

CDP-XB720/XB720E

SERVICE MANUAL

AEP Model
CDP-XB720

UK Model
CDP-XB720E



Photo: CDP-XB720

Model Name Using Similar Mechanism	CDP-XE520
CD Mechanism Type	CDM14FLS-5BD25
Base Unit Type	BU-5BD25
Optical Pick-up Type	KSS-213BA/F-NP

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 $\pm 0.5 \text{ dB}$
Signal-to-noise ratio	More than 102 dB
Dynamic range	More than 98 dB
Harmonic distortion	Less than 0.0035%
Channel separation	More than 100 dB

Outputs

	Jack type	Maximum output level	Load impedance
LINE OUT	Phono jacks	2 V (at 50 kilohms)	Over 50 kilohms
DIGITAL OUT (OPTICAL)	Optical output connector	-18 dBm	Wave length: 660 nm
DIGITAL OUT (COAXIAL)	Coaxial output connector	0.5 Vp-p (at 75 ohms)	75 ohms
PHONES (only for CDP-XB920, CDP-XB820 and CDP-XB720)	Stereo phone jack	10 mW	32 ohms

General

Power requirements	220 V - 230 V AC, 50/60 Hz
Power consumption	13 W
Dimensions (approx.) (w/h/d)	430 $\times$ 115 $\times$ 290 mm (17 $\times$ 4 5/8 $\times$ 11 1/2 in.) incl. projecting parts
Mass (approx.)	4.8 kg (10 lbs 9 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

SONY®



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 : INVISIBLE LASER RADIATION WHEN OPEN AND INTERLOCKS DEFEATED, AVOID EXPOSURE TO BEAM.
ADVARSEL : USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGA UDSÆTTELSE FOR STRÅLING.
VORSICHT : UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET UND SICHERHEITSVERRIEGELUNG ÜBERBRÜCKT, NICHT DEM STRAHL AUSSETZEN.
VARO! : AVATTAESSA JA SUOJALUKITUS OHITETTASSA OLET ALT-TIINA NÄKYMÄTTÖMÄLLE LASERSÄTEYLLE, ÄLÄ KATSO SÄTEESEEN.
VARNING : OSYNLIG LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD, BETRÄKTA EJ STRÅLEN.
ADVARSEL : USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES, UNNGÅ EKSPONERING FOR STRÅLEN.
VIGYÁZATI! : A BURKOLAT NYITÁSAKOR LÁTHATATIAN LÉZERSUGÁRVESZÉLY! KERÜLJE A BESUGÁRZÁST!

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.

SAFETY-RELATED COMPONENT WARNING !!

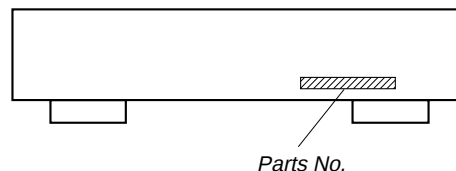
COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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MODEL IDENTIFICATION

— BACK PANEL —



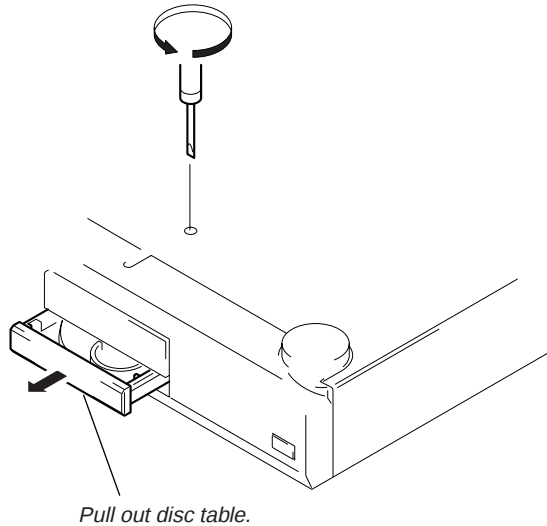
PARTS No.	MODEL
4-997-214-0□	XB720
4-997-214-1□	XB720E

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 close the disc table, turn the driver in the reverse direction.*



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.

LASER DIODE AND FOCUS SEARCH OPERATION CHECK

Carry out the "S curve check" in "CD section adjustment" and check that the S curve waveform is output continuously.

CD-TEXT TEST DISC

This unit is able to display the TEXT data (character information) written in the CD on its fluorescent indicator tube.

The CD-TEXT TEST DISC (TGCS-313: J-2501-126-A) is used for checking the display.

To check, perform the following procedure.

Procedure:

1. Turn ON the power and set the test disc.
2. Press the  button and play back the disc.
3. The following will be displayed on the fluorescent indicator tube.
Display : CD TEXT-----
4. Rotate the  knob to switch the track. The text data of each track will be displayed.

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		

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

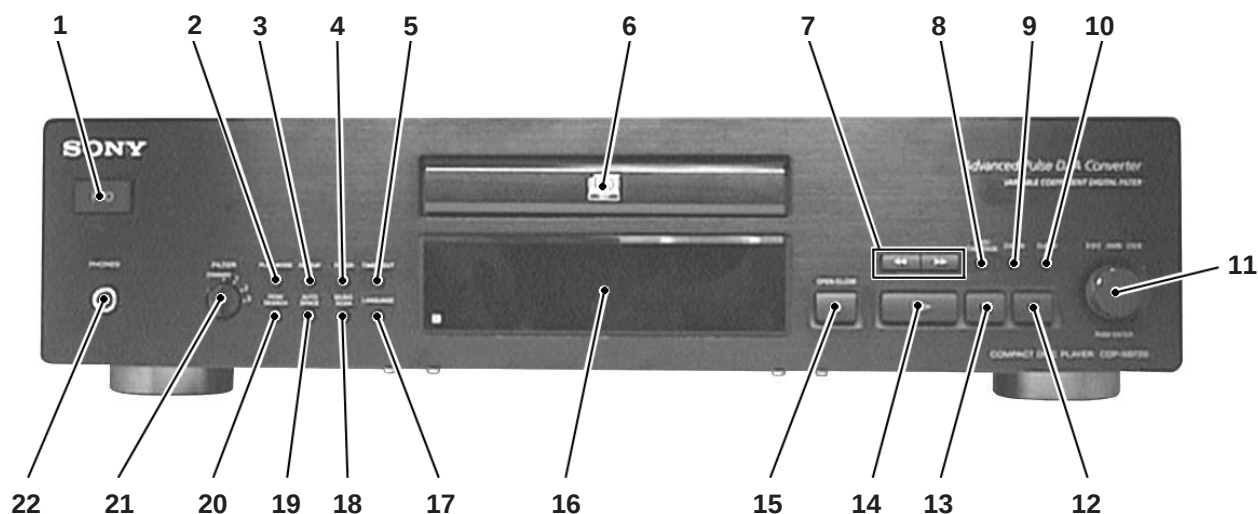
However, only 8 digits are displayed, and the 9th digit onwards are displayed as “-----”.

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

Front Panel



LOCATION OF PARTS AND CONTROLS

- 1 I/O (power) switch
- 2 PLAY MODE button
- 3 REPEAT button
- 4 FADER button
- 5 TIME/TEXT button
- 6 Disc tray
- 7 ⏮, ⏭ button
- 8 EDIT/TIME FADE button
- 9 CHECK button
- 10 CLEAR button
- 11 AMS knob (PUSH ENTER)
- 12 ■ (stop) button
- 13 || (pause) button
- 14 ▷ (play) button
- 15 ⏮, ⏭ OPEN CLOSE button
- 16 Window display
- 17 LANGUAGE button
- 18 MUSIC SCAN button
- 19 AUTO SPACE button
- 20 PEAK SEARCH button
- 21 FILTER (STANDARD-1-2-3) switch
- 22 PHONE jack

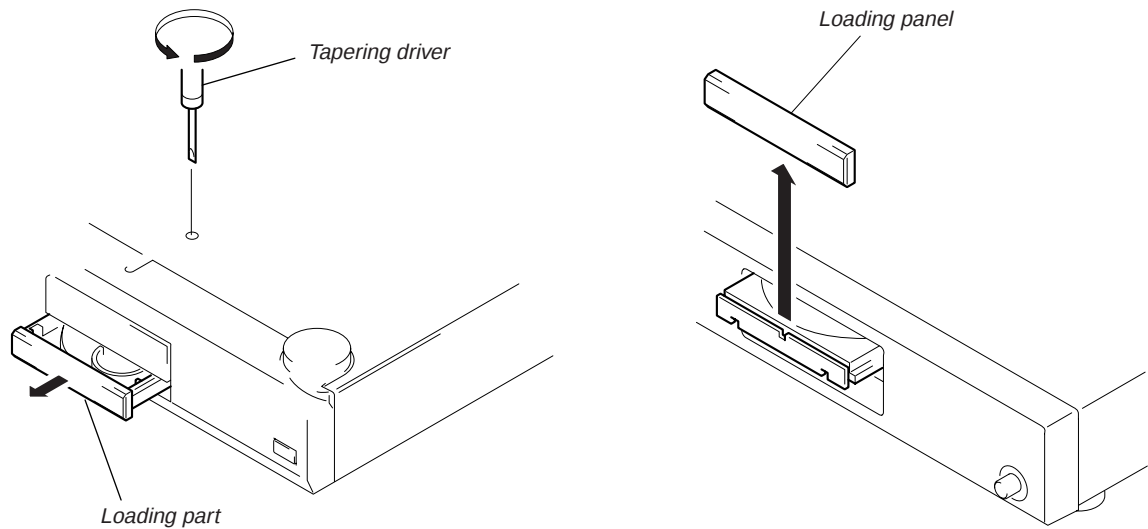
* AMS is the abbreviation for Automatic Music Sensor.

SECTION 3 DISASSEMBLY

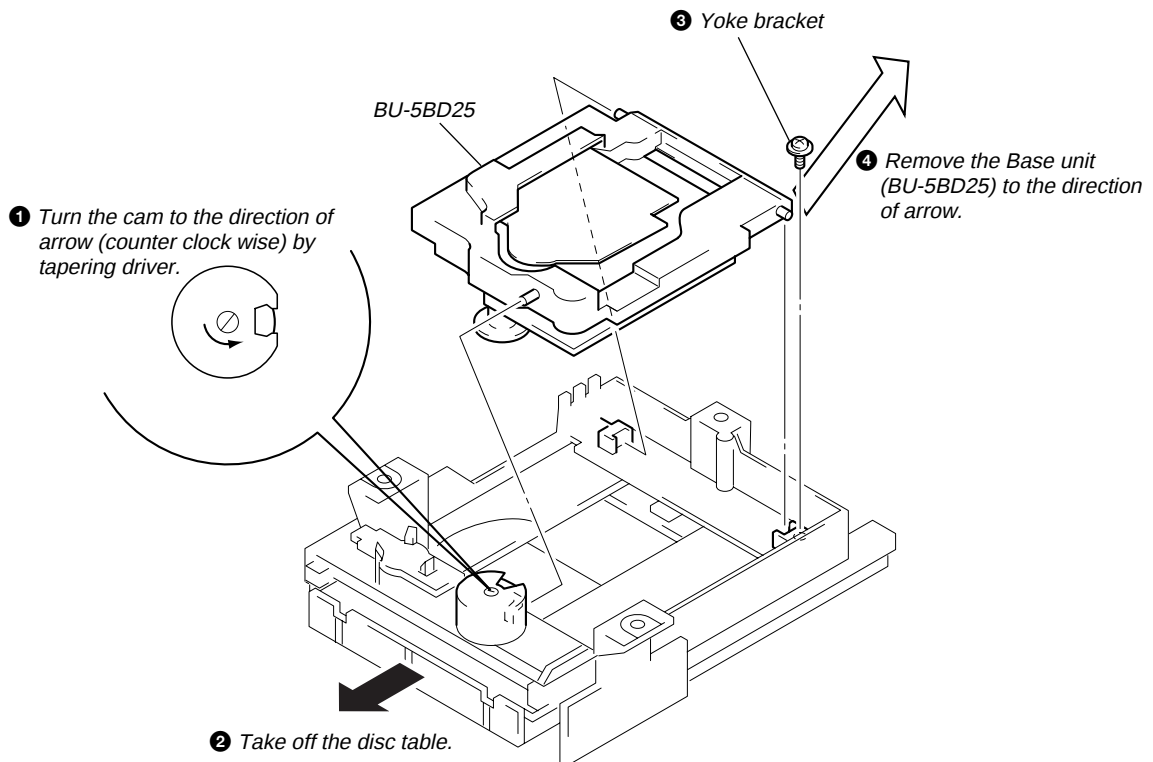
Note : Follow the disassembly procedure in the numerical order given.

3-1. FRONT PANEL

- In order to remove the front panel block when the power supply does not turn on, rotate the cam with tapering driver as the figure shows, and the loading part will be moved. Then pull out the loading part by your hand to remove the loading panel as the figure shows. After that take out the front panel block.



3-2. BASE UNIT (BU-5BD25)



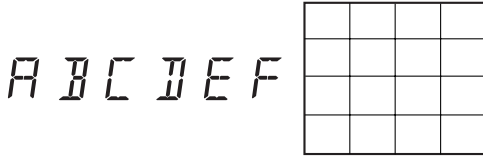
SECTION 4 TEST MODE

4-1. AF MODE

The following checks can be performed in the AF mode, which is set by connecting the JW004 (AFADJ) terminal on MAIN board to the Ground and turning on the power.

• FL tube check

After all segments light up, when the  button is pressed, the following will be displayed. (Partial lighting 1)



(Partial lighting 1)

When the  button is pressed, the following will be displayed. (partial lighting 2)

	2		4	
6		8		10
	12		14	
16		18		20

(Partial lighting 2)

The display will light up as follows (partial lighting 3) when the  AMS  knob is rotated to the right, and as follows (partial lighting 4) when rotated to the left.



(Partial lighting 3)

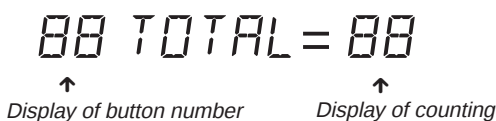


(Partial lighting 4)

When the  button is pressed, all will light up again.

• Key check

All buttons have corresponding button numbers. When a button is pressed, the counter will count up and display the button's number. However, the counter will only count to "16". It will not count for buttons already pressed once, but will display the button's number.



Button	Button No. Displayed	Button	Button No. Displayed
LANGUAGE	0	EDIT/	10
MUSIC SCAN	1	TIME FADE	
AUTO SPACE	2	◀◀	11
PEAK SEARCH	3	▶▶	12
PLAY MODE	4		18
REPEAT	5	ENTER (AMS)	20
FADER	6	OPEN/	All lit
TIME EDIT	7	CLOSE 	
CLEAR	8	PLAY 	Partial lighting 1
CHECK	9	STOP 	Partial lighting 2

• Remote commander check

When buttons other than the  button are pressed when the whole display is lit, the display will change to partial lighting 2. When the "▶" button is pressed, the display will light up as follows.



(Partial lighting 5)

4-2. ADJ MODE

The following operations are performed in the ADJ mode, which is set by connecting the JW003 (ADJ) terminal to the Ground and turning on the power.

Table of Button Operations in ADJ Mode

The functions of the number buttons are shown in the following table.

Function of Number Buttons

(With the General Remote Commander)

Button	Function
4	Tracking servo, sled servo off
9	Tracking servo, sled servo on
11	S curve continuous output check mode

* **NOTE** : Other buttons are not used for servicing and should not be pressed without a reason.

4-3. 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.

Aging method 1

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

1. Press the  button and turn ON the power.
2. Set the disc on the tray.
3. Press the  button of the aging remote controller.
4. Aging starts and the message shown in Fig. 1 is displayed on the fluorescent display tube.
5. To end, press the  button.

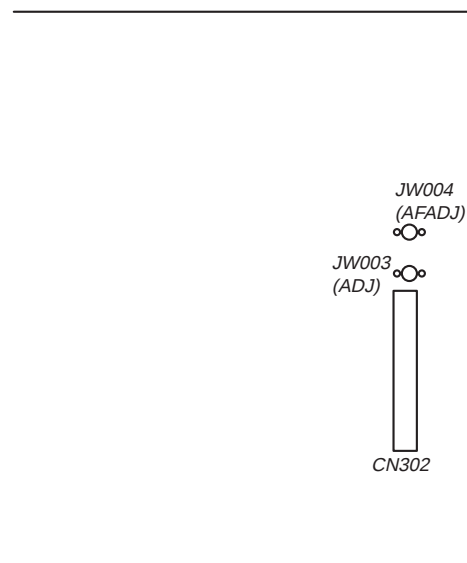
Aging method 2 (When no aging mode remote controller):

1. Press the  button and turn ON the power.
2. Set the disc on the tray.
3. Press the  button,  button, and  button at the same time. (If these buttons are not pressed at the same time, nothing performs.)
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 Message in Aging Mode

Code No.	State	Display when normal	Display when abnormal
0	Load in	AGING-0	ERROR-0
1	Access to TOC	AGING-1	ERROR-1
2	Access to last track	AGING-2	ERROR-2
3	Playback of last track (3 seconds)	Counter display	ERROR-3
4	Access to first track	AGING-4	ERROR-4
5	Playback of first track (3 seconds)	Counter display	ERROR-5
6	Load out	AGING-6	ERROR-6

[MAIN BOARD] – Component Side –

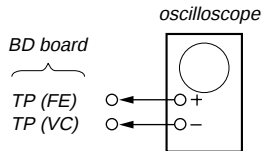


SECTION 5 ELECTRICAL BLOCK CHECKING

Note:

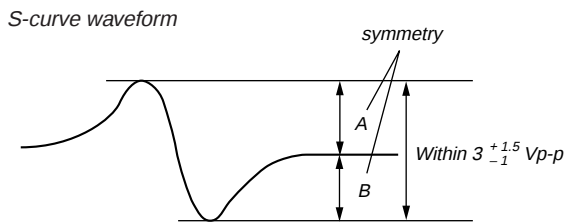
1. CD Block is basically designed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use an oscilloscope with more than 10M Ω impedance.
4. Clean the object lens by an applicator with neutral detergent when the signal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

S Curve Check (With general remote commander)



Procedure :

1. Connect oscilloscope to test point TP (FE) on BD board.
2. Connect the test point JW003 (ADJ) on MAIN board to the ground with a lead wire.
3. Turn ON the power.
4. Put disc (YEDS-18) in press (play) button.
5. When the **[11]** button of the remote commander is pressed, the S curve will be output continuously.
6. Check the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within $3^{+1.5}_{-1}$ Vp-p.

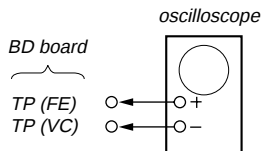


7. After check, remove the lead wire connected in step 2.

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.

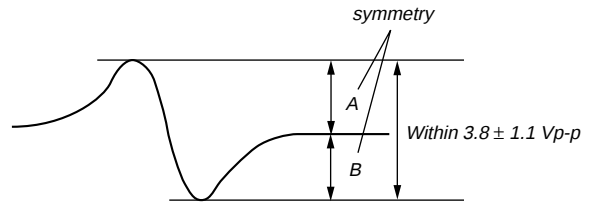
S Curve Check (Without general remote commander)



Procedure :

1. Connect oscilloscope to test point TP (FE) on BD board.
2. Connect between test point TP (FEI) 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 3.8 ± 1 Vp-p.

S-curve waveform

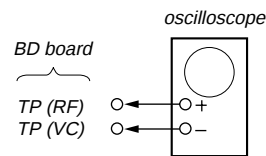


7. After check, remove the lead wire connected in step 2 and 3.

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



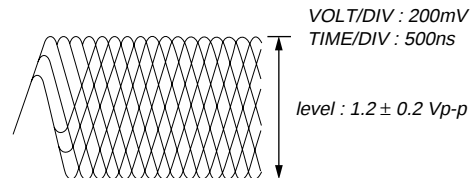
Procedure :

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.

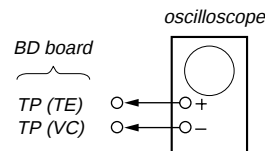
Note:

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

RF signal waveform



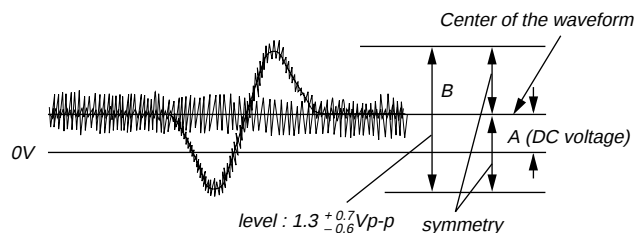
E-F Balance (1 Track Jump) Check (Without general remote commander)



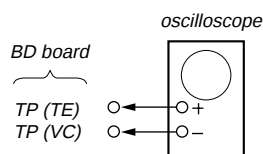
Procedure :

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 (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



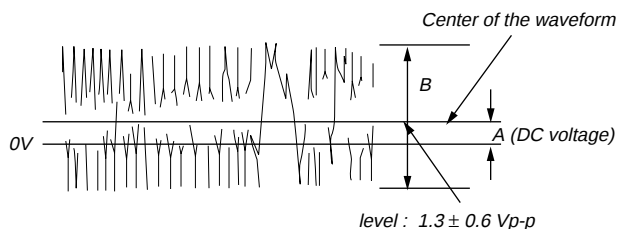
E-F Balance Check (With general remote commander)



Procedure :

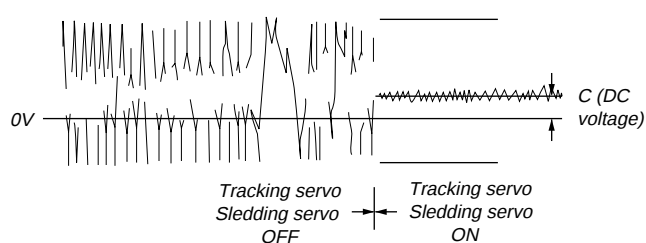
1. Connect the test point JW003 (ADJ) on MAIN board to the ground with a lead wire on main board.
2. Connect oscilloscope to test point TP (TE) on BD board.
3. Turn ON the power and to set the ADJ mode.
4. Put disc (YEDS-18) in to play the number five track.
5. Press the [4] button. (The tracking servo and the sledding servo are turned OFF.)
6. 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



7. Press the [9] 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.

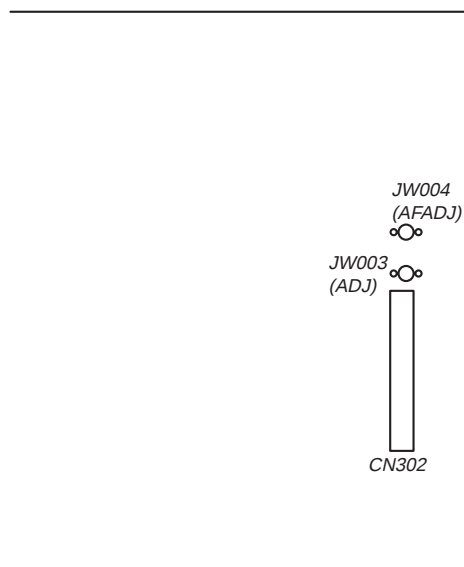
Traverse waveform



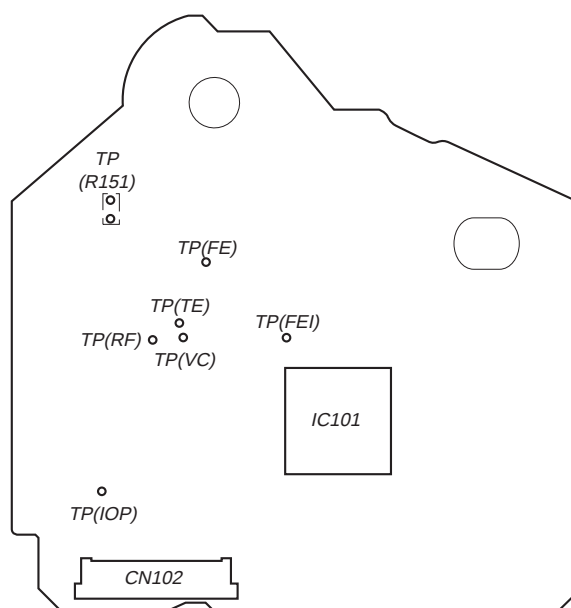
8. Disconnect the lead wire of JW003 (ADJ) connected in step 1.

Adjustment Location :

[MAIN BOARD] – Component Side –

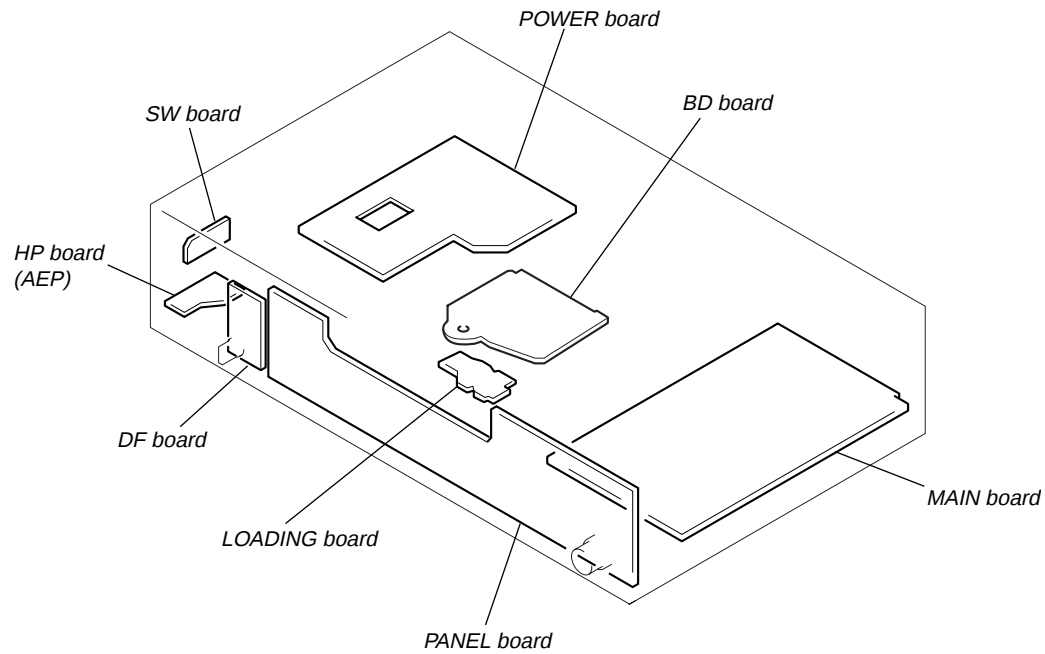


[BD BOARD] – Side A –



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: μpF
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.

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

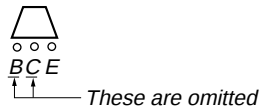
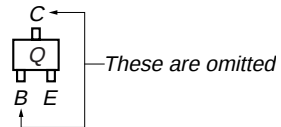
For printed wiring boards.

Note:

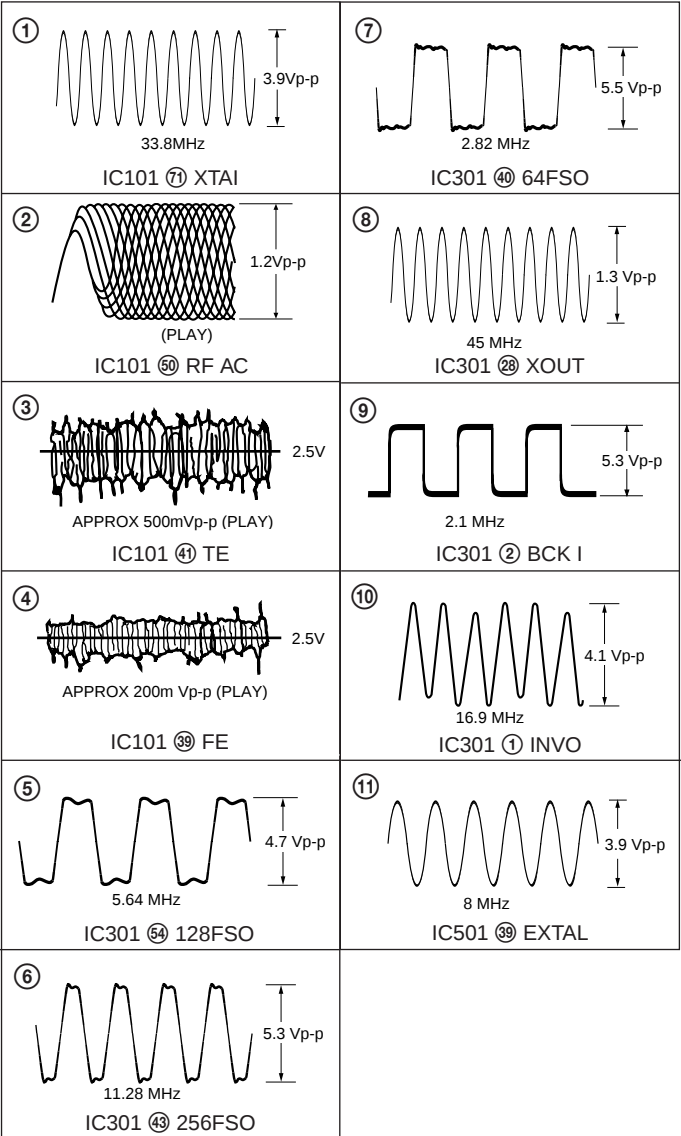
- $\circ$: parts extracted from the component side.
- --- : parts extracted from the conductor side.
- $\blacksquare$: parts mounted on the conductor side.
- $\circ$: Through hole.
- Pattern : Pattern from the side which enables seeing.
(The other layers' patterns are not indicated.)

Caution:
Pattern face side: Parts on the pattern face side seen from the
(Side B) pattern face are indicated.
Parts face side: Parts on the parts face side seen from the
(Side A) parts face are indicated.

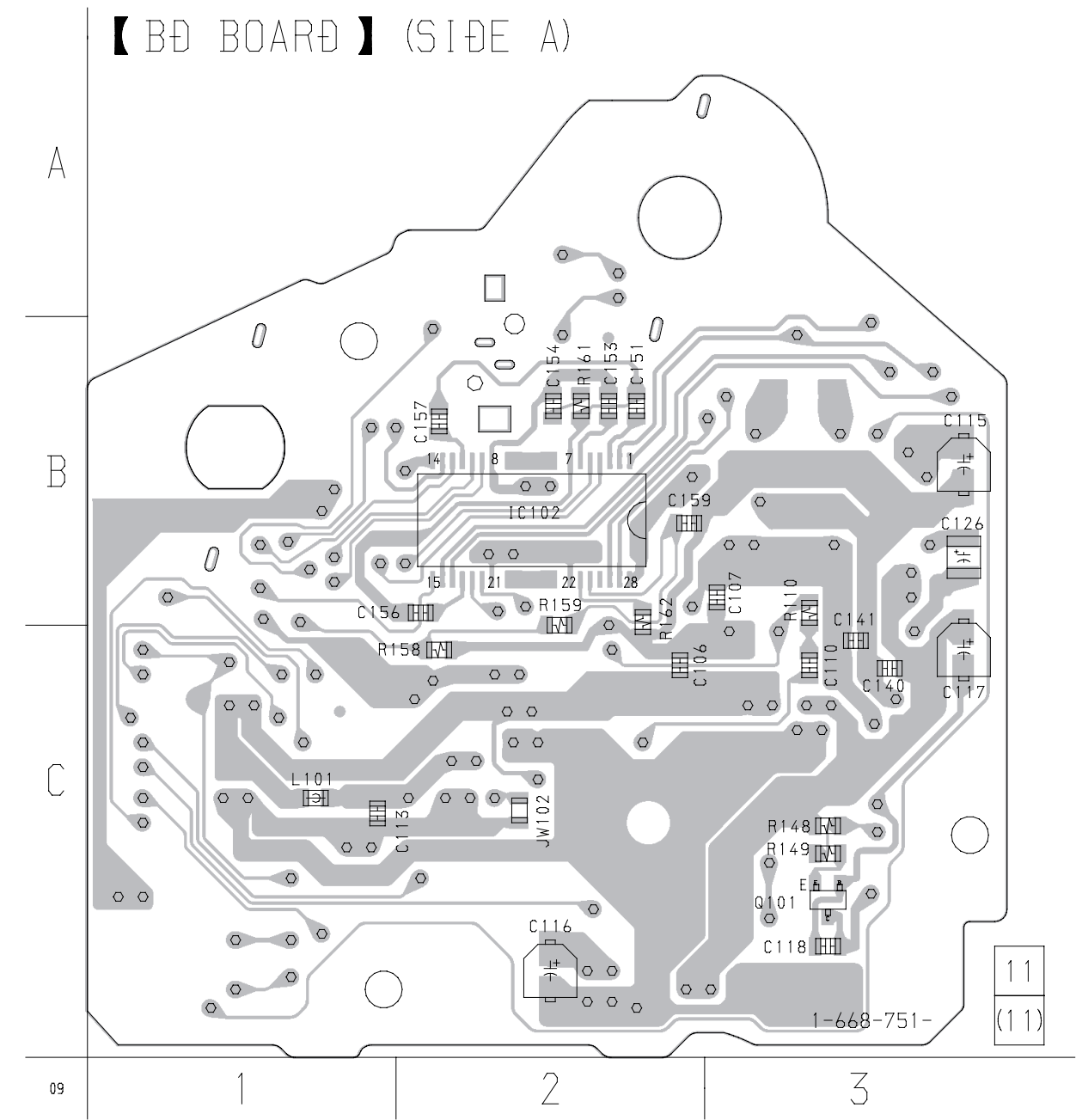
• Indication of transistor



WAVEFORMS

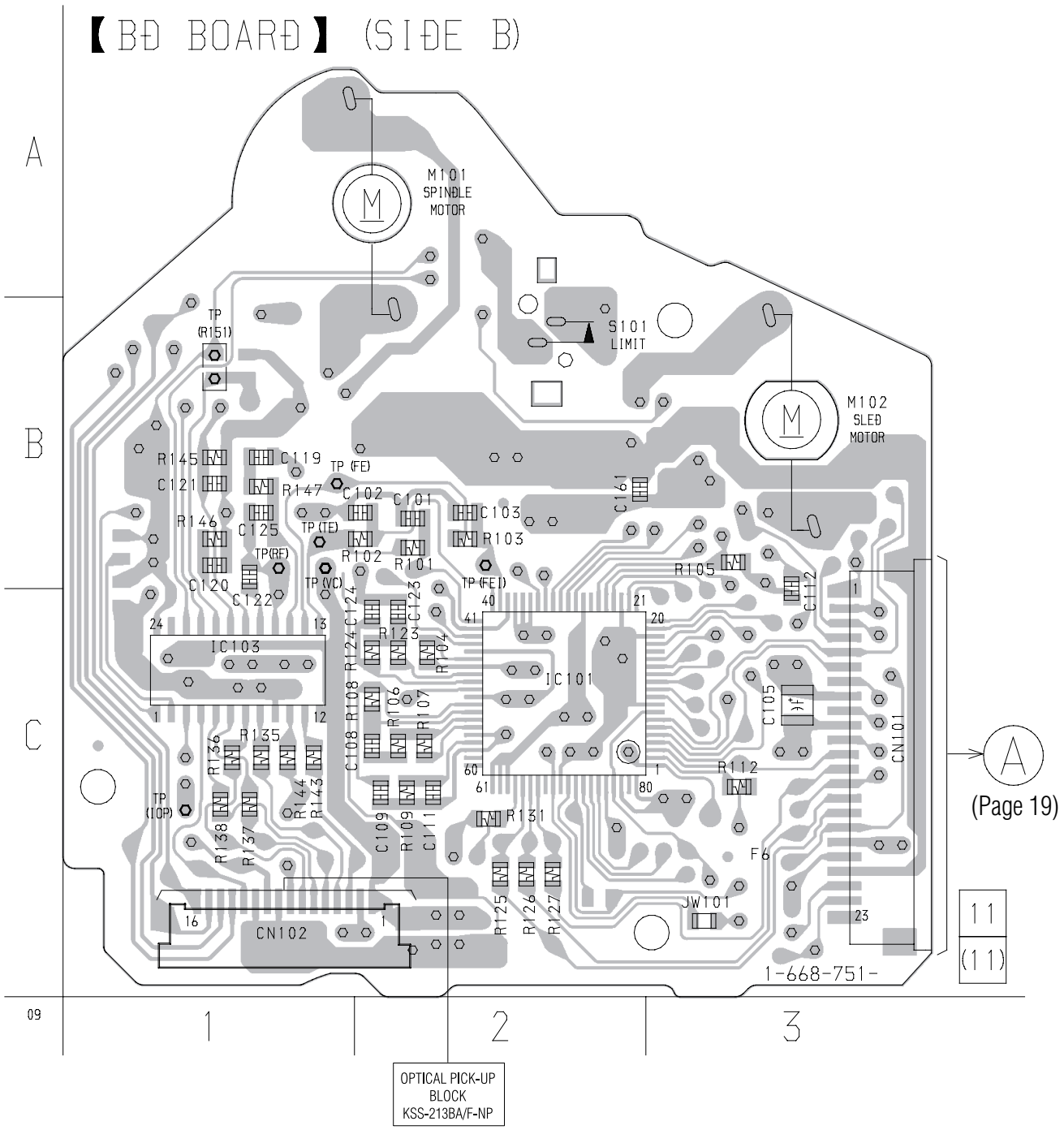


6-2. PRINTED WIRING BOARD – BD SECTION –
• See page 12 for Circuit Boards Location.



• Semiconductor Location

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

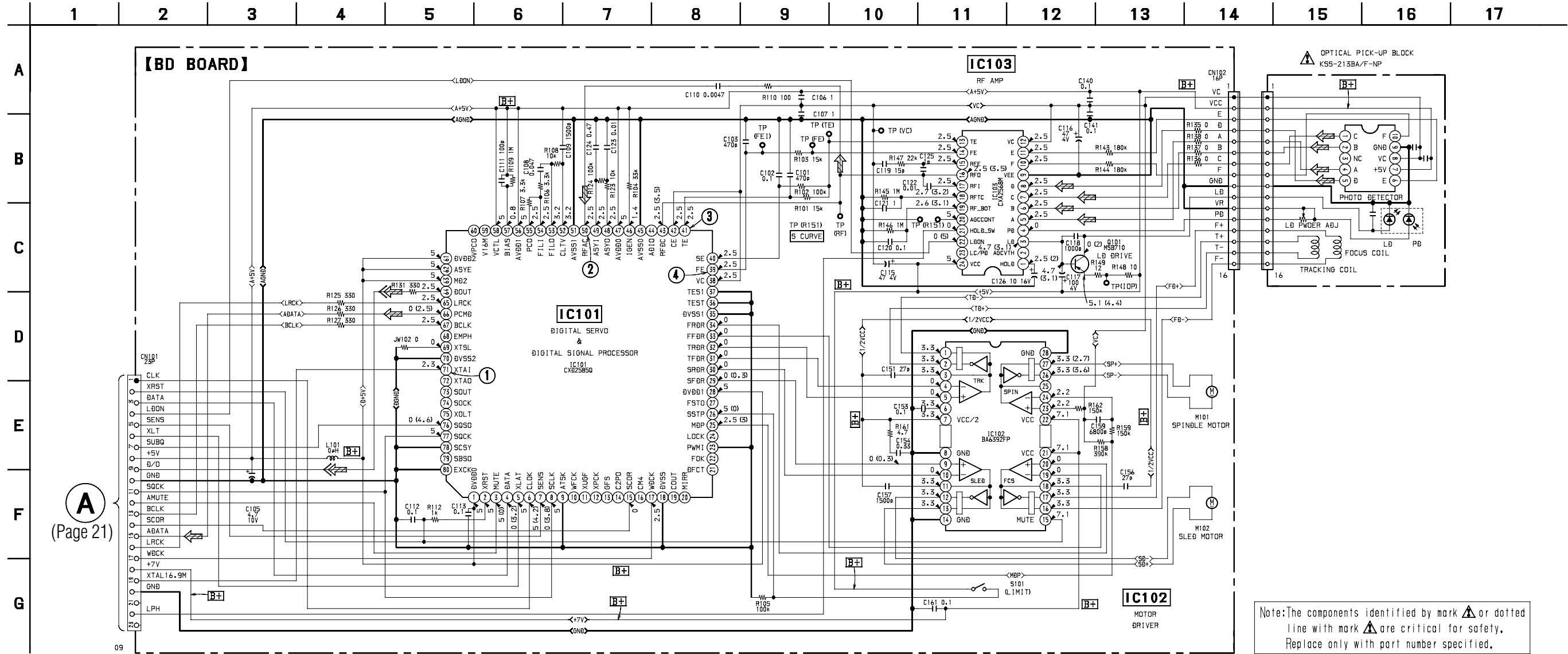


• Semiconductor Location

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

6-3. SCHEMATIC DIAGRAM – BD SECTION –

- See page 14 for Waveforms.
- See page 30 for IC Pin Functions.
- See page 34 for IC Block Diagrams.

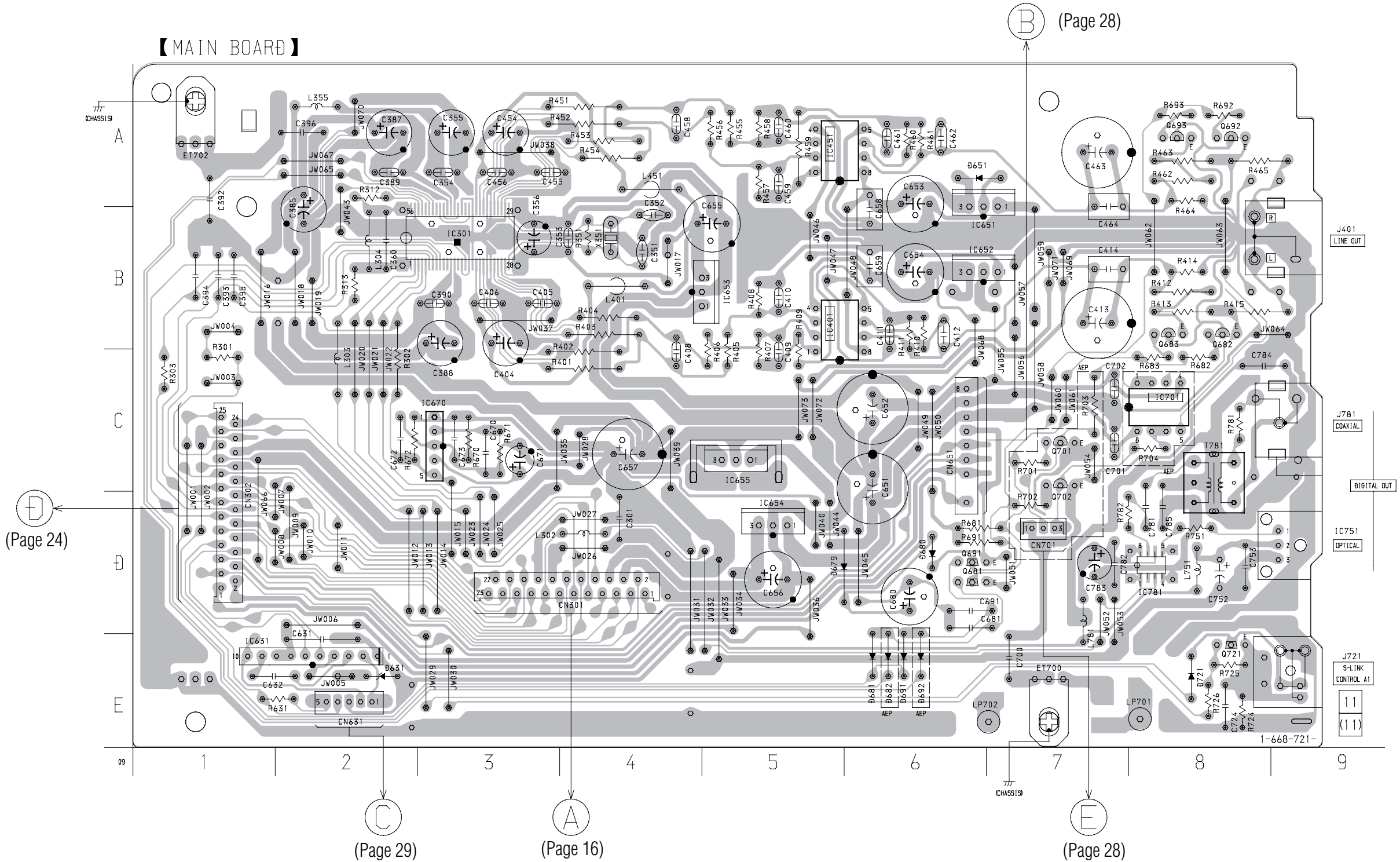


Note: The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

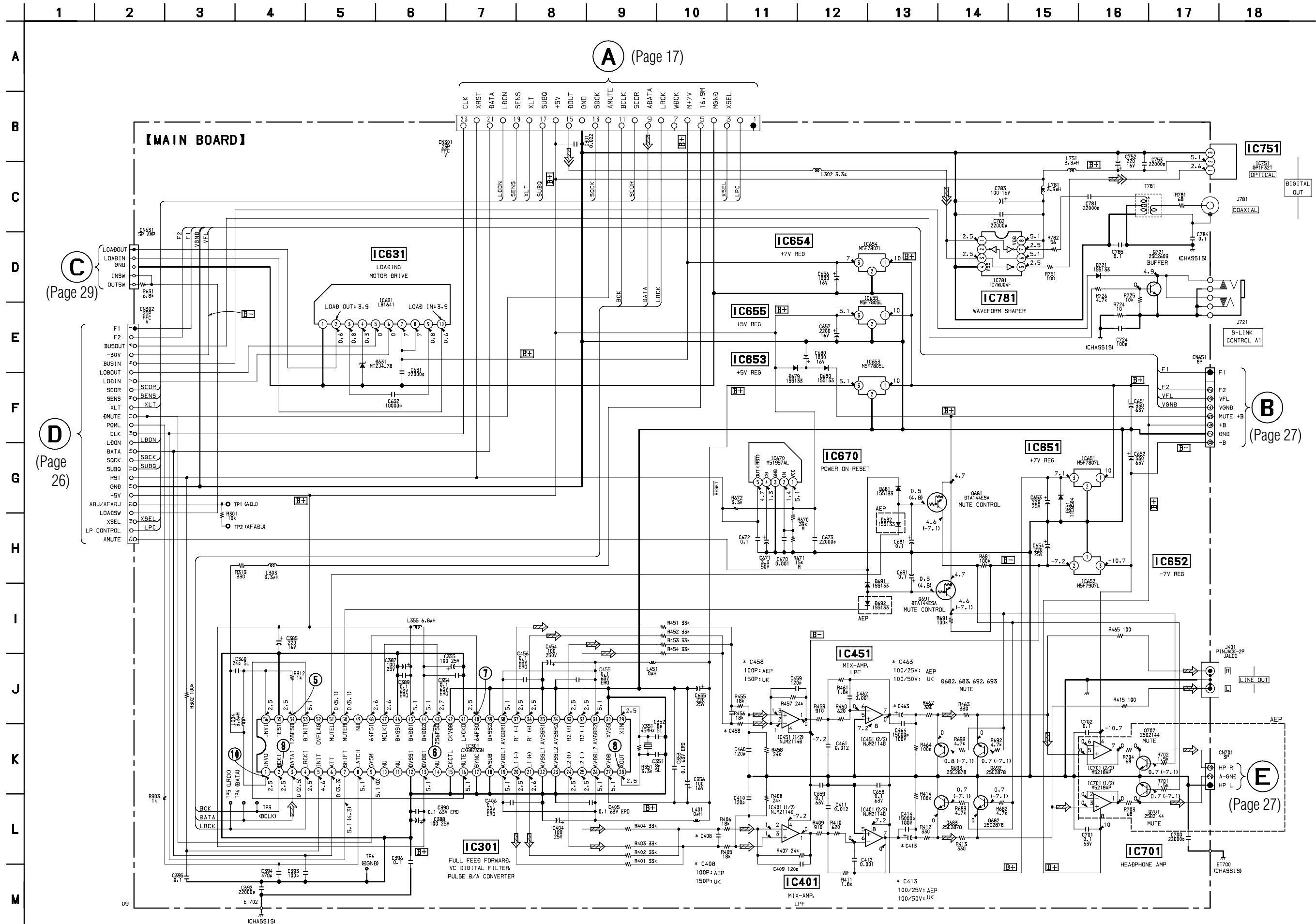
6-4. PRINTED WIRING BOARD – MAIN SECTION –
 • See page 12 for Circuit Boards Location.

【 MAIN BOARD 】

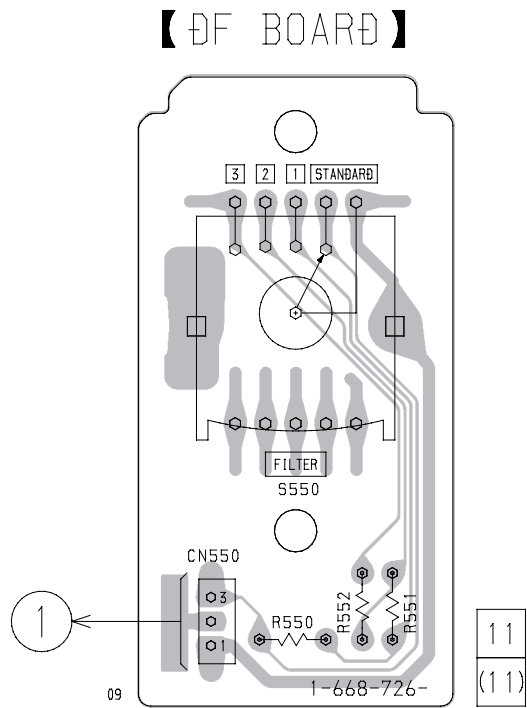
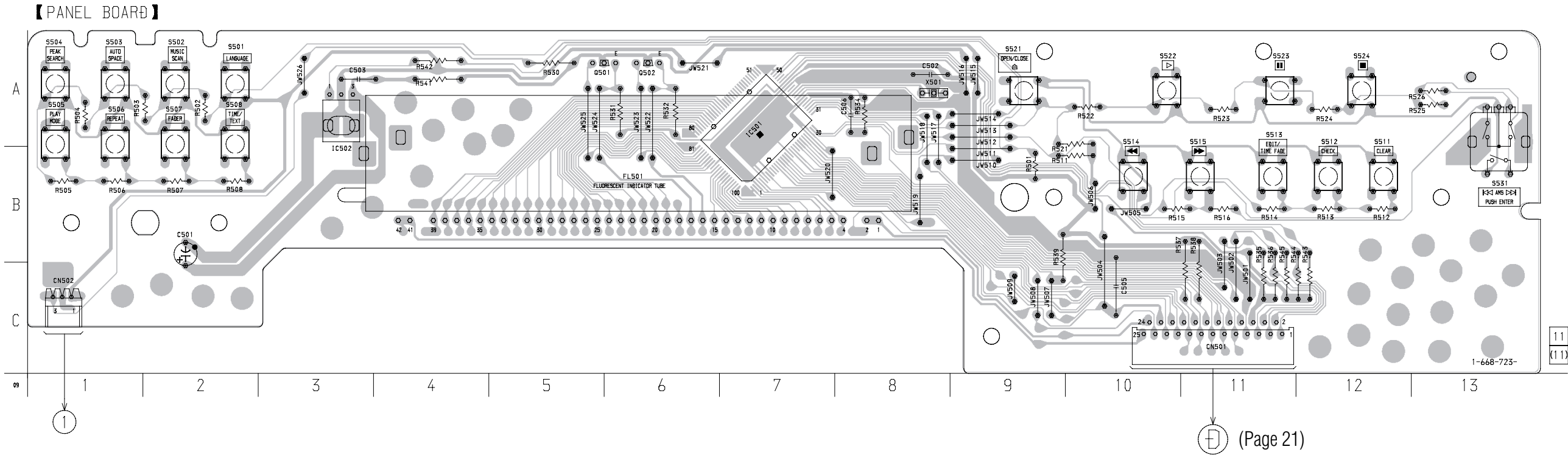
• Semiconductor Location	
Ref. No.	Location
D631	E-2
D651	A-6
D679	D-6
D680	D-6
D681	E-6
D682	E-6
D691	E-6
D692	E-6
D721	E-8
IC301	B-3
IC401	B-5
IC451	A-5
IC631	E-2
IC651	A-7
IC652	B-7
IC653	B-5
IC654	D-5
IC655	C-5
IC670	C-3
IC701	C-8
IC751	D-9
IC781	D-8
Q681	D-6
Q682	B-8
Q683	B-8
Q691	D-6
Q692	A-8
Q693	A-8
Q701	C-7
Q702	C-7
Q721	E-8



6-5. SCHEMATIC DIAGRAM – MAIN SECTION –
• See page 36 for IC Block Diagrams.

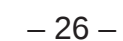


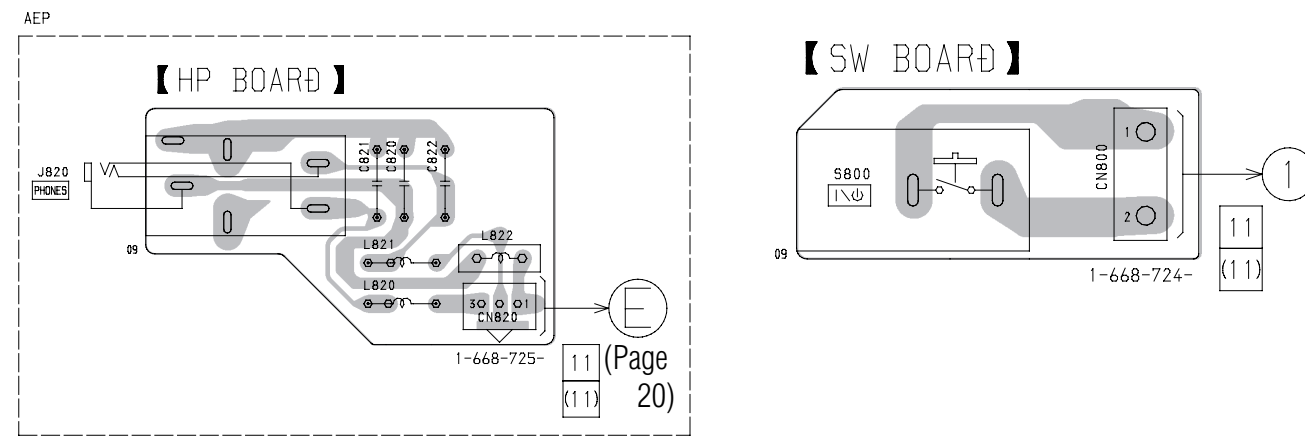
6-6. PRINTED WIXRING BOARD – DISPLAY SECTION –
• See page 12 for Circuit Boards Location.



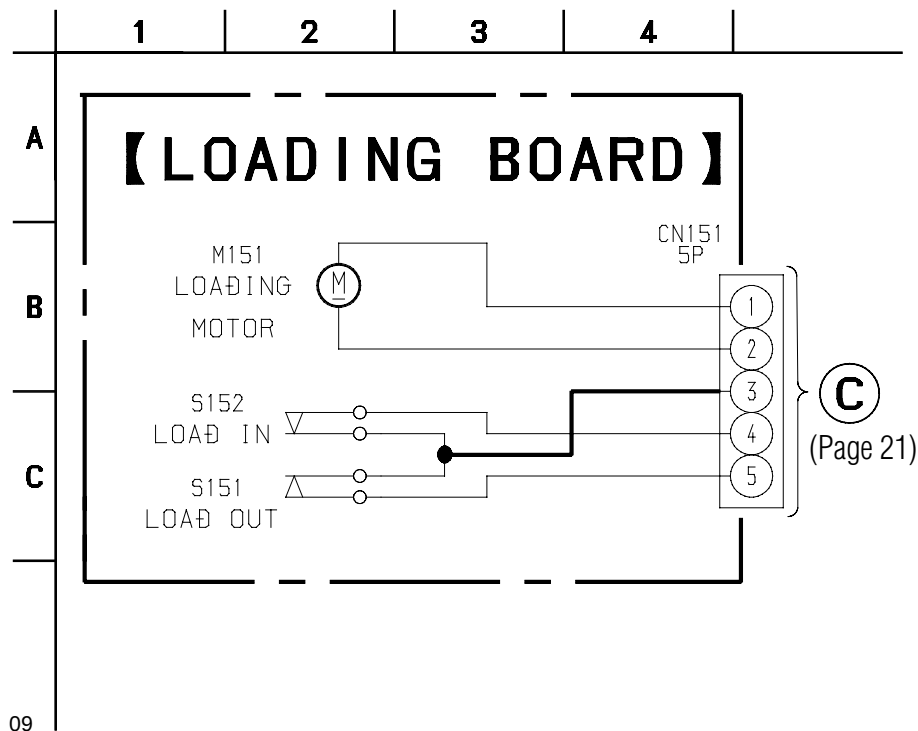
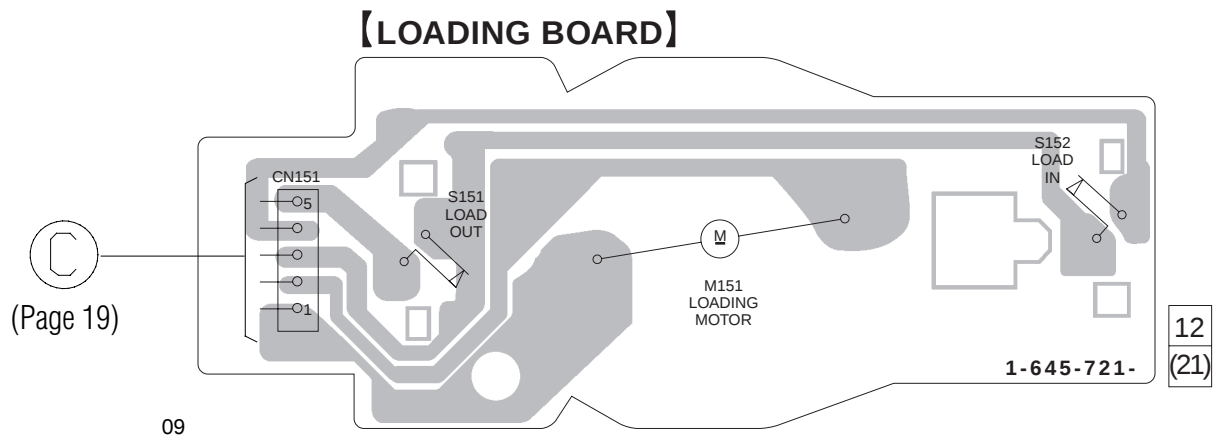
• Semiconductor Location

Ref. No.	Location
IC501	A-7
IC502	A-3
Q501	A-6
Q502	A-6





6-10. SCHEMATIC DIAGRAM – LOADING MOTOR SECTION –

6-11. PRINTED WIRING BOARD – LOADING MOTOR SECTION –
• See page 12 for Circuit Boards Location.

6-12. IC PIN FUNCTIONS

• IC101 DIGITAL SIGNAL PROCESSOR (CXD2585Q)

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	CLOCK	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	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 (CXP82832-009Q)

Pin No.	Pin Name	I/O	Function
1	13G	O	FL grid signal output
2	14G	O	FL grid signal output
3	NC	–	Connected to VDD
4	+5V	–	Power supply (+5V)
5	SCOR	I	Sub code sync input
6, 7	GND	–	Ground
8	RMIN	I	Remote control signal input
9	GND	–	Ground
10, 11	X	–	Not used (Open)
12	LD OUT	O	Loading motor control
13	LD IN	O	Loading motor control
14	SENS	I	Sense signal input
15	XLT	O	Serial latch output
16	AMUTE	O	Audio mute output
17	PGML	O	Digital filter latch output
18	SENSOR. IN	–	Connected to VDD
19	BUSOUT	O	CONTROL-A1 transmission output
20	BUSIN	I	CONTROL-A1 receive input
21	SENSOR. SW	–	Not used (Open)
22	CLK	O	Serial clock output
23	LDON	O	Optical pick-up laser diode control output
24	DATA	O	Serial data output
25	SQCK	O	Subcode Q data readout clock output
26	SUBQ	I	Subcode Q data input
27	+5V	–	Power supply (+5V)
28	AVREF	I	Analog reference voltage input
29	KEY 0	I	Key input
30	KEY 1	I	Key input
31	KEY 2	I	Key input
32	FILTER. SW	–	Connected to ground
33	ADJ/AFADJ	I	Test mode terminal
34	LOADSW	O	Load in/out select control output
35	MODEL. SEL1	–	Model select pin (Connected to ground)
36	MODEL. SEL2	–	Model select pin (Connected to VDD)
37	AVSS	–	Analog ground
38	$\overline{\text{RST}}$	I	Reset signal input
39	EXTAL	I	8 MHz clock input
40	XTAL	O	8 MHz clock output

• Abbreviation

FL : Fluorescent indicator tube

Pin No.	Pin Name	I/O	Function
41	VSS	–	Ground
42	TX	–	Not used
43	TEX	–	Connected to ground
44	VDD (+5V)	–	Power supply (+5V)
45	VFDP (–30V)	–	Pull down voltage (–30V)
46	XSEL	O	Not used
47	REINIT	–	Not used
48	LP CONTROL	O	LP control hold output
49	B-MUTE	O	Line mute control output
50 to 66	OPEN	–	Not used
67 to 87	S21 to S1	O	FL segment signal output
88	1G	O	FL grid signal output
89	VDD (+5V)	–	Power supply (+5V)
90 to 100	2G to 12G	O	FL grid signal output

- Abbreviation
FL : Fluorescent indicator tube

- **BD section**

The diagram illustrates the internal architecture of the TMS320C49 DSP, organized into several functional blocks and their interconnections with external pins.

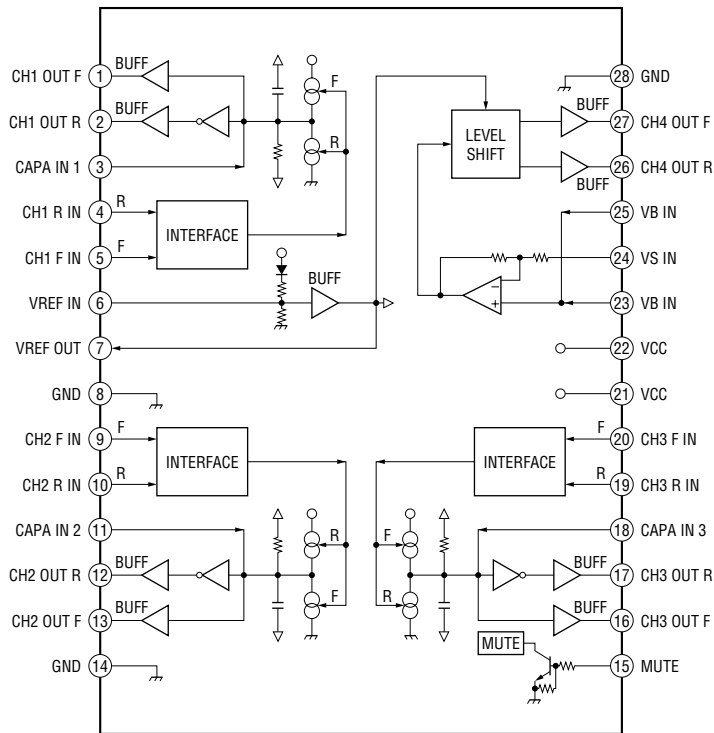
Internal Blocks:

- Clock Generator:** Receives external clock signals (XTAO, XTAL, DVSS2, XTSL) and provides a clock signal to the CPU Interface.
- D/A Interface:** Connected to the CPU Interface and the Digital OUT block.
- CPU Interface:** The central processing unit, connected to various external pins (DATA, XLAT, CLOCK, SENS, SCLK, ATSK, WFCCK, XUGF, XPCK, GFS, V2PO, SCOR, C4M, WDCK, DVSS0, COUT, MIRR) and internal blocks.
- Error Corrector:** Connected to the CPU Interface and the 32K RAM.
- 32K RAM:** Provides memory for the system.
- Sub Code Processor:** Connected to the CPU Interface and the EFM demodulator.
- EFM demodulator:** Receives signals from the Sub Code Processor and the Digital PLL, and outputs to the Servo Auto Sequencer.
- Digital PLL:** Receives signals from the EFM demodulator and the Asymmetry Corrector, and outputs to the Digital CLV.
- Asymmetry Corrector:** Receives signals from the Digital PLL and the Digital CLV, and outputs to the Servo Auto Sequencer.
- Servo Auto Sequencer:** Receives signals from the EFM demodulator and the Asymmetry Corrector, and outputs to the Digital CLV.
- Digital CLV:** Receives signals from the Servo Auto Sequencer and the Digital PLL, and outputs to the MIRR DFCT FOK block.
- MIRR DFCT FOK:** Receives signals from the Digital CLV and the Servo Interface, and outputs to the Servo Interface.
- Servo Interface:** Receives signals from the MIRR DFCT FOK block and the Servo DSP, and outputs to the Servo Interface.
- Servo DSP:** Contains the Focus Servo, Tracking Servo, and SLED Servo blocks, which receive signals from the Servo Interface and the Servo Interface.
- PWM GENERATOR:** Contains the Focus PWM Generator, Tracking PWM Generator, and SLED PWM Generator, which receive signals from the Servo DSP.
- A/D Converter:** Receives signals from the Servo DSP and the OPAMP Analog SW.
- OPAMP Analog SW:** Receives signals from the A/D Converter and the Servo DSP.

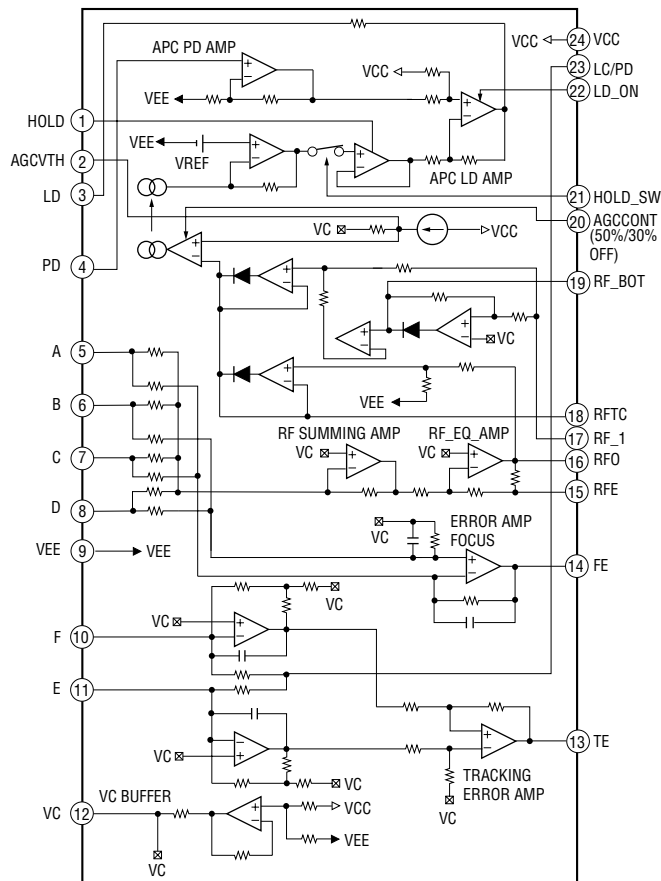
Pin Connections:

- Top Pins (1-61):** DVDD0, XRST, MUTE, DATA, XLAT, CLOCK, SENS, SCLK, ATSK, WFCCK, XUGF, XPCK, GFS, V2PO, SCOR, C4M, WDCK, DVSS0, COUT, MIRR, ECK, 89S0, SCSY, SCK, SQS0, XOLT, SCK, SOUT, XTAO, XTAL, DVSS2, XTSL, EMPH, BCK, PCMD, LRCK, DOUT, MD2, ASYE, DVDD2.
- Right Pins (60-51):** VPCO, V16M, VCTL, BIAS, AVDD1, PCO, FILI, FILO, CLTV, AVSS1, RFAC, ASYI, ASYO, AVDD0.
- Bottom Pins (46-41):** IGEN, AVSS0, ADIO, RFDC, CE, TE, DVSS1, TEST, TES1, VC, FE, SE.

IC102 BA6392FP



IC103 CXD2568M



IC301 CXD8735N



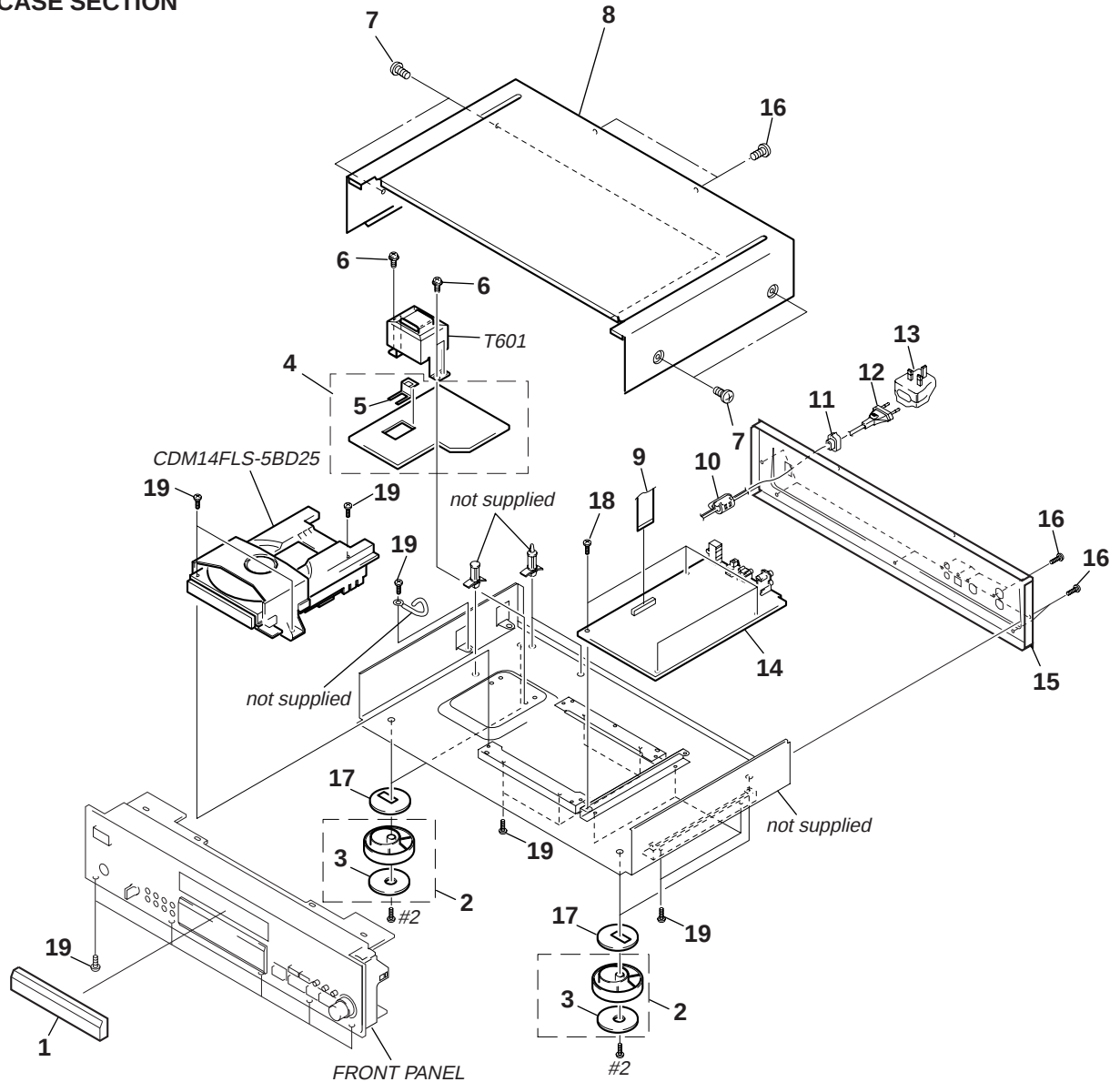
SECTION 7 EXPLODED VIEWS

NOTE:

- 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.

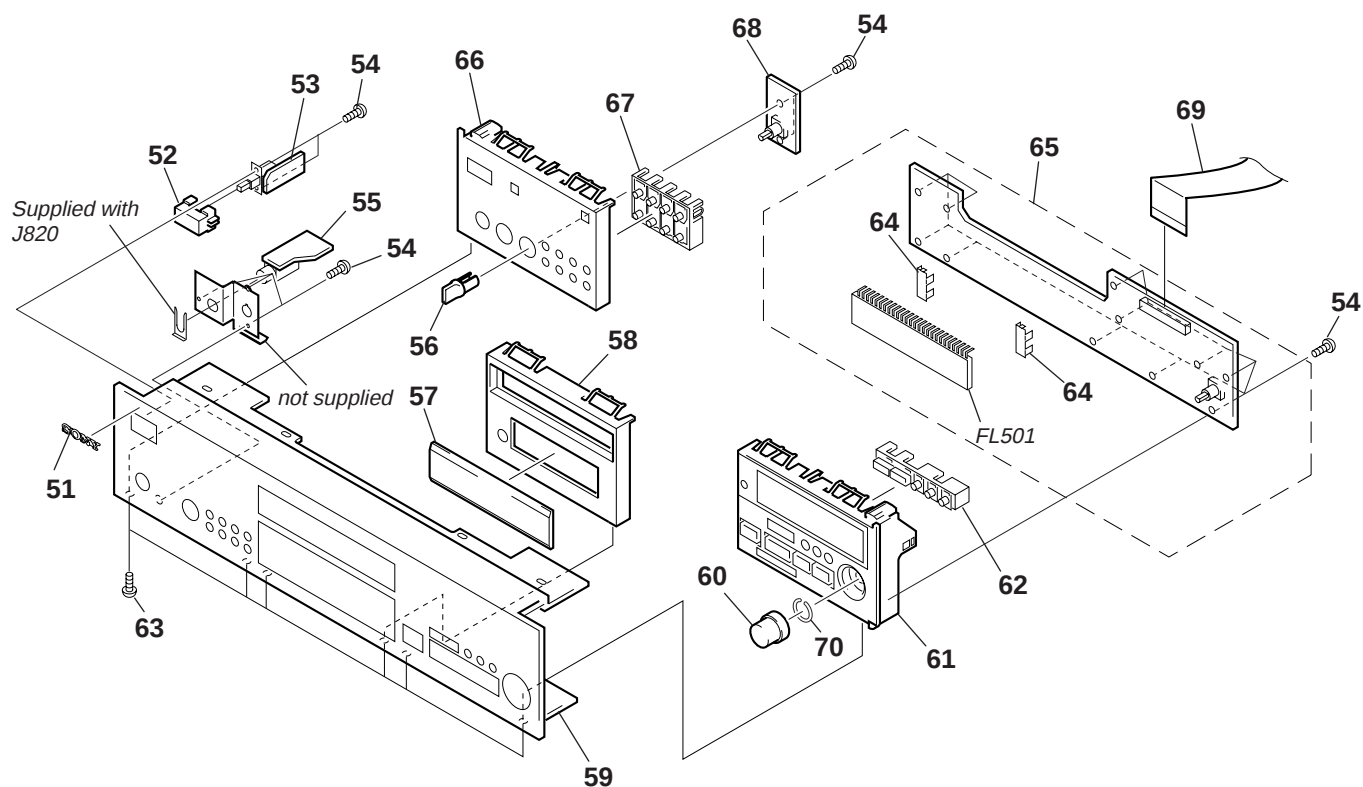
The components identified by mark $\triangle$ or dotted line with mark $\triangle$ are critical for safety. Replace only with part number specified.

7-1. CASE SECTION



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-997-218-01	PANEL, LOADING		* 14	A-4699-972-A	MAIN BOARD, COMPLETE (AEP)	
2	X-4949-523-1	FOOT ASSY (F50180S)		* 14	A-4724-196-A	MAIN BOARD, COMPLETE (UK)	
3	4-970-124-01	CUSHION (F50180S)		* 15	4-997-214-01	PANEL, BACK (AEP)	
* 4	1-668-722-11	POWER BOARD		* 15	4-997-214-11	PANEL, BACK (UK)	
* 5	4-962-200-01	PLATE (TR), GROUND		16	3-704-515-21	SCREW (BV/RING)(AEP)	
				16	3-704-515-41	SCREW (BV/RING)(UK)	
6	4-886-821-11	SCREW, S TIGHT, +PTTWH 3X6		17	4-984-485-01	CUSHION (FOOT)	
7	4-210-291-01	SCREW (CASE 3 TP2)(AEP)		18	3-703-685-21	SCREW (+BV 3X8)(AEP)	
7	4-999-877-01	SCREW (CASE)(UK)		18	4-929-074-01	SCREW (3X8)(UK)	
* 8	4-997-138-01	CASE (4095269)		19	4-974-510-01	SCREW (+BV 3X8 B)(UK)	
9	1-773-179-11	WIRE (FLAT TYPE) (23 CORE)		19	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S (AEP)	
10	1-500-386-11	FILTER, CLAMP (FERRITE CORE)		$\triangle$ T601	1-431-715-11	TRANSFORMER, POWER	
11	4-966-267-11	BUSHING (FBS001), CORD					
$\triangle$ 12	1-575-651-21	CORD, POWER					
$\triangle$ 13	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK)					

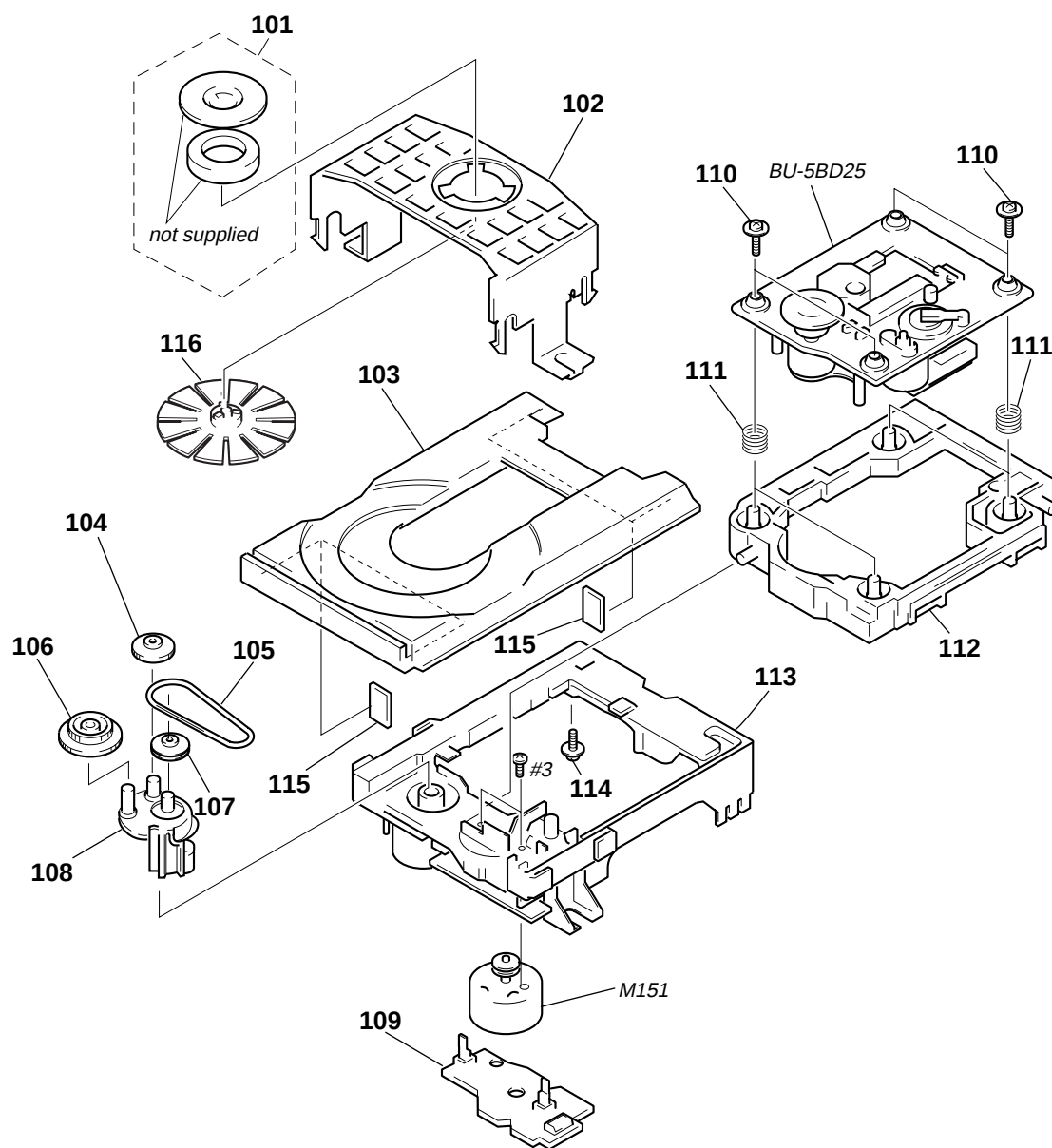
7-2. FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
51	4-942-568-41	EMBLEM (NO.5), SONY	
52	4-998-790-01	KNOB, POWER	
* 53	1-668-724-11	SW BOARD	
54	4-951-620-01	SCREW (2.6X8), +BVTP	
* 55	1-668-725-11	HP BOARD (AEP)	
56	4-950-189-01	KNOB (A) (VOL)	
57	4-997-219-01	PLATE, INDICATION	
58	4-997-216-01	BASE (M2), PANEL	
59	4-997-215-01	PANEL, FRONT (AEP)	
59	4-997-215-11	PANEL, FRONT (UK)	
60	4-996-687-51	KNOB (AMS)	
61	X-4949-458-1	BASE (R) ASSY, PANEL	

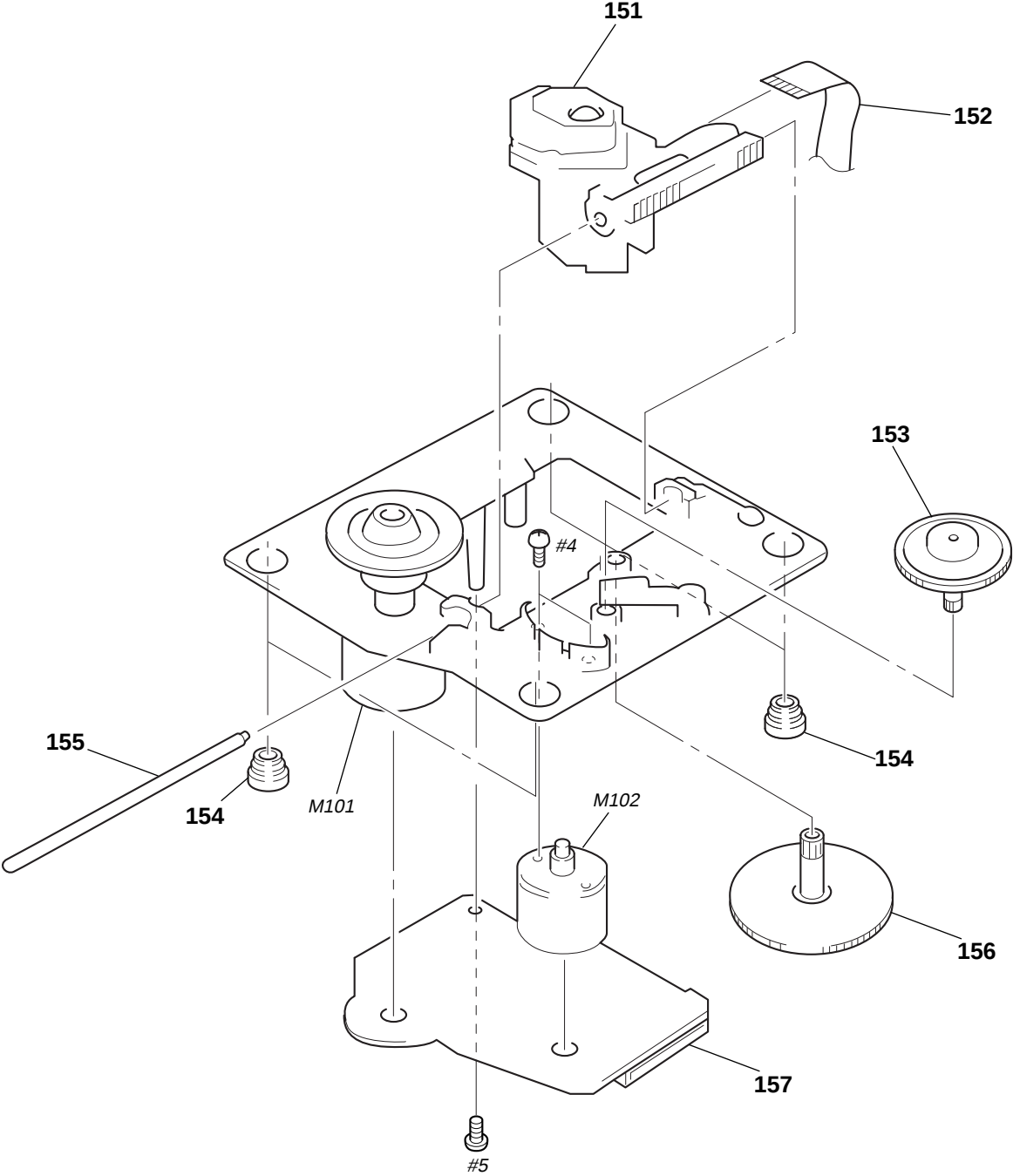
Ref. No.	Part No.	Description	Remark
62	4-997-213-01	BUTTON (FR)	
63	4-974-510-01	SCREW (+BV 3X8 B)(UK)	
63	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S (AEP)	
* 64	4-997-495-01	GUIDE (FL)	
* 65	A-4699-973-A	PANEL BOARD, COMPLETE	
66	4-997-200-01	BASE (L), PANEL	
67	4-997-211-01	BUTTON (MODE)	
* 68	1-668-726-11	DF BOARD	
69	1-773-211-11	WIRE (FLAT TYPE) (25 CORE)	
70	3-354-981-11	SPRING (SUS), RING	
FL501	1-517-740-11	INDICATOR TUBE, FLUORESCENT	

7-3. MECHANISM DECK SECTION (CDM14FLS-5BD25)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	1-452-925-21	MAGNET ASSY		110	4-933-134-01	SCREW +PTPWH M2.6X6	
102	4-933-110-41	HOLDER (MG)		111	4-959-996-01	SPRING (932), COMPRESSION	
103	4-995-814-11	TABLE (FL), DISC		112	4-933-129-01	HOLDER (BU)	
104	4-967-268-01	GEAR (C)		113	4-933-111-11	CHASSIS (MD)	
105	4-927-649-01	BELT		* 114	4-917-583-21	BRACKET, YOKE	
106	4-933-107-01	GEAR (PL)		115	4-925-315-31	DAMPER	
107	4-927-651-01	PULLEY (S)					
108	4-933-109-01	CAM		116	4-993-142-11	PULLY (L), PRESS	
* 109	1-645-721-11	LOADING BOARD		M151	A-4672-207-A	MOTOR (L) ASSY (LOADING)	

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



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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
$\triangle$ 151	8-848-379-31	OPTICAL PICK-UP KSS-213BA/F-NP		156	4-917-564-01	GEAR (P), FLATNESS	
152	1-769-069-11	WIRE (FLAT TYPE)(16 CORE)		* 157	A-4699-969-A	BD BOARD, COMPLETE	
153	4-917-567-21	GEAR (M)		M101	X-4917-523-4	MOTOR ASSY (SPINDLE)	
154	4-951-940-01	INSULATOR (BU)		M102	X-4917-504-1	MOTOR ASSY (SLED)	
155	4-917-565-01	SHAFT, SLED					

SECTION 8 ELECTRICAL PARTS LIST

BD

Note:

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

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

- 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.
- RESISTORS
All resistors are in ohms
METAL: Metal-film resistor
METAL OXIDE: Metal Oxide-film resistor
F : nonflammable

- SEMICONDUCTORS
In each case, u: μ , for example:
uA...: μ A..., uPA...: μ PA..., uPB...: μ PB...,
uPC...: μ PC..., uPD...: μ PD...
- CAPACITORS
uF : μ F
- COILS
uH : μ H

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-4699-969-A	BD BOARD, COMPLETE *****		IC103	8-752-085-51	IC CXA2568M-T6	
		< CAPACITOR >				< JUMPER RESISTOR >	
C101	1-163-005-11	CERAMIC CHIP 470PF 10% 50V		JW102	1-216-295-91	SHORT 0	
C102	1-163-038-91	CERAMIC CHIP 0.1uF 25V				< COIL >	
C103	1-163-005-11	CERAMIC CHIP 470PF 10% 50V		L101	1-414-234-11	INDUCTOR CHIP 0uH	
C105	1-135-155-21	TANTALUM CHIP 4.7uF 10% 16V				< TRANSISTOR >	
C106	1-164-346-11	CERAMIC CHIP 1uF 16V		Q101	8-729-010-08	TRANSISTOR MSB710-R	
C107	1-164-346-11	CERAMIC CHIP 1uF 16V				< RESISTOR >	
C108	1-163-035-00	CERAMIC CHIP 0.047uF 50V		R101	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C109	1-163-145-00	CERAMIC CHIP 0.0015uF 5% 50V		R102	1-216-097-91	RES,CHIP 100K 5% 1/10W	
C110	1-163-017-00	CERAMIC CHIP 0.0047uF 5% 50V		R103	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C111	1-163-251-11	CERAMIC CHIP 100PF 5% 50V		R104	1-216-085-00	METAL CHIP 33K 5% 1/10W	
C112	1-163-038-91	CERAMIC CHIP 0.1uF 25V		R105	1-216-097-91	RES,CHIP 100K 5% 1/10W	
C113	1-163-038-91	CERAMIC CHIP 0.1uF 25V		R106	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
C115	1-126-607-11	ELECT CHIP 47uF 20% 4V		R107	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
C116	1-126-607-11	ELECT CHIP 47uF 20% 4V		R108	1-216-073-00	METAL CHIP 10K 5% 1/10W	
C117	1-126-209-11	ELECT CHIP 100uF 20% 4V		R109	1-216-121-91	RES,CHIP 1M 5% 1/10W	
C118	1-163-275-11	CERAMIC CHIP 0.001uF 5% 50V		R110	1-216-025-91	RES,CHIP 100 5% 1/10W	
C119	1-163-231-11	CERAMIC CHIP 15PF 5% 50V		R112	1-216-049-91	RES,CHIP 1K 5% 1/10W	
C120	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V		R123	1-216-073-00	METAL CHIP 10K 5% 1/10W	
C121	1-109-982-11	CERAMIC CHIP 1uF 10% 10V		R124	1-216-097-91	RES,CHIP 100K 5% 1/10W	
C122	1-164-232-11	CERAMIC CHIP 0.01uF 50V		R125	1-216-037-00	METAL CHIP 330 5% 1/10W	
C123	1-164-232-11	CERAMIC CHIP 0.01uF 50V		R126	1-216-037-00	METAL CHIP 330 5% 1/10W	
C124	1-164-005-11	CERAMIC CHIP 0.47uF 25V		R127	1-216-037-00	METAL CHIP 330 5% 1/10W	
C125	1-163-217-11	CERAMIC CHIP 1PF 0.25PF 50V		R131	1-216-037-00	METAL CHIP 330 5% 1/10W	
C126	1-135-216-11	TANTALUM CHIP 10uF 20% 10V		R135	1-216-295-91	SHORT 0	
C140	1-163-038-91	CERAMIC CHIP 0.1uF 25V		R136	1-216-295-91	SHORT 0	
C141	1-163-038-91	CERAMIC CHIP 0.1uF 25V		R137	1-216-295-91	SHORT 0	
C151	1-163-237-11	CERAMIC CHIP 27PF 5% 50V		R138	1-216-295-91	SHORT 0	
C153	1-163-038-91	CERAMIC CHIP 0.1uF 25V		R143	1-216-103-00	METAL CHIP 180K 5% 1/10W	
C154	1-164-336-11	CERAMIC CHIP 0.33uF 25V		R144	1-216-103-00	METAL CHIP 180K 5% 1/10W	
C156	1-163-237-11	CERAMIC CHIP 27PF 5% 50V		R145	1-216-121-91	RES,CHIP 1M 5% 1/10W	
C157	1-163-145-00	CERAMIC CHIP 0.0015uF 5% 50V		R146	1-216-121-91	RES,CHIP 1M 5% 1/10W	
C159	1-163-019-00	CERAMIC CHIP 0.0068uF 10% 50V		R147	1-216-081-00	METAL CHIP 22K 5% 1/10W	
C161	1-163-038-91	CERAMIC CHIP 0.1uF 25V		R148	1-216-001-00	METAL CHIP 10 5% 1/10W	
		< CONNECTOR >		R149	1-216-003-11	RES,CHIP 12 5% 1/10W	
CN101	1-770-072-11	CONNECTOR,(LIF(NON-ZIF))FFC23P		R158	1-216-111-00	METAL CHIP 390K 5% 1/10W	
CN102	1-777-937-11	CONNECTOR, FFC/FPC 16P		R159	1-216-101-00	METAL CHIP 150K 5% 1/10W	
		< IC >		R161	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
IC101	8-752-389-34	IC CXD2585Q		R162	1-216-101-00	METAL CHIP 150K 5% 1/10W	
IC102	8-759-455-91	IC BA6392FP-E2					

Ref. No.	Part No.	Description	Remark			
< SWITCH >						
S101	1-572-085-11	SWITCH, LEAF (LIMIT)				

*	1-668-726-11	DF BOARD				

< RESISTOR >						
R550	1-249-415-11	CARBON	680	5%	1/4W	F
R551	1-249-417-11	CARBON	1K	5%	1/4W	F
R552	1-249-419-11	CARBON	1.5K	5%	1/4W	F
< SWITCH >						
S550	1-771-312-11	SWITCH, ROTARY				
			(FILTER STANDARD→1→2→3)			

*	1-668-725-11	HP BOARD (AEP)				

< CAPACITOR >						
C820	1-164-159-21	CERAMIC	0.1uF	50V		
C821	1-161-494-00	CERAMIC	0.022uF	25V		
C822	1-161-494-00	CERAMIC	0.022uF	25V		
< JACK >						
J820	1-770-307-11	JACK (LARGE TYPE)(PHONES)				
< COIL >						
L820	1-410-322-11	INDUCTOR	3.3uH			
L821	1-410-322-11	INDUCTOR	3.3uH			
L822	1-424-122-11	FILTER, NOISE				

*	1-645-721-11	LOADING BOARD				

< CONNECTOR >						
* CN151	1-568-943-11	PIN, CONNECTOR 5P				
< SWITCH >						
S151	1-572-086-11	SWITCH, LEAF (LOAD OUT)				
S152	1-572-086-11	SWITCH, LEAF (LOAD IN)				

*	A-4699-972-A	MAIN BOARD, COMPLETE (AEP)				

*	A-4724-196-A	MAIN BOARD, COMPLETE (UK)				

		1-690-123-21	REED (WITH CONNECTOR) (2 CORE)			
		4-211-300-01	RING, RUBBER			
*		4-962-200-01	PLATE (TR), GROUND			
		7-685-871-01	SCREW +BVTT 3X6 (S)			

Ref. No.	Part No.	Description	Remark		
< CAPACITOR >					
C301	1-161-494-00	CERAMIC	0.022uF		25V
C351	1-102-945-00	CERAMIC	8.0PF	±0.5PF	50V
C352	1-102-945-00	CERAMIC	8.0PF	±0.5PF	50V
C353	1-136-850-11	FILM	0.1uF	5%	63V
C354	1-136-850-11	FILM	0.1uF	5%	63V
C355	1-119-800-11	ELECT	100uF	20%	25V
C356	1-126-009-81	ELECT	100uF	20%	16V
C360	1-162-208-31	CERAMIC	24PF	5%	50V
C385	1-126-024-11	ELECT	220uF	20%	16V
C387	1-119-800-11	ELECT	100uF	20%	25V
C388	1-119-800-11	ELECT	100uF	20%	25V
C389	1-136-165-00	FILM	0.1uF	5%	50V
C390	1-136-165-00	FILM	0.1uF	5%	50V
C392	1-161-494-00	CERAMIC	0.022uF		25V
C393	1-162-282-31	CERAMIC	100PF	10%	50V
C394	1-162-290-31	CERAMIC	470PF	10%	50V
C395	1-164-159-21	CERAMIC	0.1uF		50V
C396	1-164-159-21	CERAMIC	0.1uF		50V
C404	1-119-800-11	ELECT	100uF	20%	25V
C405	1-136-850-11	FILM	0.1uF	5%	63V
C406	1-136-850-11	FILM	0.1uF	5%	63V
C408	1-101-361-00	CERAMIC	150PF	5%	50V (UK)
C408	1-102-973-00	CERAMIC	100PF	5%	50V
C409	1-102-816-00	CERAMIC	120PF	5%	50V
C410	1-102-816-00	CERAMIC	120PF	5%	50V
C411	1-130-484-00	MYLAR	0.012uF	5%	50V
C412	1-106-343-00	MYLAR	1000PF	5%	200V
C413	1-115-197-11	ELECT	100uF	20%	25V
C413	1-128-201-11	ELECT	100uF	20%	50V (UK)
C414	1-136-802-11	FILM	0.015uF	5%	100V
C454	1-119-800-11	ELECT	100uF	20%	25V
C455	1-136-850-11	FILM	0.1uF	5%	63V
C456	1-136-850-11	FILM	0.1uF	5%	63V
C458	1-101-361-00	CERAMIC	150PF	5%	50V (UK)
C458	1-102-973-00	CERAMIC	100PF	5%	50V
C459	1-102-816-00	CERAMIC	120PF	5%	50V
C460	1-102-816-00	CERAMIC	120PF	5%	50V
C461	1-130-484-00	MYLAR	0.012uF	5%	50V
C462	1-106-343-00	MYLAR	1000PF	5%	200V
C463	1-115-197-11	ELECT	100uF	20%	25V
C463	1-128-201-11	ELECT	100uF	20%	50V (UK)
C464	1-136-802-11	FILM	0.015uF	5%	100V
C631	1-161-494-00	CERAMIC	0.022uF		25V
C632	1-162-306-11	CERAMIC	0.01uF	20%	16V
C651	1-119-839-21	ELECT	330uF	20%	63V
C652	1-119-839-21	ELECT	330uF	20%	63V
C653	1-124-699-11	ELECT	220uF	20%	25V
C654	1-124-699-11	ELECT	220uF	20%	25V
C655	1-124-699-11	ELECT	220uF	20%	25V
C656	1-126-013-11	ELECT	1000uF	20%	16V
C657	1-124-556-11	ELECT	2200uF	20%	16V
C658	1-136-850-11	FILM	0.1uF	5%	63V
C659	1-136-850-11	FILM	0.1uF	5%	63V

Ref. No.	Part No.	Description	Remark			Ref. No.	Part No.	Description	Remark		
C670	1-162-294-31	CERAMIC	0.001uF	10%	50V	J721	1-774-726-11	JACK (S-LINK CONTROL A1)			
C671	1-126-962-11	ELECT	3.3uF	20%	50V	J781	1-778-228-11	JACK, PIN 1P (DIGITAL OUT:COAXIAL)(AEP)			
						J781	1-784-689-11	JACK, PIN 1P (DIGITAL OUT:COAXIAL)(UK)			
C672	1-164-159-21	CERAMIC	0.1uF		50V			< COIL >			
C673	1-161-494-00	CERAMIC	0.022uF		25V						
C680	1-126-767-11	ELECT	1000uF	20%	16V	L302	1-410-322-11	INDUCTOR 3.3uH			
C681	1-164-159-21	CERAMIC	0.1uF		50V	L303	1-410-322-11	INDUCTOR 3.3uH			
C691	1-164-159-21	CERAMIC	0.1uF		50V	L304	1-410-503-11	INDUCTOR 3.3uH			
						L355	1-410-507-11	INDUCTOR 6.8uH			
C700	1-161-494-00	CERAMIC	0.022uF		25V	L401	1-412-473-21	INDUCTOR 0uH			
C701	1-136-850-11	FILM	0.1uF	5%	63V						
C702	1-136-850-11	FILM	0.1uF	5%	63V	L451	1-412-473-21	INDUCTOR 0uH			
C724	1-162-282-31	CERAMIC	100PF	10%	50V	L751	1-410-322-11	INDUCTOR 3.3uH			
C752	1-126-024-11	ELECT	220uF	20%	16V	L781	1-410-322-11	INDUCTOR 3.3uH			
								< TRANSISTOR >			
C753	1-161-494-00	CERAMIC	0.022uF		25V	Q681	8-729-029-56	TRANSISTOR DTA144ESA			
C781	1-161-494-00	CERAMIC	0.022uF		25V	Q682	8-729-231-55	TRANSISTOR 2SC2878-AB			
C782	1-161-494-00	CERAMIC	0.022uF		25V	Q683	8-729-231-55	TRANSISTOR 2SC2878-AB			
C783	1-126-009-81	ELECT	100uF	20%	16V	Q691	8-729-029-56	TRANSISTOR DTA144ESA			
C784	1-164-159-21	CERAMIC	0.1uF		50V	Q692	8-729-231-55	TRANSISTOR 2SC2878-AB			
C785	1-164-159-21	CERAMIC	0.1uF		50V						
		< CONNECTOR >				Q693	8-729-231-55	TRANSISTOR 2SC2878-AB			
* CN301	1-568-839-11	SOCKET, CONNECTOR 23P				Q701	8-729-922-37	TRANSISTOR 2SD2144S-UVW (AEP)			
* CN302	1-568-841-11	SOCKET, CONNECTOR 25P				Q702	8-729-922-37	TRANSISTOR 2SD2144S-UVW (AEP)			
CN701	1-506-468-11	PIN, CONNECTOR 3P (AEP)				Q721	8-729-620-05	TRANSISTOR 2SC2603-EF			
		< DIODE >						< RESISTOR >			
D631	8-719-921-40	DIODE MTZJ-4.7C				R301	1-249-429-11	CARBON 10K	5%	1/4W	
D651	8-719-210-21	DIODE 11EQS04				R302	1-249-441-11	CARBON 100K	5%	1/4W	
D679	8-719-991-33	DIODE 1SS133T-77				R303	1-249-417-11	CARBON 1K	5%	1/4W	F
D680	8-719-991-33	DIODE 1SS133T-77				R312	1-249-417-11	CARBON 1K	5%	1/4W	F
D681	8-719-991-33	DIODE 1SS133T-77				R313	1-249-411-11	CARBON 330	5%	1/4W	
D682	8-719-991-33	DIODE 1SS133T-77 (AEP)				R351	1-247-843-11	CARBON 3.3K	5%	1/4W	
D691	8-719-991-33	DIODE 1SS133T-77				R401	1-249-435-11	CARBON 33K	5%	1/4W	
D692	8-719-991-33	DIODE 1SS133T-77 (AEP)				R402	1-249-435-11	CARBON 33K	5%	1/4W	
D721	8-719-991-33	DIODE 1SS133T-77				R403	1-249-435-11	CARBON 33K	5%	1/4W	
		< EARTH TERMINAL >				R404	1-249-435-11	CARBON 33K	5%	1/4W	
* ET700	1-537-738-21	TERMINAL, EARTH				R405	1-249-432-11	CARBON 18K	5%	1/4W	
* ET702	1-537-738-21	TERMINAL, EARTH				R406	1-249-432-11	CARBON 18K	5%	1/4W	
		< IC >				R407	1-247-864-11	CARBON 24K	5%	1/4W	
IC301	8-759-527-07	IC CXD8735N				R408	1-247-864-11	CARBON 24K	5%	1/4W	
IC401	8-759-712-02	IC NJM2114D				R409	1-247-830-11	CARBON 910	5%	1/4W	
IC451	8-759-712-02	IC NJM2114D				R410	1-247-826-00	CARBON 620	5%	1/4W	
IC631	8-759-822-09	IC LB1641				R411	1-249-420-11	CARBON 1.8K	5%	1/4W	F
IC651	8-759-604-86	IC M5F7807L				R412	1-249-411-11	CARBON 330	5%	1/4W	
IC652	8-759-604-90	IC M5F7907L				R413	1-249-411-11	CARBON 330	5%	1/4W	
IC653	8-759-231-53	IC TA7805S				R414	1-249-441-11	CARBON 100K	5%	1/4W	
IC654	8-759-604-86	IC M5F7807L				R415	1-247-807-31	CARBON 100	5%	1/4W	
IC655	8-759-231-53	IC TA7805S				R451	1-249-435-11	CARBON 33K	5%	1/4W	
IC670	8-759-636-16	IC M51957AL				R452	1-249-435-11	CARBON 33K	5%	1/4W	
IC701	8-759-634-51	IC M5218AP (AEP)				R453	1-249-435-11	CARBON 33K	5%	1/4W	
IC751	8-749-921-12	IC GP1F32T (DIGITAL OUT:OPTICAL)				R454	1-249-435-11	CARBON 33K	5%	1/4W	
IC781	8-759-242-70	IC TC7WU04F				R455	1-249-432-11	CARBON 18K	5%	1/4W	
		< JACK >				R456	1-249-432-11	CARBON 18K	5%	1/4W	
J401	1-770-719-11	JACK, PIN 2P (LINE OUT)(AEP)				R457	1-247-864-11	CARBON 24K	5%	1/4W	
J401	1-774-727-11	JACK, PIN 2P (LINE OUT)(UK)				R458	1-247-864-11	CARBON 24K	5%	1/4W	
						R459	1-247-830-11	CARBON 910	5%	1/4W	
						R460	1-247-826-00	CARBON 620	5%	1/4W	
						R461	1-249-420-11	CARBON 1.8K	5%	1/4W	F

MAIN

PANEL

Ref. No.	Part No.	Description	Remark
R462	1-249-411-11	CARBON 330 5%	1/4W
R463	1-249-411-11	CARBON 330 5%	1/4W
R464	1-249-441-11	CARBON 100K 5%	1/4W
R465	1-247-807-31	CARBON 100 5%	1/4W
R631	1-249-427-11	CARBON 6.8K 5%	1/4W F
R670	1-249-436-11	CARBON 39K 5%	1/4W
R671	1-249-431-11	CARBON 15K 5%	1/4W
R672	1-247-843-11	CARBON 3.3K 5%	1/4W
R681	1-249-441-11	CARBON 100K 5%	1/4W
R682	1-249-425-11	CARBON 4.7K 5%	1/4W F
R683	1-249-425-11	CARBON 4.7K 5%	1/4W F
R691	1-249-441-11	CARBON 100K 5%	1/4W
R692	1-249-425-11	CARBON 4.7K 5%	1/4W F
R693	1-249-425-11	CARBON 4.7K 5%	1/4W F
R701	1-249-419-11	CARBON 1.5K 5%	1/4W F (AEP)
R702	1-249-419-11	CARBON 1.5K 5%	1/4W F (AEP)
R703	1-249-403-11	CARBON 68 5%	1/4W F (AEP)
R704	1-249-403-11	CARBON 68 5%	1/4W F (AEP)
R724	1-249-393-11	CARBON 10 5%	1/4W F
R725	1-249-429-11	CARBON 10K 5%	1/4W
R726	1-249-425-11	CARBON 4.7K 5%	1/4W F
R751	1-247-807-31	CARBON 100 5%	1/4W
R781	1-249-403-11	CARBON 68 5%	1/4W F
R782	1-249-402-11	CARBON 56 5%	1/4W F
< TRANSFORMER >			
T781	1-409-594-11	COIL (WITH CORE)	
< VIBRATOR >			
X351	1-760-955-11	VIBRATOR, CRYSTAL (45MHz)	

*	A-4699-973-A	PANEL BOARD, COMPLETE	*****
*	4-997-495-01	GUIDE (FL)	
< CAPACITOR >			
C501	1-126-382-11	ELECT 100uF 20%	6.3V
C502	1-164-159-21	CERAMIC 0.1uF	50V
C503	1-164-159-21	CERAMIC 0.1uF	50V
C505	1-164-159-21	CERAMIC 0.1uF	50V
C506	1-164-159-21	CERAMIC 0.1uF	50V
< CONNECTOR >			
* CN501	1-568-867-11	SOCKET, CONNECTOR 25P	
* CN502	1-568-941-11	PIN, CONNECTOR 3P	
< FLUORESCENT INDICATOR >			
FL501	1-517-740-11	INDICATOR TUBE, FLUORESCENT	
< IC >			
IC501	8-752-888-75	IC CXP82832-009Q	

Ref. No.	Part No.	Description	Remark
IC502	8-749-014-66	IC NJL64H400A	
< TRANSISTOR >			
Q501	8-729-029-66	TRANSISTOR DTC114ESA	
Q502	8-729-029-66	TRANSISTOR DTC114ESA	
< RESISTOR >			
R501	1-249-427-11	CARBON 6.8K 5%	1/4W F
R502	1-249-415-11	CARBON 680 5%	1/4W F
R503	1-249-417-11	CARBON 1K 5%	1/4W F
R504	1-249-419-11	CARBON 1.5K 5%	1/4W F
R505	1-249-421-11	CARBON 2.2K 5%	1/4W F
R506	1-247-843-11	CARBON 3.3K 5%	1/4W
R507	1-249-427-11	CARBON 6.8K 5%	1/4W F
R507	1-247-864-11	CARBON 24K 5%	1/4W
R508	1-249-429-11	CARBON 10K 5%	1/4W
R511	1-249-427-11	CARBON 6.8K 5%	1/4W F
R512	1-249-415-11	CARBON 680 5%	1/4W F
R513	1-249-417-11	CARBON 1K 5%	1/4W F
R514	1-249-419-11	CARBON 1.5K 5%	1/4W F
R515	1-249-421-11	CARBON 2.2K 5%	1/4W F
R516	1-247-843-11	CARBON 3.3K 5%	1/4W
R521	1-249-427-11	CARBON 6.8K 5%	1/4W F
R522	1-249-415-11	CARBON 680 5%	1/4W F
R523	1-249-417-11	CARBON 1K 5%	1/4W F
R524	1-249-419-11	CARBON 1.5K 5%	1/4W F
R525	1-249-421-11	CARBON 2.2K 5%	1/4W F
R526	1-247-843-11	CARBON 3.3K 5%	1/4W
R530	1-249-427-11	CARBON 6.8K 5%	1/4W F
R531	1-249-441-11	CARBON 100K 5%	1/4W
R532	1-249-441-11	CARBON 100K 5%	1/4W
R534	1-249-417-11	CARBON 1K 5%	1/4W F
R535	1-249-429-11	CARBON 10K 5%	1/4W
R536	1-249-427-11	CARBON 6.8K 5%	1/4W F
R537	1-249-429-11	CARBON 10K 5%	1/4W
R538	1-249-429-11	CARBON 10K 5%	1/4W
R539	1-249-429-11	CARBON 10K 5%	1/4W
R541	1-247-807-31	CARBON 100 5%	1/4W
R542	1-247-807-31	CARBON 100 5%	1/4W
R543	1-249-429-11	CARBON 10K 5%	1/4W
R544	1-249-429-11	CARBON 10K 5%	1/4W
R545	1-249-429-11	CARBON 10K 5%	1/4W
< SWITCH >			
S501	1-554-303-21	SWITCH, TACTILE (LANGUAGE)	
S502	1-554-303-21	SWITCH, TACTILE (MUSIC SCAN)	
S503	1-554-303-21	SWITCH, TACTILE (AUTO SPACE)	
S504	1-554-303-21	SWITCH, TACTILE (PEAK SEARCH)	
S505	1-554-303-21	SWITCH, TACTILE (PLAY MODE)	
S506	1-554-303-21	SWITCH, TACTILE (REPEAT)	
S507	1-554-303-21	SWITCH, TACTILE (FADER)	
S508	1-554-303-21	SWITCH, TACTILE (TIME/TEXT)	
S511	1-554-303-21	SWITCH, TACTILE (CLEAR)	
S512	1-554-303-21	SWITCH, TACTILE (CHECK)	
S513	1-554-303-21	SWITCH, TACTILE (EDIT/TIME FADE)	
S514	1-554-303-21	SWITCH, TACTILE (◀◀)	
S515	1-554-303-21	SWITCH, TACTILE (▶▶)	
S521	1-554-303-21	SWITCH, TACTILE (≡ OPEN/CLOSE)	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
S522	1-554-303-21	SWITCH, TACTILE (▷)		R641	1-247-843-11	CARBON 3.3K 5%	1/4W
S523	1-554-303-21	SWITCH, TACTILE (■)		R642	1-247-843-11	CARBON 3.3K 5%	1/4W
S524	1-554-303-21	SWITCH, TACTILE (■)		R643	1-212-873-11	FUSIBLE 47 5%	1/4W F
S531	1-475-543-11	ENCODER, ROTARY (◀◀ AMS ▶▶ PUSH ENTER)		R644	1-247-807-31	CARBON 100 5%	1/4W
		< VIBRATOR >		R645	1-247-807-31	CARBON 100 5%	1/4W
X501	1-579-125-11	VIBRATOR, CERAMIC (8MHz)		R646	1-249-432-11	CARBON 18K 5%	1/4W
*****				< TRANSFORMER >			
*****				△ T601	1-431-715-11	TRANSFORMER, POWER	
*****				*****			
*	1-668-722-11	POWER BOARD *****		*	1-668-724-11	SW BOARD *****	
		< CAPACITOR >				< SWITCH >	
C601	1-126-017-11	ELECT 6800uF 20% 16V		△ S800	1-572-267-51	SWITCH, PUSH (AC POWER)(1 KEY)(I/⌘)	
C602	1-126-013-11	ELECT 1000uF 20% 16V		*****			
C603	1-128-576-11	ELECT 100uF 20% 63V		MISCELLANEOUS *****			
C605	1-164-159-21	CERAMIC 0.1uF 50V		9	1-773-179-11	WIRE (FLAT TYPE) (23 CORE)	
C606	1-164-159-21	CERAMIC 0.1uF 50V		10	1-500-386-11	FILTER, CLAMP (FERRITE CORE)	
C607	1-164-159-21	CERAMIC 0.1uF 50V		△ 12	1-575-651-21	CORD, POWER	
C608	1-161-494-00	CERAMIC 0.022uF 25V		△ 13	1-770-019-11	ADAPTOR, CONVERSION PLUG 3P (UK)	
C610	1-126-933-11	ELECT 100uF 20% 16V		69	1-773-211-11	WIRE (FLAT TYPE) (25 CORE)	
C611	1-161-494-00	CERAMIC 0.022uF 25V		101	1-452-925-21	MAGNET ASSY	
C612	1-136-165-00	FILM 0.1uF 5% 50V		△ 151	8-848-379-31	OPTICAL PICK-UP KSS-213BA/F-NP	
C613	1-136-165-00	FILM 0.1uF 5% 50V		152	1-769-069-11	WIRE (FLAT TYPE)(16 CORE)	
△ C620	1-113-924-11	CERAMIC 0.0047uF 20% 250V		M101	X-4917-523-4	MOTOR ASSY (SPINDLE)	
C641	1-126-964-11	ELECT 10uF 20% 50V		M102	X-4917-504-1	MOTOR ASSY (SLED)	
		< CONNECTOR >		M151	A-4672-207-A	MOTOR (L) ASSY (LOADING)	
CN601	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P		△ T601	1-431-715-11	TRANSFORMER, POWER	
CN602	1-564-321-00	PIN, CONNECTOR 2P		FL501	1-517-740-11	INDICATOR TUBE, FLUORESCENT	
CN603	1-766-270-11	PIN, CONNECTOR (PC BOARD) 8P		*****			
		< DIODE >		ACCESSORIES & PACKING MATERIALS *****			
D601	8-719-200-82	DIODE 11ES2		1-473-720-11	REMOTE COMMANDER (RM-DX50)		
D602	8-719-200-82	DIODE 11ES2		1-558-271-11	CORD, CONNECTION (AUDIO, 108cm)(AEP)		
D603	8-719-200-82	DIODE 11ES2		1-590-925-31	CORD, CONNECTION (AUDIO, 100cm)(UK)		
D604	8-719-200-82	DIODE 11ES2		3-810-765-72	MANUAL,COMMONNESS INSTRUCTION (ENGLISH,FRENCH,GERMAN,SPANISH, DUTCH,ITALIAN,PORTUGUESE)		
D605	8-719-200-82	DIODE 11ES2		3-861-844-11	MANUAL, INSTRUCTION (ENGLISH,FRENCH,SPANISH)		
D606	8-719-200-82	DIODE 11ES2		3-861-844-21	MANUAL, INSTRUCTION (GERMAN,DUTCH,SWEDISH,ITALIAN, PORTUGUESE)(AEP)		
D607	8-719-200-82	DIODE 11ES2		4-983-956-01	COVER, BATTERY (FOR RM-DX50)		
D608	8-719-921-40	DIODE MTZJ-4.7C		*****			
D641	8-719-982-22	DIODE MTZJ-30D		< TRANSISTOR >			
D643	8-719-109-85	DIODE RD5.1ESB2		Q641	8-729-041-38	TRANSISTOR 2SB1241TV2Q	
		< COIL >				< RESISTOR >	
L601	1-410-322-11	INDUCTOR 3.3uH		R601	1-249-411-11	CARBON 330 5% 1/4W	
L602	1-410-322-11	INDUCTOR 3.3uH					
L603	1-410-322-11	INDUCTOR 3.3uH					
L604	1-410-322-11	INDUCTOR 3.3uH					
L605	1-412-473-21	INDUCTOR 0uH					

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

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Remark</u>

HARDWARE LIST			

#1	7-685-871-01	SCREW +BVTT 3X6 (S)	
#2	7-685-885-09	SCREW +BVTT 4X16 (S)	
#3	7-621-775-10	SCREW +B 2.6X4	
#4	7-621-255-15	SCREW +P 2X3	
#5	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S	