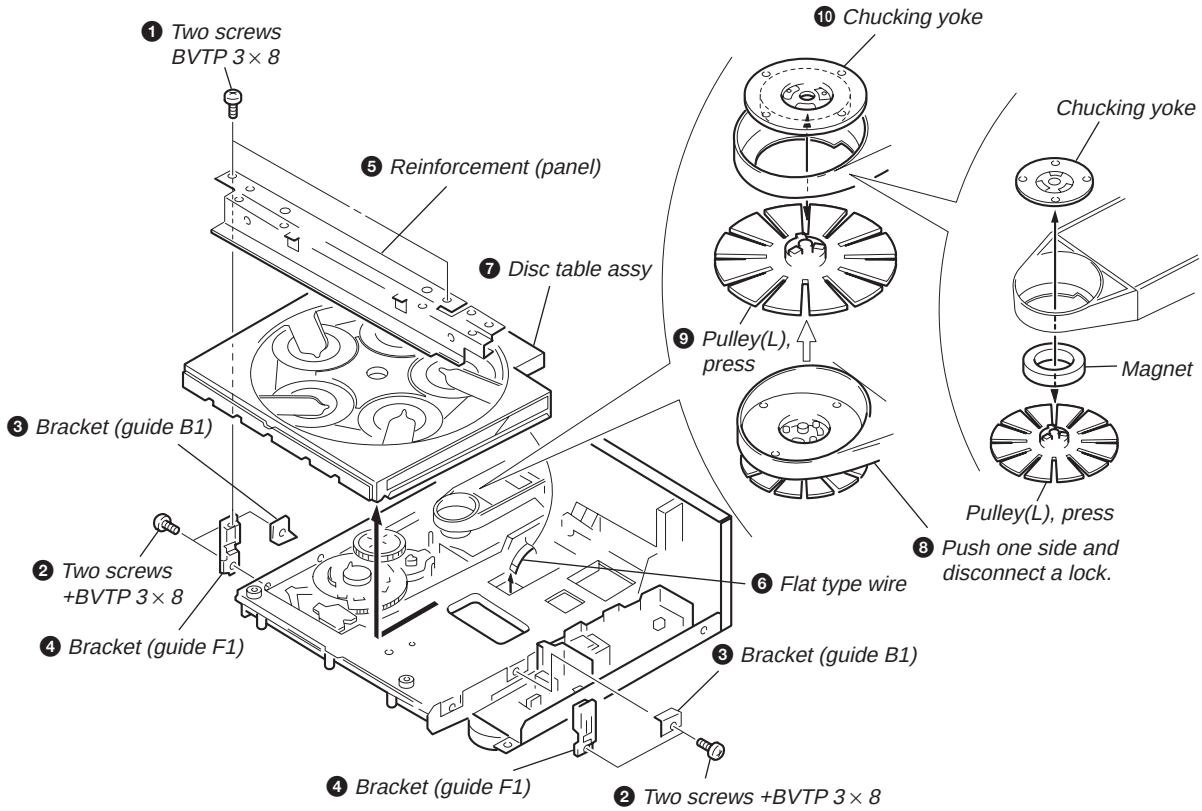
Note : Follow the disassembly procedure in the numerical order given.

2-1. FRONT PANEL

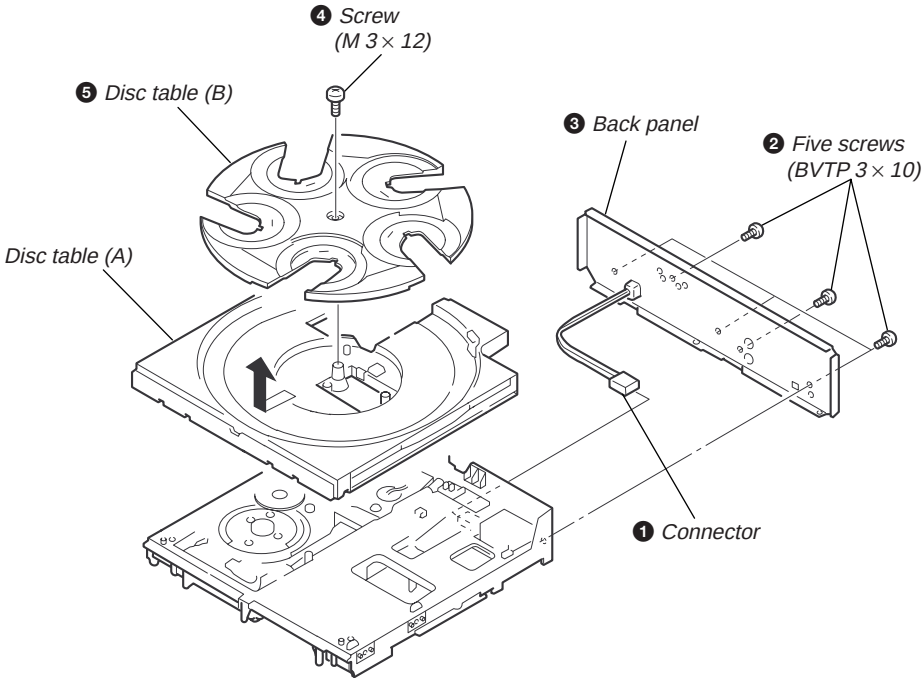
❶ Remove top cover.
❷ Eject the disc table referring to SERVICING NOTE (Page 4).



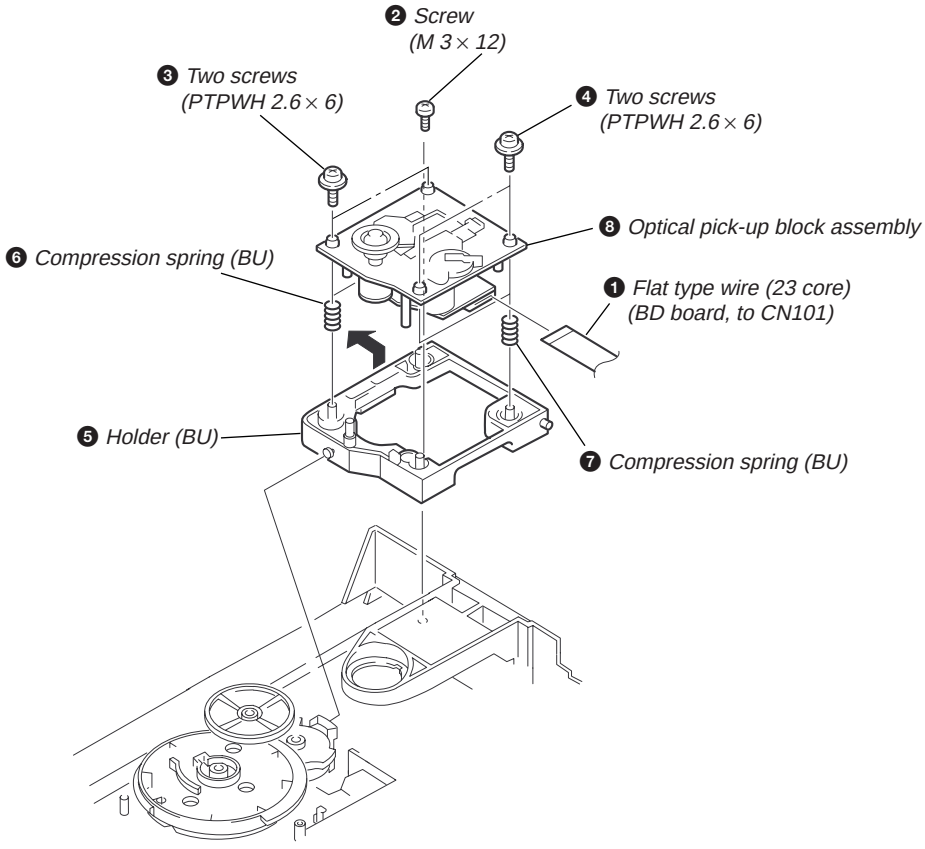
2-2. DISC TABLE ASSY



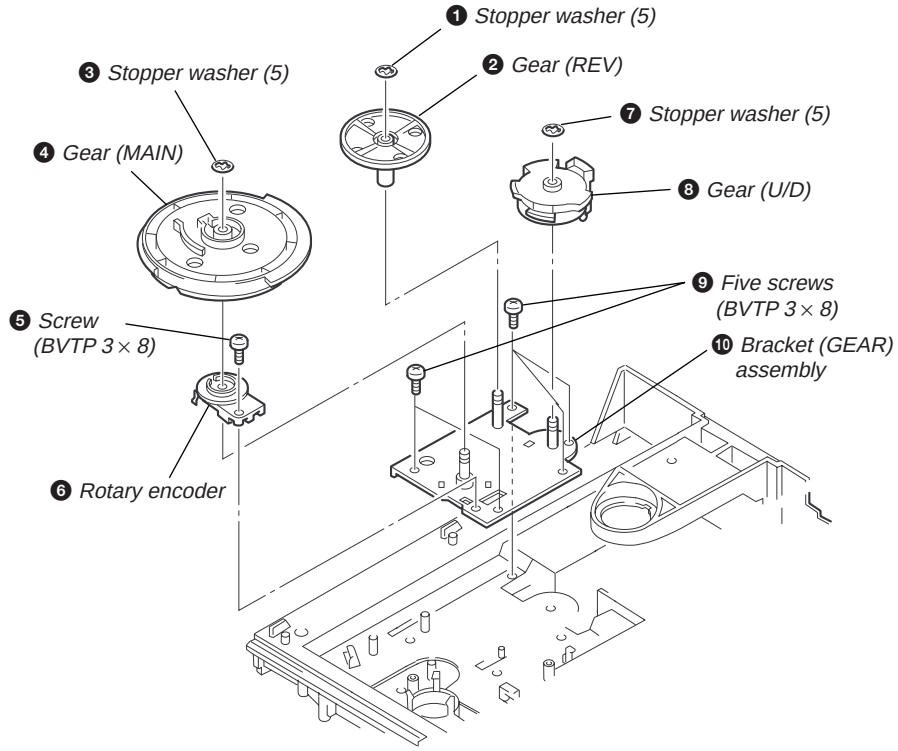
2-3. BACK PANEL AND DISC TABLE



2-4. OPTICAL PICK-UP BLOCK ASSEMBLY



2-5. BRACKET (GEAR) ASSEMBLY



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

SECTION 3
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 I/⏻ 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 I/⏻ button to turn OFF the power.

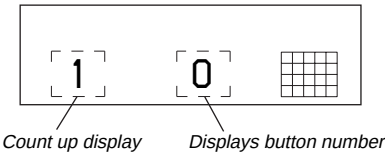
- Prohibits high speed search during accessing
- Ignores even if GFS becomes L

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 I/⏻ 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.



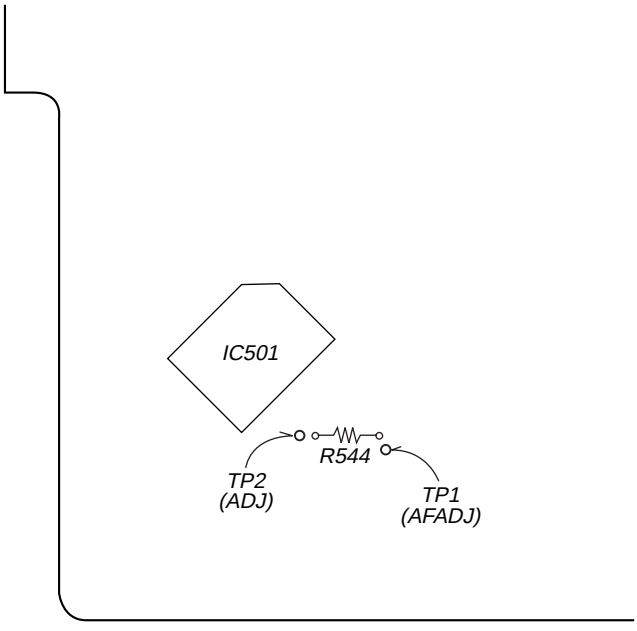
When remote controller signals are received, "RM ✻✻" will be displayed.
(✻✻ are the numbers corresponding to the remote controller keys.)
When using the remote controller, switch the COMMAND MODE switch to CD1.

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

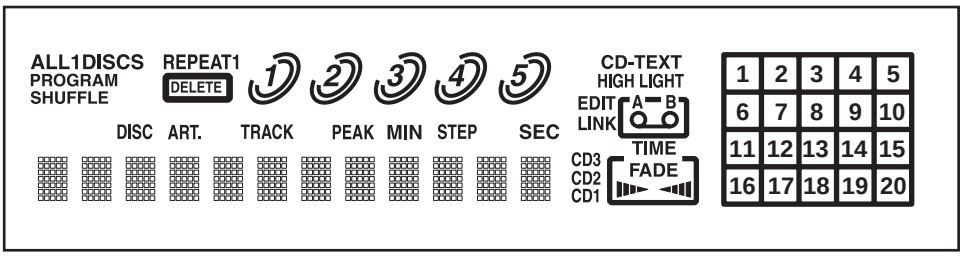
Buttons and Corresponding Button Numbers

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

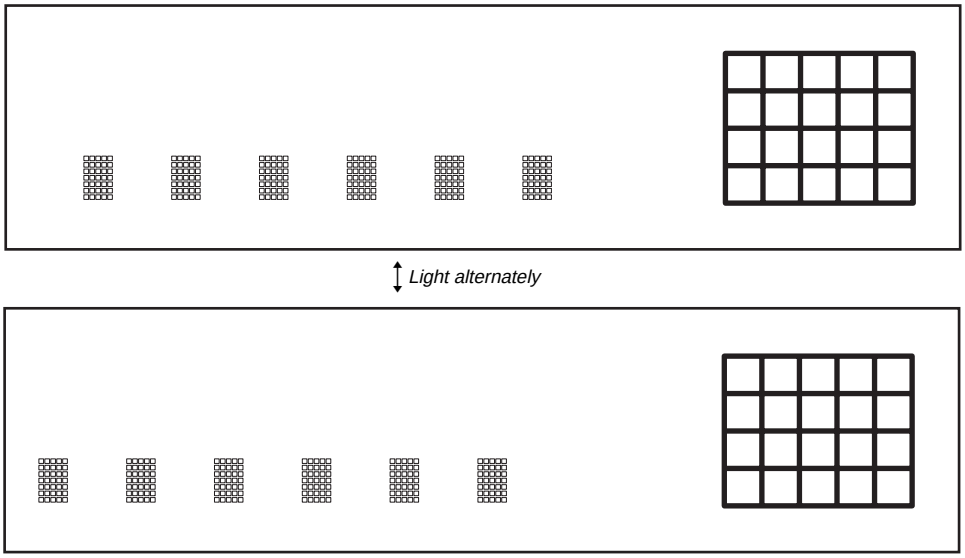
[MAIN BOARD] – CONDUCTOR SIDE –



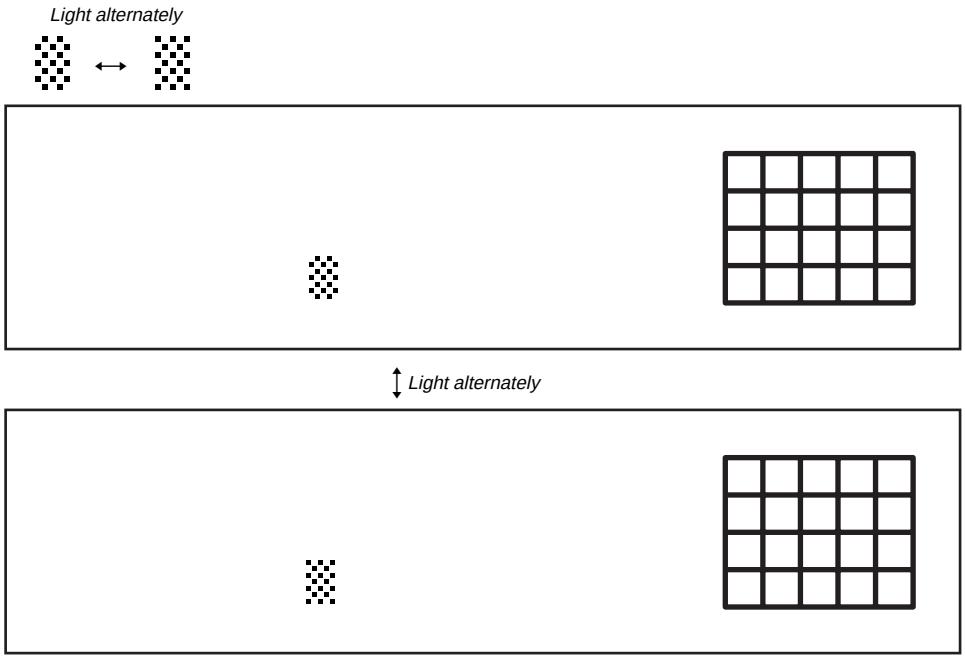
All lit



Partial lighting 1



Partial lighting 2



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 I/⏻ 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 I/⏻ button.

Aging method 2

(When no aging mode remote controller):

1. Press the I/⏻ button and turn ON the power.
2. Set discs on all trays.
   (More than two discs if five are not available.)
3. Press the 4 button, 10 button, and DISC SKIP 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 I/⏻ 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

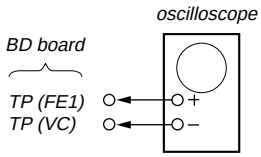
The discs are selected in the order of DISC 1 ⟶ DISC 2 ⟶ DISC 3 ⟶ DISC 4 ⟶ DISC 5 ⟶ DISC 1 ⟶ .... Empty trays are skipped.

SECTION 4
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 10MΩ 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.

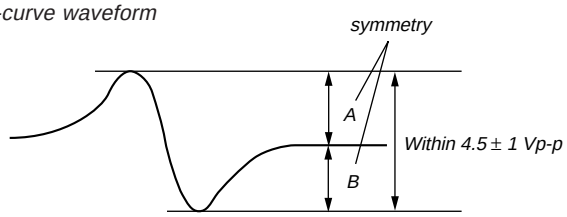
S Curve Check



Procedure :

1. Connect oscilloscope to test point TP (FE1) on BD board.
2. Connect between test point TP (FE2) 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

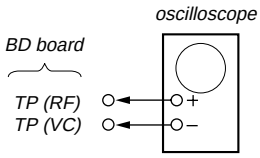


7. After check, remove the lead wire connected in step 2 and 3.

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



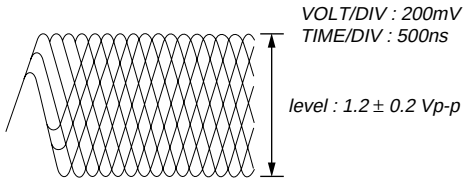
Procedure :

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.

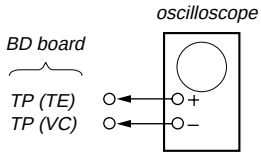
Note:

A clear RF signal waveform means that the shape "◊" can be clearly distinguished at the center of the waveform.

RF signal waveform

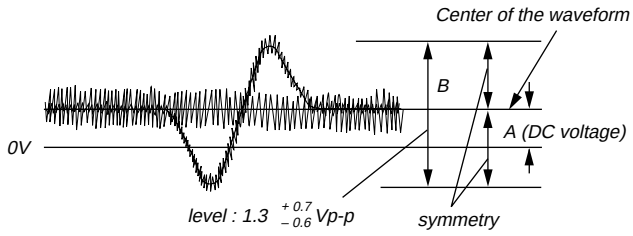


E-F Balance (1 Track Jump) Check (without general remote commander)

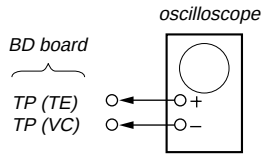


Procedure :

1. Connect oscilloscpe 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 ▮▮ (Pause) button. (Becomes the 1 track jump mode)
5. Check the level B of the oscilliscope's waveform and the A (DC voltage) of the center of the Traverse waveform.
   Confirm the following :
   A/B x 100 = less than ± 22%



1 track jump waveform



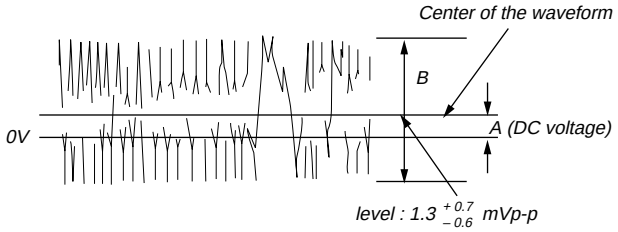
E-F Balance Check (With general remote commander)

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, automaticaly play the number five track.
5. Press the 3 button. (The tracking servo and the sledding servo are turned OFF.)

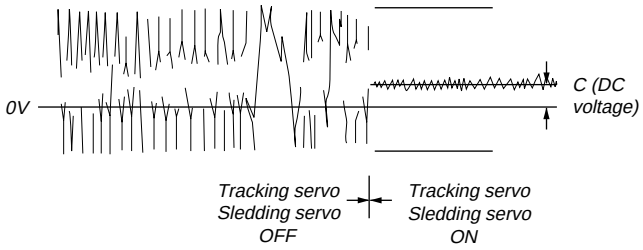
6. Check the level B of the oscilliscope's waveform and the A (DC voltage) of the center of the Traverse waveform.
   Confirm the following :
   A/B x 100 = less than ± 22%

Traverse waveform



7. 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.

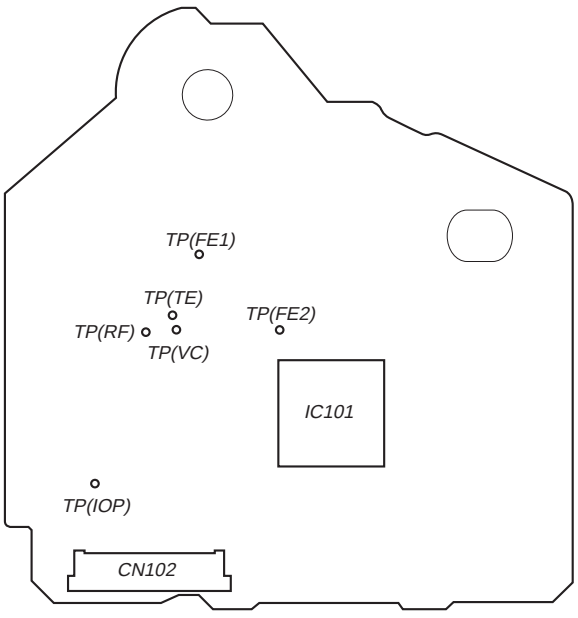
Traverse waveform



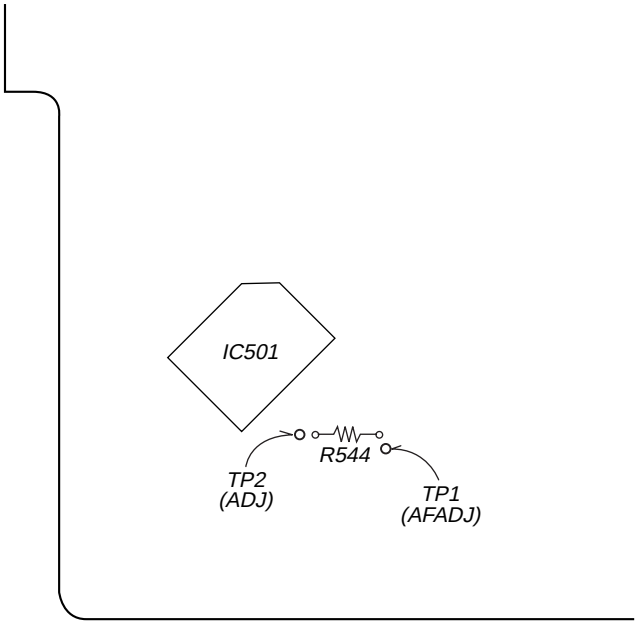
8. Disconnect the lead wire of TP2 (ADJ) connected in step 2.

Adjustment Location :

[BD BOARD] – SIDE A –

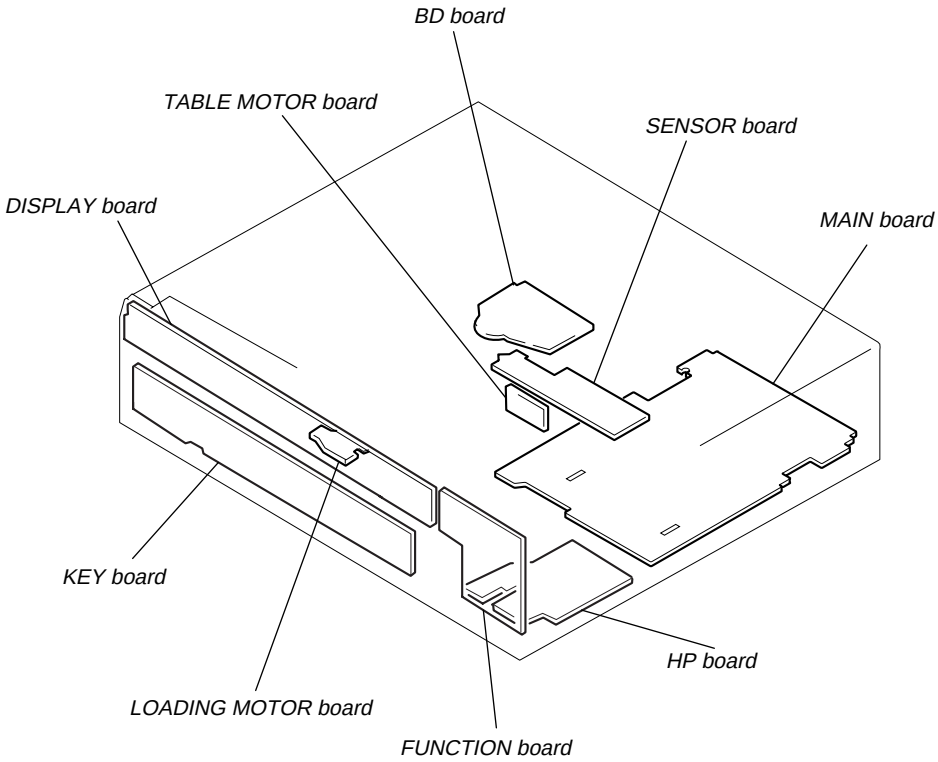


[MAIN BOARD] – CONDUCTOR SIDE –



SECTION 5
DIAGRAMS

5-1. 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: µµF 50 WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4 W or less unless otherwise specified.
- △ : internal component.
- ▭ : panel designation

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

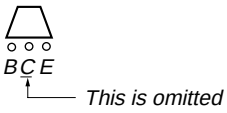
- B+ : B+ Line.
- B− : B– Line.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
  no mark : PLAY
- ∗ : Impossible to measure.
- Voltages are taken with a VOM (Input impedance 10 MΩ).
  Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  ⇨ : CD
  ⇨ : digital out

For printed wiring boards.

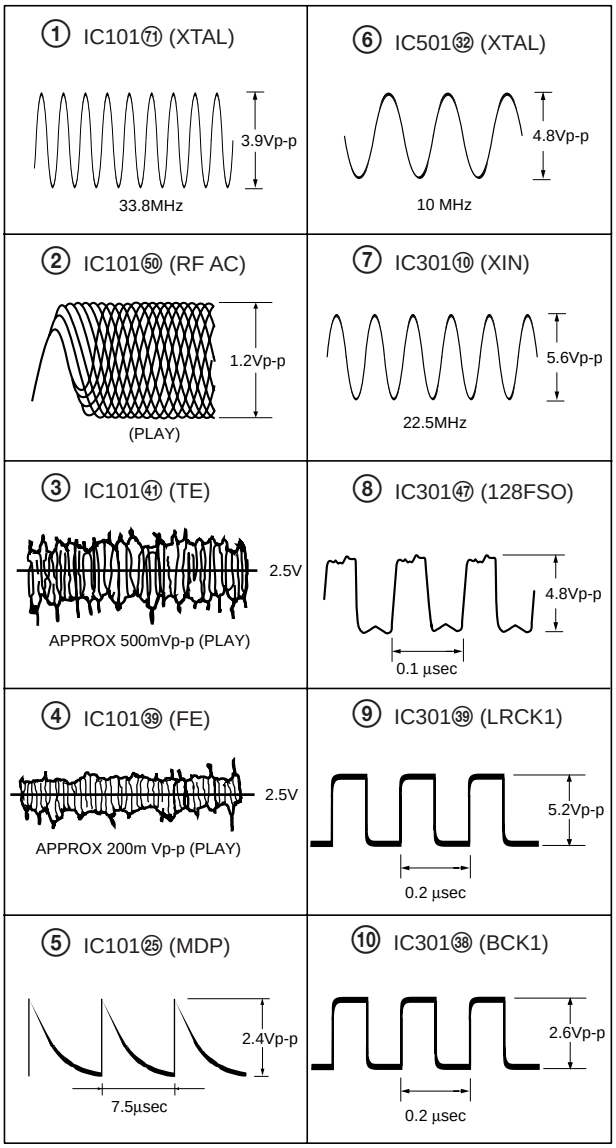
Note:

- o——— : parts extracted from the component side.
- ▒▒▒ : Pattern from the side which enables seeing.

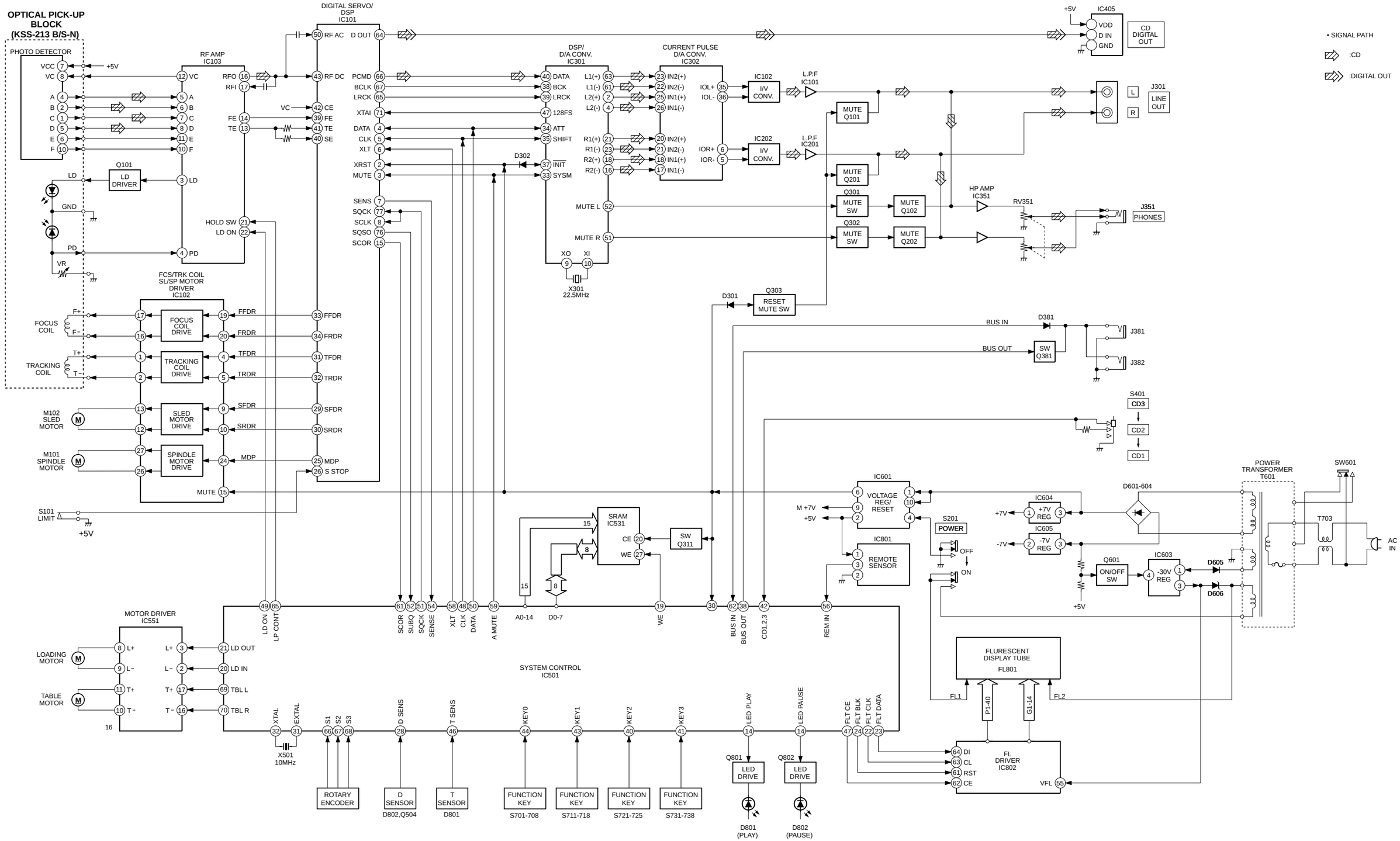
• Indication of transistor



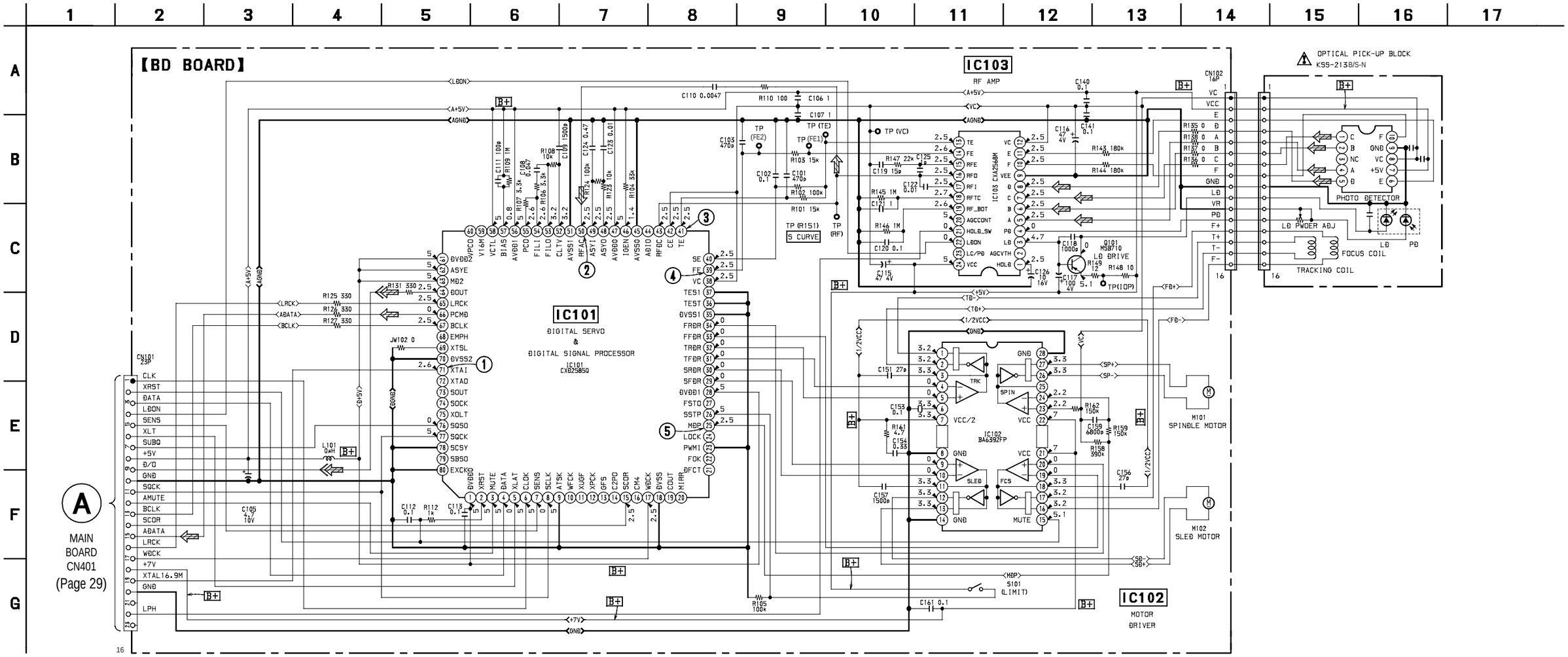
• Waveforms



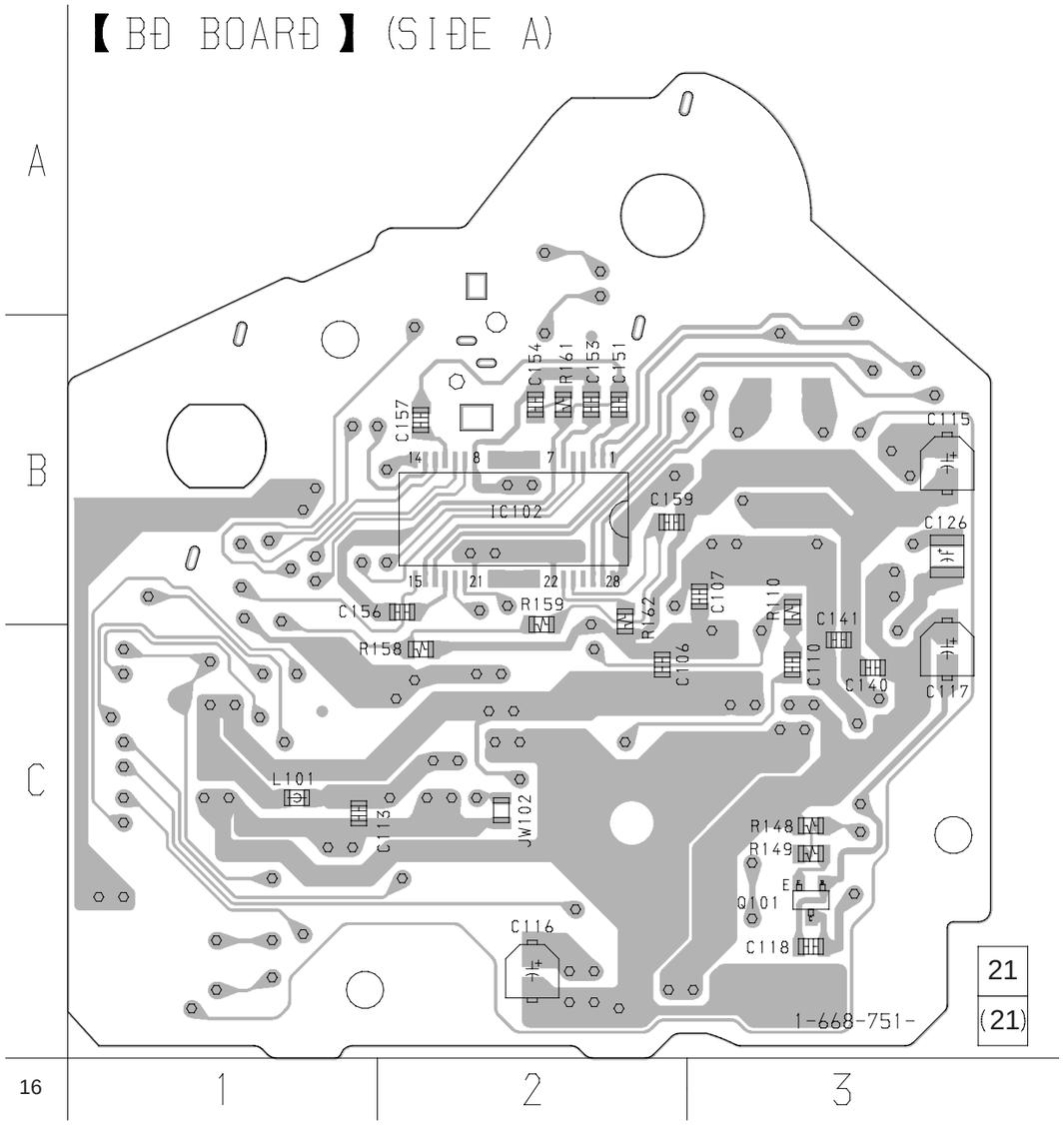
5-2. BLOCK DIAGRAM



5-3. SCHEMATIC DIAGRAM – BD SECTION – • See page 20 for Waveforms. • See page 39 for IC Block Diagrams. • See page 42 for IC Pin Functions. (IC101)

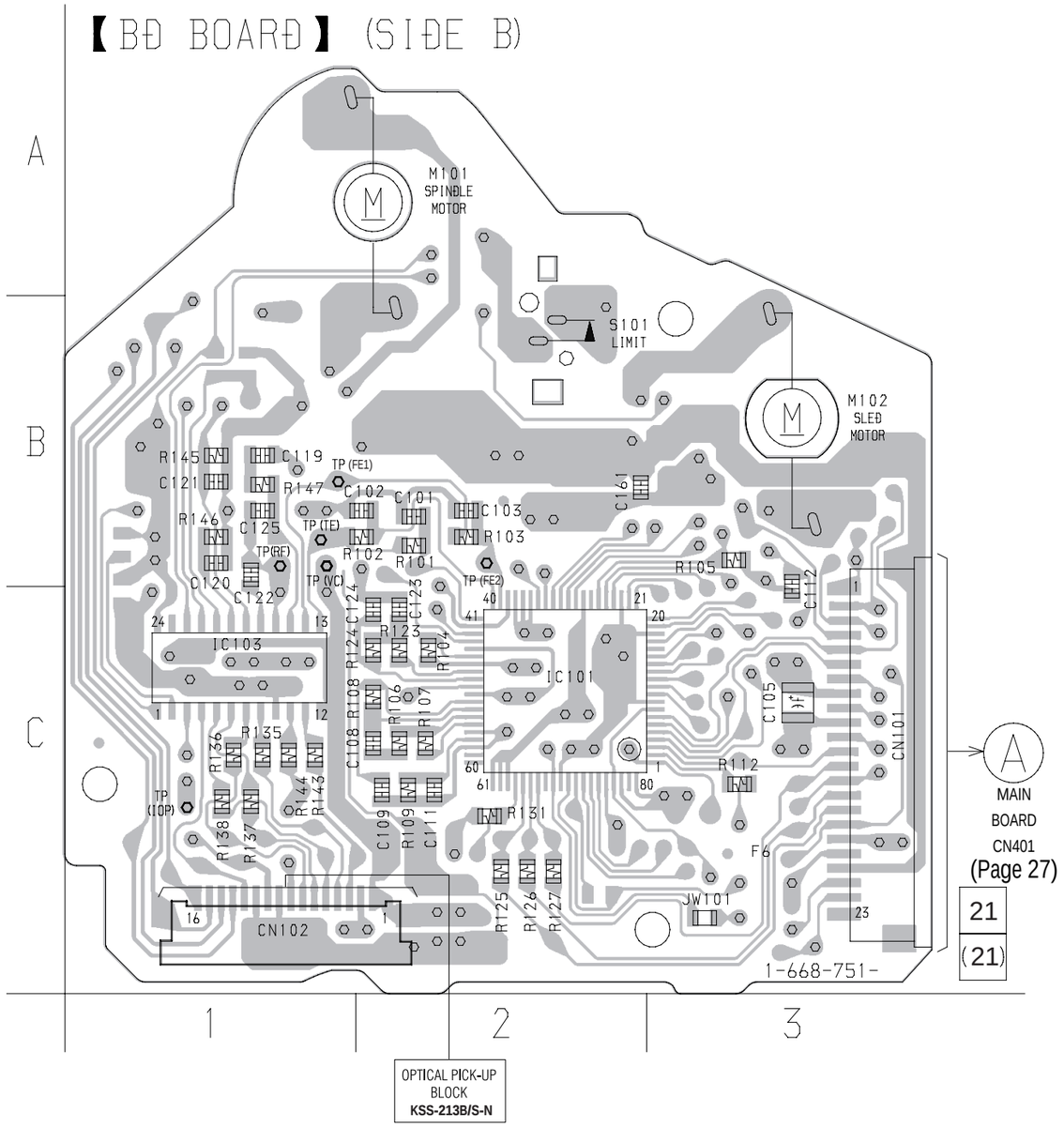


5-4. PRINTED WIRING BOARD – BD SECTION – • See page 19 for Circuit Boards Location.



• **Semiconductor Location**

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

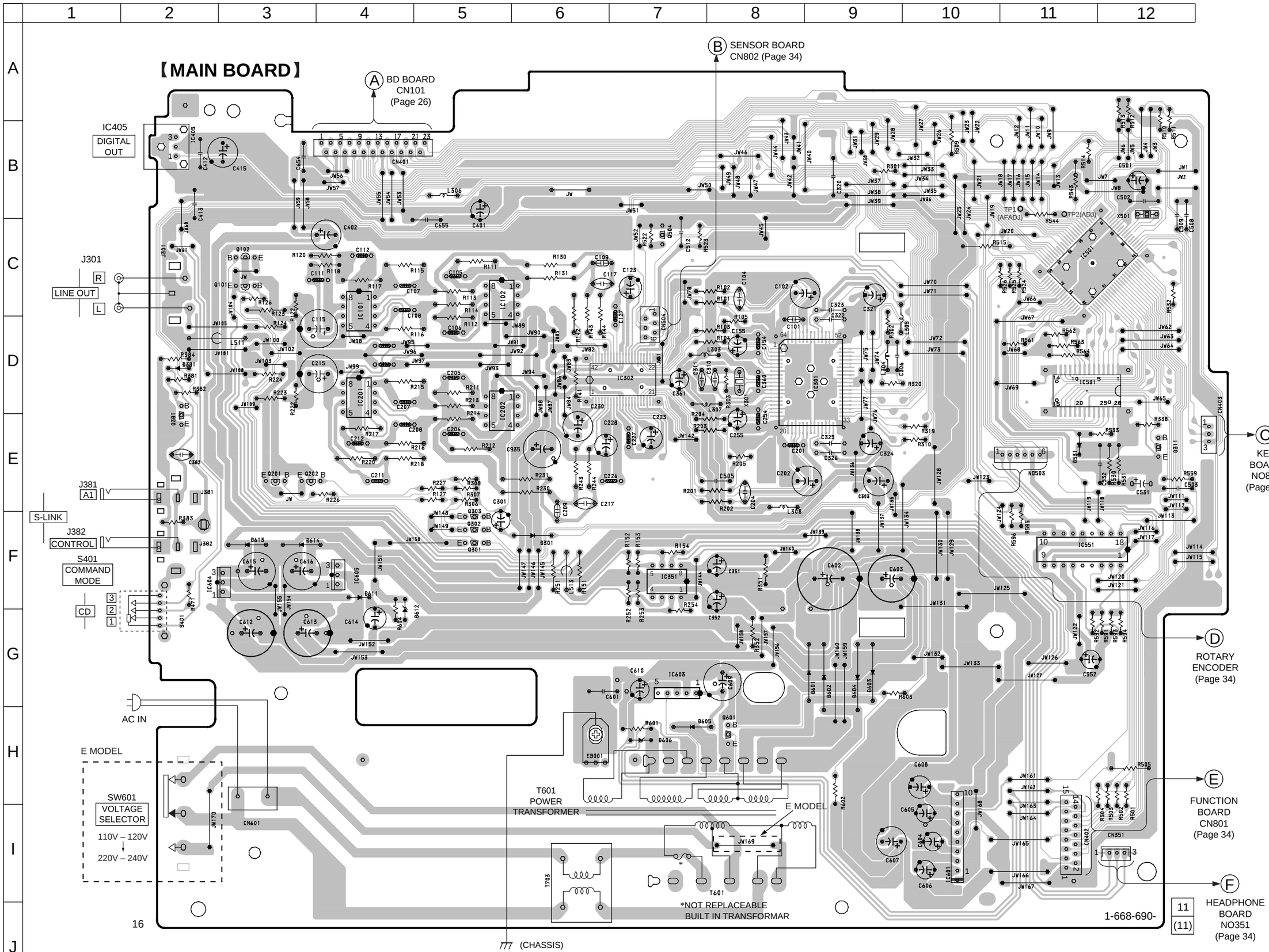


• **Semiconductor Location**

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

5-5. PRINTED WIRING BOARD – MAIN SECTION –

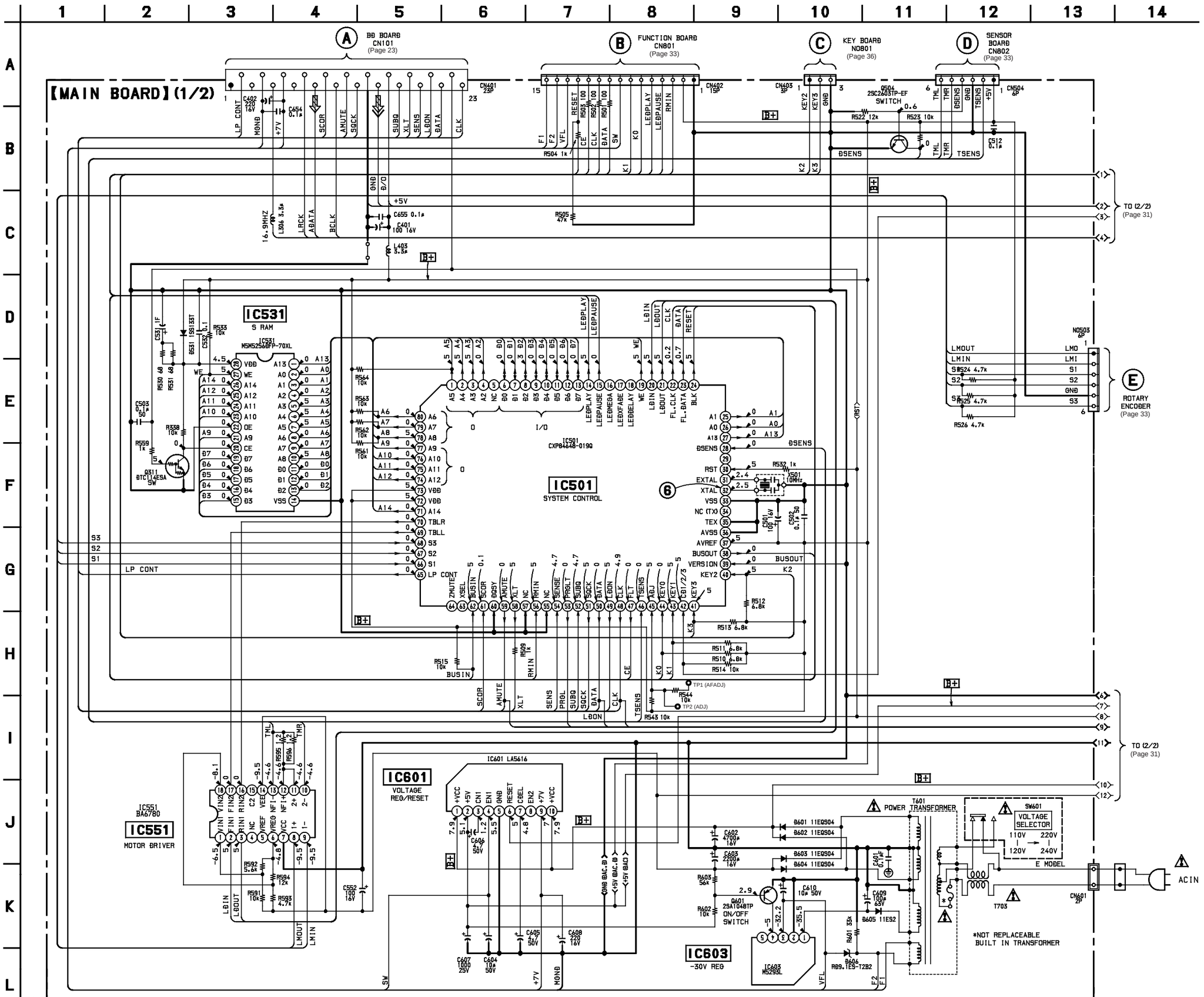
• See page 19 for Circuit Boards Location.



• **Semiconductor Location**

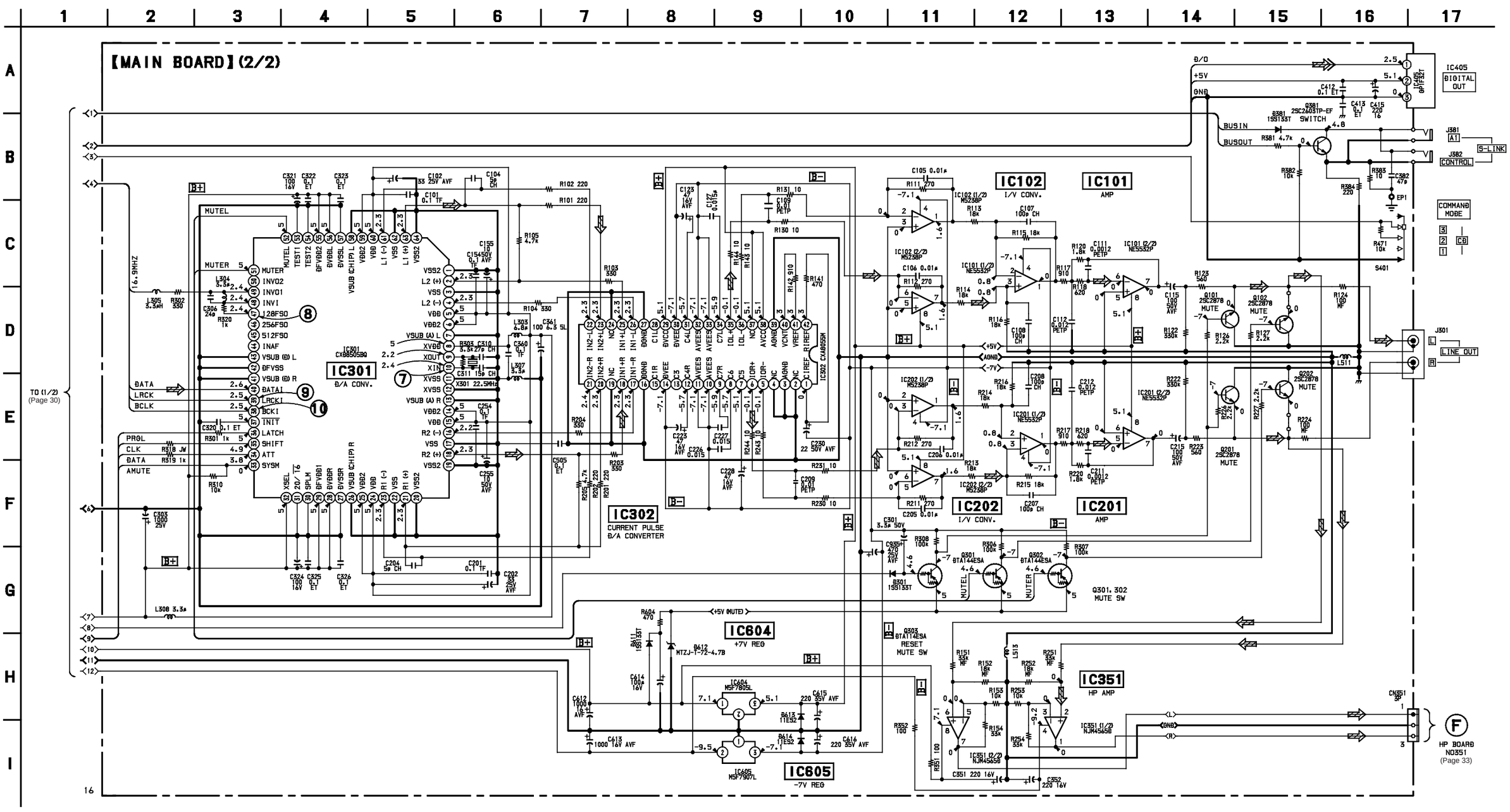
Ref. No.	Location
D301	F-6
D381	D-2
D531	E-11
D601	G-9
D602	G-9
D603	G-9
D604	G-9
D605	H-7
D606	H-7
D611	F-4
D612	G-4
D613	F-3
D614	F-3
IC101	C-4
IC102	C-5
IC201	D-4
IC202	D-5
IC301	D-9
IC302	D-7
IC351	F-7
IC405	B-2
IC501	C-11
IC531	D-11
IC551	F-11
IC601	I-10
IC603	G-7
IC604	F-3
IC605	F-4
Q101	C-3
Q102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

5-6. SCHEMATIC DIAGRAM – MAIN SECTION (1/2) – • See page 40 for IC Block Diagrams.

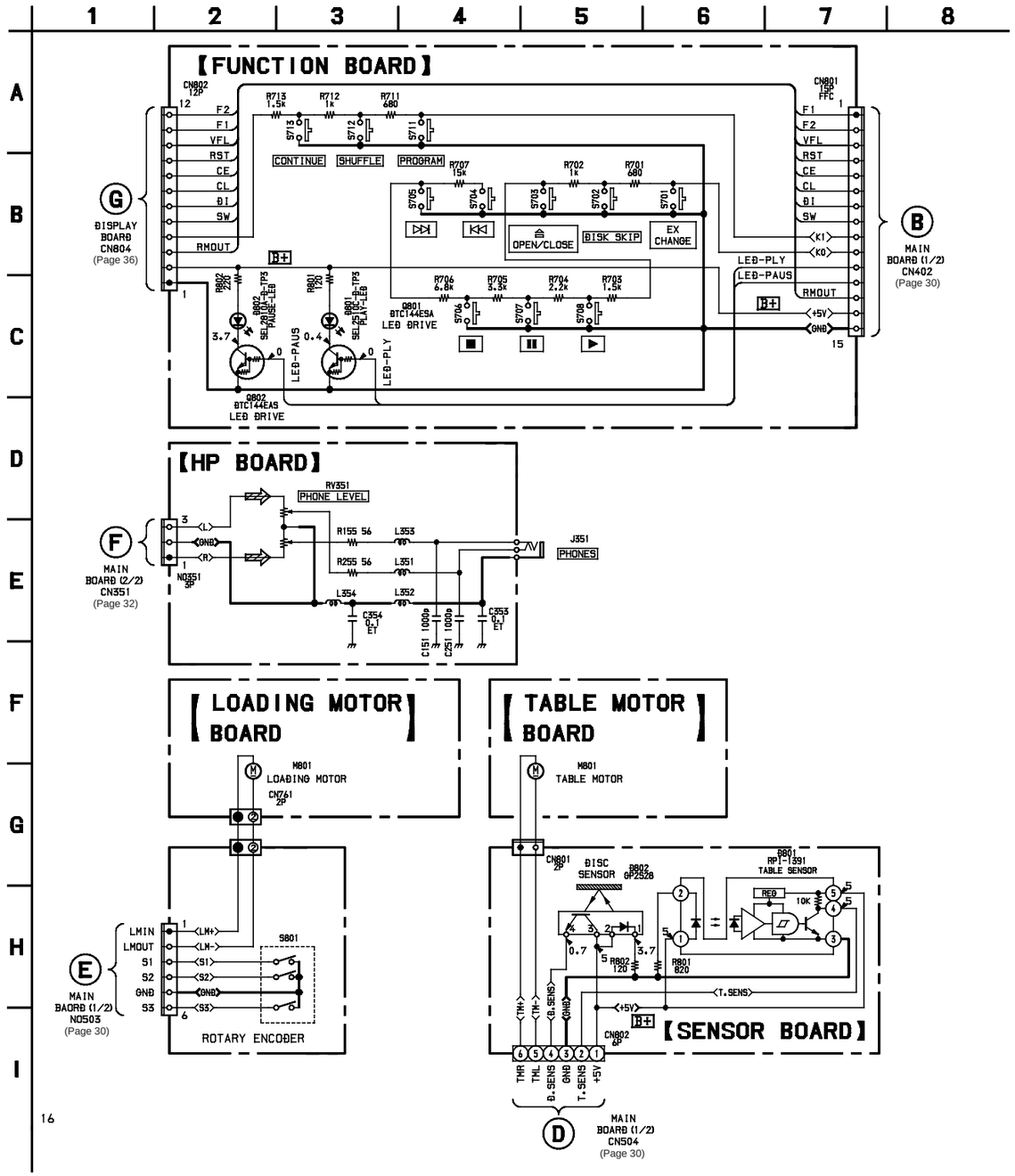


5-7. SCHEMATIC DIAGRAM – MAIN SECTION (2/2) –

• See page 39 for IC Block Diagrams.

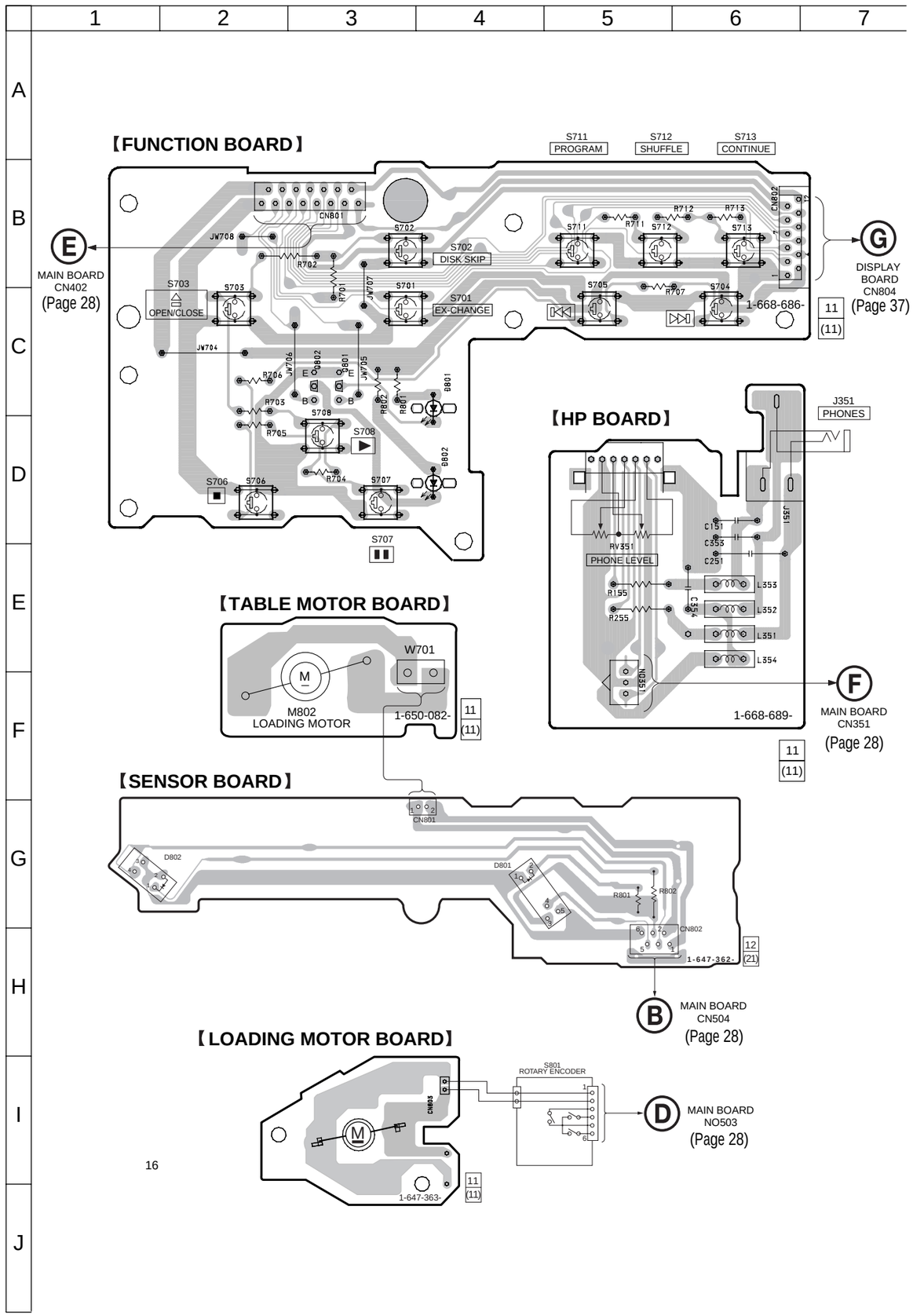


5-8. SCHEMATIC DIAGRAM – HP/FUNCTION SECTION –



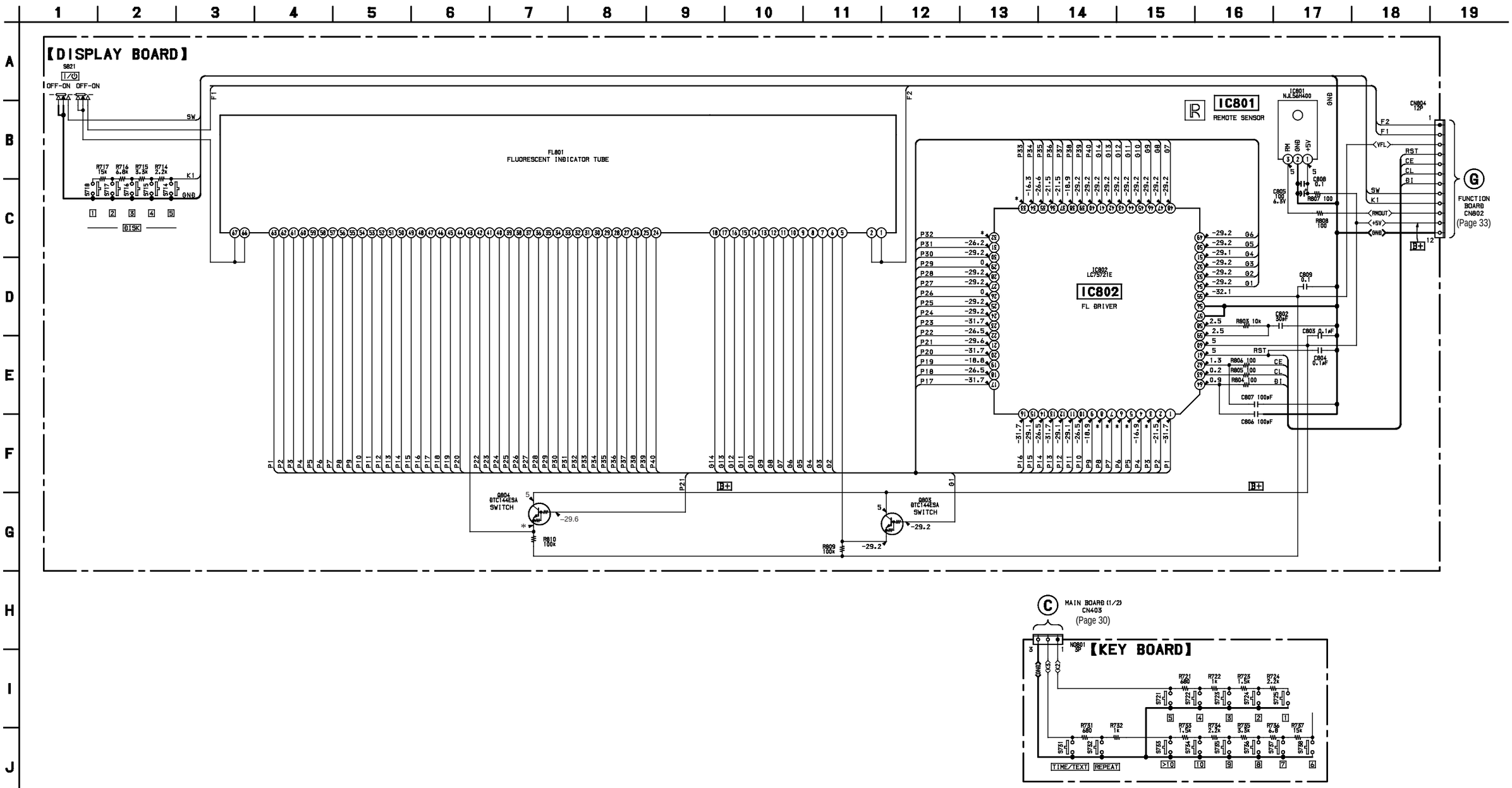
5-9. PRINTED WIRING BOARD – HP/FUNCTION SECTION –

• See page 19 for Circuit Boards Location.



5-10. SCHEMATIC DIAGRAM – DISPLAY SECTION –

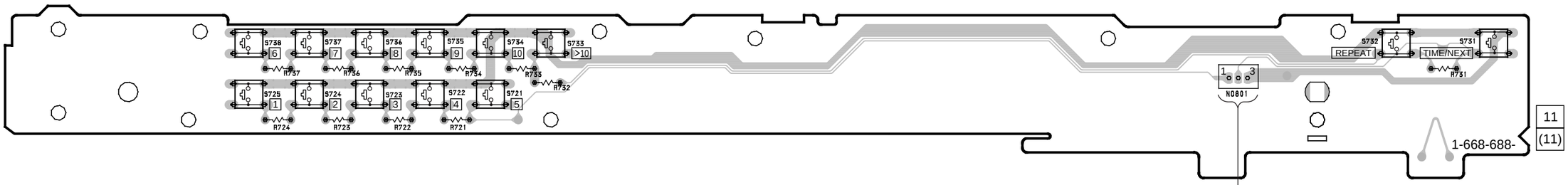
• See page 44 for IC Pin Functions.



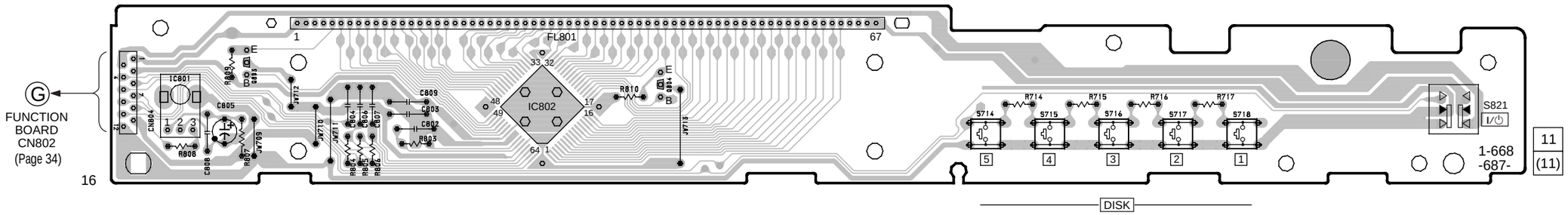
5-11. PRINTED WIRING BOARD – DISPLAY SECTION –

• See page 19 for Circuit Boards Location.

【KEY BOARD】

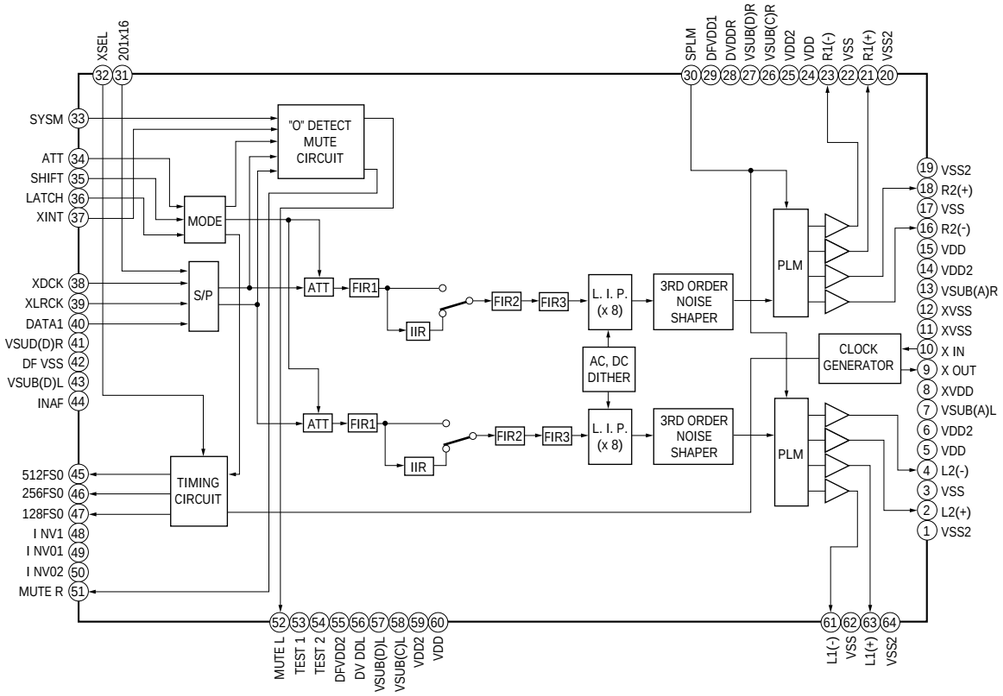


【DISPLAY BOARD】

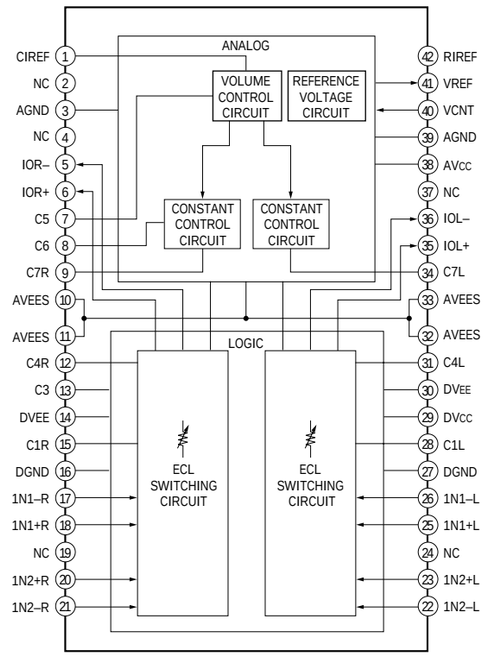


5-12. IC BLOCK DIAGRAMS

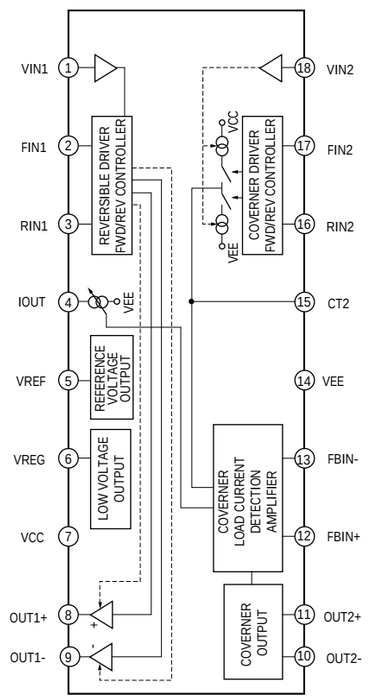
IC301 CXD8505BQ (MAIN BOARD (2/2))



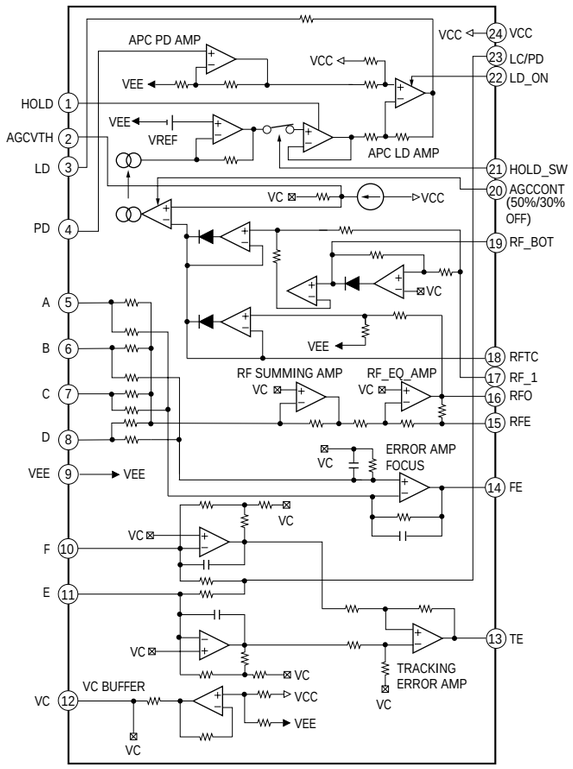
IC302 CXA8055M (MAIN BOARD (2/2))



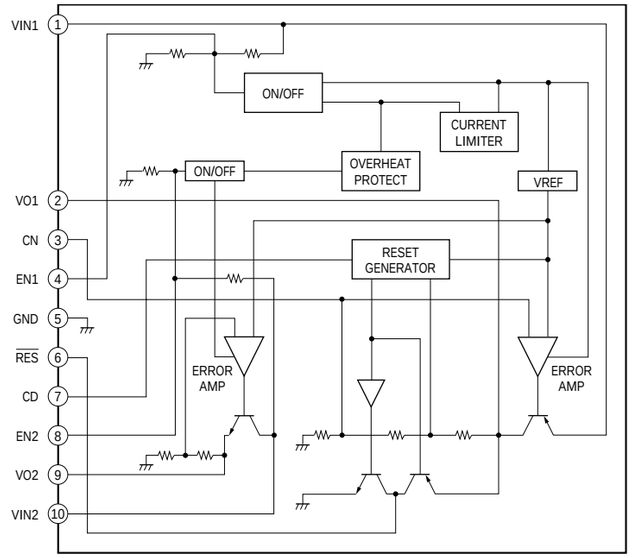
IC551 BA6780 (MAIN BOARD (1/2))



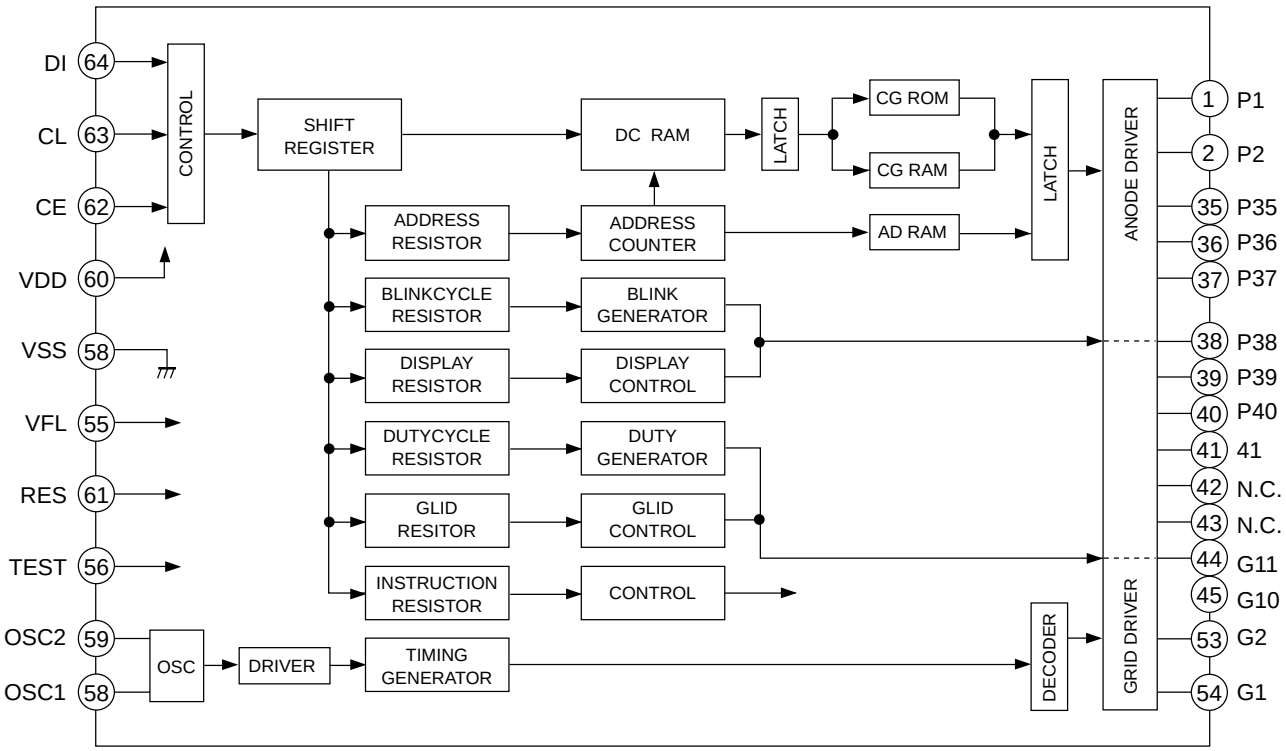
IC103 CXA2568M (BD BOARD)



IC601 LA5616 (MAIN BOARD (1/2))



IC802 LC75721E (DISPLAY BOARD)



5-13. 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 comparate 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 = Fs)
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 (CXP84648-019Q) (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	O	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 6
EXPLODED VIEWS

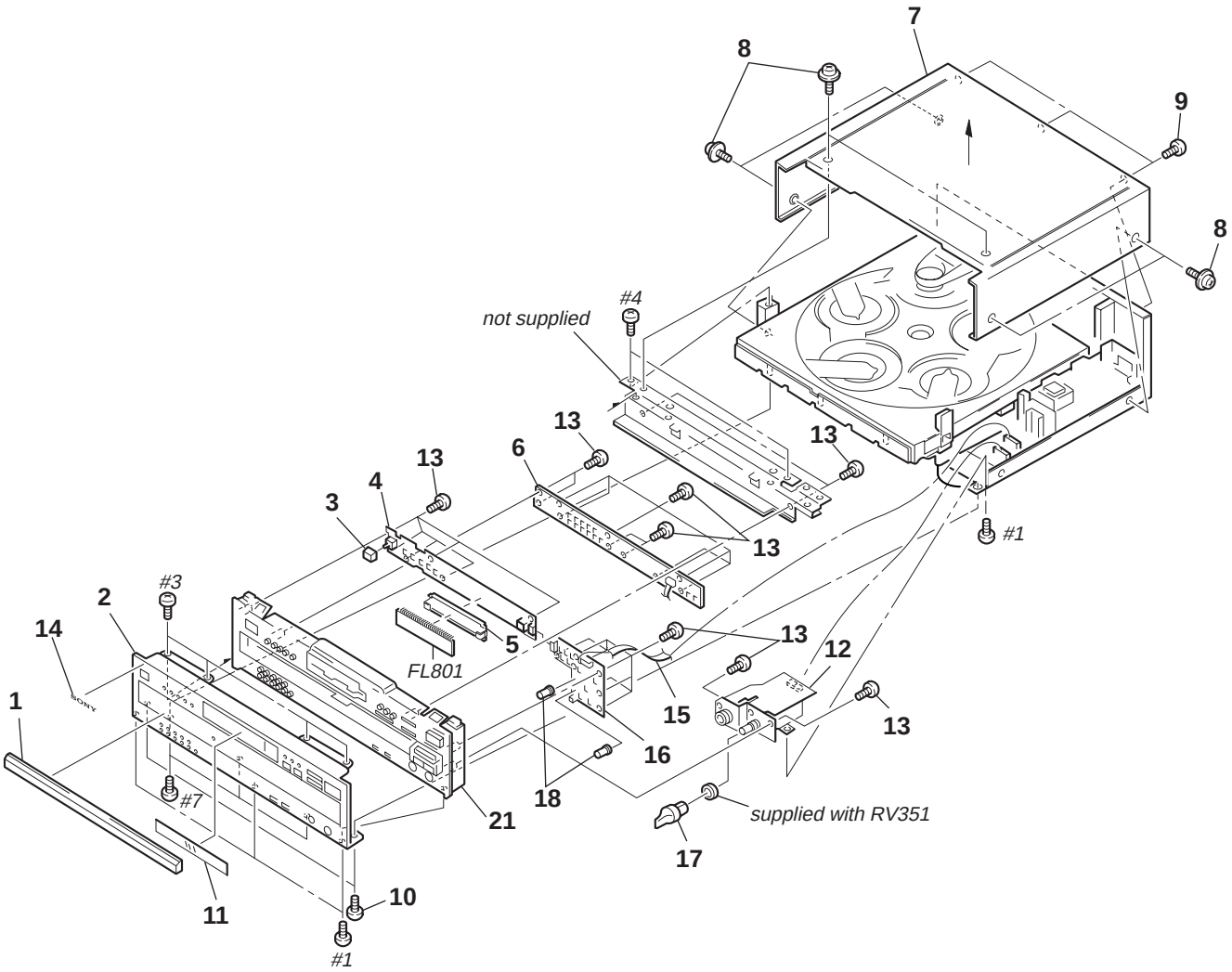
NOTE:

- -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
  SP : Singapore

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

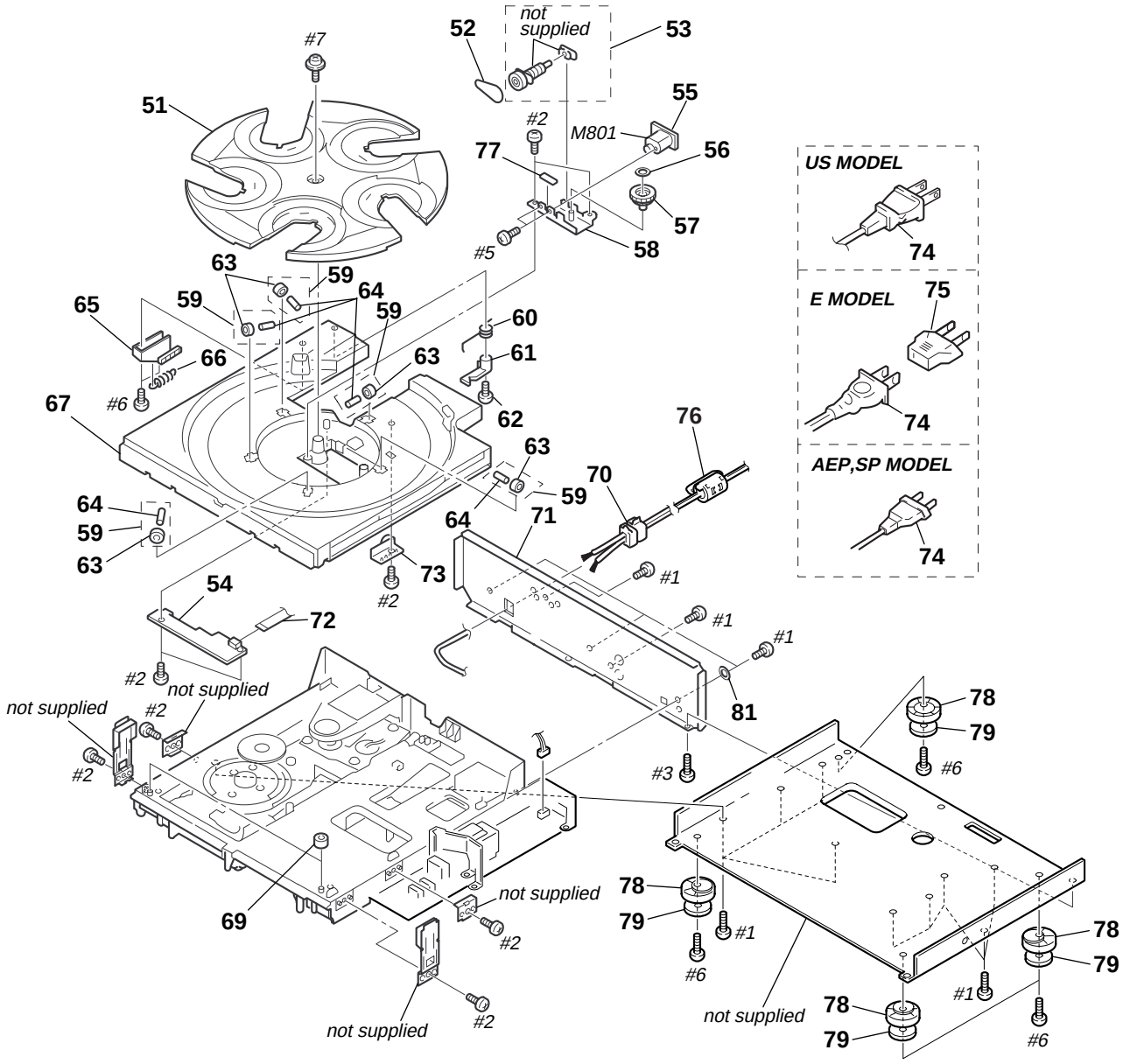
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

5-1. FRONT PANEL AND CASE SECTION



Ref. No.	Part No.	Description	Remarks
1	4-999-508-01	PANEL, LOADING	
2	4-972-224-72	PANEL, FRONT (US)	
2	4-972-224-82	PANEL, FRONT (AEP,E,SP)	
3	4-922-921-71	BUTTON (POWER)	
* 4	1-668-687-11	DISPLAY BOARD	
5	4-996-841-01	HOLDER (FL)	
* 6	1-668-688-11	KEY BOARD	
* 7	4-972-223-21	CASE	
8	4-210-291-01	SCREW (CASE 3 TP2)	
9	3-704-515-21	SCREW (BV/RING)	
10	3-703-685-21	SCREW (+BV 3X8)	
11	4-972-214-01	PLATE, INDICATION	
* 12	1-668-689-11	HP BOARD	
13	4-951-620-01	SCREW (2.6X8), +BVTP	
14	4-942-568-41	EMBLEM (NO.5), SONY	
15	1-769-456-11	WIRE (FLAT TYPE) (15 CORE)	
* 16	1-668-686-11	FUNCTION BOARD	
17	4-950-189-01	KNOB (A) (VOL)	
* 18	3-362-478-11	HOLDER (T), LED	
21	X-4946-751-1	BASE ASSY, PANEL	
FL801	1-517-664-11	INDICATOR TUBE, FLUORESCENT	

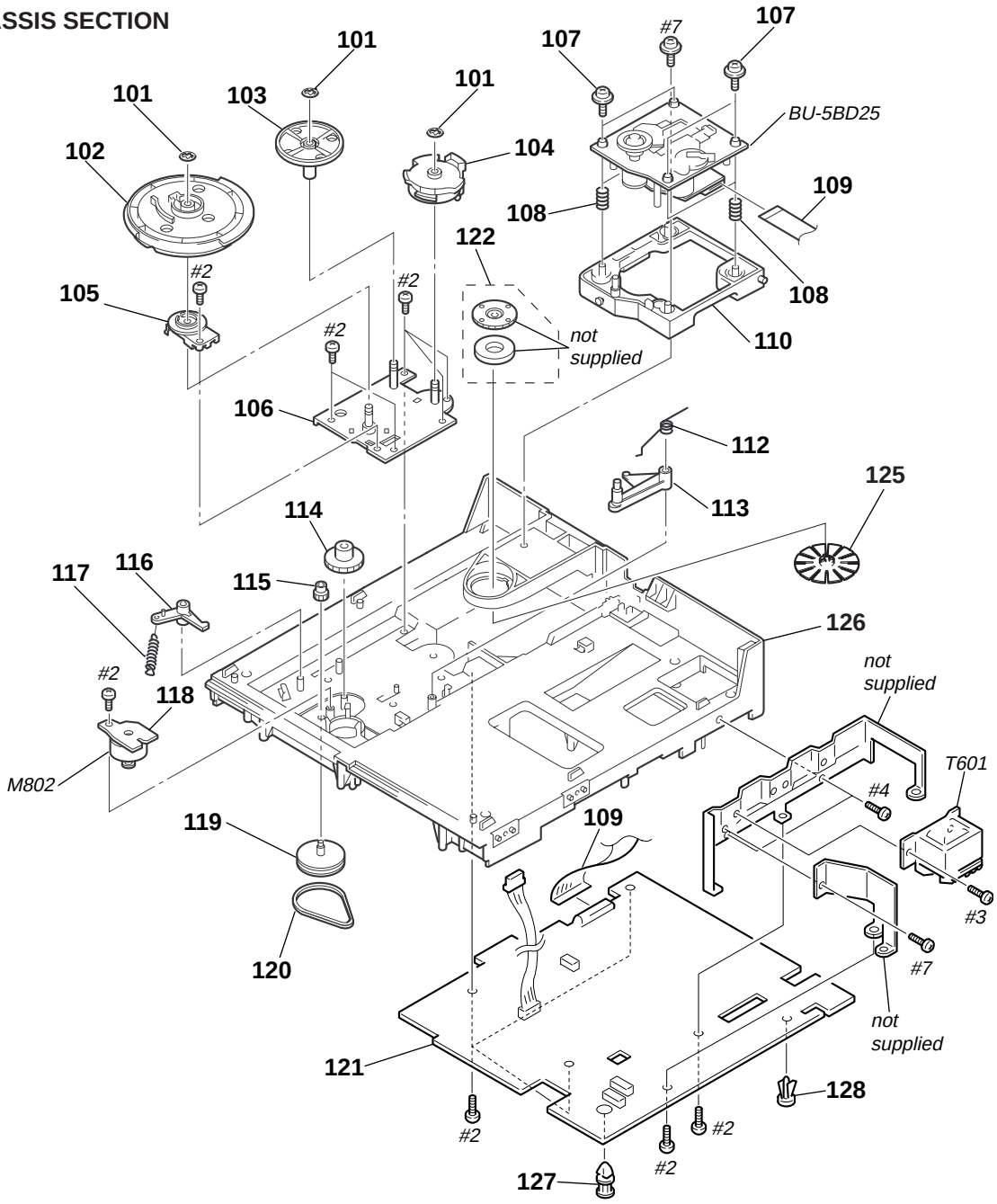
5-2. BACK PANEL AND DISC TABLE SECTION



Ref. No.	Part No.	Description	Remarks
* 51	4-957-299-41	TABLE (B), DISC	
52	4-957-304-01	BELT (RM)	
53	X-4943-479-1	GEAR (ROTARY A) ASSY	
* 54	1-647-362-11	SENSOR BOARD	
* 55	1-650-082-11	TABLE MOTOR BOARD	
56	3-325-697-21	WASHER	
57	4-957-284-01	GEAR (ROTARY B)	
58	X-4944-128-1	BRACKET (RM) ASSY	
* 59	X-4924-457-1	ROLLER ASSY	
60	4-957-293-11	SPRING (RACK RELEASE)	
61	4-957-291-11	LEVER (RACK RELEASE)	
62	4-957-868-11	SCREW (+PTPWH 2.6X20)	
63	4-988-162-01	ROLLER	
64	4-934-376-01	SHAFT (ROLLER)	
65	4-957-292-11	SLIDER (RACK)	
66	4-957-294-11	SPRING (D.T), TENSION	
* 67	4-957-298-41	TABLE (A), DISC	
* 69	4-951-619-01	CUSHION (A)	

Ref. No.	Part No.	Description	Remarks
* 70	3-703-244-00	BUSHING (2104), CORD (US,AEP,SP)	
70	3-703-571-11	BUSHING (S) (4516), CORD (E)	
* 71	4-998-478-01	BACK,PANEL (US)	
* 71	4-998-478-22	BACK,PANEL (E)	
* 71	4-998-478-42	BACK,PANEL (SP)	
* 71	4-998-478-52	BACK,PANEL (AEP)	
72	1-751-052-11	WIRE (FLAT TYPE) (6 CORE)	
73	X-4944-129-1	BRACKET (ROLLER D) ASSY	
74	1-575-042-21	CORD, POWER (US)	
74	1-575-651-21	CORD, POWER (AEP,SP)	
74	1-696-027-11	CORD, POWER (E)	
75	1-569-007-11	ADAPTOR, CONVERSION 2P (E)	
76	1-500-386-11	FILTER, CLAMP (FERRITE CORE)	
* 77	4-957-295-11	CUSHION (RM)	
78	4-970-123-01	FOOT (F501/80S)	
79	4-970-124-01	CUSHION (F501/80S)	
81	4-975-737-01	WASHER	
M801	A-4660-525-A	MOTOR ASSY, ROTARY	

5-3. CHASSIS SECTION

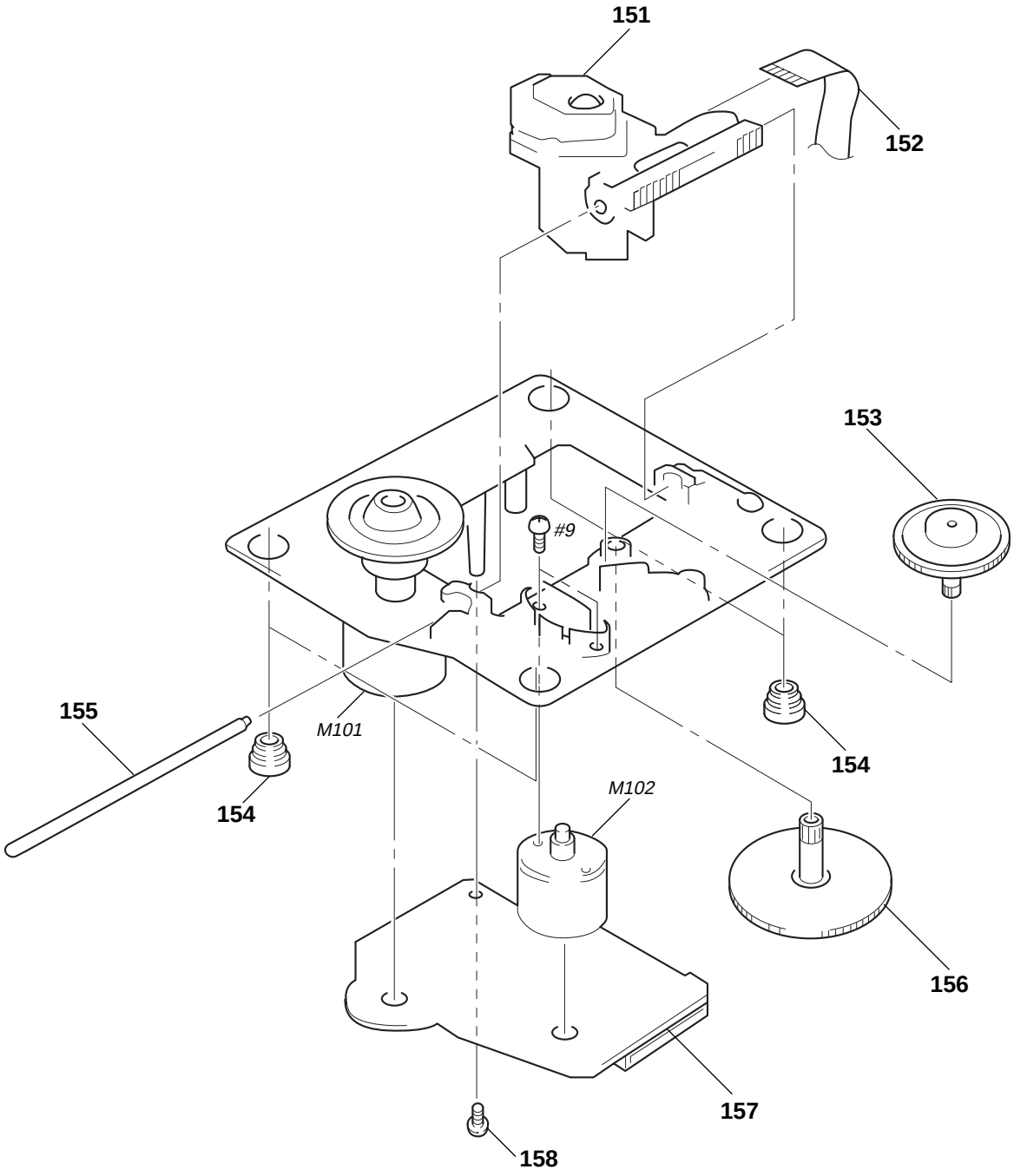


Ref. No.	Part No.	Description	Remarks
101	4-957-283-11	WASHER (5), STOPPER	
102	4-957-288-01	GEAR (MAIN)	
103	4-957-287-01	GEAR (REV)	
104	4-957-286-11	GEAR (U/D)	
105	1-466-996-11	ENCODER, ROTARY	
106	X-4944-127-1	BRACKET (GEAR) ASSY	
107	4-933-134-01	SCREW (+PTPWH M2.6X6)	
108	4-948-503-01	SPRING (BU), COMPRESSION	
109	1-765-443-11	WIRE (FLAT TYPE) (23 CORE)	
* 110	4-957-289-12	HOLDER (BU)	
112	4-957-281-11	SPRING (LOCK LEVER)	
113	4-957-279-11	LEVER, LOCK	
114	4-957-303-01	GEAR (LOADING C)	
115	4-934-375-01	GEAR (LOADING B)	
116	4-957-285-11	LEVER, SET	

Ref. No.	Part No.	Description	Remarks
117	4-962-087-01	SPRING (S), TENSION	
* 118	1-647-363-11	LOADING MOTOR BOARD	
119	X-4941-529-1	PULLEY ASSY	
120	4-944-490-01	BELT (TIMING)	
* 121	A-4724-036-A	MAIN BOARD, COMPLETE (E)	
* 121	A-4724-041-A	MAIN BOARD, COMPLETE (US,AEP,SP)	
122	1-452-925-21	MAGNET ASSY	
125	4-993-142-21	PULLEY (L), PRESS	
126	4-957-300-03	CHASSIS	
127	3-682-057-01	SPACER (SMALL)	
128	3-531-576-11	RIVET	
M802	A-4604-847-A	MOTOR ASSY, LOADING	
⚠T601	1-429-499-11	TRANSFORMER, POWER (US)	
⚠T601	1-429-500-11	TRANSFORMER, POWER (AEP,SP)	
⚠T601	1-429-501-11	TRANSFORMER, POWER (E)	

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

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



Ref. No.	Part No.	Description	Remarks
⚠151	8-848-379-31	DEVICE, OPTICAL KSS-213B/S-N	
152	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)	
153	4-917-567-01	GEAR (M)	
154	4-951-940-01	INSULATOR (BU)	
155	4-917-565-01	SHAFT, SLED	
156	4-917-564-01	GEAR (P), FLATNESS	
* 157	A-4724-002-A	BD BOARD, COMPLETE	
158	4-951-620-01	SCREW (2.6X8), +BVTP	
M101	X-4917-523-4	MOTOR ASSY (SPINDLE)	
M102	X-4917-504-1	MOTOR ASSY (SLED)	

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

BD

SECTION 7
ELECTRICAL PARTS LIST

NOTE:

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

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

- Abbreviation
  SP : Singapore
- 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: µF
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- COILS
  uH: µH
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

Ref. No.	Part No.	Description			Remarks
*	A-4724-002-A	BD BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C102	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C103	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C105	1-135-155-21	TANTALUM CHIP	4.7uF	10%	16V
C106	1-164-346-11	CERAMIC CHIP	1uF		16V
C107	1-164-346-11	CERAMIC CHIP	1uF		16V
C108	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C109	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C110	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C111	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C112	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C113	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C115	1-126-607-11	ELECT CHIP	47uF	20%	4V
C116	1-126-607-11	ELECT CHIP	47uF	20%	4V
C117	1-126-209-11	ELECT CHIP	100uF	20%	4V
C118	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C119	1-163-231-11	CERAMIC CHIP	15PF	5%	50V
C120	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C121	1-109-982-11	CERAMIC CHIP	1uF	10%	10V
C122	1-163-021-91	CERAMIC CHIP	0.01uF		50V
C123	1-163-021-91	CERAMIC CHIP	0.01uF		50V
C124	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C125	1-163-217-11	CERAMIC CHIP	1PF	0.25PF	50V
C126	1-135-216-11	TANTALUM CHIP	10uF	20%	10V
C140	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C141	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C151	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C153	1-163-038-91	CERAMIC CHIP	0.1uF		25V
C154	1-164-336-11	CERAMIC CHIP	0.33uF		25V
C156	1-163-237-11	CERAMIC CHIP	27PF	5%	50V
C157	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C159	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C161	1-163-038-91	CERAMIC CHIP	0.1uF		25V
		< CONNECTOR >			
CN101	1-770-072-11	CONNECTOR,(LIF(NON-ZIF))FFC23P			
CN102	1-777-937-11	CONNECTOR, FFC/FPC 16P			
		< IC >			
IC101	8-752-389-34	IC CXD2585Q			
IC102	8-759-455-91	IC BA6392FP-E2			
IC103	8-752-085-51	IC CXA2568M			

Ref. No.	Part No.	Description			Remarks
		< JUMPER RESISTOR >			
JW102	1-216-295-91	SHORT 0			
		< COIL >			
L101	1-414-234-11	INDUCTOR CHIP 0uH			
		< MOTOR >			
M101	X-4917-523-4	MOTOR ASSY (SPINDLE)			
M102	X-4917-504-1	MOTOR ASSY (SLED)			
		< TRANSISTOR >			
Q101	8-729-010-08	TRANSISTOR MSB710-R			
		< 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
R106	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
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
R110	1-216-025-91	RES,CHIP	100	5%	1/10W
R112	1-216-049-91	RES,CHIP	1K	5%	1/10W
R123	1-216-073-00	METAL CHIP	10K	5%	1/10W
R124	1-216-097-91	RES,CHIP	100K	5%	1/10W
R125	1-216-037-00	METAL CHIP	330	5%	1/10W
R126	1-216-037-00	METAL CHIP	330	5%	1/10W
R127	1-216-037-00	METAL CHIP	330	5%	1/10W
R131	1-216-037-00	METAL CHIP	330	5%	1/10W
R135	1-216-295-91	SHORT	0		
R136	1-216-295-91	SHORT	0		
R137	1-216-295-91	SHORT	0		
R138	1-216-295-91	SHORT	0		
R143	1-216-103-00	METAL CHIP	180K	5%	1/10W
R144	1-216-103-00	METAL CHIP	180K	5%	1/10W
R145	1-216-121-91	RES,CHIP	1M	5%	1/10W
R146	1-216-121-91	RES,CHIP	1M	5%	1/10W
R147	1-216-081-00	METAL CHIP	22K	5%	1/10W
R148	1-216-001-00	METAL CHIP	10	5%	1/10W
R149	1-216-003-11	RES,CHIP	12	5%	1/10W
R158	1-216-111-00	METAL CHIP	390K	5%	1/10W
R159	1-216-101-00	METAL CHIP	150K	5%	1/10W
R161	1-216-308-00	METAL CHIP	4.7	5%	1/10W
R162	1-216-101-00	METAL CHIP	150K	5%	1/10W

Ref. No.	Part No.	Description			Remarks
		< SWITCH >			
S101	1-572-085-11	SWITCH, LEAF (LIMIT)			
**********					
*	1-668-687-11	DISPLAY BOARD			
		**********			
*	3-362-478-11	HOLDER (T), LED			
*	4-996-841-01	HOLDER (FL)			
		< CAPACITOR >			
C802	1-162-210-31	CERAMIC	30PF	5%	50V
C803	1-164-159-11	CERAMIC	0.1uF		50V
C804	1-164-159-11	CERAMIC	0.1uF		50V
C805	1-124-584-00	ELECT	100uF	20%	10V
C806	1-162-282-31	CERAMIC	100PF	10%	50V
C807	1-162-282-31	CERAMIC	100PF	10%	50V
C808	1-164-159-11	CERAMIC	0.1uF		50V
C809	1-164-159-11	CERAMIC	0.1uF		50V
		< CONNECTOR >			
* CN804	1-695-821-11	CONNECTOR, BOARD TO BOARD 12P			
		< FILTER >			
FL801	1-517-664-11	INDICATOR TUBE, FLUORESCENT			
		< IC >			
IC801	8-749-014-66	IC NJL56H400A			
IC802	8-759-337-52	IC LC75721E			
		< TRANSISTOR >			
Q803	8-729-030-02	TRANSISTOR DTC144ESA			
Q804	8-729-030-02	TRANSISTOR DTC144ESA			
		< 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
R803	1-249-429-11	CARBON	10K	5%	1/4W
R804	1-247-807-31	CARBON	100	5%	1/4W
R805	1-247-807-31	CARBON	100	5%	1/4W
R806	1-247-807-31	CARBON	100	5%	1/4W
R807	1-247-807-31	CARBON	100	5%	1/4W
R808	1-247-807-31	CARBON	100	5%	1/4W
R809	1-249-441-11	CARBON	100K	5%	1/4W
R810	1-249-441-11	CARBON	100K	5%	1/4W
		< SWITCH >			
S714	1-554-303-21	SWITCH, TACTILE(DISK 5)			
S715	1-554-303-21	SWITCH, TACTILE(DISK 4)			
S716	1-554-303-21	SWITCH, TACTILE(DISK 3)			
S717	1-554-303-21	SWITCH, TACTILE(DISK 2)			
S718	1-554-303-21	SWITCH, TACTILE(DISK 1)			
S821	1-572-714-11	SWITCH, PUSH (I/⏻)			
**********					

Ref. No.	Part No.	Description			Remarks
*	1-668-686-11	FUNCTION BOARD			
		**********			
		< CONNECTOR >			
CN801	1-695-338-11	PIN, CONNECTOR (PC BOARD) 15P			
* CN802	1-695-820-11	CONNECTOR, BOARD TO BOARD 12P			
		< DIODE >			
D801	8-719-303-02	DIODE SEL2510C-D			
D802	8-719-301-52	DIODE SEL2810A-C			
		< TRANSISTOR >			
Q801	8-729-030-02	TRANSISTOR DTC144ESA			
Q802	8-729-030-02	TRANSISTOR DTC144ESA			
		< RESISTOR >			
R701	1-249-415-11	CARBON	680	5%	1/4W F
R702	1-249-417-11	CARBON	1K	5%	1/4W F
R703	1-249-419-11	CARBON	1.5K	5%	1/4W F
R704	1-249-421-11	CARBON	2.2K	5%	1/4W F
R705	1-247-843-11	CARBON	3.3K	5%	1/4W
R706	1-249-427-11	CARBON	6.8K	5%	1/4W F
R707	1-249-431-11	CARBON	15K	5%	1/4W
R711	1-249-415-11	CARBON	680	5%	1/4W F
R712	1-249-417-11	CARBON	1K	5%	1/4W F
R713	1-249-419-11	CARBON	1.5K	5%	1/4W F
R801	1-249-406-11	CARBON	120	5%	1/4W F
R802	1-249-409-11	CARBON	220	5%	1/4W F
		< SWITCH >			
S701	1-554-303-21	SWITCH, TACTILE(EX-CHANGE)			
S702	1-554-303-21	SWITCH, TACTILE(DISK SKIP)			
S703	1-554-303-21	SWITCH, TACTILE(⏏OPEN/CLOSE)			
S704	1-554-303-21	SWITCH, TACTILE(⏮◁◁)			
S705	1-554-303-21	SWITCH, TACTILE(▷▷⏭)			
S706	1-554-303-21	SWITCH, TACTILE(■)			
S707	1-554-303-21	SWITCH, TACTILE(❚❚)			
S708	1-554-303-21	SWITCH, TACTILE(▶)			
S711	1-554-303-21	SWITCH, TACTILE(PROGRAM)			
S712	1-554-303-21	SWITCH, TACTILE(SHUFFLE)			
S713	1-554-303-21	SWITCH, TACTILE(CONTINUE)			
**********					
*	1-668-689-11	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
		< JACK >			
J351	1-750-162-61	JACK (LARGE TYPE)(PHONES)			

HP | KEY | LOADING MOTOR | MAIN

Ref. No.	Part No.	Description				Remarks
		< COIL >				
L351	1-424-122-11	FILTER, NOISE				
L352	1-410-397-21	FERRITE BEAD INDUCTOR				
L353	1-424-122-11	FILTER, NOISE				
L354	1-424-122-11	FILTER, NOISE				
		< 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 (PHONES)				
**********						
*	1-668-688-11	KEY BOARD				
		**********				
		< RESISTOR >				
R721	1-249-415-11	CARBON	680	5%	1/4W	F
R722	1-249-417-11	CARBON	1K	5%	1/4W	F
R723	1-249-419-11	CARBON	1.5K	5%	1/4W	F
R724	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R731	1-249-415-11	CARBON	680	5%	1/4W	F
R732	1-249-417-11	CARBON	1K	5%	1/4W	F
R733	1-249-419-11	CARBON	1.5K	5%	1/4W	F
R734	1-249-421-11	CARBON	2.2K	5%	1/4W	F
R735	1-247-843-11	CARBON	3.3K	5%	1/4W	
R736	1-249-427-11	CARBON	6.8K	5%	1/4W	F
R737	1-249-431-11	CARBON	15K	5%	1/4W	
		< SWITCH >				
S721	1-554-303-21	SWITCH, TACTILE(5)				
S722	1-554-303-21	SWITCH, TACTILE(4)				
S723	1-554-303-21	SWITCH, TACTILE(3)				
S724	1-554-303-21	SWITCH, TACTILE(2)				
S725	1-554-303-21	SWITCH, TACTILE(1)				
S731	1-554-303-21	SWITCH, TACTILE(TIME/NEXT)				
S732	1-554-303-21	SWITCH, TACTILE(REPEAT)				
S733	1-554-303-21	SWITCH, TACTILE(>10)				
S734	1-554-303-21	SWITCH, TACTILE(10)				
S735	1-554-303-21	SWITCH, TACTILE(9)				
S736	1-554-303-21	SWITCH, TACTILE(8)				
S737	1-554-303-21	SWITCH, TACTILE(7)				
S738	1-554-303-21	SWITCH, TACTILE(6)				
**********						
*	1-647-363-11	LOADING MOTOR BOARD				
		**********				
		< MOTOR >				
M802	A-4604-847-A	MOTOR ASSY,LOADING				
**********						
*	A-4724-041-A	MAIN BOARD, COMPLETE (US,AEP,SP)				
		**********				
*	A-4724-036-A	MAIN BOARD, COMPLETE (E)				
		**********				
	7-685-871-01	SCREW +BVTT 3X6 (S)				

Ref. No.	Part No.	Description			Remarks
		< 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	1-130-483-00	MYLAR	0.01uF	5%	50V
C123	1-124-910-11	ELECT	47uF	20%	50V
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	1-130-483-00	MYLAR	0.01uF	5%	50V
C223	1-124-910-11	ELECT	47uF	20%	50V
C226	1-130-485-00	MYLAR	0.015uF	5%	50V
C227	1-130-485-00	MYLAR	0.015uF	5%	50V
C228	1-124-910-11	ELECT	47uF	20%	50V
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
C361	1-124-584-00	ELECT	100uF	20%	10V
C382	1-102-852-91	CERAMIC	47PF	5%	50V
C401	1-126-933-11	ELECT	100uF	20%	16V
C402	1-126-934-11	ELECT	220uF	20%	16V
C412	1-164-159-11	CERAMIC	0.1uF		50V

Ref. No.	Part No.	Description			Remarks
C413	1-164-159-11	CERAMIC	0.1uF		50V
C415	1-126-934-11	ELECT	220uF	20%	16V
C501	1-126-933-11	ELECT	100uF	20%	16V
C502	1-164-159-11	CERAMIC	0.1uF		50V
C503	1-164-159-11	CERAMIC	0.1uF		50V
C505	1-164-159-11	CERAMIC	0.1uF		50V
C508	1-162-294-31	CERAMIC	0.001uF	10%	50V
C509	1-162-294-31	CERAMIC	0.001uF	10%	50V
C512	1-164-159-11	CERAMIC	0.1uF		50V
C531	1-110-489-11	CAPACITOR	1F		5.5V
C532	1-164-159-11	CERAMIC	0.1uF		50V
C552	1-126-933-11	ELECT	100uF	20%	16V
C601	1-164-159-11	CERAMIC	0.1uF		50V
C602	1-126-937-11	ELECT	4700uF	20%	16V
C603	1-124-556-11	ELECT	2200uF	20%	16V
C604	1-126-059-11	ELECT	10uF	20%	50V
C605	1-126-163-11	ELECT	4.7uF	20%	50V
C606	1-126-163-11	ELECT	4.7uF	20%	50V
C607	1-126-942-61	ELECT	1000uF	20%	25V
C608	1-126-934-11	ELECT	220uF	20%	16V
C609	1-126-063-11	ELECT	100uF	20%	63V
C610	1-126-059-11	ELECT	10uF	20%	50V
C612	1-124-689-11	ELECT	1000uF	20%	16V
C613	1-124-689-11	ELECT	1000uF	20%	16V
C614	1-126-052-11	ELECT	100uF	20%	16V
C615	1-124-484-11	ELECT	220uF	20%	35V
C616	1-124-484-11	ELECT	220uF	20%	35V
C654	1-164-159-11	CERAMIC	0.1uF		50V
C655	1-164-159-11	CERAMIC	0.1uF		50V
C935	1-126-026-11	ELECT	470uF	20%	25V
		< CONNECTOR >			
CN351	1-506-468-11	PIN, CONNECTOR 3P			
CN401	1-750-640-11	CONNECTOR, FFC/FPC 23P			
CN402	1-695-338-11	PIN, CONNECTOR (PC BOARD) 15P			
* CN403	1-568-941-11	PIN, CONNECTOR 3P			
* CN504	1-695-329-31	PIN, CONNECTOR (PC BOARD) 6P			
CN601	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P			
		< DIODE >			
D301	8-719-911-19	DIODE 1SS119			
D381	8-719-911-19	DIODE 1SS119			
D531	8-719-911-19	DIODE 1SS119			
D601	8-719-210-21	DIODE 11EQS04			
D602	8-719-210-21	DIODE 11EQS04			
D603	8-719-210-21	DIODE 11EQS04			
D604	8-719-210-21	DIODE 11EQS04			
D605	8-719-024-99	DIODE 11ES2-NTA2B			
D606	8-719-929-15	DIODE RD9.1ES-T2B2			
D606	8-719-110-12	DIODE RD9.1ES-B1			
D611	8-719-911-19	DIODE 1SS119			
D612	8-719-921-40	DIODE MTZJ-4.7C			
D613	8-719-024-99	DIODE 11ES2-NTA2B			
D614	8-719-024-99	DIODE 11ES2-NTA2B			
		< EARTH >			
EB001	1-537-770-21	TERMINAL BOARD, GROUND			

Ref. No.	Part No.	Description			Remarks
		< IC >			
IC101	8-759-900-72	IC NE5532P			
IC102	8-759-900-72	IC NE5532P			
IC201	8-759-900-72	IC NE5532P			
IC202	8-759-900-72	IC NE5532P			
IC301	8-759-370-62	IC CXD8505BQ			
IC302	8-759-361-58	IC CXA8055M			
IC351	8-759-167-88	IC NJM4565D			
IC405	8-749-921-12	IC GP1F32T			
IC501	8-752-893-90	IC CXP84648-019Q			
IC531	8-759-463-99	IC M5M5256DFP-70XL			
IC551	8-759-356-03	IC BA6780			
IC601	8-759-330-29	IC LA5616			
IC603	8-759-633-42	IC M5293L			
IC604	8-759-231-53	IC TA7805S			
IC605	8-759-604-90	IC M5F7907L			
		< JACK >			
J301	1-569-442-21	JACK, PIN 2P(LINE OUT)			
* J381	1-764-188-11	JACK (SMALL TYPE) (DIA. 3.5)(A1)			
* J382	1-764-188-11	JACK (SMALL TYPE) (DIA. 3.5)(CONTROL)			
		< COIL >			
L303	1-410-507-11	INDUCTOR	6.8uH		
L304	1-410-503-11	INDUCTOR	3.3uH		
L305	1-410-503-11	INDUCTOR	3.3uH		
L306	1-410-503-11	INDUCTOR	3.3uH		
L307	1-410-503-11	INDUCTOR	3.3uH		
L308	1-410-503-11	INDUCTOR	3.3uH		
L511	1-412-473-21	INDUCTOR	0uH		
L513	1-412-473-21	INDUCTOR	0uH		
		< TRANSISTOR >			
Q101	8-729-231-55	TRANSISTOR 2SC2878-AB			
Q102	8-729-231-55	TRANSISTOR 2SC2878-AB			
Q201	8-729-231-55	TRANSISTOR 2SC2878-AB			
Q202	8-729-231-55	TRANSISTOR 2SC2878-AB			
Q301	8-729-029-56	TRANSISTOR DTA144ESA			
Q302	8-729-029-56	TRANSISTOR DTA144ESA			
Q303	8-729-029-21	TRANSISTOR DTA114ESA			
Q311	8-729-030-02	TRANSISTOR DTC144ESA			
Q381	8-729-620-05	TRANSISTOR 2SC2603-EF			
Q504	8-729-620-05	TRANSISTOR 2SC2603-EF			
Q601	8-729-119-76	TRANSISTOR 2SA1175-HFE			
		< RESISTOR >			
R101	1-215-405-00	METAL	220	1%	1/4W
R102	1-215-405-00	METAL	220	1%	1/4W
R103	1-215-409-00	METAL	330	1%	1/4W
R104	1-215-409-00	METAL	330	1%	1/4W
R105	1-215-437-00	METAL	4.7K	1%	1/4W
R111	1-215-407-00	METAL	270	1%	1/4W
R112	1-215-407-00	METAL	270	1%	1/4W
R113	1-215-451-00	METAL	18K	1%	1/4W
R114	1-215-451-00	METAL	18K	1%	1/4W
R115	1-215-451-00	METAL	18K	1%	1/4W

MAIN

Ref. No.	Part No.	Description			Remarks
R116	1-215-451-00	METAL	18K	1%	1/4W
R117	1-215-420-00	METAL	910	1%	1/4W
R118	1-215-416-00	METAL	620	1%	1/4W
R120	1-215-427-00	METAL	1.8K	1%	1/4W
R122	1-215-481-00	METAL	330K	1%	1/4W
R123	1-215-415-00	METAL	560	1%	1/4W
R124	1-215-397-00	METAL	100	1%	1/4W
R126	1-249-421-11	CARBON	2.2K	5%	1/4W F
R127	1-249-421-11	CARBON	2.2K	5%	1/4W F
R130	1-215-373-31	METAL	10	1%	1/4W
R131	1-215-373-31	METAL	10	1%	1/4W
R141	1-215-413-00	METAL	470	1%	1/4W
R142	1-215-420-00	METAL	910	1%	1/4W
R143	1-215-373-31	METAL	10	1%	1/4W
R144	1-215-373-31	METAL	10	1%	1/4W
R151	1-215-457-00	METAL	33K	1%	1/4W
R152	1-215-451-00	METAL	18K	1%	1/4W
R153	1-249-429-11	CARBON	10K	5%	1/4W
R154	1-249-435-11	CARBON	33K	5%	1/4W
R201	1-215-405-00	METAL	220	1%	1/4W
R202	1-215-405-00	METAL	220	1%	1/4W
R203	1-215-409-00	METAL	330	1%	1/4W
R204	1-215-409-00	METAL	330	1%	1/4W
R205	1-215-437-00	METAL	4.7K	1%	1/4W
R211	1-215-407-00	METAL	270	1%	1/4W
R212	1-215-407-00	METAL	270	1%	1/4W
R213	1-215-451-00	METAL	18K	1%	1/4W
R214	1-215-451-00	METAL	18K	1%	1/4W
R215	1-215-451-00	METAL	18K	1%	1/4W
R216	1-215-451-00	METAL	18K	1%	1/4W
R217	1-215-420-00	METAL	910	1%	1/4W
R218	1-215-416-00	METAL	620	1%	1/4W
R220	1-215-427-00	METAL	1.8K	1%	1/4W
R222	1-215-481-00	METAL	330K	1%	1/4W
R223	1-215-415-00	METAL	560	1%	1/4W
R224	1-215-397-00	METAL	100	1%	1/4W
R226	1-249-421-11	CARBON	2.2K	5%	1/4W F
R227	1-249-421-11	CARBON	2.2K	5%	1/4W F
R230	1-215-373-31	METAL	10	1%	1/4W
R231	1-215-373-31	METAL	10	1%	1/4W
R243	1-215-373-31	METAL	10	1%	1/4W
R244	1-215-373-31	METAL	10	1%	1/4W
R251	1-215-457-00	METAL	33K	1%	1/4W
R252	1-215-451-00	METAL	18K	1%	1/4W
R253	1-249-429-11	CARBON	10K	5%	1/4W
R254	1-249-435-11	CARBON	33K	5%	1/4W
R301	1-249-417-11	CARBON	1K	5%	1/4W F
R302	1-249-411-11	CARBON	330	5%	1/4W
R303	1-247-843-11	CARBON	3.3K	5%	1/4W
R306	1-249-441-11	CARBON	100K	5%	1/4W
R307	1-249-441-11	CARBON	100K	5%	1/4W
R308	1-249-441-11	CARBON	100K	5%	1/4W
R310	1-249-429-11	CARBON	10K	5%	1/4W
R319	1-249-417-11	CARBON	1K	5%	1/4W F
R320	1-249-417-11	CARBON	1K	5%	1/4W F
R338	1-249-429-11	CARBON	10K	5%	1/4W
R351	1-247-807-31	CARBON	100	5%	1/4W
R352	1-247-807-31	CARBON	100	5%	1/4W
R381	1-249-425-11	CARBON	4.7K	5%	1/4W F
R382	1-249-429-11	CARBON	10K	5%	1/4W
R383	1-249-393-11	CARBON	10	5%	1/4W F
R384	1-249-409-11	CARBON	220	5%	1/4W F
R471	1-249-429-11	CARBON	10K	5%	1/4W
R501	1-247-807-31	CARBON	100	5%	1/4W
R502	1-247-807-31	CARBON	100	5%	1/4W
R503	1-247-807-31	CARBON	100	5%	1/4W
R504	1-247-807-31	CARBON	100	5%	1/4W
R505	1-249-437-11	CARBON	47K	5%	1/4W
R509	1-249-417-11	CARBON	1K	5%	1/4W F
R510	1-249-427-11	CARBON	6.8K	5%	1/4W F
R511	1-249-427-11	CARBON	6.8K	5%	1/4W F
R512	1-249-427-11	CARBON	6.8K	5%	1/4W F
R513	1-249-427-11	CARBON	6.8K	5%	1/4W F
R514	1-249-429-11	CARBON	10K	5%	1/4W
R515	1-249-429-11	CARBON	10K	5%	1/4W
R522	1-249-430-11	CARBON	12K	5%	1/4W
R523	1-249-429-11	CARBON	10K	5%	1/4W
R524	1-249-425-11	CARBON	4.7K	5%	1/4W F
R525	1-249-425-11	CARBON	4.7K	5%	1/4W F
R526	1-249-425-11	CARBON	4.7K	5%	1/4W F
R530	1-249-403-11	CARBON	68	5%	1/4W F
R531	1-249-403-11	CARBON	68	5%	1/4W F
R532	1-249-417-11	CARBON	1K	5%	1/4W F
R533	1-249-429-11	CARBON	10K	5%	1/4W
R543	1-249-429-11	CARBON	10K	5%	1/4W
R544	1-249-429-11	CARBON	10K	5%	1/4W
R559	1-249-417-11	CARBON	1K	5%	1/4W F
R561	1-249-429-11	CARBON	10K	5%	1/4W
R562	1-249-429-11	CARBON	10K	5%	1/4W
R563	1-249-429-11	CARBON	10K	5%	1/4W
R564	1-249-429-11	CARBON	10K	5%	1/4W
R591	1-249-429-11	CARBON	10K	5%	1/4W
R592	1-249-426-11	CARBON	5.6K	5%	1/4W
R593	1-249-425-11	CARBON	4.7K	5%	1/4W F
R594	1-249-430-11	CARBON	12K	5%	1/4W
R595	1-249-382-11	CARBON	1.2	5%	1/6W F
R596	1-249-382-11	CARBON	1.2	5%	1/6W F
R601	1-249-435-11	CARBON	33K	5%	1/4W
R602	1-249-429-11	CARBON	10K	5%	1/4W
R603	1-249-438-11	CARBON	56K	5%	1/4W
R604	1-249-413-11	CARBON	470	5%	1/4W F
		< SWITCH >			
S401	1-571-308-11	SWITCH, SLIDE(COMMAND MODE)			
		< SWITCH >			
⚠SW601	1-572-675-11	SWITCH, POWER(VOLTAGE CHANGE) (E)			
		< TRANSFORMER >			
⚠T703	1-424-485-11	FILTER, LINE			
		< VIBRATOR >			
X301	1-579-314-11	VIBRATOR, CRYSTAL (22.5MHz)			
X501	1-579-175-11	VIBRATOR, CERAMIC (10MHz)			

****

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

Ref. No.	Part No.	Description	Remarks
*	1-647-362-12	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 (US)	
74	1-575-651-21	CORD, POWER (AEP,SP)	
74	1-696-027-11	CORD, POWER (E)	
75	1-569-007-11	ADAPTOR, CONVERSION 2P (E)	
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	
⚠151	8-848-379-31	DEVICE, OPTICAL KSS-213B/S-N	
152	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)	
M101	X-4917-523-4	MOTOR ASSY (SPINDLE)	
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 (US)	
⚠T601	1-429-500-11	TRANSFORMER, POWER (AEP,SP)	
⚠T601	1-429-501-11	TRANSFORMER, POWER (E)	
**********			

Ref. No.	Part No.	Description	Remarks
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-475-680-11	REMOTE COMMANDER (RM-DC80)	
	1-590-925-31	CORD, CONNECTION	
	3-810-765-11	MANUAL,COMMONNESS INSTRUCTION (ENGLISH) (US)	
	3-810-765-21	MANUAL,COMMONNESS INSTRUCTION (ENGLISH,FRENCH,GERMAN,SPANISH,DUTCH,SWEDISH, ITALIAN,PORTUGUESE,CHINESE) (AEP,E,SP)	
	3-862-223-11	MANUAL,INSTRUCTION (ENGLISH) (US)	
	3-862-223-21	MANUAL,INSTRUCTION (FRENCH,SPANISH,CHINESE) (AEP,E,SP)	
	3-862-223-31	MANUAL,INSTRUCTION (GERMAN,DUTCH,ITALIAN,PORTUGUESE) (AEP)	
	4-981-643-01	BATTERY,COVER (for RM-DC80)	
**********			
		**********	
		HARDWARE LIST	
		**********	
#1	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
#2	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
#3	7-685-871-01	SCREW +BVTT 3X6 (S)	
#4	7-685-872-09	SCREW +BVTT 3X8 (S)	
#5	7-621-772-00	SCREW +B 2X3	
#6	7-682-564-04	SCREW +P 4X14	
#7	7-685-648-79	SCREW (M3X12), TAPPING	
#8	7-685-902-21	SCREW +PTPWH 2.6X8 (TYPE 2)	
#9	7-621-255-15	SCREW +P2X3	

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9-922-876-11

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Home A&V Products Company

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