

CDP-CA8ES/CA9ES

SERVICE MANUAL

US Model
Canadian Model
CDP-CA8ES/CA9ES
AEP Model
E Model
CDP-CA8ES

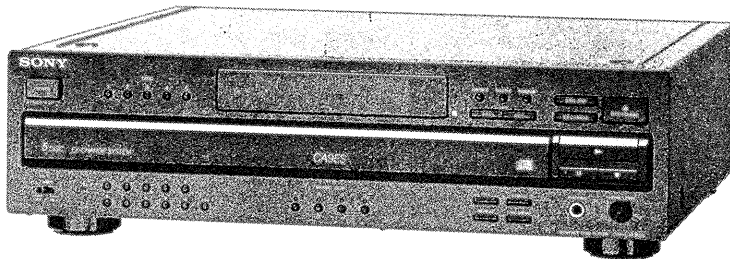


Photo: CDP-CA9ES

Model Name Using Similar Mechanism	CDP-C545
Base Unit Name	BU-5BD10B
Optical Pick-Up Block Type	KSS-240A

SPECIFICATIONS

Compact disc player

Laser	Semiconductor laser
Wavelength	780 – 790 nm
Frequency response	2 Hz to 20 kHz $\pm$ 0.3 dB
Signal-to-noise ratio	More than 117 dB
Dynamic range	More than 100 dB
Harmonic distortion	CDP-CA9ES: Less than 0.0023% CDP-CA8ES: Less than 0.0025%
Channel separation	More than 110 dB

Output

	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	15 mW	32 ohms

General

Power requirements	120 V AC, 60 Hz
Power consumption	CDP-CA9ES: 17 W CDP-CA8ES: 15 W
Dimensions (approx.) (w/h/d)	430 $\times$ 125 $\times$ 400 mm (17 $\times$ 5 $\times$ 15 3/4 in.) incl. projecting parts
Mass (approx.)	CDP-CA9ES: 7.5 kg (16 lbs 9 oz) CDP-CA8ES: 7.0 kg (15 lbs 7 oz)

Supplied accessories

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

Design and specifications are subject to change without notice.

COMPACT DISC PLAYER
SONY®



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

The laser diode in the optical pick-up block may suffer electrostatic breakdown because of the potential difference generated by the charged electrostatic load, etc. on clothing and the human body.

During repair, pay attention to electrostatic breakdown and also use the procedure in the printed matter which is included in the repair parts.

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

NOTES ON LASER DIODE EMISSION CHECK

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

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

CLASS 1 LASER PRODUCT
LUOKAN 1 LASERLAITE
KLASS 1 LASERAPPARAT

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

CAUTION	: INVISIBLE LASER RADIATION WHEN OPEN AVOID EXPOSURE TO BEAM
ADVARSEL	: USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSÆTTELSE FOR STRÅLING
VARO!	: AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTIINA LASERSÄTEILYLLE
VARNING	: LASERSTRÅLING NÅR DENNA DEL ÄR ÖPPNAD OCH SPARREN ÄR URKOPPLAD
ADVARSEL	: USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES UNNGÅ EKSPONERING FOR STRÅLEN

This caution
label is located
inside the unit.

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

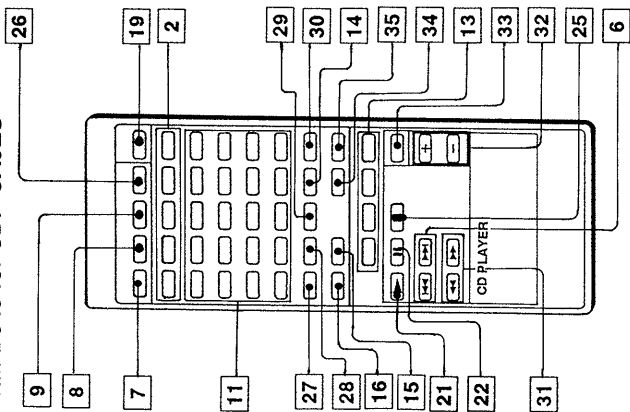
ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

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

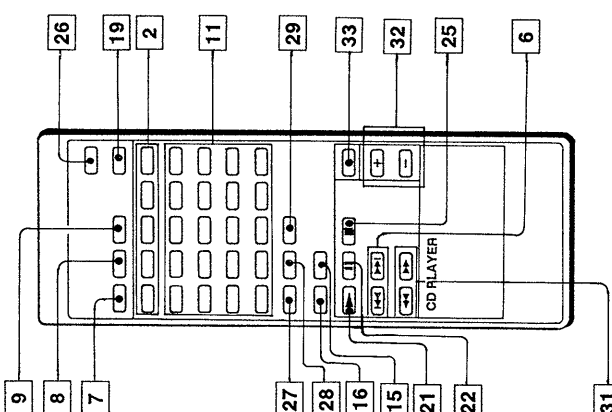
This section is extracted from instruction manual.

SECTION 1 GENERAL

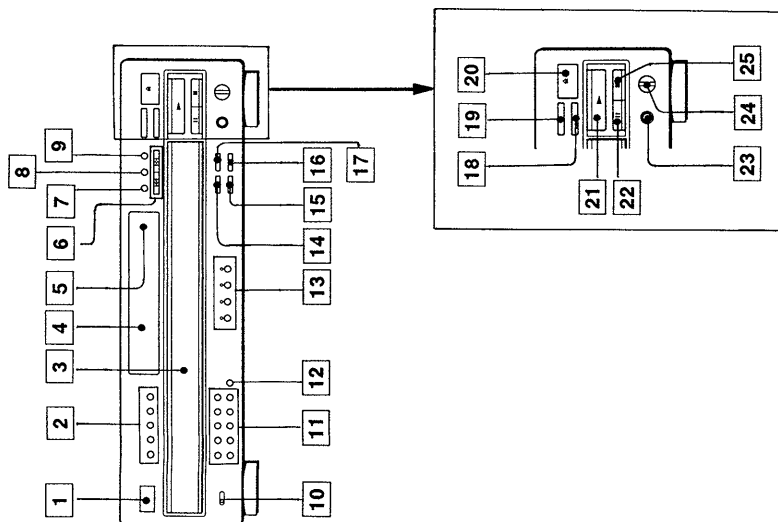
RM-D645 for CDP-CA9ES



RM-D515 for CDP-CA8ES



• Parts Identification

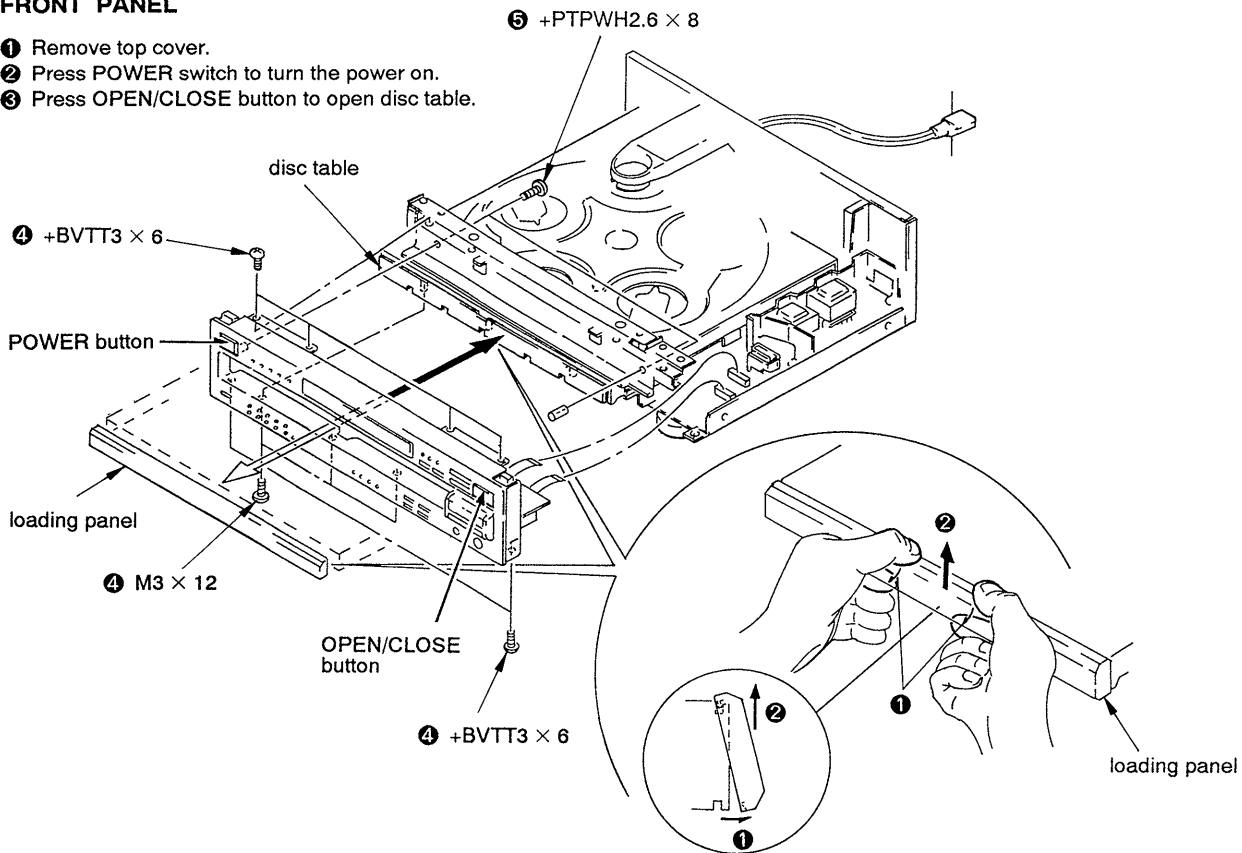


SECTION 2 DISASSEMBLY

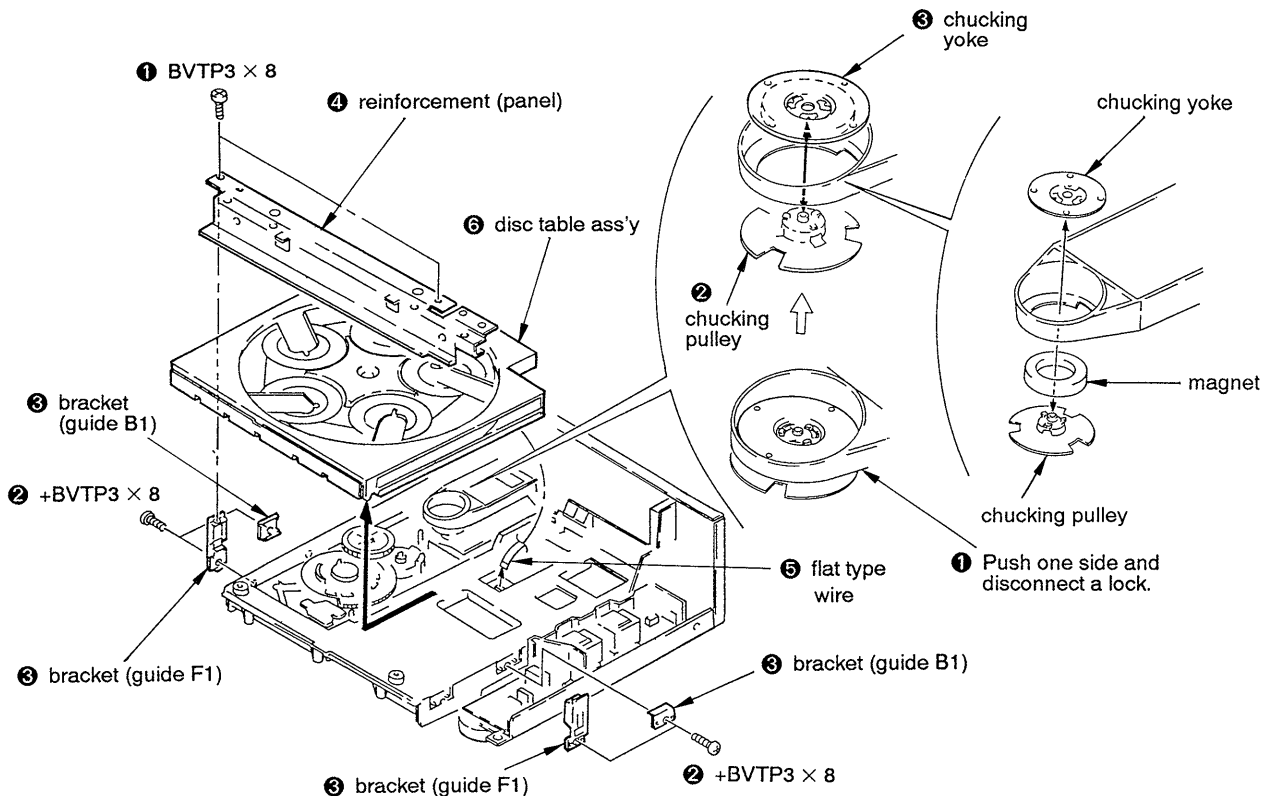
Note: Follow the disassembly procedure in the numerical order given.

FRONT PANEL

- ① Remove top cover.
- ② Press POWER switch to turn the power on.
- ③ Press OPEN/CLOSE button to open disc table.



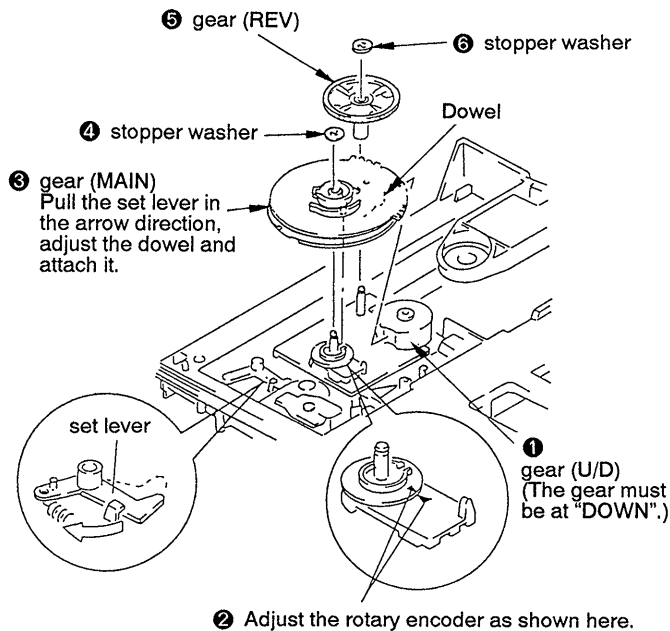
DISC TABLE ASS'Y



SECTION 3 MECHANICAL ADJUSTMENT

Positioning the Encoder when Attaching the Gear (Main)

The position of the rotary encoder must be adjusted when attaching the gear (MAIN). If its position is not adjusted properly, problem may occur afterwards during operation.

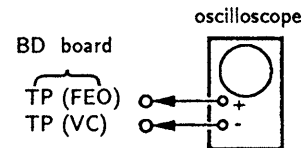


SECTION 4 ELECTRICAL BLOCK CHECKING

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 the oscilloscope with more than $10M\Omega$ 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.

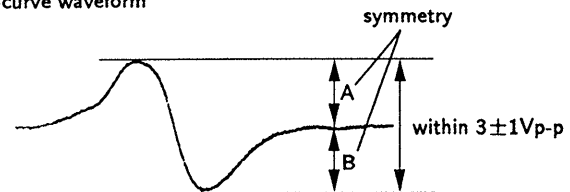
S-Curve Check



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.
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 $3\pm 1V_{p-p}$.

S-curve waveform

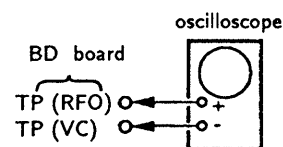


6. After check, remove the lead wire connected in step 2.

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



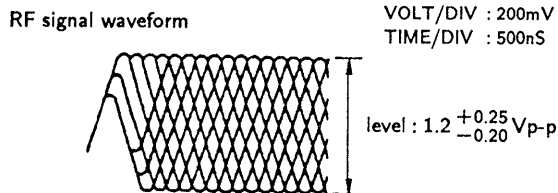
Procedure :

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

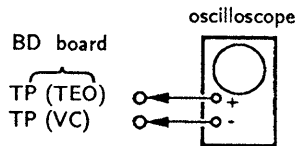
- Put disc (YEDS-18) in and playback.
- Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

Note :

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



E-F Balance Check



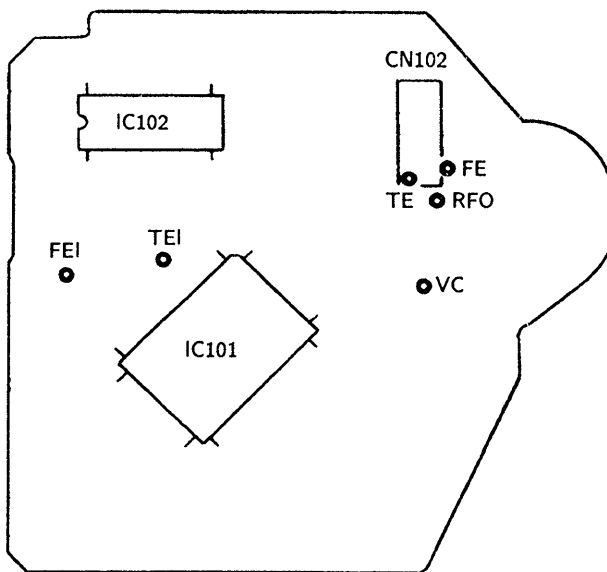
Procedure :

- Connect test point TP (ADJ) to ground and TP (TES) to TP (VC) with lead wire.
- Connect oscilloscope to test point TP (TEO) on BD board.

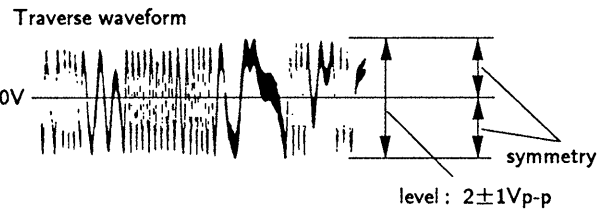
Adjustment Location :

【BD BOARD】

- Conductor side -



- Turned Power switch on.
- Put disc (YEDS-18) in and playback.
- Confirm that the oscilloscope waveform is symmetrical on the top and bottom in relation to 0V, and check this level.

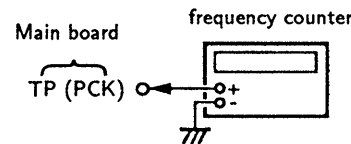


- Remove the lead wire connected in step 1.

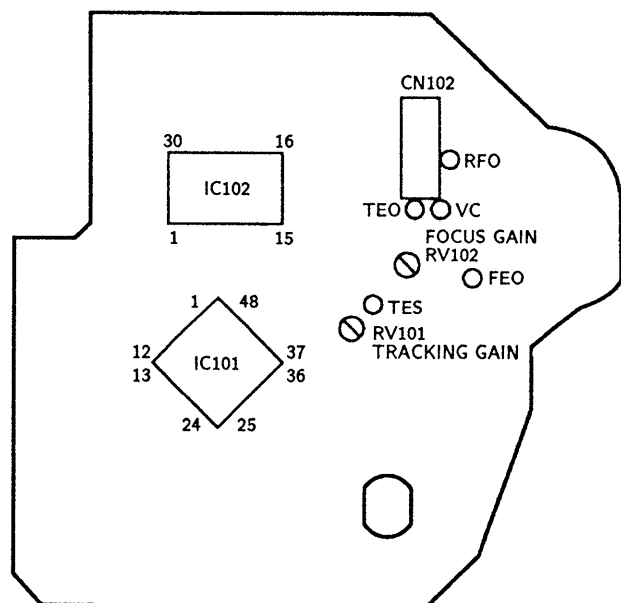
RF PLL Free-run Frequency Check

Procedure :

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



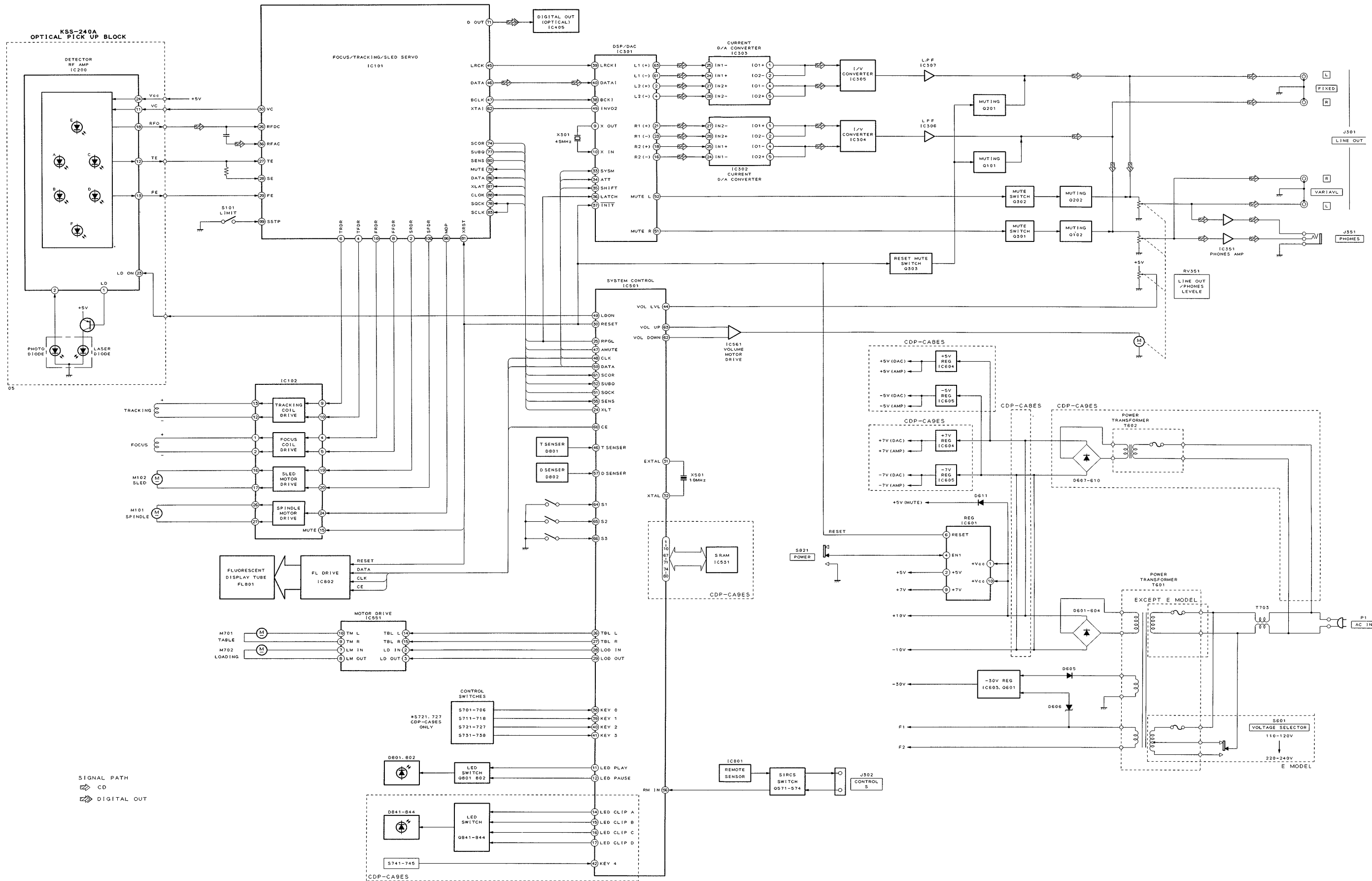
- Turned Power switch on.
- Confirm that reading on frequency counter is 4.3218MHz.



SECTION 5

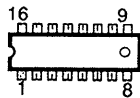
DIAGRAMS

5-1. BLOCK DIAGRAM

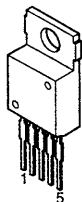


• Semiconductor Lead Layouts

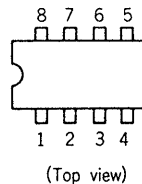
BA6193



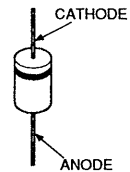
LA6500-FA



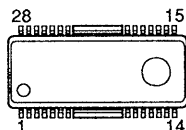
NE5532P



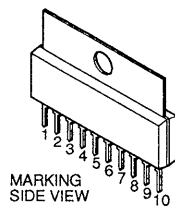
1N4148M



BA6297AFP



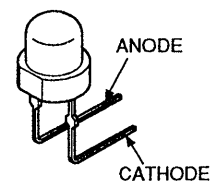
LA5616



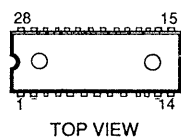
**DTA114ES
DTA144ES
DTC144ES**



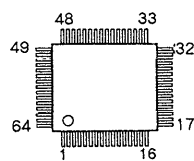
SEL2510C-D



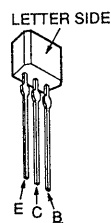
CXA8042S



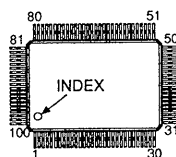
LC75721E



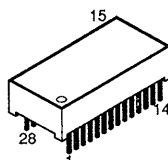
2SA1175-HFE



CXD2515Q



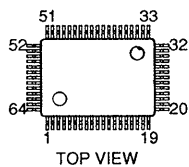
LH5160TF



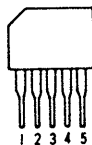
2SC2878-AB



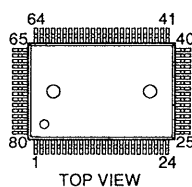
CXD8505Q



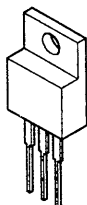
M5293L



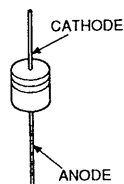
CXP84124-026Q



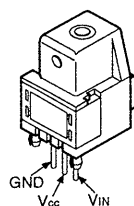
**M5F7807
M5F7807L**



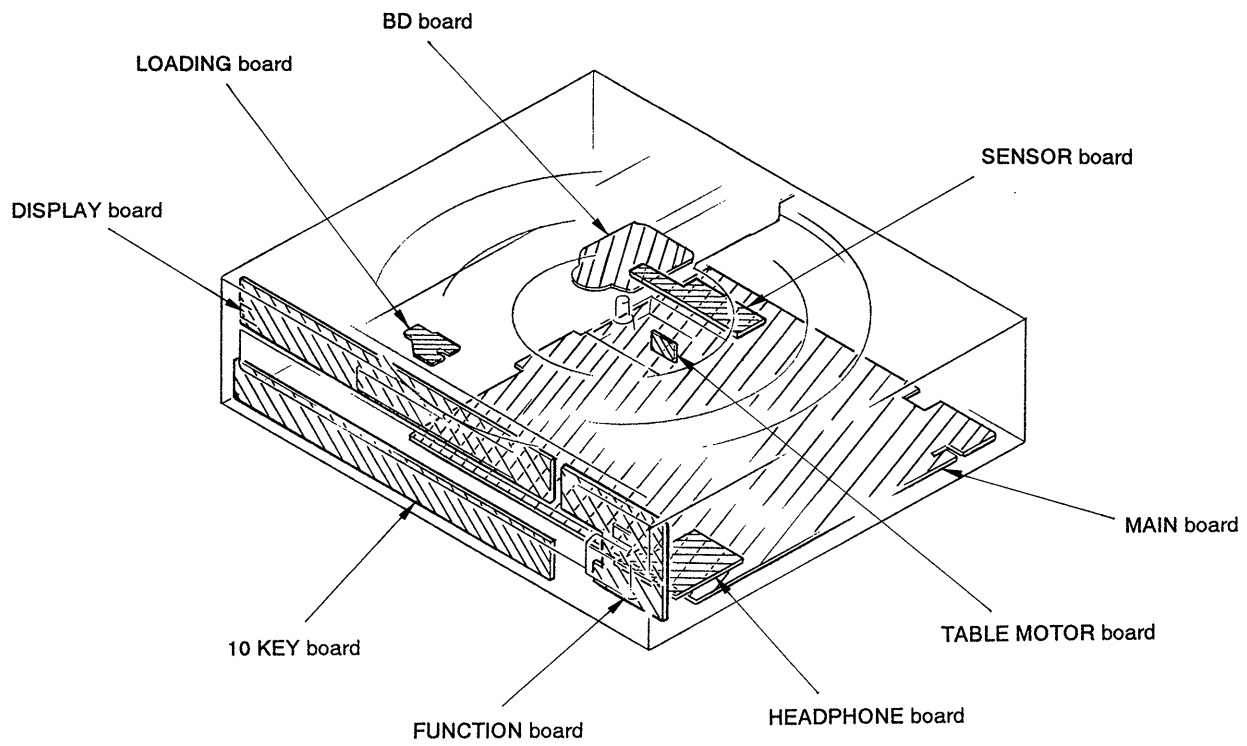
**RD5.1ES-B2
RD5.6ES-B
RD6.2ES-B1
RD9.1ESB2
11ES2
11EQS04**



GP1F32T



• **Circuit Boards Location**

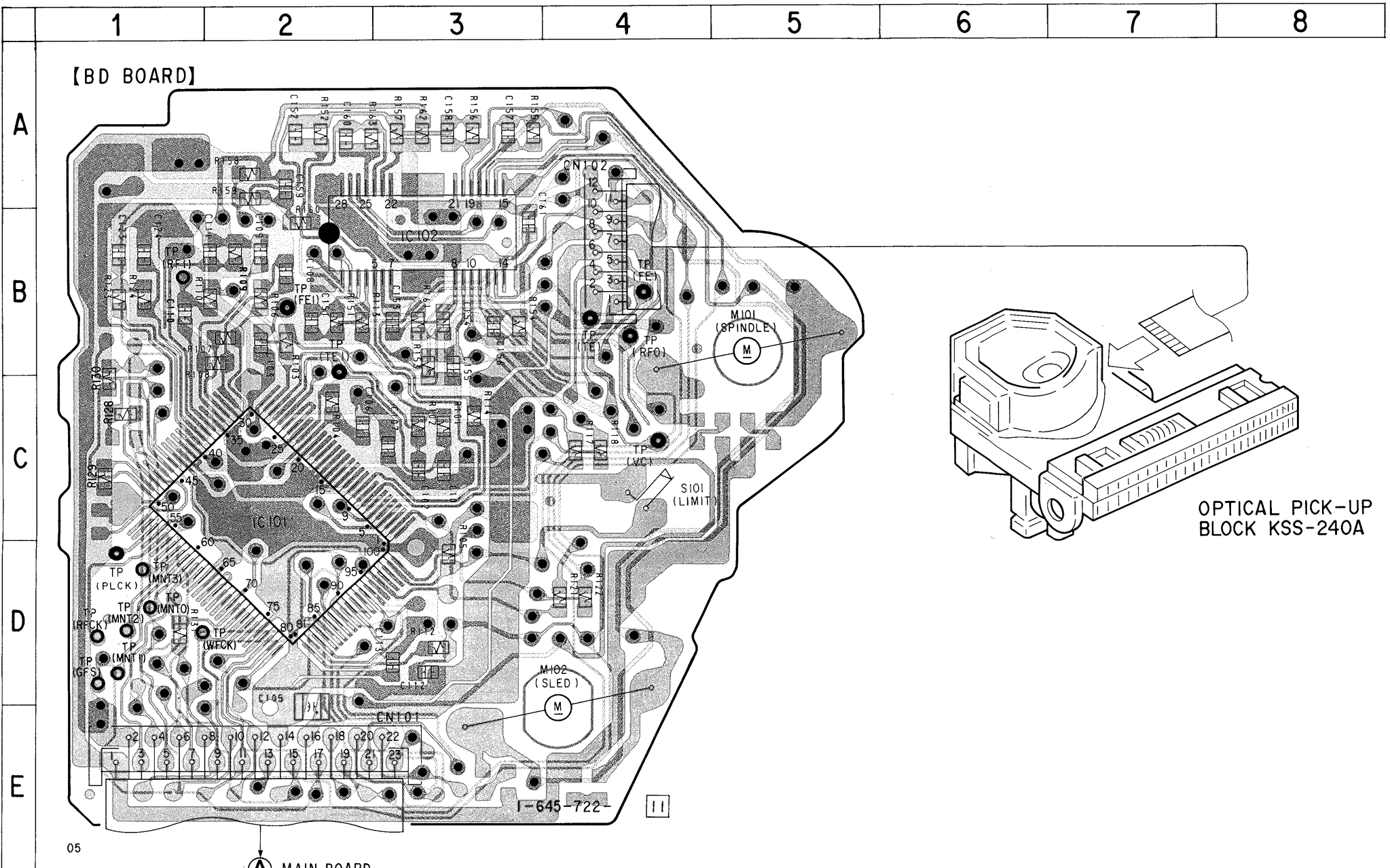


5-2. BASE UNIT SECTION PRINTED WIRING BOARD AND SCHEMATIC DIAGRAM

• See page 9 for Semiconductor Lead Layouts and page 27 for IC Block Diagrams.

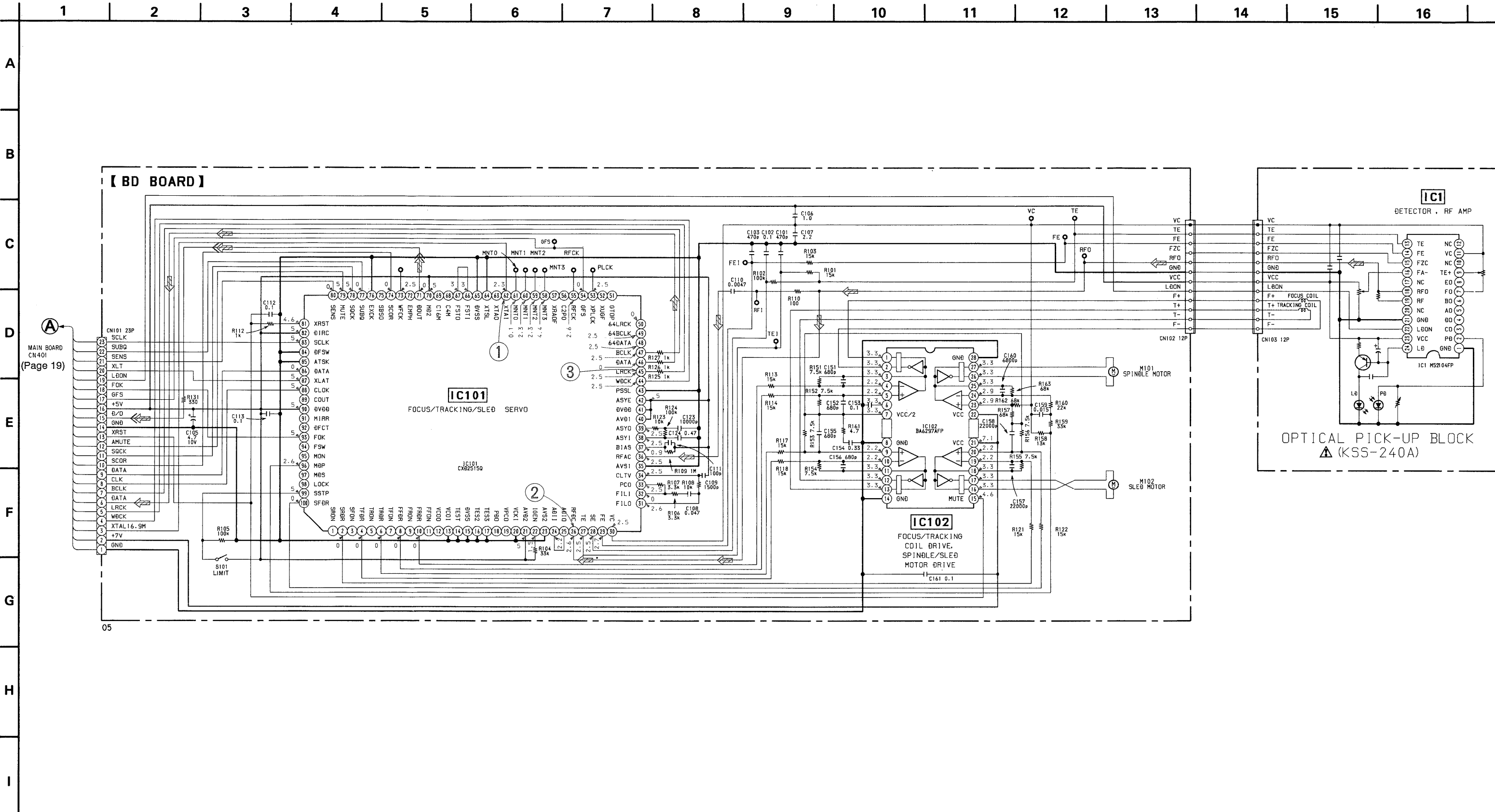
• Semiconductor Location

Ref. No.	Location
IC101	C-2
IC102	B-3

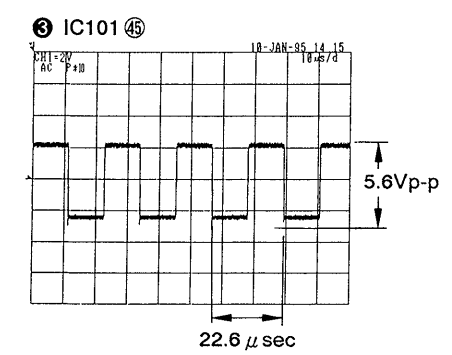
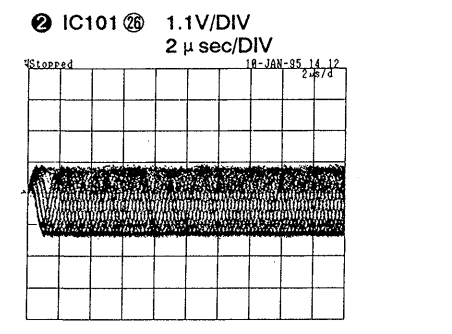
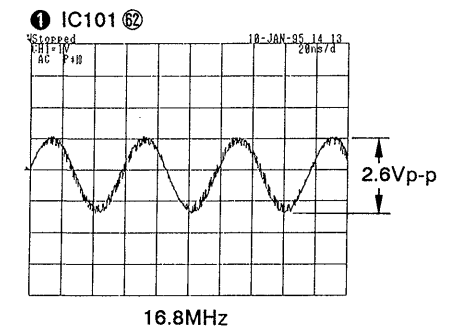


Note on Printed Wiring Board:

- — : parts extracted from the component side.
- : Through hole.
- ▨ : Pattern of the rear side.
- ▩ : Pattern from the side which enables seeing.



• Waveforms



Note on Schematic Diagram:

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

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

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

- ① : B + Line.
- ② : Voltage and waveforms are dc with respect to ground under no-signal conditions.
- ③ : Voltages are taken with a VOM (10 M Ω/V). Voltage variations may be noted due to normal production tolerances.
- ④ : Waveforms are taken with an oscilloscope. Voltage variations may be noted due to normal production tolerances.
- ⑤ : Circled numbers refer to waveforms.
- ⑥ : Signal path.
- ⑦ : CD
- ⑧ : digital out

5-3. MAIN SECTION PRINTED WIRING BOARD

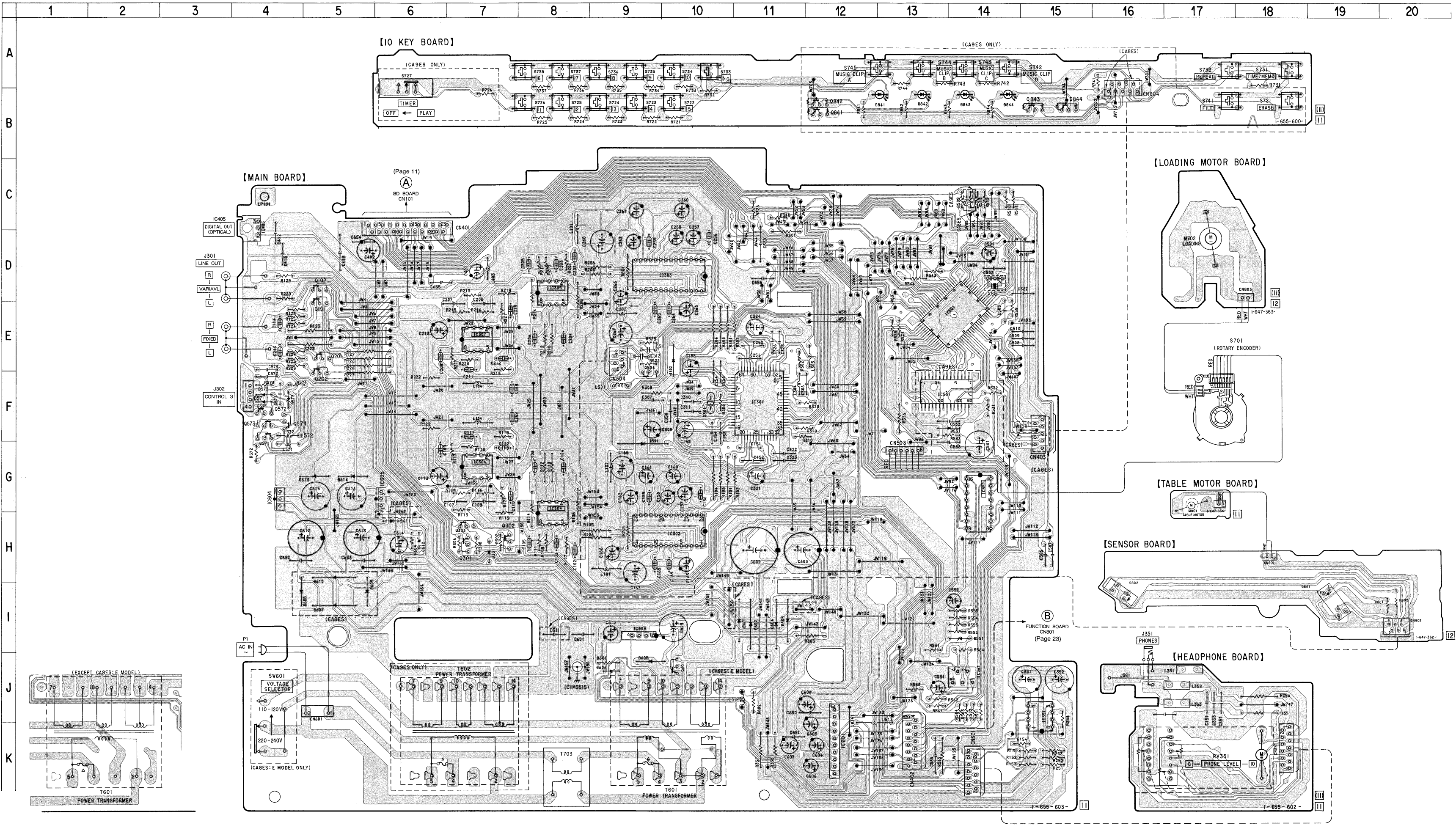
• See page 9 for Semiconductor Lead Layouts.

• Semiconductor Location

Ref. No.	Location
D301	H-7
D531	F-14
D551	I-14
D571	F-4
D572	F-4
D573	F-4
D601	I-11
D602	I-11
D603	I-11
D604	I-11
D605	J-9
D606	J-9
D607	I-5
D608	I-4
D609	I-5
D610	H-5
D611	H-6
D612	H-6
D613	G-5
D614	G-5
D841	B-13
D842	B-13
D843	B-14
D844	B-14
IC301	F-11
IC302	H-10
IC303	D-10
IC304	G-8
IC305	D-8
IC306	G-7
IC307	E-7
IC351	J-15
IC405	D-4
IC501	E-13
IC531	F-13
IC551	G-14
IC561	J-14
IC601	K-12
IC603	I-9
IC604	G-4
IC605	G-6
Q101	E-5
Q102	D-5
Q201	E-5
Q202	F-5
Q301	H-7
Q302	H-7
Q303	H-7
Q504	F-9
Q571	F-4
Q572	F-4
Q573	F-4
Q574	F-4
Q601	J-10
Q841	B-12
Q842	B-12
Q843	B-15
Q844	B-15

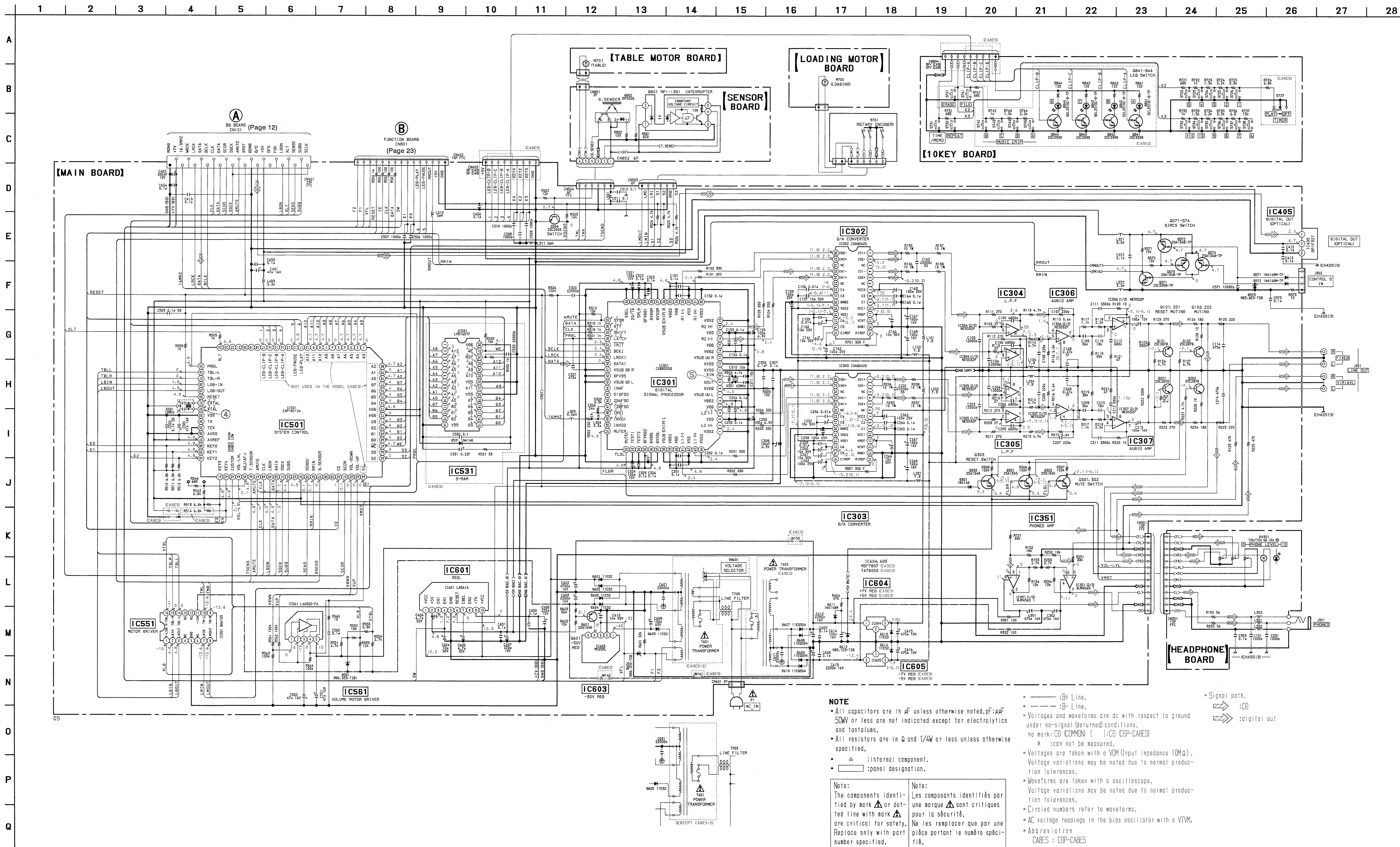
Note on Printed Wiring Board:

- : parts extracted from the component side.
- Abbreviation
CA8ES: CDP-CA8ES
CA9ES: CDP-CA9ES



5-4. MAIN SECTION SCHEMATIC DIAGRAM

• See page 27 for IC Block Diagrams.



NOTE

- All capacitors are in μF unless otherwise noted. $\text{pF} = \mu\text{F} \times 10^{-6}$.
- All resistors are in Ω and $1/4\text{W}$ or less unless otherwise specified.
- Δ : internal component.
- $\square$: panel designation.

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

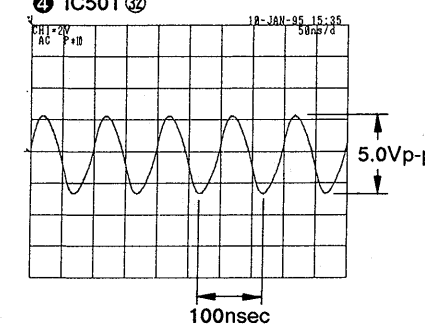
Note: Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

- —: B+ Line.
- ---: B- Line.
- Voltages and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- No mark: CD COMMON (1: CD CDP-CA8ES).
- * : can not be measured.
- 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 an oscilloscope.
- Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- AC voltage readings in the bias oscillator with a VTVM.
- Abbreviation: CABS: CDP-CA8ES.

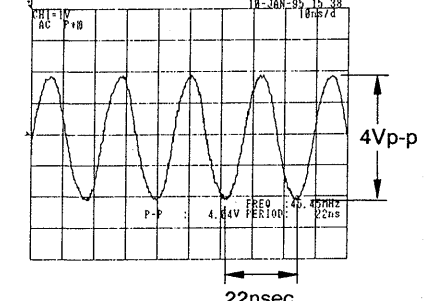
- Signal path.
- $\Rightarrow$: CD
- $\Rightarrow$: digital out

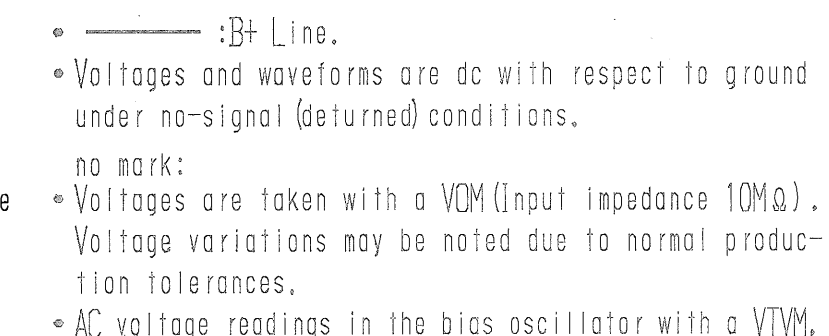
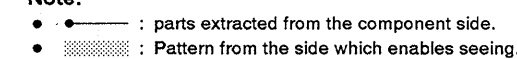
• Waveforms

① IC501



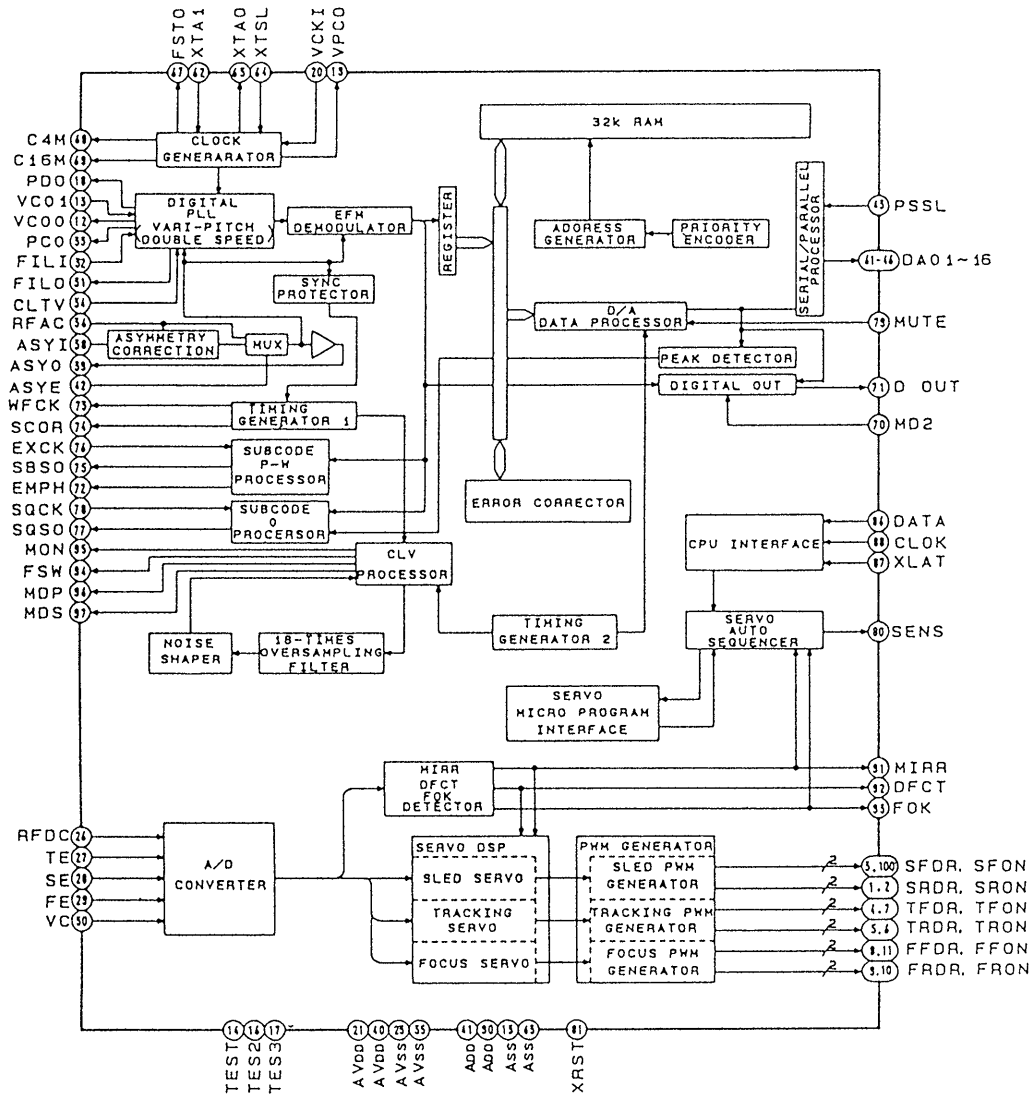
② IC301



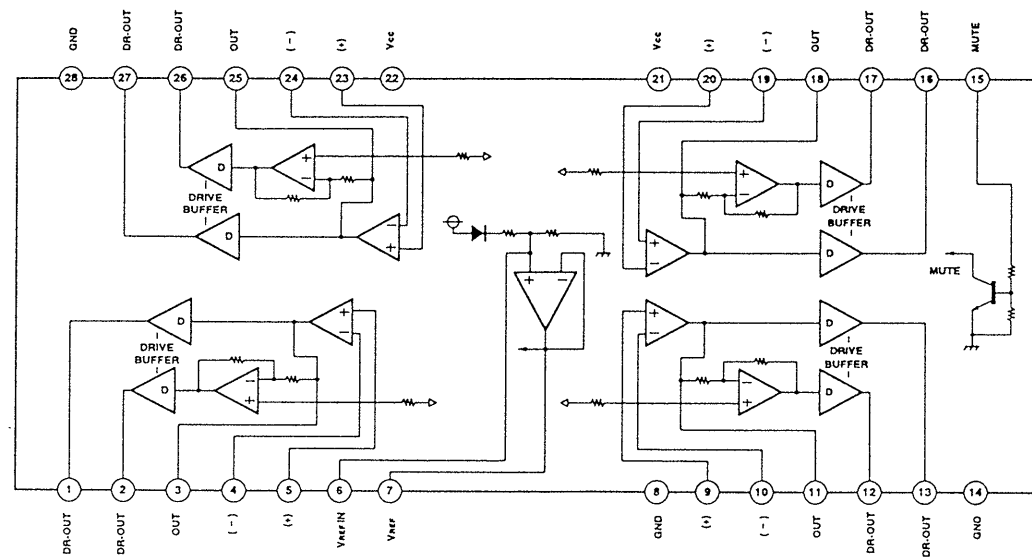


• IC Block Diagrams

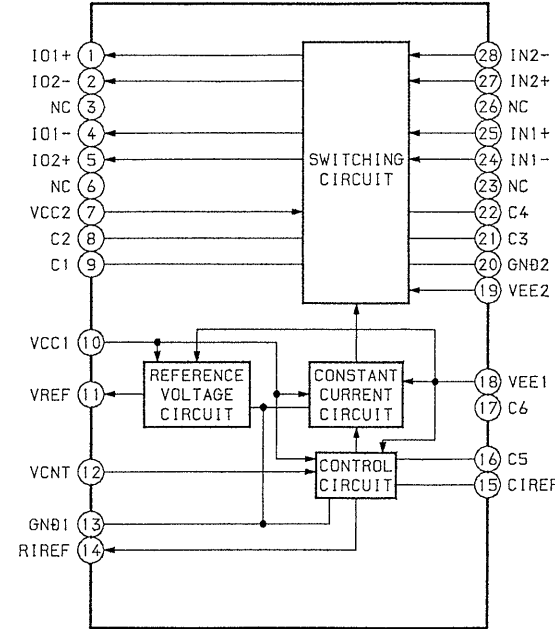
IC101 CXD2515Q (BD BOARD)



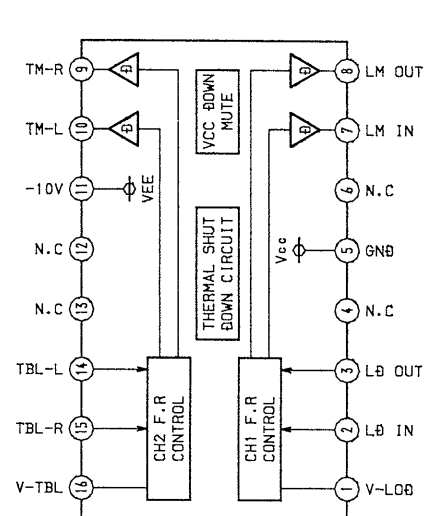
IC102 BA6297AFP (BD BOARD)



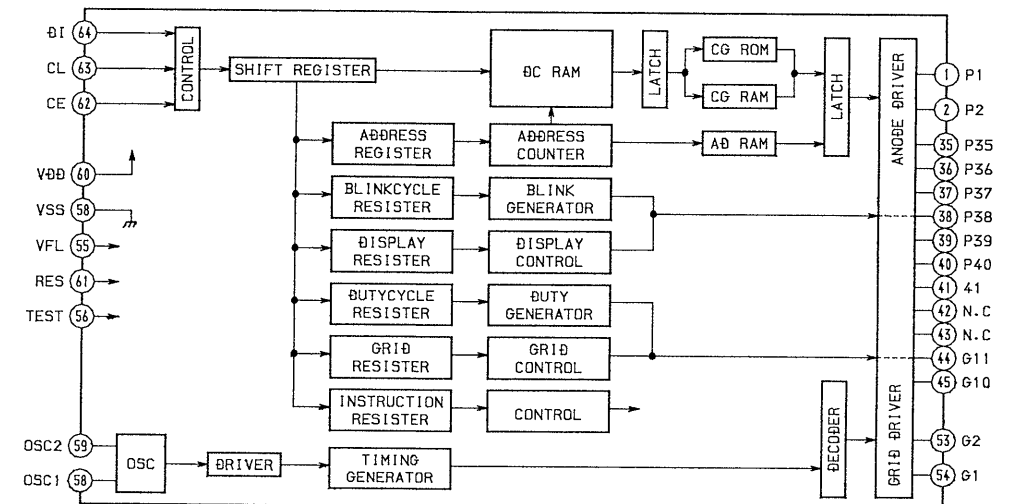
IC302 CXA8042S (MAIN BOARD)



IC551 BA6193 (MAIN BOARD)



IC802 LC75721E (DISPLAY BOARD)



5-6. IC PIN FUNCTION DESCRIPTION
IC501 CXP84124-026Q (MAIN BOARD)

Pin No.	Pin Name	I/O	Function
1 to 10	A3 to A12	O	S-RAM address control output pin.
11	LED-PLAY	O	▷ LED ON/OFF pin.
12	LED-PAUSE	O	▬ LED ON/OFF pin.
13	—	—	Not used.
14	LED-CLIP-A	O	} LED ON/OFF pin. (Not used in the model CDP-CA8ES)
15	LED-CLIP-B	O	
16	LED-CLIP-C	O	
17	LED-CLIP-D	O	
18 to 23	—	—	Not used.
24	XLT	O	Serial data latch signal output pin.
25	PRGL	O	Serial data latch signal output pin to Digital Signal processor.
26	TBL-L	O	} Table motor control pin.
27	TBL-R	O	
28	LOD-IN	O	} Loading motor control pin.
29	LOD-OUT	O	
30	RESET	I	Reset signal input pin.
31	EXTAL	I	8 MHz clock input pin.
32	XTAL	O	8 MHz clock output pin.
33	Vss	—	GND
34	TX	—	Not used.
35	TEX	—	GND
36	AVss	—	GND
37	AVREF	I	Reference voltage input pin of A/D conversion. (Connected GND)
38 to 42	KEY0 to KEY4	I	Key input pin. (A/D)
43	CUSTOM	—	GND (CDP-CA8ES), +5V (CDP-CA9ES)
44	VOL LEVEL	I	Volume level input pin.
45	ADJ/AFJ	I	Test mode pin. Normally: "H"
46	T. SENSOR	I	Slit sensor of disc table input pin.
47	AMUTE	O	Analog muting control signal output pin.
48	CLK	O	Serial clock output pin to BD.
49	LDON	O	Optical pick-up laser diode control pin. ON: "H"
50	DATA	O	Serial data output pin.
51	SQCLK	O	Subcode Q data readout clock output pin.
52	SUBQ	I	Subcode Q data input pin.
53	—	—	Not used.
54	—	—	Connected to +5 V.
55	SENSE	I	SENSE signal input pin.
56	RM IN	I	Remote control signal input pin.
57	D. SENSOR	I	Disc sensor input pin.
58, 59	—	—	Not used.

Pin No.	Pin Name	I/O	Function
60	CE	O	Chip enable output.
61	SCOR	I	Subcord Q data readout timing signal input pin.
62	VOL-DOWN	O	} Volume motor drive pin.
63	VOL-UP	O	
64 to 66	S1 to S3	I	Rotary encorder input. (S701) (Not used in the model CDP-CA8ES)
67	$\overline{\text{WE}}$	O	Write enable output pin. (Not used in the model CDP-CA8ES)
68 to 71	D0 to D3	O	FL segment output pin. (Not used in the model CDP-CA8ES)
72	VDD	—	Connected to +5 V.
73	VDD	—	Power supply pin. (+5 V)
74 to 77	D4 to D7	O	FL timing output pin.
78 to 80	A0 to A2	O	S-RAM address control output pin.

IC101 CXD2515Q (BD BOARD)

Pin No.	Pin Name	I/O	Function
1	SRON	—	Not used.
2	SRDR	O	Sled drive signal output.
3	SFON	—	Not used.
4	TFDR	O	Tracking drive signal output.
5	TRON	—	Not used.
6	TRDR	O	Tracking drive signal output.
7	TFON	—	Not used.
8	FFDR	O	Focus drive signal output.
9	FRON	—	Not used.
10	FRDR	O	Focus drive signal output.
11	FFON	O	Not used.
12	VCOO	—	Not used.
13	VCOI	I	Connected to the oscillating circuit for analog EFM PLL.
14	TEST	I	TEST terminal, Normally connected to ground.
15	Vss	—	Digital ground.
16	TES2	I	TEST terminal. Normally connected to ground.
17	TES3	I	TEST terminal. Normally connected to ground.
18	PDO	—	Not used.
19	VPCO	—	Not used.
20	VCKI	I	Clock input from external VCO for variable pitch. fcenter=16.9344 MHz.
21	AVDD	—	Analog power supply.
22	IGEN	I	Connected to current source reference resistor for OP amplifier.
23	AVss	—	Analog ground.
24	ADII	I	A/D converter input.
25	ADIO	O	OP amplifier output.
26	RFDC	I	RF signal input. Input range 2.15 ~ 5.0 V (On VDD=AVDD=5.0 V).
27	TE	I	Tracking error signal input. Input range 2.5 ± 1.0 V (On VDD=AVDD=5.0 V).
28	SE	I	Sled error signal input. Input range 2.5 ± 1.0 V (On VDD=AVDD=5.0 V).
29	FE	I	Focus error signal input. Input range 2.5 ± 1.0 V (On VDD=AVDD=5.0 V).
30	VC	I	Center point of voltage input.
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	VCO for master control voltage input.
35	AVss	—	Analog ground.
36	RFAC	I	EFM signal input.
37	BIAS	I	Asymmetry circuit constant-current input.
38	ASYI	I	Asymmetry comparing voltage input.
39	ASYO	O	EFM full swing output (L=VSS, H=VDD).
40	AVDD	—	Analog power supply.

Pin No.	Pin Name	I/O	Function
41	VDD	—	Digital power supply.
42	ASYE	I	Asymmetry circuit ON/OFF (L=OFF, H=ON).
43	PSSL	I	Audio data output mode select input. L: Serial output H: Parallel output.
44	WDCK	O	48 bit slot D/A interface. Word clock f=2Fs.
45	LRCK	O	48 bit slot D/A interface. LR clock f=FS.
46	DA16	O	DA16 output when PSSL=1. 48 bit slot serial data when PSSL=0.
47	DA15	O	DA15 output when PSSL=1. 48 bit slot bit clock when PSSL=0.
48	DA14	—	Not used.
49	DA13	—	Not used.
50	DA12	—	Not used.
51	GTOP	O	DA11 output when PSSL=1. GTOP output when PSSL=0.
52	XUGF	—	Not used.
53	XPLCK	—	Not used.
54	GFS	O	DA08 output when PSSL=1. GFS output when PSSL=0.
55	RFCK	O	DA07 output when PSSL=1. RFCK output when PSS=0.
56	C2PO	—	Not used.
57	XRAOF	O	DA05 output when PSSL=1. XRAOF output when PSSL=0.
58	MNT3	—	Not used.
59	MNT2	—	Not used.
60	MNT1	—	Not used.
61	MNT0	—	Not used.
62	XTAI	I	Input from X'tal oscillating circuit. 16.9344 MHz or 33.8688 MHz input.
63	XTAO	O	X'tal oscillating circuit output.
64	XTSL	I	X'tal select input. L: 16.9344 MHz. H: 33.8688MHz.
65	Vss	—	Digital ground.
66	FSTI	I	2/3 divided signal of pins ⑥2 and ⑥3 input.
67	FSTO	O	2/3 divided signal of pins ⑥2 and ⑥3 output.
68	C4M	O	4.2336 MHz output. Changed at the same time on variable pitch.
69	C16M	—	Not used.
70	MD2	I	Digital out ON/OFF control. L=OFF, H=ON.
71	DOUT	O	Digital-out output.
72	EMPH	—	Not used.
73	WFCK	O	WFCK output.
74	SCOR	O	Sub-code sync. output. (H when sub-code sync. So or SI is detected.)
75	SBSO	—	Not used.
76	EXCK	—	Not used.
77	SQSO	O	Sub Q 80 bit output. PCM peak data, level data 16 bit output.
78	SQCK	I	Clock for SQSO read out input.
79	MUTE	I	Mute switch. H: Mute.
80	SENS	O	SENS output to CPU.

Pin No.	Pin Name	I/O	Function
81	XRST	I	System reset. L: Reset.
82	DIRC	—	Not used.
83	SCLK	I	Clock for reading SENS serial data.
84	DFSW	I	DFCT switch. H: Circuit for DFCT OFF.
85	ATSK	I	For anti-shock.
86	DATA	I	Serial data from CPU input.
87	XLAT	I	Latch from CPU input.
88	CLOCK	I	Clock for serial data transferring from CPU input.
89	COUT	—	Not used.
90	VDD	—	Digital power supply.
91	MIRR	—	Not used.
92	DFCT	—	Not used.
93	FOK	O	Focus OK input.
94	FSW	—	Not used.
95	MON	—	Not used.
96	MDP	O	Spindle motor servo control.
97	MDS	O	Spindle motor servo control.
98	LOCK	—	Not used.
99	SSTP	I	Most inner circuit on disc detection signal.
100	SFDR	O	Sled drive output.

SECTION 6

EXPLODED VIEWS

NOTE:

- -XX and -X mean standardized parts, so they may have some difference from the original one.
- Color Indication of Appearance Parts
Example:
KNOB, BALANCE (WHITE) ... (RED)

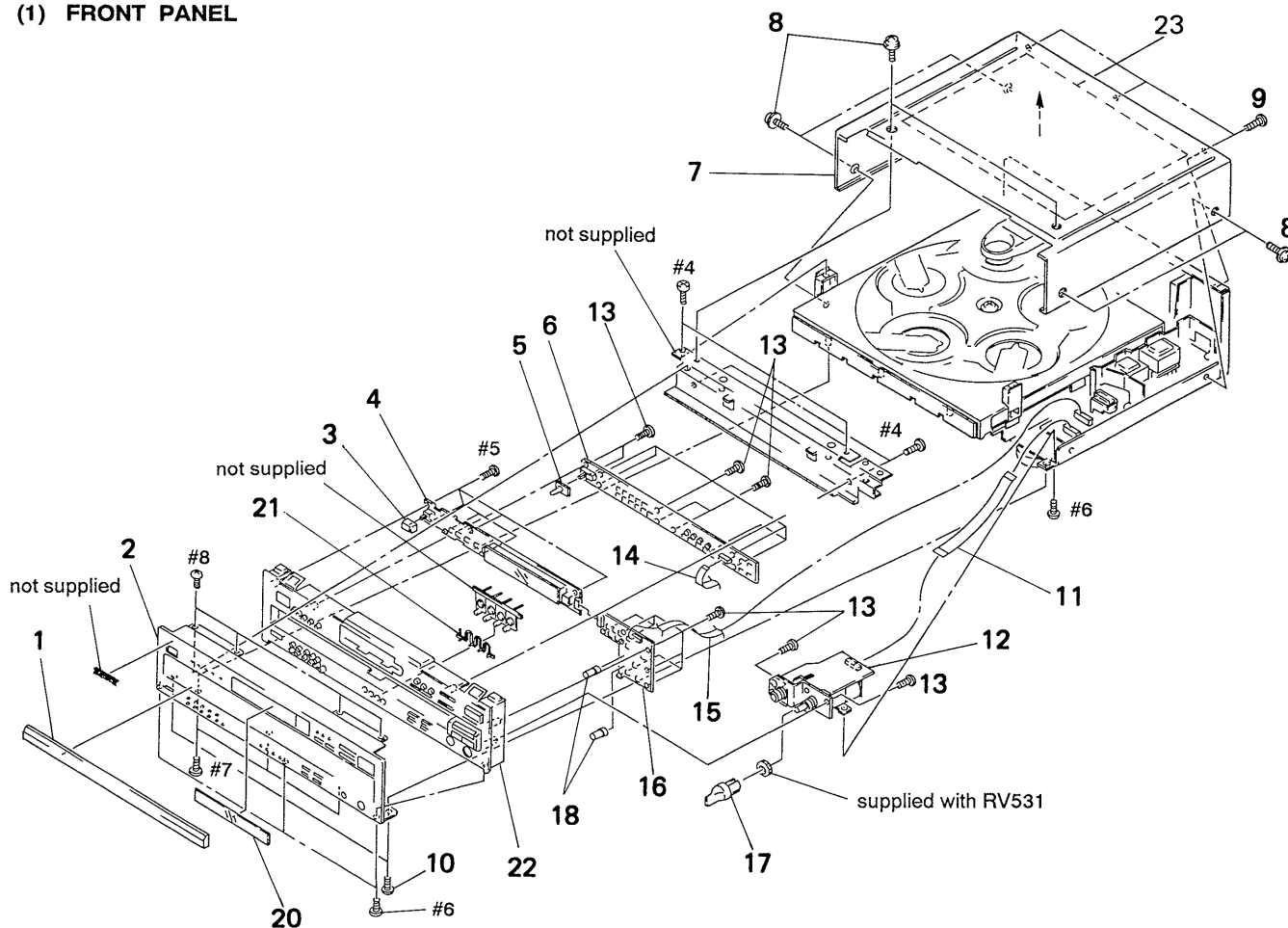
↑
Parts Color
↑
Cabinet's Color
- Abbreviation
CND: Canadian
CA9ES: CDP-CA9ES
CA8ES: CDP-CA8ES

- 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 the electrical parts list.

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

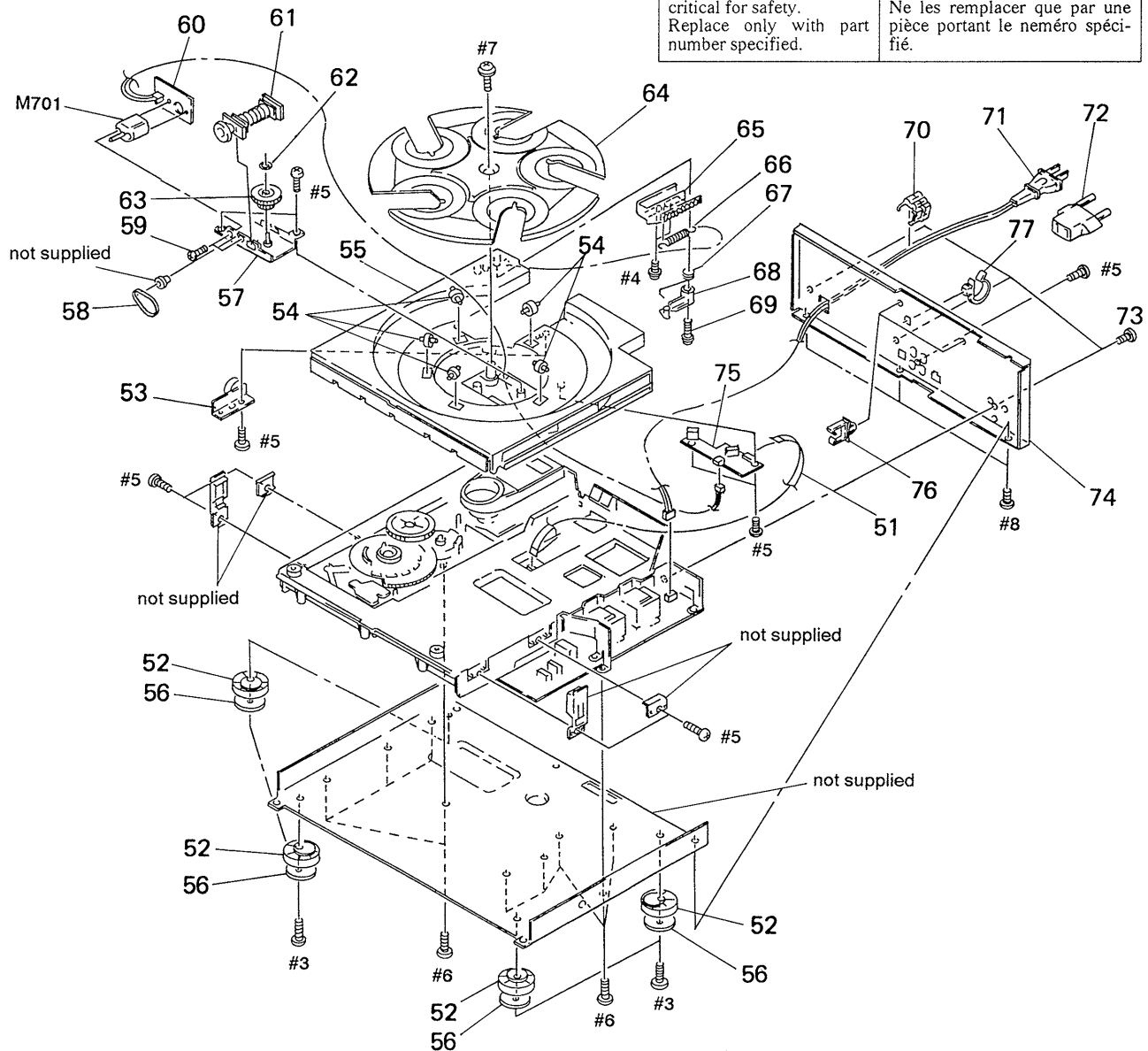
Les composants identifiés par une marque sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

(1) FRONT PANEL



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-972-205-01	PANEL, LOADING (CA9ES)		11	1-769-457-11	WIRE (FLAT TYPE) (13 CORE)	
1	4-972-205-11	PANEL, LOADING (CA8ES)		* 12	1-655-602-11	HEADPHONE BOARD	
2	4-972-224-01	PANEL, FRONT (CA9ES)		13	4-951-620-01	SCREW (2.6X8), +BVTP	
2	4-972-224-21	PANEL, FRONT (CA8ES:US, CND)		14	1-769-455-11	WIRE (FLAT TYPE) (9 CORE) (CA9ES)	
2	4-972-224-31	PANEL, FRONT (CA8ES:AEP, E)		14	1-769-458-11	WIRE (FLAT TYPE) (5 CORE) (CA8ES)	
3	4-922-921-01	BUTTON (POWER)		15	1-769-456-11	WIRE (FLAT TYPE) (15 CORE)	
* 4	A-4673-466-A	DISPLAY BOARD, COMPLETE		* 16	1-665-601-11	FUNCTION BOARD	
5	3-917-216-11	KNOB (TIMER) (CA9ES)		17	4-950-189-01	KNOB (A) (VOL)	
* 6	A-4673-462-A	10 KEY BOARD, COMPLETE (CA8ES)		* 18	3-362-478-11	HOLDER (T), LED	
* 6	A-4673-467-A	10 KEY BOARD, COMPLETE (CA9ES)		20	4-972-214-01	PLATE, INDICATION	
7	4-972-223-01	CASE		* 21	4-972-215-01	INDICATOR (CLIP) (CA9ES)	
8	3-704-366-01	SCREW (CASE) (M3X8)		22	X-4945-738-1	BASE ASSY, PANEL (CA9ES)	
9	3-704-515-21	SCREW (BV/RING)		22	X-4945-739-1	BASE ASSY, PANEL (CA8ES)	
10	3-703-685-21	SCREW (+BV 3X8)		23	4-974-014-01	REINFORCEMENT (TOP PLATE)	

(2) DISC TABLE

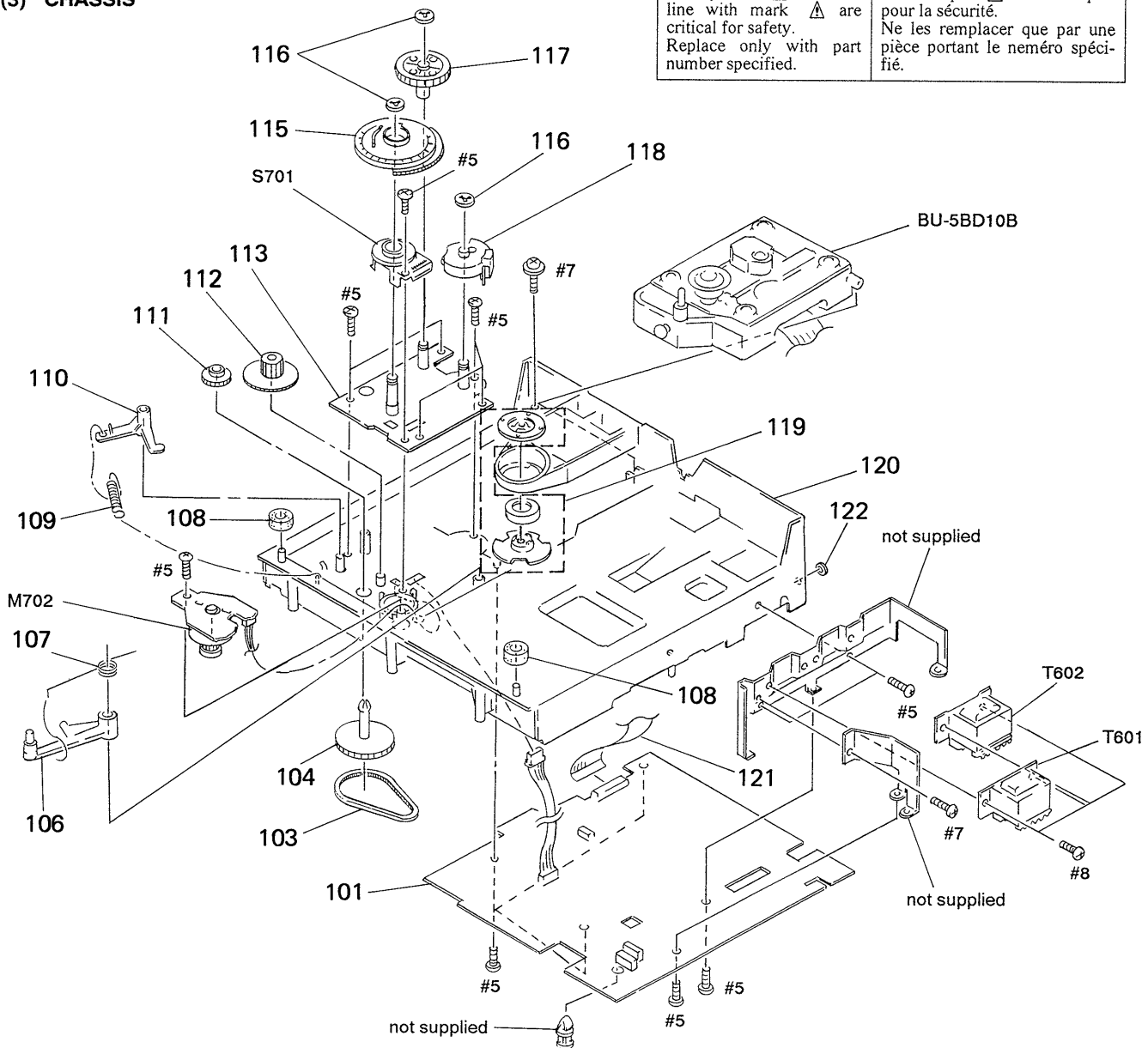


Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
51	1-751-052-11	WIRE (FLAT TYPE) (6 CORE)		69	4-957-868-01	SCREW (+PTPH 2.6X20)	
52	4-970-123-01	FOOT (F50180S)		* 70	3-703-244-00	BUSHING (2104), CORD	
53	X-4943-480-1	BRACKET (ROLLER D) ASSY		Δ 71	1-575-651-21	CORD, POWER (CA8ES:AEP)	
54	X-4924-457-1	ROLLER ASSY		Δ 71	1-590-926-11	CORD, POWER (CA8ES:US, CND/CA9ES)	
55	4-957-298-21	TABLE (A), DISK		Δ 71	1-696-027-11	CORD, POWER (CA8ES:E)	
56	4-970-124-01	CUSHION (F50180S)		72	1-569-007-11	ADAPTER, CONVERSION 2P (CA8ES:E)	
57	X-4943-477-1	BRACKET (RM) ASSY		73	3-704-366-01	SCREW (CASE) (M3X8)	
58	4-957-304-01	BELT (RM)		* 74	4-972-221-02	PANEL, BACK (CA9ES:US)	
59	4-965-659-01	SCREW (+B 2X2.2)		* 74	4-972-221-12	PANEL, BACK (CA9ES:CND)	
* 60	1-647-364-11	TABLE MOTOR BOARD		* 74	4-972-221-32	PANEL, BACK (CA8ES:US)	
61	X-4943-479-1	GEAR (ROTARY A) ASSY		* 74	4-972-221-42	PANEL, BACK (CA8ES:CND)	
62	3-325-697-01	WASHER		* 74	4-972-221-52	PANEL, BACK (CA8ES:AEP)	
63	4-957-284-01	GEAR (LOTARY B)		* 74	4-972-221-62	PANEL, BACK (CA8ES:E)	
64	4-957-299-21	TABLE (B), DISC		75	1-647-362-11	SENSOR BOARD	
65	4-957-292-01	SLIDER (RACK)		* 76	4-974-684-01	CLAMP, WIRE	
66	4-957-294-01	SPRING (D.T), TENSION		* 77	4-949-235-01	HOO	
67	4-957-293-01	SPRING (RACK RELEASE)		M701	A-4660-322-A	MOTOR ASSY, ROTARY (TABLE)	
68	4-957-291-01	LEVER (RACK RELEASE)					

(3) CHASSIS

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

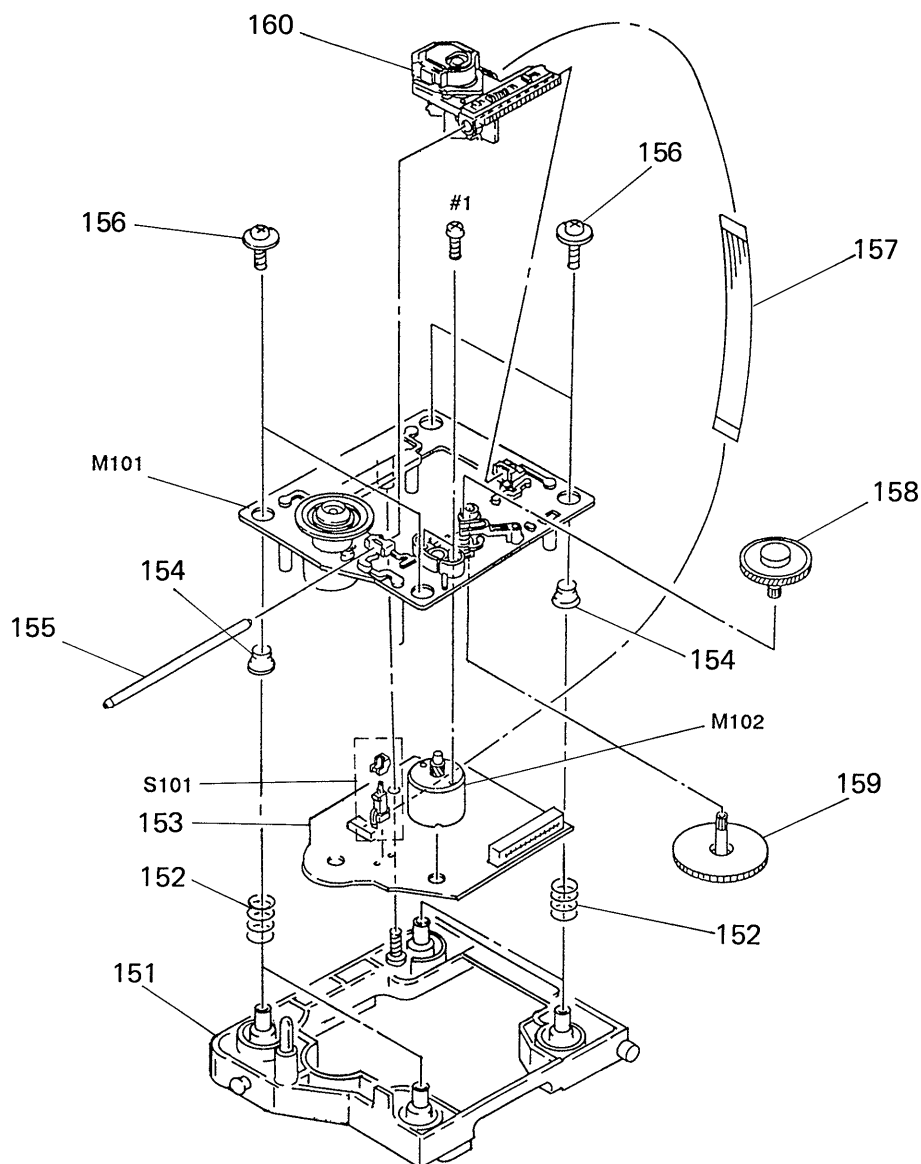
Note:
Les composants identifiés par une marque Δ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.



Ref. No.	Part No.	Description	Remark
* 101	A-4673-463-A	MAIN BOARD, COMPLETE (CA8ES:US, CND)	
* 101	A-4673-469-A	MAIN BOARD, COMPLETE (CA8ES:AEP)	
* 101	A-4673-471-A	MAIN BOARD, COMPLETE (CA8ES:E)	
* 101	A-4673-473-A	MAIN BOARD, COMPLETE (CA9ES)	
103	4-944-490-01	BELT (TIMING)	
104	X-4941-529-1	PULLEY ASSY	
106	4-957-279-01	LEVER, LOCK	
107	4-957-281-01	SPRING (LOCK LEVER)	
* 108	4-951-619-01	CUSHION (A)	
109	4-962-087-01	SPRING (S), TENSION	
110	4-957-285-01	LEVER, SET	
111	4-934-375-01	GEAR (LOADING B)	
112	4-957-303-01	GEAR (LOADING C)	
113	X-4943-478-1	BRACKET (GEAR) ASSY	

Ref. No.	Part No.	Description	Remark
115	4-957-288-01	GEAR (MAIN)	
116	4-957-283-01	WASHER (5), STOPPER	
117	4-957-287-01	GEAR (REV)	
118	4-957-286-01	GEAR (U/D)	
* 119	1-452-538-11	MAGNET	
* 120	4-957-300-03	CHASSIS	
121	1-765-443-11	WIRE (FLAT TYPE) (23 CORE)	
122	4-949-302-81	WASHER	
M702	A-4604-834-A	MOTOR ASSY, LOADING	
S701	1-466-996-11	ENCODER, ROTARY	
Δ T601	1-427-859-11	TRANSFORMER, POWER (CA8ES:US, CND/CA9ES)	
Δ T601	1-427-860-11	TRANSFORMER, POWER (CA8ES:AEP)	
Δ T601	1-427-946-11	TRANSFORMER, POWER (CA8ES:E)	
Δ T602	1-427-859-11	TRANSFORMER, POWER (CA9ES)	

(4) BASE UNIT
(BU-5BD10B)



Ref.No.	Part No.	Description	Remark	Ref.No.	Part No.	Description	Remark
* 151	4-957-289-01	HOLDER (BU)		158	4-917-567-01	GEAR (M)	
152	4-948-503-01	SPRING (BU), COMPRESSION		159	4-917-564-01	GEAR (P), FLATNESS	
* 153	A-4649-432-A	BD BOARD, COMPLETE		△160	8-848-144-11	DEVICE, OPTICAL KSS-240A	
154	4-951-940-01	INSULATOR (BU)		M101	X-4917-523-3	BASE (OUT SERT) ASSY (SPINDLE MOTOR)	
155	4-917-565-01	SHAFT, SLED		M102	X-4917-504-1	MOTOR, ASSY (SLED MOTOR)	
156	4-933-134-01	SCREW (+PTPWH M2.6X6)		S101	1-572-085-11	SWITCH, LEAF (LIMIT)	
157	1-575-001-11	WIRE, FLAT TYPE (12 CORE)					

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

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

SECTION 7

ELECTRICAL PARTS LIST

NOTE:

- 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 and -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
- Abbreviations
CND : Canadian

- 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: 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

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

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

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

CA8ES : CDP-CA8ES

CA9ES : CDP-CA9ES

Ref. No.	Part No.	Description	Remark
*	A-4673-462-A	10 KEY BOARD, COMPLETE (CA8ES) *****	
*	A-4673-467-A	10 KEY BOARD, COMPLETE (CA9ES) *****	
*	3-362-478-11	HOLDER (T), LED	
< CONNECTOR >			
CN804	1-695-328-11	PIN, CONNECTOR (PC BOARD) 5P (CA8ES)	
CN804	1-568-828-11	PIN, CONNECTOR (PC BOARD) 9P (CA9ES)	
< DIODE >			
D841	8-719-303-02	DIODE SEL2510C-D (MUSIC CLIP A) (CA9ES)	
D842	8-719-303-02	DIODE SEL2510C-D (MUSIC CLIP B) (CA9ES)	
D843	8-719-303-02	DIODE SEL2510C-D (MUSIC CLIP C) (CA9ES)	
D844	8-719-303-02	DIODE SEL2510C-D (MUSIC CLIP D) (CA9ES)	
< TRANSISTOR >			
Q841	8-729-900-89	TRANSISTOR DTC144ES (CA9ES)	
Q842	8-729-900-89	TRANSISTOR DTC144ES (CA9ES)	
Q843	8-729-900-89	TRANSISTOR DTC144ES (CA9ES)	
Q844	8-729-900-89	TRANSISTOR DTC144ES (CA9ES)	
< RESISTOR >			
R721	1-249-415-11	CARBON 680 5% 1/4W F	
R722	1-249-417-11	CARBON 1K 5% 1/4W F	
R723	1-249-419-11	CARBON 1.5K 5% 1/4W F	
R724	1-249-421-11	CARBON 2.2K 5% 1/4W F	
R725	1-249-423-11	CARBON 3.3K 5% 1/4W F	
R726	1-249-427-11	CARBON 6.8K 5% 1/4W F (CA9ES)	
R731	1-249-415-11	CARBON 680 5% 1/4W F	
R732	1-249-417-11	CARBON 1K 5% 1/4W F	
R733	1-249-419-11	CARBON 1.5K 5% 1/4W F	
R734	1-249-421-11	CARBON 2.2K 5% 1/4W F	
R735	1-249-423-11	CARBON 3.3K 5% 1/4W F	
R736	1-249-427-11	CARBON 6.8K 5% 1/4W F	
R737	1-249-431-11	CARBON 15K 5% 1/4W F	
R741	1-249-415-11	CARBON 680 5% 1/4W F (CA9ES)	
R742	1-249-417-11	CARBON 1K 5% 1/4W F (CA9ES)	

Ref. No.	Part No.	Description	Remark
R743	1-249-419-11	CARBON 1.5K 5% 1/4W F (CA9ES)	
R744	1-249-421-11	CARBON 2.2K 5% 1/4W F (CA9ES)	
R841	1-249-406-11	CARBON 120 5% 1/4W F (CA9ES)	
R842	1-249-406-11	CARBON 120 5% 1/4W F (CA9ES)	
R843	1-249-406-11	CARBON 120 5% 1/4W F (CA9ES)	
R844	1-249-406-11	CARBON 120 5% 1/4W F (CA9ES)	
< SWITCH >			
S721	1-554-303-21	SWITCH, TACTILE (ERASE) (CA9ES)	
S722	1-554-303-21	SWITCH, TACTILE (5)	
S723	1-554-303-21	SWITCH, TACTILE (4)	
S724	1-554-303-21	SWITCH, TACTILE (3)	
S725	1-554-303-21	SWITCH, TACTILE (2)	
S726	1-554-303-21	SWITCH, TACTILE (1)	
S727	1-570-157-51	SWITCH, SLIDE (TIMER) (CA9ES)	
S731	1-554-303-21	SWITCH, TACTILE (TIME/MEMO)	
S732	1-554-303-21	SWITCH, TACTILE (REPEAT)	
S733	1-554-303-21	SWITCH, TACTILE (>10)	
S734	1-554-303-21	SWITCH, TACTILE (10)	
S735	1-554-303-21	SWITCH, TACTILE (9)	
S736	1-554-303-21	SWITCH, TACTILE (8)	
S737	1-554-303-21	SWITCH, TACTILE (7)	
S738	1-554-303-21	SWITCH, TACTILE (6)	
S741	1-554-303-21	SWITCH, TACTILE (FILE) (CA9ES)	
S742	1-554-303-21	SWITCH, TACTILE (MUSIC CLIP D) (CA9ES)	
S743	1-554-303-21	SWITCH, TACTILE (MUSIC CLIP C) (CA9ES)	
S744	1-554-303-21	SWITCH, TACTILE (MUSIC CLIP B) (CA9ES)	
S745	1-554-303-21	SWITCH, TACTILE (MUSIC CLIP A) (CA9ES)	
S821	1-572-714-11	SWITCH, PUSH (POWER)	

*	A-4649-432-A	BD BOARD, COMPLETE *****	
< CAPACITOR >			
C101	1-163-005-11	CERAMIC CHIP 470PF 10% 50V	
C102	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C103	1-163-005-11	CERAMIC CHIP 470PF 10% 50V	
C105	1-135-155-21	TANTALUM CHIP 4.7uF 10% 16V	
C106	1-164-346-11	CERAMIC CHIP 1uF 16V	

BD

DISPLAY

Ref. No.	Part No.	Description	Remark		
C107	1-164-505-11	CERAMIC CHIP	2.2uF	16V	
C108	1-163-035-00	CERAMIC CHIP	0.047uF	50V	
C109	1-163-011-11	CERAMIC CHIP	0.0015uF	10% 50V	
C110	1-163-017-00	CERAMIC CHIP	0.0047uF	5% 50V	
C111	1-163-251-11	CERAMIC CHIP	100PF	5% 50V	
C112	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C113	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C123	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C124	1-164-005-11	CERAMIC CHIP	0.47uF	25V	
C151	1-163-007-11	CERAMIC CHIP	680PF	10% 50V	
C152	1-163-007-11	CERAMIC CHIP	680PF	10% 50V	
C153	1-163-038-00	CERAMIC CHIP	0.1uF	25V	
C154	1-164-336-11	CERAMIC CHIP	0.33uF	25V	
C155	1-163-007-11	CERAMIC CHIP	680PF	10% 50V	
C156	1-163-007-11	CERAMIC CHIP	680PF	10% 50V	
C157	1-163-033-00	CERAMIC CHIP	0.022uF	50V	
C158	1-163-033-00	CERAMIC CHIP	0.022uF	50V	
C159	1-163-023-00	CERAMIC CHIP	0.015uF	5% 50V	
C160	1-163-019-00	CERAMIC CHIP	0.0068uF	10% 50V	
C161	1-163-038-00	CERAMIC CHIP	0.1uF	25V	

< CONNECTOR >

* CN101 1-568-865-11 SOCKET, CONNECTOR 23P
 CN102 1-568-795-11 SOCKET, CONNECTOR 12P

< IC >

IC101 8-752-351-94 IC CXD2515Q
 IC102 8-759-071-79 IC BA6297AFP

< RESISTOR >

R101	1-216-077-00	METAL CHIP	15K	5%	1/10W
R102	1-216-097-00	METAL CHIP	100K	5%	1/10W
R103	1-216-077-00	METAL CHIP	15K	5%	1/10W
R104	1-216-085-00	METAL CHIP	33K	5%	1/10W
R105	1-216-097-00	METAL CHIP	100K	5%	1/10W
R106	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R107	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R108	1-216-073-00	METAL CHIP	10K	5%	1/10W
R109	1-216-121-00	METAL CHIP	1M	5%	1/10W
R110	1-216-025-00	METAL GLAZE	100	5%	1/10W
R112	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R113	1-216-077-00	METAL CHIP	15K	5%	1/10W
R114	1-216-077-00	METAL CHIP	15K	5%	1/10W
R117	1-216-077-00	METAL CHIP	15K	5%	1/10W
R118	1-216-077-00	METAL CHIP	15K	5%	1/10W
R121	1-216-077-00	METAL CHIP	15K	5%	1/10W
R122	1-216-077-00	METAL CHIP	15K	5%	1/10W
R123	1-216-073-00	METAL CHIP	10K	5%	1/10W
R124	1-216-097-00	METAL CHIP	100K	5%	1/10W

Ref. No.	Part No.	Description	Remark		
R125	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R126	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R127	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R131	1-216-037-00	METAL CHIP	330	5%	1/10W
R151	1-216-070-00	METAL CHIP	7.5K	5%	1/10W
R152	1-216-070-00	METAL CHIP	7.5K	5%	1/10W
R153	1-216-070-00	METAL CHIP	7.5K	5%	1/10W
R154	1-216-070-00	METAL CHIP	7.5K	5%	1/10W
R155	1-216-070-00	METAL CHIP	7.5K	5%	1/10W
R156	1-216-070-00	METAL CHIP	7.5K	5%	1/10W
R157	1-216-093-00	METAL CHIP	68K	5%	1/10W
R158	1-216-076-00	METAL CHIP	13K	5%	1/10W
R159	1-216-085-00	METAL CHIP	33K	5%	1/10W
R160	1-216-081-00	METAL CHIP	22K	5%	1/10W
R161	1-216-308-00	METAL CHIP	4.7	5%	1/10W
R162	1-216-093-00	METAL CHIP	68K	5%	1/10W
R163	1-216-093-00	METAL CHIP	68K	5%	1/10W

< SWITCH >

S101 1-572-085-11 SWITCH, LEAF (LIMIT)

* A-4373-466-A DISPLAY BOARD, COMPLETE

< CAPACITOR >

C801	1-161-494-00	CERAMIC	0.022uF	25V	
C802	1-162-211-31	CERAMIC	33PF	5% 50V	
C803	1-164-159-11	CERAMIC	0.1uF	50V	
C804	1-164-159-11	CERAMIC	0.1uF	50V	
C805	1-126-157-11	ELECT	10uF	20% 16V	
C806	1-162-282-31	CERAMIC	100PF	10% 50V	
C807	1-162-282-31	CERAMIC	100PF	10% 50V	

< CONNECTOR >

* CN803 1-695-821-11 CONNECTOR, BOARD TO BOARD 12P

< FILTER >

FL801 1-517-278-11 INDICATOR TUBE, FLUORESCENT

< IC >

IC801 8-749-010-21 IC TFMT5400
 IC802 8-759-337-52 IC LC75721E

DISPLAY

FUNCTION

HEADPHONE

Ref. No.	Part No.	Description	Remark
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< TRANSISTOR >

Q803	8-729-900-89	TRANSISTOR	DTC144ES
Q804	8-729-900-89	TRANSISTOR	DTC144ES
Q805	8-729-900-89	TRANSISTOR	DTC144ES
Q806	8-729-900-89	TRANSISTOR	DTC144ES
Q807	8-729-900-89	TRANSISTOR	DTC144ES

< RESISTOR >

R714	1-249-421-11	CARBON	2. 2K 5%	1/4W F
R715	1-249-423-11	CARBON	3. 3K 5%	1/4W F
R716	1-249-427-11	CARBON	6. 8K 5%	1/4W F
R717	1-249-431-11	CARBON	15K 5%	1/4W
R803	1-249-433-11	CARBON	22K 5%	1/4W
R804	1-249-417-11	CARBON	1K 5%	1/4W F
R805	1-249-417-11	CARBON	1K 5%	1/4W F
R806	1-249-417-11	CARBON	1K 5%	1/4W F
R807	1-249-411-11	CARBON	330 5%	1/4W
R808	1-249-441-11	CARBON	100K 5%	1/4W
R809	1-249-441-11	CARBON	100K 5%	1/4W
R810	1-249-441-11	CARBON	100K 5%	1/4W
R811	1-249-441-11	CARBON	100K 5%	1/4W
R812	1-249-441-11	CARBON	100K 5%	1/4W
R813	1-249-441-11	CARBON	100K 5%	1/4W

< SWITCH >

S714	1-554-303-21	SWITCH, TACTILE (DISC 5)
S715	1-554-303-21	SWITCH, TACTILE (DISC 4)
S716	1-554-303-21	SWITCH, TACTILE (DISC 3)
S717	1-554-303-21	SWITCH, TACTILE (DISC 2)
S718	1-554-303-21	SWITCH, TACTILE (DISC 1)

*	1-655-601-11	FUNCTION BOARD

< CONNECTOR >

CN801	1-695-338-11	PIN, CONNECTOR (PC BOARD) 15P
* CN802	1-695-820-11	CONNECTOR, BOARD TO BOARD 12P

< DIODE >

D801	8-719-303-02	DIODE SEL2510C-D (▶)
D802	8-719-301-52	LED SEL2810A-C (■)

< TRANSISTOR >

Q801	8-729-900-89	TRANSISTOR	DTC144ES
Q802	8-729-900-89	TRANSISTOR	DTC144ES

< RESISTOR >

R701	1-249-415-11	CARBON	680 5%	1/4W F
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Ref. No.	Part No.	Description	Remark
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R702	1-249-417-11	CARBON	1K 5% 1/4W F
R703	1-249-419-11	CARBON	1. 5K 5% 1/4W F
R704	1-249-421-11	CARBON	2. 2K 5% 1/4W F
R705	1-249-423-11	CARBON	3. 3K 5% 1/4W F

R706	1-249-427-11	CARBON	6. 8K 5% 1/4W F
R707	1-249-431-11	CARBON	15K 5% 1/4W
R711	1-249-415-11	CARBON	680 5% 1/4W F
R712	1-249-417-11	CARBON	1K 5% 1/4W F
R713	1-249-419-11	CARBON	1. 5K 5% 1/4W F

R801	1-249-406-11	CARBON	120 5% 1/4W F
R802	1-249-409-11	CARBON	220 5% 1/4W F

< SWITCH >

S701	1-554-303-21	SWITCH, TACTILE (EX-CHANGE)
S702	1-554-303-21	SWITCH, TACTILE (DISC SKIP)
S703	1-554-303-21	SWITCH, TACTILE (▲ OPEN/CLOSE)
S704	1-554-303-21	SWITCH, TACTILE (AMS ▶▶)
S705	1-554-303-21	SWITCH, TACTILE (AMS ◀◀)

S706	1-554-303-21	SWITCH, TACTILE (■)
S707	1-554-303-21	SWITCH, TACTILE (■)
S708	1-554-303-21	SWITCH, TACTILE (▶)
S711	1-554-303-21	SWITCH, TACTILE (PROGRAM)
S712	1-554-303-21	SWITCH, TACTILE (SHUFFLE)

S713	1-554-303-21	SWITCH, TACTILE (CONTINUE)
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*	1-655-602-11	HEADPHONE BOARD

< CAPACITOR >

C151	1-162-294-31	CERAMIC	0. 001uF 10% 50V
C251	1-162-294-31	CERAMIC	0. 001uF 10% 50V
C353	1-164-159-11	CERAMIC	0. 1uF 50V

< CONNECTOR >

* CN351	1-695-374-31	PIN, CONNECTOR (PC BOARD) 13P
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< JACK >

J351	1-750-162-61	JACK (LARGE TYPE) (PHONES)
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< COIL >

L351	1-424-122-11	FILTER, NOISE
L352	1-424-122-11	FILTER, NOISE
L353	1-424-122-11	FILTER, NOISE

< RESISTOR >

R155	1-249-402-11	CARBON	56 5% 1/4W F
R255	1-249-402-11	CARBON	56 5% 1/4W F

HEADPHONE

LOADING MOTOR

MAIN

Ref. No.	Part No.	Description	Remark
		< VARIABLE RESISTOR >	
RV351	1-223-857-11	RES, VAR, CARBON (LINE OUT/PHONE LEVEL)	

*	1-647-363-11	LOADING MOTOR BOARD	

		< MOTOR >	
M702	A-4604-834-A	MOTOR ASSY, LOADING	
		< ENCODER ROTARY >	
S701	1-466-996-11	ENCODER, ROTARY	

*	A-4673-463-A	MAIN BOARD, COMPLETE (CA8ES:US, CND)	

*	A-4673-469-A	MAIN BOARD, COMPLETE (CA8ES:AEP)	

*	A-4673-471-A	MAIN BOARD, COMPLETE (CA8ES:E)	

*	A-4673-473-A	MAIN BOARD, COMPLETE (CA9ES)	

	7-685-871-01	SCREW +BVTT 3X6 (S)	
		< CAPACITOR >	
C102	1-130-487-00	MYLAR 0.022uF 5% 50V	
C103	1-130-484-00	MYLAR 0.012uF 5% 50V	
C104	1-130-484-00	MYLAR 0.012uF 5% 50V	
C105	1-106-363-00	MYLAR 6800PF 5% 200V	
C106	1-106-363-00	MYLAR 6800PF 5% 200V	
C107	1-162-286-31	CERAMIC 220PF 10% 50V	
C108	1-162-286-31	CERAMIC 220PF 10% 50V	
C109	1-107-160-00	MICA 36PF 5% 500V	
C110	1-107-208-00	MICA 18PF 5% 500V	
C111	1-130-477-00	MYLAR 0.0033uF 5% 50V	
C112	1-130-469-00	MYLAR 680PF 5% 50V	
C113	1-124-994-11	ELECT 100uF 20% 10V	
C114	1-130-467-00	MYLAR 470PF 5% 50V	
C151	1-164-159-11	CERAMIC 0.1uF 50V	
C152	1-164-159-11	CERAMIC 0.1uF 50V	
C153	1-164-159-11	CERAMIC 0.1uF 50V	
C154	1-164-159-11	CERAMIC 0.1uF 50V	
C155	1-126-177-11	ELECT 100uF 20% 10V	
C156	1-136-153-00	FILM 0.01uF 5% 50V	
C157	1-126-059-11	ELECT 10uF 20% 50V	
C158	1-124-478-11	ELECT 100uF 20% 25V	

Ref. No.	Part No.	Description	Remark
C159	1-136-153-00	FILM 0.01uF 5% 50V	
C160	1-126-059-11	ELECT 10uF 20% 50V	
C161	1-126-059-11	ELECT 10uF 20% 50V	
C162	1-124-478-11	ELECT 100uF 20% 25V	
C163	1-124-478-11	ELECT 100uF 20% 25V	
C164	1-136-165-00	FILM 0.1uF 5% 50V	
C165	1-136-165-00	FILM 0.1uF 5% 50V	
C166	1-126-059-11	ELECT 10uF 20% 50V	
C167	1-124-122-11	ELECT 100uF 20% 50V	
C168	1-124-122-11	ELECT 100uF 20% 50V	
C169	1-136-173-00	FILM 0.47uF 5% 50V	
C202	1-130-487-00	MYLAR 0.022uF 5% 50V	
C203	1-130-484-00	MYLAR 0.012uF 5% 50V	
C204	1-130-484-00	MYLAR 0.012uF 5% 50V	
C205	1-106-363-00	MYLAR 6800PF 5% 200V	
C206	1-106-363-00	MYLAR 6800PF 5% 200V	
C207	1-162-286-31	CERAMIC 220PF 10% 50V	
C208	1-162-286-31	CERAMIC 220PF 10% 50V	
C209	1-107-160-00	MICA 36PF 5% 500V	
C210	1-107-208-00	MICA 18PF 5% 500V	
C211	1-130-477-00	MYLAR 0.0033uF 5% 50V	
C212	1-130-469-00	MYLAR 680PF 5% 50V	
C213	1-124-994-11	ELECT 100uF 20% 10V	
C214	1-130-467-00	MYLAR 470PF 5% 50V	
C251	1-164-159-11	CERAMIC 0.1uF 50V	
C252	1-164-159-11	CERAMIC 0.1uF 50V	
C253	1-164-159-11	CERAMIC 0.1uF 50V	
C254	1-164-159-11	CERAMIC 0.1uF 50V	
C255	1-126-177-11	ELECT 100uF 20% 10V	
C256	1-136-153-00	FILM 0.01uF 5% 50V	
C257	1-126-059-11	ELECT 10uF 20% 50V	
C258	1-124-478-11	ELECT 100uF 20% 25V	
C259	1-136-153-00	FILM 0.01uF 5% 50V	
C260	1-126-059-11	ELECT 10uF 20% 50V	
C261	1-126-059-11	ELECT 10uF 20% 50V	
C262	1-124-478-11	ELECT 100uF 20% 25V	
C263	1-124-478-11	ELECT 100uF 20% 25V	
C264	1-136-165-00	FILM 0.1uF 5% 50V	
C265	1-136-165-00	FILM 0.1uF 5% 50V	
C266	1-126-059-11	ELECT 10uF 20% 50V	
C267	1-124-122-11	ELECT 100uF 20% 50V	
C268	1-124-122-11	ELECT 100uF 20% 50V	
C269	1-136-173-00	FILM 0.47uF 5% 50V	
C306	1-162-208-31	CERAMIC 24PF 5% 50V	
C307	1-164-159-11	CERAMIC 0.1uF 50V	
C308	1-126-177-11	ELECT 100uF 20% 10V	
C310	1-162-199-31	CERAMIC 10PF 5% 50V	
C311	1-162-199-31	CERAMIC 10PF 5% 50V	
C320	1-161-494-00	CERAMIC 0.022uF 25V	

MAIN

Ref. No.	Part No.	Description	Remark
C321	1-124-994-11	ELECT 100uF	20% 10V
C322	1-164-159-11	CERAMIC 0.1uF	50V
C323	1-164-159-11	CERAMIC 0.1uF	50V
C324	1-124-994-11	ELECT 100uF	20% 10V
C325	1-164-159-11	CERAMIC 0.1uF	50V
C326	1-164-159-11	CERAMIC 0.1uF	50V
C327	1-162-290-31	CERAMIC 470PF	10% 50V
C350	1-164-159-11	CERAMIC 0.1uF	50V
C351	1-126-012-11	ELECT 470uF	20% 16V
C352	1-126-012-11	ELECT 470uF	20% 16V
C401	1-126-022-11	ELECT 47uF	20% 16V
C402	1-124-604-00	ELECT 330uF	20% 10V
C412	1-164-159-11	CERAMIC 0.1uF	50V
C413	1-164-159-11	CERAMIC 0.1uF	50V
C419	1-164-159-11	CERAMIC 0.1uF	50V
C501	1-126-022-11	ELECT 47uF	20% 16V
C502	1-164-159-11	CERAMIC 0.1uF	50V
C503	1-164-159-11	CERAMIC 0.1uF	50V
C506	1-162-294-31	CERAMIC 0.001uF	10% 50V
C507	1-162-294-31	CERAMIC 0.001uF	10% 50V
C508	1-162-294-31	CERAMIC 0.001uF	10% 50V
C509	1-162-294-31	CERAMIC 0.001uF	10% 50V
C510	1-162-294-31	CERAMIC 0.001uF	10% 50V
C511	1-164-159-11	CAP, CERAMIC 0.1uF	50V
C512	1-164-159-11	CAP, CERAMIC 0.1uF	50V
C531	1-104-905-11	CAP, DOUBLE LAYERS 0.22F	(CA9ES)
C532	1-164-159-11	CERAMIC 0.1uF	50V (CA9ES)
C533	1-161-494-00	CERAMIC 0.022uF	25V (CA9ES)
C551	1-126-022-11	ELECT 47uF	20% 16V
C552	1-126-022-11	ELECT 47uF	20% 16V
C565	1-164-159-11	CERAMIC 0.1uF	50V
C571	1-162-306-11	CERAMIC 0.01uF	20% 16V
C572	1-164-159-11	CERAMIC 0.1uF	50V
C573	1-164-159-11	CERAMIC 0.1uF	50V
C601	1-161-494-00	CERAMIC 0.022uF	25V
C602	1-126-937-11	ELECT 4700uF	20% 16V
C603	1-124-556-11	ELECT 2200uF	20% 16V
C604	1-126-059-11	ELECT 10uF	20% 50V
C605	1-126-163-11	ELECT 4.7uF	20% 50V
C606	1-126-163-11	ELECT 4.7uF	20% 50V
C607	1-126-101-11	ELECT 100uF	20% 16V
C608	1-126-101-11	ELECT 100uF	20% 16V
C609	1-124-572-11	ELECT 100uF	20% 63V
C610	1-126-059-11	ELECT 10uF	20% 50V
C611	1-161-494-00	CERAMIC 0.022uF	25V (CA9ES)
C612	1-124-556-11	ELECT 2200uF	20% 16V
C613	1-124-556-11	ELECT 2200uF	20% 16V
C614	1-126-023-11	ELECT 100uF	20% 16V
C615	1-126-103-11	ELECT 470uF	20% 16V

Ref. No.	Part No.	Description	Remark
C616	1-126-103-11	ELECT 470uF	20% 16V
C650	1-164-159-11	CERAMIC 0.1uF	50V
C651	1-164-159-11	CERAMIC 0.1uF	50V
C652	1-164-159-11	CERAMIC 0.1uF	50V
C653	1-164-159-11	CERAMIC 0.1uF	50V
C654	1-164-159-11	CERAMIC 0.1uF	50V
C655	1-164-159-11	CERAMIC 0.1uF	50V
C656	1-164-159-11	CERAMIC 0.1uF	50V
< CONNECTOR >			
CN301	1-695-336-31	PIN, CONNECTOR (PC BOARD) 13P	
CN401	1-750-640-11	CONNECTOR, FFC/FPC 23P	
CN402	1-695-338-11	PIN, CONNECTOR (PC BOARD) 15P	
CN403	1-695-366-21	PIN, CONNECTOR (PC BOARD) 5P (CA8ES)	
CN403	1-568-852-11	PIN, CONNECTOR (PC BOARD) 9P (CA9ES)	
* CN504	1-695-329-31	PIN, CONNECTOR (PC BOARD) 6P	
CN601	1-580-230-11	PIN, CONNECTOR (PC BOARD) 3P	
< DIODE >			
D301	8-719-987-63	DIODE 1N4148M	
D531	8-719-987-63	DIODE 1N4148M (CA9ES)	
D551	8-719-109-92	DIODE RD6.2ES-B1	
D571	8-719-987-63	DIODE 1N4148M	
D572	8-719-987-63	DIODE 1N4148M	
D573	8-719-109-87	DIODE RD5.6ES-B	
D601	8-719-210-21	DIODE 11EQS04 (CA8ES)	
D601	8-719-200-82	DIODE 11ES2 (CA9ES)	
D602	8-719-210-21	DIODE 11EQS04 (CA8ES)	
D602	8-719-200-82	DIODE 11ES2 (CA9ES)	
D603	8-719-210-21	DIODE 11EQS04 (CA8ES)	
D603	8-719-200-82	DIODE 11ES2 (CA9ES)	
D604	8-719-210-21	DIODE 11EQS04 (CA8ES)	
D604	8-719-200-82	DIODE 11ES2 (CA9ES)	
D605	8-719-200-82	DIODE 11ES2	
D606	8-719-110-13	DIODE RD9.1ESB2	
D607	8-719-210-21	DIODE 11EQS04 (CA9ES)	
D608	8-719-210-21	DIODE 11EQS04 (CA9ES)	
D609	8-719-210-21	DIODE 11EQS04 (CA9ES)	
D610	8-719-210-21	DIODE 11EQS04 (CA9ES)	
D611	8-719-987-63	DIODE 1N4148M	
D612	8-719-109-85	DIODE RD5.1ES-B2	
D613	8-719-200-82	DIODE 11ES2	
D614	8-719-200-82	DIODE 11ES2	
< IC >			
IC301	8-759-287-70	IC CXD8505Q	
IC302	8-759-293-17	IC CXA8042S	
IC303	8-759-293-17	IC CXA8042S	
IC304	8-759-900-72	IC NE5532P	

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
IC305	8-759-900-72	IC NE5532P		Q574	8-729-900-61	TRANSISTOR DTA114ES	
IC306	8-759-900-72	IC NE5532P		Q601	8-729-119-76	TRANSISTOR 2SA1175-HFE	
IC307	8-759-900-72	IC NE5532P		< RESISTOR >			
IC351	8-759-167-88	IC NJM4565D		R101	1-215-409-00	METAL 330 1% 1/4W	
IC405	8-749-921-12	IC GP1F32T (DIGITAL OUT)		R102	1-215-409-00	METAL 330 1% 1/4W	
IC501	8-752-858-45	IC CXP84124-026Q		R103	1-215-409-00	METAL 330 1% 1/4W	
IC531	8-759-289-94	IC LH5160TF (CA9ES)		R104	1-215-409-00	METAL 330 1% 1/4W	
IC551	8-759-330-30	IC BA6193		R105	1-215-373-31	METAL 10 1% 1/4W	
IC561	8-759-803-42	IC LA6500-FA		R106	1-215-373-31	METAL 10 1% 1/4W	
IC601	8-759-330-29	IC LA5616		R107	1-215-373-31	METAL 10 1% 1/4W	
IC603	8-759-633-42	IC M5293L		R108	1-215-373-31	METAL 10 1% 1/4W	
IC604	8-759-231-53	IC TA7805S (CA8ES)		R109	1-215-383-00	METAL 27 1% 1/4W	
IC604	8-759-604-86	IC M5F7807 (CA9ES)		R110	1-215-383-00	METAL 27 1% 1/4W	
IC605	8-759-245-79	IC TA79005S (CA8ES)		R111	1-215-407-00	METAL 270 1% 1/4W	
IC605	8-759-604-90	IC M5F7907L (CA9ES)		R112	1-215-407-00	METAL 270 1% 1/4W	
< JACK >				R113	1-215-437-00	METAL 4.7K 1% 1/4W	
J301	1-569-443-21	JACK, PIN 4P (LINE OUT)		R114	1-215-437-00	METAL 4.7K 1% 1/4W	
J302	1-566-213-11	PIN, CONNECTOR 4P (CONTROL S)		R115	1-215-439-00	METAL 5.6K 1% 1/4W	
< COIL >				R116	1-215-439-00	METAL 5.6K 1% 1/4W	
L101	1-412-473-21	INDUCTOR 0uH		R117	1-215-422-00	METAL 1.1K 1% 1/4W	
L102	1-412-473-21	INDUCTOR 0uH		R118	1-215-429-00	METAL 2.2K 1% 1/4W	
L104	1-412-473-21	INDUCTOR 0uH		R119	1-215-459-00	METAL 39K 1% 1/4W	
L201	1-412-473-21	INDUCTOR 0uH		R120	1-215-373-31	METAL 10 1% 1/4W	
L202	1-412-473-21	INDUCTOR 0uH		R121	1-215-389-00	METAL 47 1% 1/4W	
L204	1-412-473-21	INDUCTOR 0uH		R122	1-215-481-00	METAL 330K 1% 1/4W	
L304	1-410-503-11	INDUCTOR 3.3uH		R123	1-215-407-00	METAL 270 1% 1/4W	
L305	1-410-503-11	INDUCTOR 3.3uH		R124	1-215-403-00	METAL 180 1% 1/4W	
L403	1-410-503-11	INDUCTOR 3.3uH		R125	1-215-405-00	METAL 220 1% 1/4W	
L501	1-424-122-11	FILTER, NOISE		R126	1-249-425-11	CARBON 4.7K 5% 1/4W F	
L511	1-412-423-21	INDUCTOR 0uH		R127	1-249-425-11	CARBON 4.7K 5% 1/4W F	
L512	1-412-423-21	INDUCTOR 0uH		R128	1-249-393-11	CARBON 10 5% 1/4W F	
L571	1-410-503-11	INDUCTOR 3.3uH		R129	1-249-413-11	CARBON 470 5% 1/4W F	
L572	1-410-503-11	INDUCTOR 3.3uH		R151	1-249-435-11	CARBON 33K 5% 1/4W	
< TRANSISTOR >				R152	1-249-432-11	CARBON 18K 5% 1/4W	
Q101	8-729-231-55	TRANSISTOR 2SC2878-AB		R153	1-249-422-11	CARBON 2.7K 5% 1/4W F	
Q102	8-729-231-55	TRANSISTOR 2SC2878-AB		R154	1-249-429-11	CARBON 10K 5% 1/4W	
Q201	8-729-231-55	TRANSISTOR 2SC2878-AB		R201	1-215-409-00	METAL 330 1% 1/4W	
Q202	8-729-231-55	TRANSISTOR 2SC2878-AB		R202	1-215-409-00	METAL 330 1% 1/4W	
Q301	8-729-900-65	TRANSISTOR DTA144ES		R203	1-215-409-00	METAL 330 1% 1/4W	
Q302	8-729-900-65	TRANSISTOR DTA144ES		R204	1-215-409-00	METAL 330 1% 1/4W	
Q303	8-729-900-61	TRANSISTOR DTA114ES		R205	1-215-373-31	METAL 10 1% 1/4W	
Q504	8-729-620-05	TRANSISTOR 2SC2603-EF		R206	1-215-373-31	METAL 10 1% 1/4W	
Q571	8-729-900-89	TRANSISTOR DTC144ES		R207	1-215-373-31	METAL 10 1% 1/4W	
Q572	8-729-900-61	TRANSISTOR DTA114ES		R208	1-215-373-31	METAL 10 1% 1/4W	
Q573	8-729-900-61	TRANSISTOR DTA114ES		R209	1-215-383-00	METAL 27 1% 1/4W	
				R210	1-215-383-00	METAL 27 1% 1/4W	
				R211	1-215-407-00	METAL 270 1% 1/4W	
				R212	1-215-407-00	METAL 270 1% 1/4W	

MAIN

SENSOR

Ref. No.	Part No.	Description	Remark
R213	1-215-437-00	METAL 4. 7K 1%	1/4W
R214	1-215-437-00	METAL 4. 7K 1%	1/4W
R215	1-215-439-00	METAL 5. 6K 1%	1/4W
R216	1-215-439-00	METAL 5. 6K 1%	1/4W
R217	1-215-422-00	METAL 1. 1K 1%	1/4W
R218	1-215-429-00	METAL 2. 2K 1%	1/4W
R219	1-215-459-00	METAL 39K 1%	1/4W
R220	1-215-373-31	METAL 10 1%	1/4W
R221	1-215-389-00	METAL 47 1%	1/4W
R222	1-215-481-00	METAL 330K 1%	1/4W
R223	1-215-407-00	METAL 270 1%	1/4W
R224	1-215-403-00	METAL 180 1%	1/4W
R225	1-215-405-00	METAL 220 1%	1/4W
R226	1-249-425-11	CARBON 4. 7K 5%	1/4W F
R227	1-249-425-11	CARBON 4. 7K 5%	1/4W F
R228	1-249-393-11	CARBON 10 5%	1/4W F
R229	1-249-413-11	CARBON 470 5%	1/4W F
R251	1-249-435-11	CARBON 33K 5%	1/4W
R252	1-249-432-11	CARBON 18K 5%	1/4W
R253	1-249-422-11	CARBON 2. 7K 5%	1/4W F
R254	1-249-429-11	CARBON 10K 5%	1/4W
R301	1-249-417-11	CARBON 1K 5%	1/4W F
R302	1-249-409-11	CARBON 220 5%	1/4W F
R303	1-249-425-11	CARBON 4. 7K 5%	1/4W F
R306	1-249-441-11	CARBON 100K 5%	1/4W
R307	1-249-441-11	CARBON 100K 5%	1/4W
R308	1-249-441-11	CARBON 100K 5%	1/4W
R309	1-247-807-31	CARBON 100 5%	1/4W
R310	1-249-429-11	CARBON 10K 5%	1/4W
R318	1-249-417-11	CARBON 1K 5%	1/4W F
R319	1-249-417-11	CARBON 1K 5%	1/4W F
R320	1-249-423-11	CARBON 3. 3K 5%	1/4W F
R326	1-249-441-11	CARBON 100K 5%	1/4W
R351	1-247-807-31	CARBON 100 5%	1/4W
R352	1-247-807-31	CARBON 100 5%	1/4W
R501	1-247-807-31	CARBON 100 5%	1/4W
R502	1-247-807-31	CARBON 100 5%	1/4W
R503	1-247-807-31	CARBON 100 5%	1/4W
R504	1-249-417-11	CARBON 1K 5%	1/4W F
R509	1-249-417-11	CARBON 1K 5%	1/4W F
R510	1-249-427-11	CARBON 6. 8K 5%	1/4W F
R511	1-249-427-11	CARBON 6. 8K 5%	1/4W F
R512	1-249-427-11	CARBON 6. 8K 5%	1/4W F
R513	1-249-427-11	CARBON 6. 8K 5%	1/4W F
R514	1-249-427-11	CARBON 6. 8K 5%	1/4W F (CA9ES)
R522	1-249-430-11	CARBON 12K 5%	1/4W
R523	1-249-429-11	CARBON 10K 5%	1/4W
R524	1-249-425-11	CARBON 4. 7K 5%	1/4W F
R525	1-249-425-11	CARBON 4. 7K 5%	1/4W F

Ref. No.	Part No.	Description	Remark
R526	1-249-425-11	CARBON 4. 7K 5%	1/4W F
R531	1-249-399-11	CARBON 33 5%	1/4W F (CA9ES)
R532	1-249-417-11	CARBON 1K 5%	1/4W F (CA9ES)
R533	1-249-429-11	CARBON 10K 5%	1/4W (CA9ES)
R543	1-249-427-11	CARBON 6. 8K 5%	1/4W F
R544	1-249-415-11	CARBON 680 5%	1/4W F
R551	1-249-425-11	CARBON 4. 7K 5%	1/4W F
R552	1-249-429-11	CARBON 10K 5%	1/4W
R553	1-249-427-11	CARBON 6. 8K 5%	1/4W F
R554	1-249-422-11	CARBON 2. 7K 5%	1/4W F
R555	1-249-429-11	CARBON 10K 5%	1/4W
R559	1-249-417-11	CARBON 1K 5%	1/4W F
R561	1-249-441-11	CARBON 100K 5%	1/4W
R562	1-249-441-11	CARBON 100K 5%	1/4W
R563	1-249-441-11	CARBON 100K 5%	1/4W
R564	1-249-441-11	CARBON 100K 5%	1/4W
R565	1-249-393-11	CARBON 10 5%	1/4W F
R571	1-249-429-11	CARBON 10K 5%	1/4W
R572	1-249-429-11	CARBON 10K 5%	1/4W
R573	1-249-393-11	CARBON 10 5%	1/4W F
R601	1-249-435-11	CARBON 33K 5%	1/4W
R602	1-249-429-11	CARBON 10K 5%	1/4W
R603	1-249-438-11	CARBON 56K 5%	1/4W
R604	1-249-413-11	CARBON 470 5%	1/4W F
R701	1-215-409-00	METAL 330 1%	1/4W
R801	1-215-409-00	METAL 330 1%	1/4W
< SWITCH >			
SW601	1-572-675-11	SWITCH, POWER VOLTAGE CHANGE (CA8ES:E)	
< TRANSFORMER >			
A703	1-424-485-11	FILTER, LINE	
< VIBRATOR >			
X301	1-579-161-11	VIBRATOR, CRYSTAL (45MHz)	
X501	1-579-175-11	VIBRATOR, CERAMIC (10MHz)	

*	1-647-362-11	SENSOR BOARD	

< CONNECTOR >			
CN801	1-573-383-11	PIN, CONNECTOR (PC BOARD) 2P	
CN802	1-750-243-11	SOKET, CONNECTOR 6P	
< PHOTO INTERRUPTER >			
D801	8-749-924-18	PHOTO INTERRUPTER RPI-1391	
D802	8-749-924-30	PHOTO REFLECTOR GP2S28	

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

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

SENSOR

TABLE MOTOR

Ref.No.	Part No.	Description	Remark
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< RESISTOR >

R801	1-249-416-11	CARBON	820 5% 1/4W
R802	1-249-406-11	CARBON	120 5% 1/4W F

* 1-647-364-11 TABLE MOTOR BOARD

< MOTOR >

M701 A-4660-322-A MOTOR ASSY, ROTARY (TABLE)

MISCELLANEOUS

11	1-769-457-11	WIRE (FLAT TYPE) (13 CORE)
14	1-769-455-11	WIRE (FLAT TYPE) (9 CORE) (CA9ES)
14	1-769-458-11	WIRE (FLAT TYPE) (5 CORE) (CA8ES)
15	1-769-456-11	WIRE (FLAT TYPE) (15 CORE)
51	1-751-052-11	WIRE (FLAT TYPE) (6 CORE)

△71 1-575-651-21 CORD, POWER (CA8ES:AEP)

△71 1-590-926-11 CORD, POWER (CA8ES:US, CND/CA9ES)

△71 1-696-027-11 CORD, POWER (CA8ES:E)

72 1-569-007-11 ADAPTER, CONVERSION 2P (CA8ES:E)

76 1-751-052-11 WIRE (FLAT TYPE) (6 CORE)

102 1-750-243-11 SOCKET, CONNECTOR 6P

* 119 1-452-538-11 MAGNET

121 1-765-443-11 WIRE (FLAT TYPE) (23 CORE)

157 1-575-001-11 WIRE, FLAT TYPE (12 CORE)

△160 8-848-144-11 DEVICE, OPTICAL KSS-240A

M101 X-4917-523-3 BASE (OUT SERT) ASSY (SPINDLE MOTOR)

M102 X-4917-504-1 MOTOR, ASSY (SLED MOTOR)

S101 1-572-085-11 SWITCH, LEAF (LIMIT)

△T601 1-427-859-11 TRANSFORMER, POWER (CA8ES:US, CND/CA9ES)

△T601 1-427-860-11 TRANSFORMER, POWER (CA8ES:AEP)

△T601 1-427-946-11 TRANSFORMER, POWER (CA8ES:E)

△T602 1-427-859-11 TRANSFORMER, POWER (CA9ES)

HARDWARE LIST

#1	7-621-255-15	SCREW +P 2X3
#2	7-682-548-09	SCREW +BVTT 3X8 (S)
#3	7-682-564-04	SCREW +P 4X14
#4	7-685-134-19	SCREW +PTPWH 2.6X8 (TYPE2)
#5	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S
#6	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S
#7	7-685-648-79	SCREW (M3X12), TAPPING
#8	7-685-871-01	SCREW +BVTT 3X6 (S)

Ref.No.	Part No.	Description	Remark
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ACCESSORIES & PACKING MATERIALS

1-465-730-11 REMOTE COMMANDER (RM-D515) (CA8ES)

1-467-670-21 REMOTE COMMANDER (RM-D645) (CA9ES)

1-558-271-11 CORD, CONNECTION

1-590-925-31 CORD, CONNECTION

3-707-584-01 COVER, BATTERY (for RM-D515) (CA8ES)

3-707-584-21 COVER, BATTERY (for RM-D645) (CA9ES)

3-798-765-11 MANUAL, INSTRUCTIN (ENGLISH, FRENCH, SPANISH, CHINESE) (CA8ES:CND, AEP, E)

3-798-765-21 MANUAL, INSTRUCTION (ENGLISH) (CA8ES:US/CA9ES:US)

3-798-765-41 MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN, PORTURUESE) (CA8ES:AEP)

* 4-965-971-01 CUSHION (FRONT)

* 4-965-972-01 CUSHION (REAR)

* 4-973-285-01 INDIVIDUAL CARTON (CA9ES)

* 4-973-287-01 INDIVIDUAL CARTON (CA8ES)

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

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

CDP-CA8ES/CA9ES

SONY

SERVICE MANUAL

US Model
Canadian Model
CDP-CA8ES/CA9ES
AEP Model
E Model
CDP-CA8ES

SUPPLEMENT-1

File this supplement with the service manual.

Subject: 1. Parts Changed and Correction
2. MAIN Board Modification
3. Base Unit Changed (BU-5BD20)
4. Electrical Parts List (MAIN and BD Board)

(ECN-CD500187, CD601038)

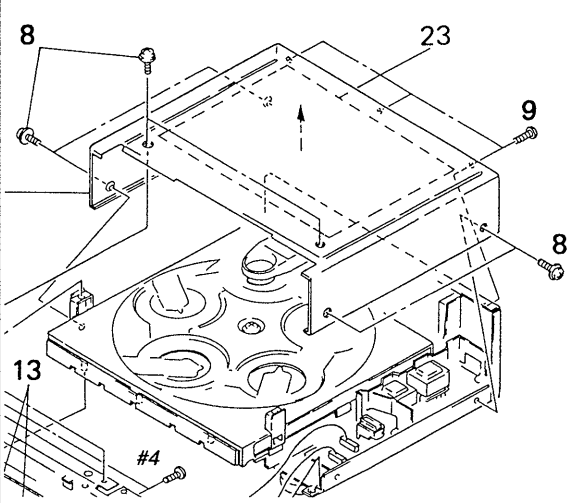
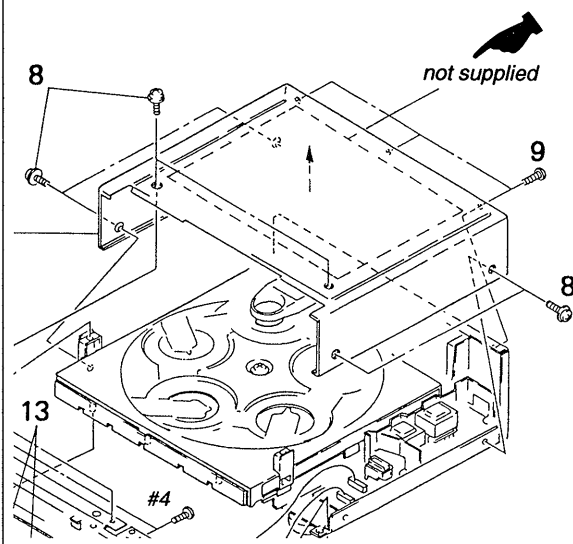
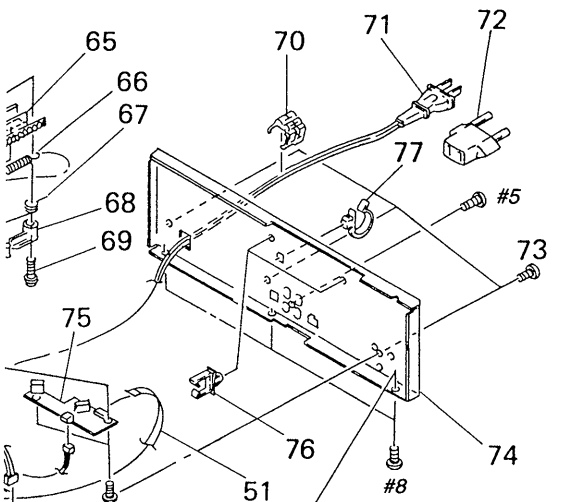
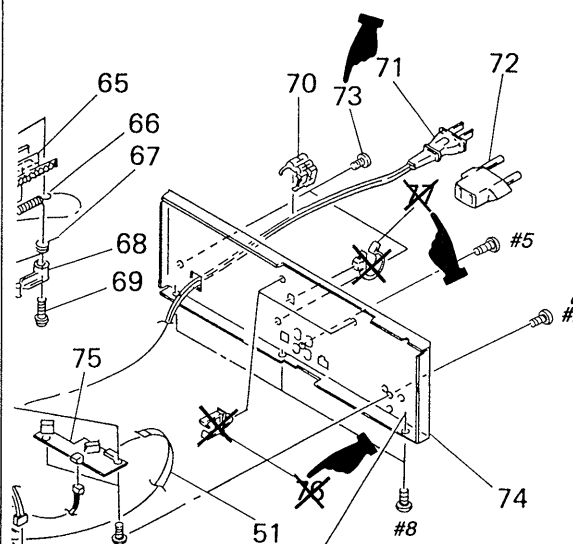
1. PARTS CHANGED AND CORRECTION

1-1. Parts Changed

 : indicates changed portion

Exploded Views

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

Page	Former Type				New Type			
34								
	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
	23	4-974-014-01	REIN FORCEMENT (TOP PLATE)					
35								
	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
	* 76	4-974-684-01	CLAMP, WIRE					
	* 77	4-949-235-01	HOOK					
					#2	7-685-872-09	SCREW +BVT 3X8 (S)	

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Former Type

New Type

Ref. No.	Part No.	Description	Remark
122	4-949-302-81	WASHER	

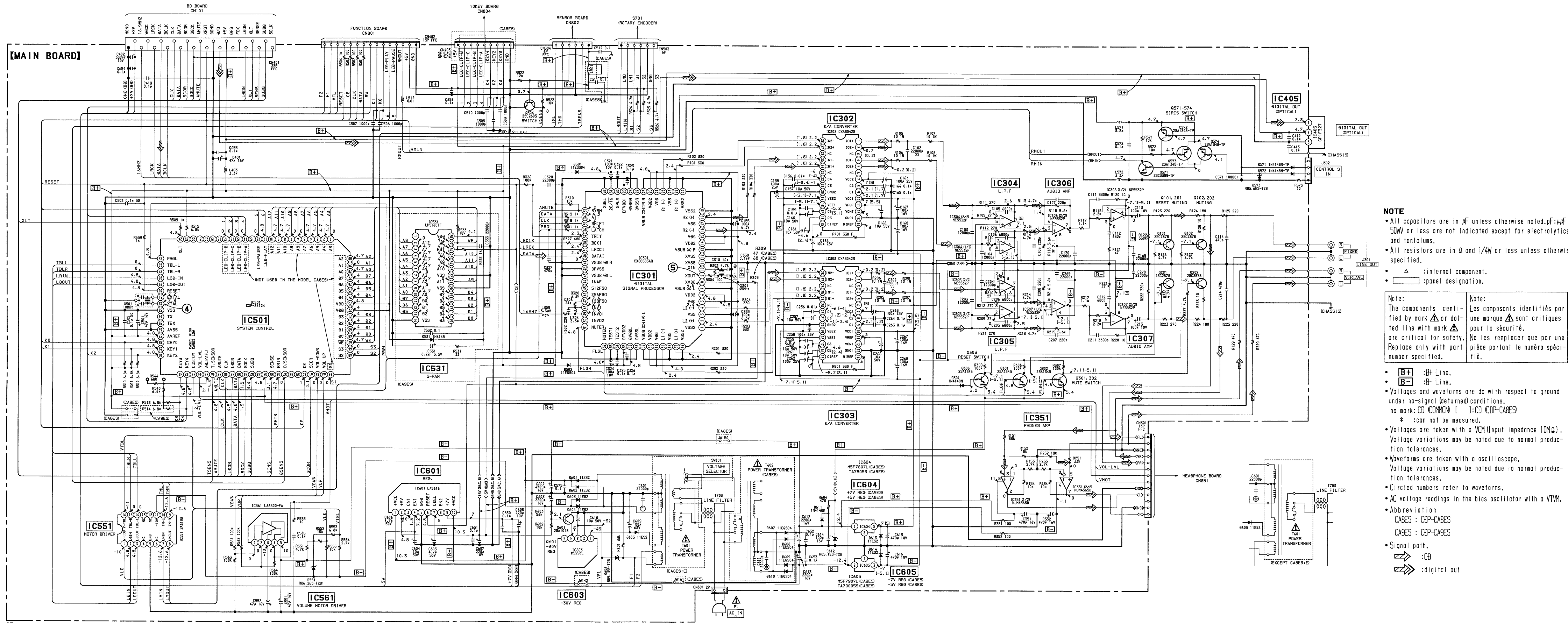
Ref. No.	Part No.	Description	Remark
122	4-975-737-01		
123	3-511-576-11	REKET	
124	3-682-057-01	SPACER (SMALL)	
#2	7-685-872-09	SCREW +BVT 3X8 (S)	

1-2. Correction

: indicates corrected portion

Page	INCORRECT				CORRECT			
34	Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
	* 16	1-665-601-11	FUNCTION BOARD		* 16	<u>1-655-601-11</u>	FUNCTION BOARD	

Ref. No.	Location
D301	E-5
D501	E-9
D502	D-9
D531	E-13
D551	H-13
D571	E-4
D572	D-4
D573	E-4
D601	H-10
D602	H-10
D603	H-11
D604	H-11
D605	H-9
D606	H-9
D607	G-5
D608	G-4
D609	G-5
D610	G-5
D611	F-5
D612	G-6
D613	F-4
D614	F-5
IC301	E-11
IC302	F-9
IC303	F-9
IC304	F-8
IC305	C-8
IC306	E-7
IC307	D-7
IC351	I-14
IC405	B-4
IC501	C-13
IC531	I-14
IC551	F-14
IC561	H-14
IC601	I-11
IC603	H-9
IC604	F-4
IC605	F-5
Q101	C-4
Q102	C-4
Q201	D-4
Q202	D-4
Q301	G-6
Q302	G-7
Q303	F-6
Q504	D-9
Q571	E-4
Q572	E-4
Q573	E-4
Q574	E-4
Q601	H-9



3. BASE UNIT CHANGED (BU-5BD20)

3-1. BU-5BD20 Difference Table

☛ : indicates changed and correction portion

Page	Former Type (BU-5BD10B)	New Type (BU-5BD20)																																				
37																																						
	<table><tr><th>Ref. No.</th><th>Part No.</th><th>Description</th><th>Remark</th></tr><tr><td>* 153</td><td>A-4649-432-A</td><td>BD BOARD, COMPLETE</td><td></td></tr><tr><td>157</td><td>1-575-001-11</td><td>WIRE, FLAT TYPE (12 CORE)</td><td></td></tr><tr><td>△160</td><td>8-848-144-11</td><td>OPTICAL PICK-UP KSS-240A</td><td></td></tr></table>	Ref. No.	Part No.	Description	Remark	* 153	A-4649-432-A	BD BOARD, COMPLETE		157	1-575-001-11	WIRE, FLAT TYPE (12 CORE)		△160	8-848-144-11	OPTICAL PICK-UP KSS-240A		<table><tr><th>Ref. No.</th><th>Part No.</th><th>Description</th><th>Remark</th></tr><tr><td>* 153</td><td>A-4673-509-A</td><td>BD BOARD, COMPLETE</td><td></td></tr><tr><td>157</td><td>1-769-069-11</td><td>WIRE, FLAT TYPE (16 CORE)</td><td></td></tr><tr><td>△160</td><td>8-848-367-11</td><td>OPTICAL PICK-UP KSS-213B</td><td></td></tr><tr><td>#4</td><td>7-685-134-19</td><td>SCREW +PTPHW 2. 6X8 (TYPE2)</td><td></td></tr></table>	Ref. No.	Part No.	Description	Remark	* 153	A-4673-509-A	BD BOARD, COMPLETE		157	1-769-069-11	WIRE, FLAT TYPE (16 CORE)		△160	8-848-367-11	OPTICAL PICK-UP KSS-213B		#4	7-685-134-19	SCREW +PTPHW 2. 6X8 (TYPE2)	
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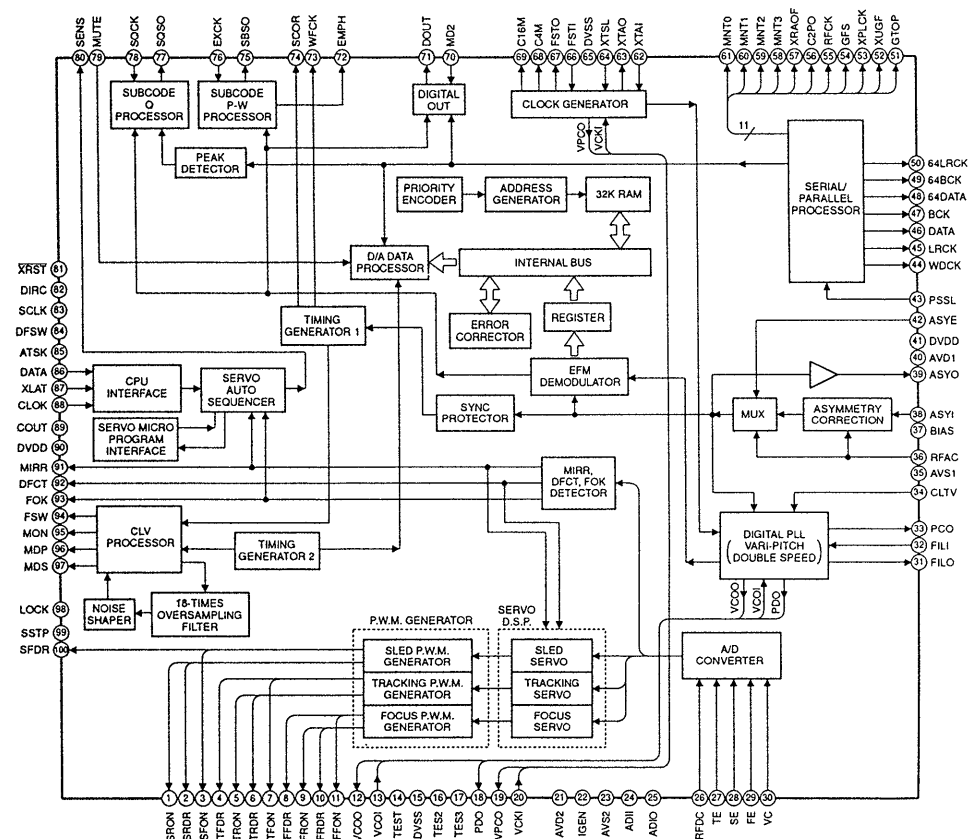
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

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

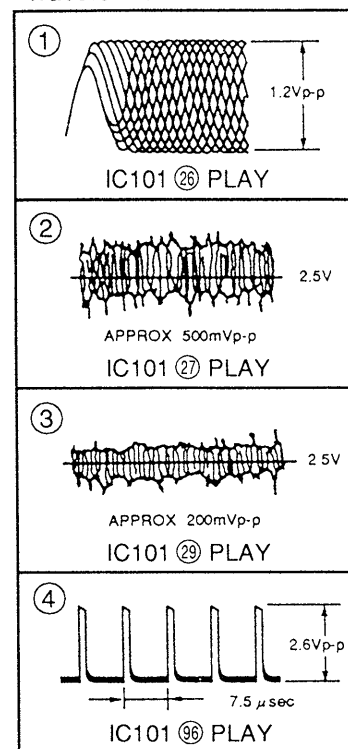
Les composants identifiés par une marque △ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

• IC Block Diagrams

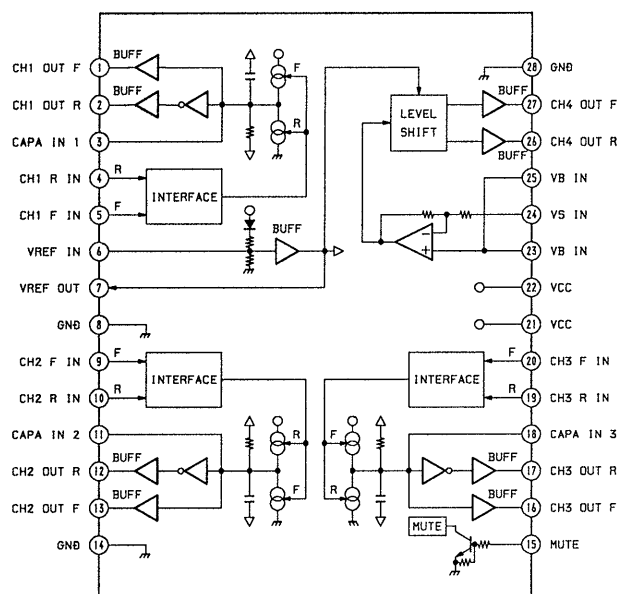
IC101 CXD2515Q



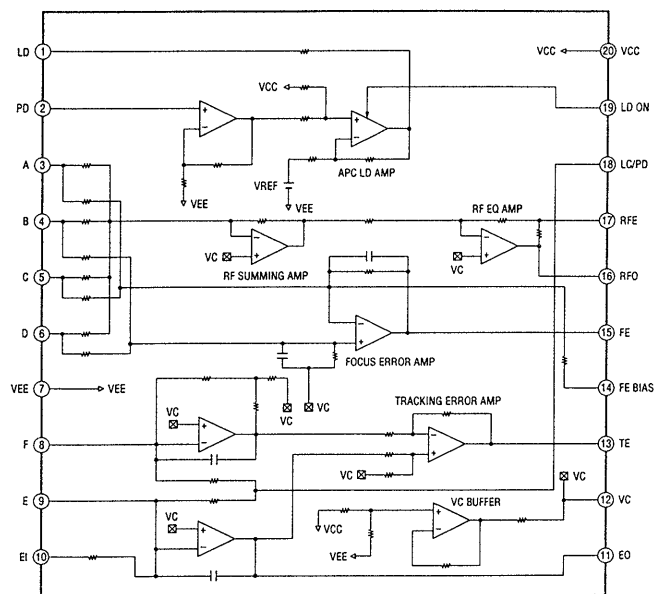
• Waveforms



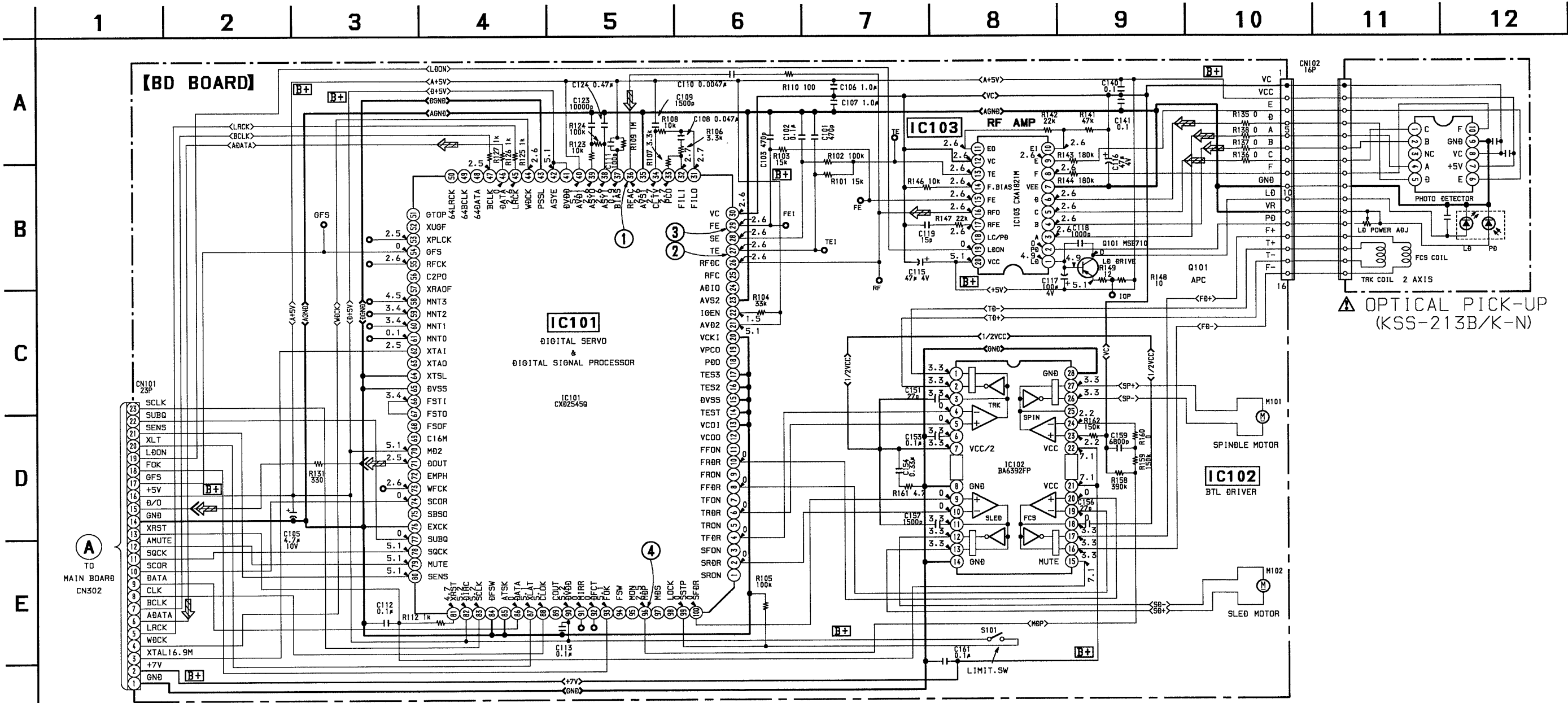
IC102 BA6392FP



IC103 CXA1821M



3-2. Schemaitc Diagram – BD Board –



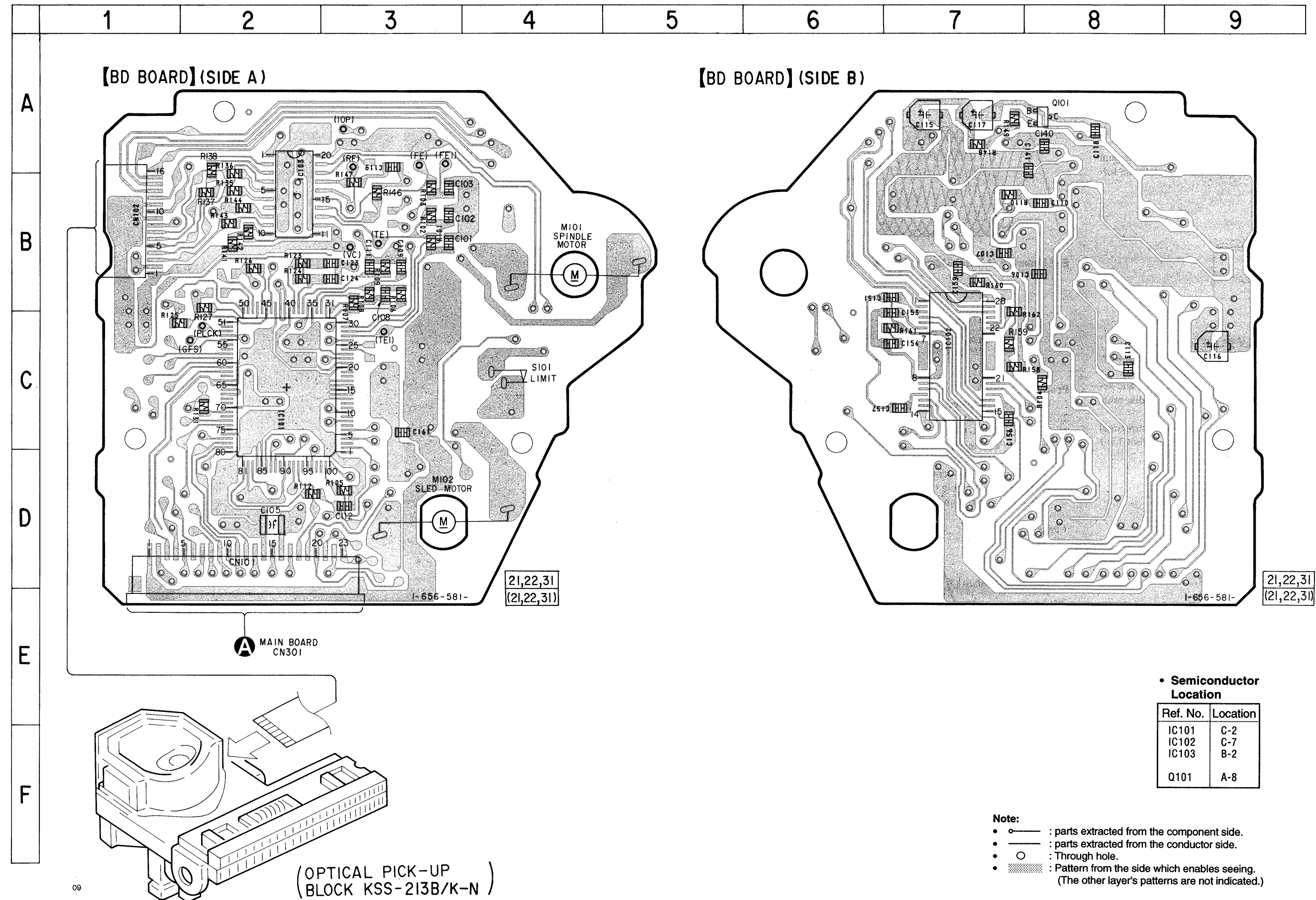
OPTICAL PICK-UP
(KSS-213B/K-N)

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  or dotted line with mark  are critical for safety. Replace only with part number specified.	Note: Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.
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- **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.
- Signal path.
 :CD
 :digital out

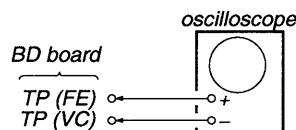


3-4. Electrical Block Checking (for BU-5BD20)

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 10 M Ω impedance.
4. Clean the object lens by an applicator with neutral detergent when the signal level is low than specified value with the following checks.

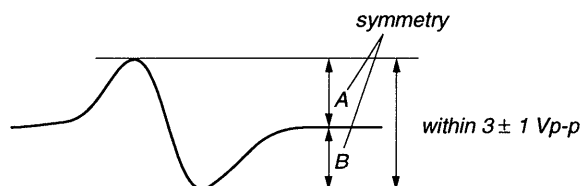
S-Curve Check



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. Turn Power switch on.
4. Put disc (YEDS-18) in and turn Power switch on again and actuate the focus search. (actuate the focus search when disc table is moving in and out.)
5. Check if the oscilloscope waveform (S-curve) is symmetrical between A and B. And confirm peak to peak level within 3 ± 1 Vp-p.

S-curve waveform

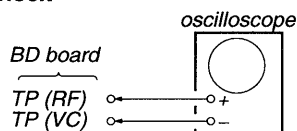


6. After check, remove the lead wire connected in step 2.

Note: • Try to measure several times to make sure than the ratio of A:B or B:A is more than 10:7.

- Set sweep time as long as possible and set the brightness to obtain best waveform.

RF Level Check

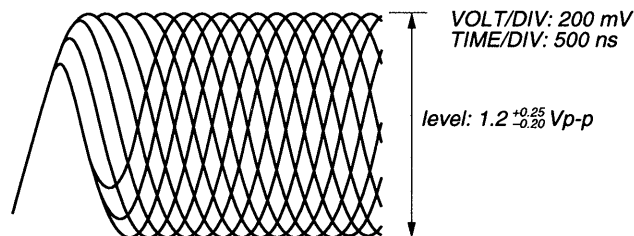


Procedure:

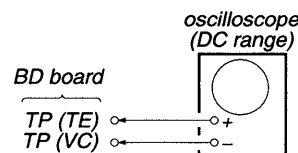
1. Connect oscilloscope to test point TP (RF) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

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

RF signal waveform



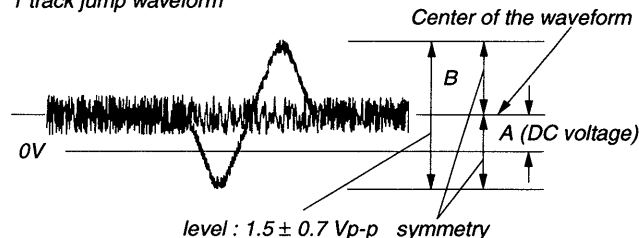
E-F Balance (1 Track Jump) Check



Procedure:

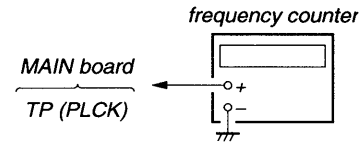
1. Connect oscilloscope to test point TP (TE) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in to play the number five track.
4. Press the “||| (Pause)” button. (Becomes the 1 track jump mode)
5. Check the level B of the oscilloscope's waveform and the A (DC voltage) of the center of the Travers waveform. Confirm the following :
 $A/B \times 100 = \text{less than } \pm 20 \%$

1 track jump waveform

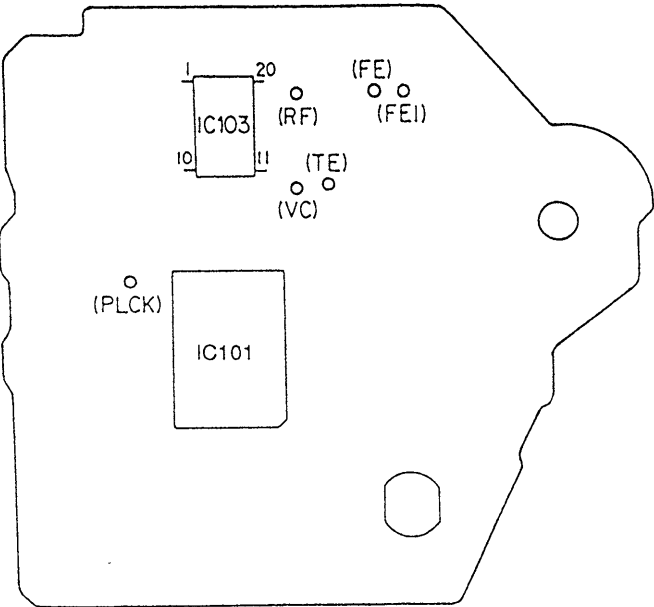


RF PLL Free-run Frequency Check

Procedure:

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

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

[BD BOARD] — Conductor Side —



3-5. IC Pin Function Description

BD BOARD IC101 CXD2545Q (DIGITAL SERVO, DIGITAL SIGNAL PROCESSOR)

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 input for analog EFM PLL (Ground)
14	TEST	I	TEST pin connected normally to Ground
15	DVSS	—	Digital Ground
16	TES2	I	TEST pin connected normally to Ground
17	TES3	I	TEST pin connected normally to Ground
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 (Ground)
21	AVD2	—	Analog power supply
22	IGEN	I	Power supply pin for operational amplifiers
23	AVS2	—	Analog Ground
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	AVSI	—	Analog Ground
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 PFCK 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 XRAOF 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 (Not used)
65	DVSS	—	Digital Ground
66	FSTI	I	2/3 divider input 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 (+5 V)
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 though Sub-W serial output (Not used)
76	EXCK	I	Clock input for SBSO read-out (Ground)
77	SUBQ	O	Sub-Q 80-bit output
78	SQCK	I	Clock input for SQSO read-out
79	MUTE	I	Muting selection pin
80	SENS	O	SENS output

Pin No.	Pin Name	I/O	Function
81	XRST	I	System reset
82	DIRC	I	Used in 1-track jump mode (+5 V)
83	SCLK	I	SENS serial data read-out clock
84	DFSW	I	DFCT selection pin (Ground)
85	ATSK	I	Input pin for anti-shock (Ground)
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	Slide drive output

4. ELECTRICAL PARTS LIST

NOTE:

- 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 and -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:

$$uA \dots : \mu A. \dots \quad uPA \dots : \mu PA. \dots$$
$$\mu_{PB..} : \mu_{PB..} \quad \mu_{PC..} : \mu_{PC..} \quad \mu_{PD..} : \mu_{PD..}$$

● CAPACITORS

$$\mathbf{u}F; \mu F$$

● COILS

 $11\text{H} : 14\text{H}$

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

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

Les composants identifiés par une
marque  sont critiques pour
la sécurité.

Ne les remplacer que par une pièce portant le numéro spécifié.

[illegible]

Ref. No.	Part No.	Description	Remark		
R147	1-216-081-00	METAL CHIP	22K	5%	1/10W
R148	1-216-001-00	METAL CHIP	10	5%	1/10W
R149	1-216-003-11	METAL GLAZE	12	5%	1/10W
R158	1-216-111-91	METAL GLAZE	390K	5%	1/10W
R159	1-216-101-00	METAL CHIP	150K	5%	1/10W
R160	1-216-295-91	CONDUCTOR, CHIP		(2012)	
R161	1-216-308-00	METAL CHIP	4.7	5%	1/10W
R162	1-216-101-00	METAL CHIP	150K	5%	1/10W
< SWITCH >					
S101	1-572-085-11	SWITCH, LEAF (LIMIT)			

*	A-4673-463-A	MAIN BOARD, COMPLETE (CA8ES:US/CND)			
*	A-4673-469-A	MAIN BOARD, COMPLETE (CA8ES:AEP)			
*	A-4673-471-A	MAIN BOARD, COMPLETE (CA8ES:E)			
*	A-4673-473-A	MAIN BOARD, COMPLETE (CA9ES)			

	7-685-871-01	SCREW +BVTT 3X6 (S)			
< CAPACITOR >					
C102	1-130-487-00	MYLAR	0.022uF	5%	50V
C103	1-130-484-00	MYLAR	0.012uF	5%	50V
C104	1-130-484-00	MYLAR	0.012uF	5%	50V
C105	1-106-363-00	MYLAR	6800PF	5%	200V
C106	1-106-363-00	MYLAR	6800PF	5%	200V
C107	1-162-286-31	CERAMIC	220PF	10%	50V
C108	1-162-286-31	CERAMIC	220PF	10%	50V
C111	1-130-477-00	MYLAR	0.0033uF	5%	50V
C112	1-130-469-00	MYLAR	680PF	5%	50V
C113	1-126-052-11	ELECT	100uF	20%	10V
C114	1-130-467-00	MYLAR	470PF	5%	50V
C155	1-126-177-11	ELECT	100uF	20%	10V
C156	1-136-153-00	FILM	0.01uF	5%	50V
C157	1-126-059-11	ELECT	10uF	20%	50V
C158	1-126-023-11	ELECT	100uF	20%	25V
C159	1-136-153-00	FILM	0.01uF	5%	50V
C160	1-126-059-11	ELECT	10uF	20%	50V
C161	1-126-059-11	ELECT	10uF	20%	50V
C162	1-126-023-11	ELECT	100uF	20%	25V
C163	1-126-023-11	ELECT	100uF	20%	25V
C164	1-136-165-00	FILM	0.1uF	5%	50V
C165	1-136-165-00	FILM	0.1uF	5%	50V
C166	1-126-059-11	ELECT	10uF	20%	50V
C167	1-126-052-11	ELECT	100uF	20%	16V
C168	1-126-052-11	ELECT	100uF	20%	16V
C169	1-161-494-00	CERAMIC	0.022uF		25V
C170	1-161-494-00	CERAMIC	0.022uF		25V
C202	1-130-487-00	MYLAR	0.022uF	5%	50V

Ref.No.	Part No.	Description	Remark		
C203	1-130-484-00	MYLAR	0.012uF	5%	50V
C204	1-130-484-00	MYLAR	0.012uF	5%	50V
C205	1-106-363-00	MYLAR	6800PF	5%	200V
C206	1-106-363-00	MYLAR	6800PF	5%	200V
C207	1-162-286-31	CERAMIC	220PF	10%	50V
C208	1-162-286-31	CERAMIC	220PF	10%	50V
C211	1-130-477-00	MYLAR	0.0033uF	5%	50V
C212	1-130-469-00	MYLAR	680PF	5%	50V
C213	1-126-052-11	ELECT	100uF	20%	10V
C214	1-130-467-00	MYLAR	470PF	5%	50V
C255	1-126-177-11	ELECT	100uF	20%	10V
C256	1-136-153-00	FILM	0.01uF	5%	50V
C257	1-126-059-11	ELECT	10uF	20%	50V
C258	1-126-023-11	ELECT	100uF	20%	25V
C259	1-136-153-00	FILM	0.01uF	5%	50V
C260	1-126-059-11	ELECT	10uF	20%	50V
C261	1-126-059-11	ELECT	10uF	20%	50V
C262	1-126-023-11	ELECT	100uF	20%	25V
C263	1-126-023-11	ELECT	100uF	20%	25V
C264	1-136-165-00	FILM	0.1uF	5%	50V
C265	1-136-165-00	FILM	0.1uF	5%	50V
C266	1-126-059-11	ELECT	10uF	20%	50V
C267	1-126-052-11	ELECT	100uF	20%	16V
C268	1-126-052-11	ELECT	100uF	20%	16V
C269	1-161-494-00	CERAMIC	0.022uF		25V
C270	1-161-494-00	CERAMIC	0.022uF		25V
C306	1-162-208-31	CERAMIC	24PF	5%	50V
C310	1-162-199-31	CERAMIC	10PF	5%	50V
C311	1-162-199-31	CERAMIC	10PF	5%	50V
C320	1-161-494-00	CERAMIC	0.022uF		25V
C321	1-126-052-11	ELECT	100uF	20%	10V
C322	1-164-159-11	CERAMIC	0.1uF		50V
C323	1-164-159-11	CERAMIC	0.1uF		50V
C324	1-126-052-11	ELECT	100uF	20%	10V
C325	1-164-159-11	CERAMIC	0.1uF		50V
C326	1-164-159-11	CERAMIC	0.1uF		50V
C327	1-162-290-31	CERAMIC	470PF	10%	50V
C350	1-164-159-11	CERAMIC	0.1uF		50V
C351	1-126-012-11	ELECT	470uF	20%	16V
C352	1-126-012-11	ELECT	470uF	20%	16V
C401	1-126-022-11	ELECT	47uF	20%	16V
C402	1-128-222-11	ELECT	330uF	20%	10V
C412	1-164-159-11	CERAMIC	0.1uF		50V
C413	1-164-159-11	CERAMIC	0.1uF		50V
C419	1-164-159-11	CERAMIC	0.1uF		50V
C501	1-126-022-11	ELECT	47uF	20%	16V
C502	1-164-159-11	CERAMIC	0.1uF		50V
C503	1-164-159-11	CERAMIC	0.1uF		50V

MAIN

Ref. No.	Part No.	Description	Remark
C506	1-162-294-31	CERAMIC	0.001uF 10% 50V
C507	1-162-294-31	CERAMIC	0.001uF 10% 50V
C508	1-162-294-31	CERAMIC	0.001uF 10% 50V
C509	1-162-294-31	CERAMIC	0.001uF 10% 50V
C510	1-162-294-31	CERAMIC	0.001uF 10% 50V
C511	1-164-159-11	CERAMIC	0.1uF 50V (CA9ES)
C512	1-164-159-11	CERAMIC	0.1uF 50V
C531	1-104-905-11	CAPACITOR	0.22F 5.5V (CA9ES)
C532	1-164-159-11	CERAMIC	0.1uF 50V (CA9ES)
C533	1-161-494-00	CERAMIC	0.022uF 25V (CA9ES)
C551	1-126-022-11	ELECT	47uF 20% 16V
C552	1-126-022-11	ELECT	47uF 20% 16V
C565	1-164-159-11	CERAMIC	0.1uF 50V
C571	1-162-306-11	CERAMIC	0.01uF 20% 16V
C572	1-164-159-11	CERAMIC	0.1uF 50V
C575	1-164-159-11	CERAMIC	0.1uF 50V
C601	1-161-494-00	CERAMIC	0.022uF 25V
C602	1-126-937-11	ELECT	4700uF 20% 16V
C603	1-124-556-11	ELECT	2200uF 20% 16V
C604	1-126-059-11	ELECT	10uF 20% 50V
C605	1-126-163-11	ELECT	4.7uF 20% 50V
C606	1-126-163-11	ELECT	4.7uF 20% 50V
C607	1-126-101-11	ELECT	100uF 20% 16V
C608	1-126-101-11	ELECT	100uF 20% 16V
C609	1-126-063-11	ELECT	100uF 20% 63V
C610	1-126-059-11	ELECT	10uF 20% 50V
C611	1-161-494-00	CERAMIC	0.022uF 25V (CA9ES)
C612	1-124-556-11	ELECT	2200uF 20% 16V
C613	1-124-556-11	ELECT	2200uF 20% 16V
C614	1-126-052-11	ELECT	100uF 20% 16V
C615	1-126-103-11	ELECT	470uF 20% 16V
C616	1-126-103-11	ELECT	470uF 20% 16V
C650	1-164-159-11	CERAMIC	0.1uF 50V
C651	1-164-159-11	CERAMIC	0.1uF 50V
C652	1-164-159-11	CERAMIC	0.1uF 50V
C653	1-164-159-11	CERAMIC	0.1uF 50V
C654	1-164-159-11	CERAMIC	0.1uF 50V
C655	1-164-159-11	CERAMIC	0.1uF 50V
C656	1-164-159-11	CERAMIC	0.1uF 50V

< CONNECTOR >

CN301	1-695-336-31	PIN, CONNECTOR (PC BOARD) 13P
CN401	1-750-640-11	CONNECTOR, FFC/FPC 23P
CN402	1-695-338-11	PIN, CONNECTOR (PC BOARD) 15P
CN403	1-695-366-21	PIN, CONNECTOR (PC BOARD) 5P (CA8ES)
CN403	1-568-852-11	PIN, CONNECTOR (PC BOARD) 9P (CA9ES)

* CN504	1-695-329-31	PIN, CONNECTOR (PC BOARD) 6P
CN601	1-580-230-11	PIN, CONNECTOR (PC BOARD) 2P

Ref. No.	Part No.	Description	Remark
< DIODE >			
D301	8-719-987-63	DIODE 1N4148M	
D501	8-719-210-21	DIODE 11EQS04	
D502	8-719-210-21	DIODE 11EQS04	
D531	8-719-987-63	DIODE 1N4148M (CA9ES)	
D551	8-719-109-92	DIODE RD6. 2ES-B1	
D571	8-719-987-63	DIODE 1N4148M	
D572	8-719-987-63	DIODE 1N4148M	
D573	8-719-109-87	DIODE RD5. 6ES-B	
D601	8-719-210-21	DIODE 11EQS04 (CA8ES)	
D601	8-719-200-82	DIODE 11ES2 (CA9ES)	
D602	8-719-210-21	DIODE 11EQS04 (CA8ES)	
D602	8-719-200-82	DIODE 11ES2 (CA9ES)	
D603	8-719-210-21	DIODE 11EQS04 (CA8ES)	
D603	8-719-200-82	DIODE 11ES2 (CA9ES)	
D604	8-719-210-21	DIODE 11EQS04 (CA8ES)	
D604	8-719-200-82	DIODE 11ES2 (CA9ES)	
D605	8-719-200-82	DIODE 11ES2	
D606	8-719-110-13	DIODE RD9. 1ESB2	
D607	8-719-210-21	DIODE 11EQS04 (CA9ES)	
D608	8-719-210-21	DIODE 11EQS04 (CA9ES)	
D609	8-719-210-21	DIODE 11EQS04 (CA9ES)	
D610	8-719-210-21	DIODE 11EQS04 (CA9ES)	
D611	8-719-987-63	DIODE 1N4148M	
D612	8-719-109-85	DIODE RD5. 1ES-B2	
D613	8-719-200-82	DIODE 11ES2	
D614	8-719-200-82	DIODE 11ES2	
< IC >			
IC301	8-759-334-75	IC CXD8505AQ	
IC302	8-759-293-17	IC CXA8042S	
IC303	8-759-293-17	IC CXA8042S	
IC304	8-759-900-72	IC NE5532P	
IC305	8-759-900-72	IC NE5532P	
IC306	8-759-900-72	IC NE5532P	
IC307	8-759-900-72	IC NE5532P	
IC351	8-759-167-88	IC NJM4565D	
IC405	8-749-921-12	IC GP1F32T (DIGITAL OUT)	
IC501	8-752-871-27	IC CXP84124-038Q	
IC531	8-759-289-94	IC LH5160TF (CA9ES)	
IC551	8-759-330-30	IC BA6193	
IC561	8-759-803-42	IC LA6500-FA	
IC601	8-759-330-29	IC LA5616	
IC603	8-759-633-42	IC M5293L	
IC604	8-759-231-53	IC TA7805S (CA8ES)	
IC604	8-759-604-86	IC M5F7807L (CA9ES)	
IC605	8-759-245-79	IC TA79005S (CA8ES)	
IC605	8-759-604-90	IC M5F7907L (CA9ES)	

Ref.No.	Part No.	Description	Remark
< JACK >			
J301	1-569-443-21	JACK, PIN 4P (LINE OUT)	
J302	1-566-213-11	PIN, CONNECTOR 4P (CONTROL S)	
< COIL >			
L304	1-410-503-11	INDUCTOR 3.3uH	
L305	1-410-503-11	INDUCTOR 3.3uH	
L403	1-410-503-11	INDUCTOR 3.3uH	
L501	1-424-122-11	FILTER, NOISE (CA9ES)	
L511	1-412-473-21	INDUCTOR 0uH	
L512	1-412-473-21	INDUCTOR 0uH	
L571	1-410-503-11	INDUCTOR 3.3uH	
L572	1-410-503-11	INDUCTOR 3.3uH	
< TRANSISTOR >			
Q101	8-729-231-55	TRANSISTOR 2SC2878-AB	
Q102	8-729-231-55	TRANSISTOR 2SC2878-AB	
Q201	8-729-231-55	TRANSISTOR 2SC2878-AB	
Q202	8-729-231-55	TRANSISTOR 2SC2878-AB	
Q301	8-729-900-65	TRANSISTOR DTA144ES	
Q302	8-729-900-65	TRANSISTOR DTA144ES	
Q303	8-729-422-57	TRANSISTOR UN4111	
Q504	8-729-620-05	TRANSISTOR 2SC2603-EF	
Q571	8-729-900-89	TRANSISTOR DTC144ES	
Q572	8-729-422-57	TRANSISTOR UN4111	
Q573	8-729-422-57	TRANSISTOR UN4111	
Q574	8-729-422-57	TRANSISTOR UN4111	
Q601	8-729-119-76	TRANSISTOR 2SA1175-HFE	
< RESISTOR >			
R101	1-215-409-00	METAL 330 1% 1/4W	
R102	1-215-409-00	METAL 330 1% 1/4W	
R103	1-215-409-00	METAL 330 1% 1/4W	
R104	1-215-409-00	METAL 330 1% 1/4W	
R105	1-215-373-31	METAL 10 1% 1/4W	
R106	1-215-373-31	METAL 10 1% 1/4W	
R107	1-215-373-31	METAL 10 1% 1/4W	
R108	1-215-373-31	METAL 10 1% 1/4W	
R109	1-215-383-00	METAL 27 1% 1/4W	
R110	1-215-383-00	METAL 27 1% 1/4W	
R111	1-215-407-00	METAL 270 1% 1/4W	
R112	1-215-407-00	METAL 270 1% 1/4W	
R113	1-215-437-00	METAL 4.7K 1% 1/4W	
R114	1-215-437-00	METAL 4.7K 1% 1/4W	
R115	1-215-439-00	METAL 5.6K 1% 1/4W	
R116	1-215-439-00	METAL 5.6K 1% 1/4W	
R117	1-215-422-00	METAL 1.1K 1% 1/4W	

Ref.No.	Part No.	Description	Remark
R118	1-215-429-00	METAL 2.2K 1% 1/4W	
R120	1-215-373-31	METAL 10 1% 1/4W	
R121	1-215-389-00	METAL 47 1% 1/4W	
R122	1-215-481-00	METAL 330K 1% 1/4W	
R123	1-215-407-00	METAL 270 1% 1/4W	
R124	1-215-403-00	METAL 180 1% 1/4W	
R125	1-215-405-00	METAL 220 1% 1/4W	
R126	1-249-425-11	CARBON 4.7K 5% 1/4W	
R127	1-249-425-11	CARBON 4.7K 5% 1/4W	
R128	1-249-393-11	CARBON 10 5% 1/4W	
R129	1-249-413-11	CARBON 470 5% 1/4W	
R151	1-249-435-11	CARBON 33K 5% 1/4W	
R152	1-249-432-11	CARBON 18K 5% 1/4W	
R153	1-249-422-11	CARBON 2.7K 5% 1/4W	
R154	1-249-429-11	CARBON 10K 5% 1/4W	
R201	1-215-409-00	METAL 330 1% 1/4W	
R202	1-215-409-00	METAL 330 1% 1/4W	
R203	1-215-409-00	METAL 330 1% 1/4W	
R204	1-215-409-00	METAL 330 1% 1/4W	
R205	1-215-373-31	METAL 10 1% 1/4W	
R206	1-215-373-31	METAL 10 1% 1/4W	
R207	1-215-373-31	METAL 10 1% 1/4W	
R208	1-215-373-31	METAL 10 1% 1/4W	
R209	1-215-383-00	METAL 27 1% 1/4W	
R210	1-215-383-00	METAL 27 1% 1/4W	
R211	1-215-407-00	METAL 270 1% 1/4W	
R212	1-215-407-00	METAL 270 1% 1/4W	
R213	1-215-437-00	METAL 4.7K 1% 1/4W	
R214	1-215-437-00	METAL 4.7K 1% 1/4W	
R215	1-215-439-00	METAL 5.6K 1% 1/4W	
R216	1-215-439-00	METAL 5.6K 1% 1/4W	
R217	1-215-422-00	METAL 1.1K 1% 1/4W	
R218	1-215-429-00	METAL 2.2K 1% 1/4W	
R220	1-215-373-31	METAL 10 1% 1/4W	
R221	1-215-389-00	METAL 47 1% 1/4W	
R222	1-215-481-00	METAL 330K 1% 1/4W	
R223	1-215-407-00	METAL 270 1% 1/4W	
R224	1-215-403-00	METAL 180 1% 1/4W	
R225	1-215-405-00	METAL 220 1% 1/4W	
R226	1-249-425-11	CARBON 4.7K 5% 1/4W	
R227	1-249-425-11	CARBON 4.7K 5% 1/4W	
R228	1-249-393-11	CARBON 10 5% 1/4W	
R229	1-249-413-11	CARBON 470 5% 1/4W	
R251	1-249-435-11	CARBON 33K 5% 1/4W	
R252	1-249-432-11	CARBON 18K 5% 1/4W	
R253	1-249-422-11	CARBON 2.7K 5% 1/4W	
R254	1-249-429-11	CARBON 10K 5% 1/4W	
R301	1-249-417-11	CARBON 1K 5% 1/4W	

MAIN

Ref. No.	Part No.	Description	Remark		
R302	1-249-409-11	CARBON	220	5%	1/4W
R303	1-249-425-11	CARBON	4.7K	5%	1/4W
R304	1-247-807-31	CARBON	100	5%	1/4W
R306	1-249-441-11	CARBON	100K	5%	1/4W
R307	1-249-441-11	CARBON	100K	5%	1/4W
R308	1-249-441-11	CARBON	100K	5%	1/4W
R309	1-249-401-11	CARBON	47	5%	1/4W (CA8ES)
R309	1-249-403-11	CARBON	68	5%	1/4W (CA9ES)
R310	1-249-429-11	CARBON	10K	5%	1/4W
R318	1-249-417-11	CARBON	1K	5%	1/4W
R319	1-249-417-11	CARBON	1K	5%	1/4W
R320	1-247-843-11	CARBON	3.3K	5%	1/4W
R326	1-249-441-11	CARBON	100K	5%	1/4W
R327	1-247-827-11	CARBON	680	5%	1/4W
R351	1-247-807-31	CARBON	100	5%	1/4W
R352	1-247-807-31	CARBON	100	5%	1/4W
R501	1-247-807-31	CARBON	100	5%	1/4W
R502	1-247-807-31	CARBON	100	5%	1/4W
R503	1-247-807-31	CARBON	100	5%	1/4W
R504	1-249-417-11	CARBON	1K	5%	1/4W
R509	1-249-417-11	CARBON	1K	5%	1/4W
R510	1-249-427-11	CARBON	6.8K	5%	1/4W
R511	1-249-427-11	CARBON	6.8K	5%	1/4W
R512	1-249-427-11	CARBON	6.8K	5%	1/4W
R513	1-249-427-11	CARBON	6.8K	5%	1/4W
R514	1-249-427-11	CARBON	6.8K	5%	1/4W (CA9ES)
R515	1-249-427-11	CARBON	6.8K	5%	1/4W
R522	1-249-430-11	CARBON	12K	5%	1/4W
R523	1-249-429-11	CARBON	10K	5%	1/4W
R524	1-249-425-11	CARBON	4.7K	5%	1/4W
R525	1-249-425-11	CARBON	4.7K	5%	1/4W
R526	1-249-425-11	CARBON	4.7K	5%	1/4W
R531	1-249-399-11	CARBON	33	5%	1/4W (CA9ES)
R532	1-249-417-11	CARBON	1K	5%	1/4W (CA9ES)
R533	1-249-429-11	CARBON	10K	5%	1/4W (CA9ES)
R543	1-249-427-11	CARBON	6.8K	5%	1/4W
R544	1-249-415-11	CARBON	680	5%	1/4W
R551	1-249-425-11	CARBON	4.7K	5%	1/4W
R552	1-249-429-11	CARBON	10K	5%	1/4W
R553	1-249-427-11	CARBON	6.8K	5%	1/4W
R554	1-249-422-11	CARBON	2.7K	5%	1/4W
R555	1-249-429-11	CARBON	10K	5%	1/4W
R559	1-249-417-11	CARBON	1K	5%	1/4W
R561	1-249-441-11	CARBON	100K	5%	1/4W
R562	1-249-441-11	CARBON	100K	5%	1/4W
R563	1-249-441-11	CARBON	100K	5%	1/4W
R564	1-249-441-11	CARBON	100K	5%	1/4W
R565	1-249-393-11	CARBON	10	5%	1/4W
R571	1-249-429-11	CARBON	10K	5%	1/4W

Ref. No.	Part No.	Description	Remark		
R572	1-249-429-11	CARBON	10K	5%	1/4W
R573	1-249-393-11	CARBON	10	5%	1/4W
R601	1-249-435-11	CARBON	33K	5%	1/4W
R602	1-249-429-11	CARBON	10K	5%	1/4W
R603	1-249-438-11	CARBON	56K	5%	1/4W
R604	1-249-413-11	CARBON	470	5%	1/4W
R701	1-215-409-00	METAL	330	1%	1/4W
R801	1-215-409-00	METAL	330	1%	1/4W
< TRANSFORMER >					
T703	1-424-485-11	FILTER, LINE			
< VIBRATOR >					
X301	1-579-161-11	VIBRATOR, CRYSTAL (45MHz)			
X501	1-579-175-11	VIBRATOR, CERAMIC (10MHz)			

MISCELLANEOUS					

157	1-769-069-11	WIRE, FLAT TYPE (16 CORE)			
△160	8-848-367-11	OPTICAL PICK-UP KSS-213B			

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