D-147CR

SERVICE MANUAL

AEP Model
UK Model
E Model
Australian Model

Model Name Using Similar Mechanism	D-232/235
CD Mechanism Type	KSM-331CAN (S)
Optical Pick-Up Name	KSS-331C

SPECIFICATIONS

System
Compact disc digital audio system
Laser diode properties
Material: GaAlAs
Wavelength: λ = 780 nm
Emission duration: Continuous
Laser output: Less than 44.6 µW (measured at 200 mm away from the objective lens surface)
Error correction
Sony Super Strategy Cross Interleave Reed Solomon Code
D-A conversion
1-bit quartz time-axis control
Frequency response
20 - 20,000 Hz $^{+1}_{-2}$ dB (measured by EIAJ CP-307)
Output (at 4.5 V input level)
Headphones (stereo minijack)
20 mW + 20 mW at 16 ohms
Line output (stereo minijack)
Output level 0.7 V rms at 47 kilohms
Recommended load impedance over 10 kilohms

General

Power requirements
- Rechargeable battery: 2.4 V DC
- Two LR6 (size AA) batteries: 3 V DC
- AC power adaptor (DC IN 4.5 V jack):
  220 - 230 V, 50 Hz (European, Asian and Middle Eastern model)
  120 V, 60 Hz (USA, Canadian, Central and South American model)
  240 V, 50 Hz (U.K. and Australian model)
  100 - 240 V, 50/60 Hz (Model for other countries)
- Sony CPM-300P mount plate and CPA-8 car connecting pack for use on car battery: 4.5 V DC

Dimensions (w/h/d) (without projecting parts and controls)
Approx. 130 × 30.5 × 142 mm (5 ⅛ × 1 ¼ × 5 ⅝ in.)
Mass (without rechargeable battery)
Approx. 260 g (9.2 oz)
Operating temperature
5°C - 35°C (41°F - 95°F)

Supplied accessories

AC power adaptor (1)
Connecting cord (Phono plug × 2 ↔ stereo miniplug) (1)
Stereo headphones (1)
Rechargeable battery BP-DM10 (1)
Card remote control with lithium battery (1)

Design and specifications are subject to change without notice.

使用時は添付資料も参照のこと
Refer to the additional documents.

COMPACT DISC COMPACT PLAYER

SONY®

TABLE OF CONTENTS

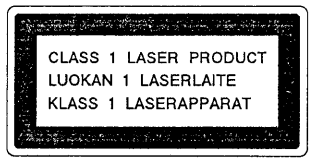
Flexible Circuit Board Repairing

- Keep the temperature of the soldering iron around 270 ℃ during repairing.
- Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
- Be careful not to apply force on the conductor when soldering or unsoldering.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

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



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!!

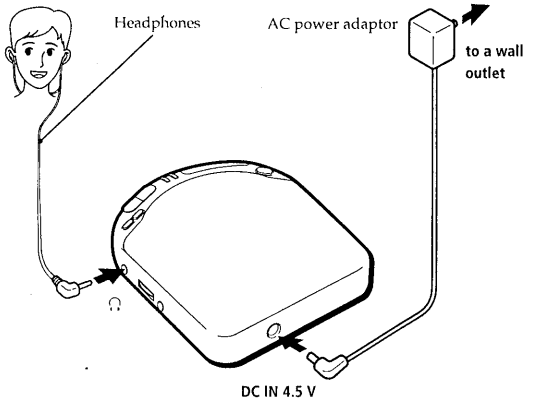
COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

This section is extracted from instruction manual.

Playing a CD right away!

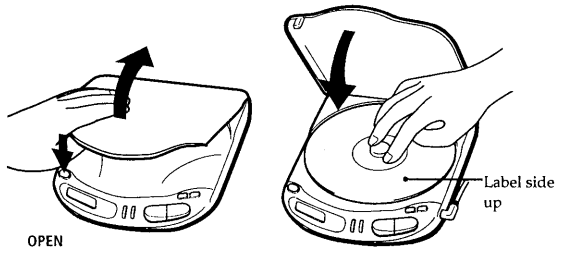
If you want to play a CD right now, choose to use your Discman on house current. Other choices are the following three: rechargeable battery, dry batteries (see "Power Sources" on the reverse side) and car battery.

1 Connect



For models supplied with the AC plug adaptor
If the AC power adaptor does not fit the wall outlet, use the AC plug adaptor.

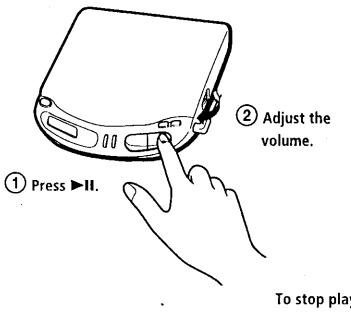
2 Place a CD



① Press OPEN and open the lid.

② Fit the CD to the pivot.

3 Play

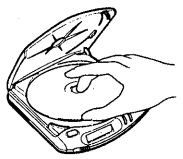


To stop play, press ■.

To	Press
Pause	►II
Resume play after pause	►II
Find the beginning of the current track (AMS*)	I◄◄ once**
Find the beginning of previous tracks (AMS)	I◄◄ repeatedly**
Find the beginning of the next track (AMS)	►►I once**
Find the beginning of succeeding tracks (AMS)	►►I repeatedly**
Go forward quickly	Hold down ►►I **
Go backwards quickly	Hold down I◄◄ **

*AMS = Automatic Music Sensor
**These operations are possible during both play and pause.

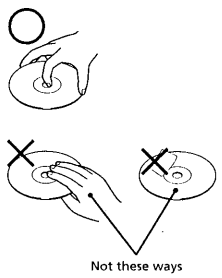
To remove the CD
Remove the CD while pressing the pivot.



Notes on controlling the volume with the remote control
Press LEVEL + button on the remote control repeatedly so that the volume is set to 10. Then adjust the volume on the Discman to the level that you want to be the maximum for adjusting the volume with the remote control.

Notes on display
- When you press ►II, the total number of the tracks in the CD and the total playing time appear for 2 seconds.
- During play, the track number and the elapsed playing time of the current track appear.
- During pause, the elapsed playing time flashes in the display.
- Between the tracks, the time to the beginning of the next track will appear with the "–" indication.

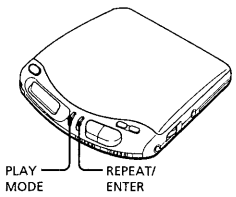
Notes on handling CDs
- To keep the CD clean, handle it by its edge. Do not touch the surface.
- Do not stick paper or tape onto the CD.
- Do not expose the CD to direct sunlight or heat sources such as hot air ducts. Do not leave the CD in a car parked in direct sunlight.



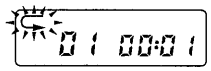
►Other Operations

Playing tracks repeatedly (Repeat Play)

You can play tracks repeatedly in normal, INTRO PGM, shuffle or RMS (Random Music Sensor) play modes. Repeat all the tracks or only one track.

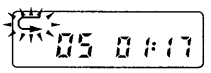


To repeat all the tracks
Press REPEAT/ENTER during play.
The "⇆" indication appears.

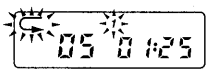


To cancel repeat play, press REPEAT/ENTER again.

To repeat a single track
1 Press REPEAT/ENTER while the track you want to repeat is playing.
The "⇆" indication appears.



2 Press PLAY MODE repeatedly until "1" appears.

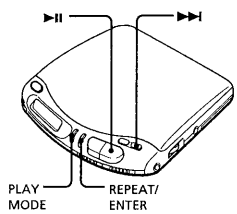


To repeat another track, press I◄◄ or ►►I.

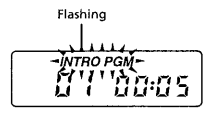
To cancel repeat play, press REPEAT/ENTER again.

Playing only the tracks you want (INTRO PGM Play)

You can choose and play your favorite tracks by scanning through the beginning of each track in a CD.



1 During play, press PLAY MODE repeatedly until "INTRO PGM" flashes.



2 Press ►II to start scanning.
The Discman plays the first 15 seconds of each track and "INTRO PGM" flashes faster.

3 Press REPEAT/ENTER while the track you want is playing. To skip the track, press ►►I or just wait for the next track.

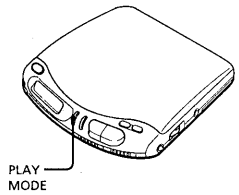
When you go through the CD, "INTRO PGM" stops flashing and the tracks you chose play automatically.

To finish programming before hearing through the CD, press ►II. The selected tracks are played.

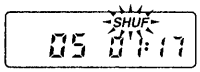
To cancel INTRO PGM play, press PLAY MODE repeatedly until no play mode is indicated in the display.

Playing tracks in random order (Shuffle Play)

You can play the tracks in a CD in random order.



During play, press PLAY MODE repeatedly until "SHUF" appears.
The tracks play in random order.



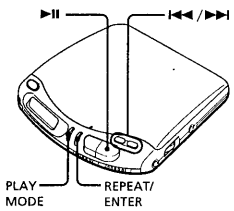
To cancel shuffle play, press PLAY MODE repeatedly until no play mode is indicated in the display.

Note

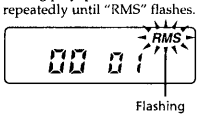
- During shuffle play, you cannot return to previous tracks by pressing I◄◄ .

Playing tracks in the order you want (RMS play)

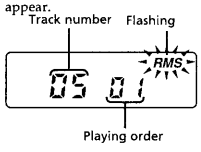
You can program up to 22 tracks to play in any order you choose.



1 During play, press PLAY MODE repeatedly until "RMS" flashes.



2 Press I◄◄ or ►►I to choose a track.
The track number and the playing order appear.



3 Press REPEAT/ENTER to program the track.

4 Repeat steps 2 and 3 to program the remaining tracks.

5 Press ►II .
"RMS" stops flashing and the tracks you chose play in the order you specified.

To cancel RMS play, press PLAY MODE until "RMS" disappears.

To check the program

To check during programming, press REPEAT/ENTER before step 5. To check during RMS play, press PLAY MODE repeatedly until "RMS" flashes, then press REPEAT/ENTER.
Each time you press the button, the track numbers appear in the order you specified.

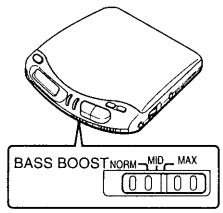
Note

- If you program another track after the 22nd track, the first track programed is cleared and the new track is programed instead.

Using other functions

To enjoy more powerful bass sound

You can enjoy a powerful bass-boosted sound.



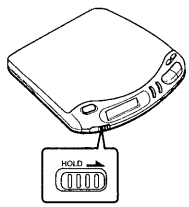
Set BASS BOOST to the desired position.

Note

- If the sound is distorted when emphasizing bass, turn down the volume.

To lock the buttons

You can lock your Discman against any accidental operations.

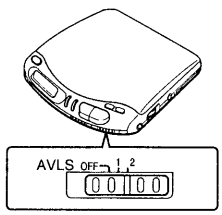


Slide HOLD in the direction of the arrow. When you press any button, "*Hol d*" appears in the display.

To unlock, slide HOLD back.

To protect your hearing (AVLS)

The AVLS (Automatic Volume Limiter System) function keeps down the maximum volume to protect your ears.



Set AVLS to 1 (middle) or 2 (max).

Note

- If the sound is distorted when you listen to the bass-boosted sound with the AVLS function, turn down the volume.

To turn off the beep

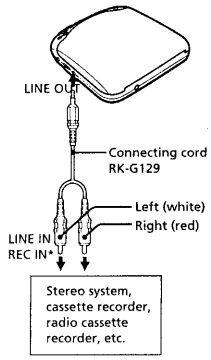
You can turn off the beep that sounds as you operate your Discman.

While you press and hold down ■ on the main unit, connect the power source.

Continue to the reverse side →

Connecting to other stereo equipment

You can listen to the CD through other stereo equipment or record a CD on a cassette tape. Refer to the instruction manual of other equipment for details. Before making connections, turn off each equipment.



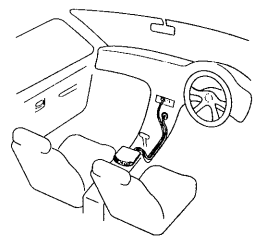
*To connect an equipment without LINE IN nor REC IN jack, use the RK-G134 connecting cord and connect to MIC jack.

Note

- Before you play the CD, turn down the volume of the connected equipment so as not to damage the connected speakers.

Playing a CD in a car

You can use your Discman in a car as illustrated below.



To connect your Discman to a car cassette deck, you need the following accessories:
Place your Discman on a console box.
- Mount plate CPM-300P
- Car connecting pack CPA-4, CPA-8,

or,
- Mount kit CPM-300PC (Mount plate + Car connecting pack)

Refer to the instruction manual of each accessory for details.

When you use the CPM-300P mount plate

Attach the car mount adaptor supplied to the CPM-300P before installing the Discman.

Notes

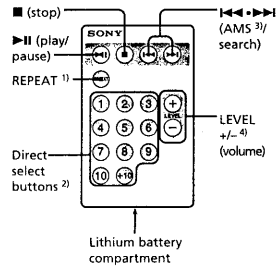
- Do not put the Discman on the dashboard.
- Do not leave the Discman in a car parked in sunlight.
- Use a Sony car connecting pack for reducing noise.

Switched ignition function

With this feature, your Discman stops automatically when you turn off the engine of the car. (This function is not possible with some cars depending on the model).

Using the supplied card remote control

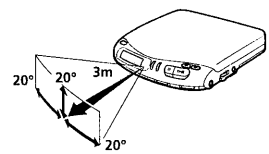
You can operate the remote control only when the power is supplied through the DC IN 4.5 V jack.
The buttons on the remote control have the same function as those with the same names on the main unit.



1) To repeat all the tracks, press REPEAT during play.
2) To play the track you want, press the button(s) corresponding to the track number.
To select a track number over 10, press +10 (more than twice, if necessary) first, then press the last number to enter.
Example 1: 12th track
Press +10, then 2.
Example 2: 24th track
Press + 10 twice, then 4.
3) Automatic Music Sensor
4) To adjust the volume, press LEVEL + or – button.
The volume is displayed in 10 steps from "01" to "10".

Remotely controllable area

When you use the card remote control, the controlable area is as illustrated.
Point the card remote control toward the remotel sensor of the unit.



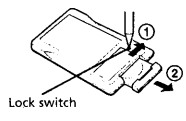
Note

Be sure that the remote sensor on the Discman is not exposed to direct sunlight or bright light as from fluorescent light, which could prevent the remote control from operating correctly.

To replace the lithium battery

Your remote control comes with a factory installed lithium battery. When the remote controllable area becomes smaller, replace the battery.

1 Slide the lithium battery compartment in the direction of the arrow while pressing the lock switch to the right.



2 Replace the battery with a new lithium battery CR2025. Install the battery with the + side facing up.

3 Insert the lithium battery compartment as before.

Lithium battery life

The new lithium battery usually lasts for approx. 6 months.

Notes on the lithium battery

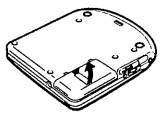
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Use only a Sony CR2025 lithium battery. Use of other batteries may cause a risk of fire or explosion.

▶Power Sources

Using rechargeable battery (BP-DM10)

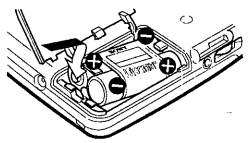
Charge the rechargeable battery before using it for the first time.

1 Open the lid of the battery compartment.

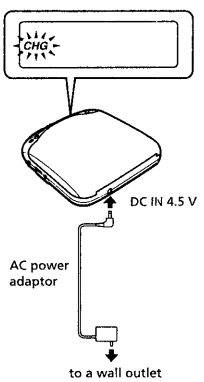


(rear)

2 Insert the rechargeable battery so that the word "Discman" is facing the same direction as illustrated inside the lid, and close the lid.



3 Connect the AC power adaptor and charge for about 3 hours.
While charging, the indication "CHG" lights.



4 When fully charged, disconnect the AC power adaptor.

When to charge the battery

When the battery is used up, ⌧ indication appears in the display. Charge the rechargeable battery.

Battery life

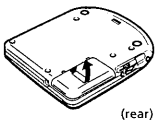
When you use the Discman on a flat and stable place, approx. 3.5 hours of continuous play is possible.

Notes

- Charging time varies depending on how the rechargeable battery is used.
- If the battery is new or has not been used for a long time, it may not be charged completely until you charge and discharge it several times.
- If the battery life becomes shorter by about half, replace it with Sony BP-DM10 rechargeable battery. Do not use any other rechargeable battery.

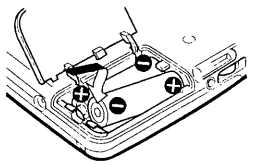
Using dry batteries

1 Open the lid of the battery compartment.



(rear)

2 Insert two LR6 (size AA) alkaline batteries by matching the ⊕ and ⊖ to the diagram inside the battery compartment and close the lid.



When to replace the dry batteries

When the battery is used up, ⌧ indication appears in the display. Replace all the batteries with new ones.

Alkaline battery life

When you use the Discman on a flat and stable place, approx. 10 hours of continuous play is possible.

Notes

- Do not charge the dry batteries.
- Do not mix new batteries with old ones.
- Do not use different types of batteries together.

▶Additional Information

Precautions

On safety

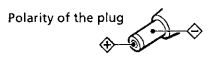
- Should any solid objects or liquid fall into the unit, unplug it and have it checked by qualified personnel before operating it any further.
- Do not put any foreign objects in the DC IN 4.5 V (external power input) jack.

On power sources

- When you are not using the unit for a long time, disconnect all power sources from the unit.
- The nameplate indicating operating voltage, power consumption, etc. is located at the back of the AC power adaptor (for Middle East only.)

On the AC power adaptor

- Use only the supplied AC power adaptor. If your unit is not supplied with it, use AC-E45HG AC power adaptor. Do not use any other AC power adaptor.



- To unplug the AC power adaptor from the wall outlet, grasp the adaptor itself, do not pull its cord.

On dry and rechargeable batteries

- Do not throw the batteries into fire.
- Do not carry the rechargeable battery with coins or other metallic objects. It can generate heat if the positive and negative terminals of the battery are accidentally contacted by a metallic object.

On the lithium battery

- Do not hold the battery with metalic tweezers as doing so may cause a short-circuit.
- Wipe the battery with a dry cloth to assure a good contact.

> **WARNING**
> Battery may explode if mistreated. Do not recharge, disassemble or dispose of in fire.

On the unit

- Keep the lens on the unit clean and do not touch it. If you do so, the lens may be damaged and the unit will not operate properly.
- Do not put any heavy object on top of the unit. The unit and the CD may be damaged.
- Do not leave the unit in a location near heat sources, or in a place subject to direct sunlight, excessive dust or sand, moisture, rain, mechanical shock, unleveled surface, or in a car with its windows closed.
- If the unit causes interference to the radio or television reception, turn off the unit or move it away from the radio or television.
- Do not wrap the unit in a cloth or blanket during use as it may cause malfunction or serious accidents.

On headphones

Road safety

Do not use headphones while driving, cycling, or operating any motorized vehicle. It may create a traffic hazard and is illegal in some areas. It can also be potentially dangerous to play your headsets at high volume while walking, especially at pedestrian crossings. You should exercise extreme caution or discontinue use in potentially hazardous situations.

Preventing hearing damage

Avoid using headphones at high volume. Hearing experts advise against continuous, loud and extended play. If you experience a ringing in your ears, reduce volume or discontinue use.

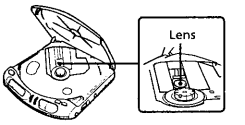
Caring for others

Keep the volume at a moderate level. This will allow you to hear outside sounds and to be considerate to the people around you.

Maintenance

To clean the lens

Clean the lens with a lens cleaning kit KK-DM1.



To clean the casing

Use a soft cloth slightly moistened in water or a mild detergent solution. Do not use alcohol, benzine or thinner.

SECTION 2
SERVICE NOTE

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.

Before Replacing the Optical Pick-Up Block

Please be sure to check thoroughly the parameters as par the "Optical Pick-Up Block Checking Procedures" (Part No.: 9-960-027-11) issued separately before replacing the optical pick-up block.
Note and specifications required to check are given below.

- FOK output: IC501 ⑫ pin
  When checking FOK, remove the lead wire to disc motor.
- S curve P-to-P value: 1.2 Vp-p IC501 ⑬ pin
  When checking S curve P-to-P value, remove the lead wire to disc motor.
- Adjusted part for focus gain adjustment: RV602
- RF signal P-to-P value: 0.8 – 1.3 Vp-p
- Traverse signal P-to-P value: 1.2 – 2.0 Vp-p
- The repairing grating holder is impossible.
- Adjusted part for tracking gain adjustment: RV601

Precautions for Checking Emission of Laser Diode

Laser light of the equipment is focused by the object lens in the optical pick-up so that the light focuses on the reflection surface of the disc. Therefore, be sure to keep your eyes more then 30 cm apart from the object lens when you check the emission of laser diode.

Laser Diode Checking Methods

During normal operation of the equipment, emission of the laser diode is prohibited unless the upper panel is closed while turning ON the S808 (push switch type).
The following two checking methods for the laser diode are operable.

- **Method-1 (In the service mode or normal operation): Emission of the laser diode is visually checked.**

1. Open the upper panel.
2. Push the S808 as shown in Fig. 1.
3. Check the object lens for confirming normal emission of the laser diode. If not emitting, there is a trouble in the automatic power control circuit or the optical pick-up.
   During normal operation, the laser diode is turned ON about 2.5 seconds for focus searching.

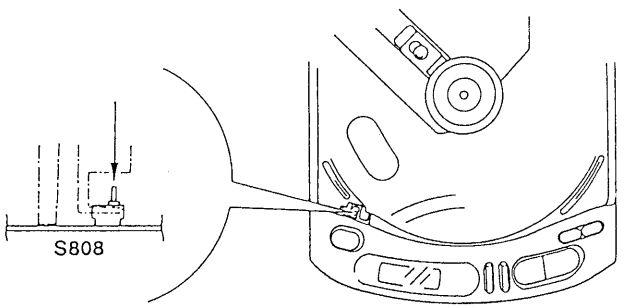
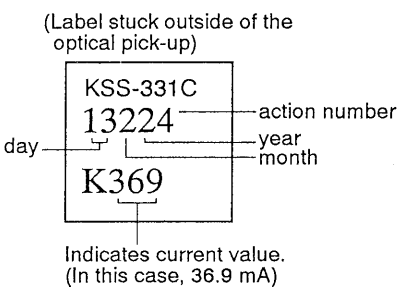


Fig. 1 Method to push the S808

- **Method-2 (In the service mode or normal operation): Check the value of current flowing in the laser diode.**

1. Remove the upper panel.
2. Read the current printed on the label attached on the rear side of the optical pick-up.



3. Connect a VOM as shown in Fig. 2.
4. Press the ▶II key.
5. Calculate current value by the reading of the VOM.
   Reading of the tester (V) ÷ 1 (Ω) = current value (A)
   (Example) Reading of the VOM of 0.037 V:
   0.037 V ÷ 1 Ω = 0.037 (A) = 37 mA

6. Check that the current value is within the following range.
   - Current value of the label $^{+5}_{-11}$ mA (25 ℃)
     Variation by temperature: 0.4 mA/℃
     Current increases with temperature increased.
     Current decreases with temperature decreased.

   If the current is more than the range above, there is a trouble in the automatic power control circuit or the laser diode is in deterioration.
   If less than the range, a trouble exists in the automatic power control circuit or the optical pick-up.

– MAIN BOARD – (Conductor Side)

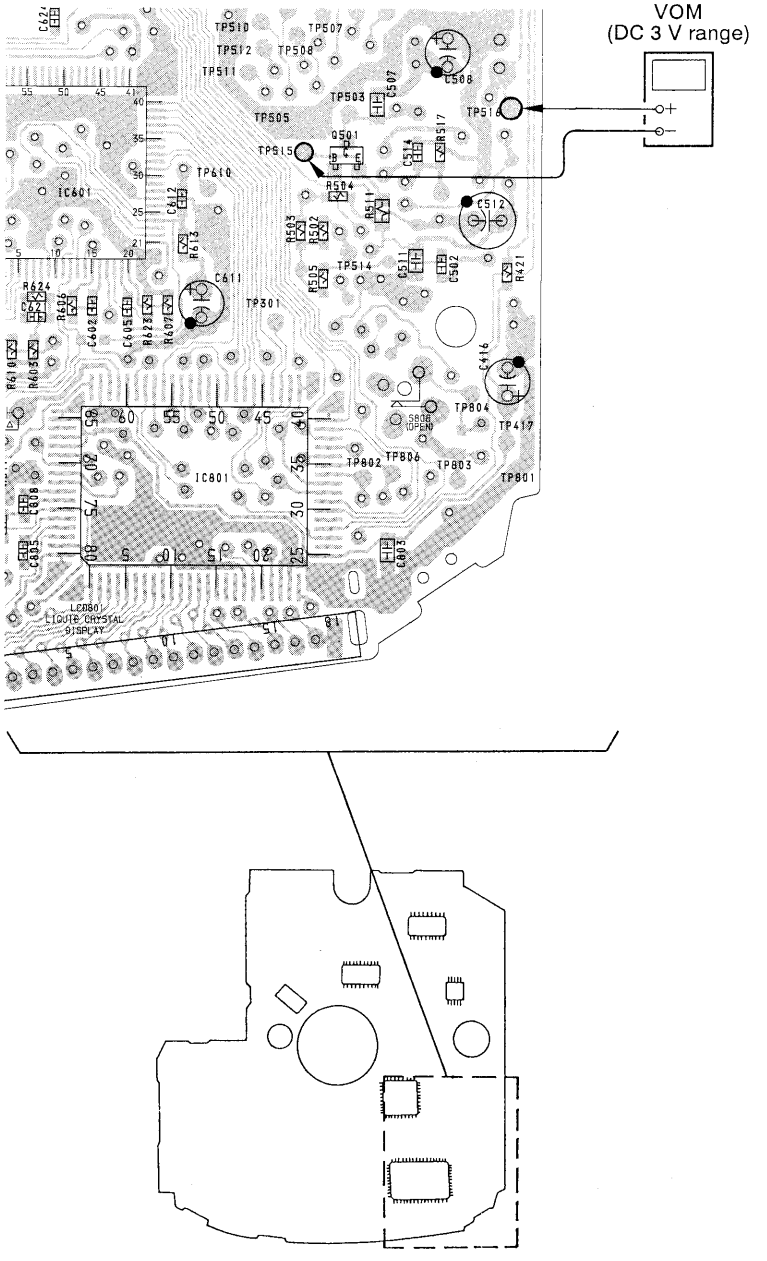


Fig. 2 VOM connecting location

SECTION 3
SERVICE MODE

Service Mode (Service program)

The equipment is provided with a service program built in the microcomputer, like conventional models.
Service program operation methods are described in the following.

Descriptions in [ ] indicate major operations in the service mode. For more information, see Step 2.

Fig. 3 Layout of each key

• Step 1 (Service mode setting methods)

1. Turn OFF the HOLD switch with external power supply disconnected (power is not applied to the set).
2. Solder across the TEST terminal (pin ㉞, IC801 (TEST) is grounded).
3 Keep the S808 in continuously pressed state. (Or, solder the jumper wire across the OPEN terminal.)

   Thus, the set is switched to the service mode.

• Step 2 (Operation in the service mode)

1. Once the service mode is effected, the LCD displays 5 indications each of which is repeatedly displayed.
   However, the following operations can be activated even if LCD indication is effected.
2. By pressing the ⏭ or ⏮ key, the optical pick-up is movable inwardly or outwardly. However, if this is activated, tracking servo and sled servo are turned OFF, so it can be turned ON by pressing the PLAY MODE key if required.
3. By pressing the REPEAT/ENTER key, all indications light up.
   With the key released, repeated indication is continued, so you can check each segment.
4. By pressing the ⏯ key, focus is turned ON from focus searching while entering CLV-S (pull-in mode).
   Without disc, focus searching is repeated continuously.
5. By pressing the PLAY MODE key, tracking servo, sled servo and CLV-A (servo in PLAY) are turned ON.
6. When 4. and 5. are performed, playing begins. No muting is ON in the service mode.
7. By pressing the ■ key, all servos (focus, tracking and sled) are turned OFF. However, the disc motor revolves for a while by inertia.

• Step 3 (Resetting of service mode)

1. Be sure to disconnect the external power supply and remove the solder bridge at the TEST terminal and OPEN terminal connected before in setting.
2. The set thus becomes available for normal operation.

– MAIN BOARD – (Component Side)

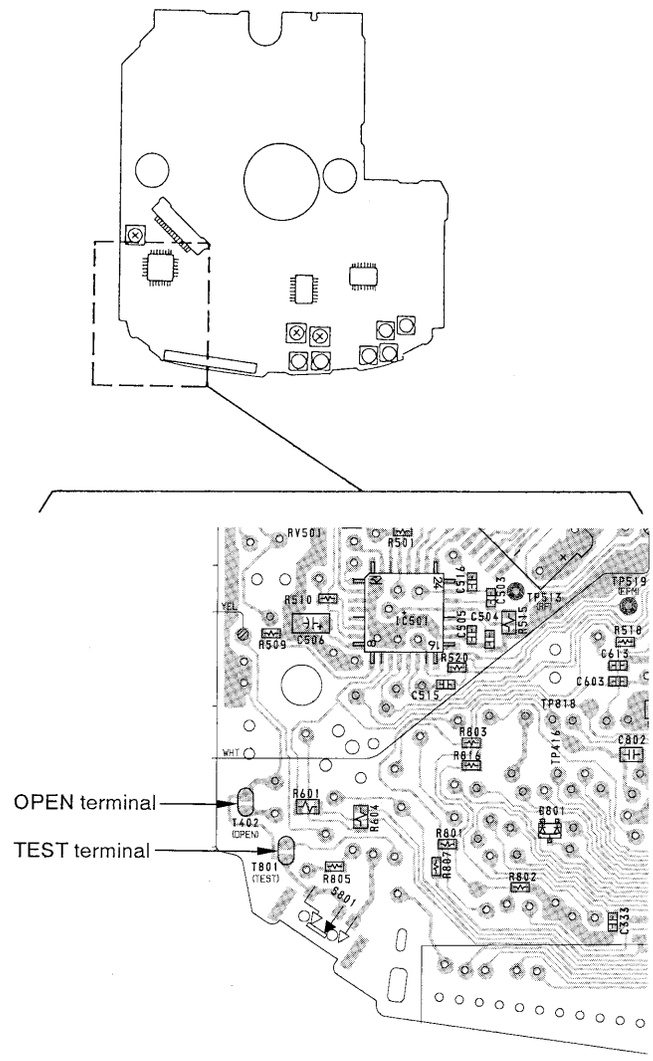


Fig. 4 Location of Test terminal and Open terminal

SECTION 4
ELECTRICAL ADJUSTMENTS

Precautions for Adjustment

1. Before beginning adjustment, set the equipment to service mode.
   After the completion of adjustment, be sure to reset the service mode.
   For more information, see "Service Mode (service program)" on page 8.
2. Perform adjustments in the order given.
3. Use YEDS-18 disc (Part No.: 3-702-101-01) unless otherwise indicated.
4. Power supply voltage requirement.: DC4.5 V
   HOLD switch : OFF
   VOLUME switch : Minimum
   BASS BOOST switch : NORM
   AVLS switch : OFF

Before Beginning Adjustment

Set the equipment to service mode (See page 8) and check the following. If there is an error, repair the equipment.

• Checking of the sled motor

1. Open the upper panel.
2. Press the ▶▶| and |◀◀ keys and check that the optical pick-up can move smoothly without sluggishness or abnormal noise in innermost periphery → outermost periphery → innermost periphery.
   ▶▶| : The optical pick-up moves outwardly.
   |◀◀ : The optical pick-up moves inwardly.

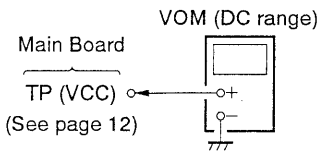
• Checking of focus searching

1. Open the upper panel.
2. Press the ▶|| key. (Focus searching operation is activated continuously.)
3. Check the object lens of the optical pick-up for smooth up/down motion without sluggishness or abnormal noise.
4. Press the ■ key.
   Check that focus searching operation is deactivated. If not, again press the ■ key slightly longer.

VCC Check

*Use a LR6 (size AA) battery for VCC Check

Checking Procedure:



1. Connect the VOM to (VCC) of the main board.
2. Check for 3.25 ± 0.1 V reading on the VOM.

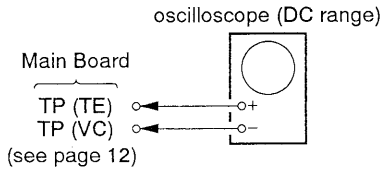
Connection Location: Main Board

Tracking Balance Adjustment

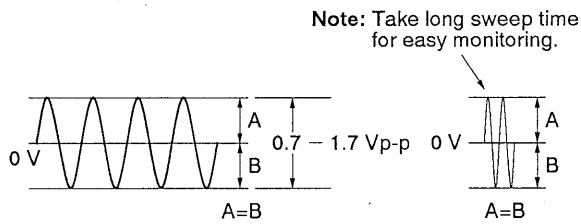
Condition:

- Hold the set in horizontal state.

Adjustment Procedure:



1. Connect the oscilloscope to TP (TE) of the main board.
2. Set the equipment to service mode stop state. (See page 8.)
3. Move the optical pick-up by pressing the ▶▶| and |◀◀ keys.
4. Put the disc (YEDS-18).
5. Press the ▶|| key.
   [From focus searching, focus is turned ON while entering CLV drawing-in mode. Tracking and sled are turned OFF.]
6. Adjust RV501 so that the waveform on the oscilloscope becomes up/down symmetrical with an axis of 0 V.



7. Stop removing of the disc motor by pressing the ■ key.
8. After the completion of adjustment, reset service mode. (See page 8.)

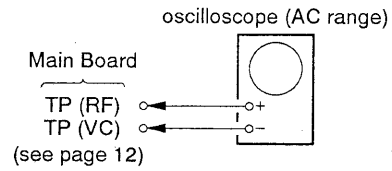
Adjustment Location: Main Board

Focus Bias Check

Condition:

- Hold the set in horizontal state.

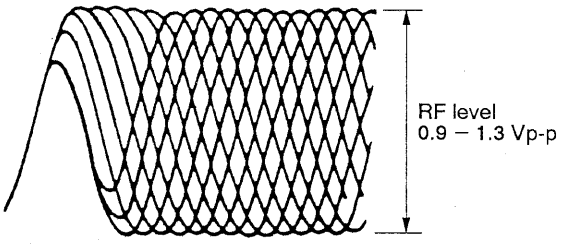
Checking Procedure:



1. Hold the set in service mode stop state. (See page 8.)
2. Connect the oscilloscope to the test point TP (RFO) of the main board.
3. Move the optical pick-up by pressing the ▶▶| and |◀◀ keys.
   (To display the eye pattern more clearly, move the optical pick-up to the music range of the disc.)
4. Put the disc (YEDS-18).
5. Put the ▶|| key.
   [From focus searching, focus is turned ON while entering CLV drawing-in mode. Tracking and sled are turned OFF.]
6. Press the PLAY MODE key. (Both tracking and sled are turned ON.)
7. Check the oscilloscope waveform is as shown below.
   A good eye pattern means that the diamond shape (◇) in the center of the waveform can be clearly distinguished.

RF SIGNAL WAVEFORM (EYE PATTERN)

VOLT DIV : 200 mV (With the 10:1 probe in use)
TIME DIV : 500 ns



To watch the eye pattern, set the oscilloscope to AC range and increase the vertical sensitivity of the oscilloscope for easy watching.

8. Stop revolving of the disc motor by pressing the ■ key.
9. After the completion of check, reset service mode. (See page 8.)

Connection Location: Main Board

Focus/Tracking Gain Adjustment

A servo analayzer is necessary in order to perform this adjustment exactly.

However, this gain has a margin, so even if it is slightly off, there is no probrem. Therefore, do not perform this adjustment.

Focus/tracking gain determines the pick-up follow-up relative to mechanical noise and mechanical shock when the 2-axis device operates. However, as these reciprocate, the adjustment is at the point where both are satisfied.

- When gain is rased, the noise when 2-axis device operates increase.
- When gain is lowered, it is more susceptible to mechanical shock and skipping occurs more easily.

This adjustment has to be performed upon replacing any of the following parts.

- Optical pick-up
- RV602 (Focus gain VR)
- RV601 (Tracking gain VR)

Normally, be sure not to move RV602 (focus gain VR) and RV601 (tracking gain VR).

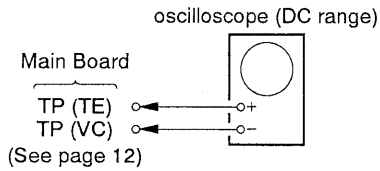
Adjustment method:

– Focus Gain Adjustment –

This adjustment is not performed.
If focus gain VR RV602 is turned, set to mechanical center.

– Tracking Gain Adjustment –

(perform at normal operation)



1. Place the optical pick-up level, horizontally. (If the optical pick-up is not level, the 2-axis device will be weIghted and adjustment cannot be done.)
2. Connect the osilloscope to TP (TE) and TP (VC) on main board.
3. Set the disc (YEDS-18) and press the ▶|| key.
4. Turn RV601 slightly clockwise (tracking gain drops) and obtain a waveform with a fundamental wave (waveform has large waves) as in Figure 1.
5. Turn RV601 slowly counterclockwise (tracking gain rises) until the fundemental wave disappears (no large waves) as in Figure 2.
6. Set RV601 to the position about 30 ° counterclockwise form the position obtained in step 5. If RV601 contact point is more than 90 ° counterclockwise from mechanical center, tracking gain is too high. In this case, readjust from step 4.
7. Press ▶▶| or |◀◀ key and observe the 100 track jump waveform. Check that no traverse waveform appears for both ▶▶| and |◀◀ directions. (See Figures 3 and 4.) It is acceptable if the traverse waveform appears only now and then, but if it appears constantly, raise tracking gain slightly and check step 7 again.
8. Check that there is not abnormal amount of operation noise (white noise) from the 2-axis device. If there is, tracking gain is too high, readjust starting with step 4.

The waveforms are those measured with the oscilloscope set as shown below.

- VOLT/DIV: 0.2 V
- TIME/DIV: 5 ms

- Waveform when tracking gain is lowered.
  Fundamental wave appears (large waves).

Fig. 1

- Waveform when fundamental wave disappears (no large waves).

Fig. 2

- Waveform with no traverse waveform during 100 track jump. (Brake application is smooth because of adjustment.)

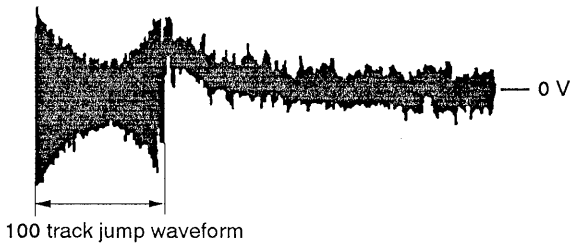


Fig. 3

- Waveform with traverse waveform during 100 track jump.
  (Brake application is poor because of adjustment.)

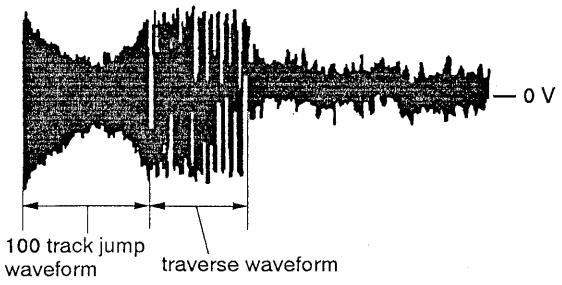
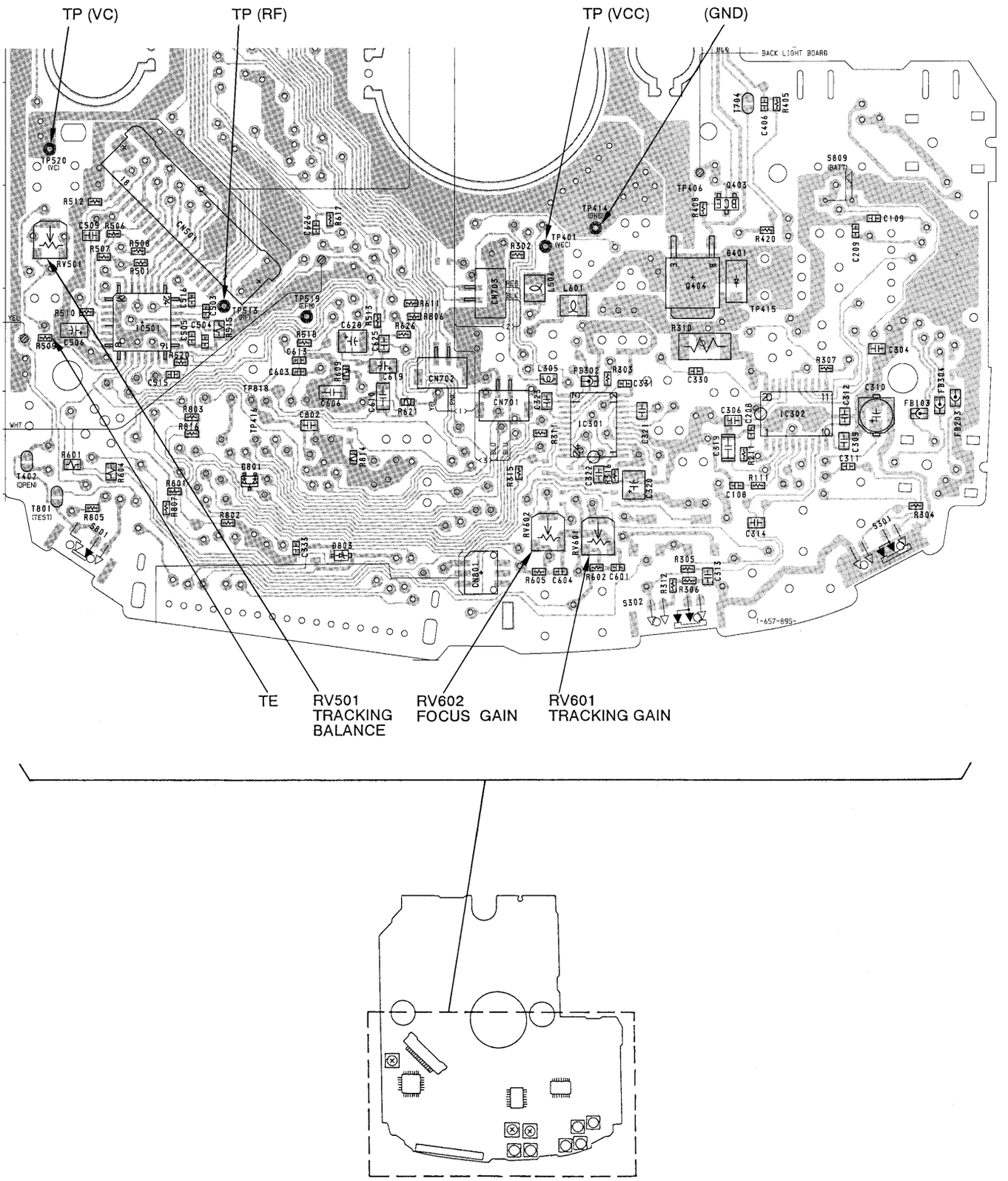


Fig. 4

Connection and Adjustment Location:
– **MAIN BOARD** – (Component Side)



SECTION 5
DIAGRAMS

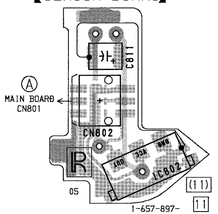
5-1. IC PIN FUNCTION DESCRIPTION
IC801 MSM65344-024GS-V1K (MAIN BOARD)

Pin No.	Pin Name	I/O	Function
1	COM3	O	LCD drive output. Connected to LCD COM3.
2 – 14	SEG0 – 12	O	LCD drive output. Connected to LCD S0 – S12.
15 – 17	SEG13 – 15	—	Not used.
18	AGND	—	Analog GND.
19	RMKEY	—	Not used.
20	HI-DC	I	HI-DC detection A/D input.
21	$\overline{\text{HI-CURR}}$	I	HI-current detection A/D input.
22	—	—	GND
23	—	—	GND
24	CHGMNT	I	Charging state surveillance A/D input.
25	AVDD	—	Analog VDD.
26	D-MUTE	—	Not used.
27	A-MUTE	O	"H" analog mute ON.
28	CHGON	O	"L" rapid charge ON.
29	EMPH	—	Not used.
30	LIGHT	—	Back light on/off control.
31	$\overline{\text{PC}}$	O	"L" power control ON. To MPC1825VM.
32	$\overline{\text{RCHG-BAT}}$	I	"L" DM-10 IN. Charging battery detecting terminal.
33	$\overline{\text{DC-IN}}$	I	"L" DC IN. DC-IN detecting terminal.
34	$\overline{\text{TEST}}$	I	"L" test (service) mode.
35	$\overline{\text{HOLD}}$	I	"L" HOLD ON. To HOLD switch.
36	$\overline{\text{RESUME}}$	—	Not used.
37	OPEN	I	"L" CLOSE. To OPEN switch.
38	$\overline{\text{LIM-SW}}$	I	"L" pick up clockwise circuit.
39	SEL	—	Connected to GND.
40	$\overline{\text{LOBAT}}$	I	LOW battery.
41	SHCK	O	DAC serial clock.
42	LATCH	O	DAC LATCH.
43	ATT	O	DAC data.
44	$\overline{\text{CLV-MUTE}}$	O	CLV reverse prevention output. "L" CLV STOP.
45	R/W	O	DSP serial data reading/writing switching singnal. To BU9312KS.
46	SQCLK	O	DSP serial clock. To BU9312KS.
47	SUBQ	I	SUB-Q serial data input. To BU9312KS.
48	CDATA	O	Serial output. To BU9312KS.
49	RMC	I	SIRCS signal in.
50	MODE	I	PLAY MODE key.
51	REPEAT	I	REPEAT/ENTER key
52	VDD	—	Digital power supply. VDD=3.2V
53	BEEP	O	Buzzer output.
54	STOP	O	STOP key.
55	FF	O	FF key.

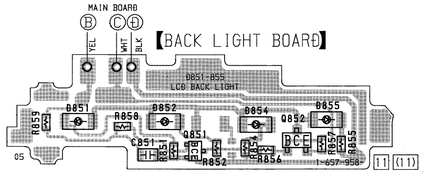
Pin No.	Pin Name	I/O	Function
56	SCOR	I	SCOR interrupting signal. From BU9312KS.
57	FR	I	FR key.
58	PLAY	I	PLAY/PAUSE key.
59	FOK	I	For FOCUS OK signal detection.
60	$\overline{WP}$	I	Sleep mode canceling signal input terminal. Cancelled at trailing edge.
61	OSC1	I	OSC side oscillator input.
62	OSC0	O	OSC side oscillator output.
63	DGND	—	GND.
64	RESET	I	Microcomputer reset terminal. "L" microcomputer reset.
65	—	—	Not used.
66	—	—	Not used. (Microcomputer test terminal)
67	—	—	Not used.
68	—	—	Not used.
69	XRST	O	System reset terminal "L" system IC reset.
70	INTRO	I	Intro program.
71	RMDATA	—	Not used.
72	BUSY	I	"L" track jumping. To BU9312KS.
73 – 75	VLCD1 – 3	O	LCD driving bias output.
76	C1	—	LCD driving bias generating condenser connecting terminal.
77	C2		
78 – 80	COM0 – 2	O	LCD driving output. Connected to LCD COM0 – 2.

5-2. PRINTED WIRING BOARDS

【SENSOR BOARD】



【BACK LIGHT BOARD】



Note:

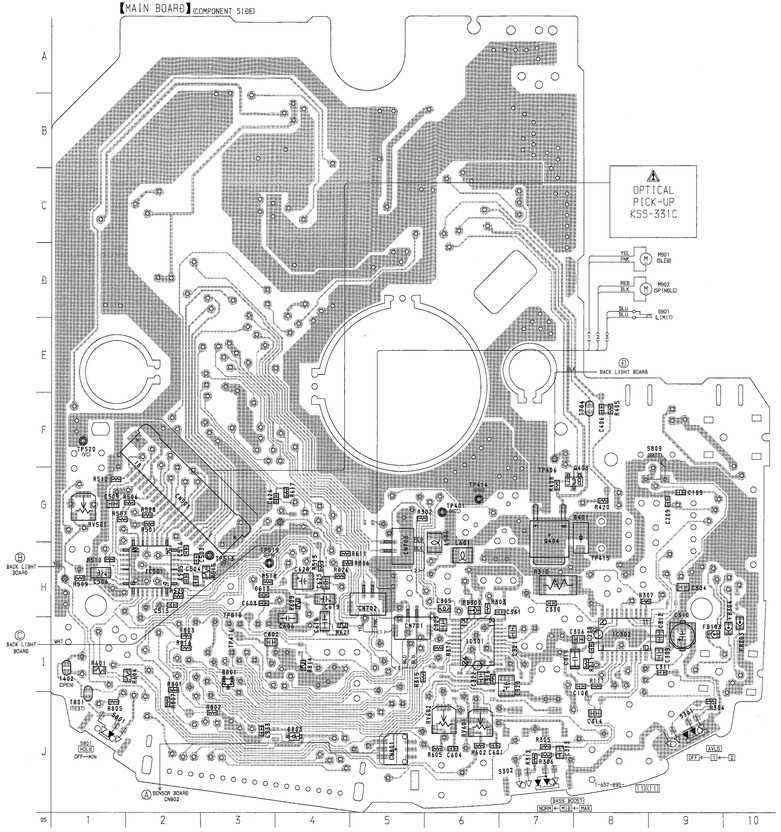
- ○——— : parts extracted from the component side.
- ● △ : internal component.
- ○ ▨▨▨ : Pattern of the rear side.
- ● ▨▨▨ : Pattern from the side which enables seeing.

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

- **Semiconductor Location**

Ref. No.	Location
D401	H-7
D801	I-3
D803	J-4
IC301	I-6
IC302	I-8
IC501	H-2
Q403	G-8
Q404	H-7

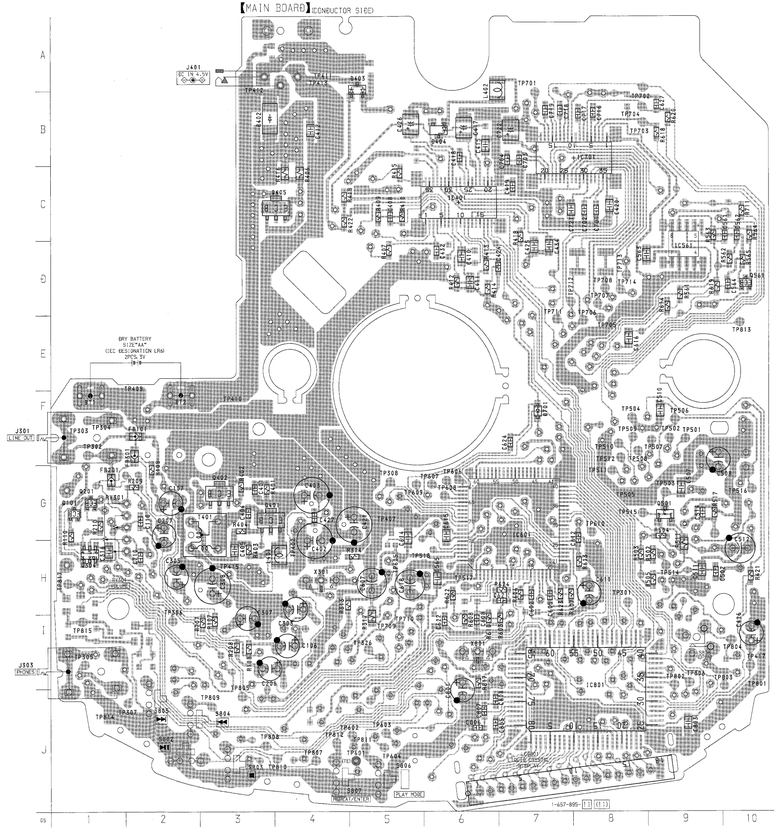
【MAIN BOARD】(COMPONENT SIDE)



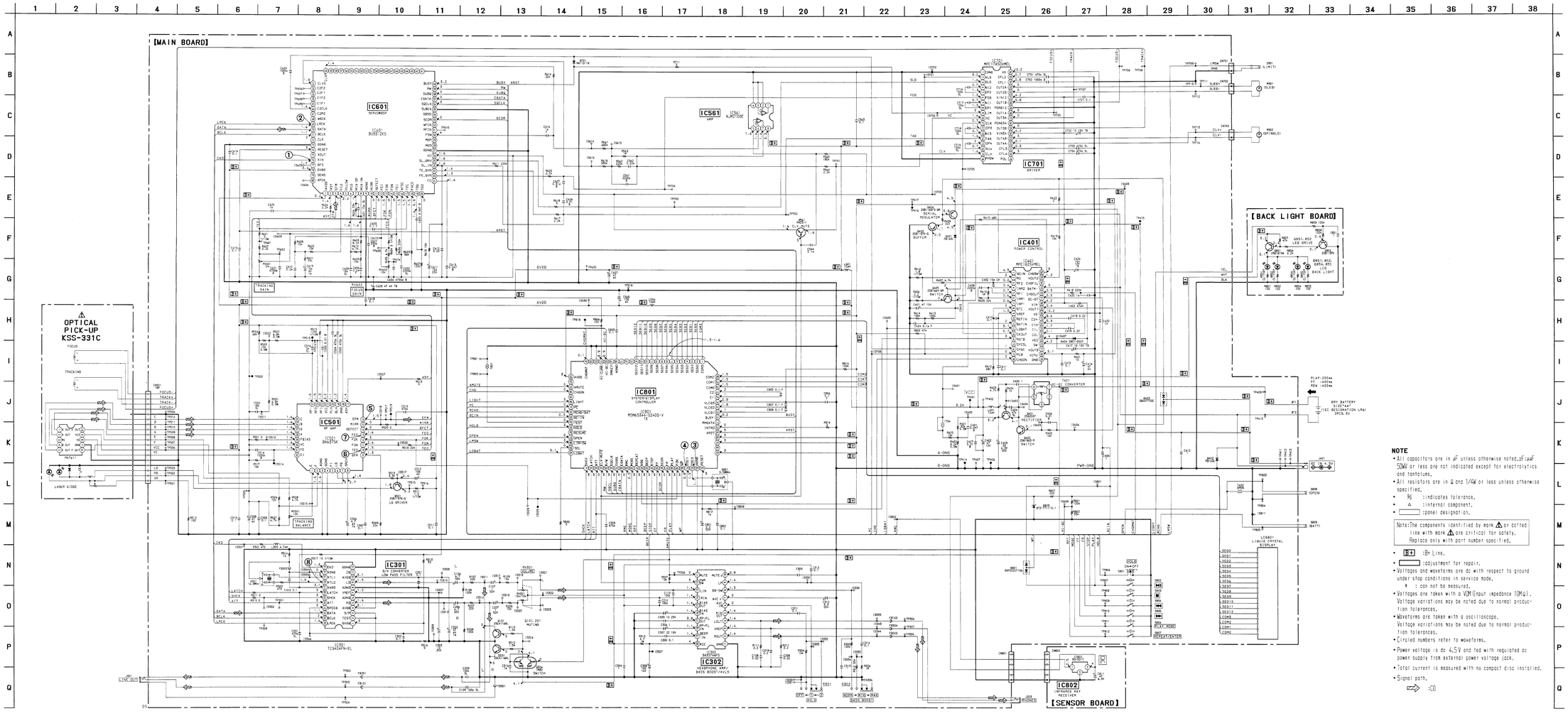
- **Semiconductor Location**

Ref. No.	Location
D402	B-3
D403	B-5
D404	B-6
D701	F-7
IC401	C-6
IC561	D-9
IC801	H-7
IC701	B-8
IC801	J-8
Q101	G-1
Q201	G-1
Q304	H-1
Q401	G-4
Q402	G-3
Q405	C-4
Q501	G-9
Q561	D-10

【MAIN BOARD】(CONDUCTOR SIDE)

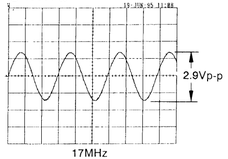


5-3. SCHEMATIC DIAGRAM • See page 24 for Waveforms and pages 25 to 27 for IC Block Diagrams.



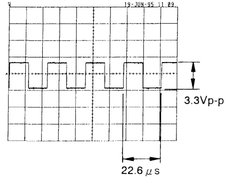
• Waveforms

❶ IC601 ㉕

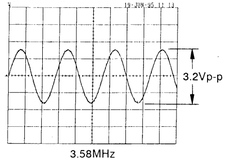


17MHz

❷ IC601 ㉓

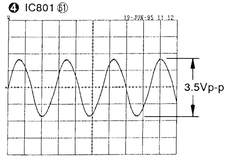


❸ IC801 ㉒



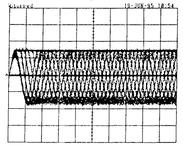
3.58MHz

❹ IC801 ㉑

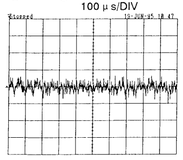


3.58MHz

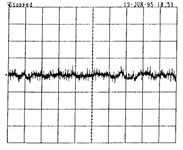
❺ IC501 ⑯ 500mV/DIV 1 μ s/DIV



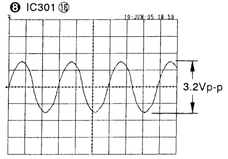
❻ IC501 ⑩ 200mV/DIV 100 μ s/DIV



❼ IC501 ⑬ 200mV/DIV 1ms/DIV



❽ IC301 ⑱

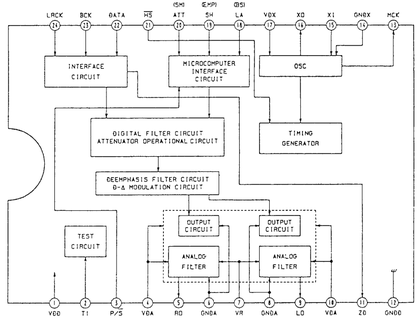


16.9MHz

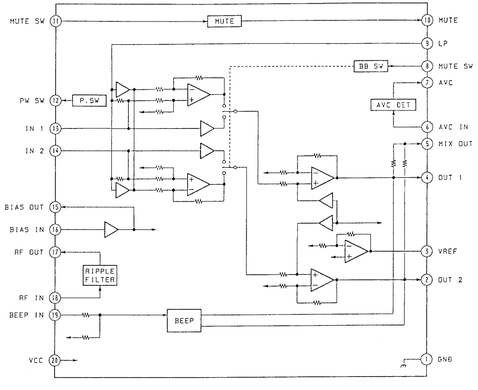
• IC Block Diagrams

MAIN BOARD

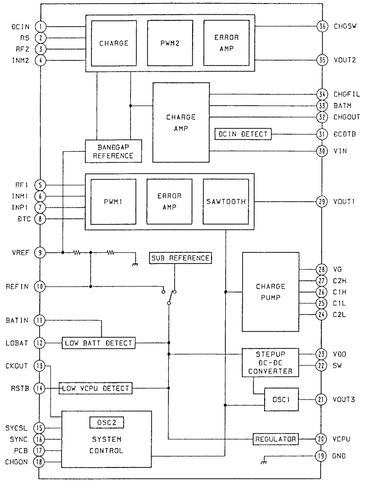
IC301 TC9404FN-EL



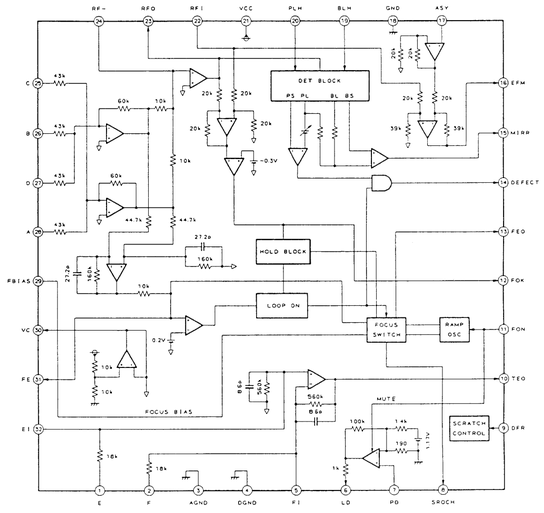
IC302 BA3574AFS



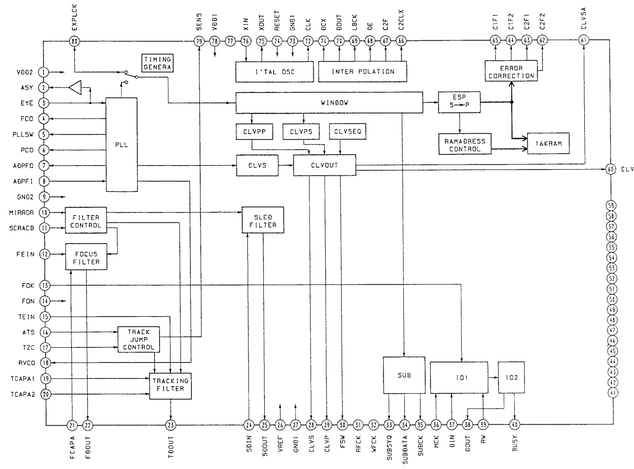
IC401 MPC1825AVMEL



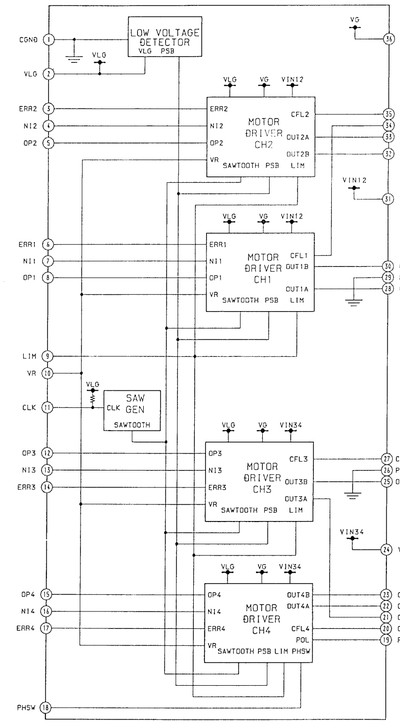
IC501 BA6375K



IC601 BU9312AKS



IC701 MPC17A50VMEL



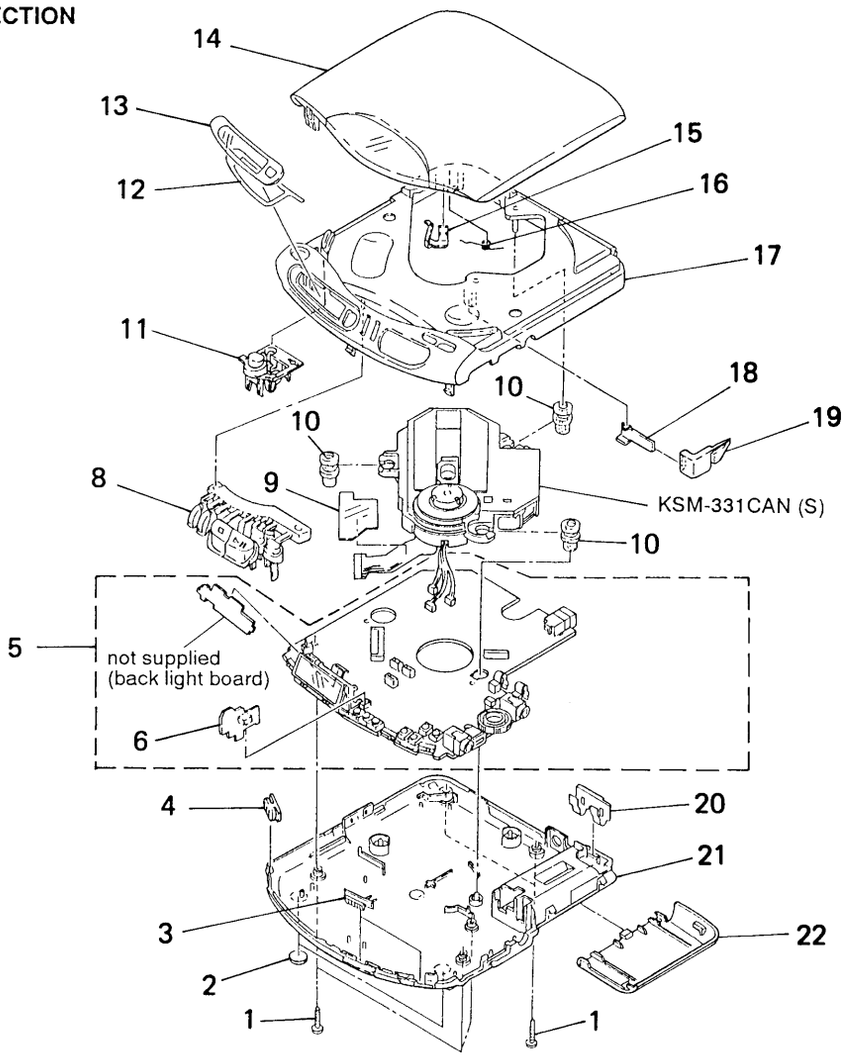
SECTION 6
EXPLODED VIEWS

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
- 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.

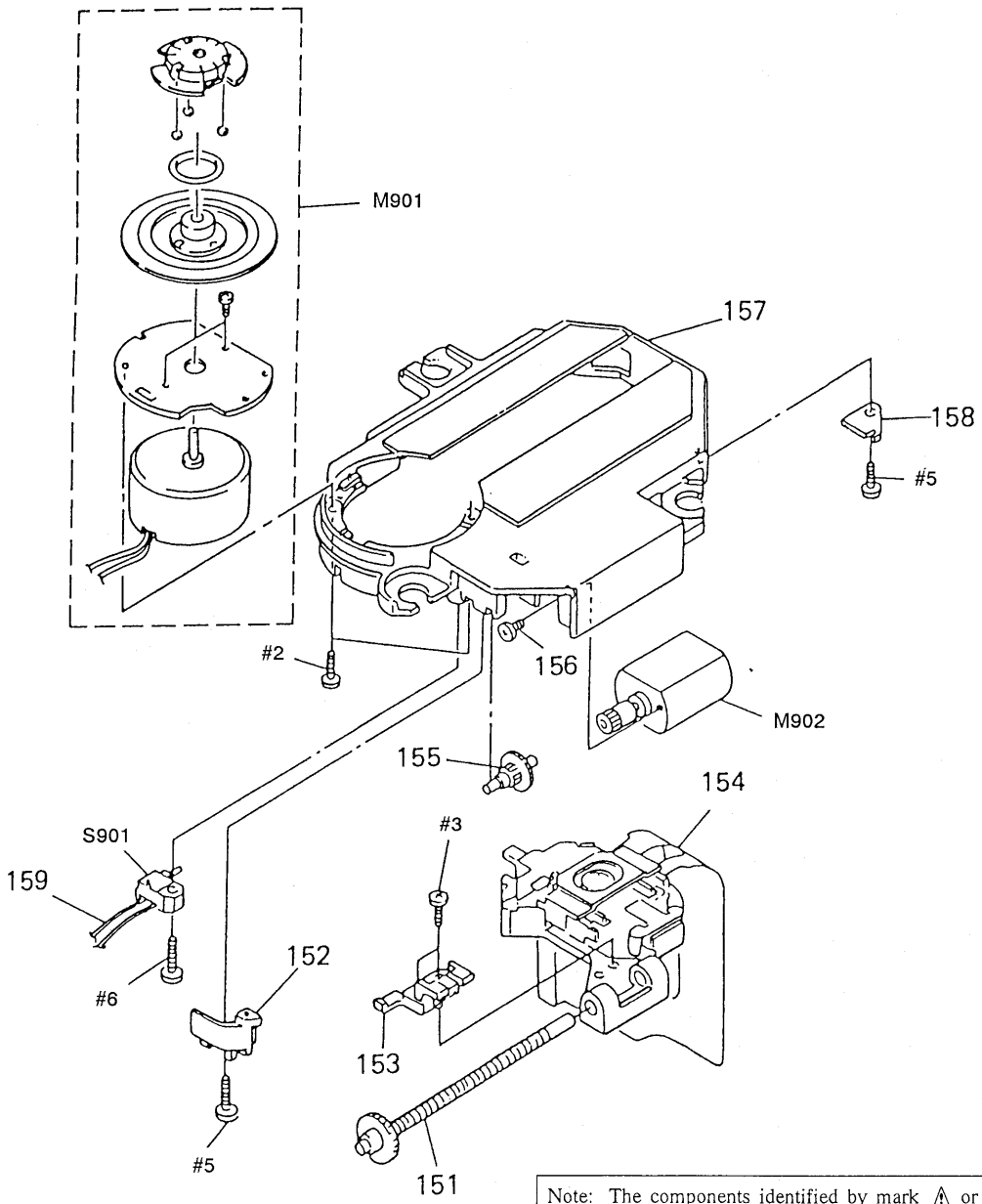
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

(1) CABINET SECTION



Ref. No.	Part No.	Description	Remark
1	4-958-597-01	SCREW	
2	4-966-278-01	FOOT, RUBBER	
3	4-965-552-01	KNOB (A-B)	
4	4-965-553-01	KNOB (HOLD)	
5	A-3276-851-A	MAIN BOARD, COMPLETE	
* 6	1-657-897-11	SENSOR BOARD	
8	4-965-545-01	BUTTON (OPE)	
9	4-956-818-01	RETAINER, FLEXIBLE	
10	4-947-759-01	INSULATOR (I)	
11	4-965-546-01	BUTTON (OPEN)	
12	4-965-559-01	SHEET (LCD), ADHESIVE	
13	4-967-887-11	WINDOW (LCD)	
14	4-972-112-01	LID, UPPER	
15	4-965-549-01	SPRING (U.LID)	
16	4-966-430-01	SPRING, TORSION	
17	4-971-398-31	CABINET (FRONT)	
18	4-964-897-01	SPRING (SEPARATOR)	
19	4-965-547-01	SEPARATOR	
20	4-944-349-11	TERMINAL BOARD (RELAY), BATTERY	
21	4-971-399-31	CABINET (REAR)	
22	4-965-558-01	LID, BATTERY CASE	

(2) OPTICAL PICK-UP BLOCK SECTION (KSM-331CAN (S))



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

Ref. No.	Part No.	Description	Remark
151	X-2625-483-1	SCREW ASSY, SLED	
152	2-625-412-02	SPRING, SLED	
153	2-625-414-02	RACK	
⚠154	8-848-295-51	OPTICAL PICK-UP KSS-331C	
155	2-625-410-01	GEAR (B)	
156	3-732-988-01	SCREW (M2X2.5)	
157	2-625-415-05	CHASSIS, MD	
158	2-625-411-01	RETAINER, SHAFT	
159	1-948-418-21	HARNESS	
M901	X-2625-171-2	MOTOR ASSY, SLED	
M902	X-2625-485-1	MOTOR ASSY (MS), T.T. (SPINDLE)	
S901	1-570-771-11	SWITCH (LIMIT)	

BACK LIGHT **MAIN**

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
- Abbreviation
  AUS:Australian
  EA:Saudi Arabia
  E: E13:220-230V AC Area, E33:100-240V AC Area
- 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..: μA.. uPA..: μPA..
  uPB..: μPB.. uPC..: μPC.. uPD..: μPD..
- CAPACITORS
  uF: μF
- COILS
  uH: μH

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

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

Ref. No.	Part No.	Description			Remark
		BACK LIGHT BOARD (Included in MAIN BOARD COMPLETE)			
		**********			
		< CAPACITOR >			
C851	1-164-346-11	CERAMIC CHIP 1uF			16V
		< DIODE >			
D851	8-719-987-41	LED CL-150Y-CD			
D852	8-719-987-41	LED CL-150Y-CD			
D854	8-719-987-41	LED CL-150Y-CD			
D855	8-719-987-41	LED CL-150Y-CD			
		< TRANSISTOR >			
Q851	8-729-230-63	TRANSISTOR 2SC4116-YG			
Q852	8-729-904-86	TRANSISTOR 2SB1197K-Q			
		< RESISTOR >			
R851	1-216-809-11	METAL CHIP	100	5% 1/16W	
R852	1-216-809-11	METAL CHIP	100	5% 1/16W	
R854	1-216-809-11	METAL CHIP	100	5% 1/16W	
R855	1-216-809-11	METAL CHIP	100	5% 1/16W	
R856	1-216-825-11	METAL CHIP	2.2K	5% 1/16W	
R857	1-216-841-11	METAL CHIP	47K	5% 1/16W	
R858	1-216-845-11	METAL CHIP	100K	5% 1/16W	
R859	1-216-845-11	METAL CHIP	100K	5% 1/16W	
**********					
	A-3276-851-A	MAIN BOARD, COMPLETE			
		**********			
	4-968-884-01	HOLDER (LCD)			
	4-968-885-02	PLATE, LIGHT GUIDE			
	4-969-086-01	TERMINAL BOARD, BATTERY			
		< CAPACITOR >			
C106	1-126-794-11	ELECT	4.7uF	20%	50V
C107	1-126-160-11	ELECT	1uF	20%	50V

Ref. No.	Part No.	Description			Remark
C108	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C109	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C110	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C206	1-126-794-11	ELECT	4.7uF	20%	50V
C207	1-126-160-11	ELECT	1uF	20%	50V
C208	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C209	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C210	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C303	1-126-096-11	ELECT	10uF	20%	35V
C304	1-164-346-11	CERAMIC CHIP	1uF		16V
C305	1-126-096-11	ELECT	10uF	20%	35V
C306	1-164-346-11	CERAMIC CHIP	1uF		16V
C307	1-126-514-11	ELECT	22uF	20%	10V
C308	1-124-455-00	ELECT	100uF	20%	16V
C309	1-164-346-11	CERAMIC CHIP	1uF		16V
C310	1-126-602-11	ELECT CHIP	3.3uF	20%	50V
C311	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C312	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C313	1-164-346-11	CERAMIC CHIP	1uF		16V
C314	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C316	1-164-346-11	CERAMIC CHIP	1uF		16V
C319	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C320	1-104-908-11	TANTAL. CHIP	47uF	20%	4V
C321	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C322	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C323	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C330	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C331	1-164-362-11	CERAMIC CHIP	470PF	5%	50V
C333	1-164-362-11	CERAMIC CHIP	470PF	5%	50V
C401	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C402	1-126-785-11	ELECT	47uF	20%	10V
C403	1-127-485-00	ELECT(SOLID)	33uF	20%	6.3V
C404	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C405	1-164-346-11	CERAMIC CHIP	1uF		16V
C406	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C408	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V

Ref. No.	Part No.	Description			Remark
C410	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C411	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C412	1-164-346-11	CERAMIC CHIP	1uF		16V
C415	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C416	1-126-513-11	ELECT	47uF	20%	4V
C417	1-135-216-11	TANTALUM CHIP	10uF	20%	10V
C418	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C419	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C420	1-164-346-11	CERAMIC CHIP	1uF		16V
C421	1-126-785-11	ELECT	47uF	20%	10V
C424	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C425	1-164-346-11	CERAMIC CHIP	1uF		16V
C426	1-135-216-11	TANTALUM CHIP	10uF	20%	10V
C427	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C432	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C434	1-164-346-11	CERAMIC CHIP	1uF		16V
C502	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C503	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C504	1-164-362-11	CERAMIC CHIP	470PF	5%	50V
C505	1-164-362-11	CERAMIC CHIP	470PF	5%	50V
C506	1-135-151-21	TANTALUM CHIP	4.7uF	20%	4V
C507	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C508	1-126-513-11	ELECT	47uF	20%	4V
C509	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C510	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C511	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C512	1-124-584-00	ELECT	100uF	20%	10V
C514	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C515	1-164-362-11	CERAMIC CHIP	470PF	5%	50V
C516	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V
C561	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C562	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C563	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C564	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C565	1-124-584-00	ELECT	100uF	20%	10V
C601	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C602	1-164-676-11	CERAMIC CHIP	2200PF	5%	16V
C603	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C604	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C605	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C606	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C607	1-126-513-11	ELECT	47uF	20%	4V
C608	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C610	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C611	1-126-096-11	ELECT	10uF	20%	35V
C612	1-165-128-11	CERAMIC CHIP	0.22uF		16V
C613	1-165-176-11	CERAMIC CHIP	0.047uF	10%	16V
C614	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C615	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C616	1-164-346-11	CERAMIC CHIP	1uF		16V
C618	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C619	1-135-201-11	TANTALUM CHIP	10uF	20%	4V
C621	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C622	1-162-961-11	CERAMIC CHIP	330PF	10%	50V
C624	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C625	1-164-346-11	CERAMIC CHIP	1uF		16V
C626	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C627	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C628	1-104-908-11	TANTAL. CHIP	47uF	20%	4V
C701	1-164-362-11	CERAMIC CHIP	470PF	5%	50V
C702	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C703	1-164-362-11	CERAMIC CHIP	470PF	5%	50V
C704	1-164-362-11	CERAMIC CHIP	470PF	5%	50V
C716	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C717	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C718	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C719	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C721	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C722	1-135-216-11	TANTALUM CHIP	10uF	20%	10V
C801	1-124-257-00	ELECT	2.2uF	20%	50V
C802	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C803	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C805	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C806	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C807	1-164-360-11	CERAMIC CHIP	0.1uF		16V
C808	1-164-360-11	CERAMIC CHIP	0.1uF		16V

< CONNECTOR >

CN501	1-566-534-11	CONNECTOR, FPC (ZIF) 18P	
* CN701	1-695-320-51	PIN, CONNECTOR (1.5MM) (SMD) 2P	
* CN702	1-695-320-31	PIN, CONNECTOR (1.5MM) (SMD) 2P	
* CN703	1-695-320-21	PIN, CONNECTOR (1.5MM) (SMD) 2P	
CN801	1-568-330-11	CONNECTOR, BOARD TO BOARD 6P	

< DIODE >

D401	8-719-048-98	DIODE	RB160L-40TE25
D402	8-719-048-98	DIODE	RB160L-40TE25
D403	8-719-989-73	DIODE	SB007T03C
D404	8-719-938-72	DIODE	SB01-05CP
D701	8-719-404-46	DIODE	MA110
D801	8-719-941-09	DIODE	DAP202U
D803	8-719-420-90	DIODE	MA8051-M

< FERRITE BEAD >

FB103	1-550-907-21	BEAD, FERRITE (CHIP)
FB203	1-550-907-21	BEAD, FERRITE (CHIP)
FB301	1-550-907-21	BEAD, FERRITE (CHIP)

MAIN

Ref. No.	Part No.	Description	Remark
FB302	1-414-235-11	INDUCTOR, FERRITE BEAD	
FB304	1-550-907-21	BEAD, FERRITE (CHIP)	
		< IC >	
IC301	8-759-327-78	IC TC9404FN-EL	
IC302	8-759-285-22	IC BA3574AFS	
IC401	8-759-356-04	IC MPC1825AVMEL	
IC501	8-759-325-52	IC BA6375K	
IC561	8-759-293-74	IC NJM2100E	
IC601	8-759-348-77	IC BU9312AKS	
IC701	8-759-326-66	IC MPC17A50VMEL	
IC801	8-759-361-06	IC MSM65344-024GS-V1K	
		< JACK >	
J301	1-565-287-41	JACK (LIME OUT)	
J303	1-565-287-11	JACK (PHONES)	
J401	1-691-099-51	JACK, DC (POLARITY UNIFIED TYPE)	(DC IN 4.5V)
		< LIQUID CRYSTAL DISPLAY >	
LCD801	1-810-495-21	DISPLAY PANEL, LIQUID CRYSTAL	
		< COIL >	
L101	1-550-907-21	BEAD, FERRITE (CHIP)	
L201	1-550-907-21	BEAD, FERRITE (CHIP)	
L305	1-412-002-31	INDUCTOR CHIP 4.7uH	
L401	1-412-029-11	INDUCTOR CHIP 10uH	
L402	1-412-031-11	INDUCTOR CHIP 47uH	
L506	1-412-029-11	INDUCTOR CHIP 10uH	
L601	1-412-029-11	INDUCTOR CHIP 10uH	
		< TRANSISTOR >	
Q101	8-729-231-74	TRANSISTOR 2SC4116-GL	
Q201	8-729-231-74	TRANSISTOR 2SC4116-GL	
Q304	8-729-907-39	TRANSISTOR IMD2	
Q401	8-729-033-08	TRANSISTOR 2SD2537-T101VW	
Q402	8-729-923-40	TRANSISTOR 2SD1963-T101-R	
Q403	8-729-904-86	TRANSISTOR 2SB1197K-Q	
Q404	8-729-921-93	TRANSISTOR 2SB1182F5-QR	
Q405	8-729-920-85	TRANSISTOR 2SD1664-QR	
Q501	8-729-904-86	TRANSISTOR 2SB1197K-Q	
Q561	8-729-014-34	TRANSISTOR RN2311-TE85L	
		< RESISTOR >	
R107	1-216-813-11	METAL CHIP 220 5% 1/16W	
R108	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R109	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R110	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R111	1-216-789-11	METAL CHIP 2.2 5% 1/16W	
R207	1-216-813-11	METAL CHIP 220 5% 1/16W	
R208	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R209	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R210	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R211	1-216-789-11	METAL CHIP 2.2 5% 1/16W	
R302	1-216-817-11	METAL CHIP 470 5% 1/16W	
R303	1-216-817-11	METAL CHIP 470 5% 1/16W	
R304	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R305	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R306	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R307	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R310	1-218-610-11	METAL CHIP 4.7 5% 1W	
R311	1-216-864-11	METAL CHIP 0 5% 1/16W	
R312	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R313	1-216-803-11	METAL CHIP 33 5% 1/16W	
R314	1-216-797-11	METAL CHIP 10 5% 1/16W	
R315	1-216-864-11	METAL CHIP 0 5% 1/16W	
R316	1-216-864-11	METAL CHIP 0 5% 1/16W	
R317	1-216-001-00	METAL CHIP 10 5% 1/10W	
R401	1-218-883-11	METAL CHIP 33K 0.50% 1/16W	
R402	1-218-869-11	METAL CHIP 8.2K 0.50% 1/16W	
R403	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R404	1-216-797-11	METAL CHIP 10 5% 1/16W	
R405	1-216-809-11	METAL CHIP 100 5% 1/16W	
R406	1-216-298-00	METAL CHIP 2.2 5% 1/10W	
R407	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R408	1-216-813-11	METAL CHIP 220 5% 1/16W	
R409	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R410	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R412	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R413	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R414	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R415	1-216-819-11	METAL CHIP 680 5% 1/16W	
R416	1-217-907-11	METAL GLAZE 1.8 5% 1/10W	
R418	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R419	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R420	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R421	1-216-797-11	METAL CHIP 10 5% 1/16W	
R422	1-216-864-11	METAL CHIP 0 5% 1/16W	
R501	1-216-864-11	METAL CHIP 0 5% 1/16W	
R502	1-218-867-11	METAL CHIP 6.8K 0.50% 1/16W	
R503	1-218-871-11	METAL CHIP 10K 0.50% 1/16W	
R504	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R505	1-218-867-11	METAL CHIP 6.8K 0.50% 1/16W	
R506	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R507	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R508	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R509	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R510	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	

Ref. No.	Part No.	Description			Remark
R511	1-217-671-11	METAL CHIP	1	5%	1/10W
R512	1-216-809-11	METAL CHIP	100	5%	1/16W
R513	1-216-864-11	METAL CHIP	0	5%	1/16W
R515	1-216-099-00	METAL CHIP	120K	5%	1/10W
R517	1-216-833-11	METAL CHIP	10K	5%	1/16W
R518	1-216-837-11	METAL CHIP	22K	5%	1/16W
R520	1-216-864-11	METAL CHIP	0	5%	1/16W
R561	1-216-855-11	METAL CHIP	680K	5%	1/16W
R562	1-216-849-11	METAL CHIP	220K	5%	1/16W
R563	1-216-857-11	METAL CHIP	1M	5%	1/16W
R564	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R565	1-216-848-11	METAL CHIP	180K	5%	1/16W
R601	1-216-295-00	CONDUCTOR, CHIP			
R602	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R603	1-216-832-11	METAL CHIP	8.2K	5%	1/16W
R604	1-216-295-00	CONDUCTOR, CHIP			
R605	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R606	1-216-849-11	METAL CHIP	220K	5%	1/16W
R607	1-216-845-11	METAL CHIP	100K	5%	1/16W
R608	1-216-835-11	METAL CHIP	15K	5%	1/16W
R609	1-216-809-11	METAL CHIP	100	5%	1/16W
R610	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R611	1-216-849-11	METAL CHIP	220K	0.50%	1/16W
R613	1-216-833-11	METAL CHIP	10K	5%	1/16W
R614	1-216-837-11	METAL CHIP	22K	5%	1/16W
R617	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R618	1-216-864-11	METAL CHIP	0	5%	1/16W
R619	1-216-851-11	METAL CHIP	330K	5%	1/16W
R620	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R621	1-216-815-11	METAL CHIP	330	5%	1/16W
R622	1-216-835-11	METAL CHIP	15K	5%	1/16W
R623	1-216-842-11	METAL CHIP	56K	5%	1/16W
R624	1-216-839-11	METAL CHIP	33K	5%	1/16W
R626	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R711	1-216-864-11	METAL CHIP	0	5%	1/16W
R801	1-216-897-11	METAL CHIP	120K	0.5%	1/16W
R802	1-218-883-11	METAL CHIP	33K	0.50%	1/16W
R803	1-216-841-11	METAL CHIP	47K	5%	1/16W
R805	1-216-864-11	METAL CHIP	0	5%	1/16W
R806	1-216-833-11	METAL CHIP	10K	5%	1/16W
R807	1-216-813-11	METAL CHIP	220	5%	1/16W
R814	1-216-864-11	METAL CHIP	0	5%	1/16W
R816	1-216-845-11	METAL CHIP	100K	5%	1/16W
R817	1-216-821-11	METAL CHIP	1K	5%	1/16W
		< VARIABLE RESISTOR >			
RV301	1-223-382-11	RES, VAR, CARBON 10K/10K (VOLUME)			
RV501	1-230-870-11	RES, ADJ, METAL 10K			
RV601	1-230-870-11	RES, ADJ, METAL 10K			
RV602	1-230-870-11	RES, ADJ, METAL 10K			
		< SWITCH >			
S301	1-692-605-11	SWITCH, SLIDE (AVLS)			
S302	1-692-605-11	SWITCH, SLIDE (BASS BOOST)			
S801	1-572-922-11	SWITCH, SLIDE (HOLD)			
S802	1-571-760-11	SWITCH, KEY BOARD (▶II)			
S803	1-571-760-11	SWITCH, KEY BOARD (■)			
S804	1-571-760-11	SWITCH, KEY BOARD (⏮)			
S805	1-571-760-11	SWITCH, KEY BOARD (⏭)			
S806	1-571-760-11	SWITCH, KEY BOARD (PLAY MODE)			
S807	1-571-760-11	SWITCH, KEY BOARD (REPEAT/ENTER)			
S808	1-570-953-11	SWITCH, PUSH (1 KEY) (OPEN)			
S809	1-692-532-21	SWITCH, PUSH (1 KEY) (BATT)			
		< TRANSFORMER >			
T401	1-427-847-11	TRANSFORMER, DC-DC CONVERTER			
		< VIBRATOR >			
X301	1-760-307-11	VIBRATOR, CERAMIC (16.9 MHz)			
X801	1-579-956-11	VIBRATOR, CERAMIC (3.58 MHz)			
**********					
*	1-657-897-11	SENSOR BOARD (Included in MAIN BOARD COMPLETE)			
		**********			
		< CAPACITOR >			
C811	1-110-569-11	TANTAL. CHIP	47uF	20%	6.3V
		< CONNECTOR >			
CN802	1-568-362-11	CONNECTOR, BOARD TO BOARD 6P			
		< IC >			
IC802	8-759-177-23	IC RS-50-T			
**********					
		MISCELLANEOUS			
		**********			
⚠154	8-848-295-51	OPTICAL PICK-UP KSS-331C			
159	1-948-418-21	HARNESS			
M901	X-2625-171-2	MOTOR ASSY, SLED			
M902	X-2625-485-1	MOTOR ASSY (MS), T.T. (SPINDLE)			
S901	1-570-771-11	SWITCH (LIMIT)			
**********					

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

Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
		******************************	
⚠	1-467-007-21	ADAPTOR, AC (AC-E455) (AUS)	
⚠	1-467-008-11	ADAPTOR, AC (AC-E455) (E13)	
⚠	1-467-012-11	ADAPTOR, AC (AC-E455) (EA)	
⚠	1-467-013-31	ADAPTOR, AC (AC-E455) (UK)	
⚠	1-467-550-11	ADAPTOR, AC (AC-E455A) (E33)	
⚠	1-473-116-31	ADAPTOR, AC (AC-E455D) (AEP)	
	1-528-444-11	BATTERY PACK (BP-DM10) (E, EA, AUS)	
	1-528-444-81	BATTERY PACK (BP-DM10) (AEP, UK)	
⚠	1-569-007-11	ADAPTER, CONVERSION 2P (E33)	
⚠	1-569-008-11	ADAPTER, CONVERSION 2P (E13, EA)	
	1-751-419-11	CORD, CONNECTION	
	3-800-428-11	MANUAL, INSTRUCTION (SPANISH) (AEP, E33)	
	3-800-428-21	MANUAL, INSTRUCTION (ENGLISH)	
	3-800-428-31	MANUAL, INSTRUCTION (FRENCH) (AEP)	
	3-800-428-41	MANUAL, INSTRUCTION (DUTCH) (AEP)	
	3-800-428-51	MANUAL, INSTRUCTION (SWEDISH) (AEP)	
	3-800-428-61	MANUAL, INSTRUCTION (PORTUGUESE) (AEP)	
	3-800-428-71	MANUAL, INSTRUCTION (GERMAN) (AEP)	
	3-800-428-81	MANUAL, INSTRUCTION (ITALIAN) (AEP)	
	3-800-428-91	MANUAL, INSTRUCTION (CHINESE) (E13)	
*	4-977-539-01	CASE, INDIVIDUAL (AEP, UK)	
*	4-977-540-01	CASE, INDIVIDUAL (AUS)	
*	4-977-541-01	INDIVIDUAL CARTON (E, EA)	
*	4-977-545-01	CUSHION (E, EA)	
	8-951-802-90	REMOTE CONTROLLER, WIRELESS RM-DM9	
	8-953-538-91	HEADPHONE MDR-E741//K1 SET	

****

****
HARDWARE LIST
****

#2	7-627-852-17	SCREW, PRECISION +P 1.7X4
#3	7-627-852-18	SCREW, PRECISION +P 1.7X4 TYPE3
#5	7-685-104-19	SCREW (2X6), TAPPING (B)
#6	7-685-105-19	SCREW (2X8), TAPPING (B)

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

English
95G0576-1
Printed in Japan

9-960-327-11

Sony Corporation
Consumer A&V Products Company
Personal A&V Products Div.

Published by Home A&V Products Div.
Quality Engineering Dept.

D-147CR

SONY

SERVICE MANUAL

AEP Model
UK Model
E Model
Australian Model

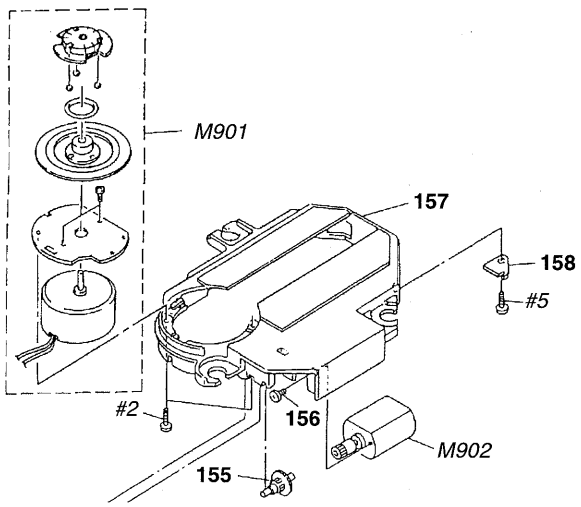
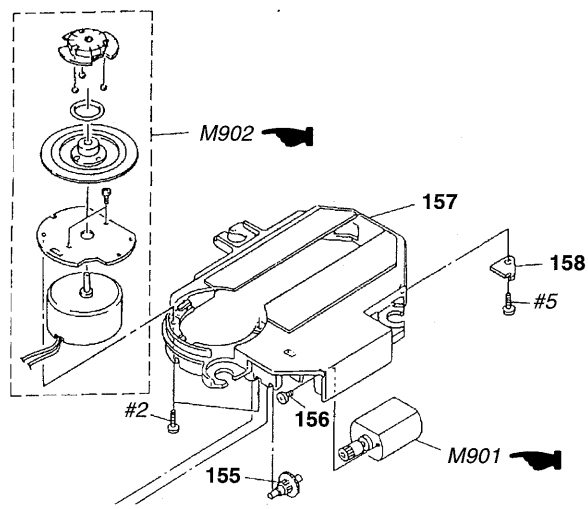
CORRECTION-1

Correct your service manual as shown below.

EXPLODED VIEWS

(2) OPTICAL PICK-UP BLOCK SECTION (KSM-331CAN (S))

☛ : Indicates corrected portion.

Page	INCORRECT	CORRECT
29		

(SPM-99009)

9-960-327-91

Sony Corporation
Personal Audio Company

99D0574-1
Printed in Japan
Published by General Engineering Dept.