

CDP-XA1ES

SERVICE MANUAL

US Model

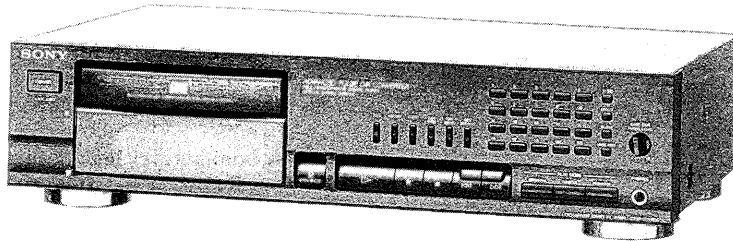


Photo : Black type

Model Name Using Similar Mechanism	CDP-515
CD Mechanism Type	CDM25C-5BD10B
Base Unit Type	BU-5BD10B
Optical Pick-up Type	KSS-240A

SPECIFICATIONS

Compact disc player

Laser	Semiconductor laser
Wavelength	780 – 790 nm
Frequency response	2 Hz to 20 kHz $\pm$ 0.5 dB
Signal-to-noise ratio	More than 108 dB
Dynamic range	More than 99 dB
Harmonic distortion	Less than 0.0027%
Channel separation	More than 103 dB

Outputs

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

General

Power requirements	120 V AC, 60 Hz
Power consumption	13 W
Dimensions (approx.) (w/h/d)	430 $\times$ 110 $\times$ 295 mm (17 $\times$ 4 3/8 $\times$ 11 5/8 in.) incl. projecting parts
Mass (approx.)	3.8 kg (8 lbs 4 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®

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CAUTION

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

SAFETY-RELATED COMPONENT WARNING !!

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

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

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

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

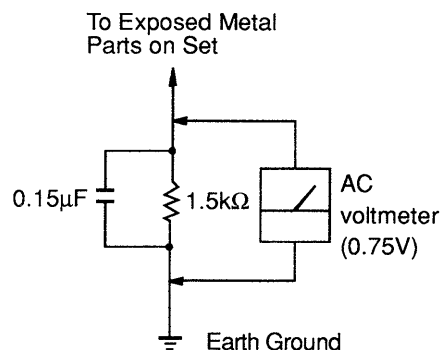


Fig. A. Using an AC voltmeter to check AC leakage.

SECTION 1

SERVICING NOTE

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.

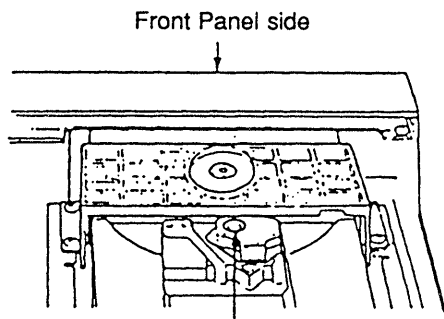
The flexible board is easily damaged and should be handled with care.

NOTES ON LASER DIODE EMISSION CHECK

The laser beam on this model is concentrated so as to be focused on the disc reflective 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

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.

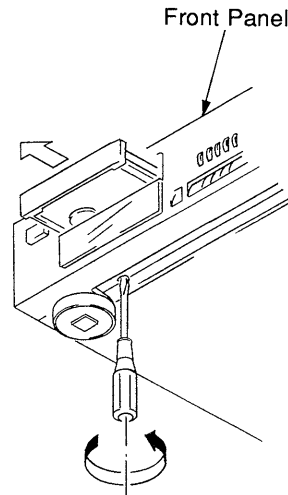


- ① Confirm that laser beam is spread.
- ② Up and down motion of the objective lens. (3 times)

HOW TO OPEN THE DISC TRAY WHEN POWER SWITCH TURNS OFF

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

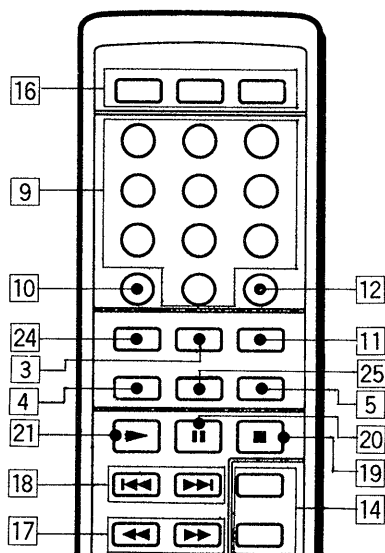
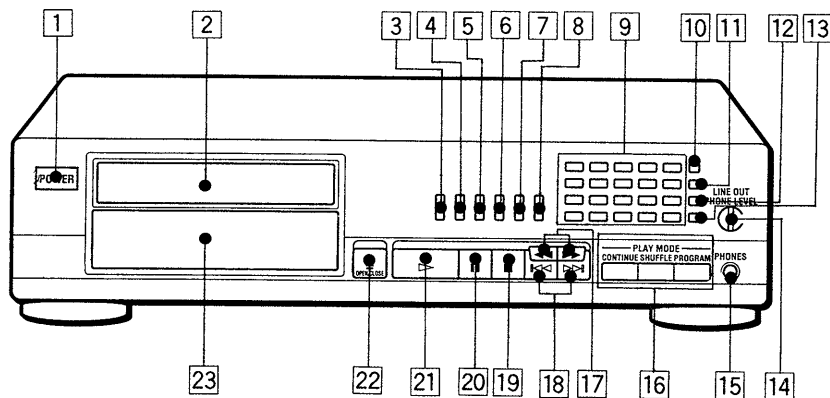
* To close the disc tray, turn the driver in the reverse direction.



SECTION 2

GENERAL

Identifying the Parts



- 1 Power switch
- 2 Disc tray
- 3 TIME button
- 4 REPEAT button
- 5 FADER button
- 6 AUTO SPACE button
- 7 PEAK SEARCH button
- 8 EDIT/TIME FADE button
- 9 Number button
- 10 >20 (over 20) button
(>10 (over 10) button on the remote commander)
- 11 CHECK (Program check) button
- 12 CLEAR (Program clear) button
- 13 MUSIC SCAN button
- 14 LINE OUT/PHONE LEVEL control
(LINE OUT LEVEL +/- buttons on the remote commander)
- 15 PHONES jack
- 16 Play mode buttons
CONTINUE button
SHUFFLE button
PROGRAM button
- 17 <</>> (manual search) buttons
- 18 <</>> (AMS*) buttons
- 19 (stop) button
- 20 (pause) button
- 21 > (play) button
- 22 OPEN/CLOSE button
- 23 Display
- 24 DISPLAY OFF button
- 25 A ↔ B button

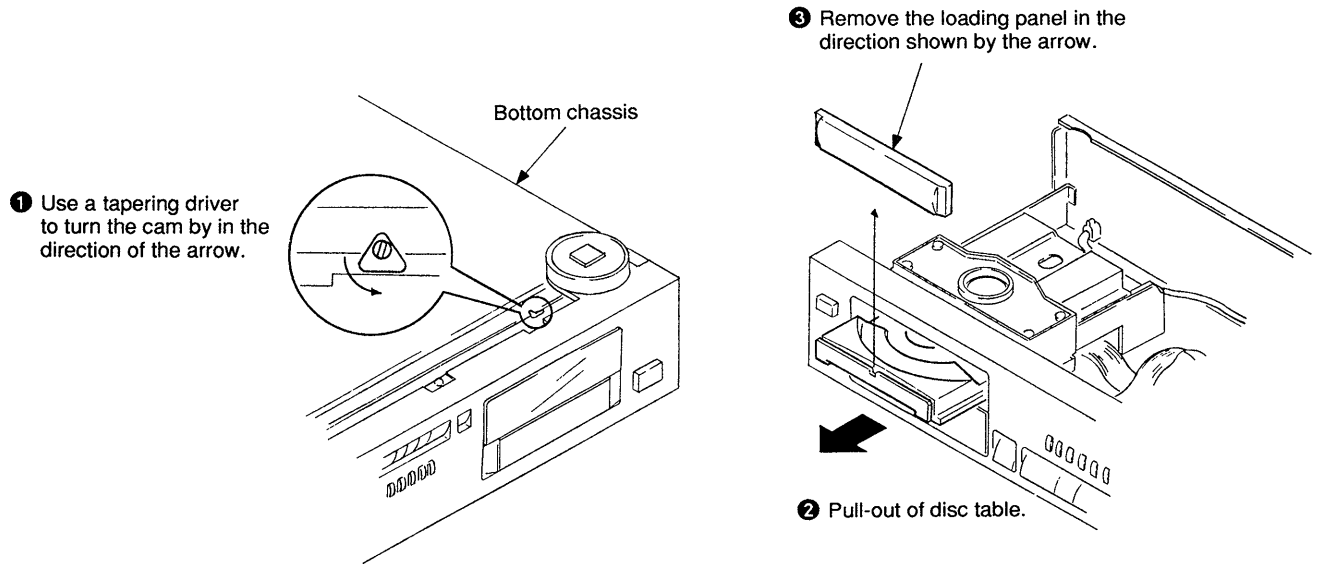
* AMS is the abbreviation of Automatic Music Sensor.

SECTION 3

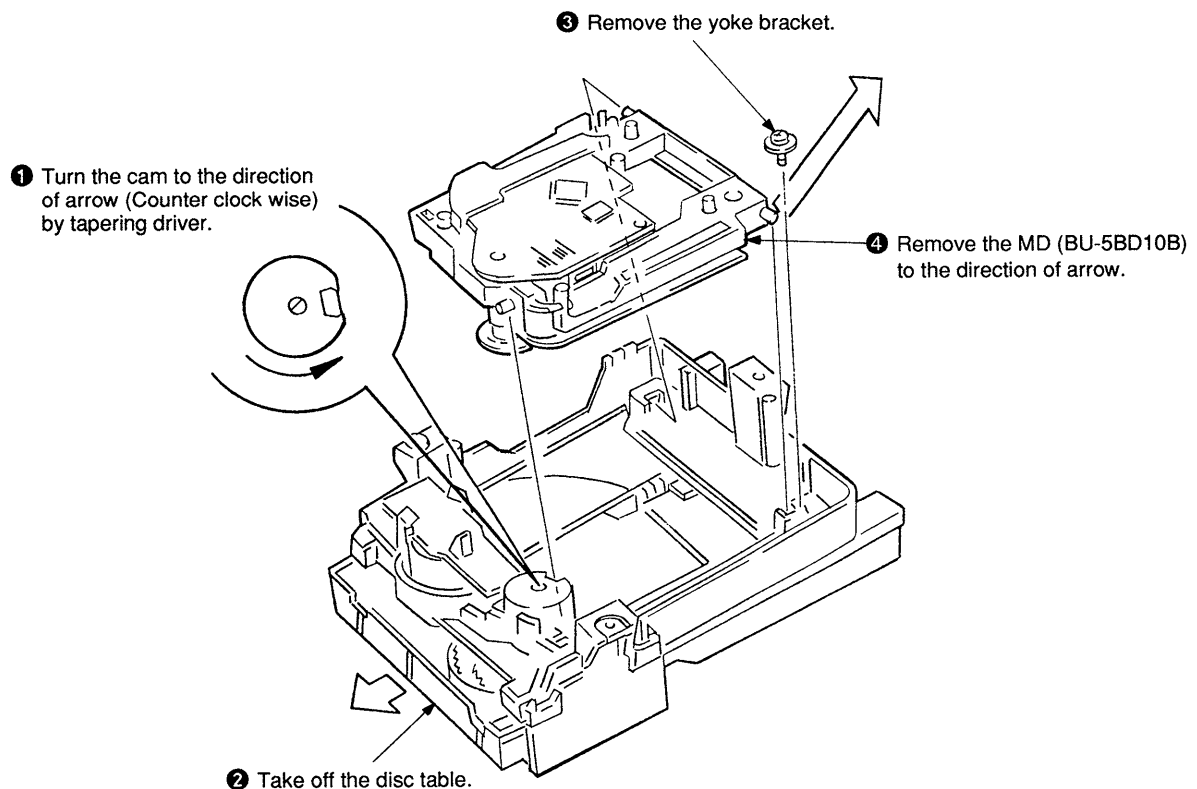
DISASSEMBLY

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

3-1. REMOVAL OF LOADING PANEL



3-2. REMOVAL OF MD (BU-5BD10B) BLOCK



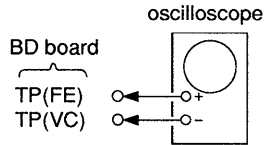
SECTION 4

ELECTRICAL BLOCK CHECKING

Note :

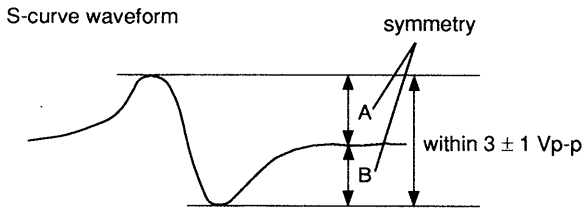
1. CD Block basically constructed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use an oscilloscope with more than 10M Ω impedance.
4. Clean an object lens by an applicator with neutral detergent when the signal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

S Curve Check



Procedure :

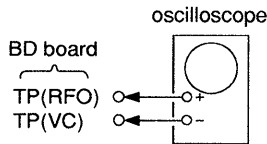
1. Connect oscilloscope to test point TP (FE) on BD board.
2. Connect between test point TP (FEI) and TP (VC) by lead wire.
3. Turned Power switch on.
4. Put disc (YEDS-18) in and turned Power switch on again and actuate the focus search. (actuate the focus search when disc table is moving in and out.)
5. Check the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within 3 ± 1 Vp-p.



6. 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



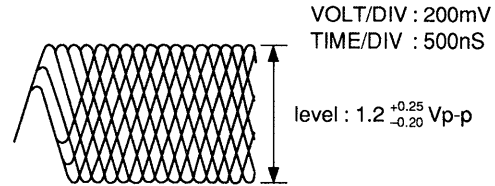
Procedure :

1. Connect oscilloscope to test point TP (RFO) on BD board.
2. Turned 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.

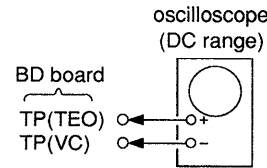
Note :

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

RF signal waveform

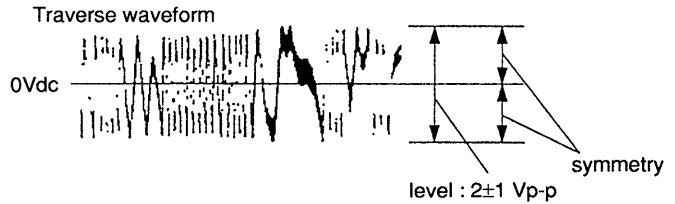


E-F Balance Check



Procedure :

1. Connect test point TP (ADJ) on MAIN board to ground and TP(TEI : IC101 ②7 PIN) to TP (VC) with lead wire.
2. Connect oscilloscope to test point TP (TEO) on BD board.
3. Turned 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 0Vdc, and check.

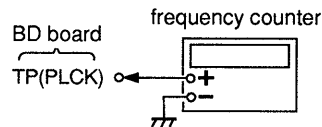


6. Remove the lead wire connected in step 1.

RF PLL Free-run Frequency Check

Procedure :

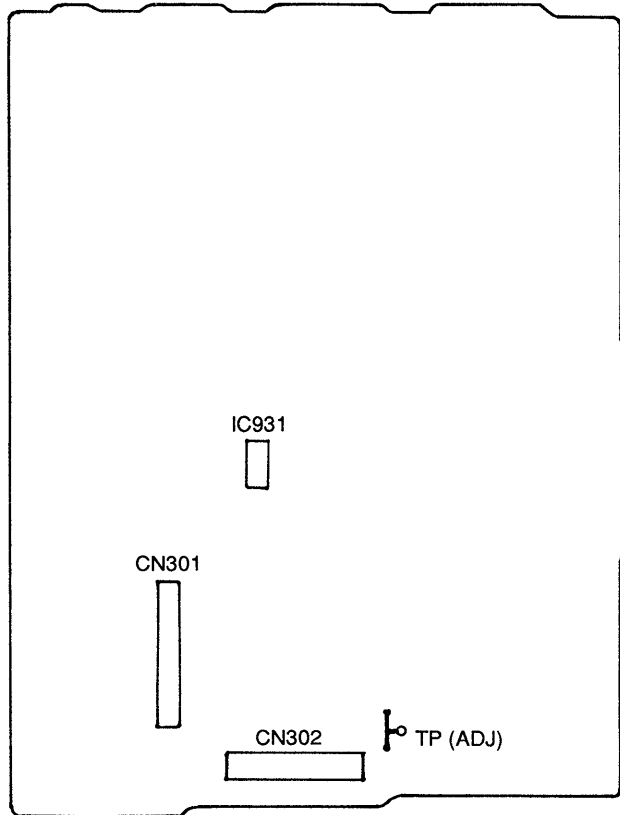
1. Connect frequency counter to test point (PLCK : IC101 ⑤3 PIN) with lead wire.



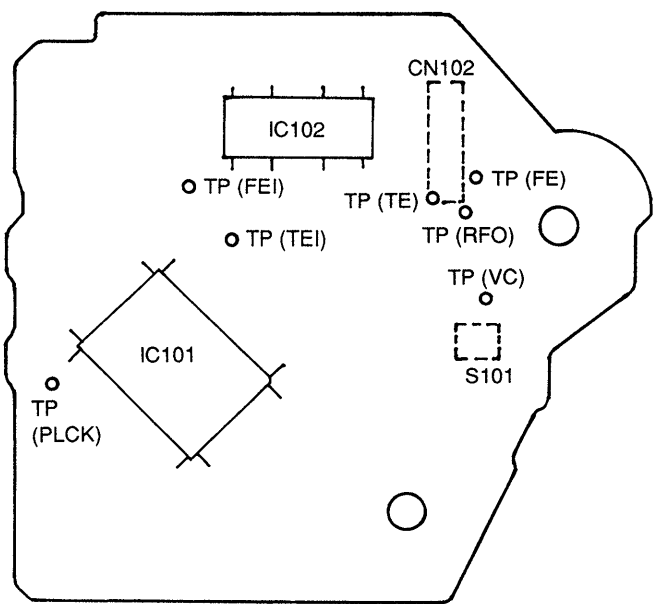
2. Turned Power switch on.
3. Confirm that reading on frequency counter is 4.3218MHz.

Adjustment Location :

[MAIN BOARD] — Component Side —

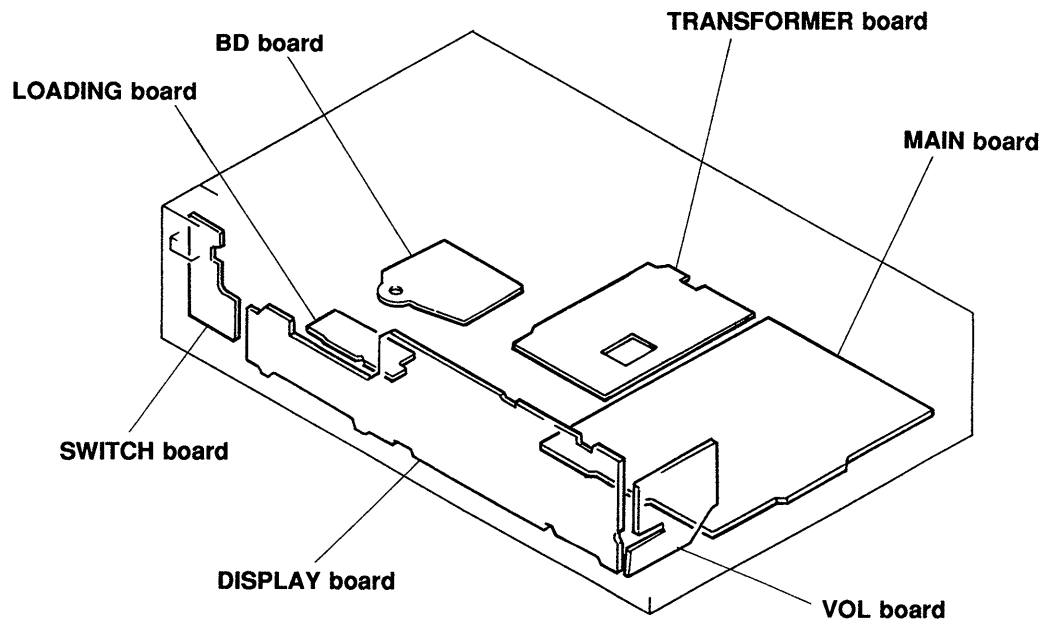


[BD BOARD] — Conductor Side —

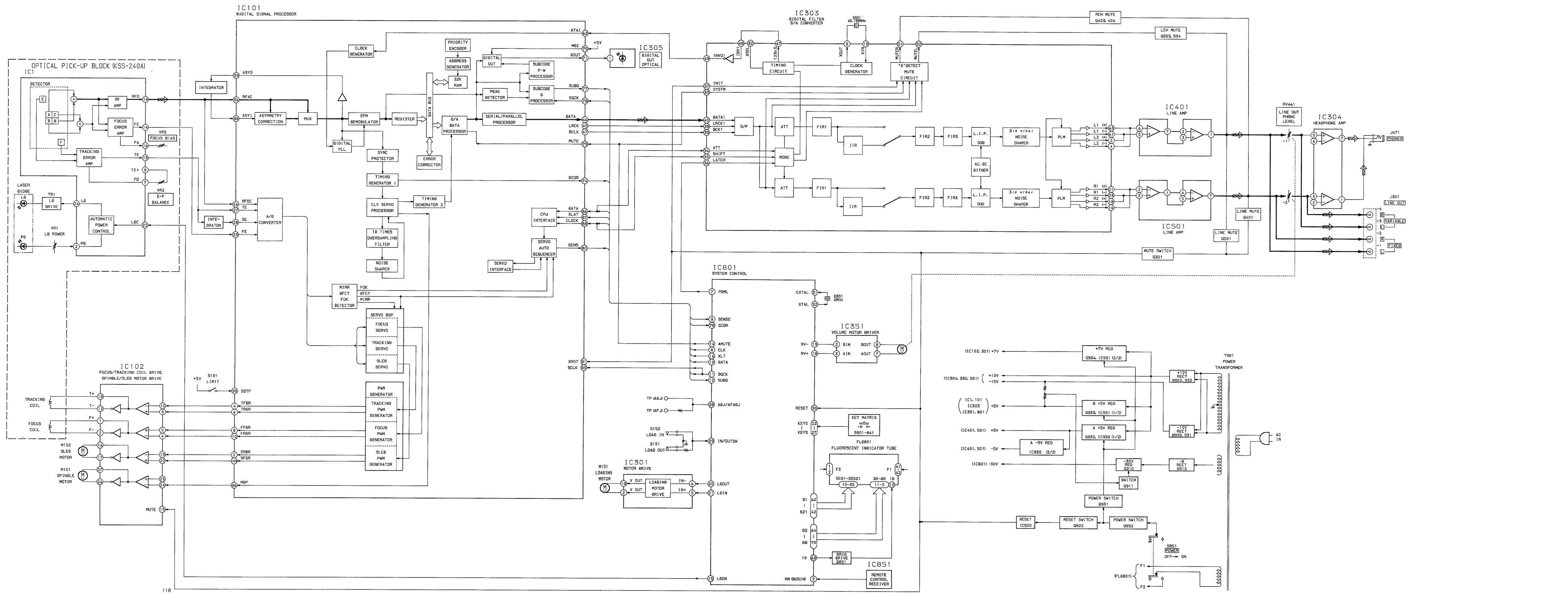


SECTION 5 DIAGRAMS

5-1. CIRCUIT BOARDS LOCATION



5-2. BLOCK DIAGRAM

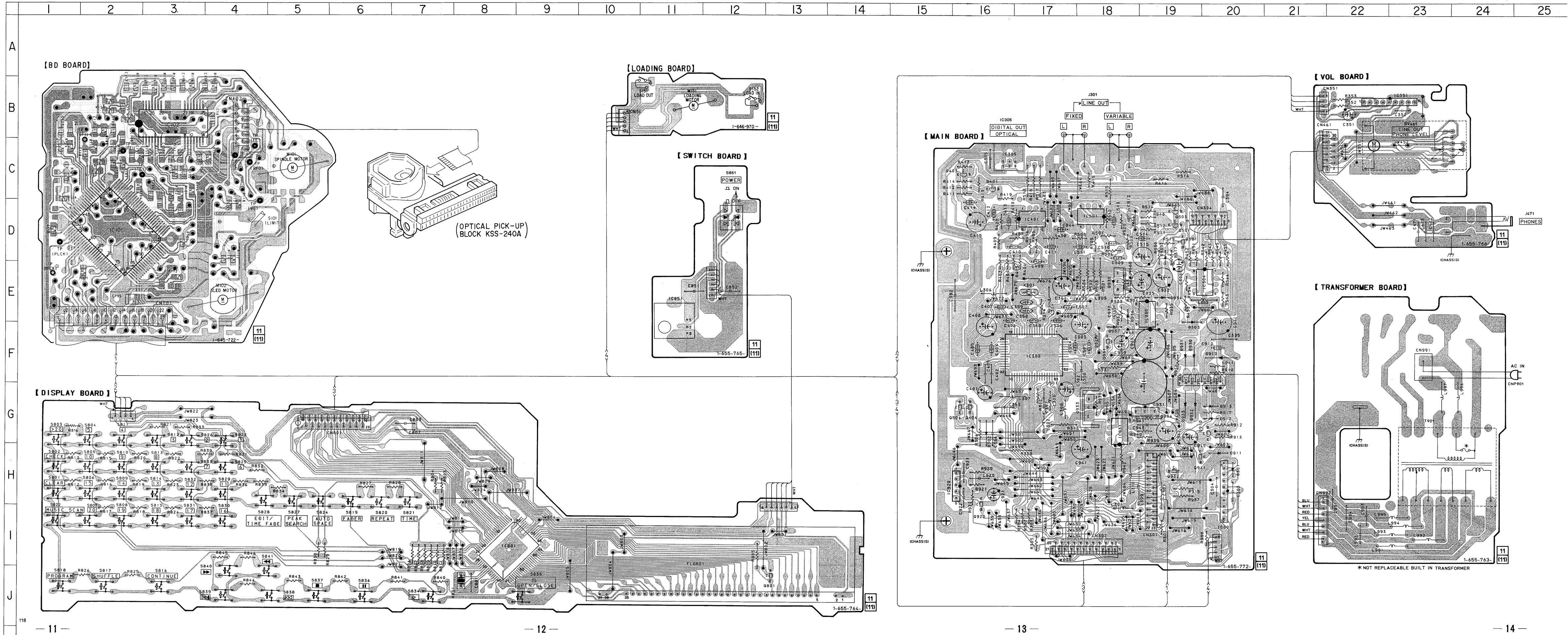


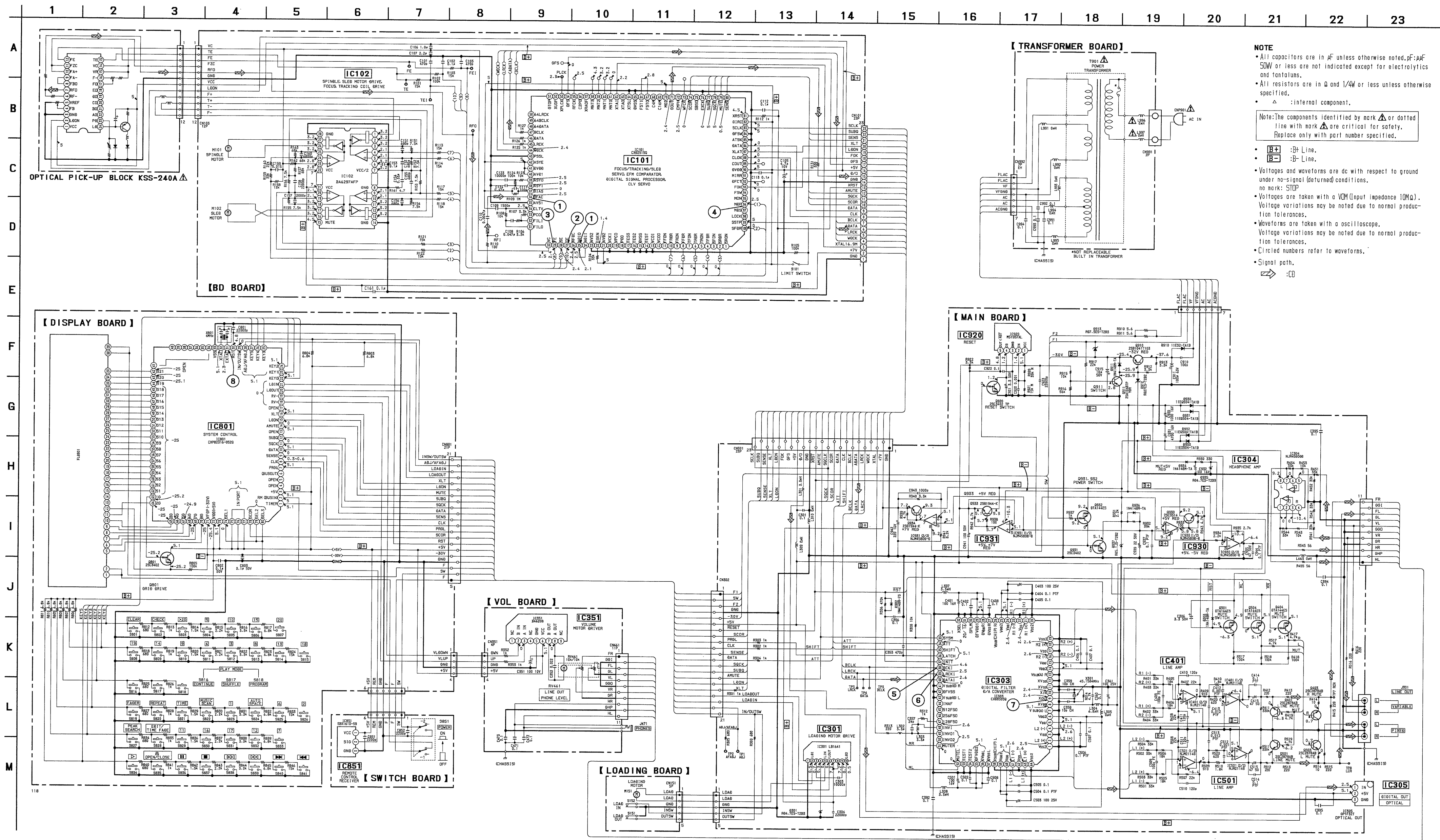
• Semiconductor Location

Ref. No.	Location
D301	H-20
D302	G-16
D303	E-19
D910	F-20
D911	H-20
D912	G-20
D913	G-20
D930	F-19
D931	F-19
D932	G-19
D933	G-19
D934	E-19
D935	D-19
D936	E-18
D937	F-18
IC101	D-2
IC102	B-3
IC301	H-20
IC303	F-17
IC304	E-19
IC305	C-16
IC351	B-23
IC401	D-17
IC501	D-18
IC801	I-8
IC851	E-11
IC920	H-16
IC930	E-19
IC931	G-18
Q301	D-19
Q401	C-16
Q403	C-16
Q404	G-16
Q501	D-19
Q503	D-19
Q504	G-16
Q801	J-13
Q910	G-20
Q911	H-19
Q920	H-16
Q930	E-18
Q931	F-18
Q932	H-19
Q933	G-18
Q934	G-19

Note:

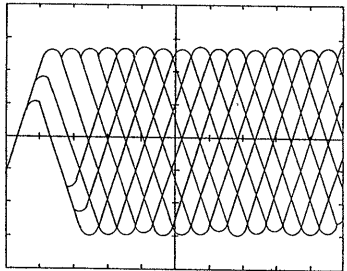
- : parts extracted from the component side.
- : Through hole.
- : Pattern on the side which seen.
- : Pattern of the rear side.
- : Chip components extracted from the rear side.



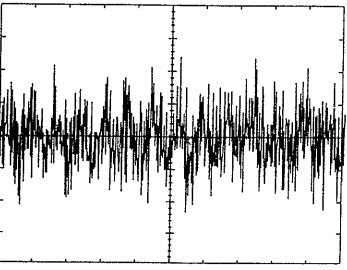


• Waveforms

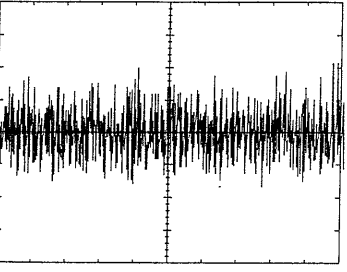
① IC101 ② ③ 1.1Vp-p PLAY



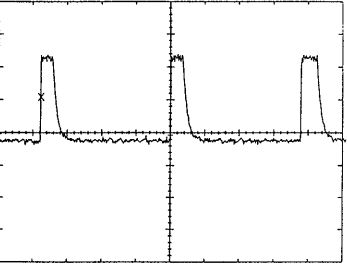
② IC101 ② 570mVp-p PLAY



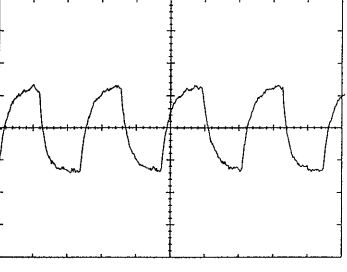
③ IC101 ③ 350mVp-p PLAY



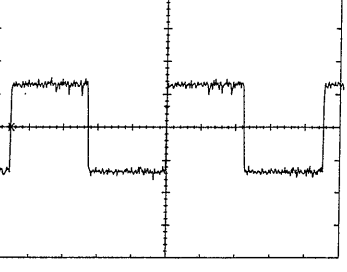
④ IC101 ④ 2.8Vp-p 7.6 μsec PLAY



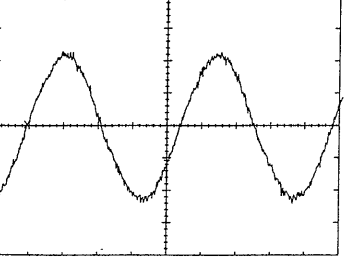
⑤ IC303 ⑤ 5.52Vp-p 2.12MHz



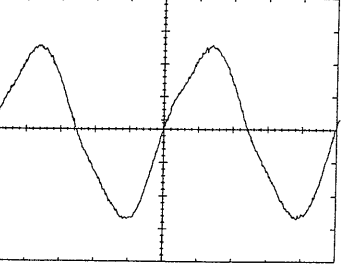
⑥ IC303 ⑥ 6.32Vp-p 22.7 μsec



⑦ IC303 ⑦ 4.76Vp-p 45.2MHz



⑧ IC801 ⑧ 5.44Vp-p 4MHz



NOTE

- All capacitors are in pF unless otherwise noted. pF: pF, μF: μF, nF: nF, or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and 1/4W or less unless otherwise specified.
- Δ : internal component.

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

- B+ : B+ Line.
- B- : B- Line.

• Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.

no mark: STOP

• Voltages are taken with a VOM (input impedance 10MΩ).

• Voltage variations may be noted due to normal production tolerances.

• Waveforms are taken with an oscilloscope.

• Voltage variations may be noted due to normal production tolerances.

• Circled numbers refer to waveforms.

• Signal path.

⇒ : C

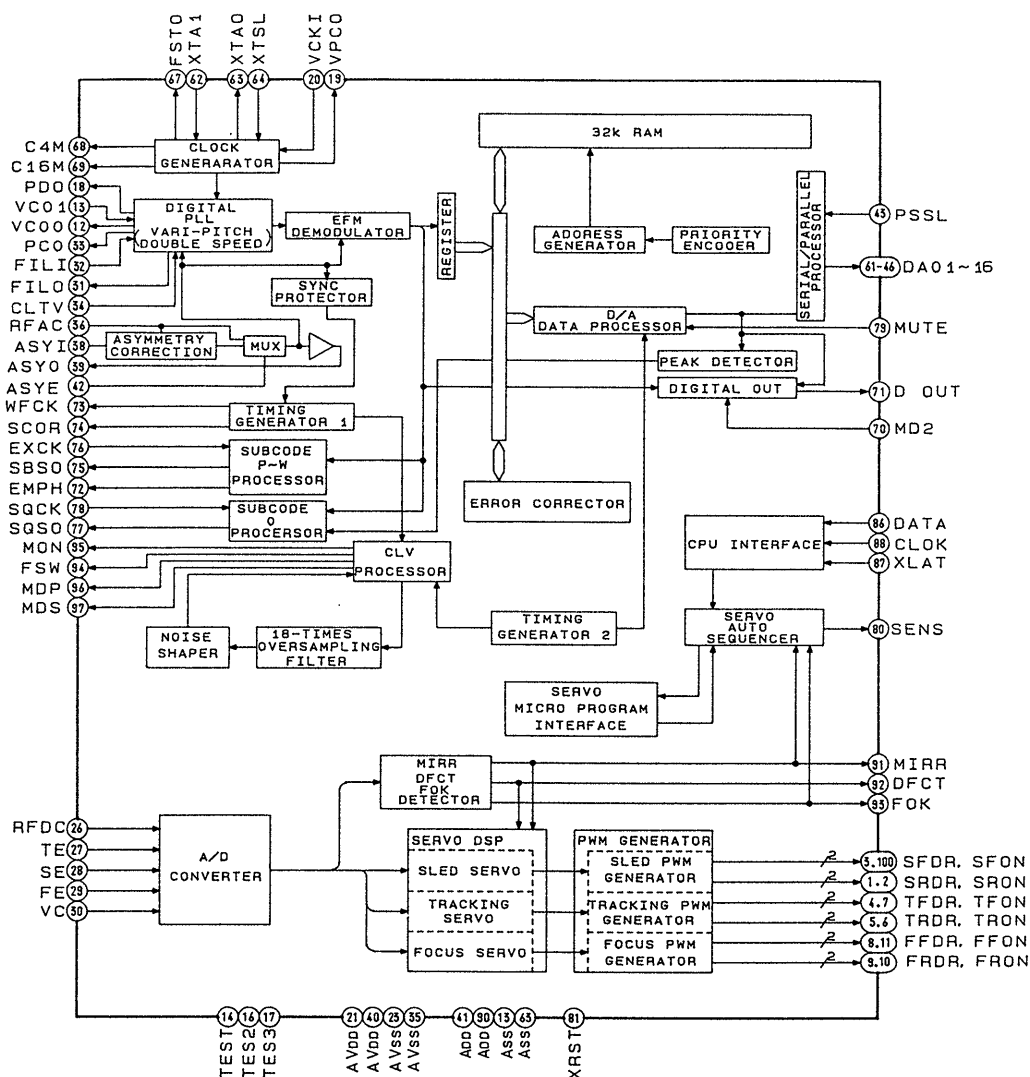
5-5. IC PIN FUNCTION

• IC801 (CXP82316-052Q)

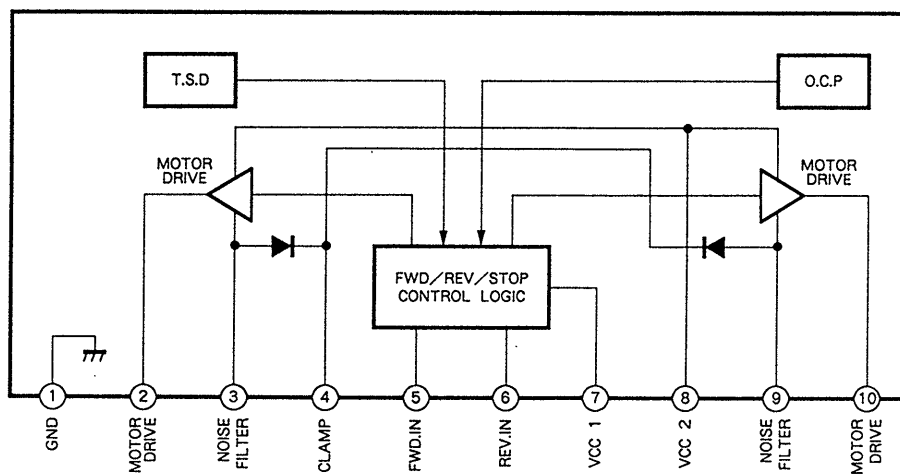
Pin No.	Pin Name	I/O	Function
1	TIMER	—	Connected to +5V.
2	RM (BUSIN)	I	Audio bus input.
3	+5V	—	Connected to +5V.
4	OPEN	—	} Not used. (open)
5	OPEN	—	
6	(BUS-OUT)	—	
7	PRGL	O	Latch signal output to digital filter (IC303).
8	CLK	O	Serial clock output.
9	SENSE	I	SENSE signal input.
10	DATA	O	Serial data output.
11	SQCK	O	Read out clock output for subcode Q data.
12	SUBQ	I	Subcode Q data input.
13	OPEN	—	Not used. (open)
14	AMUTE	O	Analog muting control signal output.
15	LDON	O	Optical pickup laser diode control output.
16	XLT	O	Serial data latch signal output.
17	OPEN	—	Not used. (open)
18	RV+	O	Remote commander volume +.
19	RV-	O	Remote commander volume -.
20	LDOUT	O	} Loading motor control signal output.
21	LDIN	O	
22 to 27	KEY0 to KEY5	I	Key input. (S801 to S841)
28	ADJ/AFADJ	—	ADJ, AFJ test pin.
29	IN/OUTSW	I	Loading IN/OUT switch input.
30	RST	I	Reset signal input.
31	EXTAL	I	Clock input. (4 MHz)
32	XTAL	O	Clock output. (4 MHz)
33	V _{SS}	—	GND
34 to 41	OPEN	—	Not used. (open)
42 to 62	SEG1 to SEG21	O	FL segment output.
63 to 70	1G to 8G	O	FL grid output.
71	VFDP (-30V)	—	-30V pin for FL display tube.
72	V _{DD} (+5V)	—	} +5V pin.
73	—	—	
74	SEL1	—	Connected to GND.
75	IN PORT	—	} Connected to +5 V.
76	IN PORT	—	
77	IN PORT	—	
78	SCOR	I	Read out timing signal input for subcode Q data.
79	SEL2	—	Connected to GND.
80	SEL3	—	Connected to GND.

5-6. IC BLOCK DIAGRAMS

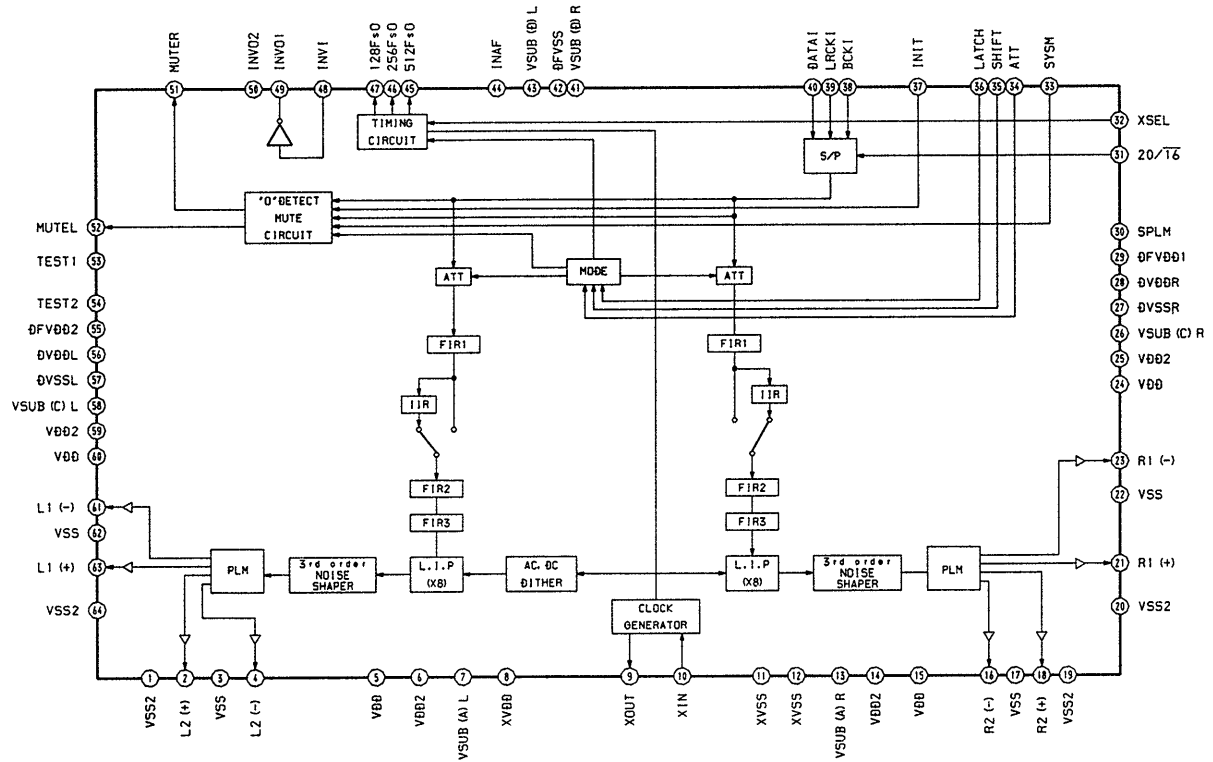
IC101 CXD2515Q



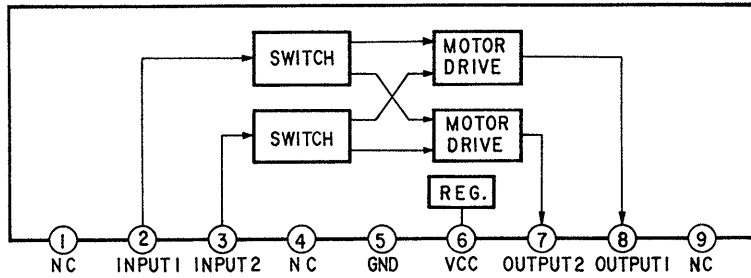
IC301 LB1641



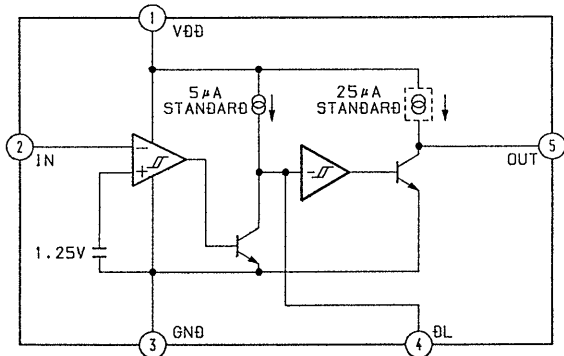
IC303 CXD8505Q



IC351 BA6208



IC920 M51957AL



SECTION 6

EXPLODED VIEWS

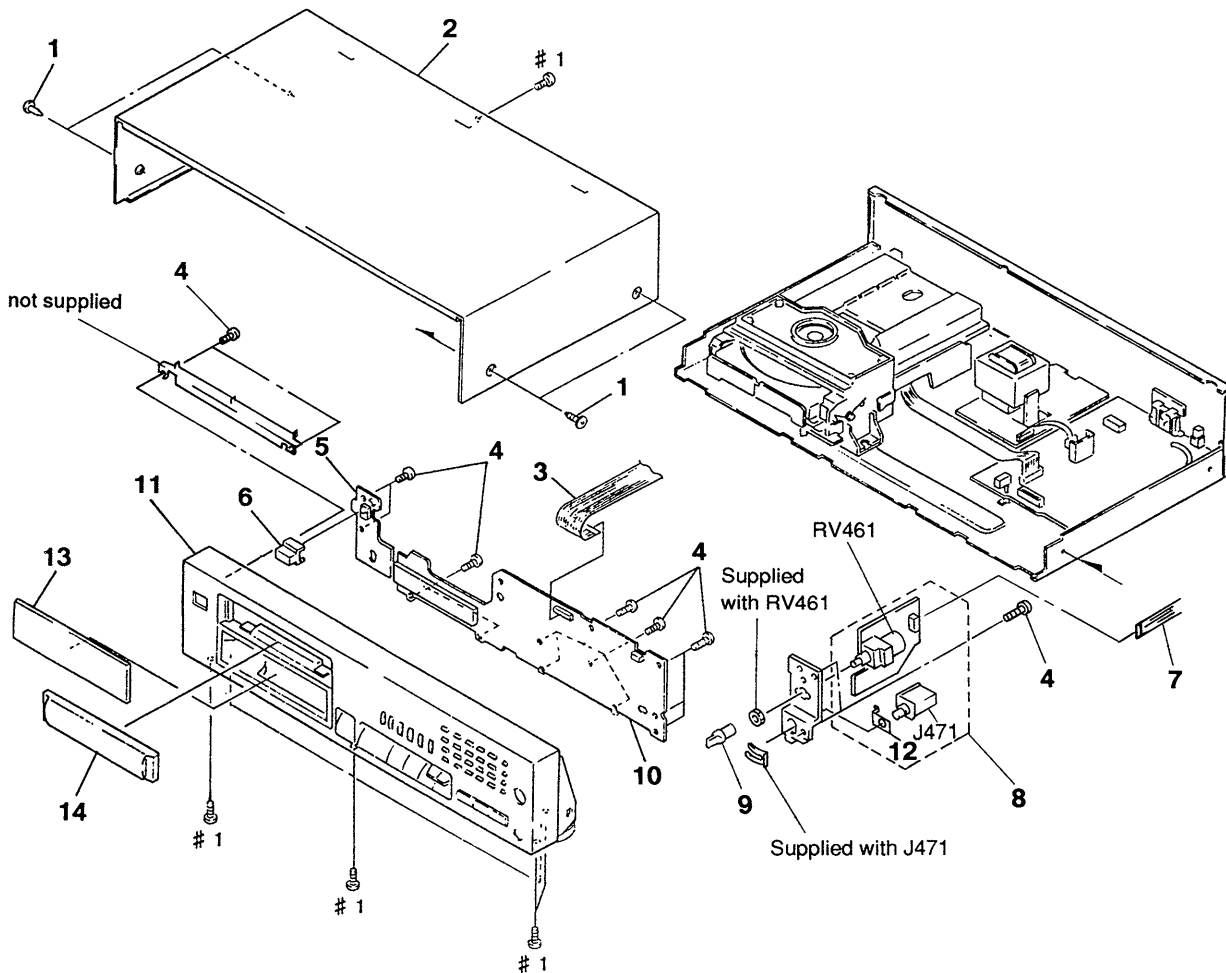
NOTE:

- 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 or dotted line with mark are critical for safety. Replace only with part number specified.

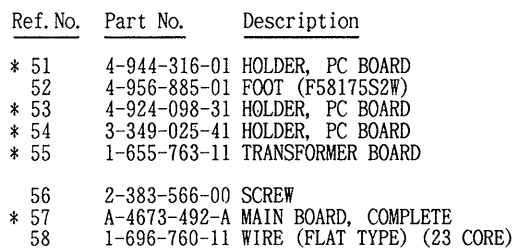
6-1. CASE AND FRONT PANEL SECTION



Ref. No.	Part No.	Description
1	3-363-099-01	SCREW (CASE 3 TP2)
* 2	4-937-817-01	CASE
3	1-751-947-11	WIRE (FLAT TYPE) (21 CORE)
4	4-951-620-01	SCREW (2.6X8), +BVTP
* 5	1-655-765-11	SWITCH BOARD
6	4-947-034-01	BUTTON (POWER)
7	1-751-712-11	WIRE (FLAT TYPE) (11 CORE)
* 8	1-655-766-11	VOL BOARD
9	4-950-189-01	KNOB (A) (VOL)

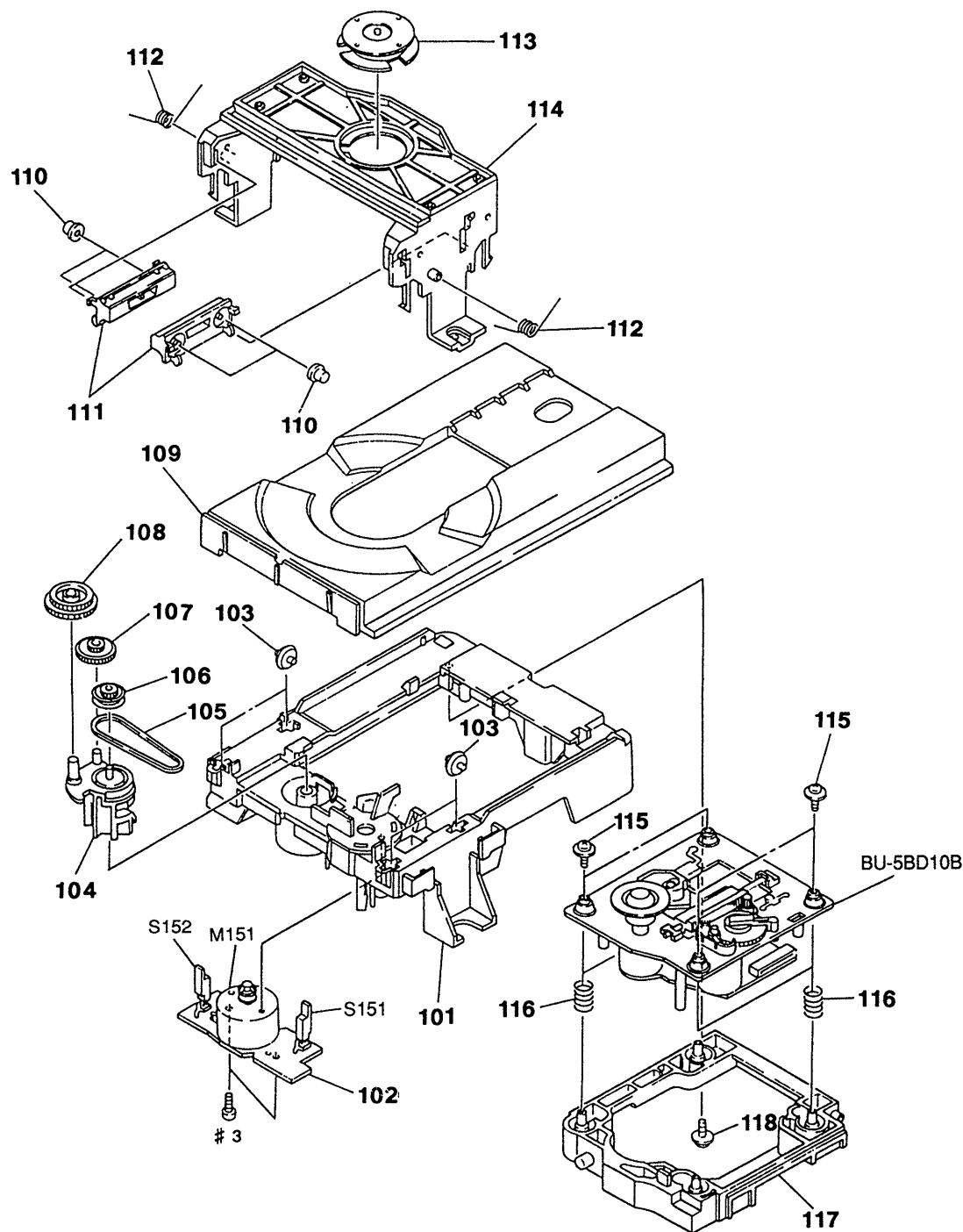
Remark	Ref. No.	Part No.	Description	Remark
	* 10	A-4673-493-A	DISPLAY BOARD, COMPLETE	
	11	X-4945-693-1	PANEL ASSY, FRONT	
	* 12	4-962-201-01	PLATE (HP), GROUND	
	13	4-962-199-01	PLATE, INDICATION	
	14	4-971-681-21	PANEL, LOADING	
	J471	1-750-162-61	JACK (LARGE TYPE) (PHONES)	
	RV461	1-223-875-11	RES, VAR (MOTOR DRIVING TYPE) (LINE OUT, PHONE LEVEL)	

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



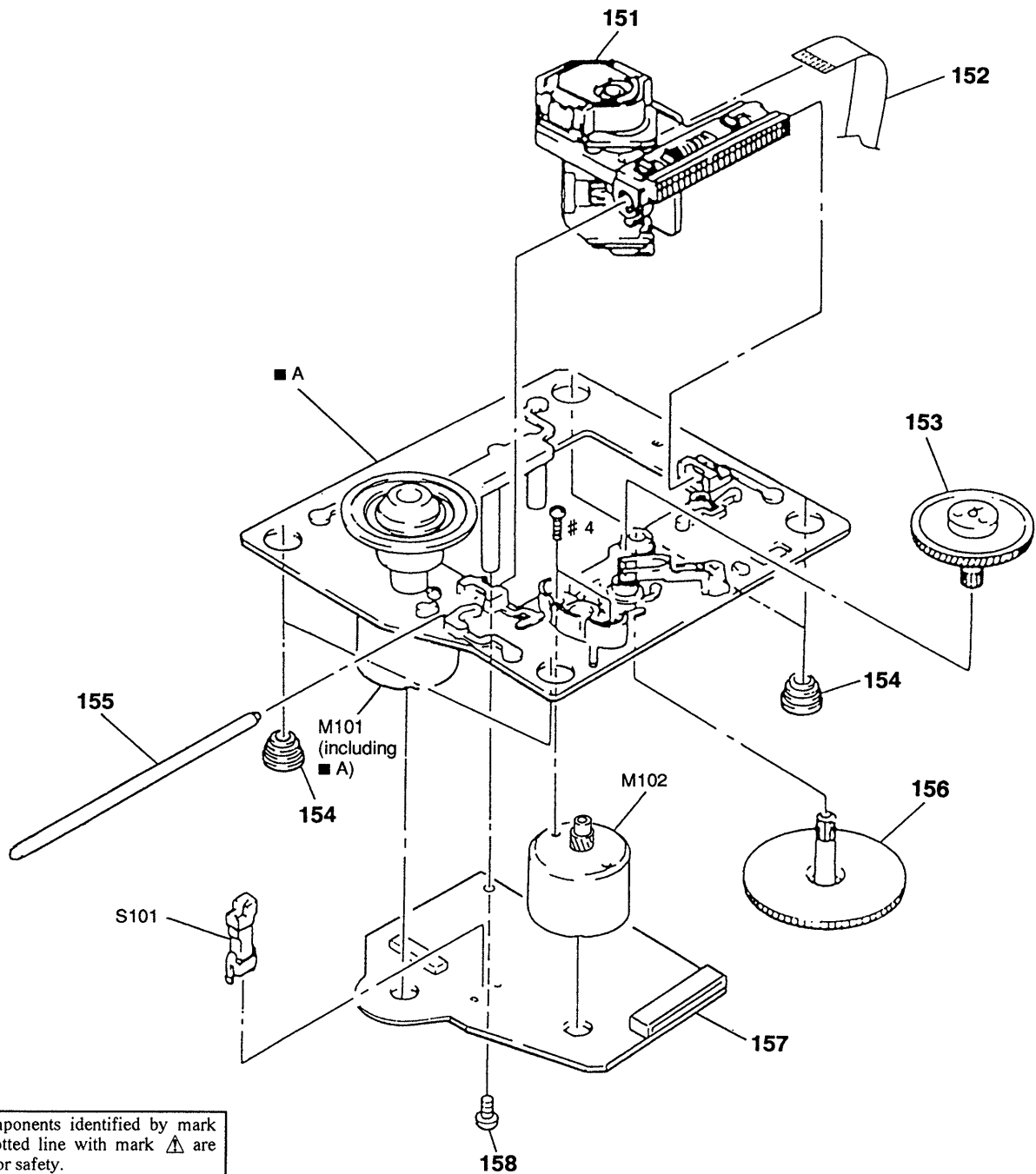
— 23 —

6-3. MECHANISM DECK SECTION (CDM25C-5BD10B)



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* 101	4-954-190-01	BASE (MD)		112	4-954-195-01	SPRING, TORSION	
* 102	1-646-970-11	LOADING BOARD		* 113	1-452-538-11	MAGNET	
103	4-954-193-01	ROLLER (A)		* 114	4-954-192-01	HOLDER (M)	
104	4-933-109-01	CAM		115	4-933-134-01	SCREW (+PTWH M2.6X6)	
105	4-927-649-01	BELT		116	4-959-996-01	SPRING (932), COMPRESSION	
106	4-927-651-01	PULLEY (S)		117	4-933-129-01	HOLDER (BU)	
107	4-967-268-01	GEAR (C)		* 118	4-917-583-21	BRACKET, YOKE	
108	4-933-107-01	GEAR (PL)		M151	A-4604-363-A	MOTOR (L) ASSY (LOADING MOTOR)	
109	4-961-794-01	TABLE, DISK		S151	1-572-086-11	SWITCH, LEAF (LOAD OUT)	
110	4-954-194-01	ROLLER (B)		S152	1-572-086-11	SWITCH, LEAF (LOAD IN)	
111	4-954-199-01	PLATE, SLIDE					

6-4. BASE UNIT SECTION (BU-5BD10B)



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
151	8-848-144-11	OPTICAL PICK-UP BLOCK KSS-240A
152	1-575-001-11	WIRE, FLAT TYPE (12 CORE)
153	4-917-567-01	GEAR (M)
154	4-951-940-01	INSULATOR (BU)
155	4-917-565-01	SHAFT, SLED

<u>Remark</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
	156	4-917-564-01	GEAR (P), FLATNESS
*	157	A-4649-432-A	BD BOARD, COMPLETE
M101	X-4917-523-3		MOTOR ASSY (SPINDLE MOTOR)
M102	X-4917-504-1		MOTOR ASSY (SLED MOTOR)
S101	1-572-085-11		SWITCH, LEAF (LIMIT SWITCH)

SECTION 7

ELECTRICAL PARTS LIST

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.
- 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-4649-432-A	BD BOARD, COMPLETE *****		R103	1-216-077-00	METAL CHIP 15K 5% 1/10W	
		< CAPACITOR >		R104	1-216-085-00	METAL CHIP 33K 5% 1/10W	
C101	1-163-005-11	CERAMIC CHIP 470PF 10% 50V		R105	1-216-097-00	METAL CHIP 100K 5% 1/10W	
C102	1-163-038-91	CERAMIC CHIP 0.1uF 25V		R106	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
C103	1-163-005-11	CERAMIC CHIP 470PF 10% 50V		R107	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
C105	1-135-155-21	TANTALUM CHIP 4.7uF 10% 16V		R108	1-216-073-00	METAL CHIP 10K 5% 1/10W	
C106	1-164-346-11	CERAMIC CHIP 1uF 16V		R109	1-216-121-00	METAL CHIP 1M 5% 1/10W	
C107	1-164-505-11	CERAMIC CHIP 2.2uF 16V		R110	1-216-025-11	METAL GLAZE 100 5% 1/10W	
C108	1-163-035-00	CERAMIC CHIP 0.047uF 50V		R112	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
C109	1-163-011-11	CERAMIC CHIP 0.0015uF 10% 50V		R113	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C110	1-163-017-00	CERAMIC CHIP 0.0047uF 5% 50V		R114	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C111	1-163-251-11	CERAMIC CHIP 100PF 5% 50V		R117	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C112	1-163-038-91	CERAMIC CHIP 0.1uF 25V		R118	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C113	1-163-038-91	CERAMIC CHIP 0.1uF 25V		R121	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C123	1-164-232-11	CERAMIC CHIP 0.01uF 50V		R122	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C124	1-164-005-11	CERAMIC CHIP 0.47uF 25V		R123	1-216-073-00	METAL CHIP 10K 5% 1/10W	
C151	1-163-007-11	CERAMIC CHIP 680PF 10% 50V		R124	1-216-097-00	METAL CHIP 100K 5% 1/10W	
C152	1-163-007-11	CERAMIC CHIP 680PF 10% 50V		R125	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
C153	1-163-038-91	CERAMIC CHIP 0.1uF 25V		R126	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
C154	1-164-336-11	CERAMIC CHIP 0.33uF 25V		R127	1-216-049-11	METAL GLAZE 1K 5% 1/10W	
C155	1-163-007-11	CERAMIC CHIP 680PF 10% 50V		R131	1-216-037-00	METAL CHIP 330 5% 1/10W	
C156	1-163-007-11	CERAMIC CHIP 680PF 10% 50V		R151	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
C157	1-163-033-91	CERAMIC CHIP 0.022uF 50V		R152	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
C158	1-163-033-91	CERAMIC CHIP 0.022uF 50V		R153	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
C159	1-163-023-00	CERAMIC CHIP 0.015uF 5% 50V		R154	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
C160	1-163-019-00	CERAMIC CHIP 0.0068uF 10% 50V		R155	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
C161	1-163-038-91	CERAMIC CHIP 0.1uF 25V		R156	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
		< CONNECTOR >		R157	1-216-093-00	METAL CHIP 68K 5% 1/10W	
* CN101	1-568-865-11	SOCKET, CONNECTOR 23P		R158	1-216-076-00	METAL CHIP 13K 5% 1/10W	
CN102	1-568-795-11	SOCKET, CONNECTOR 12P		R159	1-216-085-00	METAL CHIP 33K 5% 1/10W	
		< IC >		R160	1-216-081-00	METAL CHIP 22K 5% 1/10W	
IC101	8-752-361-94	IC CXD2515Q		R161	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
IC102	8-759-071-79	IC BA6297AFP		R162	1-216-093-00	METAL CHIP 68K 5% 1/10W	
		< RESISTOR >		R163	1-216-093-00	METAL CHIP 68K 5% 1/10W	
R101	1-216-077-00	METAL CHIP 15K 5% 1/10W				< SWITCH >	
R102	1-216-097-00	METAL CHIP 100K 5% 1/10W		S101	1-572-085-11	SWITCH, LEAF (LIMIT SWITCH)	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-4673-493-A	DISPLAY BOARD, COMPLETE *****		R831	1-249-423-11	CARBON 3.3K 5%	1/4W
		< CAPACITOR >		R832	1-249-427-11	CARBON 6.8K 5%	1/4W
C801	1-161-494-00	CERAMIC 0.022uF	25V	R833	1-249-431-11	CARBON 15K 5%	1/4W
C802	1-164-159-11	CERAMIC 0.1uF	50V	R834	1-249-415-11	CARBON 680 5%	1/4W
C803	1-164-159-11	CERAMIC 0.1uF	50V	R835	1-249-417-11	CARBON 1K 5%	1/4W
		< CONNECTOR >		R836	1-249-419-11	CARBON 1.5K 5%	1/4W
CN801	1-568-838-11	SOCKET, CONNECTOR 21P		R837	1-249-421-11	CARBON 2.2K 5%	1/4W
		< FLUORESCENT INDICATOR >		R838	1-249-423-11	CARBON 3.3K 5%	1/4W
FLD801	1-519-757-11	INDICATOR TUBE, FLUORESCENT		R839	1-249-427-11	CARBON 6.8K 5%	1/4W
		< IC >		R840	1-249-415-11	CARBON 680 5%	1/4W
IC801	8-752-861-38	IC CXP82316-052Q		R841	1-249-417-11	CARBON 1K 5%	1/4W
		< TRANSISTOR >		R842	1-249-419-11	CARBON 1.5K 5%	1/4W
Q801	8-729-900-80	TRANSISTOR DTC114ES		R843	1-249-421-11	CARBON 2.2K 5%	1/4W
		< RESISTOR >		R844	1-249-423-11	CARBON 3.3K 5%	1/4W
R803	1-249-427-11	CARBON 6.8K 5%	1/4W	R845	1-249-427-11	CARBON 6.8K 5%	1/4W
R804	1-249-427-11	CARBON 6.8K 5%	1/4W	R846	1-249-431-11	CARBON 15K 5%	1/4W
R805	1-249-441-11	CARBON 100K 5%	1/4W			< SWITCH >	
R806	1-249-427-11	CARBON 6.8K 5%	1/4W	S801	1-554-303-21	SWITCH, TACTILE (CLEAR)	
R807	1-249-427-11	CARBON 6.8K 5%	1/4W	S802	1-554-303-21	SWITCH, TACTILE (CHECK)	
R808	1-249-427-11	CARBON 6.8K 5%	1/4W	S803	1-554-303-21	SWITCH, TACTILE (>20)	
R809	1-249-427-11	CARBON 6.8K 5%	1/4W	S804	1-554-303-21	SWITCH, TACTILE (5)	
R810	1-249-427-11	CARBON 6.8K 5%	1/4W	S805	1-554-303-21	SWITCH, TACTILE (10)	
R811	1-249-427-11	CARBON 6.8K 5%	1/4W	S806	1-554-303-21	SWITCH, TACTILE (15)	
R812	1-249-415-11	CARBON 680 5%	1/4W	S807	1-554-303-21	SWITCH, TACTILE (20)	
R813	1-249-417-11	CARBON 1K 5%	1/4W	S808	1-554-303-21	SWITCH, TACTILE (19)	
R814	1-249-419-11	CARBON 1.5K 5%	1/4W	S809	1-554-303-21	SWITCH, TACTILE (14)	
R815	1-249-421-11	CARBON 2.2K 5%	1/4W	S810	1-554-303-21	SWITCH, TACTILE (9)	
R816	1-249-423-11	CARBON 3.3K 5%	1/4W	S811	1-554-303-21	SWITCH, TACTILE (4)	
R817	1-249-427-11	CARBON 6.8K 5%	1/4W	S812	1-554-303-21	SWITCH, TACTILE (3)	
R818	1-249-415-11	CARBON 680 5%	1/4W	S813	1-554-303-21	SWITCH, TACTILE (8)	
R819	1-249-417-11	CARBON 1K 5%	1/4W	S814	1-554-303-21	SWITCH, TACTILE (13)	
R820	1-249-419-11	CARBON 1.5K 5%	1/4W	S815	1-554-303-21	SWITCH, TACTILE (18)	
R821	1-249-421-11	CARBON 2.2K 5%	1/4W	S816	1-554-303-21	SWITCH, TACTILE (CONTINUE)	
R822	1-249-423-11	CARBON 3.3K 5%	1/4W	S817	1-554-303-21	SWITCH, TACTILE (SHUFFLE)	
R823	1-249-427-11	CARBON 6.8K 5%	1/4W	S818	1-554-303-21	SWITCH, TACTILE (PROGRAM)	
R824	1-249-431-11	CARBON 15K 5%	1/4W	S819	1-554-303-21	SWITCH, TACTILE (FADER)	
R825	1-249-415-11	CARBON 680 5%	1/4W	S820	1-554-303-21	SWITCH, TACTILE (REPEAT)	
R826	1-249-417-11	CARBON 1K 5%	1/4W	S821	1-554-303-21	SWITCH, TACTILE (TIME)	
R827	1-249-415-11	CARBON 680 5%	1/4W	S822	1-554-303-21	SWITCH, TACTILE (MUSIC SCAN)	
R828	1-249-417-11	CARBON 1K 5%	1/4W	S823	1-554-303-21	SWITCH, TACTILE (1)	
R829	1-249-419-11	CARBON 1.5K 5%	1/4W	S824	1-554-303-21	SWITCH, TACTILE (AUTO SPACE)	
R830	1-249-421-11	CARBON 2.2K 5%	1/4W	S825	1-554-303-21	SWITCH, TACTILE (6)	
				S826	1-554-303-21	SWITCH, TACTILE (2)	
				S827	1-554-303-21	SWITCH, TACTILE (PEAK SEARCH)	
				S828	1-554-303-21	SWITCH, TACTILE (EDIT/TIME FADE)	
				S829	1-554-303-21	SWITCH, TACTILE (11)	
				S830	1-554-303-21	SWITCH, TACTILE (16)	
				S831	1-554-303-21	SWITCH, TACTILE (17)	
				S832	1-554-303-21	SWITCH, TACTILE (12)	

DISPLAY

LOADING

MAIN

Ref. No.	Part No.	Description	Remark
S833	1-554-303-21	SWITCH, TACTILE (7)	
S834	1-554-303-21	SWITCH, TACTILE (▷)	
S835	1-554-303-21	SWITCH, TACTILE (△ OPEN/CLOSE)	
S836	1-554-303-21	SWITCH, TACTILE (■)	
S837	1-554-303-21	SWITCH, TACTILE (■)	
S838	1-554-303-21	SWITCH, TACTILE (◁▷)	
S839	1-554-303-21	SWITCH, TACTILE (▷▷)	
S840	1-554-303-21	SWITCH, TACTILE (◁◁)	
S841	1-554-303-21	SWITCH, TACTILE (◁◁)	
< VIBRATOR >			
X801	1-577-358-21	VIBRATOR, CERAMIC (4MHz)	

*	1-646-970-11	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-4673-492-A	MAIN BOARD, COMPLETE	

*	3-309-144-21	HEAT SINK	
	7-685-871-01	SCREW +BVT 3X6 (S)	
< CAPACITOR >			
C301	1-164-159-11	CERAMIC 0.1uF	50V
C303	1-162-306-11	CERAMIC 0.01uF	30% 16V
C304	1-161-494-00	CERAMIC 0.022uF	25V
C305	1-164-159-11	CERAMIC 0.1uF	50V
C306	1-126-962-11	ELECT 3.3uF	20% 50V
C353	1-162-290-31	CERAMIC 470PF	10% 50V
C356	1-164-159-11	CERAMIC 0.1uF	50V
C357	1-162-208-31	CERAMIC 24PF	5% 50V
C358	1-102-947-00	CERAMIC 10PF	5% 50V
C359	1-102-947-00	CERAMIC 10PF	5% 50V
C360	1-130-495-00	MYLAR 0.1uF	5% 50V
C361	1-124-122-11	ELECT 100uF	20% 50V
C392	1-164-159-11	CERAMIC 0.1uF	50V
C394	1-164-159-11	CERAMIC 0.1uF	50V
C395	1-164-159-11	CERAMIC 0.1uF	50V
C401	1-126-101-11	ELECT 100uF	20% 16V
C402	1-164-159-11	CERAMIC 0.1uF	50V

Ref. No.	Part No.	Description	Remark
C403	1-124-122-11	ELECT 100uF	20% 50V
C404	1-130-495-00	MYLAR 0.1uF	5% 50V
C405	1-130-495-00	MYLAR 0.1uF	5% 50V
C406	1-130-495-00	MYLAR 0.1uF	5% 50V
C407	1-130-495-00	MYLAR 0.1uF	5% 50V
C408	1-164-159-11	CERAMIC 0.1uF	50V
C409	1-107-611-11	MICA 100PF	5% 500V
C410	1-102-816-00	CERAMIC 120PF	5% 50V
C411	1-102-816-00	CERAMIC 120PF	5% 50V
C412	1-106-343-00	MYLAR 1000PF	5% 200V
C413	1-130-484-00	MYLAR 0.012uF	5% 50V
C414	1-130-495-00	MYLAR 0.1uF	5% 50V
C415	1-124-910-11	ELECT 47uF	20% 50V
C501	1-126-101-11	ELECT 100uF	20% 16V
C502	1-164-159-11	CERAMIC 0.1uF	50V
C503	1-124-122-11	ELECT 100uF	20% 50V
C504	1-130-495-00	MYLAR 0.1uF	5% 50V
C505	1-130-495-00	MYLAR 0.1uF	5% 50V
C506	1-130-495-00	MYLAR 0.1uF	5% 50V
C507	1-130-495-00	MYLAR 0.1uF	5% 50V
C508	1-164-159-11	CERAMIC 0.1uF	50V
C509	1-107-611-11	MICA 100PF	5% 500V
C510	1-102-816-00	CERAMIC 120PF	5% 50V
C511	1-102-816-00	CERAMIC 120PF	5% 50V
C512	1-106-343-00	MYLAR 1000PF	5% 200V
C513	1-130-484-00	MYLAR 0.012uF	5% 50V
C514	1-130-495-00	MYLAR 0.1uF	5% 50V
C515	1-124-910-11	ELECT 47uF	20% 50V
C910	1-107-611-11	MICA 100PF	5% 500V
C911	1-124-572-11	ELECT 100uF	20% 63V
C915	1-124-907-11	ELECT 10uF	20% 50V
C920	1-162-294-31	CERAMIC 0.001uF	10% 50V
C921	1-126-962-11	ELECT 3.3uF	20% 50V
C922	1-164-159-11	CERAMIC 0.1uF	50V
C923	1-161-494-00	CERAMIC 0.022uF	25V
C930	1-126-013-11	ELECT 1000uF	20% 16V
C931	1-126-016-11	ELECT 4700uF	20% 16V
C932	1-126-101-11	ELECT 100uF	20% 16V
C935	1-124-910-11	ELECT 47uF	20% 50V
C937	1-130-495-00	MYLAR 0.1uF	5% 50V
C939	1-124-916-11	ELECT 22uF	20% 63V
C941	1-126-052-11	ELECT 100uF	20% 50V
C942	1-124-120-11	ELECT 220uF	20% 25V
C943	1-162-294-31	CERAMIC 0.001uF	10% 50V
C944	1-130-495-00	MYLAR 0.1uF	5% 50V
< CONNECTOR >			
CN301	1-750-428-11	CONNECTOR, FFC/FPC 23P	
CN302	1-750-426-11	CONNECTOR, FFC/FPC 21P	
* CN304	1-750-416-11	CONNECTOR, FFC/FPC 11P	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
< DIODE >							
D301	8-719-109-82	DIODE RD4. 7ES-B3		Q503	8-729-231-55	TRANSISTOR 2SC2878-AB	
D302	8-719-987-63	DIODE 1N4148M		Q504	8-729-900-65	TRANSISTOR DTA144ES	
D303	8-719-987-63	DIODE 1N4148M		Q910	8-729-019-64	TRANSISTOR 2SB1041	
D910	8-719-200-82	DIODE 11ES2		Q911	8-729-119-76	TRANSISTOR 2SA1175-HFE	
D911	8-719-987-63	DIODE 1N4148M		Q920	8-729-900-80	TRANSISTOR DTC114ES	
D912	8-719-113-76	DIODE RD27ES-T2B2		Q930	8-729-104-18	TRANSISTOR 2SC3514	
D913	8-719-110-04	DIODE RD7. 5ES-B3		Q931	8-729-900-80	TRANSISTOR DTC114ES	
D930	8-719-210-21	DIODE 11EQS04		Q932	8-729-900-65	TRANSISTOR DTA144ES	
D931	8-719-210-21	DIODE 11EQS04		Q933	8-729-021-82	TRANSISTOR 2SD2396	
D932	8-719-210-21	DIODE 11EQS04		Q934	8-729-021-82	TRANSISTOR 2SD2396	
D933	8-719-210-21	DIODE 11EQS04		< RESISTOR >			
D934	8-719-987-63	DIODE 1N4148M		R300	1-249-415-11	CARBON 680 5% 1/4W	
D935	8-719-109-82	DIODE RD4. 7ES-B3		R301	1-249-417-11	CARBON 1K 5% 1/4W	
D936	8-719-987-63	DIODE 1N4148M		R302	1-249-417-11	CARBON 1K 5% 1/4W	
D937	8-719-114-30	DIODE RD5. 1JS-B2		R303	1-249-417-11	CARBON 1K 5% 1/4W	
< IC >				R304	1-249-417-11	CARBON 1K 5% 1/4W	
IC301	8-759-822-09	IC LB1641		R305	1-249-415-11	CARBON 680 5% 1/4W	
IC303	8-759-287-70	IC CXD8505Q		R306	1-247-895-00	CARBON 470K 5% 1/4W	
IC304	8-759-710-59	IC NJM4580D-D		R308	1-249-429-11	CARBON 10K 5% 1/4W	
IC305	8-749-921-12	IC GP1F32T		R312	1-249-417-11	CARBON 1K 5% 1/4W	
IC401	8-759-712-02	IC NJM2114D		R313	1-249-409-11	CARBON 220 5% 1/4W	
IC501	8-759-712-02	IC NJM2114D		R314	1-249-425-11	CARBON 4. 7K 5% 1/4W	
IC920	8-759-636-16	IC MS1957AL		R317	1-249-441-11	CARBON 100K 5% 1/4W	
IC930	8-759-710-59	IC NJM4580D-D		R401	1-249-435-11	CARBON 33K 5% 1/4W	
IC931	8-759-710-59	IC NJM4580D-D		R402	1-249-435-11	CARBON 33K 5% 1/4W	
< JACK >				R403	1-249-435-11	CARBON 33K 5% 1/4W	
J301	1-569-443-21	JACK, PIN 4P (LINE OUT) (VARIABLE, FIXED)		R404	1-249-435-11	CARBON 33K 5% 1/4W	
< COIL >				R405	1-249-432-11	CARBON 18K 5% 1/4W	
L301	1-410-322-11	INDUCTOR 3. 3uH		R406	1-249-432-11	CARBON 18K 5% 1/4W	
L302	1-410-322-11	INDUCTOR 3. 3uH		R407	1-249-433-11	CARBON 22K 5% 1/4W	
L303	1-410-503-11	INDUCTOR 3. 3uH		R408	1-249-433-11	CARBON 22K 5% 1/4W	
L304	1-410-507-11	INDUCTOR 6. 8uH		R409	1-247-830-11	CARBON 910 5% 1/4W	
L305	1-412-473-21	INDUCTOR 0uH		R410	1-249-420-11	CARBON 1. 8K 5% 1/4W	
L306	1-412-473-21	INDUCTOR 0uH		R411	1-247-891-00	CARBON 330K 5% 1/4W	
L307	1-410-322-11	INDUCTOR 3. 3uH		R412	1-249-409-11	CARBON 220 5% 1/4W	
L308	1-410-322-11	INDUCTOR 3. 3uH		R413	1-249-409-11	CARBON 220 5% 1/4W	
L309	1-412-473-21	INDUCTOR 0uH		R414	1-249-393-11	CARBON 10 5% 1/4W	
L310	1-412-473-21	INDUCTOR 0uH		R415	1-249-409-11	CARBON 220 5% 1/4W	
L663	1-412-473-21	INDUCTOR 0uH		R416	1-249-409-11	CARBON 220 5% 1/4W	
< TRANSISTOR >				R417	1-249-425-11	CARBON 4. 7K 5% 1/4W	
Q301	8-729-900-65	TRANSISTOR DTA144ES		R418	1-249-441-11	CARBON 100K 5% 1/4W	
Q401	8-729-231-55	TRANSISTOR 2SC2878-AB		R419	1-249-425-11	CARBON 4. 7K 5% 1/4W	
Q403	8-729-231-55	TRANSISTOR 2SC2878-AB		R420	1-247-826-00	CARBON 620 5% 1/4W	
Q404	8-729-900-65	TRANSISTOR DTA144ES		R451	1-249-435-11	CARBON 33K 5% 1/4W	
Q501	8-729-231-55	TRANSISTOR 2SC2878-AB		R452	1-249-435-11	CARBON 33K 5% 1/4W	
				R453	1-249-429-11	CARBON 10K 5% 1/4W	
				R454	1-249-435-11	CARBON 33K 5% 1/4W	
				R455	1-249-402-11	CARBON 56 5% 1/4W	
				R501	1-249-435-11	CARBON 33K 5% 1/4W	
				R502	1-249-435-11	CARBON 33K 5% 1/4W	

MAIN

SWITCH

TRANSFORMER

VOL

Ref. No.	Part No.	Description	Remark
R503	1-249-435-11	CARBON 33K 5% 1/4W	
R504	1-249-435-11	CARBON 33K 5% 1/4W	
R505	1-249-432-11	CARBON 18K 5% 1/4W	
R506	1-249-432-11	CARBON 18K 5% 1/4W	
R507	1-249-433-11	CARBON 22K 5% 1/4W	
R508	1-249-433-11	CARBON 22K 5% 1/4W	
R509	1-247-830-11	CARBON 910 5% 1/4W	
R510	1-249-420-11	CARBON 1.8K 5% 1/4W	
R511	1-247-891-00	CARBON 330K 5% 1/4W	
R512	1-249-409-11	CARBON 220 5% 1/4W	
R513	1-249-409-11	CARBON 220 5% 1/4W	
R514	1-249-393-11	CARBON 10 5% 1/4W	
R515	1-249-409-11	CARBON 220 5% 1/4W	
R516	1-249-409-11	CARBON 220 5% 1/4W	
R517	1-249-425-11	CARBON 4.7K 5% 1/4W	
R518	1-249-441-11	CARBON 100K 5% 1/4W	
R519	1-249-425-11	CARBON 4.7K 5% 1/4W	
R520	1-247-826-00	CARBON 620 5% 1/4W	
R541	1-249-435-11	CARBON 33K 5% 1/4W	
R542	1-249-435-11	CARBON 33K 5% 1/4W	
R543	1-249-429-11	CARBON 10K 5% 1/4W	
R544	1-249-435-11	CARBON 33K 5% 1/4W	
R545	1-249-402-11	CARBON 56 5% 1/4W	
R910	1-249-390-11	CARBON 5.6 5% 1/4W	
R911	1-249-390-11	CARBON 5.6 5% 1/4W	
R912	1-249-423-11	CARBON 3.3K 5% 1/4W	
R913	1-249-423-11	CARBON 3.3K 5% 1/4W	
R915	1-249-429-11	CARBON 10K 5% 1/4W	
R916	1-249-438-11	CARBON 56K 5% 1/4W	
R917	1-249-433-11	CARBON 22K 5% 1/4W	
R920	1-249-436-11	CARBON 39K 5% 1/4W	
R921	1-249-431-11	CARBON 15K 5% 1/4W	
R922	1-249-423-11	CARBON 3.3K 5% 1/4W	
R930	1-249-411-11	CARBON 330 5% 1/4W	
R931	1-249-421-11	CARBON 2.2K 5% 1/4W	
R932	1-249-436-11	CARBON 39K 5% 1/4W	
R933	1-247-807-31	CARBON 100 5% 1/4W	
R934	1-249-421-11	CARBON 2.2K 5% 1/4W	
R935	1-249-422-11	CARBON 2.7K 5% 1/4W	
R937	1-249-417-11	CARBON 1K 5% 1/4W	
R938	1-247-807-31	CARBON 100 5% 1/4W	
R939	1-249-425-11	CARBON 4.7K 5% 1/4W	
R940	1-249-423-11	CARBON 3.3K 5% 1/4W	
R941	1-249-428-11	CARBON 8.2K 5% 1/4W	
R942	1-249-425-11	CARBON 4.7K 5% 1/4W	
R943	1-249-425-11	CARBON 4.7K 5% 1/4W	
< VIBRATOR >			
X301	1-579-161-11	VIBRATOR, CRYSTAL (45.1584MHz)	

Ref. No.	Part No.	Description	Remark

*	1-655-765-11	SWITCH BOARD	

< CAPACITOR >			
C851	1-161-494-00	CERAMIC 0.022uF	25V
C852	1-161-494-00	CERAMIC 0.022uF	25V
< IC >			
IC851	8-741-810-59	IC SBX1610-59	
< SWITCH >			
S851	1-554-118-00	SWITCH, PUSH (1 KEY) (POWER)	

*	1-655-763-11	TRANSFORMER BOARD	

*	4-962-200-01	PLATE (TR), GROUND	
< CAPACITOR >			
C991	1-164-159-11	CERAMIC 0.1uF	50V
C992	1-164-159-11	CERAMIC 0.1uF	50V
C993	1-164-159-11	CERAMIC 0.1uF	50V
C994	1-164-159-11	CERAMIC 0.1uF	50V
< CONNECTOR >			
CN991	1-580-230-11	PIN, CONNECTOR (PC BOARD) 3P	
CN992	1-564-510-11	PLUG, CONNECTOR 7P	
< COIL >			
L991	1-412-473-21	INDUCTOR 0uH	
L992	1-412-473-21	INDUCTOR 0uH	
L993	1-412-473-21	INDUCTOR 0uH	
L994	1-412-473-21	INDUCTOR 0uH	
L995	1-412-473-21	INDUCTOR 0uH	
△L996	1-412-473-21	INDUCTOR 0uH	
△L997	1-412-473-21	INDUCTOR 0uH	

*	1-655-766-11	VOL BOARD	

*	4-962-201-01	PLATE (HP), GROUND	
< CAPACITOR >			
C351	1-124-443-00	ELECT 100uF 20%	10V
C352	1-161-494-00	CERAMIC 0.022uF	25V
C471	1-164-159-11	CERAMIC 0.1uF	50V

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	Remark	Ref.No.	Part No.	Description	Remark
C472	1-164-159-11	CERAMIC	0.1uF	50V	*	4-962-615-01	COVER, BATTERY (for RM-D820)
C473	1-164-159-11	CERAMIC	0.1uF	50V			
		< CONNECTOR >					
* CN351	1-568-942-11	PIN, CONNECTOR 4P					
CN461	1-750-452-11	CONNECTOR, FFC/FPC 11P					
		< IC >					
IC351	8-759-962-08	IC	BA6208				
		< JACK >					
J471	1-750-162-61	JACK (LARGE TYPE) (PHONES)					
		< RESISTOR >					
R352	1-249-417-11	CARBON	1K	5%	1/4W		
R353	1-249-417-11	CARBON	1K	5%	1/4W		
		< VARIABLE RESISTOR >					
RV461	1-223-875-11	RES, VAR (MOTOR DRIVING TYPE)					
		(LINE OUT, PHONE LEVEL)					

		MISCELLANEOUS					

3	1-751-947-11	WIRE (FLAT TYPE) (21 CORE)					
7	1-751-712-11	WIRE (FLAT TYPE) (11 CORE)					
58	1-696-760-11	WIRE (FLAT TYPE) (23 CORE)					
△151	8-848-144-11	OPTICAL PICK-UP BLOCK KSS-240A					
152	1-575-001-11	WIRE, FLAT TYPE (12 CORE)					
△CNP901	1-590-836-11	CORD, POWER					
J471	1-750-162-61	JACK (LARGE TYPE) (PHONES)					
M101	X-4917-523-3	MOTOR ASSY (SPINDLE MOTOR)					
M102	X-4917-504-1	MOTOR ASSY (SLED MOTOR)					
M151	A-4604-363-A	MOTOR (L) ASSY (LOADING MOTOR)					
RV461	1-223-875-11	RES, VAR (MOTOR DRIVING TYPE)					
		(LINE OUT, PHONE LEVEL)					
S101	1-572-085-11	SWITCH, LEAF (LIMIT SWITCH)					
S151	1-572-086-11	SWITCH, LEAF (LOAD OUT)					
S152	1-572-086-11	SWITCH, LEAF (LOAD IN)					
△T901	1-449-921-11	TRANSFORMER, POWER					

		ACCESSORIES & PACKING MATERIALS					

		1-473-125-11	REMOTE COMMANDER (RM-D820)				
		1-558-271-11	CORD, CONNECTION (AUDIO 108cm)				
		3-759-994-21	MANUAL, INSTRUCTION (ENGLISH)				
*		4-941-925-01	CUSHION				
		4-956-947-61	INDIVIDUAL CARTON				

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

CDP-XA1ES

SONY[®] SERVICE MANUAL

US Model

SUPPLEMENT-1

File this supplement with the service manual.

Subject : 1. Service parts changed
2. Circuit change
3. ELECTRICAL BLOCK CHECKING change (BU-5BD20)
4. BD BOARD change

(ECN-CD500671)

- The two of base unit BU-5BD10 and BU-5BD20 in the CD section are used for this model.
Refer to this service manual supplement-1 for the BD board of a set used BU-5BD20, and to the service manual is issued previously for the BD board of a set used BU-5BD10.

NOTE:

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

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

1. Service parts changed

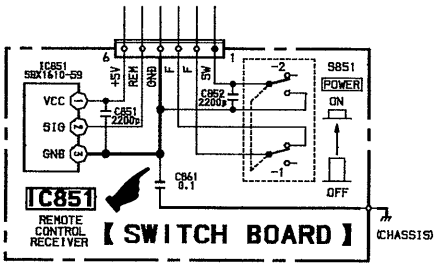
Page	FORMER			NEW		
	<u>Ref.No</u>	<u>Part No</u>	<u>Description</u>	<u>Ref.No</u>	<u>Part No</u>	<u>Description</u>
22		Not supplied.		15	4-925-334-11	EMBLEM (5-A), SONY
23	* 61	4-949-235-01	HOOK			

2. Circuit change

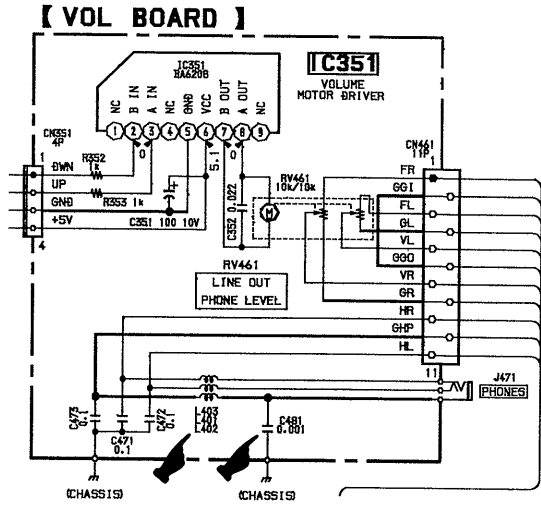
Page	FORMER			NEW		
	<u>Ref.No</u>	<u>Part No</u>	<u>Description</u>	<u>Ref.No</u>	<u>Part No</u>	<u>Description</u>
27		** DISPLAY BOARD **			** DISPLAY BOARD **	
	IC801	8-752-861-38	IC CXP82316-052Q	IC801	8-752-868-32	IC CXP82316-059Q
28		** MAIN BOARD **			** MAIN BOARD**	
	C401	1-126-101-11	ELECT 100uF 20% 16V	C393	1-162-294-31	CERAMIC 0.001uF 10% 50V
	C501	1-126-101-11	ELECT 100uF 20% 16V	C401	1-104-665-11	ELECT 100uF 20% 16V
	C932	1-126-101-11	ELECT 100uF 20% 16V	C501	1-104-665-11	ELECT 100uF 20% 16V
				C932	1-104-665-11	ELECT 100uF 20% 16V
				C951	1-126-963-11	ELECT 4.7uF 20% 50V
29	D937	8-719-114-30	DIODE RD5.1JS-B2	D937	8-719-114-26	DIODE RD4.7JS-B2
	IC303	8-759-287-70	IC CXD8505Q	IC303	8-759-334-75	IC CXD8505AQ
				L306	1-412-473-21	INDUCTOR 0uH
				L321	1-412-473-21	INDUCTOR 0uH
				L322	1-410-397-21	FERRITE BEAD INDUCTOR
	R314	1-249-425-11	CARBON 4.7K 5% 1/4W	R314	1-249-429-11	CARBON 10K 5% 1/4W
				R341	1-249-411-11	CARBON 330 5% 1/4W
30	R920	1-249-436-11	CARBON 39K 5% 1/4W	R920	1-249-434-11	CARBON 27K 5% 1/4W
		** SWITCH BOARD **			** SWITCH BOARD **	
				C861	1-164-159-11	CERAMIC 0.1uF 50V
				* NO861	1-690-880-21	LEAD (WITH CONNECTOR)
31		** VOL BOARD **			** VOL BOARD **	
				C481	1-162-294-31	CERAMIC 0.001uF 10% 50V
				L401	1-412-473-21	INDUCTOR 0uH
				L402	1-412-473-21	INDUCTOR 0uH
				L403	1-412-473-21	INDUCTOR 0uH

SCHEMATIC DIAGRAM
: Added portion

Location : M-6 to M-8

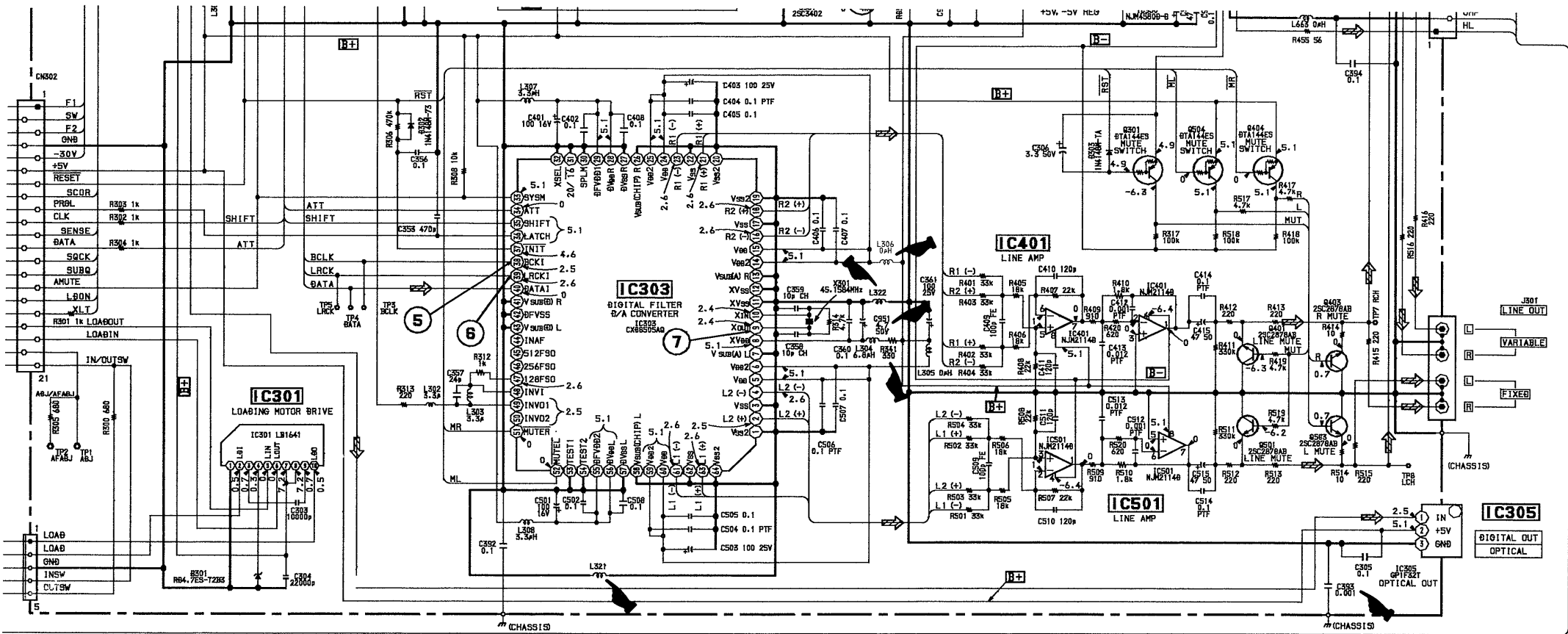


Location : K-8 to K-10



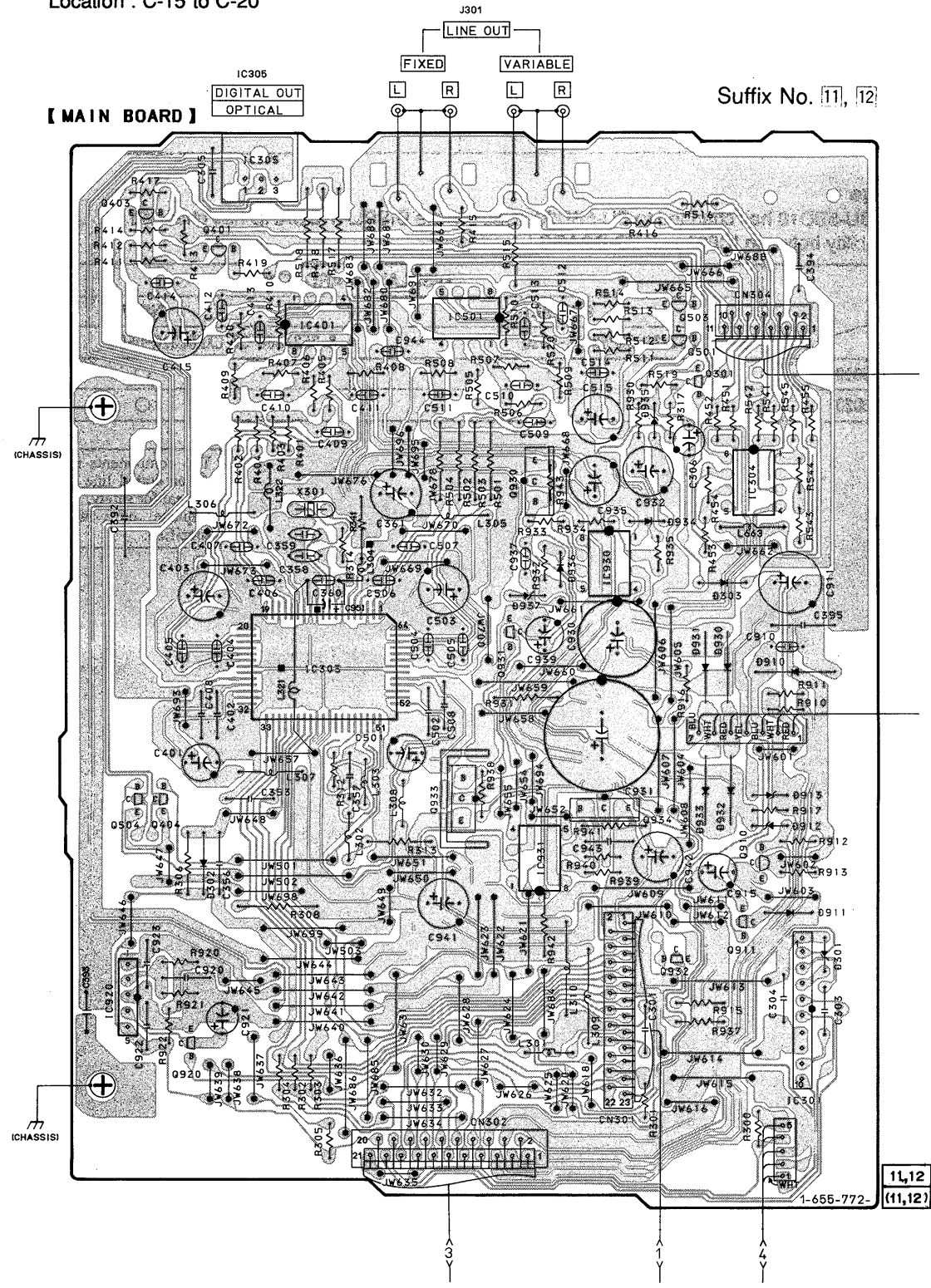
Location : J-12 to J-23

【 MAIN BOARD 】

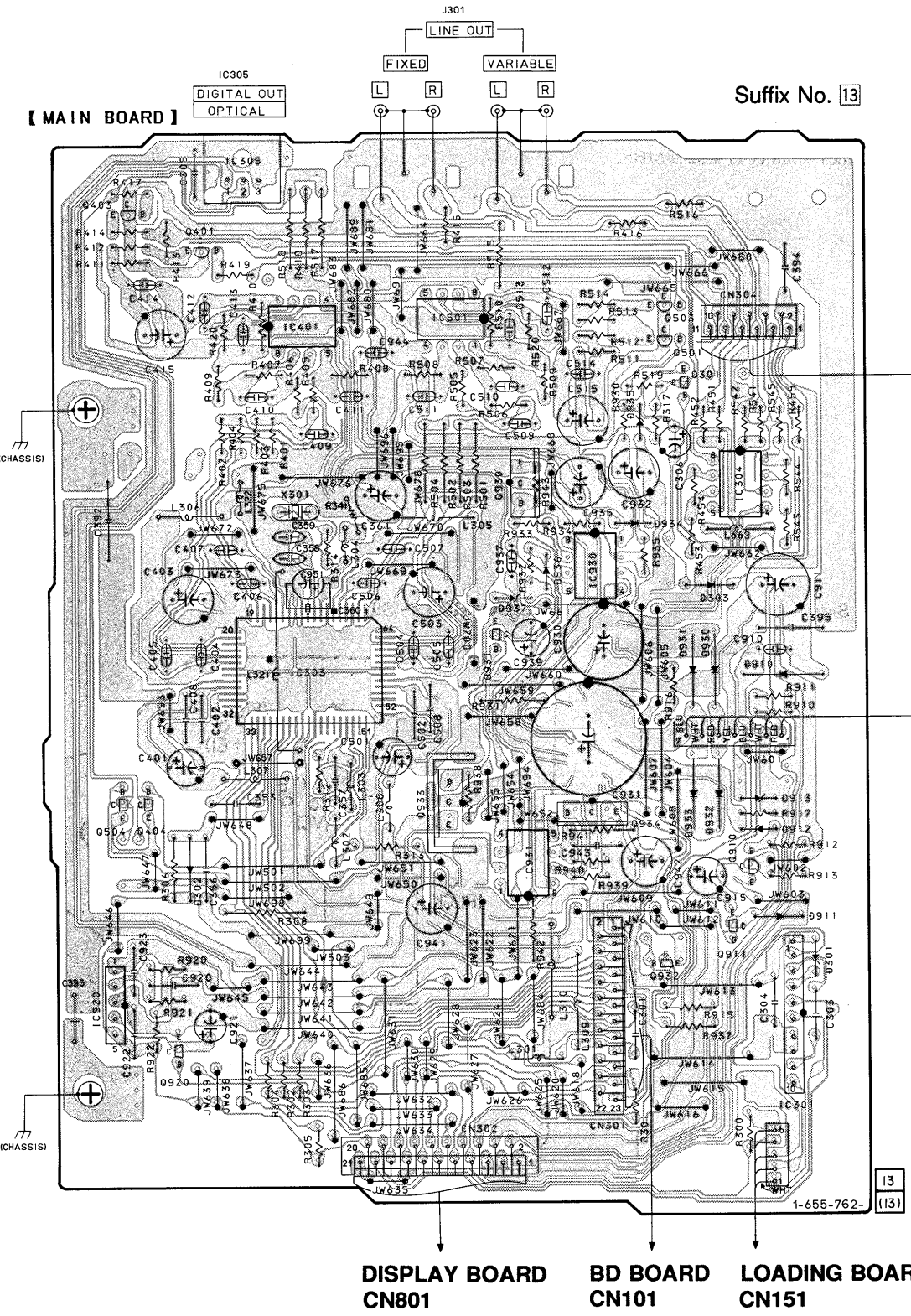


PRINTED WIRING BOARD

Location : C-15 to C-20



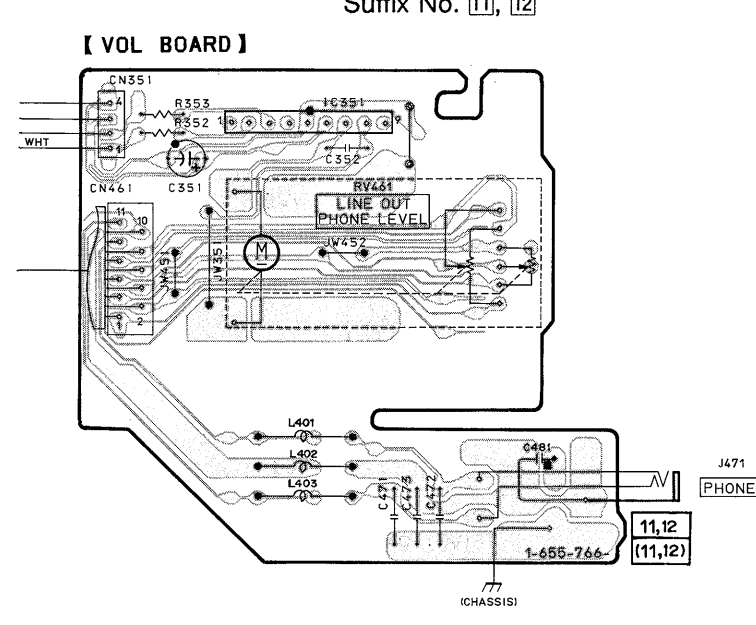
Suffix No. 13



DISPLAY BOARD CN801
BD BOARD CN101
LOADING BOARD CN151

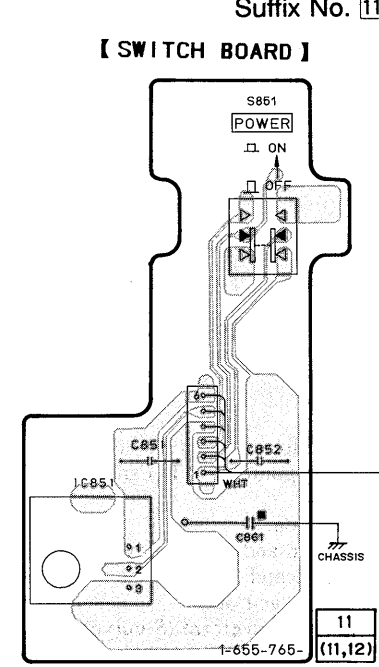
Location : B-21 to B-24

Suffix No. 11, 12



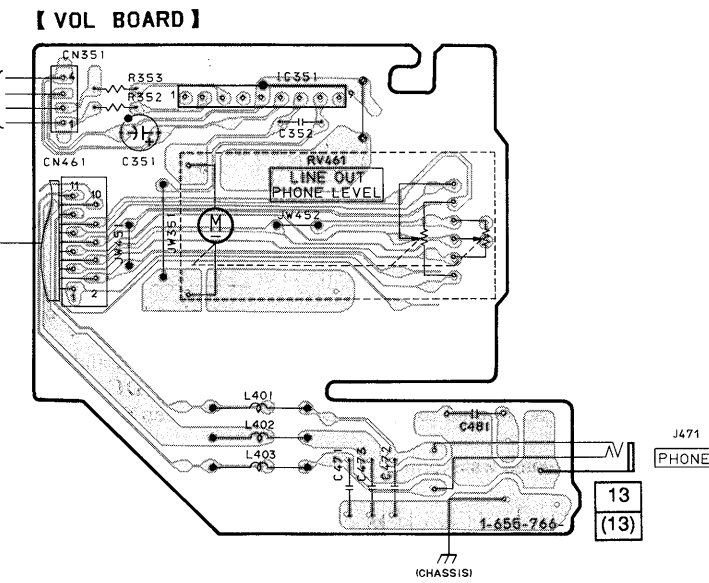
Location : C-11 to C-12

Suffix No. 11

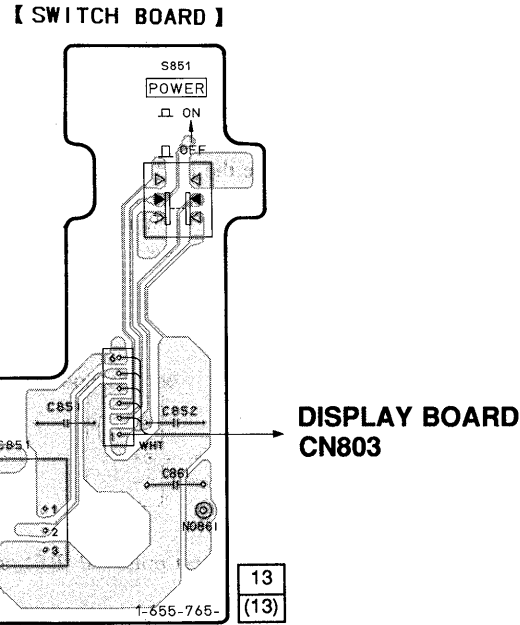


Suffix No. 13

TRANSFORMER BOARD CN992
DISPLAY BOARD CN802
MAIN BOARD CN304



Suffix No. 13



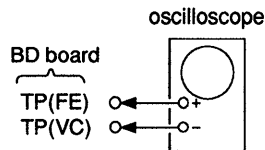
DISPLAY BOARD CN803

3. ELECTRICAL BLOCK CHECKING (for BU-5BD20)

Note :

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

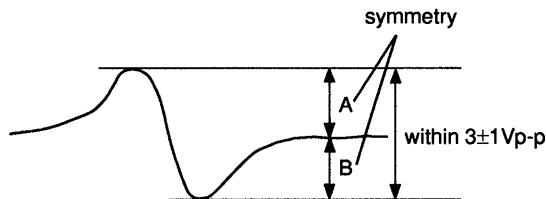
S Curve Check



Procedure :

1. Connect oscilloscope to test point TP (FE) on BD board.
2. Connect between test point TP (FEI) and TP (VC) by lead wire.
3. Turned Power switch on.
4. Put disc (YEDS-18) in and turned Power switch on again and actuate the focus search. (actuate the focus search when disc table is moving in and out.)
5. Check the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within $3 \pm 1 \text{ Vp-p}$.

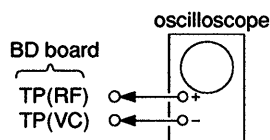
S-curve waveform



6. 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.

RF Level Check



Procedure :

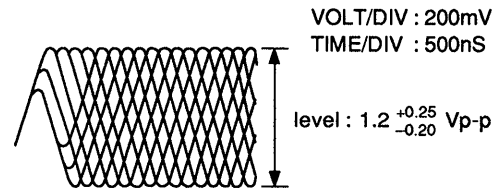
1. Connect oscilloscope to test point TP (RF) on BD board.
2. Turned Power switch on.

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.

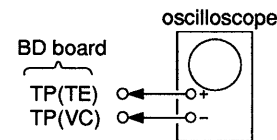
Note :

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

RF signal waveform



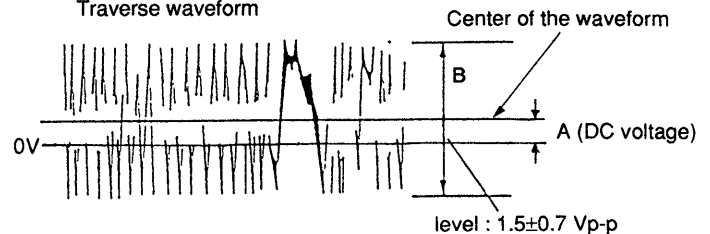
E-F Balance Check



Procedure :

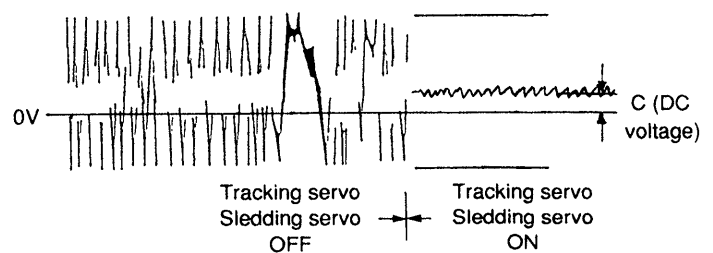
1. Connect test point TP (ADJ) to ground with lead wire.
2. Connect oscilloscope to test point TP (TE) on BD board.
3. Turned Power switch on.
4. Put disc (YEDS-18) in to play the number five track.
5. Press the CHECK button. (The tracking servo and the sledding servo are turned OFF.)
6. Check the level B of the oscilloscope's waveform and the A (DC voltage) of the center of the Traverse waveform. Confirm the following :
 $A/B \times 100 = \text{less than } \pm 20\%$.

Traverse waveform



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

Traverse waveform

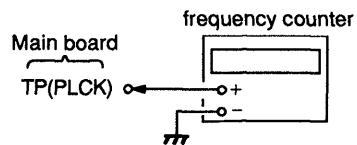


8. Disconnect the laed wire of TP (ADJ) connected in step 1.

RF PLL Free-run Frequency Check

Procedure :

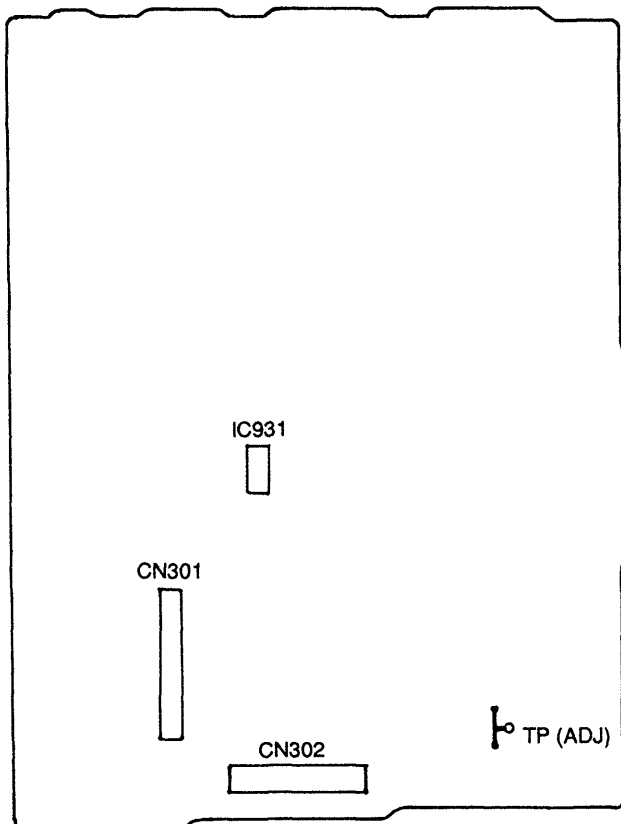
1. Connect frequency counter to test point (PLCK) with lead wire.



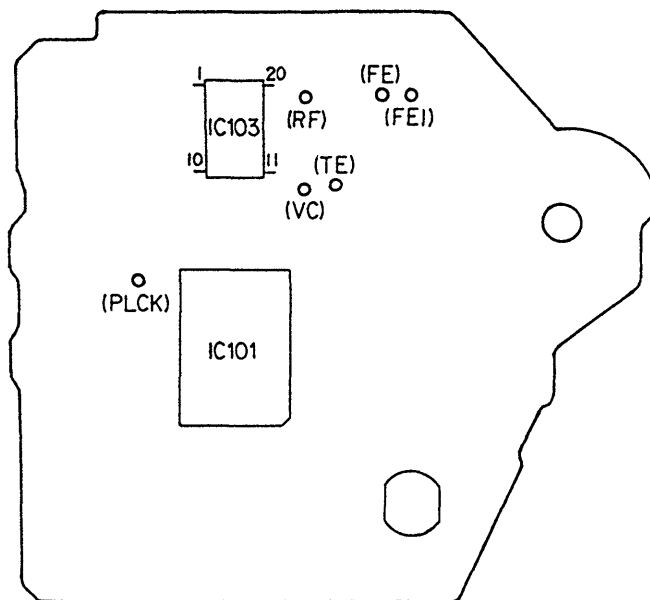
2. Turned Power switch on.
3. Put the disc (YEDS-18) in to play the number five track. Confirm that reading on frequency counter is 4.3218MHz.

Adjustment Location :

[MAIN BOARD] — Component Side —



[BD BOARD] — SIDE A —



4. BD BOARD change

BU-5BD20 DIFFERENCE TABLE

Page	BU-5BD10B			BU-5BD20		
	Ref.No	Part No	Description	Ref.No	Part No	Description
25	△151	8-848-144-11	OPTICAL PICK-UP KSS-240A	△151	8-848-367-11	OPTICAL PICK-UP KSS-213B/K-N
	152	1-575-001-11	WIRE, FLAT TYPE (12 CORE)	152	1-769-069-11	WIRE (FLAT TYPE) (16 CORE)
	* 157	A-4673-432-A	BD BOARD, COMPLETE	* 157	A-4673-509-A	BD BOARD, COMPLETE

• Base Unit Change

As the base unit BU-5BD10 has changed to BU-5BD20, IC801 of the DISPLAY BOARD has changed.

The interchangeability between IC801 and BD BOARD is as below:

		DISPLAY BOARD IC801	
		FORMER	NEW
		8-752-861-38 CXP82316-052Q	8-752-868-32 CXP82316-059Q
Base Unit Type	BU-5BD10	○	○
	BU-5BD20	×	○

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

IC PIN FUNCTIONS

• IC101 (CXD2545Q)

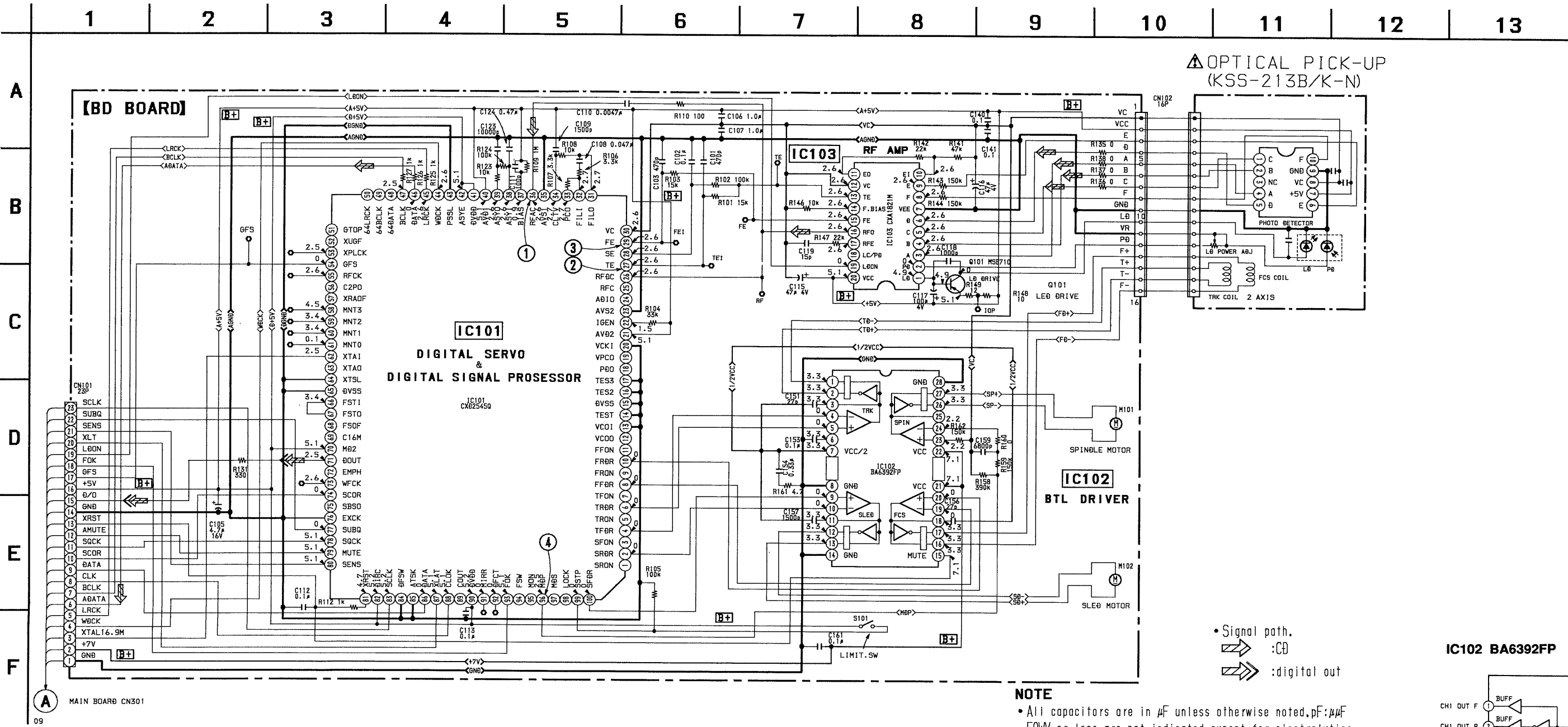
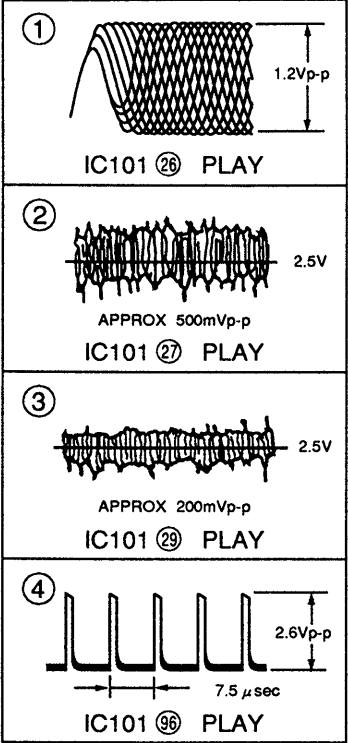
Pin No.	Pin Name	I/O	Function
1	SRON	O	Sled drive output (Not used)
2	SRDR	O	Sled drive output
3	SFON	O	Sled drive output (Not used)
4	TFDR	O	Tracking drive output
5	TRON	O	Tracking drive output (Not used)
6	TRDR	O	Tracking drive output
7	TFON	O	Tracking drive output (Not used)
8	FFDR	O	Focus drive output
9	FRON	O	Focus drive output (Not used)
10	FRDR	O	Focus drive output
11	FFON	O	Focus drive output (Not used)
12	VCOO	O	VCO output for analog EFM PLL (Not used)
13	VCOI	I	VCO output for analog EFM PLL (GND)
14	TEST	I	TEST pin connected normally to GND
15	DVss	—	Digital GND
16	TES2	I	TEST pin connected normally to GND
17	TES3	I	TEST pin connected normally to GND
18	PDO	O	Charge-pump output for analog EFM PLL (Not used)
19	VPCO	O	Charge-pump output for variable pitch PLL (Not used)
20	VCKI	I	Clock input from variable pitch external VCO (GND)
21	AVD2	—	Analog power supply
22	IGEN	I	Power supply pin for operational amplifiers
23	AVS2	—	Analog GND
24	ADIO	I	(Not used)
25	RFC	O	(Not used)
26	RFDC	I	RF signal input
27	TE	I	Tracking error signal input
28	SE	I	Sled error signal input
29	FE	I	Focus error signal input
30	VC	I	Center voltage input pin
31	FILO	O	Filter output for master PLL
32	FILI	I	Filter input for master PLL
33	PCO	O	Charge-pump output for master PLL
34	CLTV	I	Control voltage input for master VCO
35	AVS1	—	Analog GND
36	RFAC	I	EFM signal input
37	BIAS	I	Asymmetry circuit constant current input
38	ASYI	I	Asymmetry compare voltage input
39	ASYO	O	EFM full swing output
40	AVD1	—	Analog power supply

Pin No.	Pin Name	I/O	Function
41	DVDD	—	Digital power supply
42	ASYE	I	Asymmetry circuit ON/OFF
43	PSSL	I	Audio data output mode selection input
44	WDCK	O	48-bit slot D/A interface. Word clock
45	LRCK	O	48-bit slot D/A interface. LR clock
46	DATA	O	DA 16 output when PSSL=1. 48-bit slot serial data when PSSL=0
47	BCLK	O	DA 15 output when PSSL=1. 48-bit slot data when PSSL=0
48	64DATA	O	DA 14 output when PSSL=1. 64-bit slot data when PSSL=0 (Not used)
49	64BCLK	O	DA 13 output when PSSL=1. 64-bit slot data when PSSL=0 (Not used)
50	64LRCK	O	DA 12 output when PSSL=1. 64-bit slot data when PSSL=0 (Not used)
51	GTOP	O	DA 11 output when PSSL=1. GTOP output when PSSL=0 (Not used)
52	XUGF	O	DA 10 output when PSSL=1. XUGF output when PSSL=0 (Not used)
53	XPLCK	O	DA 09 output when PSSL=1. XPLCK output when PSSL=0
54	GFS	O	DA 08 output when PSSL=1. GFS output when PSSL=0
55	PFCK	O	DA 07 output when PSSL=1. RFCK output when PSSL=0
56	C2PO	O	DA 06 output when PSSL=1. C2PO output when PSSL=0 (Not used)
57	XRAOF	O	DA 05 output when PSSL=1. XRA0F output when PSSL=0
58	MNT3	O	DA 04 output when PSSL=1. MNT3 output when PSSL=0
59	MNT2	O	DA 03 output when PSSL=1. MNT2 output when PSSL=0
60	MNT1	O	DA 02 output when PSSL=1. MNT1 output when PSSL=0
61	MNT0	O	DA 01 output when PSSL=1. MNT0 output when PSSL=0
62	XTAI	I	X'tal oscillator circuit input
63	XTAO	O	X'tal oscillator circuit output (Not used)
64	XTSL	I	X'tal selection input pin (GND)
65	DVss	—	Digital GND
66	FSTI	I	2/3 divider output of pins 62, 63
67	FSTO	O	2/3 divider output of pins 62, 63
68	FSOF	O	(Not used)
69	C16M	O	16.9344 MHz output (Not used)
70	MD2	I	Digital-out ON/OFF control pin (+5V)
71	DOUT	O	Digital-out output pin
72	EMPH	O	Playback disc output in emphasis mode (Not used)
73	WFCK	O	WFCK output
74	SCOR	O	Sub-code sync output
75	SBSO	O	Sub-P through Sub-W serial output (Not used)
76	EXCK	I	Clock input for SBS0 read-out (GND)
77	SUBQ	O	Sub-Q 80-bit output
78	SQCK	I	Clock input for SQS0 read-out
79	MUTE	I	Muting selection pin
80	SENS	O	SENS output
81	XRST	I	System reset
82	DIRC	I	Used in 1-track jump mode (+5V)
83	SCLK	I	SENS serial data read-out clock
84	DFSW	I	DFCT selection pin (GND)
85	ATSK	I	Input pin for anti-shock (GND)

Pin No.	Pin Name	I/O	Function
86	DATA	I	Serial data input, supplied from CPU
87	XLAT	I	Latch input, supplied from CPU
88	CLOCK	I	Serial data transfer clock input, supplied from CPU
89	COUT	O	Numbers of track counted signal output (Not used)
90	DVDD	—	Digital power supply
91	MIRR	O	Mirror signal output
92	DFCT	O	Defect signal output
93	FOK	O	Focus OK output
94	FSW	O	Output to select spindle motor output filter (Not used)
95	MON	O	Output to control ON/OFF of spindle motor (Not used)
96	MDP	O	Output to control spindle motor servo
97	MDS	O	Output to control spindle motor servo (Not used)
98	LOCK	O	GFS is sampled by 460 Hz. H when GFS is H (Not used)
99	SSTP	I	Input signal to detect disc inner most track
100	SFDR	O	Sled drive output

SCHEMATIC DIAGRAM

Waveforms



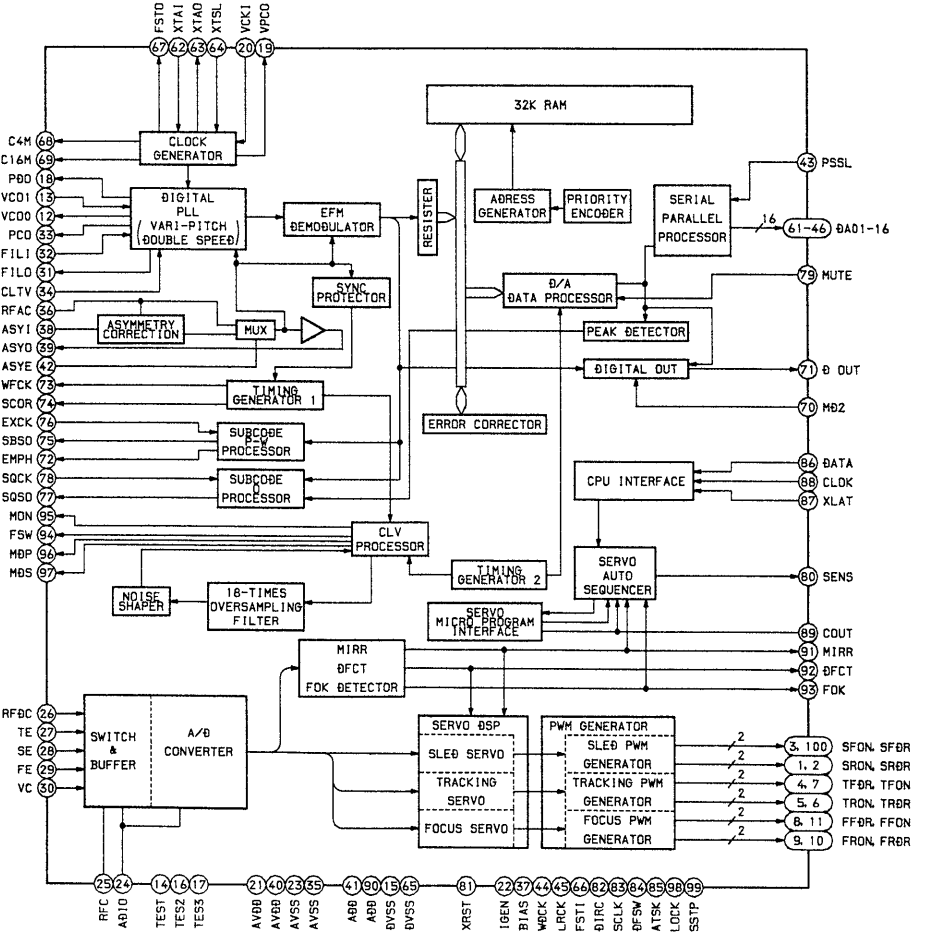
NOTE

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

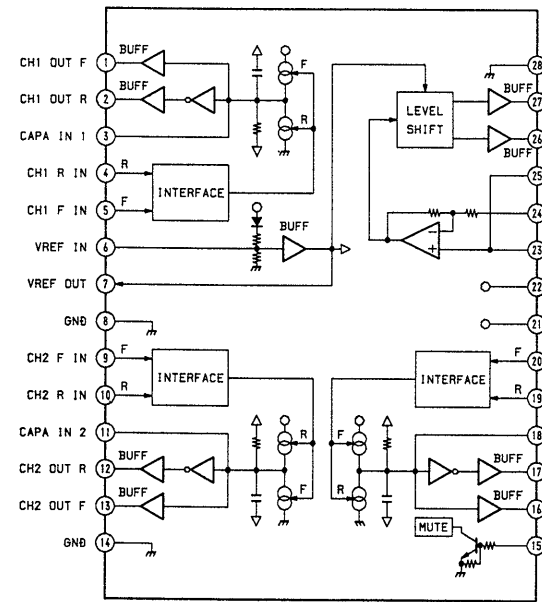
Note: The components identified by mark $\triangle$ or dotted line with mark $\triangle$ are critical for safety. Replace only with part number specified.

- B+** :B+ Line.
- Voltages and waveforms are dc with respect to ground under no-signal conditions, no mark:STOP
- Voltages are taken with a VOM (Input impedance: $10\text{M}\Omega$). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.

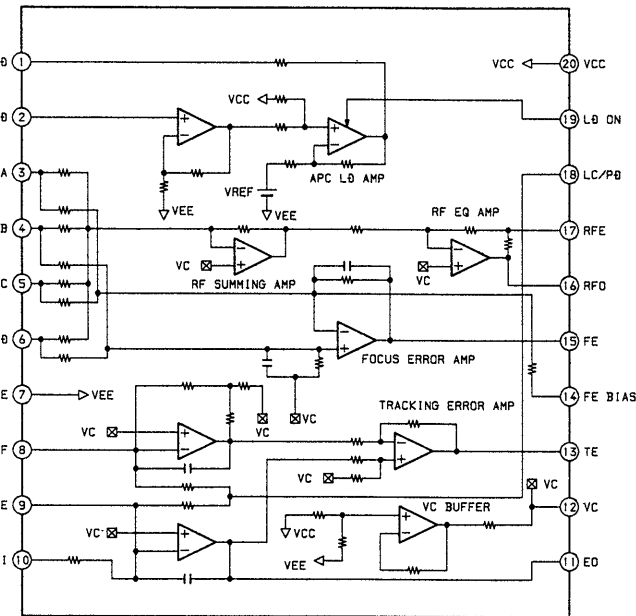
IC Block Diagrams
IC101 CXD2545Q



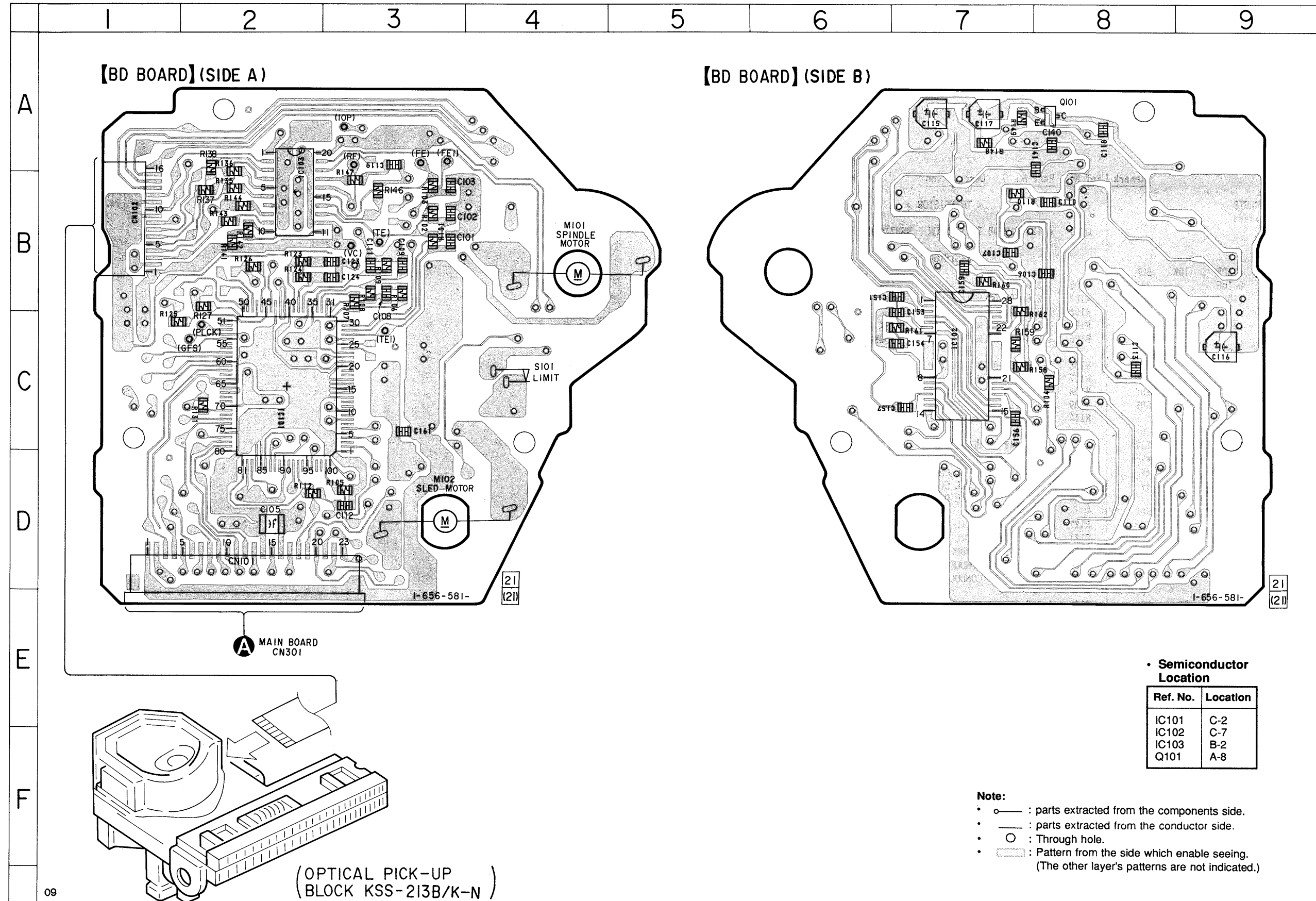
IC102 BA6392FP



IC103 CXA1821M



PRINTED WIRING BOARD — BD SECTION —



ELECTRICAL PARTS LIST

NOTE:

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.
- 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-4673-509-A	BD BOARD, COMPLETE *****				< TRANSISTOR >	
		< CAPACITOR >		Q101	8-729-010-08	TRANSISTOR MSB710-R	
						< RESISTOR >	
C101	1-163-005-11	CERAMIC CHIP 470PF 10%	50V	R101	1-216-077-00	METAL CHIP 15K 5%	1/10W
C102	1-163-038-91	CERAMIC CHIP 0.1uF	25V	R102	1-216-097-00	METAL CHIP 100K 5%	1/10W
C103	1-163-005-11	CERAMIC CHIP 470PF 10%	50V	R103	1-216-077-00	METAL CHIP 15K 5%	1/10W
C105	1-135-155-21	TANTALUM CHIP 4.7uF 10%	16V	R104	1-216-085-00	METAL CHIP 33K 5%	1/10W
C106	1-164-346-11	CERAMIC CHIP 1uF	16V	R105	1-216-097-00	METAL CHIP 100K 5%	1/10W
C107	1-164-346-11	CERAMIC CHIP 1uF	16V	R106	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
C108	1-163-035-00	CERAMIC CHIP 0.047uF	50V	R107	1-216-061-00	METAL CHIP 3.3K 5%	1/10W
C109	1-163-145-00	CERAMIC CHIP 0.0015uF 5%	50V	R108	1-216-073-00	METAL CHIP 10K 5%	1/10W
C110	1-163-017-00	CERAMIC CHIP 0.0047uF 5%	50V	R109	1-216-121-00	METAL CHIP 1M 5%	1/10W
C111	1-163-251-11	CERAMIC CHIP 100PF 5%	50V	R110	1-216-025-91	METAL GLAZE 100 5%	1/10W
C112	1-163-038-91	CERAMIC CHIP 0.1uF	25V	R112	1-216-049-91	METAL GLAZE 1K 5%	1/10W
C113	1-163-038-91	CERAMIC CHIP 0.1uF	25V	R123	1-216-073-00	METAL CHIP 10K 5%	1/10W
C115	1-126-607-11	ELECT CHIP 47uF 20%	4V	R124	1-216-097-00	METAL CHIP 100K 5%	1/10W
C116	1-126-607-11	ELECT CHIP 47uF 20%	4V	R125	1-216-049-91	METAL GLAZE 1K 5%	1/10W
C117	1-126-209-11	ELECT 100uF 20%	4V	R126	1-216-049-91	METAL GLAZE 1K 5%	1/10W
C118	1-163-275-11	CERAMIC CHIP 0.001uF 5%	50V	R127	1-216-049-91	METAL GLAZE 1K 5%	1/10W
C119	1-163-097-00	CERAMIC CHIP 15PF 5%	50V	R131	1-216-037-00	METAL CHIP 330 5%	1/10W
C123	1-164-232-11	CERAMIC CHIP 0.01uF	50V	R135	1-216-295-91	CONDUCTOR, CHIP (2012)	
C124	1-164-005-11	CERAMIC CHIP 0.47uF	25V	R136	1-216-295-91	CONDUCTOR, CHIP (2012)	
C140	1-163-038-91	CERAMIC CHIP 0.1uF	25V	R137	1-216-295-91	CONDUCTOR, CHIP (2012)	
C141	1-163-038-91	CERAMIC CHIP 0.1uF	25V	R138	1-216-295-91	CONDUCTOR, CHIP (2012)	
C151	1-163-237-11	CERAMIC CHIP 27PF 5%	50V	R141	1-216-089-00	METAL CHIP 47K 5%	1/10W
C153	1-163-038-91	CERAMIC CHIP 0.1uF	25V	R142	1-216-081-00	METAL CHIP 22K 5%	1/10W
C154	1-164-336-11	CERAMIC CHIP 0.33uF	25V	R143	1-216-101-00	METAL CHIP 150K 5%	1/10W
C156	1-163-237-11	CERAMIC CHIP 27PF 5%	50V	R144	1-216-101-00	METAL CHIP 150K 5%	1/10W
C157	1-163-145-00	CERAMIC CHIP 0.0015uF 5%	50V	R146	1-216-073-00	METAL CHIP 10K 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	METAL GLAZE 12 5%	1/10W
CN101	1-770-072-11	CONNECTOR (FFC) 23P		R158	1-216-111-00	METAL CHIP 390K 5%	1/10W
CN102	1-770-014-11	CONNECTOR, FFC/FPC 16P		R159	1-216-101-00	METAL CHIP 150K 5%	1/10W
		< IC >		R160	1-216-295-91	CONDUCTOR, CHIP (2012)	
IC101	8-752-369-78	IC CXD2545Q		R161	1-216-308-00	METAL CHIP 4.7 5%	1/10W
IC102	8-759-176-09	IC BA6392FP		R162	1-216-101-00	METAL CHIP 150K 5%	1/10W
IC103	8-752-072-45	IC CXA1821M-T6				< SWITCH >	
		< MOTOR >		S101	1-572-085-11	SWITCH, LEAF (LIMIT)	
M101	X-4917-523-4	BASE (OUTSERT) ASSY (SPINDLE)				*****	
M102	X-4917-504-1	MOTOR ASSY (SLED)				*****	

