

# CDP-C225/C325

## SERVICE MANUAL

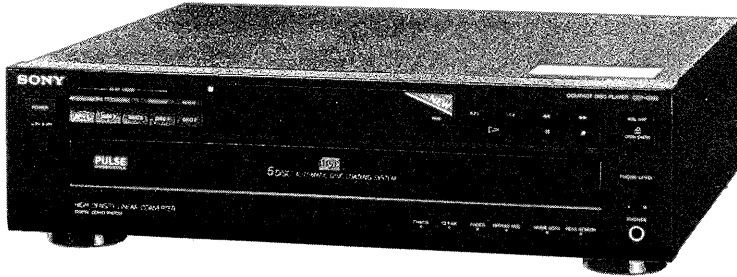


Photo: CDP-C225

*US Model*  
*Canadian Model*  
*Australian Model*  
*AEP Model*  
*E Model*

CDP-C225/C325  
CDP-C325  
CDP-C225



Model Name Using Similar Mechanism	CDP-C312M
Optical Pick-up Block Type	BU-5BD8B

### SPECIFICATIONS

**System** Compact disc digital audio system  
**Laser** Semiconductor laser ( $\lambda=780$  nm)  
Emission duration: continuous  
**Laser output** Max. 44.6  $\mu$ W\*  
\* This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.

**Frequency response** 2 Hz — 20 kHz ( $\pm 0.5$  dB)  
**Signal to noise ratio** More than 100 dB  
**Dynamic range** More than 98 dB  
**Harmonic distortion** Less than 0.005% (1 kHz)  
**Channel separation** More than 100 dB (1 kHz)  
**Wow and flutter** Below measurable limit  
**Outputs** LINE OUT (phono jacks)  
Output level 2 V (at 50 kilohms)  
Load impedance over 10 kilohms  
PHONES (stereo phone jack)  
Output level 0 — 10 mW (variable) (at 32 ohms)

**Power consumption** 12 W  
**Dimensions** Approx. 430  $\times$  125  $\times$  385 mm (w/h/d) (17  $\times$  5  $\times$  15 $\frac{1}{4}$  inches) including projecting parts and controls  
**Weight** Approx. 5.6 kg (12 lbs 6 oz), net

#### Remote commander RM-D325 (CDP-C325 only)

**Remote control system** Infrared control  
**Power requirements** 3 V DC with two batteries size AA (IEC designation R6)

#### Supplied accessories

Audio signal connecting cord (phono plug  $\times$  2  $\leftrightarrow$  phono plug  $\times$  2) (1)  
Remote commander (1) (CDP-C325 only)  
Sony SUM-3 (NS) batteries (2) (CDP-C325 only)  
Operating Manual (1)

Design and specifications subject to change without notice.

#### General

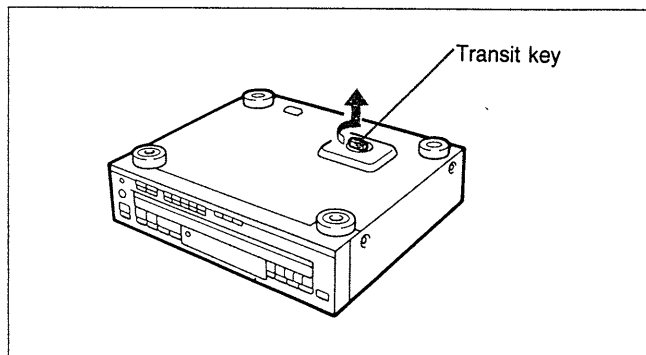
**Power requirements** US, Canadian Model:  
120 V AC, 60Hz  
UK, Australian Model:  
240 V AC, 50/60Hz  
AEP Model:  
220-230 V AC, 50/60Hz

COMPACT DISC PLAYER  
**SONY**<sup>®</sup>

## Note on the Transit Key

The transit key on the bottom exterior of the unit protects the optical system against shock during transportation. Before operating the CD player, be sure to remove the key by following the instructions on the label, and store it in a safe place.

When transporting the unit, replace the key in its original hole and lock it in place.



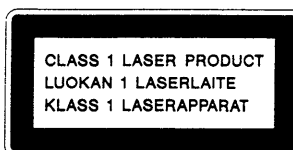
## For the customers in Canada

### CAUTION:

TO PREVENT ELECTRIC SHOCK, DO NOT USE THIS POLARIZED AC PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

THIS APPARATUS COMPLIES WITH THE CLASS B LIMITS FOR RADIO NOISE EMISSIONS SET OUT IN RADIO INTERFERENCE REGULATIONS.

## For the customers in Australia





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


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### SAFETY-RELATED COMPONENT WARNING!!

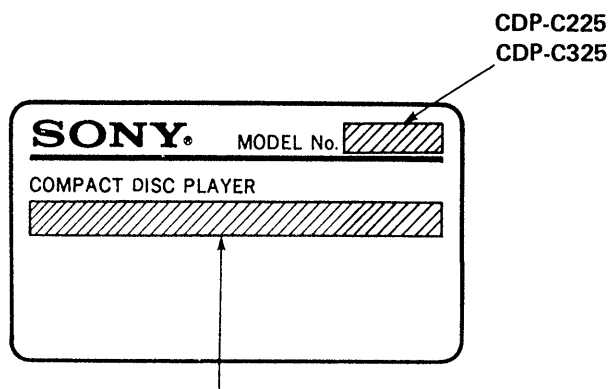
COMPONENTS IDENTIFIED BY MARK  OR DOTTED LINE WITH MARK  ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

### ATTENTION AU COMPOSANT AYANT RAPPORT À LA SÉCURITÉ!

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

## MODEL IDENTIFICATION

—Model Number Label—



US, Canadian model: AC: 120V 60Hz

UK, Australian model: AC: 240V~50/60Hz

AEP model: AC: 220~230V~50/60Hz

E model: AC: 110~120V, 220~240V~50/60Hz

## 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 30cm away from the objective lens.

## 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 TEST

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)

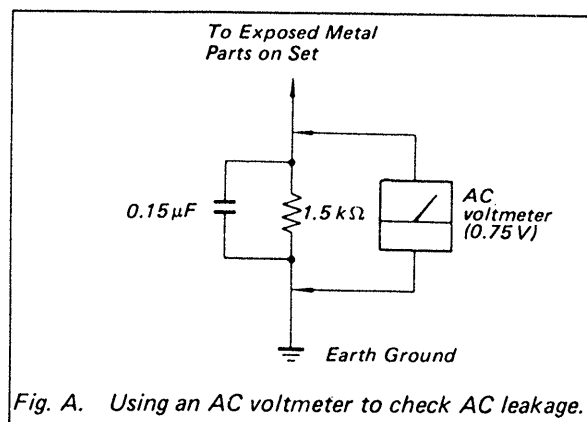


Fig. A. Using an AC voltmeter to check AC leakage.

## PROTECTION OF EYES FROM LASER BEAM DURING SERVICING

This set employs a laser. Therefore, be sure to follow carefully the instructions below when servicing.

### CAUTION

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

#### 1. Laser Diode Properties

- Material: GaAlAs
- Wavelength: 780 nm
- Emission Duration: continuous
- Laser Output: max. 44.6  $\mu$ W\*

\* This output is the value measured at a distance of about 200 mm from the objective lens surface on the Optical Pick-up Block.

2. During service, do not take the Optical Pick-up Block apart, and do not adjust the APC circuit. If there is a breakdown in the APC circuit (including laser diode), replace the entire Optical Pick-up Block (including APC board).

## BESKYTTELSE AF ØJNE MOD LASERSTRÅLING UNDER SERVICE

I dette apparat anvendes laserlys. Derfor skal nedenstående instruktioner nøje følges under service.

Følg iøvrigt instruktionerne i servicemanualen.

### ADVARSEL!!

Under service må øjnene ikke komme nær objektiv-linsen på den optiske pick-up enhed. I tilfælde af at det er nødvendigt at kontrollere udsendelsen af laserlys, skal det ske i en afstand af mere end 25 cm fra den optiske pick-up.

#### 1. Laser-diode data

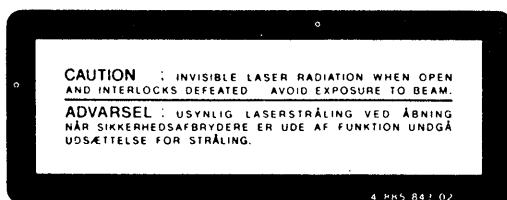
- Materiale: GaAlAs
- Bølgelængde: 780 nm
- Udstråling: Kontinuerlig
- Laseroutput: Max. 0,4 mW\*
- \* Målt i 1,6 mm afstand fra overfladen af objektiv-linsen på den optiske pick-up enhed.
- Klassifikation: Klasse IIIb.

2. Adskil aldrig den optiske pick-up enhed under service, og juster ikke APC kredsløbet (Automatic Power Control). Hvis APC kredsløbet (incl. laser-dioden) bryder ned, skal hele den optiske pick-up enhed (incl. APC printkortet) udskiftes.

## LASER ADVARSEL MÆRKNING

Følgende mærkning findes indvendig i apparatet:

#### 1. Advarsel Mærkning

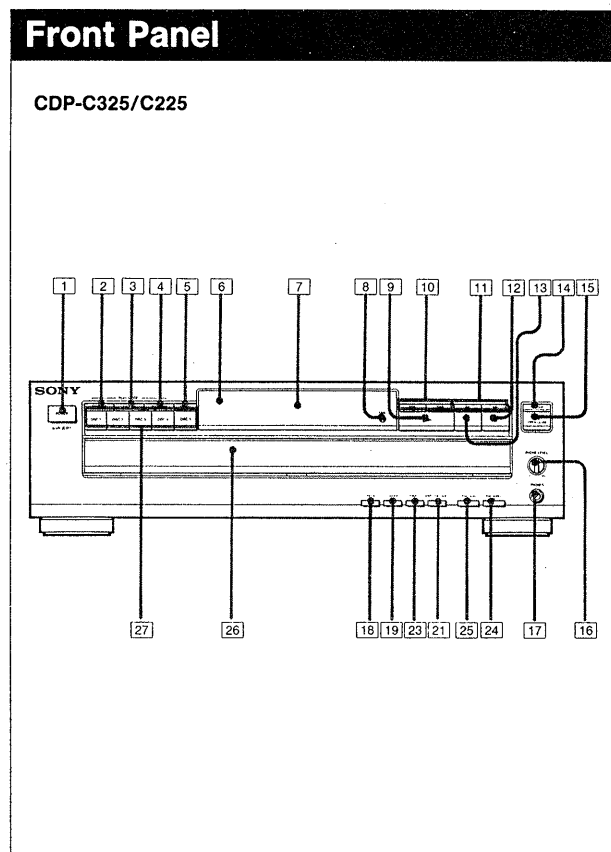


**VAROITUS:** Laite sisältää, laserdiodin, joka lähettää (näkömätöntä) silmille vaarallista lasersäteilyä.

## SECTION 1

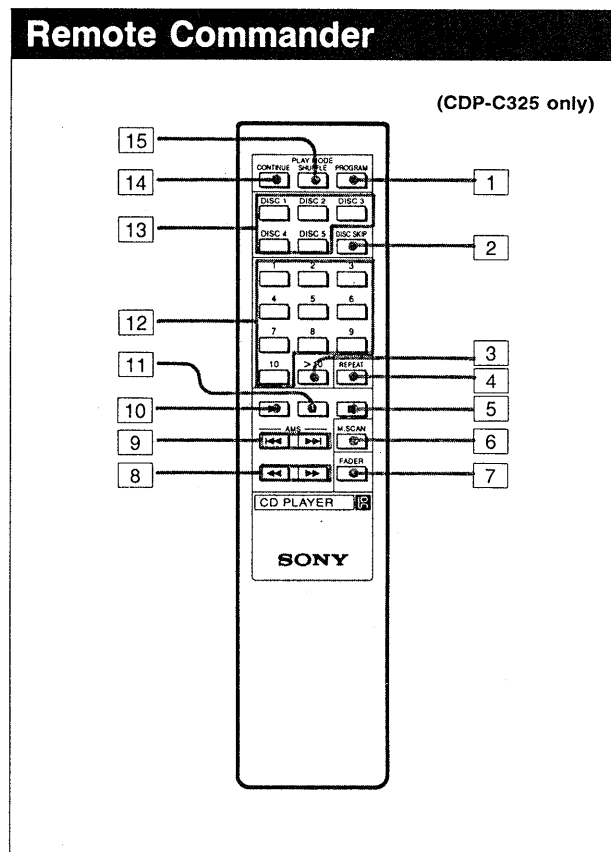
### GENERAL

#### 1-1. LOCATION OF CONTROLS



- 1 POWER switch
- 2 CONTINUE button
- 3 SHUFFLE button
- 4 PROGRAM button
- 5 REPEAT button
- 6 Remote sensor
- 7 Display window
- 8 TIME button
- 9 ► (play) button
- 10 ◀◀/▶▶ (AMS\*) buttons
- 11 ◀◀/▶▶ (manual search) buttons
- 12 ■ (stop) button
- 13 || (pause) button
- 14 DISC SKIP button
- 15 ▲ OPEN/CLOSE button
- 16 PHONE LEVEL (Headphones) control
- 17 PHONES (Headphones) jack
- 18 CHECK (program check) button
- 19 CLEAR (program clear) button
- 21 EDIT/TIME FADE button
- 23 FADER button
- 24 PEAK SEARCH button
- 25 MUSIC SCAN button
- 26 Disc tray
- 27 DISC 1-5 buttons

\* AMS is the abbreviation of Automatic Music Sensor.

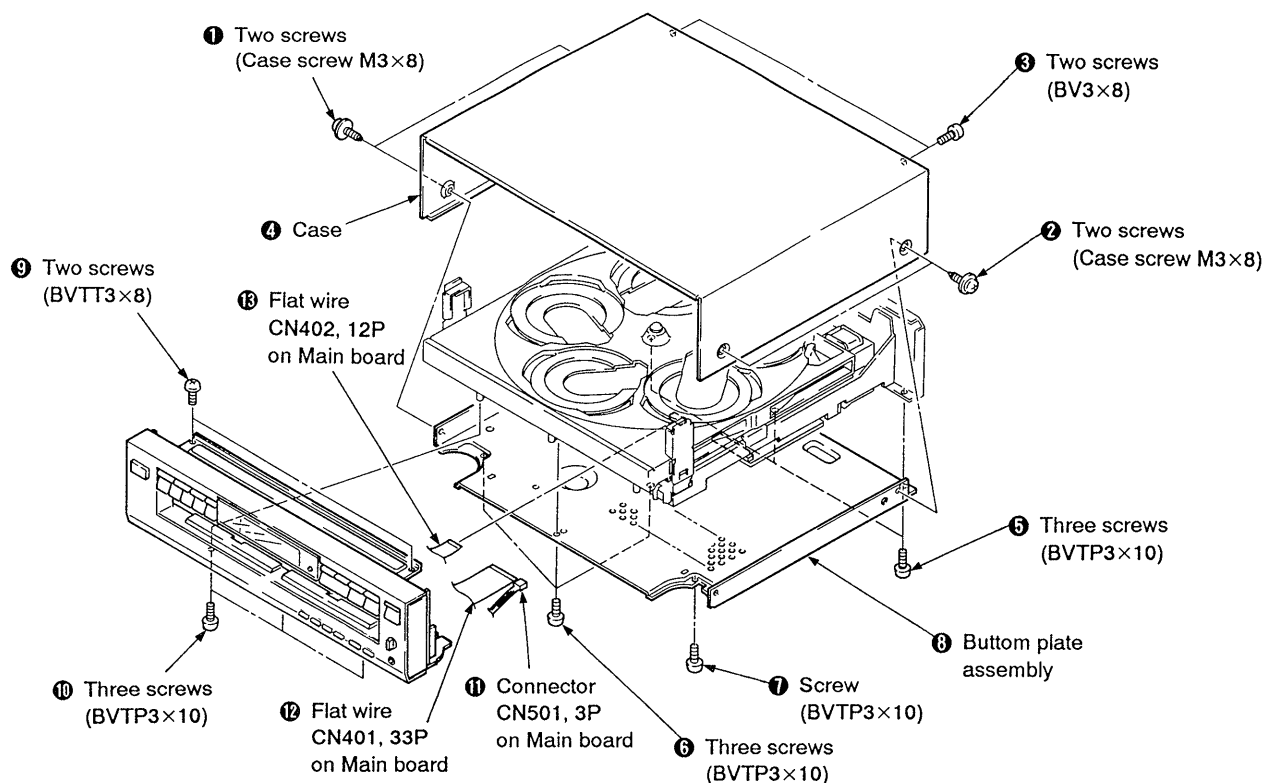


- 1 PROGRAM button
- 2 DISC SKIP button
- 3 > 10 (over 10) button
- 4 REPEAT button
- 5 ■ (stop) button
- 6 M.SCAN (Music scan) button
- 7 FADER button
- 8 ◀◀/▶▶ (manual search) buttons
- 9 ◀◀/▶▶ (AMS) buttons
- 10 ► (play) button
- 11 || (pause) button
- 12 Numeric buttons (1-10)
- 13 DISC 1-5 buttons
- 14 CONTINUE button
- 15 SHUFFLE button

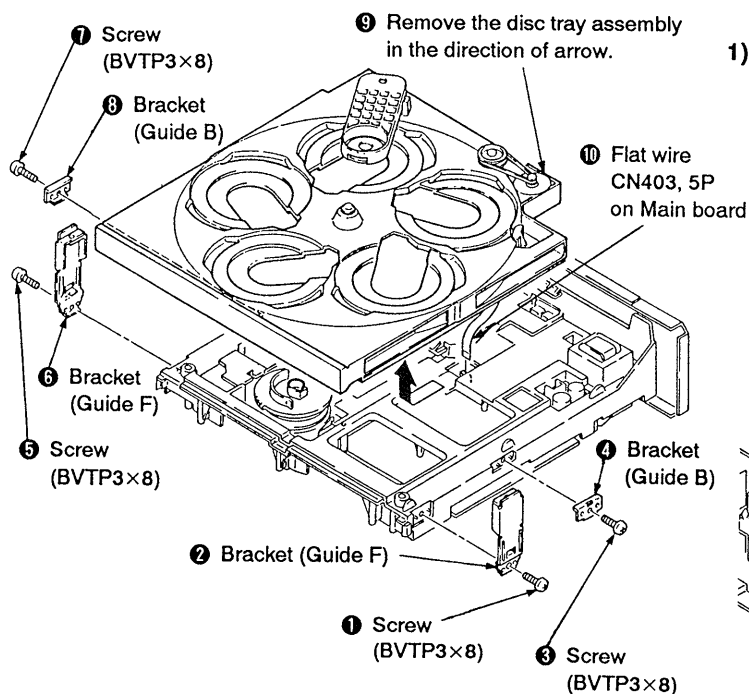
## SECTION 2

### DISASSEMBLY

#### 2-1. REMOVAL OF FRONT PANEL AND CASE ASSEMBLIES

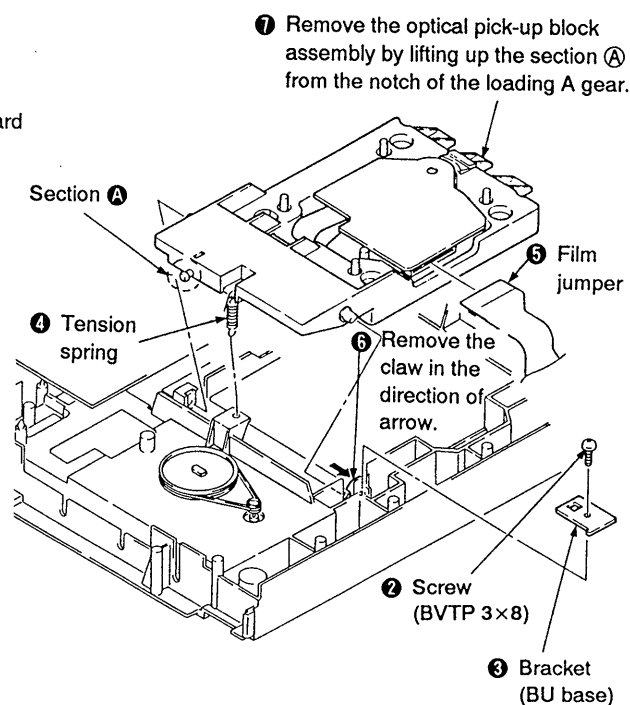


#### 2-2. REMOVAL OF DISC TRAY ASSEMBLY



#### 2-3. REMOVAL OF OPTICAL PICK-UP BLOCK ASSEMBLY

##### 1) Replace the set up side down.

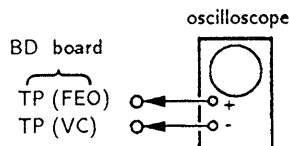


## SECTION 3 ELECTRICAL BLOCK CHECKING

### Note :

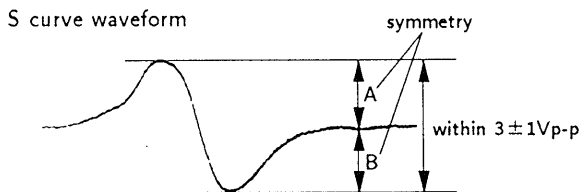
1. CD Block basically constructed to operate without adjustment. Therefore, check each item in order given.
2. Use YEDS-18 disc (3-702-101-01) unless otherwise indicated.
3. Use the oscilloscope with more than  $10M\Omega$  impedance.
4. Clean an object lens by an applicator with neutral detergent when 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 and actuate the focus serch. (actuate the focus serch when disc table is moving in and out.)
4. Check the oscilloscope waveform (S curve) is symmetrical between A and B. And confirm peak to peak level within  $3 \pm 1V_{p-p}$ .

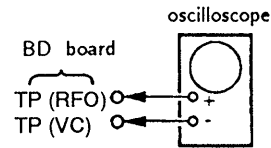


5. After check, remove the lead wire connected in step 2.

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

- Take sweep time as long as possible and light up the brightness to obtain best waveform.

### RF Level Check

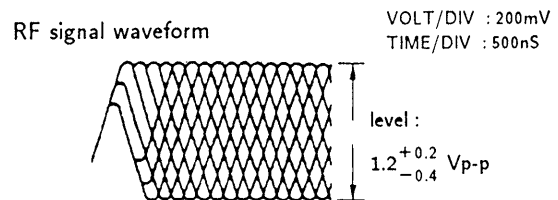


#### Procedure :

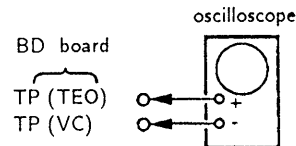
1. Connect oscilloscope to test point TP (RFO) on BD board.
2. Turn Power switch on.
3. Put disc (YEDS-18) in and playback.
4. Confirm that oscilloscope waveform is clear and check RF signal level is correct or not.

#### Note :

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

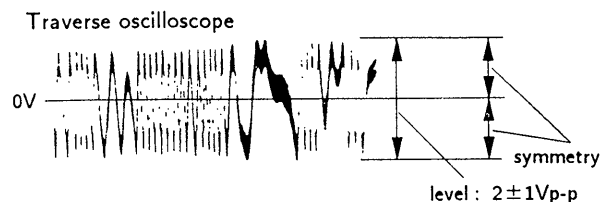


### E-F Balance Check



#### Procedure :

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

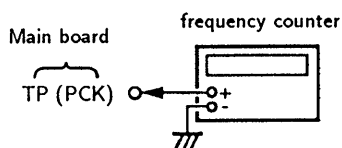


6. Remove the lead wire connected in step 1.

## RF PLL Free-run Frequency Check

### Procedure :

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



2. Turn Power switch on.
3. Confirm that reading on frequency counter is 4. 3218MHz.

## Focus/Tracking Gain

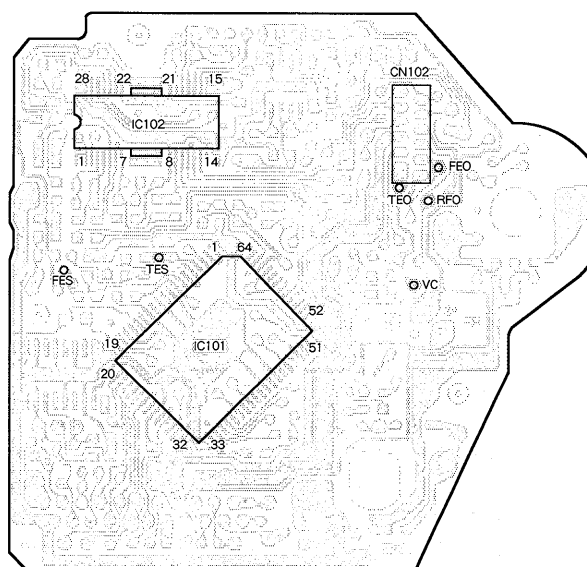
This gain has a margin, so even if it is slightly off. There is no problem.

Therefore, do not perform, this adjustment.

Please note that it should be fixed to mechanical center position when you moved and do not know original position.

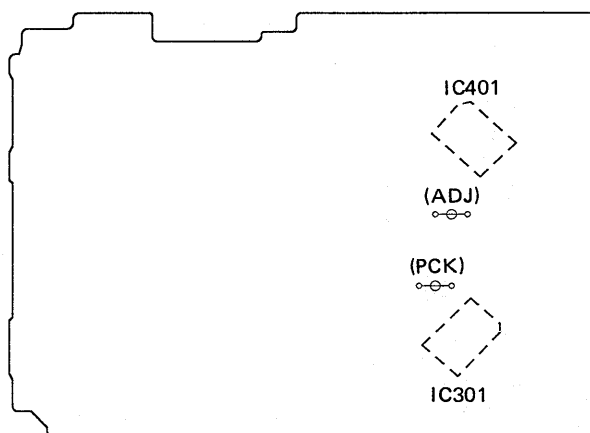
## Adjustment Locations : [BD board]

— conductor side —



## [Main board]

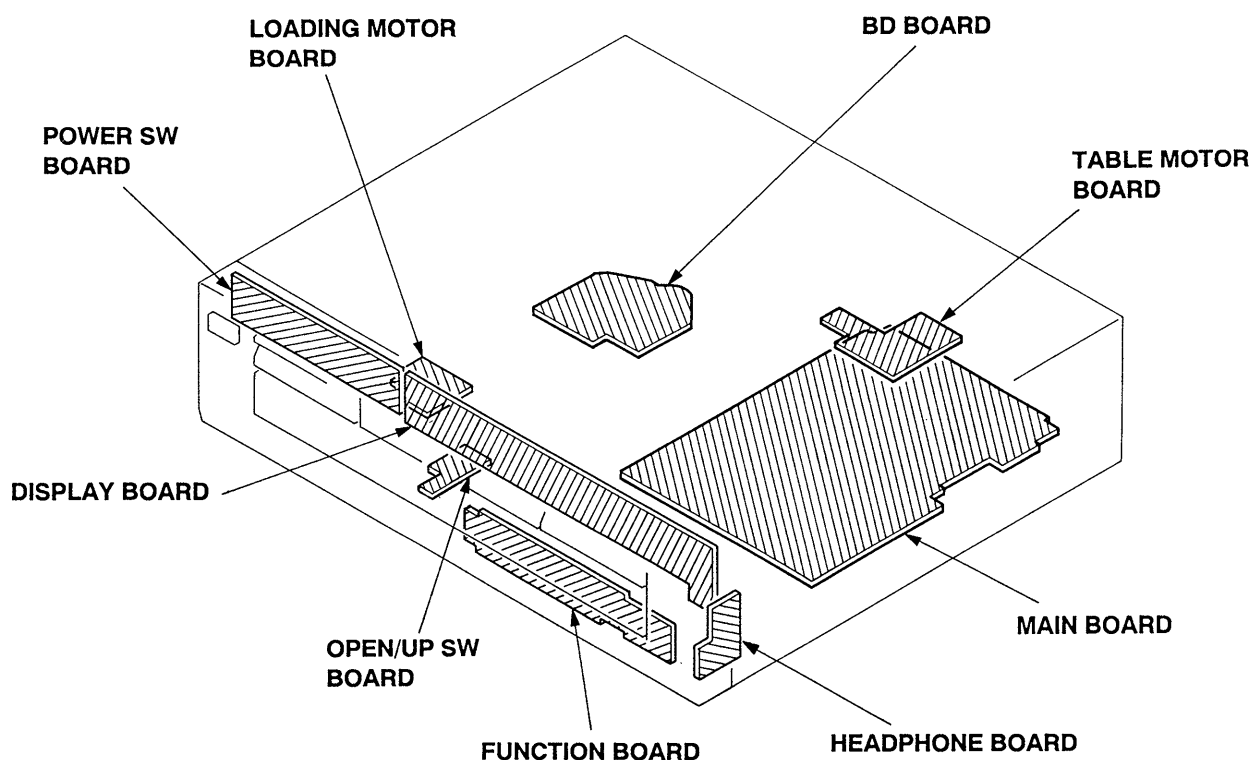
— component side —





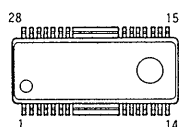
## SECTION 4 DIAGRAMS

### 4-1. CIRCUIT BOARDS LOCATION

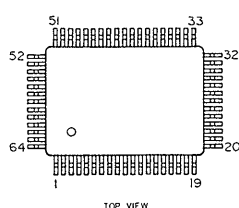


### 4-2. SEMICONDUCTOR LEAD LAYOUTS

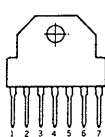
BA6297FP



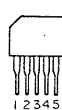
CXD25401Q



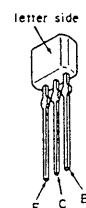
LA5602



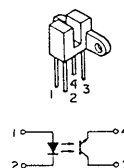
M5293L



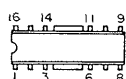
2SA1175-HFE



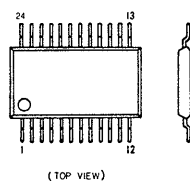
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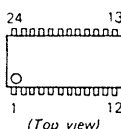
CXA1291P



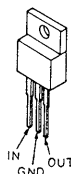
CXD2560M



LA9215



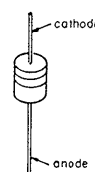
M5F7807L



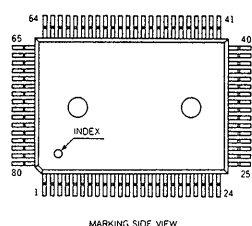
DTA114ES  
DTC114ES  
DTC144ES



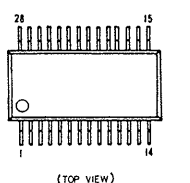
11ES2  
1N4148M  
RD8.2ES-B2



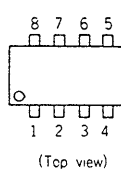
CXD2500AQ  
CXP50116-267Q



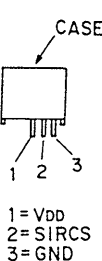
CXD2561BM



M5218AP



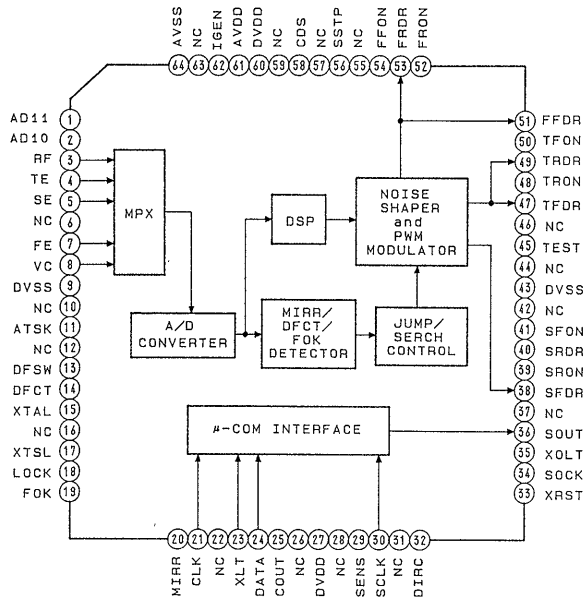
SBX1610-59



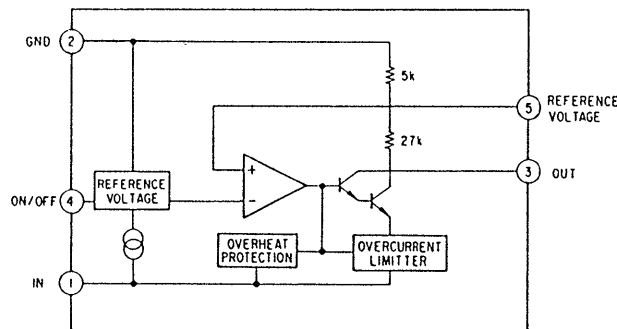
## 4-3. IC BLOCK DIAGRAMS

### IC101 CXD2501Q

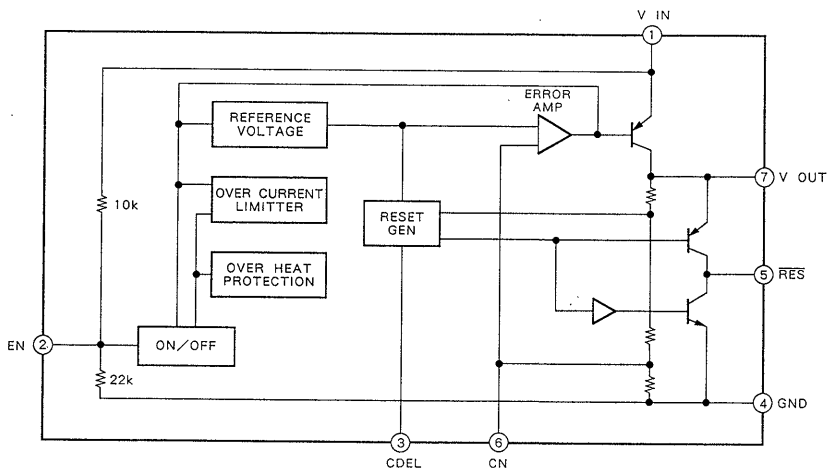
CXD2501



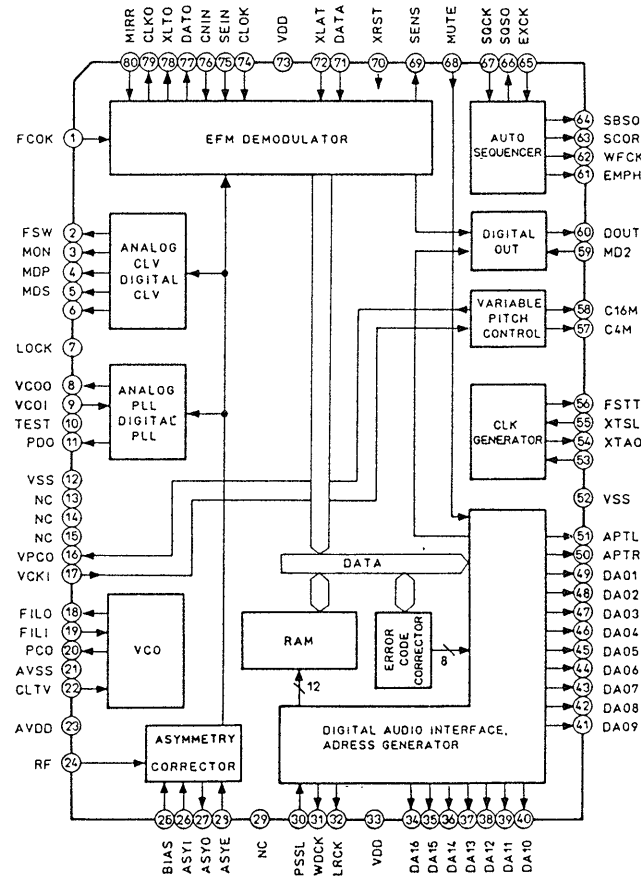
### IC201 M5293L



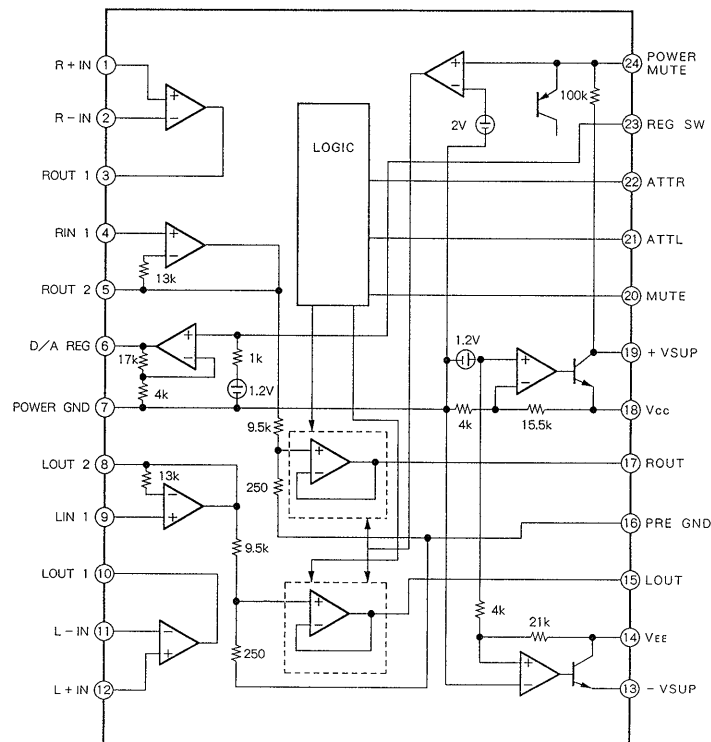
### IC202 LA5602



# IC301 CXD2500AQ



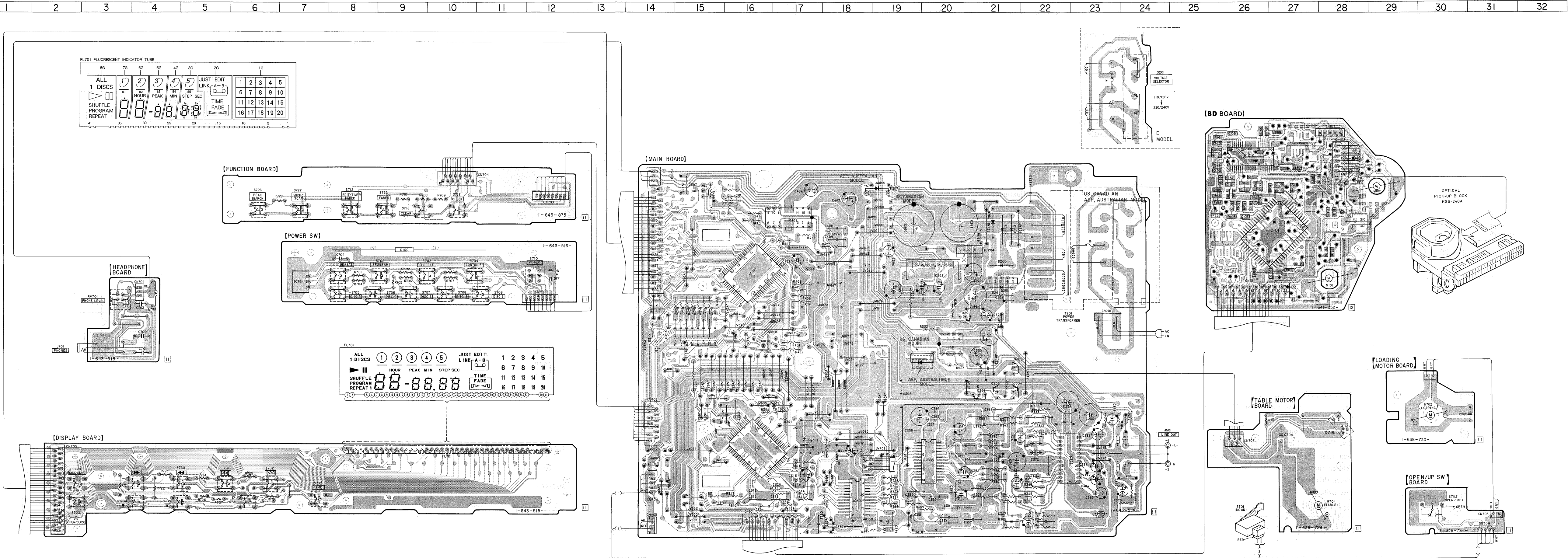
# IC306 LA9215



Semiconductor Location

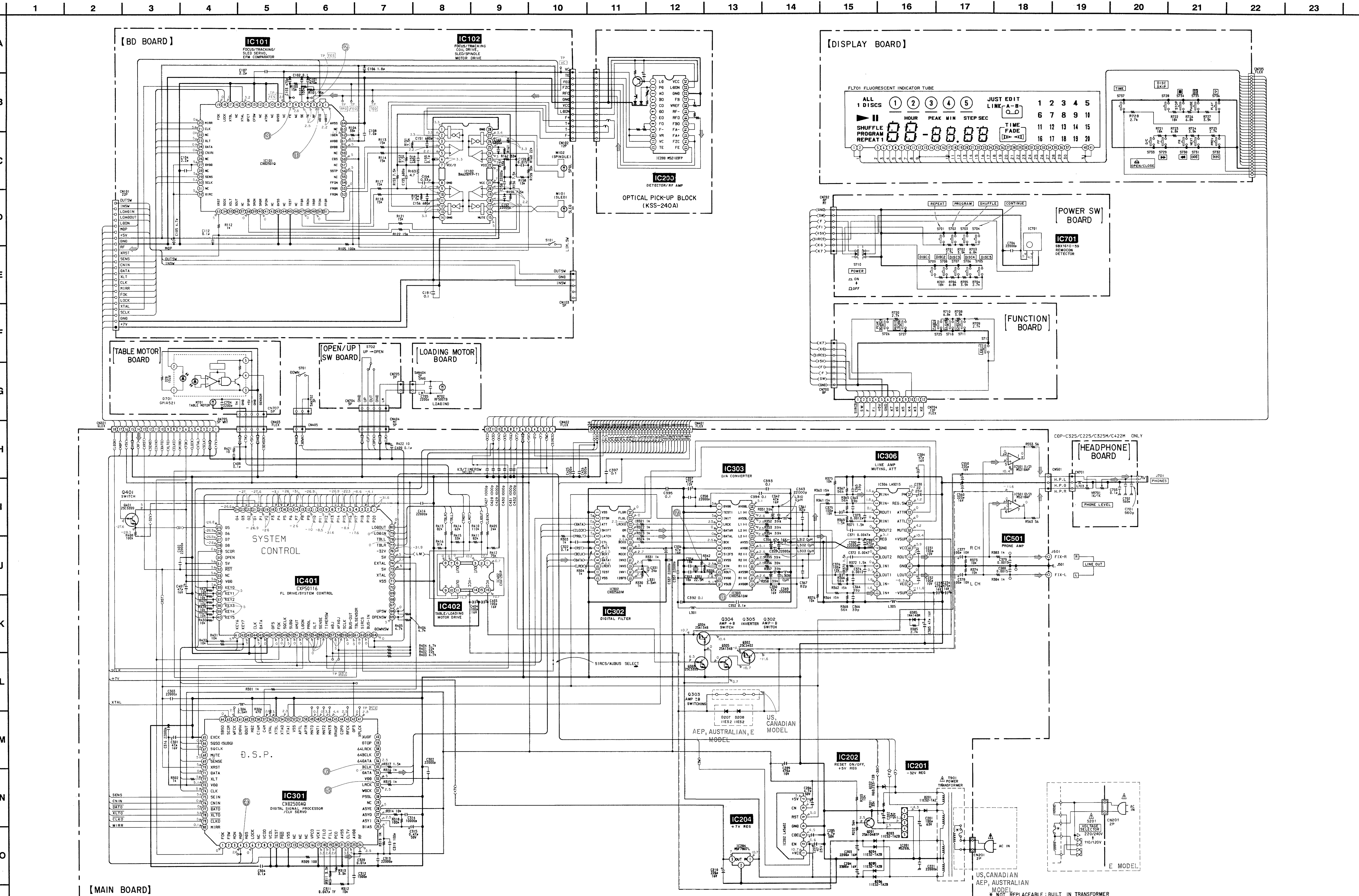
Ref. No.	Location
D201	F-21
D202	F-21
D203	E-21
D204	E-21
D205	F-21
D206	E-21
D207	D-19
D208	H-19
D385	K-21
D701	I-28
IC101	E-27
IC102	C-26
IC201	F-21
IC202	F-20
IC204	E-21
IC301	I-16
IC302	J-18
IC303	I-20
IC306	I-23
IC401	F-16
IC402	E-17
IC501	G-20
IC701	F-7
Q201	G-20
Q302	H-21
Q303	H-21
Q304	H-21
Q305	H-21
Q401	D-15

- Note:
- : parts extracted from the component side.
  - : Through hole.
  - ▨ : Pattern on the side which is seen.
  - ▩ : Pattern of the rear side.





4-5. SCHEMATIC DIAGRAM  
• Refer to page 9 for Semiconductor Lead Layout.

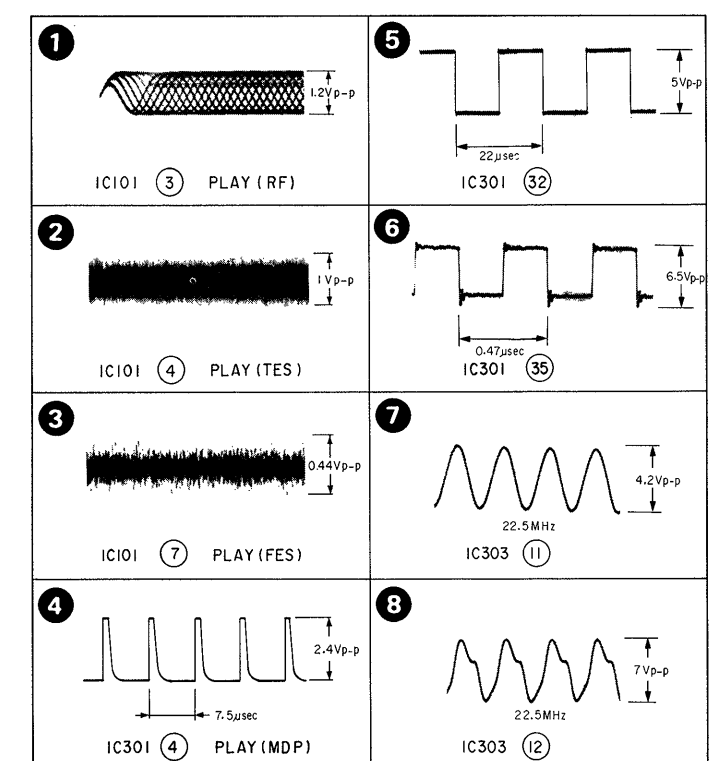


**Note:**  
• All capacitors are in  $\mu\text{F}$  unless otherwise noted.  $\text{pF}$ :  $\mu\text{F}$   
50WV or less are not indicated except for electrolytics and tantalums.  
• All resistors are in  $\Omega$  and  $\frac{1}{4}\text{W}$  or less unless otherwise specified.

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

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

•  $\Delta$ : B+ Line  
•  $\Delta$ : B- Line  
•  $\Delta$ : adjustment for repair.  
• Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.  
• Voltages are taken with a VOM (Input Impedance 10M $\Omega$ )  
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.  
• Signal path  
• CD






## SECTION 5 EXPLODED VIEWS

### NOTE:

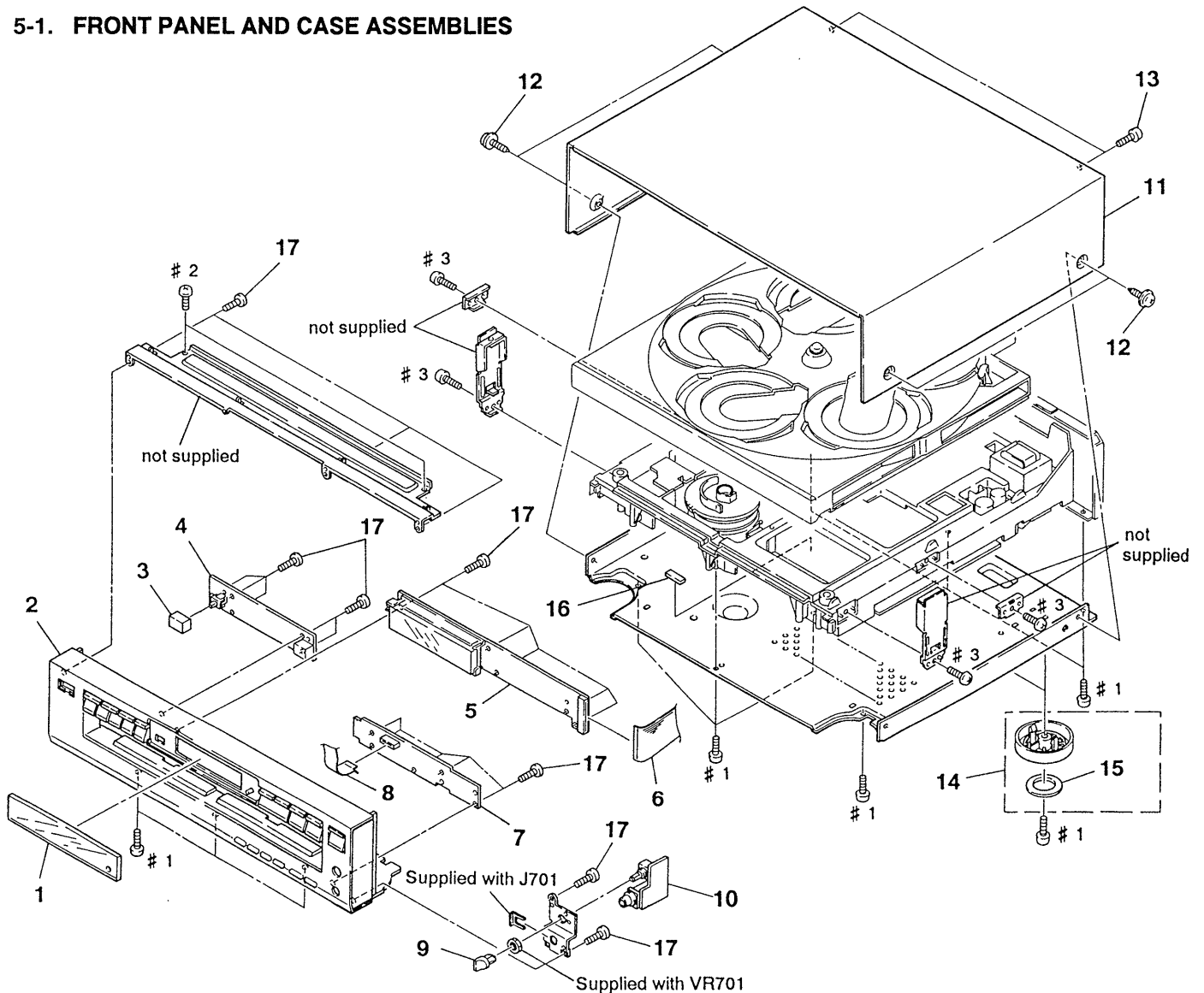
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " \* " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

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

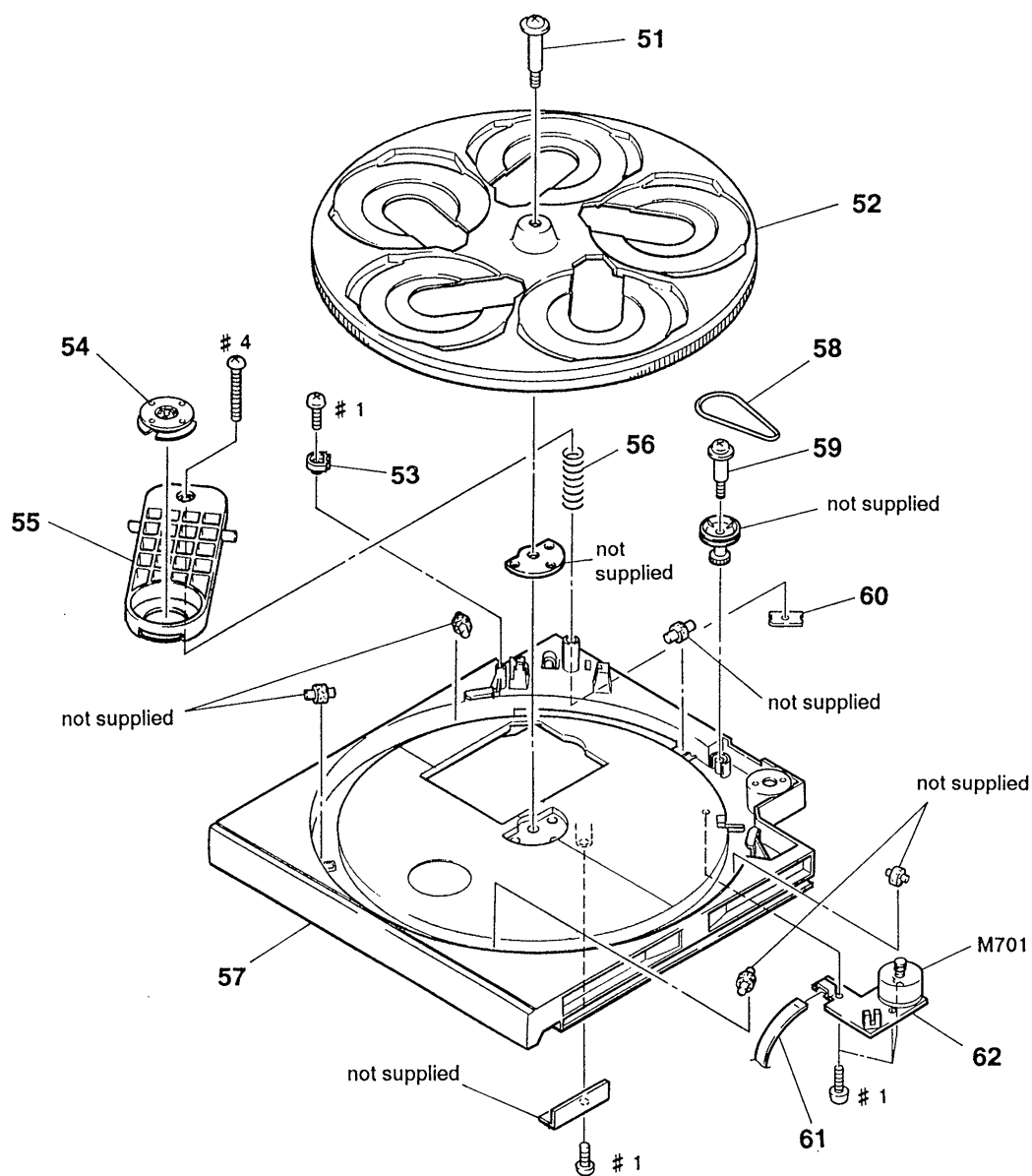
Les composants identifiés par une marque  sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

### 5-1. FRONT PANEL AND CASE ASSEMBLIES



Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
1	4-950-862-01	PLATE (FL), INDICATION (C325)		8	1-690-860-11	WIRE (FLAT TYPE) (12 CORE)	
1	4-950-862-11	PLATE (FL), INDICATION (C225)		9	4-950-189-01	KNOB (A) (VOL)	
2	X-4942-616-1	PANEL ASSY, FRONT (C325:US, Canadian)		* 10	1-643-518-11	HEADPHONE BOARD	
2	X-4942-617-1	PANEL ASSY, FRONT (C225:US, Canadian)		* 11	4-944-153-01	CASE	
2	X-4942-620-1	PANEL ASSY, FRONT (C325:Australian)					
2	X-4942-618-1	PANEL ASSY, FRONT (C225:AEP, E)		12	3-704-366-01	SCREW (CASE) (M3X8)	
3	4-922-921-01	BUTTON (POWER)		13	3-703-685-21	SCREW (+BV 3X8)	
* 4	1-643-516-11	POWER SW BOARD		14	X-4942-197-1	FOOT ASSY (US, Canadian)	
* 5	1-643-515-11	DISPLAY BOARD		14	X-4942-198-1	FOOT ASSY (AEP, Australian, E)	
6	1-690-859-11	WIRE (FLAT TYPE) (33 CORE)		15	4-923-836-11	CUSHION	
* 7	1-643-875-11	FUNCTION BOARD		* 16	4-951-946-02	SHEET	
				17	4-951-620-01	SCREW (2.6X8), +BVT	

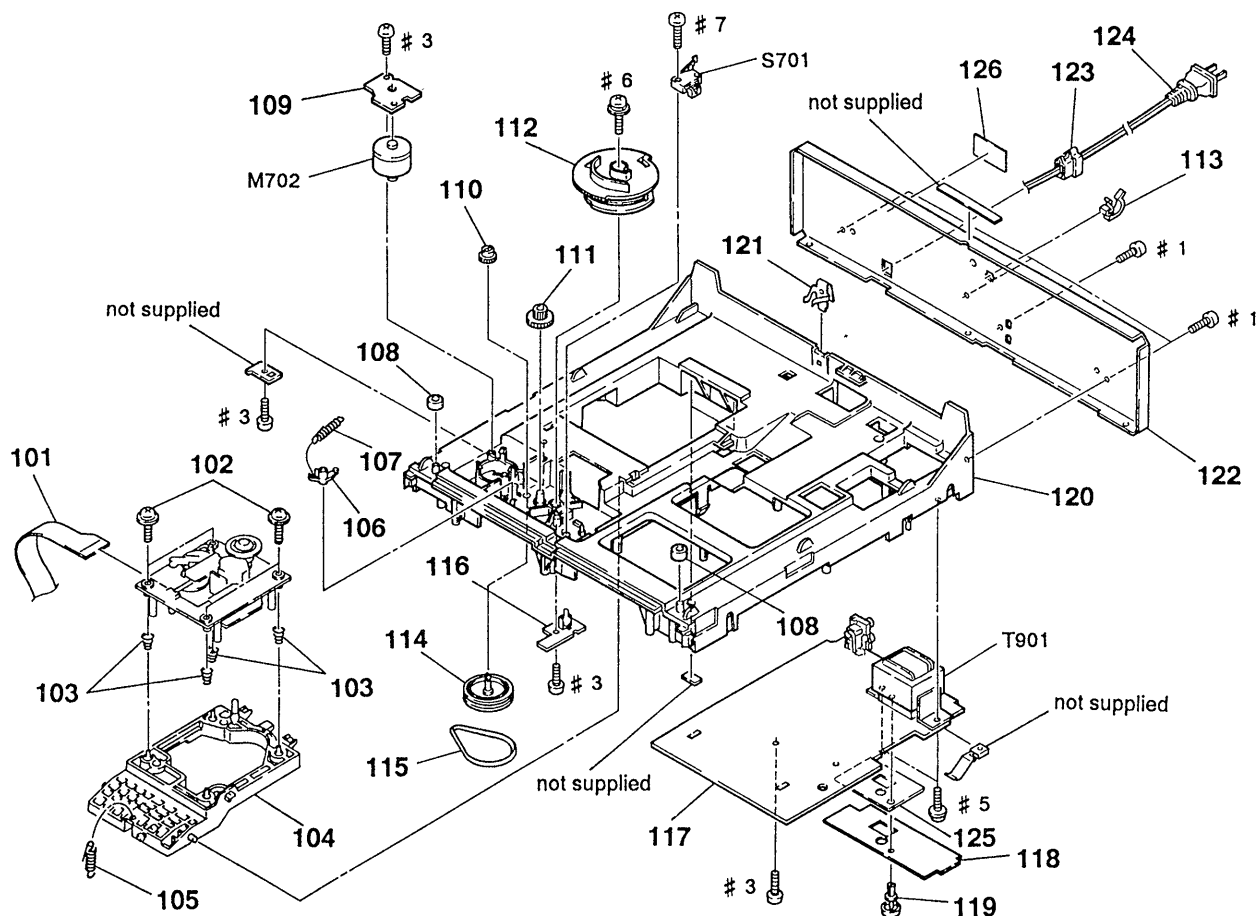
## 5-2. DISC TRAY ASSEMBLY






Ref. No.	Part No.	Description
51	4-926-384-01	SCREW, STEP
* 52	4-926-383-01	TABLE (B), DISK
* 53	4-949-226-01	PLATE, LOCK
* 54	1-452-538-11	MAGNET
* 55	4-930-506-02	BRACKET (PRESS PULLEY)
56	4-926-395-01	SPRING, COMPRESSION
57	4-950-866-01	TABLE (A), DISK (C325)
57	4-950-866-11	TABLE (A), DISK (C225)

Ref. No.	Part No.	Description
58	4-926-399-01	BELT
59	4-923-597-01	SCREW, STEP
* 60	4-926-388-01	BRACKET (ADJUSTMENT)
61	1-590-849-11	WIRE, FLAT TYPE (5 CORE)
* 62	1-638-729-11	TABLE MOTOR BOARD
M701	A-4604-585-A	MOTOR ASSY, ROTARY (TABLE)

### 5-3. CHASSIS ASSEMBLY



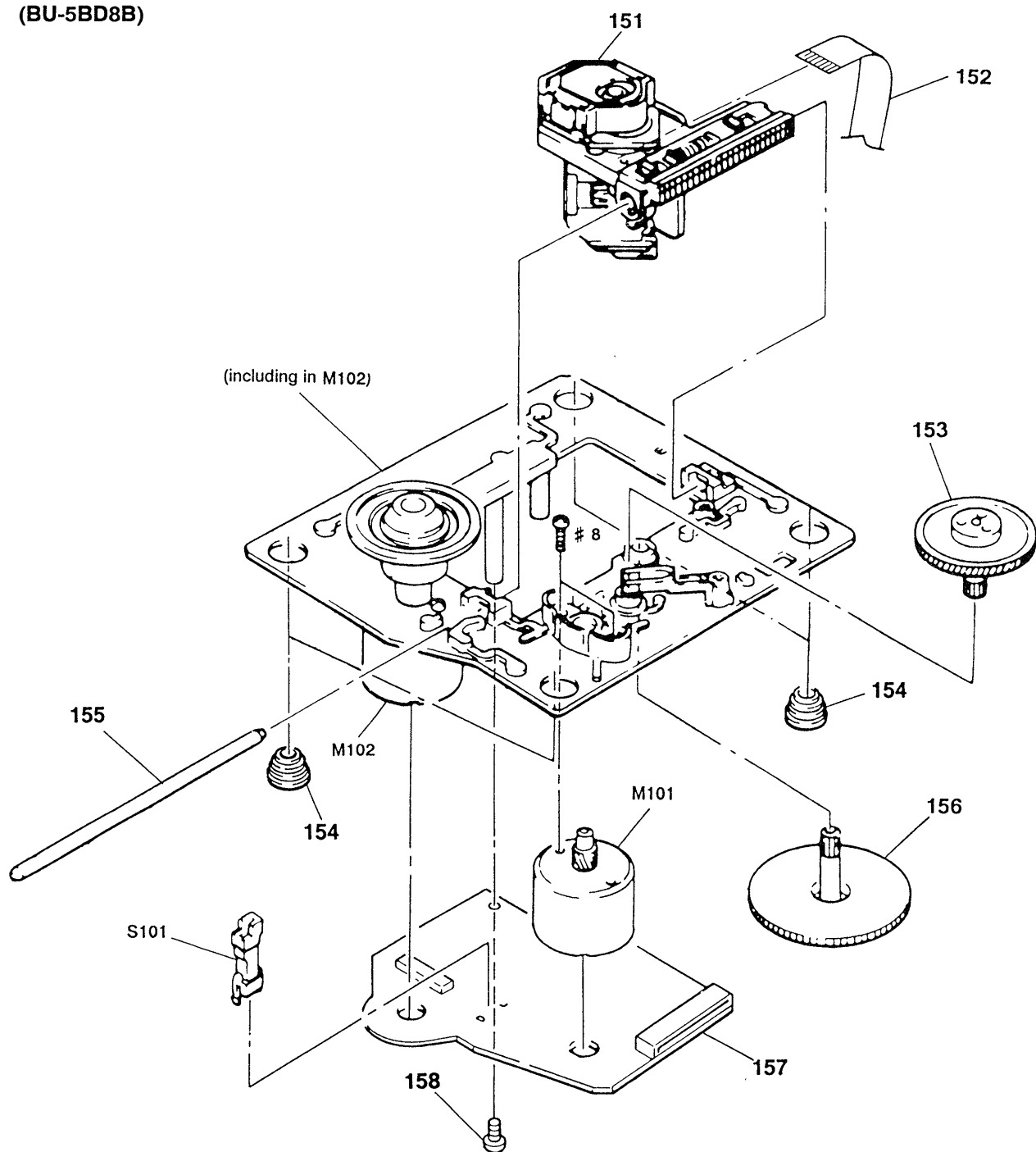
The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
101	1-694-003-11	JAMPER, FILM (WITH TARMINAL)		* 120	4-943-997-01	CHASSIS	
102	4-933-134-01	SCREW (+PTPW M2. 6X6)		* 121	4-943-996-01	SPRING, LEAF	
103	4-949-385-01	SPRING (D), COIL		* 122	4-949-994-71	PANEL, BACK (C225:US, Canadian)	
* 104	4-934-373-01	BRACKET (BU)		* 122	4-949-994-91	PANEL, BACK (C225:AEP)	
105	4-937-911-01	SPRING, TENSION					
				* 122	4-949-994-81	PANEL, BACK (E)	
106	4-917-519-01	LEVER, SET		* 122	4-951-747-01	PANEL, BACK (C325:US, Canadian)	
107	4-924-412-01	SPRING (B), TENSION		* 122	4-951-747-21	PANEL, BACK (C325:Australian)	
* 108	4-951-619-01	CUSHION (A)		* 123	3-703-244-00	BUSHING (2104), CORD (EXCEPT E)	
* 109	1-638-730-11	LOADING MOTOR BOARD		* 123	3-703-571-11	BUSHING (2104), CORD (E)	
110	4-934-375-01	GEAR (LOADING B)					
				△124	1-574-358-31	CORD, POWER (WITH CONNECTOR) (Australian)	
111	4-934-381-01	GEAR (LOADING C)		△124	1-575-651-21	CORD, POWER (AEP)	
112	4-934-391-01	GEAR (LOADING A)		△124	1-575-653-21	CORD, POWER (E)	
* 113	4-949-235-01	HOOK		△124	1-590-836-11	CORD, POWER (US, Canadian)	
114	X-4941-529-1	PULLEY ASSY		* 125	4-951-933-01	SHEET, INSULATING (AEP, Australian)	
115	4-944-490-01	BELT (TIMING)					
				* 126	4-941-548-01	LABEL, CLASS 1 (AEP, Australian)	
* 116	1-638-731-11	OPEN/UP SW BOARD		M702	A-4604-834-A	MOTOR ASSY, LOADING	
* 117	A-4649-363-A	MAIN BOARD, COMPLETE (AEP, Australian)		S701	1-572-713-11	SWITCH, PUSH (WITH CONNECTOR) (DOWN)	
* 117	A-4649-365-A	MAIN BOARD, COMPLETE (US, Canadian)		△T901	1-449-955-11	TRANSFORMER, POWER (AEP, Australian)	
* 117	A-4649-496-A	MOUNTED PCB, MAIN (E)		△T901	1-449-956-11	TRANSFORMER, POWER (E)	
* 118	4-944-178-01	SHEET (INSULATING)					
				△T901	1-450-876-11	TRANSFORMER, POWER (US, Canadian)	
119	3-531-576-11	RIVET					



5-4. OPTICAL PICK-UP BLOCK ASSEMBLY  
(BU-5BD8B)



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

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

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
$\Delta$ 151	8-848-144-11	DEVICE, OPTICAL KSS-240A		* 157	A-4649-199-A	BD BOARD, COMPLETE	
152	1-575-001-11	WIRE, FLAT TYPE (12 CORE)		158	4-951-620-01	SCREW (2.6X8), +BVTP	
153	4-917-567-01	GEAR (M)		M101	X-4917-504-1	MOTOR ASSY (SLED)	
154	4-951-940-01	INSULATOR (BU)		M102	X-4917-523-3	BASE (OUTSERT) ASSY (SPINDLE MOTOR)	
155	4-917-565-01	SHAFT, SLED		S101	1-572-085-11	SWITCH, LEAF (LIMIT IN)	
156	4-917-564-01	GEAR (P), FLATNESS					

## SECTION 6

# ELECTRICAL PARTS LIST

BD

MAIN

## NOTE:

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

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

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

• Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.

• -XX, -X mean standardized parts, so they may have some difference from the original one.

## • RESISTORS

All resistors are in ohms

METAL: Metal-film resistor

METAL OXIDE: Metal Oxide-film resistor

F: nonflammable

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

## • SEMICONDUCTORS

In each case, u:  $\mu$ , for example:

uA...:  $\mu$  A..., uPA...:  $\mu$  PA...,

uPB...:  $\mu$  PB..., uPC...:  $\mu$  PC...,

uPD...:  $\mu$  PD...

## • CAPACITORS

uF:  $\mu$  F

## • COILS

uH:  $\mu$  H

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
*	A-4649-199-A	BD BOARD, COMPLETE *****		R113	1-216-077-00	METAL CHIP 15K 5% 1/10W	
		< CAPACITOR >		R114	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C101	1-163-005-11	CERAMIC CHIP 470PF	10% 50V	R117	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C102	1-163-038-00	CERAMIC CHIP 0.1uF	25V	R118	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C103	1-163-005-11	CERAMIC CHIP 470PF	10% 50V	R121	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C104	1-164-505-11	CERAMIC CHIP 2.2uF	16V	R122	1-216-077-00	METAL CHIP 15K 5% 1/10W	
C105	1-135-155-21	TANTALUM CHIP 4.7uF	10% 16V	R151	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
				R152	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
C106	1-164-346-11	CERAMIC CHIP 1uF	16V	R153	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
C107	1-164-505-11	CERAMIC CHIP 2.2uF	16V	R154	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
C108	1-164-346-11	CERAMIC CHIP 1uF	16V	R155	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
C112	1-163-038-00	CERAMIC CHIP 0.1uF	25V	R156	1-216-070-00	METAL CHIP 7.5K 5% 1/10W	
C151	1-163-007-11	CERAMIC CHIP 680PF	10% 50V	R157	1-216-085-00	METAL CHIP 33K 5% 1/10W	
				R158	1-216-076-00	METAL CHIP 13K 5% 1/10W	
C152	1-163-007-11	CERAMIC CHIP 680PF	10% 50V	R159	1-216-085-00	METAL CHIP 33K 5% 1/10W	
C153	1-163-038-00	CERAMIC CHIP 0.1uF	25V	R160	1-216-081-00	METAL CHIP 22K 5% 1/10W	
C154	1-164-336-11	CERAMIC CHIP 0.33uF	25V	R161	1-216-093-00	METAL CHIP 68K 5% 1/10W	
C155	1-163-007-11	CERAMIC CHIP 680PF	10% 50V	R162	1-216-085-00	METAL CHIP 33K 5% 1/10W	
C156	1-163-007-11	CERAMIC CHIP 680PF	10% 50V	R163	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
						< SWITCH >	
C157	1-163-037-11	CERAMIC CHIP 0.022uF	10% 25V	S101	1-572-085-11	SWITCH, LEAF (LIMIT)	
C158	1-163-037-11	CERAMIC CHIP 0.022uF	10% 25V			*****	
C159	1-163-023-00	CERAMIC CHIP 0.015uF	5% 50V				
C160	1-163-019-00	CERAMIC CHIP 0.0068uF	10% 50V				
C181	1-163-038-00	CERAMIC CHIP 0.1uF	25V				
		< CONNECTOR >		*	A-4649-365-A	MAIN BOARD, COMPLETE ***** (C225/C325: US, Canadian)	
CN101	1-568-861-11	SOCKET, CONNECTOR 18P					
CN102	1-568-795-11	SOCKET, CONNECTOR 12P		*	A-4649-363-A	MAIN BOARD, COMPLETE ***** (C225: AEP, C325: Australian)	
		< IC >					
IC101	8-752-344-48	IC CXD2501Q		*	A-4649-496-A	MAIN BOARD, COMPLETE ***** (C225: E)	
IC102	8-759-071-80	IC BA6297AFP-T1					
		< RESISTOR >					
R101	1-216-077-00	METAL CHIP 15K 5% 1/10W			7-682-547-04	SCREW +BVTT 3X6 (S)	
R102	1-216-097-00	METAL CHIP 100K 5% 1/10W				< CAPACITOR >	
R103	1-216-077-00	METAL CHIP 15K 5% 1/10W		C201	1-124-572-11	ELECT 100uF 20% 63V	
R104	1-216-085-00	METAL CHIP 33K 5% 1/10W		C202	1-126-059-11	ELECT 10uF 20% 50V	
R105	1-216-097-00	METAL CHIP 100K 5% 1/10W		C203	1-124-556-11	ELECT 2200uF 20% 16V	
				C204	1-124-887-00	ELECT 3300uF 20% 16V	
R112	1-216-049-00	METAL CHIP 1K 5% 1/10W		C205	1-126-163-11	ELECT 4.7uF 20% 50V	

## MAIN

Ref. No.	Part No.	Description			Remark	Ref. No.	Part No.	Description			Remark
C206	1-126-163-11	ELECT	4.7uF	20%	50V	C366	1-162-213-31	CERAMIC	39PF	5%	50V
C207	1-124-910-11	ELECT	47uF	20%	50V	C367	1-162-280-31	CERAMIC	82PF	10%	50V
C209	1-124-997-11	ELECT	470uF	20%	10V	C371	1-130-479-00	MYLAR	0.0047uF	5%	50V
C210	1-126-024-11	ELECT	220uF	20%	16V						
C221	1-161-494-00	CERAMIC	0.022uF		25V	C372	1-130-479-00	MYLAR	0.0047uF	5%	50V
						C373	1-130-472-00	MYLAR	0.0012uF	5%	50V
C230	1-126-049-11	ELECT	22uF	20%	25V	C374	1-130-472-00	MYLAR	0.0012uF	5%	50V
C231	1-124-994-11	ELECT	100uF	20%	10V	C375	1-124-994-11	ELECT	100uF	20%	10V
C232	1-124-994-11	ELECT	100uF	20%	10V	C376	1-124-994-11	ELECT	100uF	20%	10V
C233	1-126-012-11	ELECT	470uF	20%	16V						
C234	1-126-012-11	ELECT	470uF	20%	16V	C377	1-124-994-11	ELECT	100uF	20%	10V
						C378	1-124-994-11	ELECT	100uF	20%	10V
C301	1-126-022-11	ELECT	47uF	20%	16V	C379	1-130-473-00	MYLAR	0.0015uF	5%	50V
C302	1-161-494-00	CERAMIC	0.022uF		25V	C380	1-130-473-00	MYLAR	0.0015uF	5%	50V
C303	1-161-494-00	CERAMIC	0.022uF		25V	C384	1-126-022-11	ELECT	47uF	20%	16V
C304	1-164-159-11	CERAMIC	0.1uF		50V						
C311	1-136-161-00	FILM	0.047uF	5%	50V	C385	1-126-022-11	ELECT	47uF	20%	16V
						C390	1-161-494-00	CERAMIC	0.022uF		25V
C312	1-161-374-11	CERAMIC	0.0015uF	20%	50V	C391	1-124-997-11	ELECT	470uF	20%	10V
C313	1-161-494-00	CERAMIC	0.022uF		25V	C392	1-164-159-11	CERAMIC	0.1uF		50V
C314	1-162-306-11	CERAMIC	0.01uF	20%	16V	C393	1-164-159-11	CERAMIC	0.1uF		50V
C315	1-126-300-11	ELECT	0.47uF	20%	50V						
C316	1-161-494-00	CERAMIC	0.022uF		25V	C394	1-164-159-11	CERAMIC	0.1uF		50V
						C395	1-164-159-11	CERAMIC	0.1uF		50V
C319	1-162-282-31	CERAMIC	100PF	10%	50V	C401	1-126-022-11	ELECT	47uF	20%	16V
C320	1-130-483-00	MYLAR	0.01uF	5%	50V	C402	1-161-494-00	CERAMIC	0.022uF		25V
C322	1-164-159-11	CERAMIC	0.1uF		50V	C403	1-126-023-11	ELECT	100uF	20%	16V
C331	1-162-208-31	CERAMIC	24PF	5%	50V						
C336	1-126-022-11	ELECT	47uF	20%	16V	C404	1-126-023-11	ELECT	100uF	20%	16V
						C408	1-164-159-11	CERAMIC	0.1uF		50V
C337	1-161-494-00	CERAMIC	0.022uF		25V	C409	1-164-159-11	CERAMIC	0.1uF		50V
C342	1-126-022-11	ELECT	47uF	20%	16V	C414	1-161-494-00	CERAMIC	0.022uF		25V
C343	1-161-494-00	CERAMIC	0.022uF		25V	C425	1-162-294-31	CERAMIC	0.001uF	10%	50V
C349	1-161-494-00	CERAMIC	0.022uF		25V						
C350	1-126-022-11	ELECT	47uF	20%	16V	C426	1-162-294-31	CERAMIC	0.001uF	10%	50V
						C427	1-162-294-31	CERAMIC	0.001uF	10%	50V
C351	1-161-494-00	CERAMIC	0.022uF		25V	C428	1-162-294-31	CERAMIC	0.001uF	10%	50V
C352	1-164-159-11	CERAMIC	0.1uF		50V	C429	1-162-294-31	CERAMIC	0.001uF	10%	50V
C353	1-162-205-31	CERAMIC	18PF	5%	50V	C430	1-162-294-31	CERAMIC	0.001uF	10%	50V
C354	1-162-205-31	CERAMIC	18PF	5%	50V						
C355	1-161-494-00	CERAMIC	0.022uF		25V	C431	1-162-294-31	CERAMIC	0.001uF	10%	50V
						C432	1-162-294-31	CERAMIC	0.001uF	10%	50V
C356	1-126-022-11	ELECT	47uF	20%	16V	C550	1-126-024-11	ELECT	220uF	20%	16V
C357	1-124-997-11	ELECT	470uF	20%	10V	C560	1-126-024-11	ELECT	220uF	20%	16V
C358	1-161-494-00	CERAMIC	0.022uF		25V						
C361	1-162-280-31	CERAMIC	82PF	10%	50V	< CONNECTOR >					
C363	1-162-213-31	CERAMIC	39PF	5%	50V						
						* CN201	1-573-047-11	PIN, CONNECTOR (PC BOARD) 2P			
C364	1-162-213-31	CERAMIC	39PF	5%	50V	* CN301	1-691-895-11	SOCKET, CONNECTOR (L TYPE) 18P			
C365	1-162-213-31	CERAMIC	39PF	5%	50V	* CN401	1-691-901-11	SOCKET, CONNECTOR (L TYPE) 33P			

MAIN

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
* CN402	1-691-891-11	SOCKET, CONNECTOR (L TYPE) 12P		< TRANSISTOR >			
* CN403	1-568-824-11	SOCKET, CONNECTOR 5P		Q201	8-729-119-76	TRANSISTOR 2SA1175-HFE	
* CN404	1-568-943-11	PIN, CONNECTOR 5P		Q302	8-729-900-80	TRANSISTOR DTC114ES	
* CN501	1-568-941-11	PIN, CONNECTOR 3P		Q303	8-729-900-89	TRANSISTOR DTC144ES	
< DIODE >				Q304	8-729-900-61	TRANSISTOR DTA114ES	
D201	8-719-200-82	DIODE 11ES2		Q305	8-729-900-61	TRANSISTOR DTA114ES	
D202	8-719-110-08	DIODE RD8. 2ES-B2		Q401	8-729-900-89	TRANSISTOR DTC144ES	
D203	8-719-200-82	DIODE 11ES2		< RESISTOR >			
D204	8-719-200-82	DIODE 11ES2		R201	1-249-435-11	CARBON 33K 5% 1/4W	
D205	8-719-200-82	DIODE 11ES2		R202	1-249-438-11	CARBON 56K 5% 1/4W	
D206	8-719-200-82	DIODE 11ES2		R203	1-249-429-11	CARBON 10K 5% 1/4W	
D207	8-719-200-82	DIODE 11ES2(C225:AEP, E, C325:Australian)		R301	1-249-417-11	CARBON 1K 5% 1/4W	
D208	8-719-200-82	DIODE 11ES2(C225:AEP, E, C325:Australian)		R302	1-249-417-11	CARBON 1K 5% 1/4W	
D385	8-719-987-63	DIODE 1N4148M		R303	1-249-417-11	CARBON 1K 5% 1/4W	
< IC >				R304	1-249-417-11	CARBON 1K 5% 1/4W	
IC201	8-759-633-42	IC M5293L		R306	1-249-413-11	CARBON 470 5% 1/4W	
IC202	8-759-061-65	IC LA5602		R309	1-249-405-11	CARBON 100 5% 1/4W	
IC204	8-759-604-86	IC M5F7807		R311	1-249-423-11	CARBON 3. 3K 5% 1/4W	
IC301	8-752-337-26	IC CXD2500AQ		R312	1-249-429-11	CARBON 10K 5% 1/4W	
IC302	8-752-342-65	IC CXD2560M		R313	1-249-423-11	CARBON 3. 3K 5% 1/4W	
IC303	8-752-351-19	IC CXD2561BM		R314	1-249-429-11	CARBON 10K 5% 1/4W	
IC306	8-759-061-66	IC LA9215		R315	1-249-417-11	CARBON 1K 5% 1/4W	
IC401	8-752-834-31	IC CXP50116-267Q		R316	1-249-417-11	CARBON 1K 5% 1/4W	
IC402	8-759-821-32	IC CXA1291P		R317	1-249-419-11	CARBON 1. 5K 5% 1/4W	
IC501	8-759-634-51	IC M5218AP		R318	1-249-441-11	CARBON 100K 5% 1/4W	
< JACK >				R319	1-247-903-00	CARBON 1M 5% 1/4W	
J501	1-569-442-11	JACK, PIN 2P (LINE OUT L/R)		R321	1-249-417-11	CARBON 1K 5% 1/4W	
< COIL >				R322	1-249-417-11	CARBON 1K 5% 1/4W	
L301	1-412-473-21	INDUCTOR 0uH		R323	1-249-417-11	CARBON 1K 5% 1/4W	
L302	1-412-473-21	INDUCTOR 0uH		R324	1-249-417-11	CARBON 1K 5% 1/4W	
L303	1-412-473-21	INDUCTOR 0uH		R330	1-249-417-11	CARBON 1K 5% 1/4W	
L305	1-412-473-21	INDUCTOR 0uH		R331	1-249-417-11	CARBON 1K 5% 1/4W	
L306	1-412-297-11	INDUCTOR 3. 3uH		R342	1-249-417-11	CARBON 1K 5% 1/4W	
L309	1-412-473-21	INDUCTOR 0uH		R351	1-249-436-11	CARBON 39K 5% 1/4W	
L310	1-412-473-21	INDUCTOR 0uH		R352	1-249-436-11	CARBON 39K 5% 1/4W	
L312	1-412-473-21	INDUCTOR 0uH		R353	1-249-436-11	CARBON 39K 5% 1/4W	
L331	1-412-297-11	INDUCTOR 3. 3uH		R354	1-249-436-11	CARBON 39K 5% 1/4W	
				R355	1-249-436-11	CARBON 39K 5% 1/4W	
				R356	1-249-436-11	CARBON 39K 5% 1/4W	
				R357	1-249-436-11	CARBON 39K 5% 1/4W	

## MAIN

## DISPLAY



## POWER SW

## HEADPHONE


## FUNCTION

Ref. No.	Part No.	Description	Remark	Ref. No.	Part No.	Description	Remark
R358	1-249-436-11	CARBON	39K 5% 1/4W	R430	1-249-429-11	CARBON	10K 5% 1/4W
R359	1-247-903-00	CARBON	1M 5% 1/4W	R431	1-249-429-11	CARBON	10K 5% 1/4W
R361	1-249-431-11	CARBON	15K 5% 1/4W	R432	1-249-429-11	CARBON	10K 5% 1/4W
R362	1-249-431-11	CARBON	15K 5% 1/4W	R553	1-249-402-11	CARBON	56 5% 1/4W
R363	1-249-431-11	CARBON	15K 5% 1/4W	R563	1-249-402-11	CARBON	56 5% 1/4W
R364	1-249-431-11	CARBON	15K 5% 1/4W	< SWITCH >			
R365	1-249-438-11	CARBON	56K 5% 1/4W	△S201	1-571-722-11	SWITCH VOLTAGE SELECTION (C225: E)	
R366	1-249-438-11	CARBON	56K 5% 1/4W	< CRYSTAL >			
R367	1-249-438-11	CARBON	56K 5% 1/4W	X351	1-579-314-11	VIBRATOR, CRYSTAL (22.5MHz)	
R368	1-249-438-11	CARBON	56K 5% 1/4W	*****			
R369	1-249-419-11	CARBON	1.5K 5% 1/4W	*	1-643-515-11	DISPLAY BOARD	
R370	1-249-419-11	CARBON	1.5K 5% 1/4W	*****			
R371	1-249-419-11	CARBON	1.5K 5% 1/4W	*	1-643-516-11	POWER SW BOARD	
R372	1-249-419-11	CARBON	1.5K 5% 1/4W	*****			
R373	1-249-429-11	CARBON	10K 5% 1/4W	*	1-643-518-11	HEADPHONE BOARD	
R374	1-249-429-11	CARBON	10K 5% 1/4W	*****			
R375	1-249-429-11	CARBON	10K 5% 1/4W	*	1-643-875-11	FUNCTION BOARD	
R376	1-249-429-11	CARBON	10K 5% 1/4W	*****			
R383	1-249-417-11	CARBON	1K 5% 1/4W	*	1-690-880-31	READ (WITH CONNECTOR)	
R384	1-249-417-11	CARBON	1K 5% 1/4W	*	4-950-864-01	HOLDER (FL)	
R385	1-249-422-11	CARBON	2.7K 5% 1/4W	< CAPACITOR >			
R401	1-249-433-11	CARBON	22K 5% 1/4W	C701	1-162-291-31	CERAMIC	560PF 10% 50V
R402	1-249-433-11	CARBON	22K 5% 1/4W	C702	1-162-291-31	CERAMIC	560PF 10% 50V
R403	1-249-425-11	CARBON	4.7K 5% 1/4W	C703	1-164-159-11	CERAMIC	0.1uF 50V
R404	1-249-425-11	CARBON	4.7K 5% 1/4W	C704	1-161-494-00	CERAMIC	0.022uF 25V
R405	1-249-425-11	CARBON	4.7K 5% 1/4W	< CONNECTOR >			
R406	1-249-425-11	CARBON	4.7K 5% 1/4W	* CN704	1-691-890-11	SOCKET, CONNECTOR (S TYPE) 12P	
R408	1-249-441-11	CARBON	100K 5% 1/4W	* CN705	1-691-901-11	SOCKET, CONNECTOR (L TYPE) 33P	
R409	1-247-864-11	CARBON	24K 5% 1/4W	< FILTER >			
R410	1-247-880-11	CARBON	110K 5% 1/4W	FL701	1-519-721-11	INDICATOR TUBE, FLUORESCENT	
R411	1-249-440-11	CARBON	82K 5% 1/4W	< IC >			
R412	1-247-876-11	CARBON	75K 5% 1/4W	IC701	8-741-100-48	IC SBX1610-59	
R413	1-249-440-11	CARBON	82K 5% 1/4W	< JACK >			
R414	1-247-874-11	CARBON	62K 5% 1/4W	J701	1-568-519-41	JACK, LARGE TYPE (PHONES)	
R415	1-249-435-11	CARBON	33K 5% 1/4W				
R416	1-247-878-00	CARBON	91K 5% 1/4W				
R421	1-249-393-11	CARBON	10 5% 1/4W				
R422	1-249-393-11	CARBON	10 5% 1/4W				
R425	1-249-429-11	CARBON	10K 5% 1/4W				
R426	1-249-429-11	CARBON	10K 5% 1/4W				
R427	1-249-429-11	CARBON	10K 5% 1/4W				
R428	1-249-429-11	CARBON	10K 5% 1/4W				
R429	1-249-429-11	CARBON	10K 5% 1/4W				



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

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