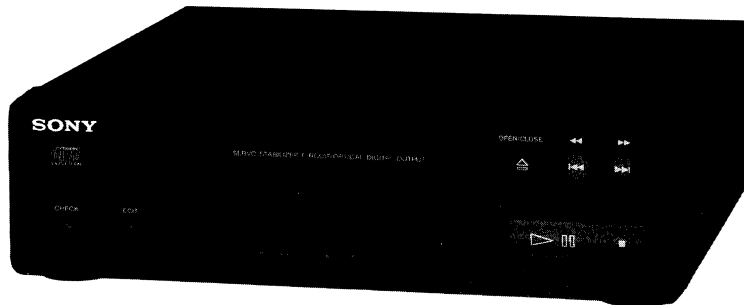


# CDP-H3600

## SERVICE MANUAL

AEP Model  
UK Model

This set is the  
CD player section in  
MHC-2600/3600



Model Name Using Similar Mechanism	CDP-H300
CD Mechanism Type	CDM13B-5BD3
Base Unit Name	BU-5BD3

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### SPECIFICATIONS

System	Compact disc digital audio system
Laser	Semiconductor laser ( $\lambda = 780 \text{ nm}$ ) Emission duration: continuous
Laser output	Max. $44.6 \mu\text{W}^*$ * This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.
Signal to noise ratio	More than 90 dB
Dynamic range	More than 90 dB
Harmonic distortion	Less than 0.05% (at 1 kHz)
Channel separation	More than 90 dB
Output level	2 V (at 50 kilohms)
Load impedance	More than 10 kilohms
Outputs	DIGITAL OUT OPTICAL (optical output connector): wave length 660 nm, output level $-18 \text{ dBm}$

CLASS 1 LASER PRODUCT  
LUOKAN 1 LASERLAITE  
KLASS 1 LASERAPPARAT

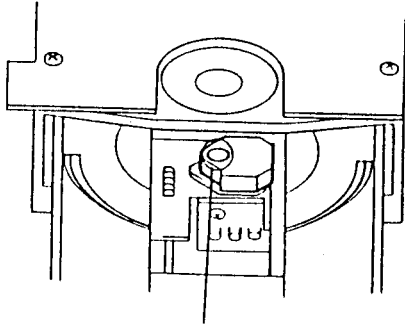
This appliance is classified as a CLASS 1 LASER product. The CLASS 1 LASER PRODUCT label is located on the rear exterior.



COMPACT DISC PLAYER  
**SONY**®

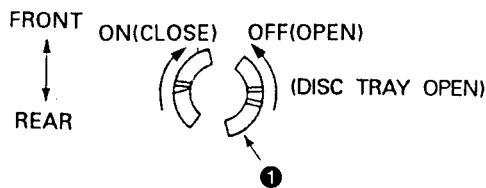
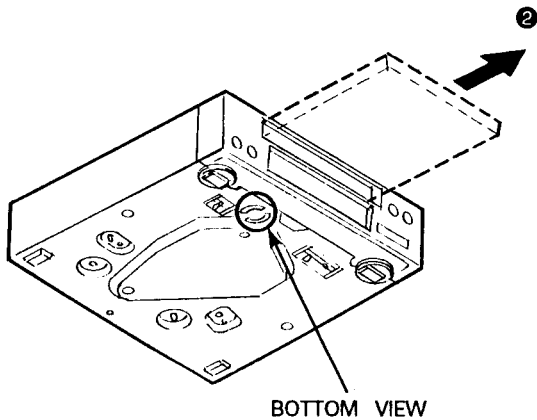
**LASER DIODE AND FOCUS SERCH OPERATION CHECK**

1. Make POWER switch on with no disc inserted and disc table closed.
2. Confirm that the following operation is performed while observing the objective lens.



- ① Confirm that laser beam is spread.
- ② Up and down motion of the objective lens. (3 times)

**HOW TO OPEN THE DISC TRAY WHEN POWER SWITCH TURNS OFF**



- (1) Insert to ① for tapering driver, etc., and turn in the direction of arrow OFF. (Disc tray open)
- (2) Tray as come out little of front panel, pull out in the direction of arrow ② by hand.

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

The laser diode in the optical pick-up block may suffer electrostatic break-down because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body. During repair, pay attention to electrostatic break-down 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 sureface 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  $\Delta$  OR DOTTED LINE WITH MARK  $\Delta$  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.

## SECTION 1 GENERAL

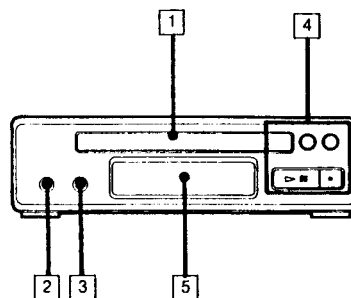
### LOCATION OF CONTROLS

This section is extracted from instruction manual.

#### CD Player Section **D**

- 1 Disc tray
- 2 CHECK button
- 3 EDIT/TIME FADE button
- 4 CD operation buttons
  - △ : OPEN/CLOSE
  - ▷|| : Play/pause
  - ◀◀ (◀◀▷▷) ▶▶ : Manual search (when kept depressed)/Automatic Music Sensor (when pressed)
- 5 Display window

# D

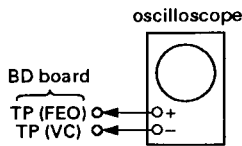


## SECTION 2 ELECTRICAL BLOCK CHECKING

**Note :**

1. CD Block basically constructed 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 the oscilloscope with more than 10MΩ impedance.
4. Clean an object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.

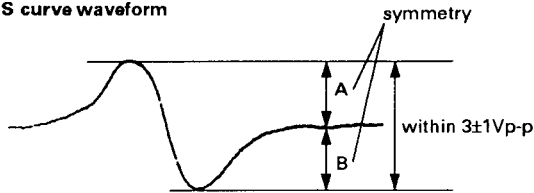
**S Curve Check**



**Procedure :**

1. Connect oscilloscope to test point TP (FEO) on BD board.
2. Connect between test point TP (FES) and TP (VC) by lead wire.
3. Turned Power switch on and actuate the focus serch. (actuate the focus serch when disc table is moving in and out.)
4. Check the oscilloscope waveform (S curve) is symmetrical between A and B. And confirm peak to peak level within  $3 \pm 1$  Vp-p.

**S curve waveform**

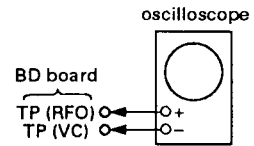


5. After check, remove the lead wire connected in step 2.

**Note :**

- Try to measure several times to make sure that 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**

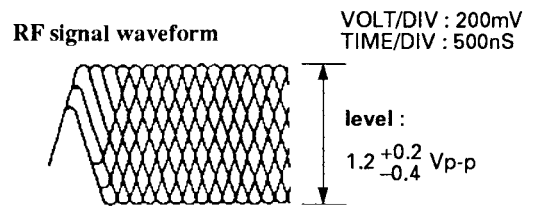


**Procedure :**

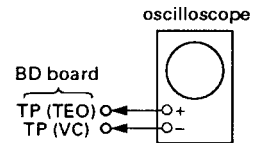
1. Connect oscilloscope to test point TP (RFO) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

**Note :**

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



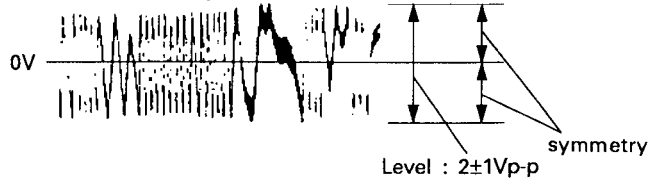
**E-F Balance Check**



**Procedure :**

1. Connect test point TP (ADJ) to ground and TP (TES) to TP (VC) with lead wire.
2. Connect oscilloscope to test point TP (TEO) on BD board.
3. Turn Power switch on.
4. Put disc (YEDS-18) in and playback.
5. Confirm that the oscilloscope waveform is symmetrical on the top and bottom in relation to 0V, and check this level.

**Traverse oscilloscope**



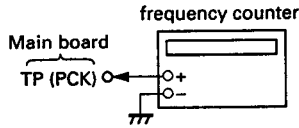
6. Remove the lead wire connected in step 1.

**RF PLL Free-run Frequency Check**

**[ BD BOARD ] – Conductor Side –**

Procedure :

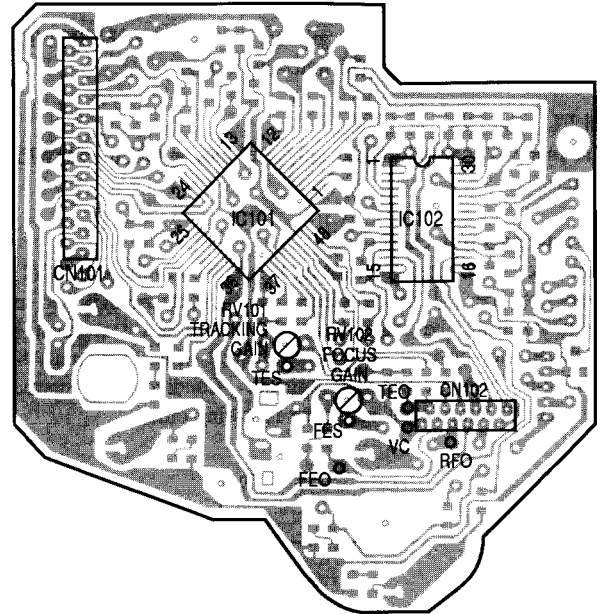
1. Connect frequency counter to test point (PCK) with lead wire.



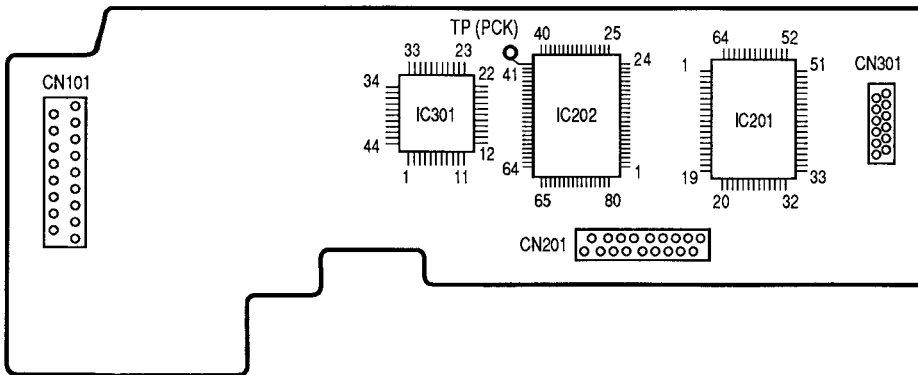
2. Turn Power switch on.
3. Confirm that reading on frequency counter is 4.3218MHz.

**Focus/Tracking Gain**

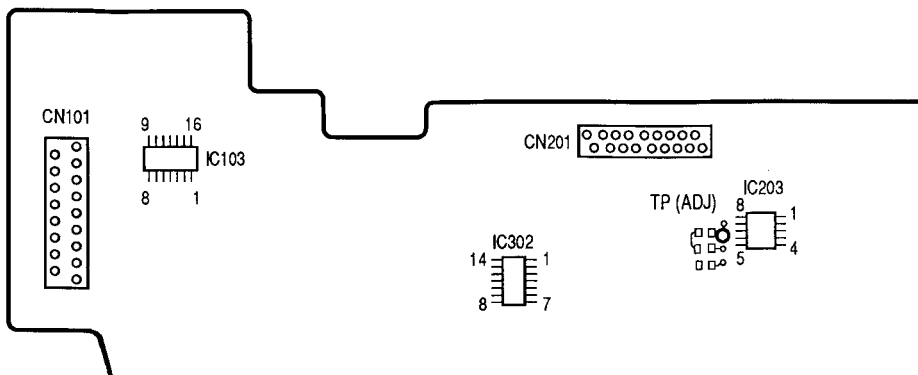
This gain has a margin, so even if it is slightly off. There is no problem. Therefore, do not perform, this adjustment. Please note that it should be fixed to mechanical center position when you moved and do not know original position.



**[ MAIN BOARD ] – Component Side –**



**[ MAIN BOARD ] – Conductor Side –**



[ TEST MODES ]



1. Test mode of display micon (IC401)

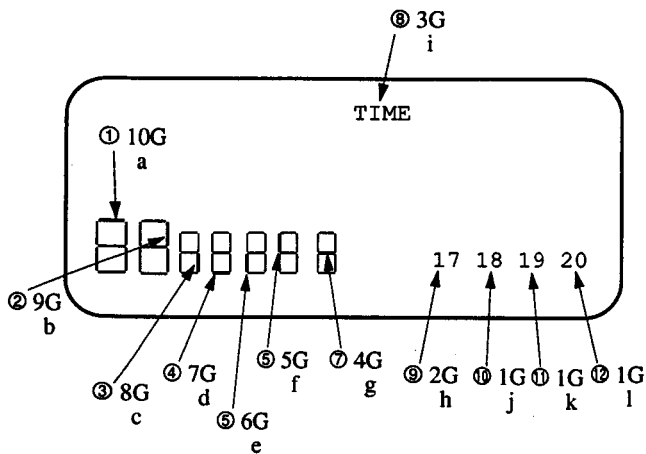
Connect Pin ⑩ of IC401 to ground and turn ON the POWER switch, thus you can test the following 3 tests.

(1) All FL tube ON


This mode is actuated immediately after turning ON the POWER switch.



(2) FL tube segment check

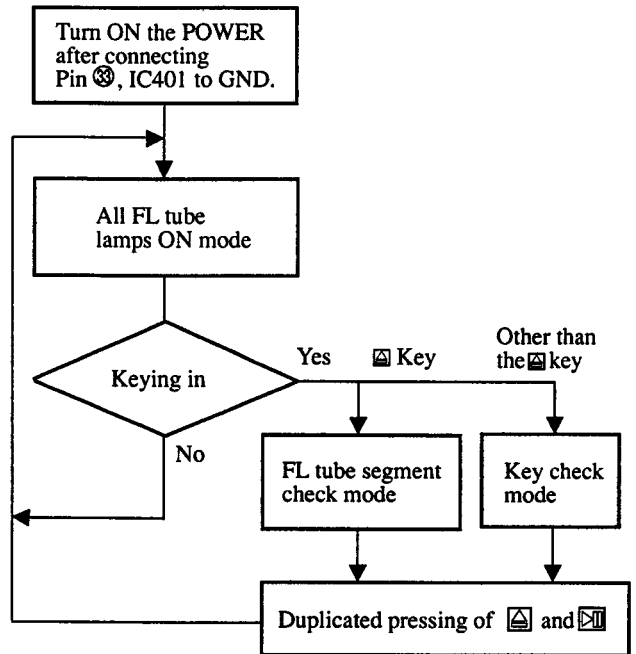
This mode is actuated by pressing the  key in the state of (1). Every time the  key is pressed, the segments are indicated sequentially from the segment a. When the last 1 segment is displayed, keying in is no longer accepted while continuing the lighting-up state of the last segment. Conditions are normal provided all lamps light up in the following order.



(3) KEY check

This mode is effected by pressing the  key in the state of (1), while indicating "1." Every time a new key is pressed subsequently, the indicated number is incremented. Conditions are normal provided "7" is indicated when all types of keys are pressed. Even if a key is pressed again, it is not counted.

\* To leave the mode (2) or (3), press the  and  keys in duplication, thereby the mode returning to all ON mode.



2. Test Modes of CD Syscon (IC202)

(1) ADJUST mode

When this mode is effected, the machine is operated normally except for the following.


- When pin ⑩, IC202 (ADJ) is set to "L" after turning ON the POWER switch:
  1. GFS is no longer monitored during PLAY, PAUSE or SEARCH, while not stopping even with GFS remaining still at "L" (NG).
  2. No high-speed feeding is activated during SEARCH.
  3. Focus gain is reset to normal gain during PLAY (normally, the gain is lowered to reduce noise when FOCUS is locked).

- When Pin ⑩, IC202 (AFADJ) is set to "L" after turning ON the POWER switch:

1. Regardless of Pin ⑩ (ADJ) of the CLV-S fixed function, the CLV mode during PLAY becomes CLV-S (rough servo) only while Pin e remains "L".

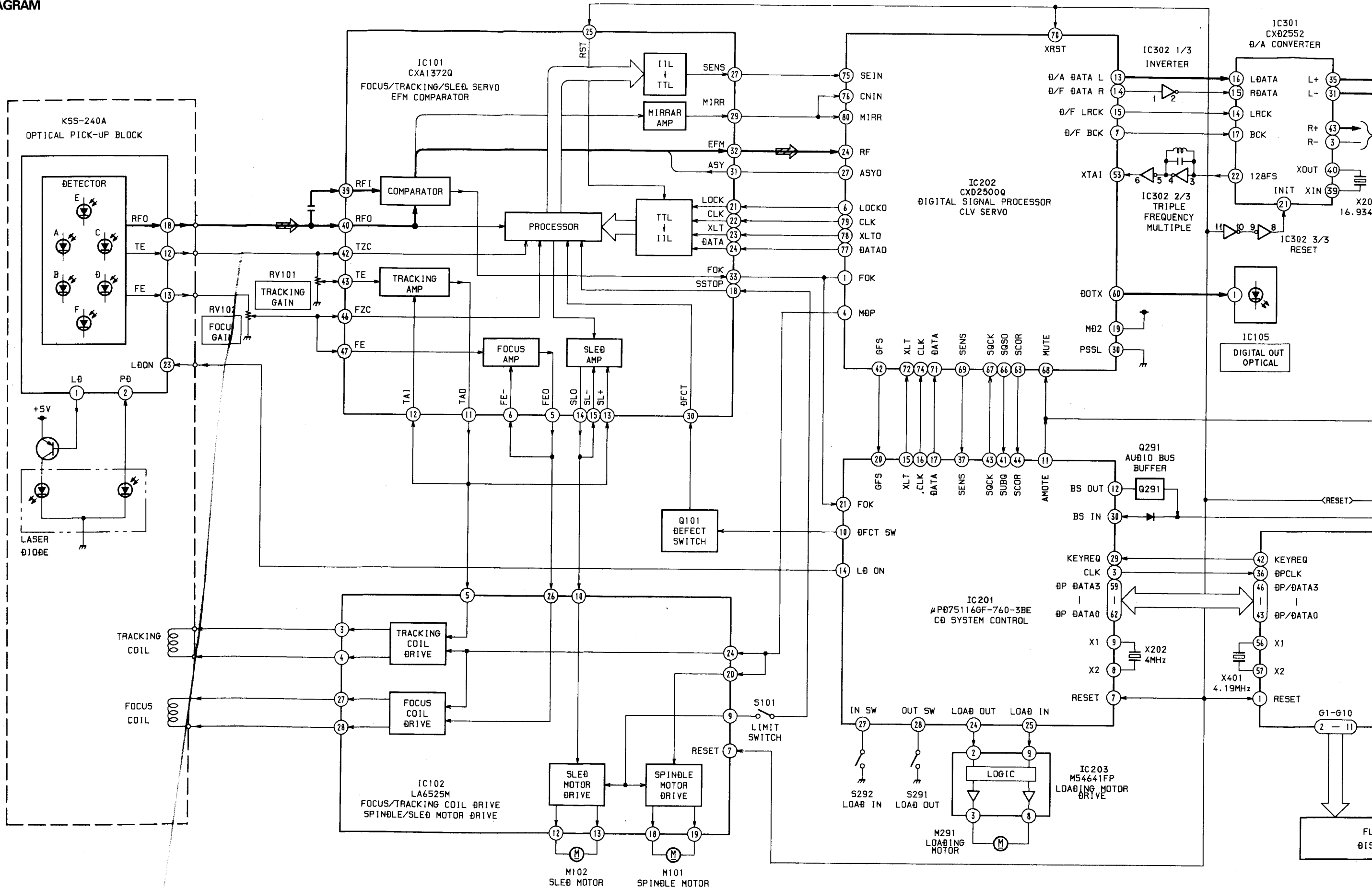
(2) AFADJUST mode

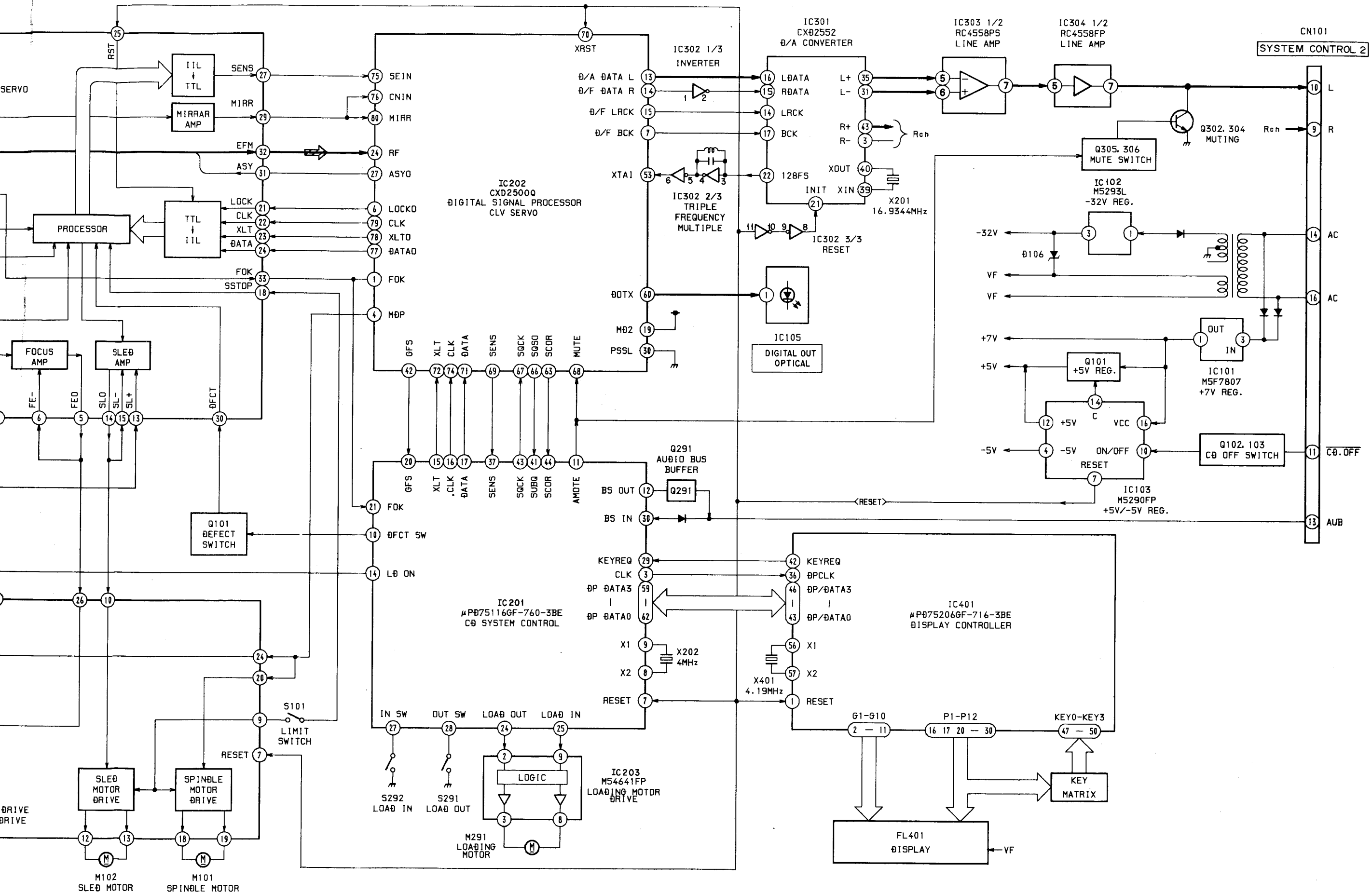
In this mode, it is possible to check the interface between the display micon (IC401) and CD syscon (IC202).

- Set Pin ⑩, IC202 (AFADJ) to "L" before turning ON the POWER switch.
- 1. Every time the  key is pressed after turning On the POWER switch, indication on the FL tube is switched correspondingly. Conditions are normal provided the indication repeats the 4 patterns including all lamp ON.

SECTION 3  
DIAGRAMS

3-1. BLOCK DIAGRAM



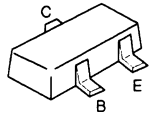




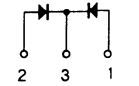
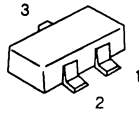


3-2. SEMICONDUCTOR LEAD LAYOUTS

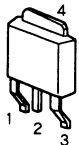
DTC144EK  
2SA1162-G  
2SC3052-EF  
2SC3624A-L15



MA152WK

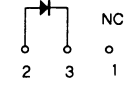
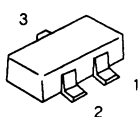


2SA1341  
2SB1122-S

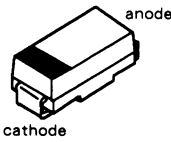


1: BASE  
2: COLLECTOR  
3: EMITTER  
4: COLLECTOR

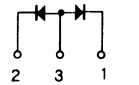
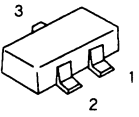
RD4.7M-B3  
RD6.8M-B2  
RD8.2M-B3



EC10DS2  
EC10QS-04



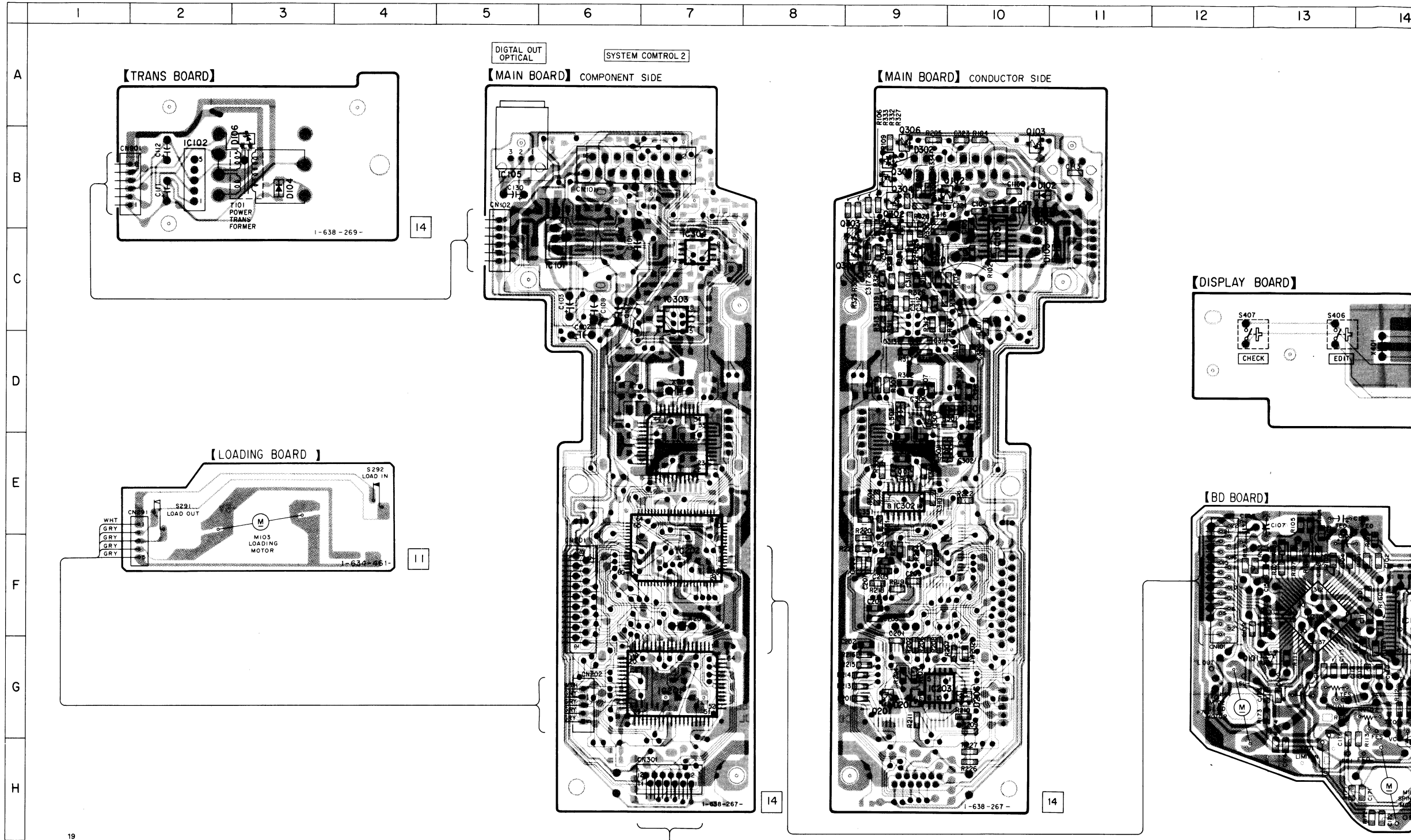
1S2836



• SEMICONDUCTOR LOCATION

BD BOARD		EXCEPT BD BOARD	
Ref. No.	LOCATION	Ref. No.	LOCATION
Q101	F-13	D101	B-10
IC101	F-13	D102	B-10
IC102	F-14	D103	C-11
		D201	G-9
		D206	G-10
		D301	D-9
		D302	B-9
		D401	D-17
		D402	D-19
		D403	D-15
		IC101	C-6
		IC102	B-2
		IC103	C-10
		IC105	B-5
		IC201	G-7
		IC202	F-7
		IC203	G-9
		IC301	E-7
		IC302	E-9
		IC303	C-7
		IC304	C-7
		IC401	D-15
		Q101	C-9
		Q102	B-9
		Q103	B-10
		Q201	G-9
		Q301	C-9
		Q302	B-9
		Q303	C-9
		Q304	B-9
		Q305	B-9
		Q306	B-9

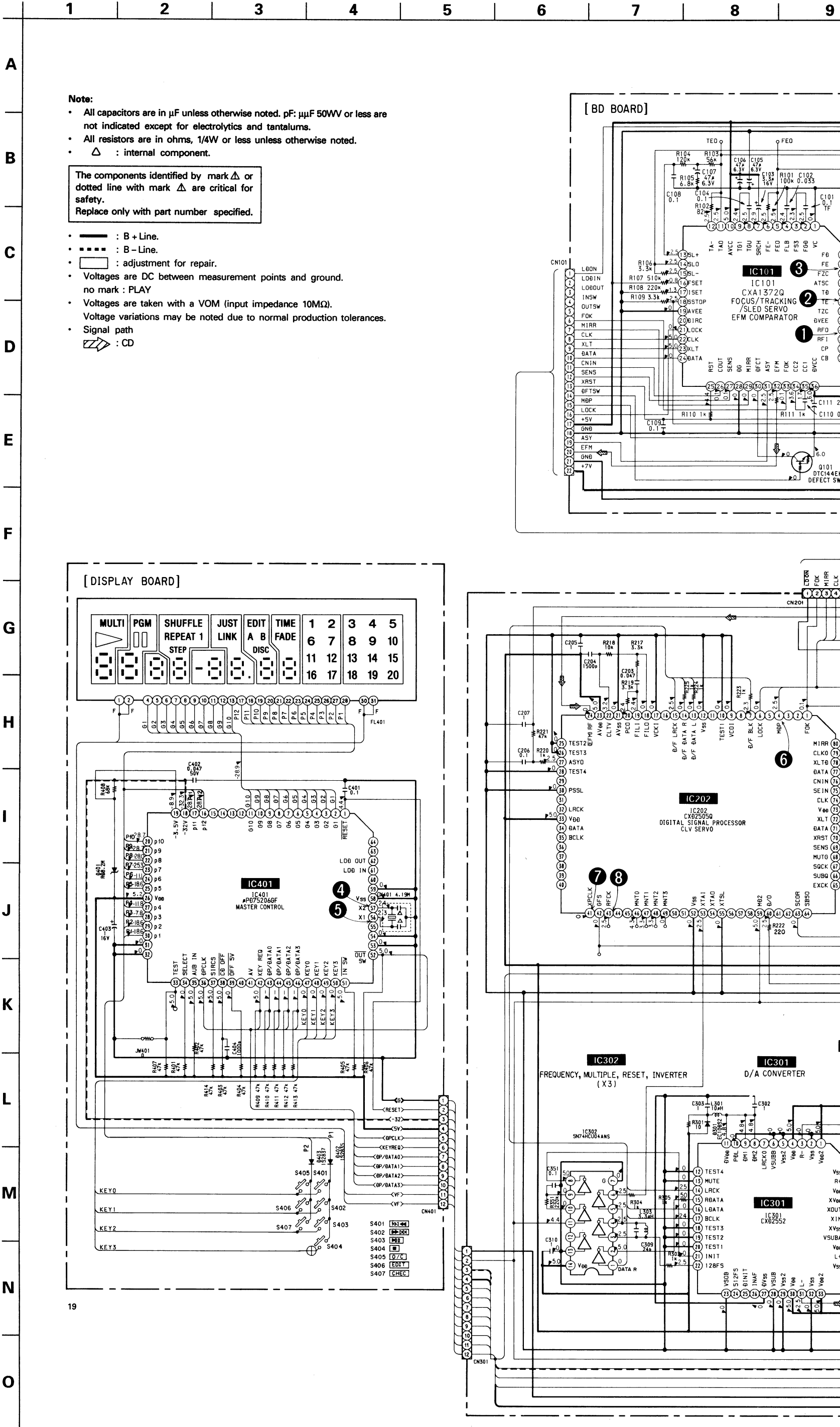
3-3. PRINTED WIRING BOARDS



Note:

- ○ : indicated a lead wire mounted on the component side.
- ◐ : indicated a lead wire mounted on the conductor side.
- ● : Through hole.
- [Pattern] : Pattern from the side which enables seeing.
- [Pattern] : Pattern of the rear side.

3-4. SCHEMATIC DIAGRAM



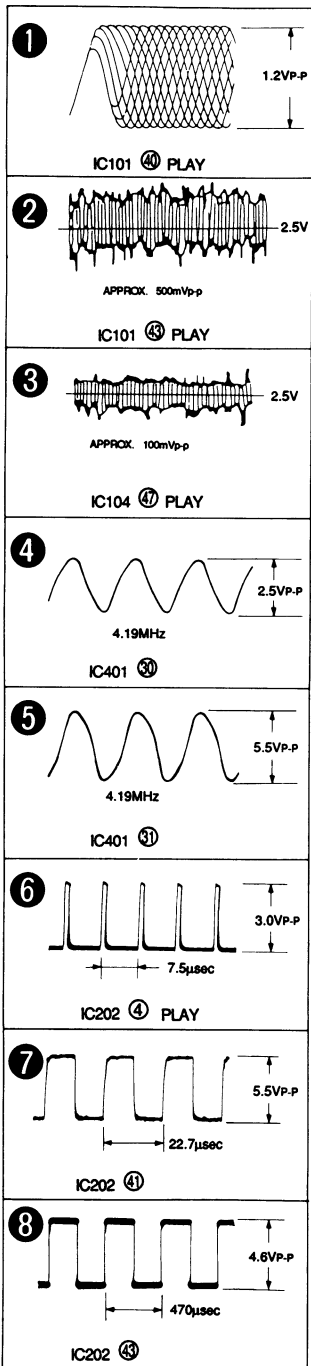
Note:

- All capacitors are in  $\mu\text{F}$  unless otherwise noted. pF:  $\mu\text{F}$  50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, 1/4W or less unless otherwise noted.
- $\Delta$  : internal component.

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

- : B+ Line.
- - - : B- Line.
- : adjustment for repair.
- Voltages are DC between measurement points and ground. no mark : PLAY
- Voltages are taken with a VOM (input impedance 10M $\Omega$ ).
- Voltage variations may be noted due to normal production tolerances.
- Signal path
- ▤ : CD

Waveforms



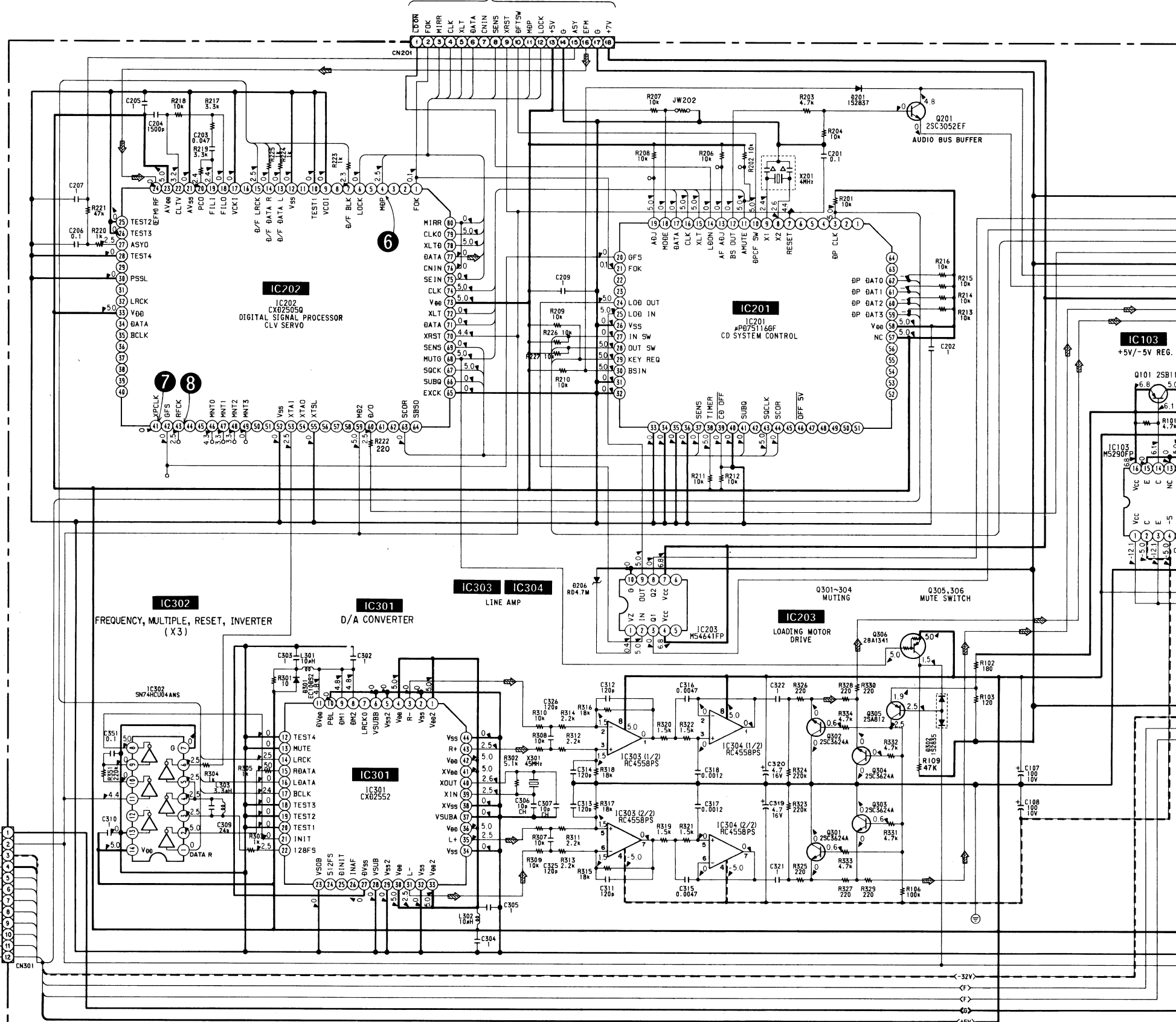
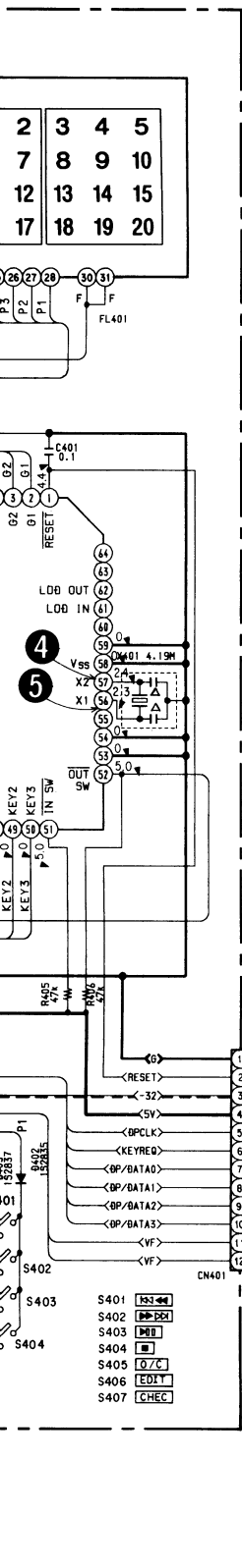
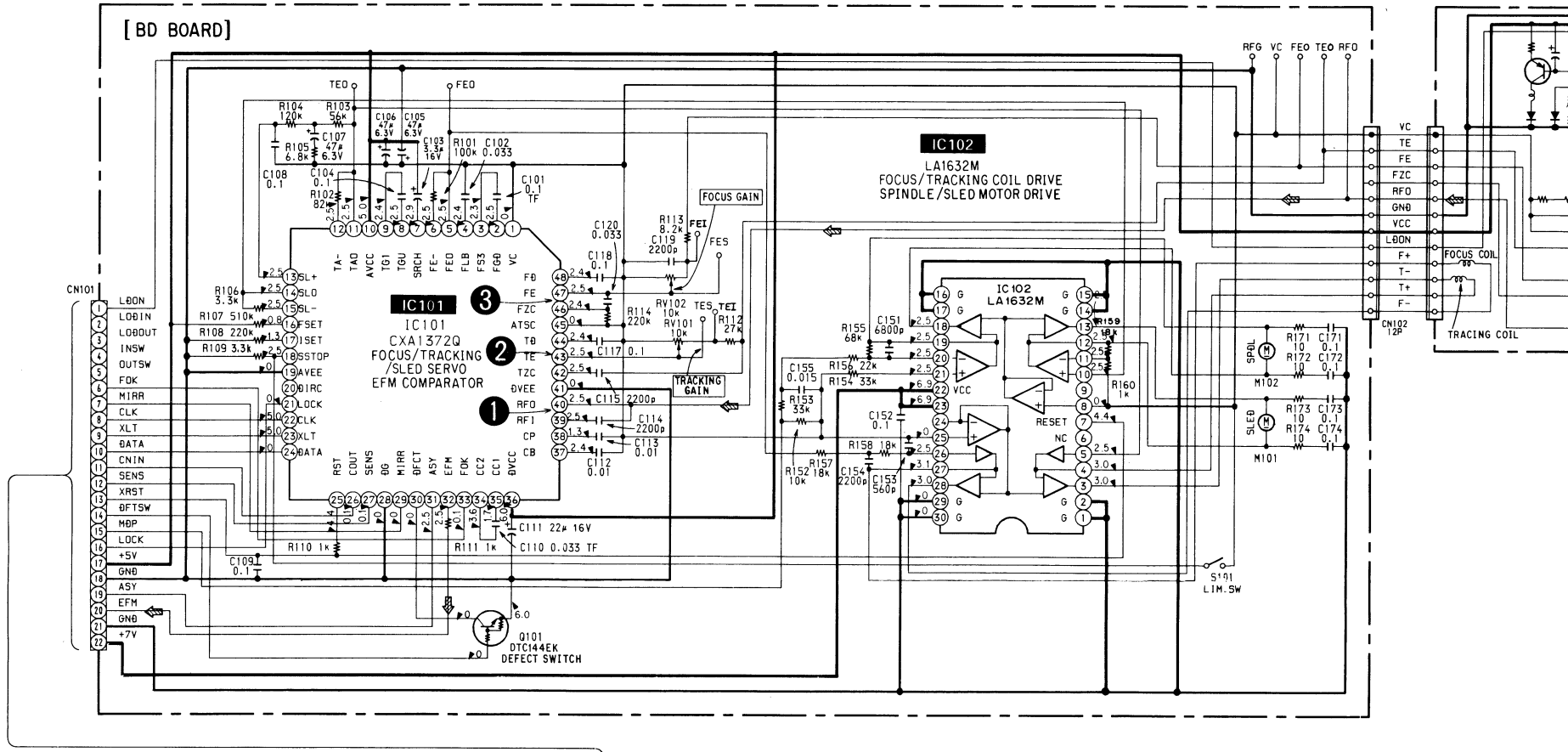
[ OPTICAL PICK-

50WV or less are

be noted.

ound.

tion tolerances.

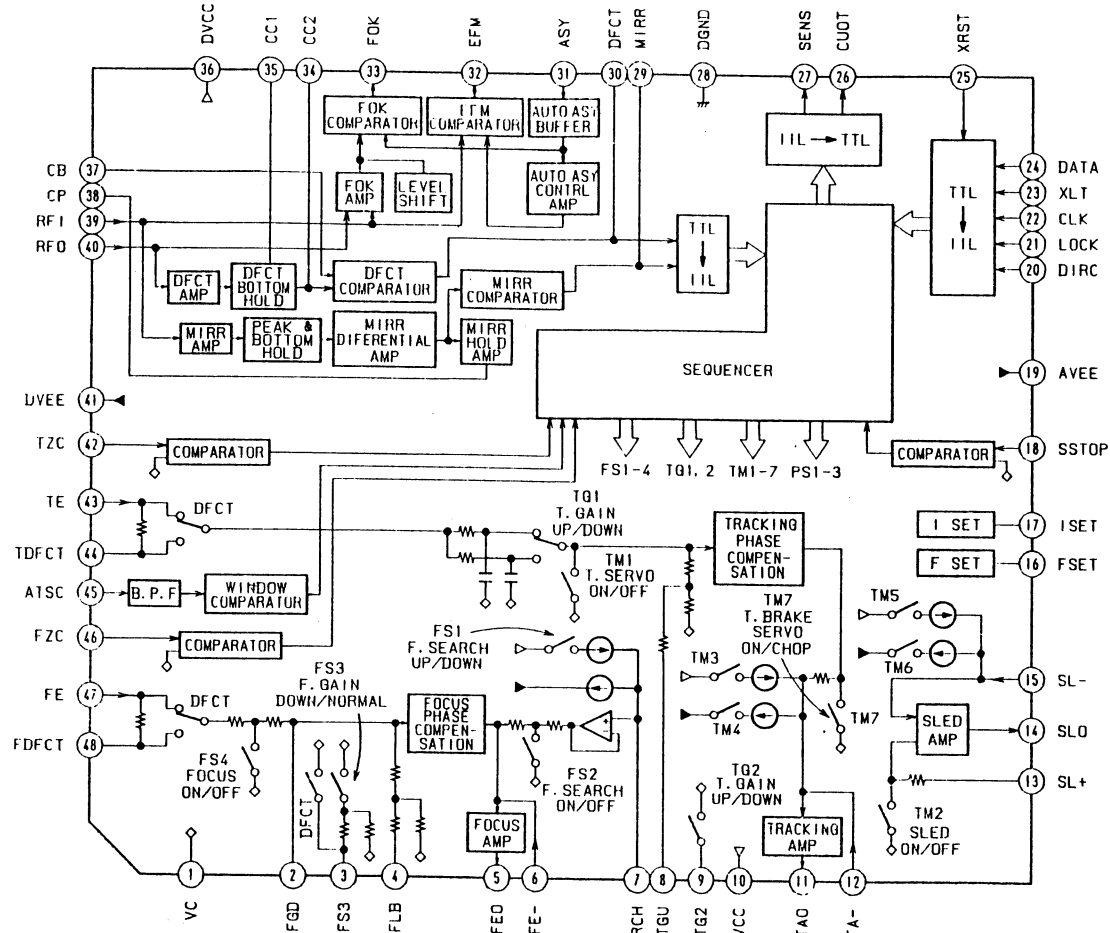




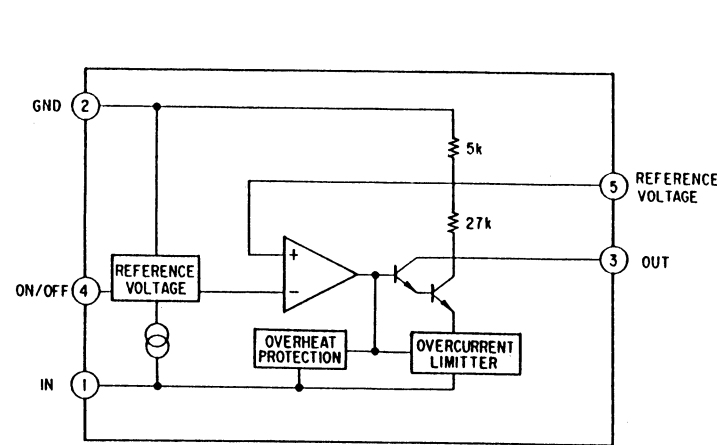


3-5. IC BLOCK DIAGRAMS

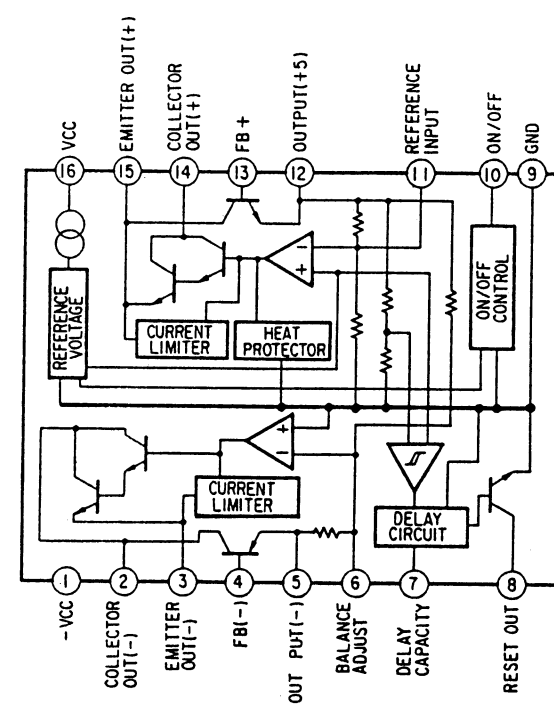
IC101 CXA1372Q



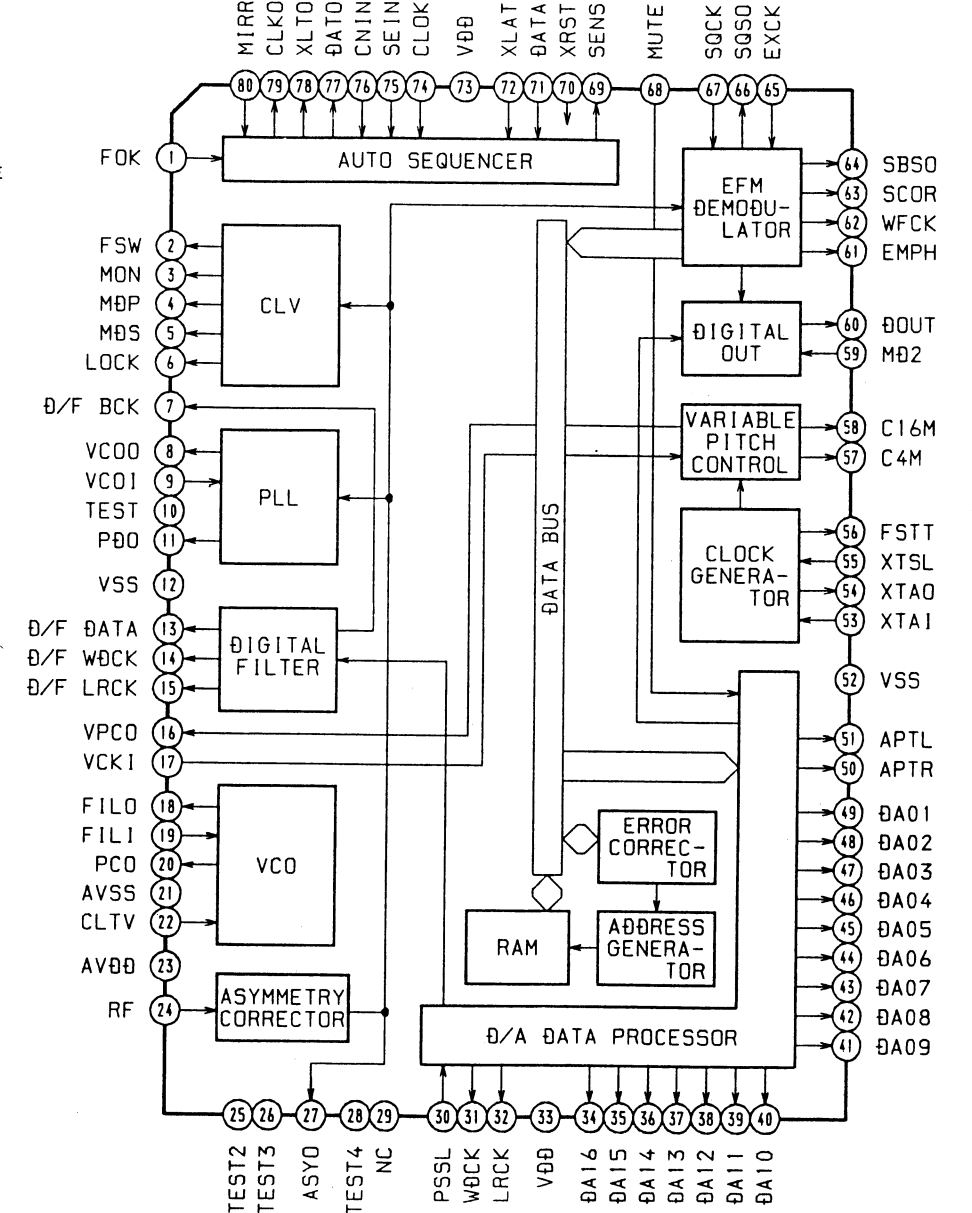
IC102 M5293L



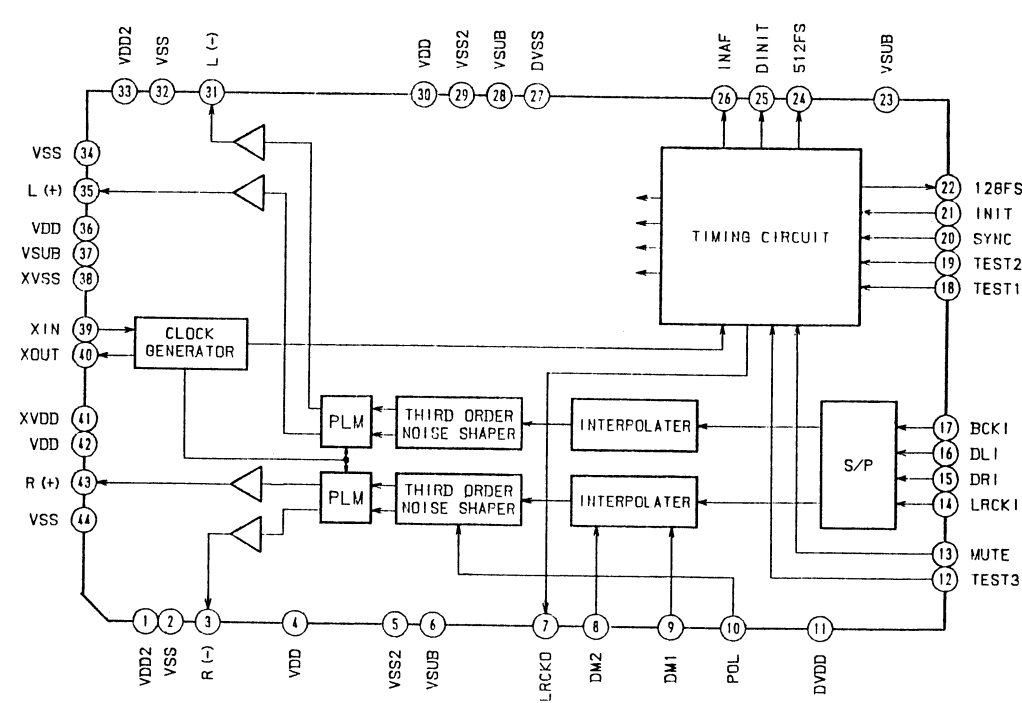
IC103 M5290FP



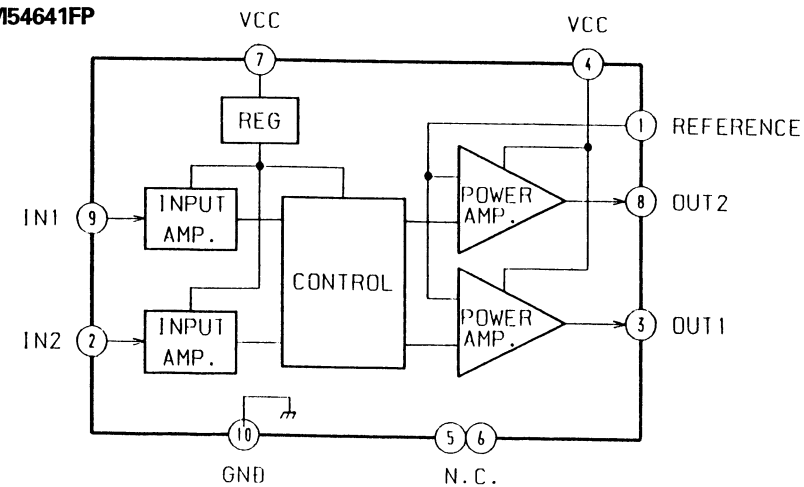
IC202 CXD2505Q



IC301 CXD2552Q



IC203 M54641FP



### 3-6. PIN FUNCTION OF IC202 AND IC401

#### • IC202 CD System Controller ( $\mu$ PD75116GF-760-3BE)

Functions effected by the captioned controller include IC101 (RF signal processing, servo), IC201 (DSP, digital filter) and loading control in the CD unit, data exchange with IC401 (display controller), audio bus entry, etc.

Pin No.	Pin Name	I/O	Description
1-2 3 4-6	DPCLK	O O O	Not in use with the model (open). Display data transfer clock output to IC401 (display micon) Not in use with the model (open)
7 8 9 10	RESET X2 X1 DFCT SW	I I I O	System reset input. "L": Reset Clock input Clock input (4 MHz) DEFECT circuit ON/OFF switching output of IC101 (CXA1372Q). It is turned OFF ("H") to focus-search the DISC flaw detection circuit.
11 12 13 14 15	AMUTE BSOUT AFADJ LDON XLT	O O I O O	Muting control output. "H": Mute Audio bus output Test mode input. Various test operations are effected upon "L" after turning ON the POWER. Optical pickup laser diode ON/OFF switching output. "H": ON Serial data latch output to IC201 (CXD2505Q)
16 17 18 19 20	CLK DATA MODE ADJ GFS	O O I I I	Serial data transfer clock output to IC201 (CXD2505Q) Serial data output to IC201 (CXD2505Q) Not in use with the model (GND) Test mode input. Upon "L," GFS checking is disabled while continuously rotating the spindle no matter whether frame synch is issued during PLAY, PAUSE or SEARCH. GFS signal input from IC201 (CXD2505Q). "L": NG "H": OK
21 22 - 23 24 25	FOK LODOUT LODIN	I O O O	Focus OK signal input from IC101 (CXA1372Q). "H": OK Not in use with the model (open) Output to rotate M291 (loading motor) in the loading out direction. *1 Output to rotate M291 (loading motor) in the loading in direction. *1
26 27 28 29 30	Vss IN SW OUT SW KEY REQ BS IN	- I I I I	Power terminal (GND) S292 (Loading in switch) input S291 (Loading out switch) input Key data request input from IC401 (display controller) Audio bus input
31 - 36 37 38 39 40	SENS TIMER D/F 16BIT	I I I I	Not in use with the model (GND) SENS input from IC101 (CXA1372Q) and IC201 (CXD2505Q) Not in use with the model (pull up) IC201 (CXD2505Q) digital filter mode setting input. It is fixed at 16 bit, 4fs with the model (pull up). Not in use with the model (GND)
41 42 43 44 45 - 56	SUBQ SQCLK SCOR	I O O I O	Subcode Q data input from IC201 (CXD2505Q) Not in use with the model (open) Subcode Q data readout clock output to IC201 (CXD2505Q) Subcode sync S0 + S1 detection input from IC201 (CXD2505Q) Not in use with the model (open)
57 58 59 - 62 63 - 64	N.C. VDD DPDATA3-0	I - I/O O	Not in use with the model (+5V) Power terminal (+5V) Key data input and display data output with IC401 (display controller) Not in use with the model (open)

\*1 Loading motor control

	IN	OUT	BRAKE
LODOUT ②	L	H	H
LODIN ②	H	L	H

• IC401 Display controller ( $\mu$ PD75206GF-716-3BE)

In charge of displaying the FL tube and keying in, it exchanges data with the IC202 (CD syscon) in 4-bit parallel mode.

Pin No.	Pin Name	I/O	Description
1	RESET	I	System reset input. "L": Reset
2 - 11	G1-10	O	Digital output to the FL tube
12 - 15		O	Not in use with the model (open)
16, 17	l, k	O	FL tube segment output
18	VLOAD	-	Power supply for the FL tube controller (builtin) (-32V)
19	VPRE	-	Power supply for the FL tube predriver (-3.5V)
20 - 25	j ~ e	O	FL tube segment output
26	V <sub>DD</sub>	-	Power terminal (+5V)
27, 28	d, c	O	FL tube segment output
29, 30	b, a	O	FL tube segment, key scan output
31, 32		I	Not in use with the model (GND)
33	TEST	I	Test mode input. "L": Test mode
34	SELECT	I	Not in use with the model (pull up)
35	BSIN	I	Not in use with the model (pull up)
36	DPCLK	I	Display data transfer clock input from IC202 (CD syscon)
37, 38		I	Not in use with the model (pull up)
39		O	Not in use with the model (pull up)
40, 41		O	Not in use with the model (open)
42	KEY REQ	O	Key data request output to IC202 (CD syscon)
43 - 46	DPDATA0-3	I/O	Key data output and display data input with IC202 (CD syscon)
47 - 50	KEY0-3	I	Key data input
51, 52		I	Not in use with the model (pull up)
53, 54		I	Not in use with the model (GND)
55		O	Not in use with the model (open)
56	X1	I	System clock input (4.19 MHz)
57	X2	I	System clock input
58	V <sub>ss</sub>	-	Power supply terminal (GND)
59		I	Not in use with the model (GND)
60 - 64		O	Not in use with the model (open)



## SECTION 4 EXPLODED VIEW

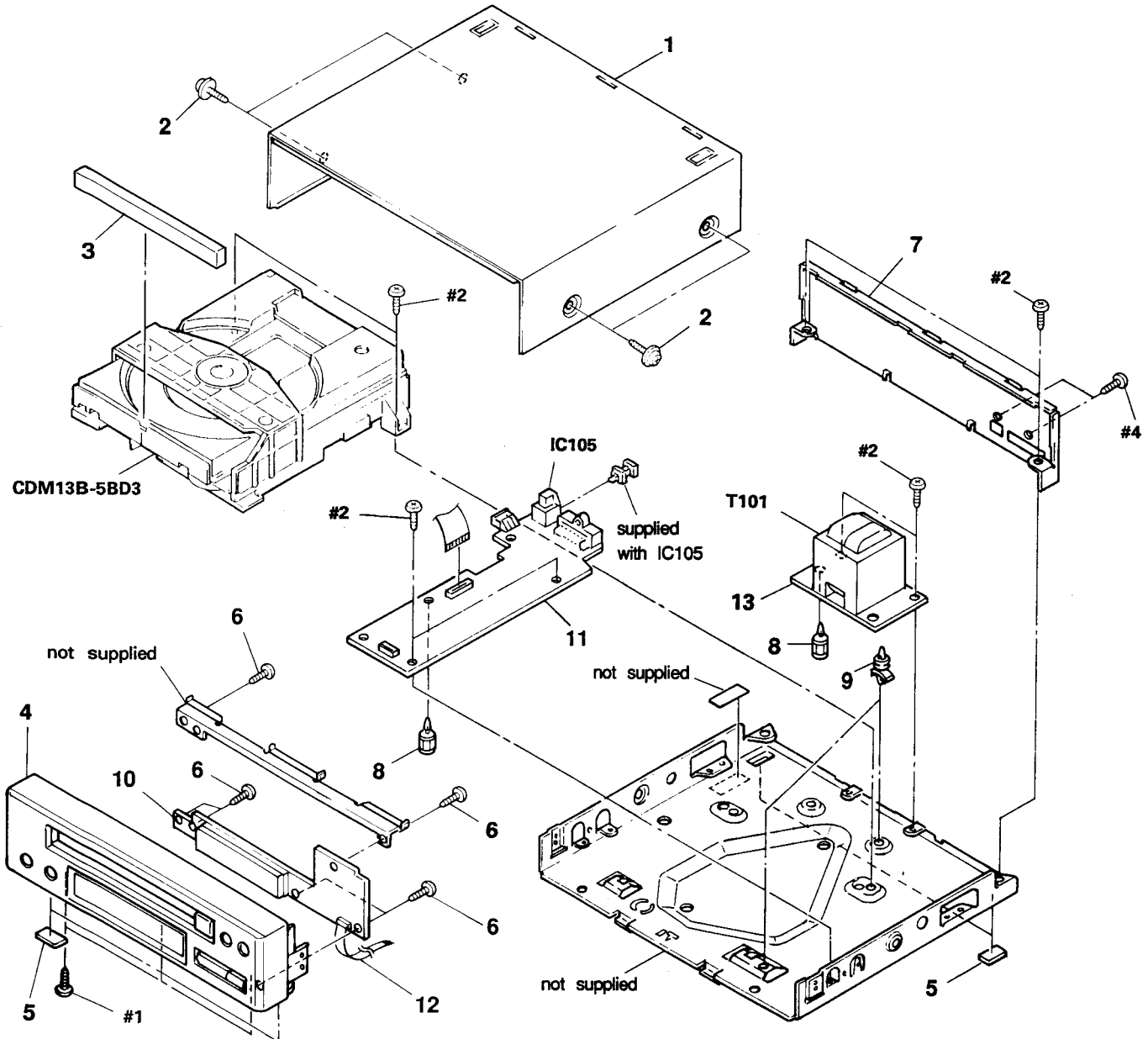
**NOTE:**

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts  
Example:  
KNOB,BALANCE(WHITE)...(RED)  
          ↑          ↑  
          Parts color Cabinet's color
- 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 is given in the last of this parts list.

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

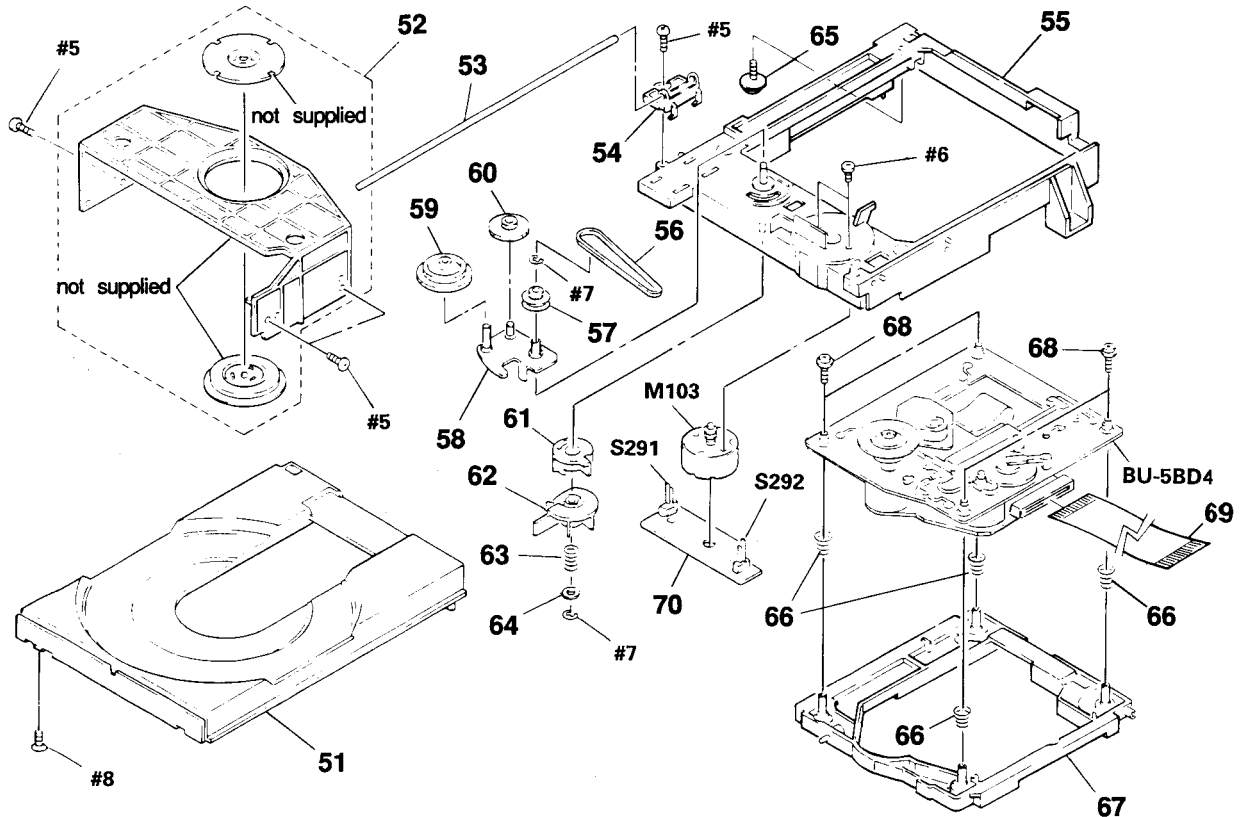
When indicating parts by reference number, please include the board name.

**(1) CHASSIS SECTION**



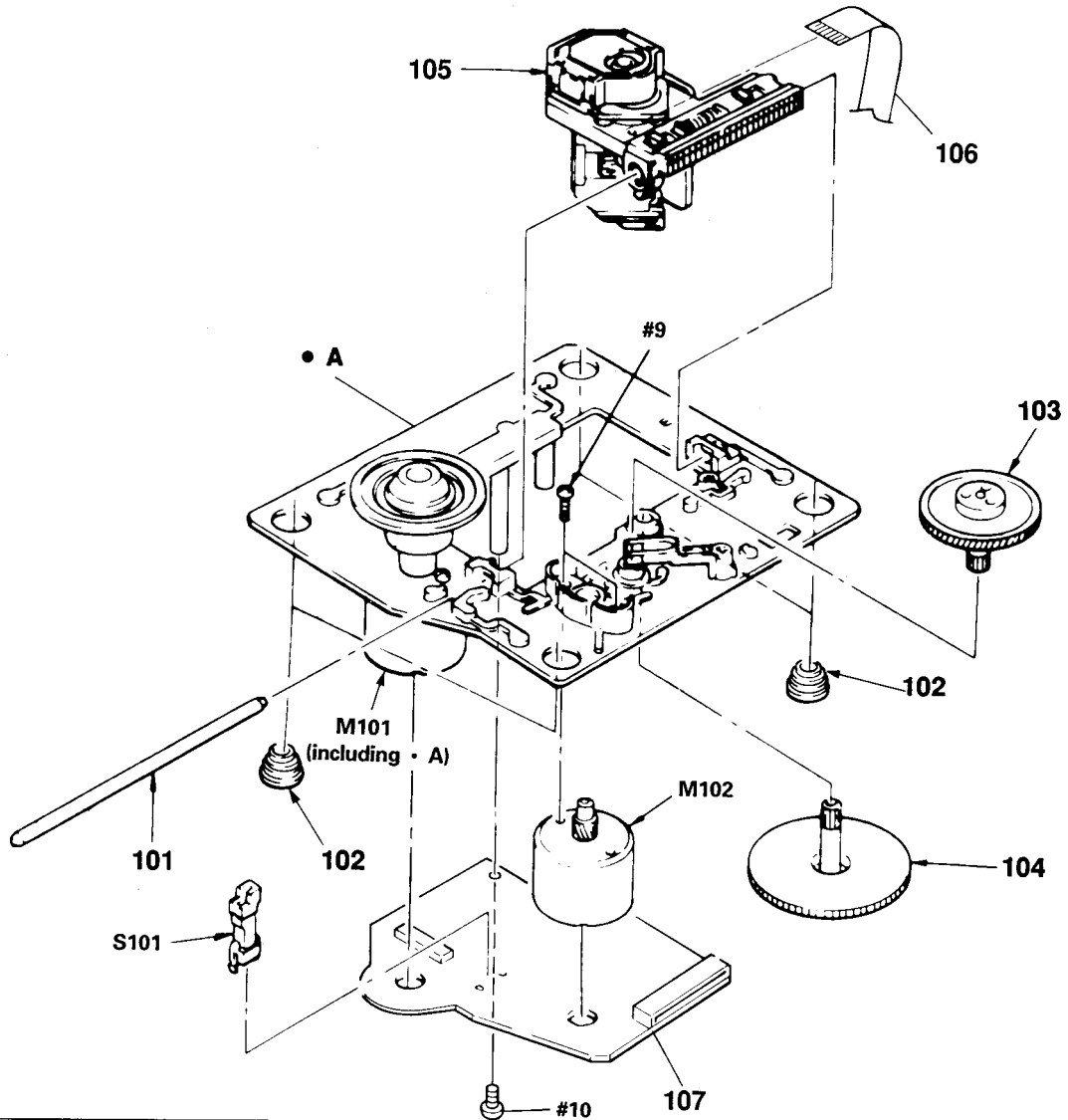
Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
1	* 4-944-423-01	CASE (K206522)		8	* 3-669-610-00	SPACER	
2	3-363-099-01	SCREW (CASE +3X8 TP2)		9	* 4-924-098-11	HOLDER, PC BOARD	
3	4-944-417-01	PANEL, LOADING		10	A-4617-811-A	DISPLAY BOARD, COMPLETE	
4	X-4941-522-1	PANEL ASSY, FRONT		11	* A-4617-805-A	MAIN BOARD, COMPLETE	
5	4-930-336-01	FOOT (FELT)		12	1-575-001-11	WIRE, FILM TYPE (12 CORE)	
6	4-928-635-01	SCREW, +BV (2.6X8) TAPPING		13	* 1-638-269-11	TRANSFORMER BOARD	
7	* 4-943-175-41	PAENL, BACK		T101	$\Delta$ 1-450-341-11	TRANSFORMER, POWER	

(2) CD MECHANISM SECTION (CDM13B-5BD3)



Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
51	4-944-012-01	TABLE, DISC		63	3-659-338-00	SPRING, COMPRESSION	
52	A-4604-752-A	HOLDER (MG) ASSY		64	4-927-654-01	WASHER (LIMITER)	
53	4-929-764-01	SHAFT (TABLE GUIDE)		65	* 4-917-583-21	BRACKET, YOKE	
54	4-944-006-01	BEARING		66	4-917-541-01	SPRING (B)	
55	X-4941-462-1	CHASSIS (MD) ASSY		67	4-929-747-01	HOLDER (BU)	
56	4-927-649-01	BELT		68	4-933-134-01	SCREW (+PTPWH M2. 6X6)	
57	4-929-724-01	PULLEY (B)		69	1-535-845-11	JUMPER, FILM (WITH TERMINAL)	
58	X-4929-703-1	ARM ASSY, SWING		70	* 1-634-461-11	LOADING BOARD	
59	4-927-620-11	GEAR (P)		M103	A-4608-362-A	MOTOR (L) ASSY (LOADING)	
60	4-927-628-01	GEAR (C)		S291	1-571-924-11	SWITCH, LEAF (LOAD OUT)	
61	4-929-727-01	CAM (A)		S292	1-571-924-11	SWITCH, LEAF (LOAD IN)	
62	4-929-729-01	CAM (B)					

(3) OPTICAL PICK-UP BLOCK (BU-5BD3)



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
101	4-917-565-01	SHAFT, SLED	
102	4-933-126-01	INSULATOR (A)	
103	4-917-567-01	GEAR (M)	
104	4-917-564-01	GEAR (P), FLATNESS	
105	△ 8-848-144-11	DEVICE, OPTICAL KSS-240A	
106	1-575-001-11	WIRE, FLAT TYPE (12 CORE)	
107	* A-4617-371-A	BD BOARD, COMPLETE	
M101	X-4917-523-3	ASSY, MOTOR (SPINDLE)	
M102	X-4917-504-1	ASSY, MOTOR (SLED)	
S101	1-572-085-11	SWITCH, LEAF (LIMIT IN)	

SECTION 5  
ELECTRICAL PARTS LIST

BD

NOTE:

The components identified by mark  $\Delta$  or dotted line with mark  $\Delta$  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.
- RESISTORS  
All resistors are in ohms  
METAL : Metal-film resistor  
METAL OXIDE : Metal Oxide-film resistor  
F : nonflammable
- Items marked "\*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS  
In each case, u :  $\mu$ , for example :  
uA... :  $\mu$ A..., uPA... :  $\mu$ PA...,  
uPB... :  $\mu$ PB..., uPC... :  $\mu$ PC...,  
uPD... :  $\mu$ PD...
- CAPACITORS  
uF :  $\mu$ F
- COILS  
uH :  $\mu$ H

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
* A-4617-371-A BD BOARD, COMPLETE *****							
< CAPACITOR >				< CONNECTOR >			
C101	1-163-038-00	CERAMIC CHIP	0.1uF 25V	CN101	1-568-796-11	SOCKET, CONNECTOR 22P	
C102	1-163-989-11	CERAMIC CHIP	0.033uF 10% 25V	CN102	1-568-795-11	SOCKET, CONNECTOR 12P	
C103	1-126-163-11	ELECT	4.7uF 20% 50V	< IC >			
C104	1-163-038-00	CERAMIC CHIP	0.1uF 25V	IC101	8-752-050-82	IC CXA13720	
C105	1-126-154-11	ELECT	47uF 20% 6.3V	IC102	8-759-822-36	IC LA6532M	
C106	1-126-154-11	ELECT	47uF 20% 6.3V	< JACK >			
C107	1-126-154-11	ELECT	47uF 20% 6.3V	J101	1-216-295-00	METAL CHIP 0	5% 1/10W
C108	1-163-038-00	CERAMIC CHIP	0.1uF 25V	J102	1-216-295-00	METAL CHIP 0	5% 1/10W
C109	1-163-038-00	CERAMIC CHIP	0.1uF 25V	< TRANSISTOR >			
C110	1-163-989-11	CERAMIC CHIP	0.033uF 10% 25V	Q101	8-729-901-01	TRANSISTOR DTC144EK	
C111	1-131-367-00	TANTALUM	22uF 10% 20V	< RESISTOR >			
C112	1-164-232-11	CERAMIC CHIP	0.01uF 50V	R101	1-216-097-00	METAL CHIP 100K	5% 1/10W
C113	1-164-232-11	CERAMIC CHIP	0.01uF 50V	R102	1-216-095-00	METAL CHIP 82K	5% 1/10W
C114	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V	R103	1-216-091-00	METAL CHIP 56K	5% 1/10W
C115	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V	R104	1-216-099-00	METAL CHIP 120K	5% 1/10W
C117	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R105	1-216-069-00	METAL CHIP 6.8K	5% 1/10W
C118	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R106	1-216-061-00	METAL CHIP 3.3K	5% 1/10W
C119	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V	R107	1-216-114-00	METAL GLAZE 510K	5% 1/10W
C120	1-163-989-11	CERAMIC CHIP	0.033uF 10% 25V	R108	1-216-105-00	METAL CHIP 220K	5% 1/10W
C151	1-163-019-00	CERAMIC CHIP	0.0068uF 10% 50V	R109	1-216-061-00	METAL CHIP 3.3K	5% 1/10W
C152	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R110	1-216-049-00	METAL CHIP 1K	5% 1/10W
C153	1-163-006-11	CERAMIC CHIP	560PF 10% 50V	R111	1-216-049-00	METAL CHIP 1K	5% 1/10W
C154	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V	R112	1-216-083-00	METAL CHIP 27K	5% 1/10W
C155	1-163-023-00	CERAMIC CHIP	0.015uF 5% 50V	R113	1-216-071-00	METAL CHIP 8.2K	5% 1/10W
C171	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R114	1-216-105-00	METAL CHIP 220K	5% 1/10W
C172	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R152	1-216-073-00	METAL CHIP 10K	5% 1/10W
C173	1-163-038-00	CERAMIC CHIP	0.1uF 25V	R153	1-216-085-00	METAL CHIP 33K	5% 1/10W
C174	1-163-038-00	CERAMIC CHIP	0.1uF 25V				

**BD    MAIN    DISPLAY    TRANSFORMER**

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
R154	1-216-085-00	METAL CHIP	33K 5% 1/10W	C207	1-164-346-11	CERAMIC CHIP 1uF	16V
R155	1-216-093-00	METAL CHIP	68K 5% 1/10W	C209	1-164-346-11	CERAMIC CHIP 1uF	16V
R156	1-216-081-00	METAL CHIP	22K 5% 1/10W	C302	1-164-346-11	CERAMIC CHIP 1uF	16V
R157	1-216-079-00	METAL CHIP	18K 5% 1/10W	C303	1-164-346-11	CERAMIC CHIP 1uF	16V
R158	1-216-079-00	METAL CHIP	18K 5% 1/10W	C304	1-164-346-11	CERAMIC CHIP 1uF	16V
R159	1-216-079-00	METAL CHIP	18K 5% 1/10W	C305	1-164-346-11	CERAMIC CHIP 1uF	16V
R160	1-216-049-00	METAL CHIP	1K 5% 1/10W	C306	1-163-227-11	CERAMIC CHIP 10PF	5% 50V
R171	1-216-001-00	METAL CHIP	10 5% 1/10W	C307	1-163-227-11	CERAMIC CHIP 10PF	5% 50V
R172	1-216-001-00	METAL CHIP	10 5% 1/10W	C309	1-163-102-00	CERAMIC CHIP 24PF	5% 50V
R173	1-216-001-00	METAL CHIP	10 5% 1/10W	C310	1-164-346-11	CERAMIC CHIP 1uF	16V
R174	1-216-001-00	METAL CHIP	10 5% 1/10W	C311	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
		< VARIABLE RESISTOR >		C312	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
RV101	1-238-016-11	RES, ADJ, CARBON 10K		C313	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
RV102	1-238-016-11	RES, ADJ, CARBON 10K		C314	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
		< SWITCH >		C315	1-163-017-00	CERAMIC CHIP 0.0047uF	5% 50V
S101	1-572-085-11	SWITCH, LEAF (LIMIT IN)		C316	1-163-017-00	CERAMIC CHIP 0.0047uF	5% 50V
		*****		C317	1-163-010-11	CERAMIC CHIP 0.0012uF	10% 50V
		* A-4617-805-A MAIN BOARD, COMPLETE		C318	1-163-010-11	CERAMIC CHIP 0.0012uF	10% 50V
		*****		C319	1-164-346-11	CERAMIC CHIP 1uF	16V
		* A-4617-811-A DISPLAY BOARD, COMPLETE		C320	1-164-346-11	CERAMIC CHIP 1uF	16V
		*****		C321	1-164-346-11	CERAMIC CHIP 1uF	16V
		* 1-638-269-11 TRANSFORMER BOARD		C322	1-164-346-11	CERAMIC CHIP 1uF	16V
		*****		C323	1-163-009-11	CERAMIC CHIP 0.001uF	10% 50V
		* 4-880-403-11 HEAT SINK		C324	1-163-009-11	CERAMIC CHIP 0.001uF	10% 50V
		* 4-932-810-11 CUSHION (FL)		C325	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
		< CAPACITOR >		C326	1-163-119-00	CERAMIC CHIP 120PF	5% 50V
C101	1-126-939-11	ELECT	10000uF 20% 16V	C351	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C102	1-124-907-11	ELECT	10uF 20% 50V	C401	1-163-038-00	CERAMIC CHIP 0.1uF	25V
C103	1-124-477-11	ELECT	47uF 20% 25V	C402	1-163-035-00	CERAMIC CHIP 0.047uF	50V
C104	1-164-346-11	CERAMIC CHIP	1uF 16V	C403	1-164-346-11	CERAMIC CHIP 1uF	16V
C105	1-164-346-11	CERAMIC CHIP	1uF 16V	C404	1-163-009-11	CERAMIC CHIP 0.001uF	10% 50V
C106	1-164-161-11	CERAMIC CHIP	0.0022uF 10% 100V			< CONNECTOR >	
C107	1-124-443-00	ELECT	100uF 20% 10V	CN101	* 1-569-624-11	SOCKET, CONNECTOR 17P	
C108	1-124-443-00	ELECT	100uF 20% 10V	CN102	1-568-662-11	CONNECTOR, BOARD TO BOARD 6P	
C111	1-126-063-11	ELECT	100uF 20% 63V	CN201	1-568-802-11	SOCKET, CONNECTOR 19P	
C112	1-124-907-11	ELECT	10uF 20% 50V	CN202	* 1-564-339-00	PIN, CONNECTOR 5P	
C113	1-164-346-11	CERAMIC CHIP	1uF 16V	CN203	* 1-564-340-00	PIN, CONNECTOR 6P	
C115	1-164-232-11	CERAMIC CHIP	0.01uF 50V	CN301	* 1-573-099-11	HOUSING, CONNECTOR 12P	
C116	1-164-232-11	CERAMIC CHIP	0.01uF 50V	CN401	* 1-573-098-11	HOUSING, CONNECTOR 12P	
C117	1-163-009-11	CERAMIC CHIP	0.001uF 10% 50V	CN901	1-568-668-11	CONNECTOR, BOARD TO BOARD 6P	
C201	1-163-038-00	CERAMIC CHIP	0.1uF 25V			< DIODE >	
C202	1-164-346-11	CERAMIC CHIP	1uF 16V	D101	8-719-210-39	DIODE EC10QS-04	
C203	1-163-035-00	CERAMIC CHIP	0.047uF 50V	D102	8-719-210-39	DIODE EC10QS-04	
C204	1-163-011-11	CERAMIC CHIP	0.0015uF 10% 50V	D103	8-719-210-33	DIODE EC10DS2	
C205	1-164-346-11	CERAMIC CHIP	1uF 16V	D104	8-719-210-33	DIODE EC10DS2	
C206	1-163-038-00	CERAMIC CHIP	0.1uF 25V	D106	8-719-106-17	DIODE RD6.8M-B2	
				D201	8-719-400-18	DIODE MA152WK	

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

MAIN	DISPLAY	TRANSFORMER
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Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
D206	8-719-105-74	DIODE RD4. 7M-B3		R101	1-216-065-00	METAL CHIP	4. 7K 5% 1/10W
D301	8-719-210-33	DIODE EC10DS2		R102	1-216-031-00	METAL CHIP	180 5% 1/10W
D302	8-719-104-34	DIODE 1S2836		R103	1-216-027-00	METAL CHIP	120 5% 1/10W
D401	8-719-106-36	DIODE RD8. 2M-B3		R104	1-216-073-00	METAL CHIP	10K 5% 1/10W
D402	8-719-104-34	DIODE 1S2836		R105	1-216-073-00	METAL CHIP	10K 5% 1/10W
D403	8-719-400-18	DIODE MA152WK		R106	1-216-097-00	METAL CHIP	100K 5% 1/10W
		( INDICATOR TUBE )		R107	1-216-061-00	METAL CHIP	3. 3K 5% 1/10W
FL401	1-519-652-11	INDICATOR TUBE, FLUORESCENT		R109	1-216-089-00	METAL CHIP	47K 5% 1/10W
		( IC )		R201	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC101	8-759-604-86	IC M5F7807L		R202	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC102	8-759-633-42	IC M5293L		R203	1-216-065-00	METAL CHIP	4. 7K 5% 1/10W
IC103	8-759-636-24	IC M5290FP		R204	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC105	8-749-922-39	IC GP1F34T		R205	1-216-001-00	METAL CHIP	10 5% 1/10W
IC201	8-759-153-16	IC uPD75116GF-760-3BE		R206	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC202	8-752-340-37	IC CXD2505Q		R207	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC203	8-759-636-20	IC M54641FP		R208	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC301	8-752-334-87	IC CXD2552Q		R209	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC302	8-759-927-29	IC SN74HC04ANS		R210	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC303	8-759-981-95	IC RC4558S		R211	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC304	8-759-981-95	IC RC4558S		R212	1-216-073-00	METAL CHIP	10K 5% 1/10W
IC401	8-759-154-14	IC uPD75206GF-716-3BE		R213	1-216-073-00	METAL CHIP	10K 5% 1/10W
		( JUMPER )		R214	1-216-073-00	METAL CHIP	10K 5% 1/10W
JW201	1-216-295-00	METAL CHIP	0 5% 1/10W	R215	1-216-073-00	METAL CHIP	10K 5% 1/10W
JW202	1-216-295-00	METAL CHIP	0 5% 1/10W	R216	1-216-073-00	METAL CHIP	10K 5% 1/10W
JW401	1-216-295-00	METAL CHIP	0 5% 1/10W	R217	1-216-061-00	METAL CHIP	3. 3K 5% 1/10W
		( COIL )		R218	1-216-073-00	METAL CHIP	10K 5% 1/10W
L301	1-410-381-11	INDUCTOR CHIP 10uH		R219	1-216-061-00	METAL CHIP	3. 3K 5% 1/10W
L302	1-410-381-11	INDUCTOR CHIP 10uH		R220	1-216-049-00	METAL CHIP	1K 5% 1/10W
L303	1-410-375-11	INDUCTOR CHIP 3. 3uH		R221	1-216-089-00	METAL CHIP	47K 5% 1/10W
		( TRANSISTOR )		R222	1-216-049-00	METAL CHIP	1K 5% 1/10W
Q101	8-729-804-41	TRANSISTOR 2SB1122-S		R223	1-216-049-00	METAL CHIP	1K 5% 1/10W
Q102	8-729-620-06	TRANSISTOR 2SC3052-EF		R224	1-216-049-00	METAL CHIP	1K 5% 1/10W
Q103	8-729-805-69	TRANSISTOR 2SA1341		R225	1-216-049-00	METAL CHIP	1K 5% 1/10W
Q201	8-729-620-06	TRANSISTOR 2SC3052-EF		R226	1-216-073-00	METAL CHIP	10K 5% 1/10W
Q301	8-729-107-46	TRANSISTOR 2SC3624A-L15		R227	1-216-073-00	METAL CHIP	10K 5% 1/10W
Q302	8-729-107-46	TRANSISTOR 2SC3624A-L15		R301	1-216-001-00	METAL CHIP	10 5% 1/10W
Q303	8-729-107-46	TRANSISTOR 2SC3624A-L15		R302	1-216-066-00	METAL CHIP	5. 1K 5% 1/10W
Q304	8-729-107-46	TRANSISTOR 2SC3624A-L15		R303	1-216-049-00	METAL CHIP	1K 5% 1/10W
Q305	8-729-216-22	TRANSISTOR 2SA1162-G		R304	1-216-049-00	METAL CHIP	1K 5% 1/10W
Q306	8-729-805-69	TRANSISTOR 2SA1341		R305	1-216-049-00	METAL CHIP	1K 5% 1/10W
		( RESISTOR )		R307	1-216-073-00	METAL CHIP	10K 5% 1/10W
				R308	1-216-073-00	METAL CHIP	10K 5% 1/10W
				R309	1-216-073-00	METAL CHIP	10K 5% 1/10W
				R310	1-216-073-00	METAL CHIP	10K 5% 1/10W
				R311	1-216-057-00	METAL CHIP	2. 2K 5% 1/10W
				R312	1-216-057-00	METAL CHIP	2. 2K 5% 1/10W
				R313	1-216-057-00	METAL CHIP	2. 2K 5% 1/10W
				R314	1-216-057-00	METAL CHIP	2. 2K 5% 1/10W
				R315	1-216-079-00	METAL CHIP	18K 5% 1/10W
				R316	1-216-079-00	METAL CHIP	18K 5% 1/10W

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

**MAIN**

**DISPLAY**

**TRANSFORMER**

**LOADING**

Ref. No.	Part No.	Description	Remarks	Ref. No.	Part No.	Description	Remarks
R317	1-216-079-00	METAL CHIP	18K 5% 1/10W	X401	1-577-359-21	VIBRATOR, CERAMIC (4.19MHz)	
R318	1-216-079-00	METAL CHIP	18K 5% 1/10W	*****			
R319	1-216-053-00	METAL CHIP	1.5K 5% 1/10W		* 1-634-461-11	LOADING BOARD	
R320	1-216-053-00	METAL CHIP	1.5K 5% 1/10W			*****	
R321	1-216-053-00	METAL CHIP	1.5K 5% 1/10W			< CONNECTOR >	
R322	1-216-053-00	METAL CHIP	1.5K 5% 1/10W	CN291	* 1-564-498-11	PIN, CONNECTOR 5P	
R323	1-216-105-00	METAL CHIP	220K 5% 1/10W			< SWITCH >	
R324	1-216-105-00	METAL CHIP	220K 5% 1/10W	S291	1-571-924-11	SWITCH, LEAF (LOADING OUT)	
R325	1-216-033-00	METAL CHIP	220 5% 1/10W	S292	1-571-924-11	SWITCH, LEAF (LOADING IN)	
R326	1-216-033-00	METAL CHIP	220 5% 1/10W	*****			
R327	1-216-033-00	METAL CHIP	220 5% 1/10W			MISCELLANEOUS	
R328	1-216-033-00	METAL CHIP	220 5% 1/10W			*****	
R329	1-216-033-00	METAL CHIP	220 5% 1/10W	12	1-575-001-11	WIRE, FILM TYPE (12 CORE)	
R330	1-216-033-00	METAL CHIP	220 5% 1/10W	69	1-535-845-11	JUMPER, FILM (WITH TERMINAL)	
R331	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	105	△ 8-848-144-11	DEVICE, OPTICAL KSS-240A	
R332	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	106	1-575-001-11	WIRE, FLAT TYPE (12 CORE)	
R333	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	M101	X-4917-523-3	ASSY, MOTOR (SPINDLE)	
R334	1-216-065-00	METAL CHIP	4.7K 5% 1/10W	M102	X-4917-504-1	ASSY, MOTOR (SLED)	
R351	1-216-105-00	METAL CHIP	220K 5% 1/10W	M103	A-4608-362-A	MOTOR (L) ASSY (LOADING)	
R401	1-216-089-00	METAL CHIP	47K 5% 1/10W	*****			
R402	1-216-089-00	METAL CHIP	47K 5% 1/10W			ACCESSORY & PACKING MATERIAL	
R403	1-216-089-00	METAL CHIP	47K 5% 1/10W			*****	
R404	1-216-089-00	METAL CHIP	47K 5% 1/10W			4-920-941-01	SHEET (B), PROTECTION
R405	1-216-089-00	METAL CHIP	47K 5% 1/10W			* 4-941-548-01	LABEL, CLASS 1
R406	1-216-089-00	METAL CHIP	47K 5% 1/10W			* 4-945-079-01	CUSHION
R407	1-216-089-00	METAL CHIP	47K 5% 1/10W	*****			
R408	1-216-093-00	METAL CHIP	68K 5% 1/10W			HARDWARE LIST	
R409	1-216-089-00	METAL CHIP	47K 5% 1/10W	# 1	7-682-547-09	SCREW +BVTT 3X6 (S)	
R410	1-216-089-00	METAL CHIP	47K 5% 1/10W	# 2	7-682-547-04	SCREW +BVTT 3X6 (S)	
R411	1-216-089-00	METAL CHIP	47K 5% 1/10W	# 3	7-685-135-19	SCREW +BTP 2.6X10 TYPE2 N-S	
R412	1-216-089-00	METAL CHIP	47K 5% 1/10W	# 4	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
R413	1-216-089-00	METAL CHIP	47K 5% 1/10W	# 5	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S	
		< SWITCH >		# 6	7-621-775-10	SCREW +B 2.6X4	
S401	1-572-184-11	SWITCH, KEYBOARD ( < < < < )		# 7	7-624-105-04	STOP RING 2.3, TYPE -E	
S402	1-572-184-11	SWITCH, KEYBOARD ( >>>> )		# 8	7-685-234-19	SCREW +KTP 2.6X8 TYPE2NON-SLIT	
S403	1-572-184-11	SWITCH, KEYBOARD ( >>>> )		# 9	7-621-255-15	SCREW +P 2X3	
S404	1-572-184-11	SWITCH, KEYBOARD ( ■ )		# 10	7-685-134-19	SCREW +BTP 2.6X8 TYPE2 N-S	
S405	1-572-184-11	SWITCH, KEYBOARD ( OPEN/CLOSE )		# 11	7-682-548-04	SCREW +BVTT 3X8 (S)	
S406	1-572-184-11	SWITCH, KEYBOARD ( EDIT )		*****			
S407	1-572-184-11	SWITCH, KEYBOARD ( CHECK )					
		< TRANSFORMER >					
T101	△ 1-450-341-11	TRANSFORMER, POWER					
		< CRYSTAL >					
X201	1-577-358-21	VIBRATOR, CERAMIC (4.0MHz)					
X301	1-577-686-11	VIBRATOR, CRYSTAL (45MHz)					

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

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