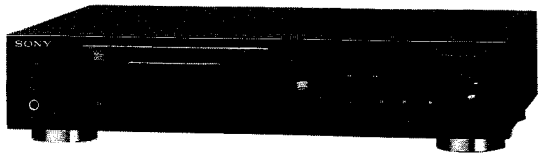
MDS-302

SERVICE MANUAL

US Model
Canadian Model
AEP Model
UK Model



Model Name Using Similar Mechanism	NEW
Mechanism Type	MDM-2A
Base Unit Type	MBU-2
Optical Pickup Block Type	KMS-210A/J-N

SPECIFICATIONS

MD recorder section

System MiniDisc digital audio system

Disc MiniDisc

Laser Semiconductor aser

Wavelength 780 - 790nm

Laser diode properties Material: GaAlAs
Emission duration: continuous
Laser output: less than 44.6 µW
(This output is the value measured at a distance of 200 mm from the lens surface on the optical pick-up block.)

Revolutions 400 rpm to 900 rpm (CLV)

Error correction Advanced Cross Interleave Reed Solomon Code (ACIRC)

Sampling frequency 44.1 kHz

Modulation system EFM (Eight-to-Fourteen Modulation)

Number of channels 2 stereo channels

Frequency response 5 to 20,000 Hz ± 0.5 dB

Signal-to-noise ratio Over 96 dB (during playback)

Wow and flutter Below measurable limit

Inputs

	Jack type	Input impedance	Rated input	Minimum input
LINE IN	Phono jacks	Over 47 kilohms	500 mVrms	158 mVrms
DIGITAL IN	Square optical connector jack	Optical wave lenghth 660 nm	—	—

— Continued on next page —

MICROFILM

MINIDISC RECORDER

SONY®

Outputs

	Jack type	Rated output	Load impedance
LINE OUT	Phono jacks	2 Vrms (at 50 kilohms)	Over 10 kilohms
DIGITAL OUT	Square optical connector jack	–18 dBm	Wave length: 660 nm
PHONES	Stereo phone jack	28 mW	32 ohms

General

Power requirements

120 V AC, 60 Hz (US, Canadian models)
220 – 230 V AC, 50/60 Hz (AEP model)
220 – 240 V AC, 50/60 Hz (UK model)

Power consumption

19 W (US, Canadian models)
20 W (AEP, UK models)

Dimensions (approx) (w/h/d)

430 × 97.5 × 292 mm (17 × 3 7/8 × 11 1/2 in.) incl. projecting parts

Mass (approx)

3.5 kg (7 lbs 11 oz)

Supplied accessories

Audio connecting cords (2 phono plugs – 2 phono plugs) (2)
Remote commander (remote) RM-D3M (1)
Sony SUM-3 (NS) batteries (2)

U.S. and foreign patents licensed from Dolby Laboratories Licensing Corporation.

Design and specifications are subject to change without notice.

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.

TABLE OF CONTENTS

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety check 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 microampers). 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 2 V AC range are suitable. (See Fig. A)

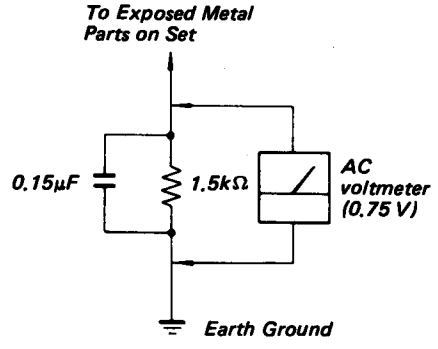
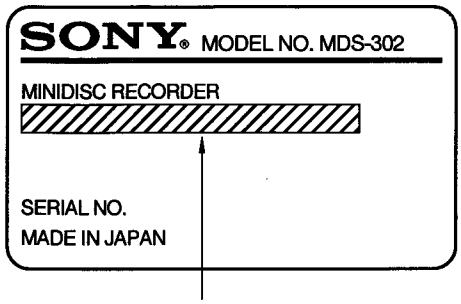


Fig. A. Using an AC voltmeter to check AC leakage.

MODEL IDENTIFICATION

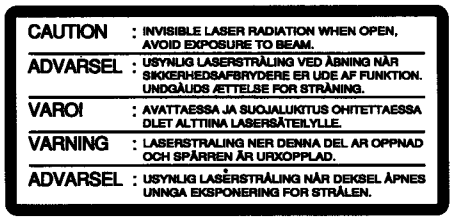
— Specification Labels —



US, Canadian model : AC: 120V 60Hz 19W
AEP model : AC: 220—230V~50/60Hz 20W
UK model : AC: 220—240V~50/60Hz

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

The following caution label is located inside of the unit.



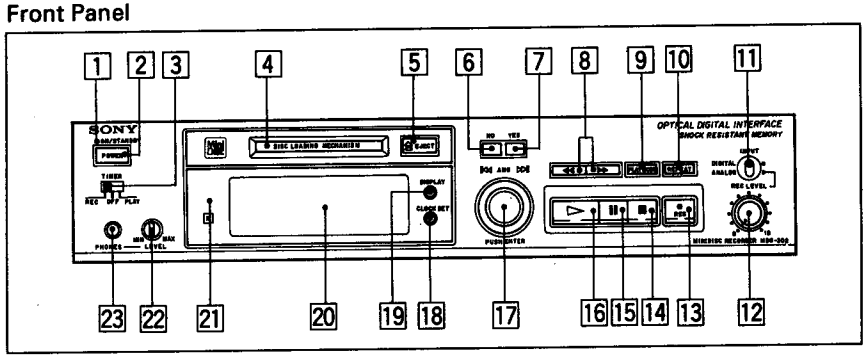
CAUTION

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

This section is extracted from instruction manual.

Looking at the Controls

Front Panel



1 **ON/STANDBY Indicator**
The indicator lights up red when power on. The indicator lights up green when standby.

2 **POWER switch**
Press to turn on the unit; press again to change to standby.

3 **TIMER switch**
Set normally to OFF. Set to REC or PLAY when using an optional timer to record or playback at preset times.

4 **Disc compartment**
Automatically loads an inserted disc.

5 **⏏EJECT button**
Press to eject the disc from the disc compartment.

6 **EDIT NO button**
Press to specify or cancel editing functions. Press during recording or recording pause to specify the track number recording method.

7 **YES button**
Press to perform editing functions (i.e. erasing, dividing, combining, and moving).

8 **◀◀ ▶▶ (search) buttons**
Press to find a specific point within a track.

9 **PLAY MODE button**
Press to select playback modes (i.e., CONTINUE, SHUFFLE, and PROGRAM).

10 **REPEAT button**
Press for repeated playback.

11 **INPUT selector switch**
Use to select the input signal source.
ANALOG: Selects the signal source connected to the LINE IN (line input) jacks.
DIGITAL: Selects the signal source connected to the DIGITAL IN jacks.

12 **REC (recording) LEVEL control**
Turn to adjust the recording level when recording from analog source. The outer knob controls the L (left) channel level and the inner knob the R (right) channel level. You can turn both knobs together, or independently by holding one while turning the other. Recording level adjustment is unnecessary when recording from a digital source.

13 **●REC (recording) button**
Press once for recording pause. Press ▷ or ▷II to start recording. Use also for track making.

14 **■ (stop) button**
Press to stop playback or recording, or to erase all programmed tracks.

15 **II (pause) button**
Press during playback or recording to pause the recorder; press again to cancel pause.

16 **▷ (play) button**
Press to start playback or recording.

17 **AMS* dial**
Turn to cue to the beginning of specific tracks, set the clock, specify the playing order of programmed tracks, edit functions, and enter text data.
Press to play or pause an MD.

18 **CLOCK SET button**
Press to set the clock.

19 **DISPLAY button**
Press to display the title of the current track and the remaining playing time on the MD.

20 **Display window**
Indicates the current operating status.

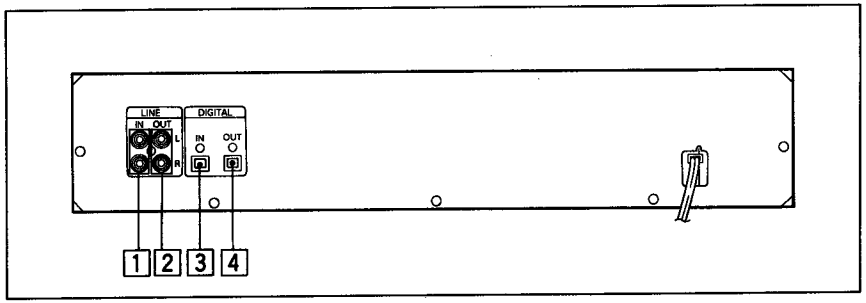
21 **Remote sensor**
Accepts commands from the remote commander.

22 **LEVEL control**
Turn to adjust the volume of the headphones.

23 **PHONES jack**
Connect headphones with a stereo phone plug here.

*AMS: Automatic Music Sensor

Rear Panel



1 **LINE IN (line input) jacks (phono jack)**
Connect to the REC OUT(recording output) of the amplifier used as a signal source for analog recording.

2 **LINE OUT (line output) jacks (phono jack)**
Connect to the TAPE (tape input) of an amplifier for analog signal output to speakers.

3 **DIGITAL IN jack (optical jack)**
Connect to the digital output jack of a digital signal source, such as an amplifier with a built-in D/A converter, CD player, DAT deck, BS tuner, or another MD recorder.

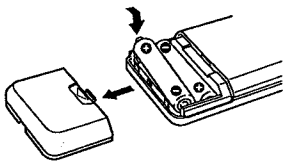
4 **DIGITAL OUT jack (optical jack)**
Connect to the digital input jack of an amplifier with a built-in D/A converter for signal output on speakers, or a DAT deck or another MD recorder for digital recording.

Unpacking

Check that you received the following items:
- Audio connecting cords (2)
- Remote commander (remote) (RM-D3M) (1)
- Sony SUM-3 (NS) batteries (2)

Inserting batteries into the remote

You can control the recorder using the supplied remote.
Insert two R6 (size AA) batteries by matching the + and – on the batteries. When using the remote, point it at the remote sensor ▣ on the recorder.



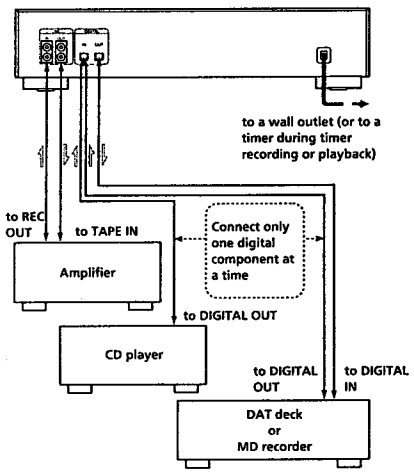
When to replace batteries
With normal use, the batteries should last for about six months. When the remote no longer operates the recorder, replace all the batteries with new ones.

Notes
- Do not leave the remote near an extremely hot or humid place.
- Do not drop any foreign object into the remote casing, particularly when replacing the batteries.
- Do not expose the remote sensor to direct sunlight or lighting apparatuses. Doing so may cause a malfunction.
- If you don't use the remote for an extended period of time, remove the batteries to avoid possible damage from battery leakage and corrosion.

Hooking Up the System

Overview

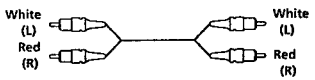
This section describes how to hook up the MD recorder to an amplifier or other components such as a CD player or DAT deck. Be sure to turn off the power of each component before connection.



: Signal flow

What cords will I need?

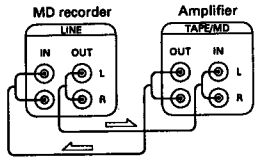
- Audio connecting cords (supplied) (2)



- Optical cable (not supplied) (1)

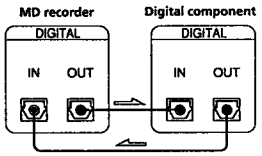
Hookups

- **Connecting the recorder to an amplifier**
  Connect the amplifier to the LINE IN/OUT jacks using the audio connecting cords (supplied), making sure to match the color-coded cord to the appropriate jacks on the components: red (right) to red and white (left) to white. Be sure to make connections firmly to prevent hum and noise.



: Signal flow

- **Connecting the recorder to a digital component such as a CD player, DAT deck, digital amplifier, or another MD recorder**
  Connect the component through the DIGITAL IN/OUT connectors using the optical cable (not supplied). Take off the cap and plug in the optical cable.



: Signal flow

Notes
- Digital program sources with different sampling frequencies cannot be recorded through the digital input jack.
  Only CD, MD (premastered) and DAT sources with a sampling frequency of 44.1 kHz can be recorded through the digital input connector. "Din Unlock" appears in the display when you attempt to record digital program sources with a sampling frequency different from that of the MD (such as 32- or 48-kHz DAT or BS). To record these program sources on an MD you must connect them through the analog LINE IN jacks and set INPUT to ANALOG.
- If "Cannot Copy" appears in the display, recording through the digital jack is not possible.
  In this case, record the program source through the LINE IN and OUT jacks with INPUT set to ANALOG.

Connecting the AC power cord

Connect the AC power cord to a wall outlet or to the outlet of a timer.

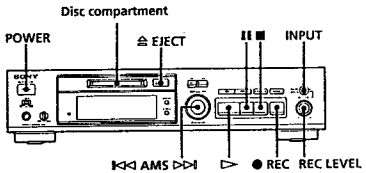
Note
Do not connect the AC power cord to a switched outlet.

Where do I go next?

Now you're ready to use your recorder.
Before using the MD recorder, turn on the amplifier and select the MD recorder with the source selector on the amplifier.

Recording on an MD

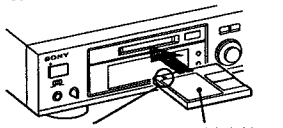
Before you begin, make sure you have correctly and firmly connected the recorder to an audio component such as an amplifier or CD player as indicated on page 5.



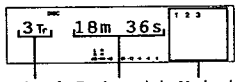
1 Turn on the amplifier and the program source, and set the program selector on the amplifier to the program source.

2 Press POWER to turn on the recorder.
The ON/STANDBY indicator changes from red to green.

3 Insert the recordable MD with the label side up and the arrow pointing toward the opening into the disc compartment until the recorder grips it.
If you insert the MD while the recorder is off, the recorder will turn on automatically and "Welcome" will appear in the display.



The total number of recorded tracks, total recorded time, and music calendar without a grid appear in the display.



4 Set INPUT according to the input terminal connected to the program source.

When you want to record through	Set INPUT to
LINE IN	ANALOG
DIGITAL IN	DIGITAL

5 Locate the position on the MD where you want to start recording.
- To record on a new (blank) recordable MD, skip this step, and go to Step 6.
- To start recording from the end of the last recorded track, go to Step 6, or turn AMS (or press I◀◀ or ▶▶I) until "End" appears.
- To record over an existing track, turn AMS (or press I◀◀ or ▶▶I) until the number of the track to be recorded over appears.

6 Press ● REC.
The recorder is now ready for recording.
- If you are recording from the end of the last recorded track, or using a new recordable MD, "New" alternates with the remaining time indication in the display.
- If you are recording over an existing track, "TRACK" flashes and "Overwrite" alternates with the remaining time indication in the display.

7 When you've set INPUT to ANALOG in Step 4, turn REC LEVEL to adjust the recording level. (The fourth dot is satisfactory for most purposes. However, for a more precise adjustment, see "Adjusting the Recording Level" on page 8.)

8 Press II or ▷ to start recording.

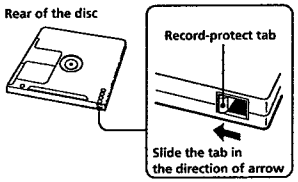
9 Start playing the program source you want to record.

10 After finishing, press ■ to stop recording. Then press ⏏ EJECT to remove the MD or press POWER to change the recorder to standby.

To	Press
Pause*	II
Resume recording after pause	II or ▷
Remove the MD	⏏ EJECT

* Whenever you pause recording, the track number increases by one. For example, if you paused recording while recording on track 4, the track number increases by one and recording continues on the new track when restarted.

To protect a MiniDisc against accidental erasure
To make it impossible to record on an MD, slide the tab in the direction of arrow, opening the slot. To allow recording, close the slot.



You can start recording from the middle of a recorded track in Step 5
Press ▷ to start playback, press II where you want to start recording, then do the procedure starting from Step 6 on page 6. However, you will not be able to record from the middle of a recorded track if "PROGRAM" or "SHUFFLE" appears in the display.

Notes on Recording

If "Protected" appears in the display
The MD is record-protected. Close the slot to record on the disc (see "To protect a MiniDisc against accidental erasure" on this page).

If "Din Unlock" appears in the display
- The program source is not connected to DIGITAL IN even though you've selected DIGITAL in Step 4 or the sampling frequency of the program source does not match that of the MD recorder (44.1 kHz). To continue, connect the program source through DIGITAL IN or select ANALOG in Step 4 to record through LINE IN.
- The digital signal has been interrupted (stopped) while you were recording. To continue recording, restart the digital program source. To stop recording, press ■ on the MD recorder.

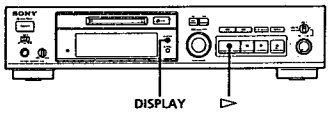
Depending on source being recorded, track numbers are marked in the two following ways:
- When recording from a CD or MD with INPUT at DIGITAL and the source connected to DIGITAL IN, the recorder automatically marks track numbers in the same sequence as the original. However, if a track is played more than once (i.e., by repeated playback during program play or single-track repeat play), the same track is recorded as a single track no matter how many times it is played.
If the source is an MD, track numbers may not be marked for tracks of less than 4 seconds.
- When INPUT is at ANALOG, the source connected through LINE IN, and the "LEVEL-SYNC" setting OFF (see "Marking Track Numbers While Recording" on page 9) or when recording from DAT with INPUT at DIGITAL and the source connected through DIGITAL IN, the source will be recorded as a single track. You can divide the track afterwards using the Divide Function (see "Dividing Recorded Tracks" on page 20) or mark track numbers during recording by using the Track Marking Function on page 9. If "LEVEL-SYNC" appears in the display, the recorder automatically marks track numbers (see "Marking track numbers atuomatically" on page 9).

If "TRACK" flashes in the display
The recorder is recording over an existing track. "TRACK" lights continuously when the recorder reaches the end of the previously recorded portion.

When "TOC" flashes in the display
The recorder is currently updating the Table Of Contents (TOC). Do not move the recorder or pull out the AC power cord. Changes to an MD made through recording are saved only when you update the TOC by ejecting the MD or changing the recorder to standby by pressing POWER.

The MD recorder uses the SCMS (Serial Copy Management System on page 28)
MDs recorded through DIGITAL IN cannot be copied onto other MDs through DIGITAL IN.

Useful Tips for Recording



Checking the remaining time on the MD

- When you press DISPLAY while recording, the remaining time on the MD appears.
- When you press DISPLAY repeatedly while the recorder is stopped, the display changes as follows: total recorded time, remaining time on the MD, disc name (see page 13).

If "Auto Cut" appears in the display

The Auto Cut Function has been activated. This happens when there is no sound input for more than 30 seconds while INPUT is at DIGITAL and the source connected through DIGITAL IN. The recorder changes to recording pause and the 30 seconds of silence are replaced by a blank of about 3 seconds.

If "Smart Space" appears in the display

The Smart Space Function has been activated. This happens when there has been an extended silence (of not more than 30 seconds) between two input signals when INPUT is at DIGITAL and the source connected through DIGITAL IN. The Smart Space Function instantaneously replaces the silence with a blank of about 3 seconds even as the recorder continues recording.

Playing back tracks just recorded

Do this procedure to immediately playback tracks that have just been recorded.

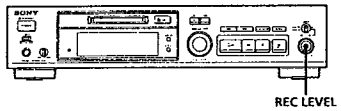
Press ▷ immediately after stopping recording. Playback starts from the first track of the material just recorded.

To play from the first track of the MD after recording

1 Press ■ again after stopping recording.
2 Press ▷.
Playback starts from the first track of the MD.

Adjusting the Recording Level

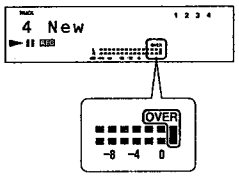
When recording a sound source while INPUT is at ANALOG and the source connected through LINE IN, use REC LEVEL to adjust the recording level before starting recording.



1 Do Steps 1 to 6 in "Recording on an MD" on page 6.

2 Play the portion of the program source with the strongest signal level.

3 While monitoring the sound, turn REC LEVEL to adjust the recording level so that the peak level meters reach their highest point without turning on the OVER indication. Occasional lighting of "OVER" is acceptable.

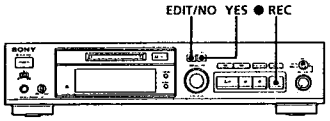


4 Stop playing the program source.

5 To start recording, do the procedure starting from Step 8 of "Recording on an MD" on page 6.

Marking Track Numbers While Recording (Track Marking)

You can mark track numbers either manually or automatically. By marking track numbers at specific points, you can quickly locate the points later using the AMS Function or Editing Functions.



Marking track numbers manually (Manual Track Marking)

You can mark track numbers at any time while recording on an MD.

Press ● REC at the place you want to add a track mark while recording.

Marking track numbers automatically (Automatic Track Marking)

The recorder adds track marks differently in the following cases:

- When recording from CDs or MDs with INPUT at DIGITAL and the source connected through DIGITAL IN:
  The recorder marks track numbers automatically. When you record from a CD or MD, the track numbers are written as they are found on the original.
- When recording with INPUT at ANALOG and the source connected through LINE IN, or when recording from DAT with INPUT at DIGITAL and the DAT connected through DIGITAL IN:
  The recorder marks a new track number whenever the signal level drops and rises to a certain point* (Automatic Track Marking). If "LEVEL-SYNC" does not light up, set the LevelSync to ON as follows:

1 Press EDIT/NO to display "LevelSync ?"during recording or recording pause.

2 Press YES twice to display "LevelSync ON." "LEVEL-SYNC" appears in the display.

To cancel Automatic Track Marking

1 Press EDIT/NO during recording or recording pause.
"LevelSync ?" appears in the display.
2 Press YES.
3 Press EDIT/NO.
"LevelSyncOFF" appears in the display.

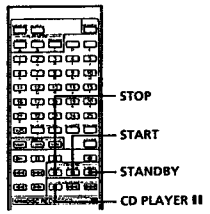
* The signal level must remain low for 2 or more seconds before a new track number is written.

When you want to mark track numbers after you've done the recording

Use the Divide Function (see "Dividing Recorded Tracks" on page 20).

Synchro-Recording With a Sony CD Player

By connecting your recorder to a Sony CD player or Hi-Fi Component System, you can easily dub CDs onto MDs using the CD synchro buttons on the remote. If your recorder is connected to a Sony CD player by the optical cable through DIGITAL IN (digital input), tracks are automatically recorded in the same sequence as the original regardless of whether "LevelSync ON" or "LevelSyncOFF" is selected. If your recorder is connected to a Sony CD player by audio connecting cords through LINE IN (analog input), tracks are automatically recorded when you select "LevelSync ON" (see "Marking Track Numbers While Recording" on page 9).
As the same remote controls both the CD player and the recorder, you may have trouble operating both units if they are far from each other. If you do, place the CD player close to this recorder.



1 Set the source selector on the amplifier to CD.

2 Do Steps 2 to 5 in "Recording on an MD" on page 6 to prepare the recorder for recording.

3 Insert a CD into the CD player.

4 Select the playback mode (shuffle play, program play, etc.) on the CD player.

5 Press STANDBY.
The CD player pauses for playing and the recorder pauses for recording.

6 Press START.
The recorder starts recording and the CD player starts playback.
The track number and elapsed recording time of the track appear in the display.

If the CD player does not start playing
Some CD player models may not respond when you press START on the remote of the recorder. Press II on the remote of the CD player instead.

7 Press STOP to stop synchro-recording.

To pause recording
Press STANDBY or CD PLAYER II.
To restart recording, press START or CD PLAYER II.
A new track number is created each time you pause recording.

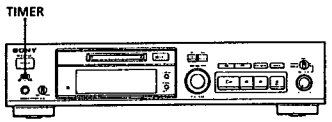
You can use the remote of the CD player during synchro-recording
Press ■.
The CD player stops and the recorder pauses for recording.
To restart synchro-recording, press ►.

You can change CDs during synchro-recording
Do the following steps instead of Step 7 above.
1 Press ■ on the remote of the CD player.
The recorder pauses for recording.
2 Change the CD.
3 Press ► on the remote of the CD player.
Synchro-recording restarts.

You can check the remaining time on the MD
Press DISPLAY (see page 8).

Recording on an MD Using a Timer

You can start recording on an MD at a preset time by connecting a timer (not supplied). Please refer to the instructions of the timer for further help.



1 Insert a recordable MD.

2 Set the program selector on the amplifier to the source you want to record.

3 Set TIMER on the recorder to REC.

4 Set the timer to the time you want.
The recorder turns off. When the specified time arrives, the recorder turns on and starts recording.

5 After you have finished using the timer, set TIMER on the recorder to OFF. Then either plug the AC power cord of the recorder into a wall outlet or set the timer to continuous on so that the recorder stays in standby status.

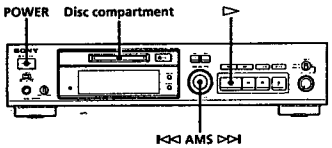
Make sure to change the recorder to standby status within two or three days after timer recording is completed
When the recorder enters standby, the TOC on the MD is updated and the recorded contents are written to the MD. If the recorder's standby status is off due to disconnection from a power source for more than two or three days, the contents recorded with the timer may disappear.

If "STANDBY" flashes when you change the recorder to standby status after timer recording is completed
The recorded contents have disappeared.

Notes
- If TIMER is left at REC, the recorder will automatically start recording the next time you turn the recorder on.
- During timer recording, new material is recorded from the end of existing material on the MD.
- Material recorded during timer recording will be saved to the disc the next time the recorder enters standby status. "TOC" will flash in the display at that time. Do not move the recorder or pull out the AC power cord while "TOC" is flashing.
- Timer recording will stop if the disc becomes full.

Playing an MD

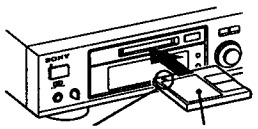
Before you begin, make sure you have connected the recorder to an amplifier correctly and firmly as indicated on page 5.



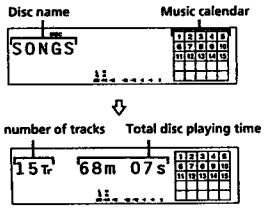
1 Turn on the amplifier and set the source selector to MD recorder.

2 Press POWER to turn on the recorder.
The ON/STANDBY indicator changes from red to green.

3 Insert the MD with the label side up and the arrow pointing toward the opening into the disc compartment until the recorder grips it.
If you insert the MD while the recorder is off, the recorder will turn on automatically.
"Welcome" appears in the display.



The disc name appears, followed by the total number of tracks (Tr) and total disc playing time. A music calendar showing all the track numbers appears within a grid if the MD is a premastered disc, or without a grid if the MD is a recordable disc.



If the total track number exceeds 25, ▶ appears to the right of number 25 in the music calendar.
To label a recordable disc and its tracks, see "Labeling Recordings" on page 23.

4 Press ⊳.
The MD starts playing.
The current track number, track title (if labeled), and elapsed playing time of the current track light up in the display.

To stop playback
Press ■.

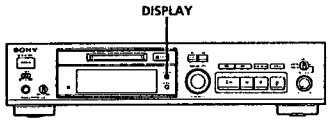
When you want to	Do the following:
Pause	Press II
Resume play after pause	Press ⊳ or II
Go to the next track	Turn AMS clockwise (or press ▶▶I on the remote)
Go back to the preceding track	Turn AMS counterclockwise (or press I◀◀ on the remote)
Remove the MD	Press ⏏ EJECT

You can locate and play back a track while the recorder is stopped
1 Turn AMS (or press I◀◀ or ▶▶I) until the number of the track you want to play appears.
2 Press AMS or ⊳.

When you listen with headphones
Connect the headphones to the PHONES jack. You can adjust the volume with the LEVEL control.

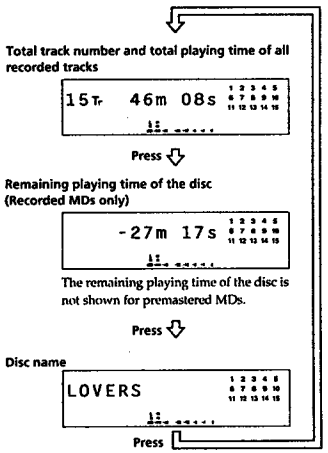
Using the Display

You can use the display to check disc and track information such as the total track number, total playing time of the tracks, remaining playing time of the disc, and disc name in the display.



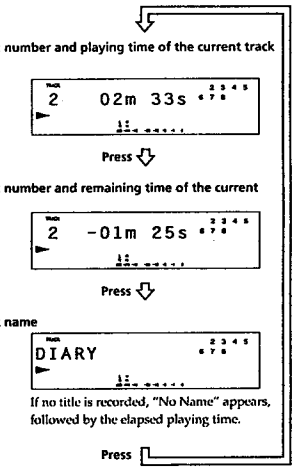
Checking the total track number, total disc playing time, remaining playing time of the disc and the title of the disc

Each time you press DISPLAY while the recorder is stopped, you can change the display as follows:



Checking remaining time and the title of a track

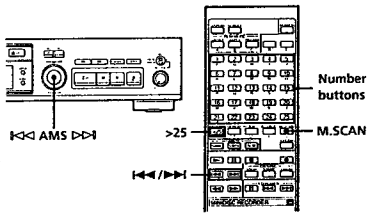
Each time you press DISPLAY while playing an MD, you can change the display as shown below. The track numbers in the music calendar disappear after they are played.



You can check the track name at any time while playing an MD by pressing SCROLL
Since the display shows up to 12 characters at a time, press SCROLL again to see the rest of the track title if the title has 13 characters or more.
Press SCROLL again to pause scrolling, and again to continue scrolling.

Locating a Specific Track

You can quickly locate any track while playing a disc by using AMS (Automatic Music Sensor), I◄◄ and ►►I, number buttons or M.SCAN on the remote.



To locate	Do the following:
The next or succeeding tracks	Turn AMS clockwise or press ►►I repeatedly until you find the track
The current or preceding tracks	Turn AMS counterclockwise or press I◄◄ repeatedly until you find the track
A specific track directly	Press number buttons to enter the track number
By scanning each track for 6 seconds (music scan)	1 Press M.SCAN before you start playing. 2 When you find the track you want, press ▷ to start playing.

To pause playing at the beginning of a track
Turn AMS (or press I◄◄ or ►►I) after pausing playback.

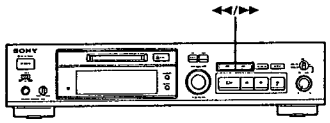
To go quickly to the beginning of the last track
Turn AMS counterclockwise (or press I◄◄) while the display shows the total track number and total disc playing time (see page 13).

When you directly locate a track with a number over 25
You must press >25 first, before entering the corresponding digits.
Press >25 once if it is a 2-digit track number, and twice if it is a 3-digit track number.
To enter "0," press button 10.
Examples:
- To play track number 30
  Press >25 once, then 3 and 10.
- To play track number 100
  Press >25 twice, then 1, 10 and 10.

You can extend the playing time during music scan
While the recorder is stopped, press M.SCAN repeatedly until the playing time you want (6, 10 or 20 seconds) appears in the display. Each press changes the time in order of 6 to 20, then from 6 again.

Locating a Particular Point in a Track

You can also use ◄◄ and ►► to locate a particular point in a track while playing an MD or during playback pause.

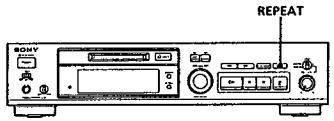


To locate a point	Press
While monitoring the sound	►► (forward) or ◄◄ (backward) and keep pressing until you find the point
Quickly by observing the display during playback pause	►► or ◄◄ and keep pressing until you find the point. There is no sound output during this operation.

Notes
- If the disc reaches the end while you are pressing ►► during playback pause, "OVER" appears in the display. Press ◄◄ (or I◄◄) or turn AMS counterclockwise to go back.
- If the disc reaches the end while you are pressing ►► during sound monitoring, the recorder stops.
- Tracks that are only a few seconds long may be too short to scan using the search function. For such tracks, it is better to play the MD at normal speed.

Playing Tracks Repeatedly

You can play tracks repeatedly in any play mode.



Press REPEAT while playing an MD.
"REPEAT" appears in the display. The recorder repeats the tracks as follows:

When the MD is played in	The recorder repeats
Continuous play (page 12)	All the tracks
Shuffle play (this page)	All the tracks in random order
Program play (page 16)	The same program

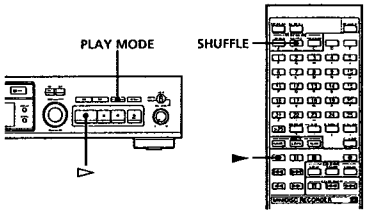
To cancel repeat play
Press REPEAT several times until "REPEAT" disappears.
The recorder returns to the original playing mode.

Repeating the current track

While the track you want to repeat is playing in continuous play, press REPEAT several times until "REPEAT 1" appears in the display.

Playing in Random Order (Shuffle Play)

You can have the recorder "shuffle" tracks and play them in random order.



1 Press PLAY MODE repeatedly (or SHUFFLE once) until "SHUFFLE" appears in the display.

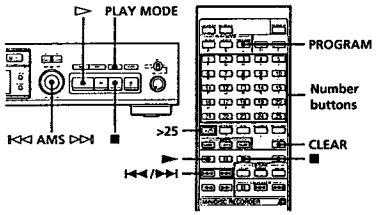
2 Press ▷ to start Shuffle Play.
"🔀" appears in the display while the recorder is "shuffling" the tracks.

To cancel Shuffle Play
Press PLAY MODE repeatedly (or CONTINUE once) until "SHUFFLE" disappears.

You can specify tracks during Shuffle Play
- To play the next track, turn AMS clockwise (or press ►►I).
- To play from the beginning of the current track again, turn AMS counterclockwise (or press I◄◄). You cannot use AMS (or I◄◄) to go to tracks that have already been played.

Creating Your Own Program (Program Play)

You can specify the playback order of the tracks on an MD and create your own programs containing up to 25 tracks.



1 Press PLAY MODE repeatedly (or PROGRAM once) until "PROGRAM" appears in the display.

2 Do either a) or b):

a) When using the remote

Press the number buttons to enter the tracks you want to program in the order you want.

To program a track with a number over 25, use the >25 button (see page 14).

If you've made a mistake

Press CLEAR, then press the right number button.

b) When using the controls on the recorder

1 Turn AMS until the track number you want appears in the display.

2 Press AMS or PLAY MODE.

3 Repeat Step 2 to enter other tracks. Each time you enter a track, the total program time is added up and appears in the display.

4 Press ▷ to start Program Play.

To cancel Program Play

Press PLAY MODE repeatedly (or CONTINUE once) until "PROGRAM" disappears.

You can program the same track repeatedly

While the track number appears in the display, press AMS as many times as you want.

The program remains even after Program Play ends

When you press ▷, you can play the same program again.

Note

The display shows "- - - -" instead of the total playing time when the total playing time of the program exceeds 100 minutes.

Checking the track order

You can check the order of tracks in your program during playback or playback pause.

Turn AMS (or press ⏮ or ⏭) during playback or playback pause. The track numbers appear in the order they were programmed.

Changing the track order

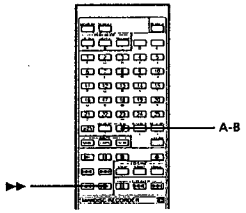
You can change the order of the tracks in your program before you start playing.

To	Do the following:
Erase the last track in the program	Press CLEAR. Each time you press the button, the last track will be cleared.
Add tracks to the end of the program	Do the procedure on this page starting from Step 2
Change the whole program completely	1 Press ■ (stop) while the recorder is stopped. 2 Do the procedure on this page starting from Step 2.

Repeating a Specific Portion (A-B Repeat)

You can play a specific portion of a track repeatedly. This might be useful when you want to memorize lyrics.

Note that you can only repeat a portion within the boundaries of a single track.



1 While playing a disc, press A-B at the starting point (point A) of the portion to be played repeatedly.

"A-B" of "REPEAT A-B" flashes in the display.

2 Continue playing the track or press ▶▶ until you reach the ending point (point B), then press A-B again.

"A-B" of "REPEAT A-B" lights continuously. The recorder starts to play the specified portion repeatedly.

To cancel A-B Repeat

Press REPEAT.

Setting new starting and ending points

You can repeat the portion immediately after the currently specified portion by changing the starting and ending points.

1 Press A-B while "REPEAT A-B" appears.

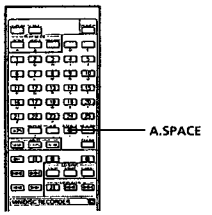
The current ending point B becomes the new starting point A and "A-B" of "REPEAT A-B" flashes in the display.

2 Continue playing the track or press ▶▶ until you reach the new ending point (point B), then press A-B again.

"A-B" of "REPEAT A-B" lights continuously and the recorder starts playing repeatedly the newly specified portion.

Useful Tips When Recording From MDs to Tape

The Auto Space and Auto Pause Functions described in this section make recording from MDs to tape more easy.



Inserting blank spaces while recording to tape (Auto Space)

The Auto Space Function inserts a 3-second blank space between each track while recording from MDs to tapes, allowing you to use the AMS function during later playback.

Before the start of recording, press A.SPACE repeatedly until "A.SPACE" appears in the display.

To cancel Auto Space

Press A.SPACE repeatedly until "A.SPACE" disappears.

Note

If the Auto Space Function is on while recording a selection containing multiple track numbers, (for example, a medley or symphony), blank spaces will be inserted within the selection whenever the track number changes.

Pausing after each track (Auto Pause)

When the Auto Pause Function is on, the recorder pauses after playing each track. Auto Pause is convenient when recording single tracks or multiple, non-consecutive tracks.

Press A.SPACE repeatedly until "A.PAUSE" appears in the display.

To restart playback

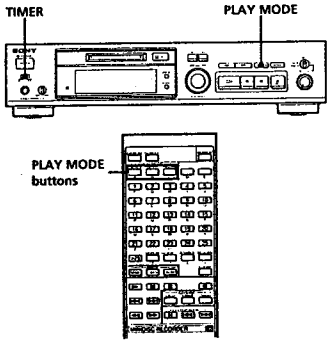
Press ▷ or ⏸.

To cancel Auto Pause

Press A.SPACE repeatedly until "A.PAUSE" disappears.

Playing an MD Using a Timer

You can start playing an MD at a preset time by connecting a timer (not supplied). Please refer to the instructions of the timer for further help.



1 Press PLAY MODE repeatedly (or one of the PLAY MODE buttons once) to select the play mode you want.

2 Set TIMER on the recorder to PLAY.

3 Set the timer to the time you want.
The recorder turns off. When the specified time arrives, the recorder turns on and starts playing.

4 After you have finished using the timer, set TIMER on the recorder to OFF.

Notes

- You can select PROGRAM in Step 1. Note, however, that programs eventually fade away when the standby status is off, and therefore if you set the time too far in the future, the program may be gone when the specified time arrives. If this has occurred, the recorder enters CONTINUE mode at the specified time and the tracks play in consecutive order.
- If you select PROGRAM in Step 1 and set TIMER to PLAY while "TOC" appears, the recorder enters CONTINUE mode at the specified time and the tracks play in consecutive order.

Notes on Editing

If "Protected" appears in the display
The recorder could not erase the specified track because the record-protect slot on the MD is open. Erase the track after closing the slot.

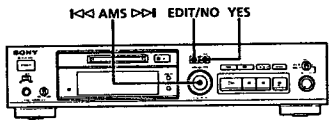
When "TOC" flashes in the display
Do not move the recorder or pull out the AC power cord. After editing, "TOC" lights continuously until you eject the MD or turn off the power. "TOC" flashes while the recorder is updating the TOC. When the recorder finishes updating the TOC, "TOC" goes off.

Erasing Recordings (Erase Function)

Do the procedures below to erase following:

- A single track
- All tracks
- Parts of a track

Note, however, that once erased, MD data cannot be recovered.

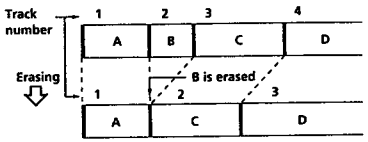


Erasing a single track

You can erase a track simply by specifying the respective track number. When you erase a track, the total number of tracks on the MD decreases by one and all tracks following the erased one are renumbered. Since erasing merely updates the TOC, there is no need to record over material.

To avoid confusion when erasing multiple tracks, you should proceed in order of high to low track number to prevent the renumbering of tracks that have not been erased yet.

Example: Erasing B



1 Turn AMS until the track number you want to erase appears in the display.

2 Press EDIT/NO repeatedly until "Erase ?" appears in the display.
The track number you selected starts flashing in the music calendar.

3 Press YES.
When the track selected in Step 1 has been erased, "Complete" appears for a few seconds and the total number of tracks in the music calendar decreases by one.
If you erase a track during playback, the track following the deleted track begins playing afterwards.

4 Repeat Steps 1 to 3 to erase more tracks.

To cancel the Erase Function
Press EDIT/NO, ■, or turn AMS to change the track number.

Note
If "Erase!! ?" appears in the display, the track was recorded or edited on another MD recorder and is record-protected. If this indication appears, press YES to erase the track.

Erasing all tracks on an MD

Erasing a recordable MD deletes the disc name, all recorded tracks, and titles (see page 24).

1 While the recorder is stopped, press EDIT/NO repeatedly until "All Erase ?" appears in the display.

2 Press YES.
All tracks in the music calendar start flashing.

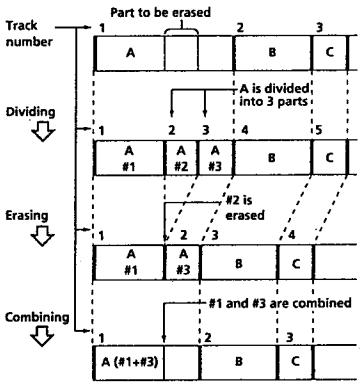
3 Press YES again.
When the disc name, all recorded tracks, and titles on the MD have been erased, "Complete" appears for a few seconds and the music calendar disappears.

To cancel the Erase Function
Press EDIT/NO or ■.

Erasing a part of a track

By using the Divide (see this page), Erase (see page 19) and Combine (see page 21) Functions, you can erase specific portions of a track.

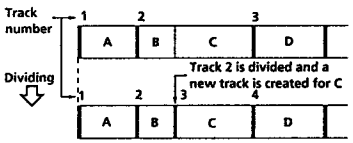
Example: Erasing a part of track A

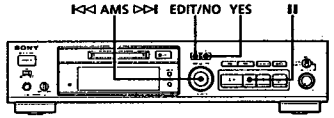


Dividing Recorded Tracks (Divide Function)

With the Divide Function you can assign a track number at places that you want to randomly access afterwards. Use this function to add tracks to MDs recorded from an analog source (and therefore contain no track numbers), or to divide an existing track into multiple portions. When you divide a track, the total number of tracks on the MD increases by one and all tracks following the divided track are renumbered.

Example: Dividing track 2 to create a new track for C



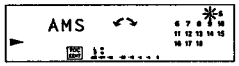


1 While playing the MD, press ▮▮ at the point where you want to create a new track.
The recorder pauses playing.

2 Press EDIT/NO repeatedly until "Divide ?" appears in the display.

3 Press YES to divide the track.
"Rehearsal" alternates with "Position ok?" in the display, the track to be divided starts flashing in the music calendar, and the starting portion of the new track begins playing repeatedly.

4 If the starting position is incorrect, press EDIT/NO. (If it is correct, go to Step 7.)



5 While monitoring the sound, turn AMS to find the starting position of the new track.
The starting portion of the new track is played back repeatedly.
"Rehearsal" alternates with "Position ok?" in the display.
The starting position can be moved within a maximum range of –128 to +127 steps of about 0.06 second each within a track.

6 If the starting position is still incorrect, repeat Step 5 until it is correct.

7 Press YES or AMS when the position is correct.
When the track has been divided, "Complete" appears for a few seconds and the newly created track begins playing. The new track will have no track title even if the original track was labeled.

To cancel the Divide Function
Press ■.

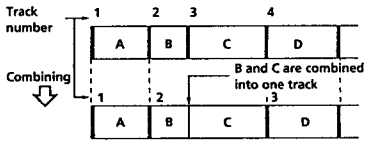
You can undo a track division
Combine the tracks again (see "Combining Recorded Tracks" on this page) then redivide the tracks if necessary.

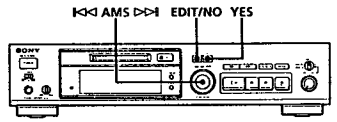
You can divide a track while recording
Use the Track Marking Function (see page 9).

Combining Recorded Tracks (Combine Function)

Use the Combine Function while the recorder is stopped, playing or in pause to combine consecutive tracks on a recorded MD. This function is useful for combining several songs into a single medley, or several independently recorded portions into a single track. When you combine two tracks, the total number of tracks decrease by one and all tracks following the combined tracks are renumbered.

Example: Combining B and C





1 Turn AMS until the second track of the two to be combined appears.
For example, when combining tracks 3 and 4, turn AMS until 4 appears.

2 Press EDIT/NO repeatedly until "Combine ?" appears in the display.

3 Press YES.
"Rehearsal" alternates with "Track ok?" in the display and the two tracks to be combined start flashing in the music calendar. The place where the two tracks will join (i.e., the end of the first track and the beginning of the second track) repeatedly plays back.

4 If the place is correct, press YES.
When the tracks have been combined, "Complete" appears for a few seconds and the total number of tracks in the music calendar decreases by one.
If both of the combined tracks have track titles, the title of the second track is erased.

To cancel the Combine Function
Press EDIT/NO or ■.

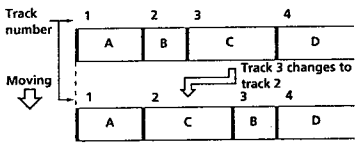
You can undo a track combination
Divide the tracks again (see "Dividing Recorded Tracks" on page 20), then repeat the combine function with the correct tracks if necessary.

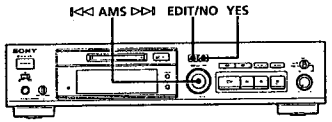
Note
If "Sorry" appears in the display, the tracks cannot be combined. This sometimes happens when you've edited the same track many times, and is due to a technical limitation of the MD system, not a mechanical error.

Moving Recorded Tracks (Move Function)

Use the Move Function to change the order of any track. After you move a track, the track numbers between the new and the old track positions increase by one.

Example: Moving track 3 to track position 2

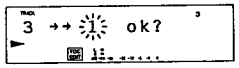




1 Turn AMS until the track number you want to move appears in the display.

2 Press EDIT/NO repeatedly until "Move ?" appears in the display.

3 Press YES.
The track number to be moved and the new track position appears.



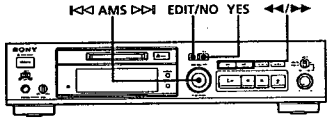
4 Turn AMS until the new track position appears.

5 Press YES or AMS.
After you have moved the track, "Complete" appears for a few seconds and the moved track begins playing back if the recorder is in playback mode.

To cancel the Move Function
Press EDIT/NO or ■.

Labeling Recordings (Title Function)

You can create titles for your recorded MDs and tracks. Titles — which may consist of uppercase and lowercase letters, numbers and symbols for a maximum of about 1,700 characters per disc — appear in the display during MD operation.



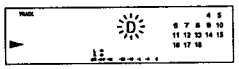
Use the following procedure to label a track or an MD. **You can label a track while it is playing, pausing or recording. If the track is playing, be sure to finish labeling before the track ends. If the track ends before you've completed the labeling procedure, the characters already entered are not recorded and the track will remain unlabeled.**

1 Press EDIT/NO repeatedly until "Name in ?" appears in the display, then do the following:

To label	Make sure that the recorder is
A track	Playing, pausing or recording the track to be labeled
An MD	Stopped

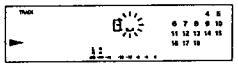
2 Press YES.
A flashing cursor appears in the display.

3 Turn AMS to select the first character.



The selected charactor flashes.
Letters, numbers, and symbols appear in sequential order as you turn AMS.
You can use the following symbols in titles:
! " # $ % & ' ( ) * + , – . / : ; < = > ? @

4 Press AMS to enter the selected character.
The cursor shifts rightward and waits for the input of the next character.



5 Repeat Steps 3 and 4 until you have entered the entire title.

If you entered the wrong character
Press ◀◀ or ▶▶ until the character to be corrected starts flashing, and repeat Steps 3 and 4 to enter the correct character.

To erase a character
Press ◀◀ or ▶▶ until the character to be erased starts flashing, then press EDIT/NO.

To enter a space
Press AMS or ▶▶ while the cursor is flashing.

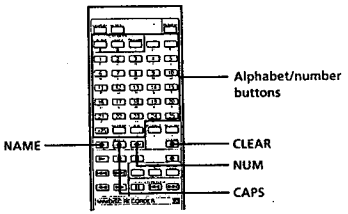
6 Press YES.
This completes the labeling procedure and the title appears on the left side of the display.

To cancel labeling
Press ■.

Note
You cannot label a track or an MD while you are recording over an existing track.

Labeling tracks and MDs with the remote

Use the following procedure to label a track or an MD with the remote.



1 Press NAME repeatedly until a flashing cursor appears in the display, then do the following:

To label	Make sure that the recorder is
A track	Playing, pausing or recording the track to be labeled
An MD	Stopped

(Continued)

2 Select the character type as follows:

To select	Press
Lowercase letters	CAPS repeatedly until "Selected abc" appears in the display
Uppercase letters	CAPS repeatedly until "Selected ABC" appears in the display
Numbers	NUM repeatedly until "Selected 123" appears in the display

3 Enter one character at a time.
After you enter a character, the cursor shifts rightward and waits for the input of the next character.

4 Repeat Steps 2 and 3 until you have entered the entire title.

If you entered the wrong character
Press ◀◀ or ▶▶ until the character to be corrected starts flashing.
Press CLEAR to erase the incorrect character, then enter the correct one.

5 Press NAME again.
The entered title appears on the left side of the display window after the label has been recorded.

To cancel labeling
Press ■.

Changing an existing title

1 Press NAME, then do the following:

To change	Make sure that the recorder is
A track title	Playing or pausing the track whose title is to be changed
A disc name	Stopped

2 Keep pressing CLEAR (or EDIT/NO on the recorder) until the current title is erased.

3 Enter the new title.
Do Steps 3 to 5 of "Labeling Recordings" on page 23, or Steps 2 to 4 of "Labeling tracks and MDs with the remote" on this page.

4 Press NAME.

Erasing all titles on a disc (Name Erase Function)

Use this function to erase all titles on an MD simultaneously.
Note that once erased, titles cannot be recovered.

1 Keep pressing EDIT/NO while the recorder is stopped until "All Erase ?" appears in the display.

2 Press EDIT/NO again. "Name Erase ?" appears in the display.

3 Press YES.
All titles are erased.

To cancel the Name Erase Function
Press ■.

You can erase all recorded tracks and titles
See "Erasing all tracks on an MD" on page 19.

Precautions

On safety
- As the laser beam used in this recorder is harmful to the eyes, do not attempt to disassemble the cabinet. Refer servicing to qualified personnel only.
- Should any solid object or liquid fall into the cabinet, unplug the recorder and have it checked by qualified personnel before operating it any further.

On power sources
- Before operating the recorder, check that the operating voltage of the recorder is identical with your local power supply. The operating voltage is indicated on the nameplate at the rear of the recorder.
- If you are not going to use the recorder for a long time, be sure to disconnect the recorder from the wall outlet. To disconnect the AC power cord, grasp the plug itself; never pull the cord.

On operation
- If the recorder is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lenses inside the recorder. Should this occur, the recorder may not operate properly. In this case, remove the MD and leave the recorder turned on for about an hour until the moisture evaporates.

On the MiniDisc cartridge
- Do not open the shutter to expose the MD.
- Do not place the cartridge where it will be subject to extremes of sunlight, temperature, moisture or dust.

On cleaning
- Clean the cabinet, panel and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

If you have any questions or problems concerning your recorder, please consult your nearest Sony dealer.

Display Messages

The following table explains the various messages that appear in the display.

Message	Meaning
Blank Disc	A new (blank) or erased MD has been inserted.
Cannot Copy	An attempt was made to make a second copy from a digitally dubbed MD (see page 28).
Cannot EDIT	An attempt was made to edit the MD during Program or Shuffle Play or the inserted disc contains Japanese characters.
Disc Error	The MD is scratched or missing a TOC.
Disc Full	The MD is full (see "System Limitations" on page 26).
Impossible	An attempt was made to combine tracks while playing back the first track.
Name Full	The titling capacity of the MD has reached its limit (about 1,792 characters).
NO DISC	There is no MD in the recorder.
No Track	The inserted MD has a disc title but no tracks.
Protected	The inserted MD is record-protected.
Retry	The first recording attempt failed due to a disturbance or scratch on the MD, and a second attempt is being made.
Retry Error	Due to vibrations to the recorder or scratches on the MD, several recording attempts were made but with no success.
Sorry	An attempt was made to combine tracks that cannot be combined.
STANDBY (flashing)	The contents recorded by timer have disappeared over time and are not be available for saving to disc, or Program Play could not be activated since the program has disappeared over time.

System Limitations

The recording system in your MiniDisc recorder is radically different from those used in cassette and DAT decks and is characterized by the limitations described below. Note, however, that these limitations are due to the inherent nature of the MD recording system itself and not to mechanical causes.

"Disc Full" lights up even before the MD has reached the maximum recording time (60 or 74 minutes)
When 255 tracks have been recorded on the MD, "Disc Full" lights up regardless of the total recorded time. More than 255 tracks cannot be recorded on the MD. To continue recording, erase unnecessary tracks or use another recordable MD.

"Disc Full" lights up before the maximum number of tracks is reached
Fluctuations in emphasis within tracks are sometimes interpreted as track intervals, incrementing the track count and causing "Disc Full" to light up.

The remaining recording time does not increase even after erasing numerous short tracks
Tracks under 12 seconds in length are not counted and so erasing them may not lead to an increase in the recording time.

Some tracks cannot be combined with others
Track combination may become impossible when tracks are edited.

The total recorded time and the remaining time on the MD may not total the maximum recording time (60 or 74 minutes)
Recording is done in minimum units of 2 seconds each, no matter how short the material. The contents recorded may thus be shorter than the maximum recording capacity. Disc space may also be further reduced by scratches.

Tracks created through editing may exhibit sound dropout during search operations.

Track numbers are not recorded correctly
Incorrect assignment or recording of track numbers may result (1) when CD tracks are divided into several smaller tracks during digital recording, or (2) while recording certain CDs with the "LEVEL-SYNC" indication on (i.e., the automatic track marking function on).

"TOC Reading" appears for a long time
If the inserted recordable MD is brand new, "TOC Reading" appears in the display longer than for MDs that have been used.

Limitations when recording over an existing track
- The correct remaining recording time may not be displayed.
- You may find it impossible to record over a track if that track has been recorded over several times already. If this happens, erase the track using the Erase Function (see page 19).
- The remaining recording time may be shortened out of proportion to the total recorded time.
- Recording over a track to eliminate noise is not recommended since this may shorten the duration of the track.
- You may find it impossible to label a track while recording over it.

The correct recorded/playing time may not be displayed during playback of monaural-format MDs.

Additional Information

Troubleshooting

If you experience any of the following difficulties while using the recorder, use this troubleshooting guide to help you remedy the problem. Should any problem persist, consult your nearest Sony dealer.

The recorder does not operate or operates poorly.
➡The MD may be damaged ("Disc Error" appears). Take the MD out and insert it again. If "Disc Error" remains, replace the MD.

The recorder does not play back.
➡Moisture has formed inside the recorder. Take the MD out and leave the recorder in a warm place for several hours until the moisture evaporates.
➡The recorder is not on. Press POWER to turn the recorder on.
➡The MD is inserted in the wrong direction. Slide the MD into the disc compartment with the label side up and the arrow pointing towards the opening until the recorder grips it.
➡The MD may not be recorded (the music calendar does not appear). Replace the disc with one that has been recorded.

The recorder does not record.
➡The MD is record-protected ("Protected" appears). Close the record-protect slot (see page 7).
➡The recorder is not connected properly to the sound source. Make connections properly to the sound source.
➡The recording level is not adjusted properly (in case of input through LINE IN). Turn REC LEVEL to adjust the recording level properly (see page 8).
➡A premastered MD is inserted. Replace it with a recordable MD.
➡There is not enough time left on the MD. Replace it with another recordable MD with fewer recorded tracks, or erase unnecessary tracks.
➡There has been a power failure or the AC power code has been disconnected. Data recorded to that point may be lost. Repeat the recording procedure.

An incompletely inserted MD cannot be pulled out.
➡The MD recorder's self-lock system has gripped the MD. Insert the MD completely, then press ⏏ EJECT.

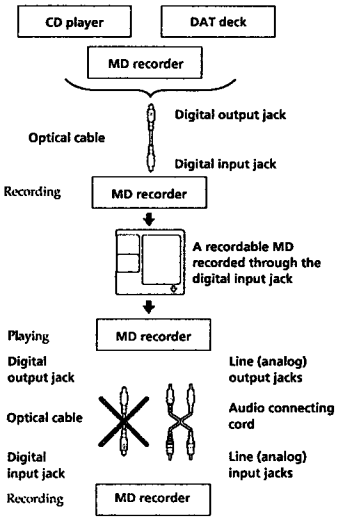
The sound has a lot of static.
➡Strong magnetism from a television or a similar device is interfering with operations. Move the recorder away from the source of strong magnetism.

Note
If the recorder does not operate properly even after you've attempted the prescribed remedies, turn off the power, then reinsert the plug into the power outlet.

Guide to the Serial Copy Management System

This MD recorder uses the Serial Copy Mangement System which allows only a first-generation digital copy to be made of prerecorded software via the MD recorder's digital input/output jacks. An outline of this system appears below:

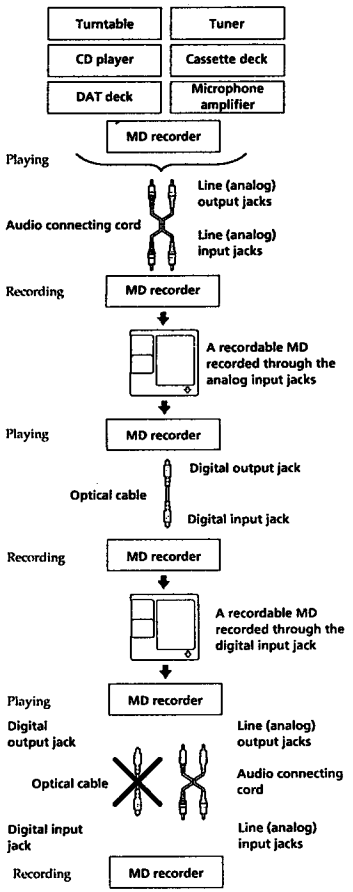
1 You can record from digital program sources (CDs, prerecorded MDs, and DAT equipment with a sampling frequency of 44.1 kHz) onto a recordable MD via the MD recorder's digital input jack. You cannot, however, record from the recorded MD onto another recordable MD via the MD recorder's digital output jack.



Note

There are no copy generation restrictions on recording between two MD recorders connected via their respective analog input/output jacks.

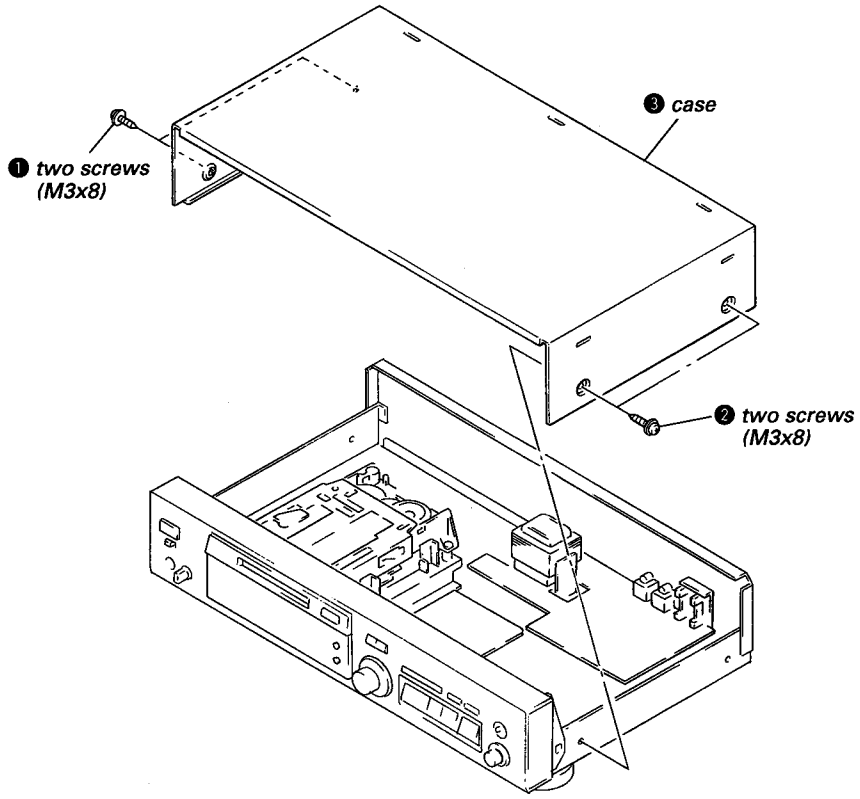
2 You can record from an MD recorded via the MD recorder's analog input jacks to another recordable MD via the MD recorder's digital output jack.
You cannot, however, make a second-generation MD copy via tha MD recorder's digital output jack.



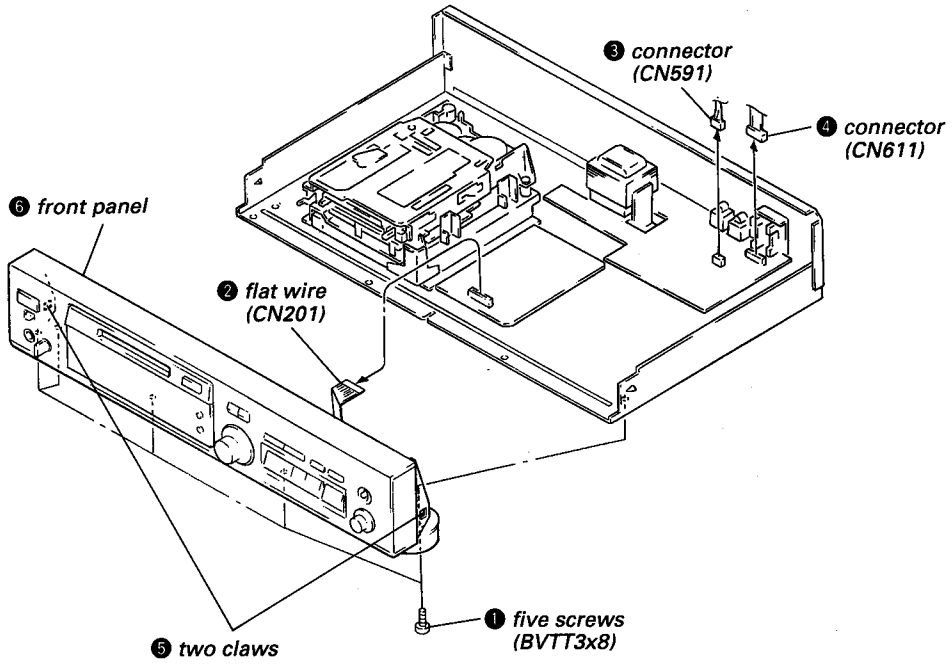
SECTION 2
DISASSEMBLY

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

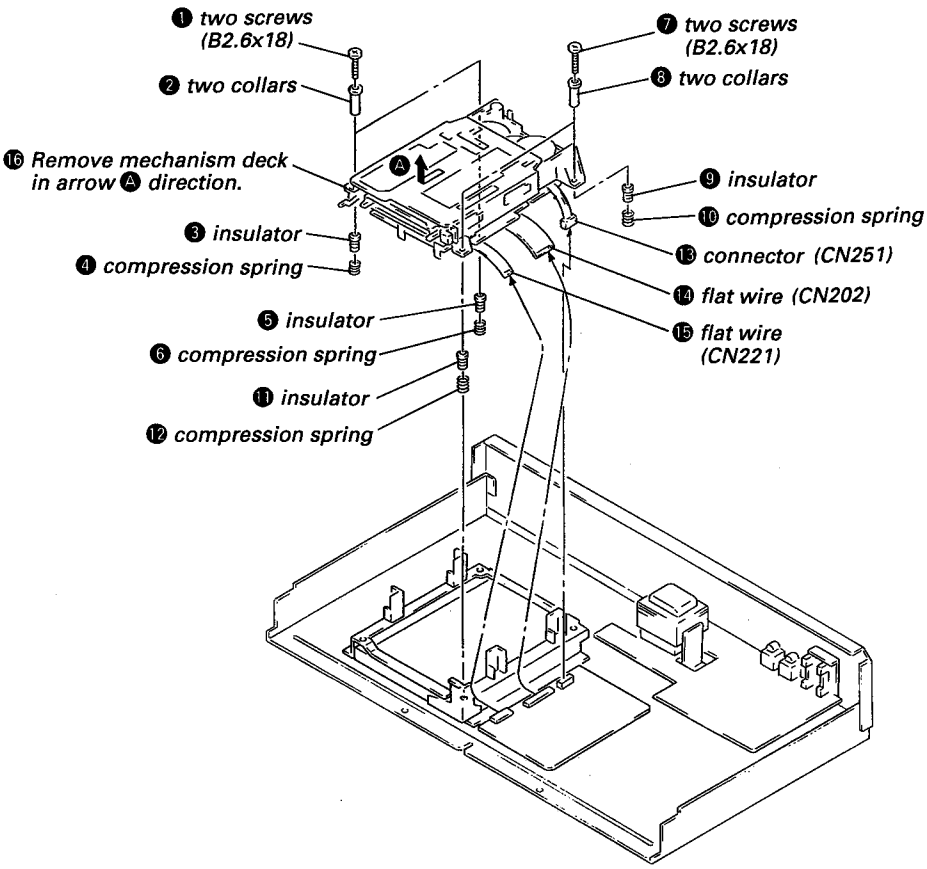
2-1. CASE



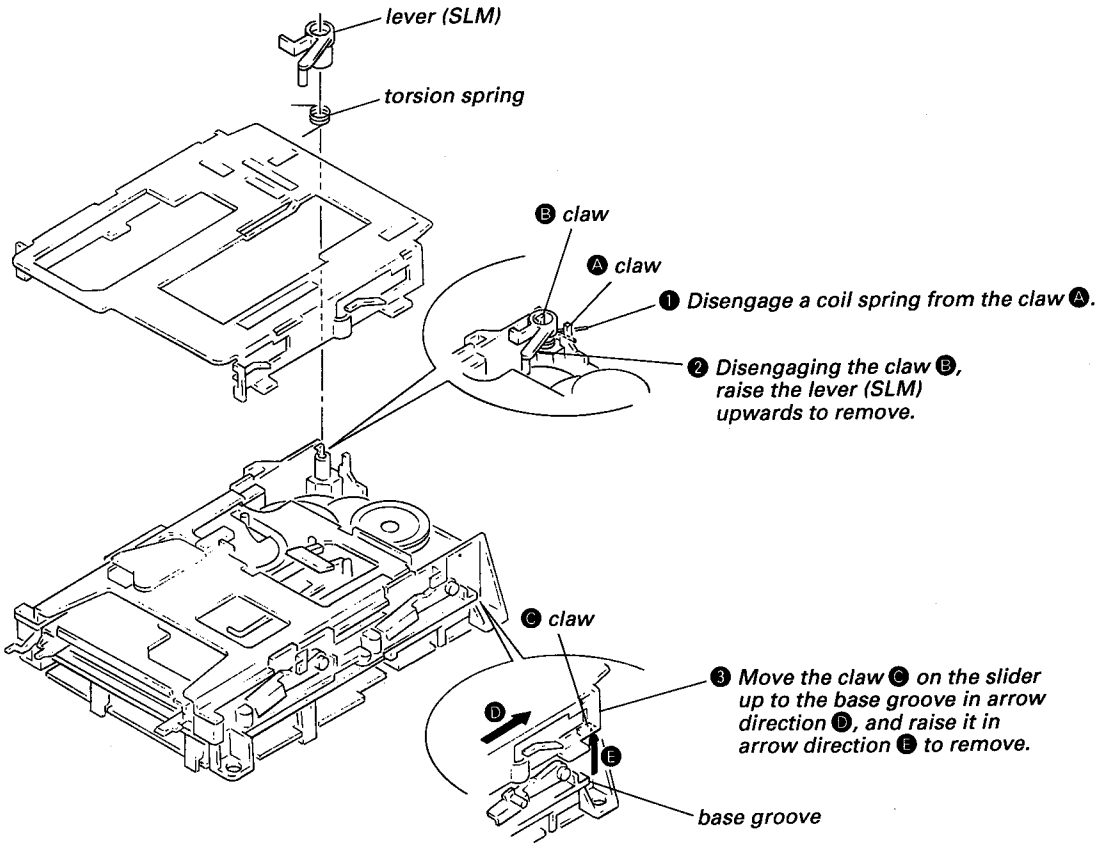
2-2. FRONT PANEL



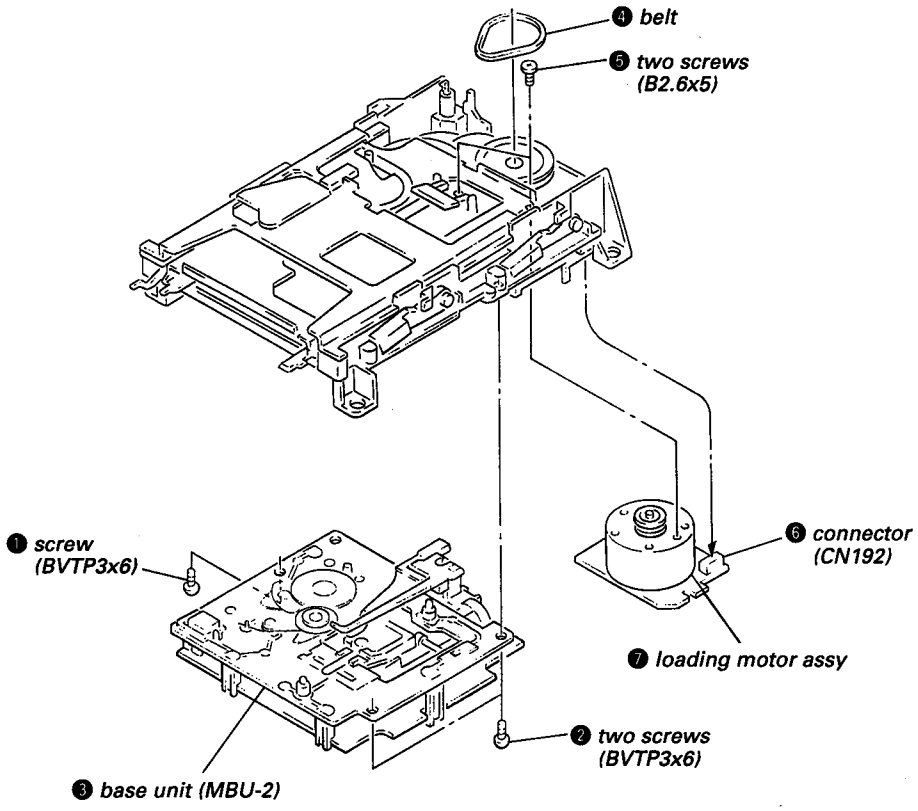
2-3. MECHANISM DECK



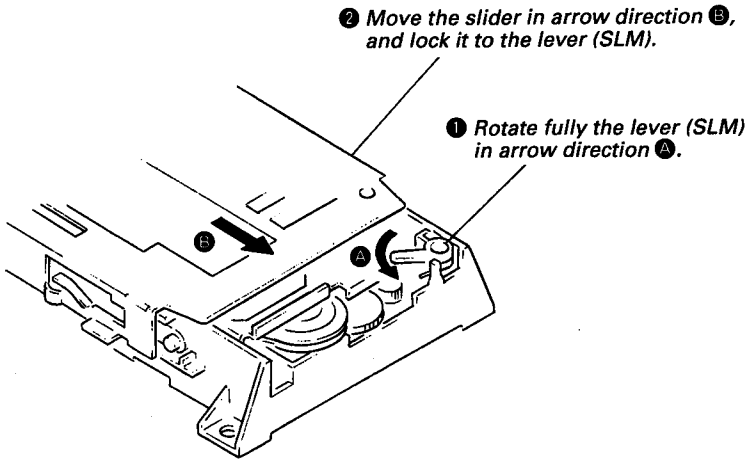
2-4. SLIDER



2-5. BASE UNIT, LOADING MOTOR ASSY



2-6. SLIDER MOUNTING



SECTION 3
DIAGRAMS

3-1. IC PIN FUNCTIONS

• IC101 RF AMP (CXA1981R)

Pin. No.	Signal Name	I/O	Description
1	VC	O	Output terminal for the center point voltage (+2.5V) generated
2—7	A—F	I	Signal input from detector circuit in the optical pick-up block
8	FI	I	Signal (-) input of the operational amplifier for F signal
9	FO	O	Signal output of the operational amplifier for F signal
10	PD	I	Front monitor Connected to the photo diode
11	APCREF	I	Input terminal for the setting of laser power
12	TEMPI	I	Terminal for the connection to temperature sensor
13	GND	—	Ground terminal
14	AAPC	O	LD amplifier output terminal of the APC circuit
15	DAPC	O	Not used (open)
16	TEMPR	O	Output terminal of the reference voltage for temperature sensor
17	XRST	I	Reset signal input from the system controller (IC201) When reset: "L"
18	SWDT	I	Write data signal input from the system controller (IC201)
19	SCLK	I	Clock signal input from the system controller (IC201)
20	XLAT	I	Latch signal input from the system controller (IC201)
21	VREF	O	Reference voltage output Not used this set (open)
22	TENV	O	Not used (open)
23	THLD	I	Not used (connected to the VC)
24	VCC	—	Power supply terminal (+5V)
25	TFIL	I	Not used (open)
26	TE	O	Tracking error signal output to CXD2535AR (IC121)
27	TLB	I	Input terminal of the adder signal to tracking error
28	CSLED	I	Terminal for the sled error lowpass filter
29	SE	O	Sled error signal output to CXD2535AR (IC121)
30	ADFM	O	FM signal output terminal of the ADIP
31	ADIN	I	Input terminal by AC coupling is FM signal of the ADIP
32	ADAGC	I	External capacitor connect terminal for AGC of the ADIP
33	ADFG	O	ADIP double turned FM signal output to CXD2535AR (IC121) (22.05kHz±1kHz)
34	AUX	O	Sub signal output to CXD2535AR (IC121).
35	FE	O	Focus error signal output to CXD2535AR (IC121)
36	FLB	I	Not used (open)
37	ABCD	O	Light amount signal output to CXD2535AR (IC121)
38	BOTM	O	Light amount bottom hold signal output to CXD2535AR (IC121)
39	PEAK	O	Light amount peak hold signal output to CXD2535AR (IC121)
40	RFAGC	I	External capacitor connect terminal of AGC circuit for the RF
41	RF	O	Playback EFM RF signal output to CXD2535AR (IC121)
42	ISET	I	Setting terminal for the internal circuit constant 22KHz, BPF center frequency
43	AGCT	I	Input terminal by AC coupling is RF signal
44	RFO	O	RF signal output terminal
45	MORFI	I	Input terminal by AC coupling is RF signal of the MO
46	MORFO	O	RF signal output terminal of the MO
47, 48	I, J	I	Signal input from detector circuit in the optical pick-up block

• IC121 DIGITAL SIGNAL PROCESSOR, DIGITAL SERVO SIGNAL PROCESSOR, EFM/ACIRC ENCODER/DECODER (CXD2535AR)

Pin. No.	Signal Name	I/O	Description
1	FS256	O	11.2896MHz clock signal output (MCLK system) Not used this set (open)
2	FOK	O	Focus OK signal output to the system controller (IC201) "H" is output when the focus is applied
3	DFCT	O	Defect ON/OFF selection signal output to CXD2536R (IC221)
4	SHCK	O	Track jump detection signal output to the system controller (IC201)
5	SHCKEN	I	Track jump detection enable input Not used this set (Fixed at "H")
6	WRPWR	I	Laser power selection signal input from the system controller (IC201)
7	DIRC	I	Not used this set (Fixed at "H")
8	SWDT	I	Write data signal input from the system controller (IC201)
9	SCLK	I	Serial clock signal input from the system controller (IC201)
10	XLAT	I	Serial latch signal input from the system controller (IC201)
11	SRDT	O	Read data signal output to the system controller (IC201)
12	SENS	O(3)	Internal status (SENSE) output to the system controller (IC201)
13	ADSY	O	ADIP sync signal output Not used this set (open)
14	SQSY	O	Sub-code Q sync (SCOR) output to the system controller (IC201) "L" every 13.3msec, Almost "H"
15	DQSY	O	Digital in U-bit CD format sub-code Q sync (SCOR) output to the system controller (IC201) "L" every 13.3msec, Almost "H"
16	XRST	I	Reset signal input from the system controller (IC201) When reset: "L"
17	TEST4	I	Test input terminal (Fixed at "L")
18	CLVSCK	O	Not used this set (open)
19	TEST5	I	Test input terminal (Fixed at "L")
20	DOUT	O	Output terminal of the digital audio signal (for optical out)
21	DIN	I	Input terminal of the digital audio signal (for optical in)
22	FMCK	O	FM modulation clock signal output of the ADIP
23	ADER	O	ADIP CRC flag output When error: "H"
24	REC	I	Record/playback selection signal input from the system controller (IC201) When recording: "H", When playback: "L"
25	DVSS	—	Ground terminal (Digital system)
26	DOVF	I	Validity flag input terminal for the digital audio out (Fixed at "L")
27	DODT	I	Input terminal of 16-bit data signal for the digital audio out from CXD2536R (IC221)
28	DIDT	O	Output terminal of 16-bit data signal for the digital audio in to CXD2536R (IC221)
29	DTI	I	Record audio data signal input from CXD2536R (IC221)
30	DTO	O(3)	Playback audio data signal output to CXD2536R (IC221)
31	C2PO	O	C2PO (indicate the error state of the data) signal output to CXD2536R (IC221) Playback: C2PO("H"), Digital recording: D.In-Vflag, Analog recording: "L"
32	BCK	O	Bit clock (2.8224MHz) signal output to CXD2536R (IC221) (MCLK system)
33	LRCK	O	L/R clock (44.1kHz) signal output to CXD2536R (IC221) (MCLK system)
34	XTAO	O	System clock (512Fs=22.5792MHz) signal output Not used this set (open)
35	XTAI	I	System clock (512Fs=22.5792MHz) signal input from CXD2536R (IC221)

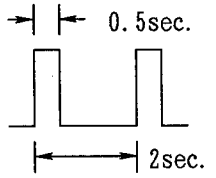
Pin. No.	Signal Name	I/O	Description
36	MCLK	O	MCLK clock (22.5792MHz) signal output
37	XBCK	O	BCK (pin 32) inverted output
38	DVDD	—	Power supply terminal (+5V) (Digital system)
39	WDCK	O	WDCK clock (88.2kHz) signal output (MCLK system)
40	RFCK	O	RFCK clock (7.35kHz) signal output (MCLK system)
41	WFCK	O	WFCK clock (7.35kHz) signal output (When playback: EFM decoder PLL system, When recording: EFM encoder PLL system)
42	GTOP	O	Opens the playback EFM frame sync protection window when "H"
43	GFS	O	The playback EFM frame sync and interpolation protection timing match when "H"
44	XPLCK	O	EFM decoder PLL clock (98Fs=4.3218MHz) signal output Falling edge of the EFM PLL clock and the EFM signal match
45	EFMO	O	EFM signal output (When recording)
46	RAOF	O	Overflow detection signal output of the internal RAM (Decoder monitor out) RAOF is a signal generated when the 32k RAM exceeds the ±4F jitter margin
47	MVCI	I	Oscillation input for PLL of the digital in Not used this set (Fixed at"L")
48	TEST2	I	Test input terminal (Fixed at "L")
49	DIPD	O(3)	Phase comparator output for PLL of the digital in When the internal VCO: Frequency; Low→"H", When the external VCO: Frequency; Low→"L"
50	DVSS	—	Ground terminal (Digital system)
51	DICV	I(A)	Control voltage input terminal of the internal VCO for digital in PLL
52	DIFI	I(A)	Filter input terminal of the internal VCO for digital in PLL
53	DIFO	O(A)	Filter output terminal of the internal VCO for digital in PLL
54	AVDD	—	Power supply terminal (+5V) (Analog system)
55	ASYO	O	Playback EFM full-swing output (L=VSS, H=VDD)
56	ASYI	I(A)	Playback EFM asymmetry comparate voltage input terminal
57	BIAS	I(A)	Playback EFM asymmetry circuit constant current input terminal
58	RFI	I(A)	Playback EFM RF signal input from CXA1981R (IC101)
59	AVSS	—	Ground terminal (Analog system)
60	CLTV	I(A)	VCO control voltage input terminal of the PLL for decoder PLL master clock
61	PCO	O(3)	Phase comparator output terminal of the PLL for decoder PLL master clock
62	FILI	I(A)	Filter input terminal of the PLL for decoder PLL master clock
63	FILO	O(3)	Filter output terminal of the PLL for decoder PLL master clock
64	PEAK	I(A)	Light amount peak hold signal input from CXA1981R (IC101)
65	BOTM	I(A)	Light amount bottom hold signal input from CXA1981R (IC101)
66	ABCD	I(A)	Light amount signal input from CXA1981R (IC101)
67	FE	I(A)	Focus error signal input from CXA1981R (IC101)
68	AUX1	I(A)	Sub signal input from CXA1981R (IC101)
69	VC	I(A)	Center point voltage (+2.5V) input from CXA1981R (IC101)
70	ADIO	O(A)	Monitor output of the A/D converter input signal

Pin. No.	Signal Name	I/O	Description
71	TEST3	I(A)	Test input terminal (Fixed at "L")
72	AVDD	—	Power supply terminal (+5V) (Analog system)
73	ADRT	I(A)	A/D converter action limits (upper side) voltage input (Fixed at "H")
74	ADRB	I(A)	A/D converter action limits (lower side) voltage input (Fixed at "L")
75	AVSS	—	Ground terminal (Analog system)
76	SE	I(A)	Sled error signal input from CXA1981R (IC101)
77	TE	I(A)	Tracking error signal input from CXA1981R (IC101)
78	AUX2	I(A)	Sub signal input terminal (2) Not used this set (Fixed at "L")
79	DCHG	I(A)	Connected to the ground
80	APC	I(A)	Input terminal for the laser APC Not used this set (Fixed at "L")
81	TEST1	I	Test input terminal (Fixed at "L")
82	ADFG	I	ADIP double turned FM signal input from CXA1981R (IC101) (22.05kHz±1kHz) (TTL schmidt input)
83	TS25	I	Test input terminal (Fixed at "L")
84	LDDR	O	Laser APC signal output
85	TRDR	O	Tracking servo drive signal output (−)
86	TFDR	O	Tracking servo drive signal output (+)
87	FFDR	O	Focus servo drive signal output (+)
88	DVDD	—	Power supply terminal (+5V) (Digital system)
89	FRDR	O	Focus servo drive signal output (−)
90	FS4	O	176.4kHz clock signal output (MCLK system)
91	SRDR	O	Sled servo drive signal output (−)
92	SFDR	O	Sled servo drive signal output (+)
93	SPRD	O	Spindle servo drive signal output (−)
94	SPFD	O	Spindle servo drive signal output (+)
95	DCLO	O	Not used (open)
96	DCLI	I	Not used (Fixed at "H")
97	XDCL	O	Not used (open)
98	OFTRK	O	Offtrack signal output
99	COUT	O	Traverse count signal output
100	DVSS	—	Ground terminal (Digital system)

* (3) of I/O is state output and (A) is analog output.

• IC201 SYSTEM CONTROLLER (M37610MD-050FP)

Pin. No.	Signal Name	I/O	Description
1	C.SET 1	I	Fixed at "L"
2	C.SET 0	I	Fixed at "L"
3	KEY 3	I	Key input terminal Not used this set (Fixed at "L")
4−6	KEY 2−KEY 0	I	Key input terminal (A/D input) *1
7		I	Fixed at "L"
8	XINT	I	Interruption status input from CXD2536R (IC221)
9	SENS	I	Internal status (SENSE) input from CXD2535AR (IC121)
10	SHCK	I	Track jump signal input from CXD2535AR (IC121)
11	AUBK	I	Audio bus signal input (Not used this set)
12	$\overline{S}$/A	O	Sircs remote controller/audio bus selection signal output (Not used this set)
13	BEEP SW	I	Fixed at "L"
14	$\overline{REC}$/OTHER	O	When recording: "L", Others: "H" (Not used this set)
15	BEEP	O	Buzzer signal output (Not used this set)
16	F.BIAS/C2	I	Fixed at "L"
17	GND (CNVSS)	—	Ground terminal
18	SYSTEM RST	I	System reset signal input "H" after several hundred ms of "L" after power start-up
19	XIN T	I	Not used this set (Fixed at "L")
20	XOUT T	O	Not used this set (Fixed at "L")
21	GND	—	Ground terminal
22	XIN	I	8MHz crystal oscillator input
23	XOUT	O	8MHz crystal oscillator output
24	+5V	—	Power supply terminal (+5V)
25	STB	O	Strobe signal output to the power supply circuit When power ON: "H", When standby: "L"
26, 27	MIC SW	I	Fixed at "L"
28	BUS OUT	O	Audio bus signal output
29		I	Fixed at "L"
30, 31	LED 2, LED 1	I	Not used this set (Connected to the ground)
32	LED 0	O	Drive signal output to LED (D701) for the power ON/standby indicator When power ON: "H", When standby: "L"
33	C1	I	Fixed at "L"
34	ADER	I	Fixed at "L"
35	N.C.	I	Fixed at "L"
36	MASTER/SLAVE	I	Master/slave selection signal input (Fixed at "H")
37, 38	JOG 1, JOG 0	I	JOG dial pulse input from the rotary encoder (S701)
39	SDA	I/O	Backup memory (IC171) data bus
40	SCL	O	Clock signal output to the backup memory (IC171)
41	POWER DOWN	I	Power down detection input Normally: "H" input
42	REMOCON	I	Remote control signal input
43	ATSY	I	ATP address sync or sub-code Q sync (SCOR) input from CXD2535AR (IC121) "L" every 13.3msec, Almost "H"
44	DQSY	I	Input the U-bit CD format sub-code Q sync (SCOR) of the digital in from CXD2535AR (IC121) "L" every 13.3msec, Almost "H"
45−48		I	Fixed at "L"

Pin. No.	Signal Name	I/O	Description
49	SCLK	O	Clock signal output to the serial bus
50	SWDT	O	Write data signal output to the serial bus
51	SRDT	I	Read data signal input from the serial bus
52		I	Connected to the pin 51
53	FLCLK	O	Serial clock signal output to the display driver (IC701)
54	FLDATA	O	Serial data signal output to the display driver (IC701)
55	FLCS	O	Chip select signal output to the display driver (IC701)
56		I	Fixed at "L"
57	TEST 0	I	Fixed at "L"
58	TEST 1	O	Reset signal output to CXD2536R (IC221)
59, 60		I	Fixed at "L"
61	AFAST	I	Fixed at "L"
62	SLOW	I	Fixed at "L"
63	LDON	O	Laser ON/OFF control signal output When laser ON: "H"
64	P/GROOVE	I	PIT/GROOVE detection input "H": Disc for playing and TOC area Not used this set (Fixed at "L")
65	FOK	I	Focus OK signal input from CXD2535AR (IC121) "H" is input when the focus is applied
66	MON	I	Not used this set (Input and the pull-down)
67	LOCK	O	Not used this set (Output and the pull-down)
68	WRPWR	O	Laser power selection signal output to the optical pick-up block and CXD2535AR (IC121)
69	DIG RST	O	Reset signal output to CXA1981R (IC101), CXD2535AR (IC121), and the motor driver (IC151) When reset: "L"
70	DA RST	O	Reset signal output to D/A converter (IC281) and the A/D converter (IC261) When reset: "L"
71, 72	SCMD1, SCMD0	O	Serial command control mode signal output to CXD2536R (IC221)
73	MOD	O	Laser modulation selection signal output When playback power: "L", When stop: "H", When recording power: 
74	REC/PB	O	Recording/playback selection signal output to CXD2535AR (IC121) When recording: "H", When playback: "L"
75	WR/MN	O	Write/monitor mode selection signal output to CXD2536R (IC221)
76	SCTX	O	Writing data transmission timing output to CXD2536R (IC221) Used together with the magnetic field head ON/OFF output
77	XLATCH	O	Latch signal output to the serial bus
78	DFLATCH	O	Latch signal output to the D/A converter (IC281)
79	DFMUTE	O	Muting signal output Not used this set (Connected to the ground)
80	AMUTE	O	Line out muting signal output
81	LDOUT	O	Loading motor (M191) control output *2
82	LDIN	O	Loading motor (M191) control output *2
83	CHKIN	I	Detection signal input from the chucking in switch (S193) When chucking: "L"

Pin. No.	Signal Name	I/O	Description
84	INSW	I	Detection signal input from the loading in switch (S191) "L" at the position where the head descends, Others: "H"
85	OUTSW	I	Detection signal input from the loading out switch (S192) "L" at the position of load out, Others: "H"
86	PROTECT	I	Rec proof detection signal input from the protect detector switch (S102-1) When protect: "H"
87	REFLECT	I	Disc reflection rate detection signal input from the reflect detector switch (S102-2) "H": Low reflection rate disc
88	LIMIT IN	I	Detection signal input from the limit in switch (S101) When sled limit in: "L"
89—92	232C.4— 232C.1	I	Input terminal for the RS232C expansion Not used this set (Fixed at "L")
93—96		I	Fixed at "L"
97	AVSS (AGND)	—	Ground terminal
98	VREF (+5V)	I	Reference voltage input (+5V)
99	TIMER REC/ PLAY	I	Timer record/timer playback/timer OFF selection signal input terminal When timer recording: "H", When timer playback: "L", When timer OFF: Center point voltage (+2.5V)
100	INPUT SELECT	I	Analog/digital in selection signal input terminal When analog in: "L", When digital in: "H"

*1 Key input

Terminal \ Voltage	0V	0.9V	1.75V	2.5V	3.4V	4.2V	5V
KEY 0 pin 6	S771 ●	S772 ■		S774 ▶▶	S775 ◀◀	S776 ⏏EJECT	No key input
KEY 1 pin 5	S761 PLAY MODE	S762 REPEAT	S763 CLOCK SET	S764 POWER			No key input
KEY 2 pin 4	S751 EDIT NO	S752 YES	S753 ▯▯	S754 ▷		S756 DISPLAY	No key input

*2 Loading motor control

Terminal \ Mode	IN	OUT	BRAKE
LDIN pin 82	"H"	"L"	"H"
LDOUT pin 81	"L"	"H"	"H"

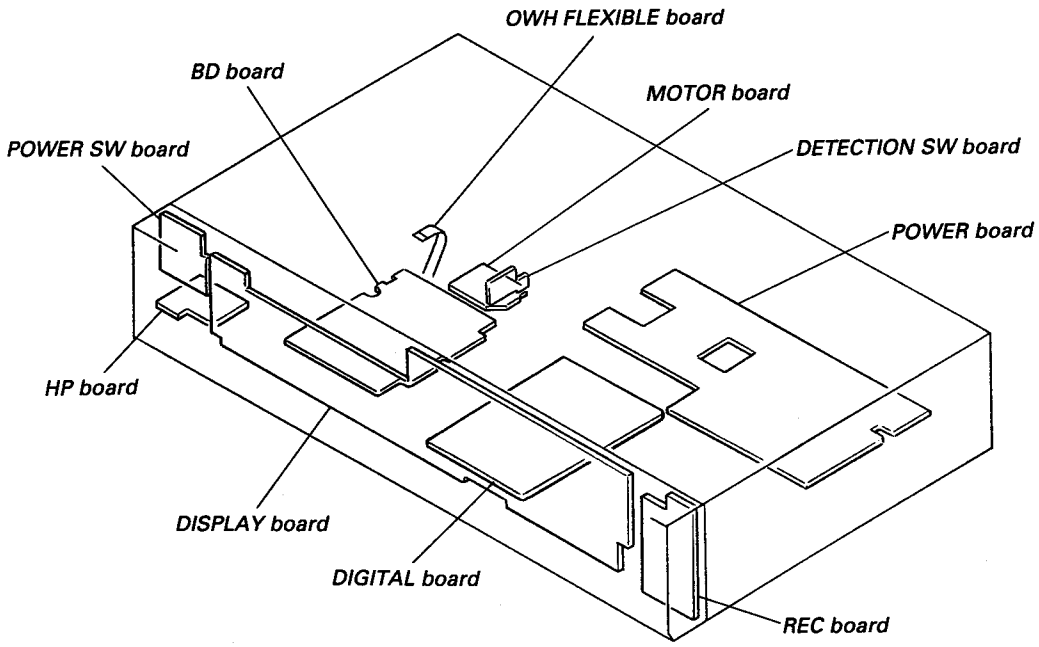
• IC221 SHOCK PROOF MEMORY CONTROLLER, ATRAC ENCODER/DECODER (CXD2536R)

Pin. No.	Signal Name	I/O	Description
1	VDD	—	Power supply terminal (+5V)
2	SWDT	I	Write data signal input from the system controller (IC201)
3	SCK	I	Serial clock signal input from the system controller (IC201)
4	XLAT	I	Serial latch signal input from the system controller (IC201)
5	SRDT	O/Z	Read data signal output to the system controller (IC201)
6	SENSE	O/Z	Internal status (SENSE) output to the system controller (IC201)
7	SCMD0	I	Serial command control mode input from the system controller (IC201)
8	SCMD1	I	Serial command control mode input from the system controller (IC201)
9	XINT	O	Interruption status output to the system controller (IC201)
10	RCPB	I	Record/playback selection signal input Not used this set (Fixed at "L")
11	WRMN	I	Write/monitor mode selection signal input from the system controller (IC201)
12	TX	I	Writing data transmission timing input from the system controller (IC201) Used together with the magnetic field head ON/OFF output
13	VSS	—	Ground terminal
14	SICK	I	Chip reserve terminal (Fixed at "L")
15	IDSL	I	Chip reserve terminal (Fixed at "L")
16	XILT	I	Chip reserve terminal (Fixed at "H")
17	XRST	I	Reset signal input from the system controller (IC201) When reset: "L"
18—21	TS0—TS3	I	Test input terminal (Fixed at "L")
22	EXIR	I	Chip reserve terminal (Fixed at "H")
23	SASL	I	Single use the block selection "L": ATRAC, "H": RAM controller (Fixed at "L")
24	SNGLE	I	Normally fixed at "L", Fixed at "H" when the ATRAC or RAM controller is single used Fixed at "L"
25	VSS	—	Ground terminal
26	AIRCPB	O	Record/playback mode signal output terminal of the ATRAC or external audio block
27	XRQ	I/O	XRQ signal input/output terminal of the ATRAC interface
28	ADTO	I/O	Decoder data signal input/output terminal of the ATRAC
29	ADTI	I/O	Encoder data signal input/output terminal of the ATRAC
30	XALT	I/O	XALT signal input/output terminal of the ATRAC interface
31	ACK	I/O	ACK signal input/output terminal of the ATRAC interface
32	AC2	I/O	Error data signal input/output terminal of the ATRAC interface
33	LCHST	I/O	Lch Start data signal input/output terminal of the ATRAC interface
34	EXE	I/O	EXE signal input/output terminal of the ATRAC interface
35	MUTE	I/O	MUTE signal input/output terminal of the ATRAC interface
36	OSCO	O	45MHz clock oscillation output
37	OSCI	I	45MHz clock oscillation input
38	VSS	—	Ground terminal
39	ATT	I/O	ATT signal input/output terminal of the ATRAC interface
40	F86	O	11.6msec timing signal output terminal of the ATRAC block
41	DOUT	O	Monitor/audio decode data signal output to the D/A converter (IC281)
42	ADIN	I	Recording data signal input from the A/D converter (IC261)
43	ABCK	O	Bit clock signal output to the A/D, D/A converter (IC261, 281)

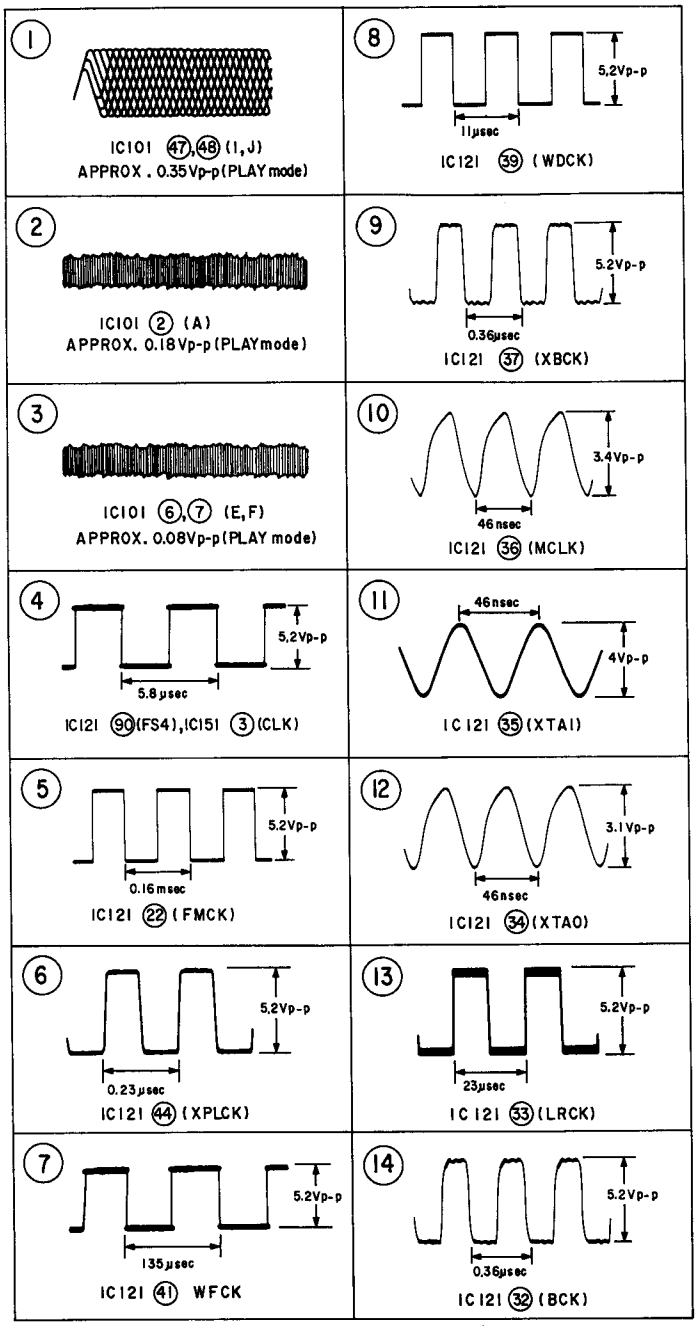
Pin. No.	Signal Name	I/O	Description
44	ALRCK	O	L/R clock signal output to the A/D, D/A converter (IC261, 281)
45−47	SA2−SA0	O	Address signal output Not used this set (open)
48, 49	A11, A10	O	Address signal output Not used this set (open)
50	VSS	−	Ground terminal
51	VDD	−	Power supply terminal (+5V)
52−55	A03−A00	O	Address signal output to the RAM (IC222)
56−60	A04−A08	O	Address signal output to the RAM (IC222)
61	XOE	O	Output enable control signal output to the RAM (IC222)
62	XCAS	O	Column address strobe signal output to the RAM (IC222)
63	VSS	−	Ground terminal
64	XCS	O	Chip select signal output to the RAM (IC222)
65	A09	O	Address signal output to the RAM (IC222)
66	XRAS	O	Row address strobe signal output to the RAM (IC222)
67	XWE	O	Write enable control signal output to the RAM (IC222)
68, 69	D1, D0	I/O	RAM (IC222) data bus
70, 71	D2, D3	I/O	RAM (IC222) data bus
72−74	D4−D6	I/O	Data bus Not used this set (open)
75	VSS	−	Ground terminal
76	D7	I/O	Data bus Not used this set (open)
77	ERR	I/O	Input/output terminal of the error (C2PO) data signal to the external RAM Not used this set (open)
78	EXTC2R	I	External RAM selection signal input for the error data writing (When "H": External RAM) Fixed at "L"
79	BUSY	O	BUSY signal output of the RAM access Not used this set (open)
80	EMP	O	Empty or before the full of the ATRAC data (When DSC=ASC+1: "H")
81	FUL	O	Full or before the empty of the ATRAC data (When ASC=DSC+1: "H")
82	EQL	O	Empty of the ATRACK data (When DSC=ASC: "H")
83	MDLK	O	Indicate the main/sub of the recording or playback data (When the sub and linking: "H", When the main: "L")
84	CPSY	O	Interpolation sync signal output
85	CTMD0	O	DSC counter mode output
86	CTMD1	O	DSC counter mode output
87	SPO	O	System clock (512Fs=22.5792MHz) signal output to CXD2535AR (IC221)
88	VSS	−	Ground terminal
89	MDSY	O	Sync detection signal output of the main data
90	LRCK	I	L/R clock (44.1kHz) signal input from CXD2535AR (IC221)
91	BCK	I	Bit clock (2.8224MHz) signal input from CXD2535AR (IC221)
92	C2PO	I	C2PO (indicate the error mode of the data) signal input from CXD2535AR (IC221) When playback: C2PO ("H"), When digital recording: D.IN-Vflag, When analog recording: "L"
93	DATA	I/O	When recording: Record audio data signal output to CXD2535AR (IC221), When playback: Playback audio data signal input from CXD2535AR (IC221)
94	DIDT	I	16-bit data input terminal for the digital audio in from the CXD2535AR (IC221)
95	DODT	O	16-bit data output terminal for the digital audio out from the CXD2535AR (IC221)

Pin. No.	Signal Name	I/O	Description
96	DIRCPB	O	Disc drive, Record or playback mode output of the EFM encoder/decoder Not used this set (open)
97	MIN	I	Defect ON/OFF selection signal input from CXD2535AR (IC121)
98	SPOSL	I	IN/OUT selection input terminal of the pin 87 ("L":IN, "H":OUT) Fixed at "H"
99	MCKT1	O	Internal master clock signal output terminal of the RAM controller
100	VSS	—	Ground terminal

3-2. CIRCUIT BOARDS LOCATION



• Waveforms



• Semiconductor Location

Ref. No.	Location
D101	C-6
D155	F-11
D161	B-8
D181	C-2
D183	C-2
IC101	D-10
IC102	D-11
IC121	F-9
IC122	D-9
IC151	G-12
IC171	D-8
IC172	C-10
IC181	C-12
IC182	C-11
IC191	G-5
Q101	B-9
Q151	F-12
Q162	B-10
Q163	B-8
Q164	B-8
Q181	C-1
Q182	C-1

Note on Printed Wiring Board:

- o—— : parts extracted from the component side.
- —— : parts extracted from the conductor side.
- ⊗ : Through hole.
- ▒▒ : Pattern from the side which enables seeing.

(The other layer's patterns are not indicated.)

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
D501	H-8
D502	H-7
D503	G-8
D504	G-8
D505	I-9
D506	J-8
D521	H-7
D522	H-7
D523	I-6
D531	I-5
D532	I-5
D551	H-6
D552	H-6
D581	J-4
D582	J-4
D701	B-1
IC501	I-8
IC511	J-7
IC521	J-7
IC531	H-4
IC541	F-6
IC551	H-6
IC561	F-5
IC571	I-2
IC591	F-3
IC621	E-5
IC622	E-4
IC623	E-5
IC701	B-7
IC702	A-4
Q531	I-6
Q532	H-6
Q551	G-7
Q581	I-3
Q583	H-3
Q584	H-3
Q585	H-2
Q586	H-3
Q701	B-2

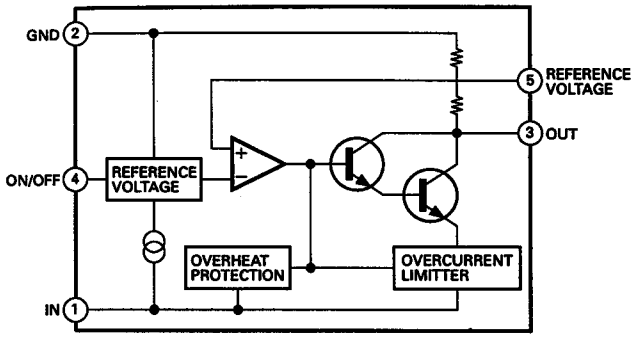
Note on Printed Wiring Board:

- o—— : parts extracted from the component side.
- ■ : parts mounted on the conductor side.
- ▒▒ : Pattern on the side which is seen.

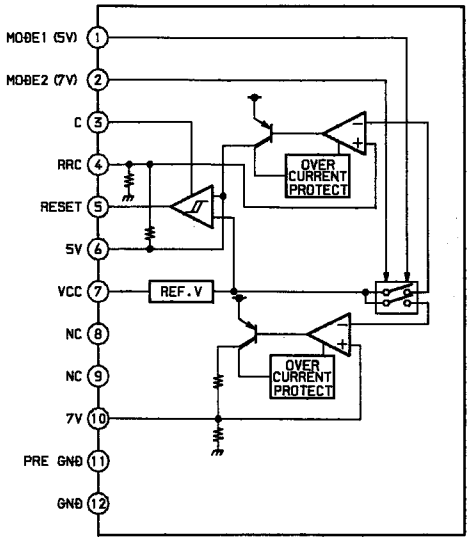
• IC Block Diagrams

— DISPLAY/POWER SUPPLY Section —

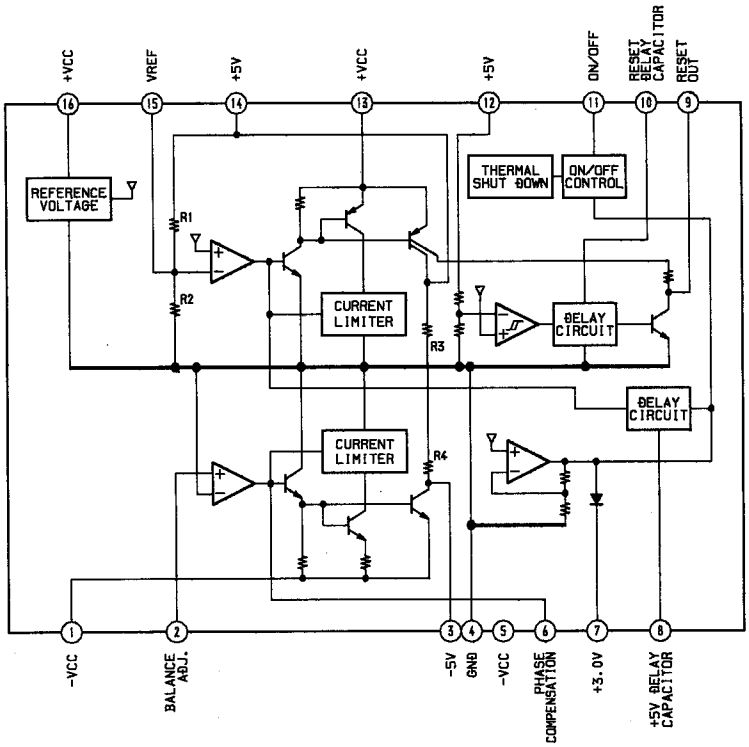
IC501 M5293L



IC511 BA3963

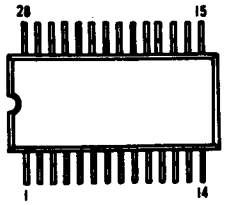


IC561 M5294P



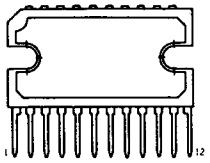
3-9. SEMICONDUCTOR LEAD LAYOUTS

AK5340-VS
CXD2564AM

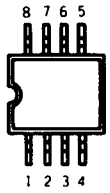


(TOP VIEW)

BA3963

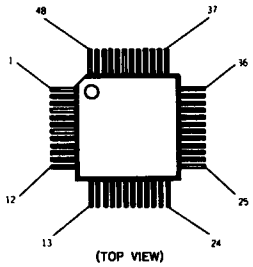


BA6287F
NJM2100V
RC4556MA
RC5532M
TC7WU04F
TL082CPS
TLV2362IPW-ELM1500
μPC842G2
X24C01S



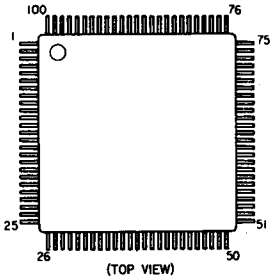
(TOP VIEW)

CXA1981R



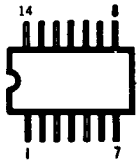
(TOP VIEW)

CXD2535AR
CXD2536R



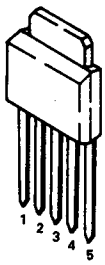
(TOP VIEW)

HD74HC00FPEL
TC74HCU04AF

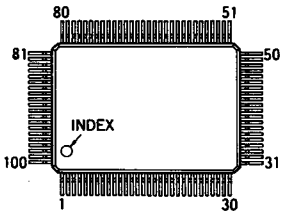


(TOP VIEW)

L88MS05T-FA

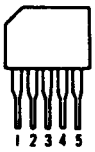


M37610MD-050FP

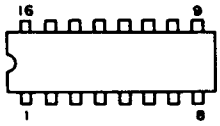


(TOP VIEW)

M5293L
M62005L

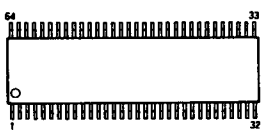


M5294P



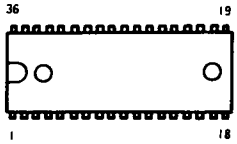
(TOP VIEW)

M66004M8FP

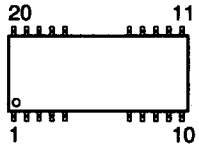


(TOP VIEW)

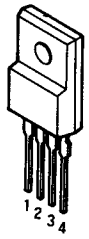
MPC17A38VMEL



MSM514400BSJADR1-K

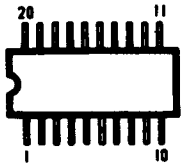


PQ05RF1
PQ30RV21



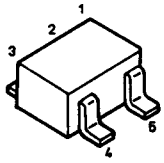
1 : V IN 3 : GND
2 : V OUT 4 : ON/OFF CONTROL

TC74ACT540FS

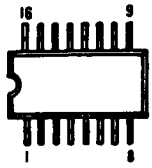


(TOP VIEW)

TC7SU04F

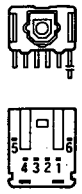


TC9246F-TP1



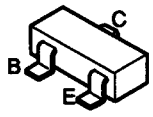
(TOP VIEW)

TORX176
TOTX176

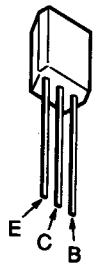


TORX176:	TOTX176:
1. OUT PUT	1. GND
2. GND_1	2. LED • R
3. V_{CC}	3. V_{CC}
4. GND_2	4. IN
5. CASE	5. NC
6. CASE	6. NC

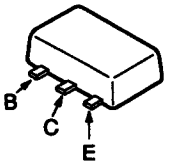
DTA123JU
DTA144EK
DTA144EU
DTC144EU
UN2213
2SB1295-UL6
2SD601A-S



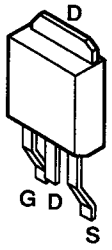
UN4111



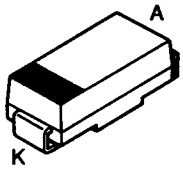
2SB798-DL



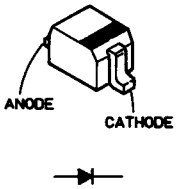
2SJ278MY
2SK1764KY



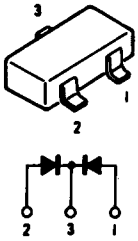
EC10DS2
EC10QS-04
F1P2STP



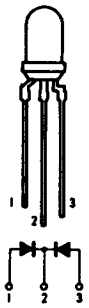
1SS352
1SS355



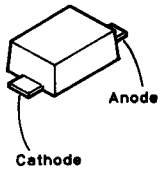
HVM17-01



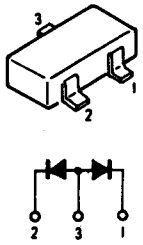
SEL1516W



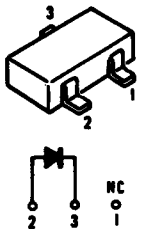
MA8027-L
MA8051-H



1SS181



1SS322-TE85L



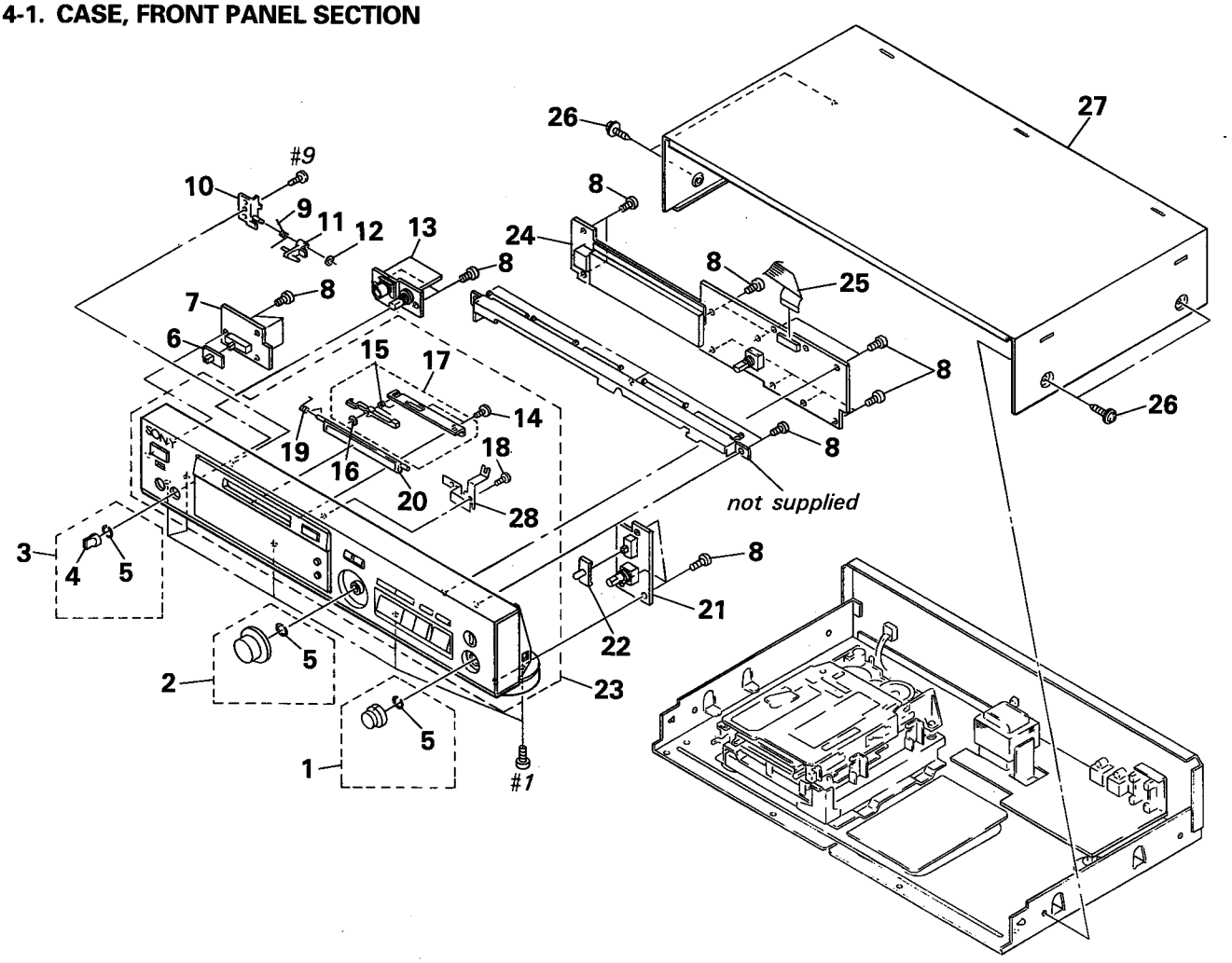
SECTION 4
EXPLODED VIEWS

NOTE:
- –XX, –X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts
  Example:
  KNOB, BALANCE (WHITE)...(RED)
  ↑ ↑
  Parts color Cabinet's color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (#mark) list and accessories and packing materials are given in the last of this parts list.

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

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

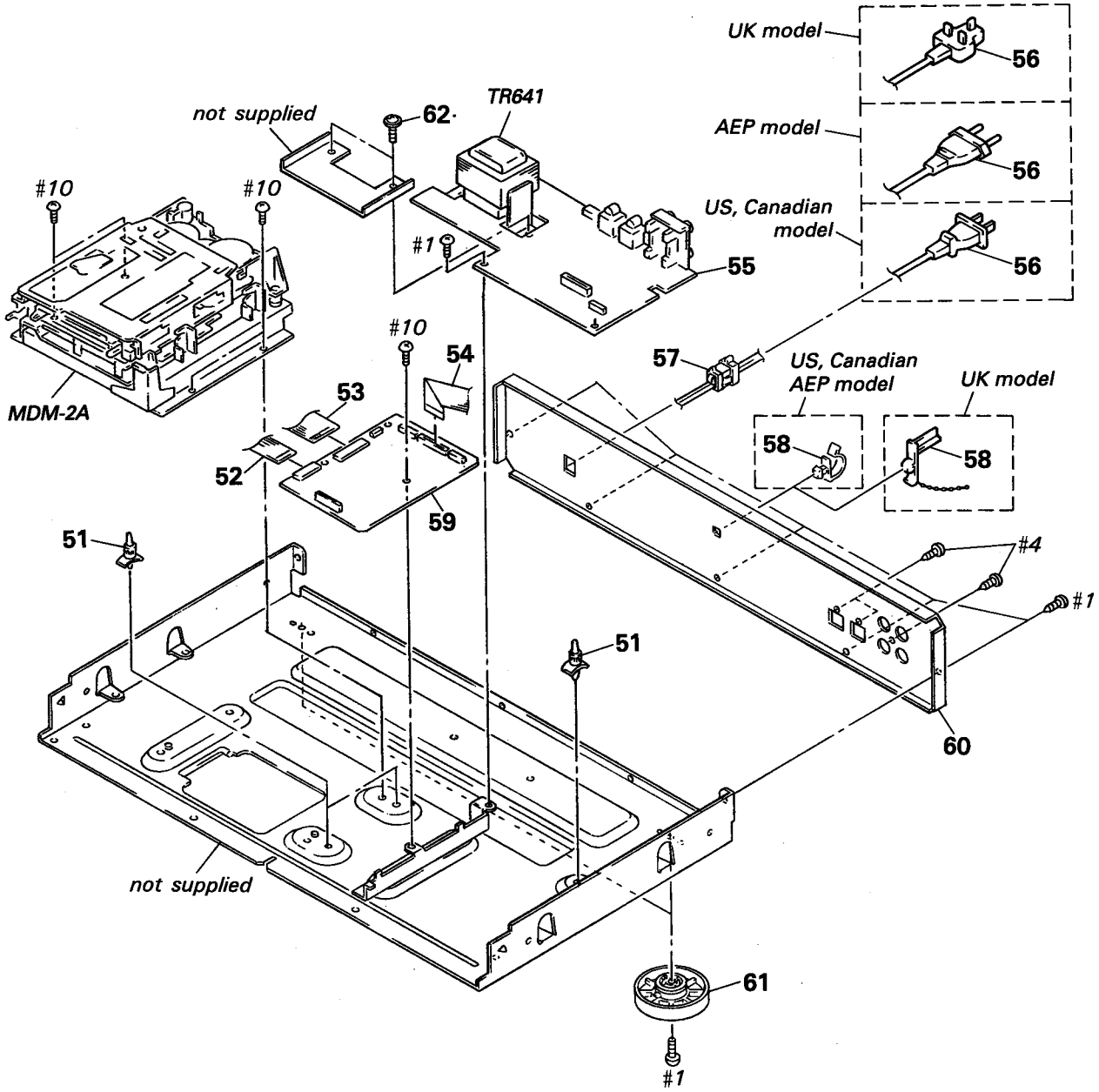
4-1. CASE, FRONT PANEL SECTION



Ref. No.	Part No.	Description	Remark
1	X-4945-244-1	KNOB (REC) ASSY	
2	X-4945-243-1	KNOB (AMS) ASSY	
3	A-2003-693-A	KNOB (DIA. 10) ASSY	
4	3-354-931-01	KNOB (DIA.10)	
5	3-354-981-01	SPRING (SUS), RING	
6	4-922-518-01	KNOB (INPUT)	
* 7	1-654-135-11	POWER SW BOARD	
8	4-951-620-01	SCREW (2.6X8), +BVTP	
9	4-969-215-01	SPRING, TORSION	
10	X-4945-242-1	BRACKET (LEVER LID) ASSY	
11	4-969-213-01	LEVER (LID)	
12	3-681-678-00	WASHER, SLIT	
* 13	1-654-134-11	HP BOARD	
14	4-908-618-21	SCREW (+BTP) (2X6)	

Ref. No.	Part No.	Description	Remark
15	4-970-768-01	SPRING, TORSION	
16	3-315-384-31	WASHER, STOPPER	
17	X-4945-420-1	BRACKET (LOCK LEVER) ASSY	
18	4-887-321-11	SCREW (B1.7) (G), TAPPING	
19	4-969-236-01	SPRING (LID), TORSION	
20	4-969-226-01	LID (CARTRIDGE)	
* 21	1-654-136-11	REC BOARD	
22	3-917-216-11	KNOB (TIMER)	
23	X-4945-241-1	PANEL ASSY, FRONT (US, Canadian)	
23	X-4945-282-1	PANEL ASSY, FRONT (AEP, UK)	
* 24	A-4673-242-A	DISPLAY BOARD, COMPLETE	
25	1-769-120-11	WIRE (FLAT TYPE) (22 CORE)	
26	3-704-366-01	SCREW (CASE) (M3X8)	
27	4-972-197-01	CASE	
28	4-972-367-01	PLATE, GROUND	

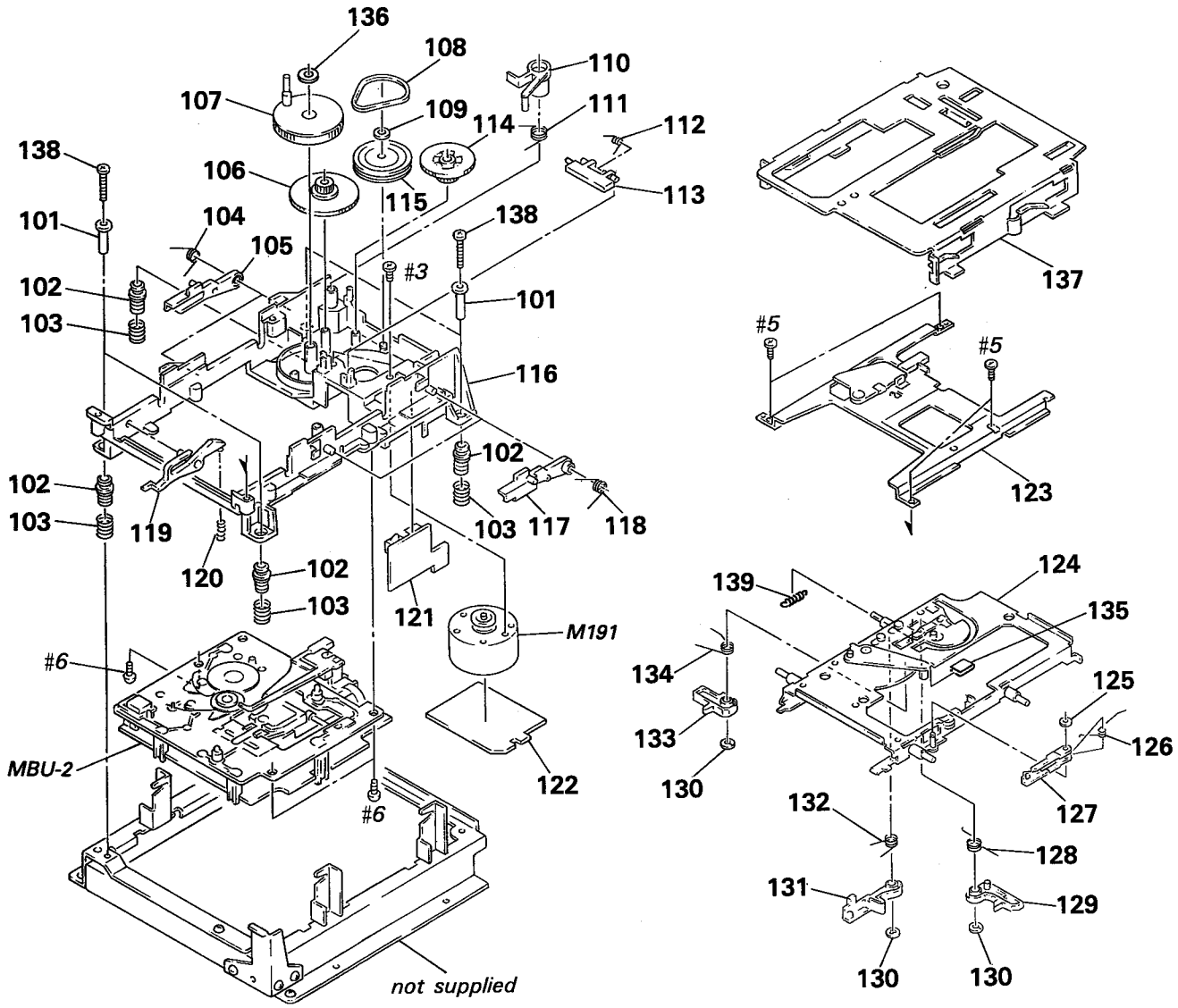
4-2. CHASSIS SECTION



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les components 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
51	3-703-353-03	SUPPORT, PC BOARD	
52	1-769-119-11	WIRE (FLAT TYPE) (18 CORE)	
53	1-769-118-11	WIRE (FLAT TYPE) (30 CORE)	
54	1-769-123-11	WIRE (FLAT TYPE) (22 CORE)	
* 55	A-4673-238-A	POWER BOARD, COMPLETE	
⚠56	1-558-945-21	CORD, POWER (POLAR. SPT-1) (US, Canadian)	
⚠56	1-696-586-11	CORD, POWER (UK)	
⚠56	1-751-275-11	CORD, POWER (AEP)	
* 57	3-703-244-00	BUSHING (2104), CORD (AEP, UK)	
* 57	3-703-571-11	BUSHING (S) (4516), CORD (US, Canadian)	
* 58	4-949-235-01	HOOK (US, Canadian, AEP)	
* 58	4-956-370-02	BAND, PLUG FIXED (UK)	
* 59	A-4673-240-A	DIGITAL BOARD, COMPLETE	
* 60	4-969-228-01	PANEL, BACK (US)	
* 60	4-969-228-21	PANEL, BACK (Canadian)	
* 60	4-969-228-31	PANEL, BACK (AEP)	
* 60	4-969-228-41	PANEL, BACK (UK)	
61	4-956-885-01	FOOT (F58175S2W) (US, Canadian)	
61	4-956-885-11	FOOT (F58175S2W) (AEP, UK)	
62	2-383-566-00	SCREW	
⚠TR641	1-423-516-11	TRANSFORMER, POWER (US, Canadian)	
⚠TR641	1-449-922-11	TRANSFORMER, POWER (AEP, UK)	

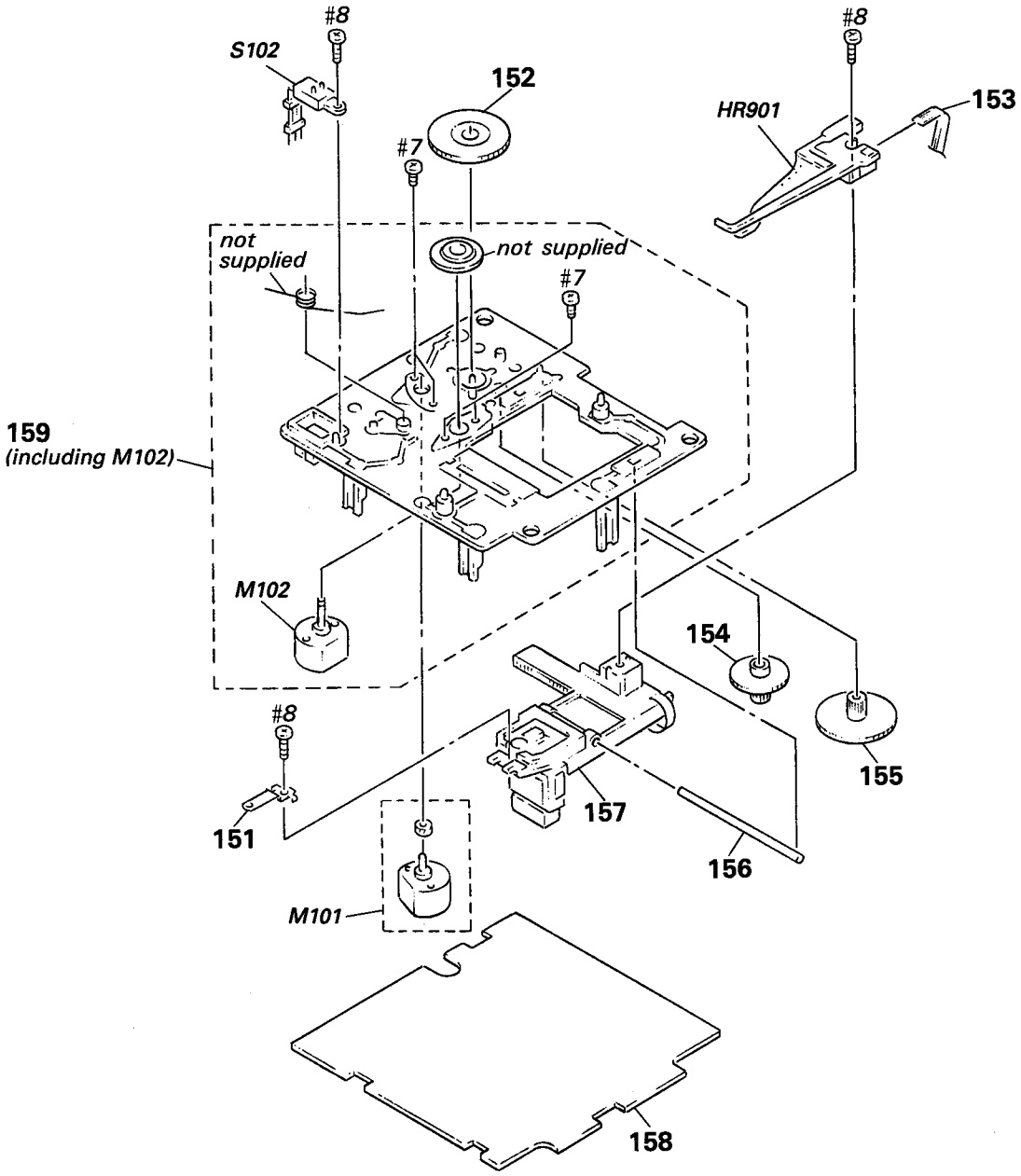
4-3. MECHANISM SECTION
(MDM-2A)



Ref. No.	Part No.	Description	Remark
101	4-967-672-01	COLLAR (DAMPER)	
102	4-967-671-01	INSULATOR (MD)	
103	4-967-673-01	SPRING, COMPRESSION	
104	4-967-668-01	SPRING (UDL), TORSION	
105	4-967-667-01	LEVER (UDL)	
106	4-967-655-01	GEAR (BD-B)	
107	X-4945-069-1	CAM ASSY	
108	4-967-656-01	BELT (BD)	
109	4-968-919-31	WASHER, STOPPER	
110	4-967-637-01	LEVER (SLM)	
111	4-967-638-01	SPRING (SLM), TORSION	
112	4-968-273-01	SPRING (OWH), TORSION	
113	4-968-272-01	LEVER (OWH)	
114	4-967-654-01	GEAR (BD-A)	
115	4-957-794-01	PULLEY (GEAR 1)	
* 116	X-4945-068-1	BASE (BD) ASSY	
117	4-967-669-01	LEVER (UDR)	
118	4-967-670-01	SPRING (UDR), TORSION	
119	4-967-657-01	LEVER (DOOR)	
120	4-970-710-01	SPRING, COMPRESSION	

Ref. No.	Part No.	Description	Remark
* 121	1-653-411-11	DETECTION SW BOARD	
* 122	1-653-412-11	MOTOR BOARD	
123	A-4660-647-B	BRACKET (LVO) ASSY	
* 124	X-4945-067-1	HOLDER ASSY	
125	4-968-919-11	WASHER, STOPPER	
126	4-967-646-01	SPRING (SHT), TORSION	
127	4-967-645-01	LEVER (SHT)	
128	4-967-640-01	SPRING (LM), TORSION	
129	4-967-639-01	LEVER (LM)	
130	4-968-919-01	WASHER, STOPPER	
131	4-967-641-01	LEVER (L)	
132	4-967-642-01	SPRING (L), TORSION	
133	4-967-643-01	LEVER (LS)	
134	4-967-644-01	SPRING (LS), TORSION	
* 135	3-561-902-01	CLOTH, RETAINING, CASSETTE	
136	4-968-919-21	WASHER, STOPPER	
* 137	X-4945-872-2	SLIDER (M) ASSY	
138	4-972-910-02	SCREW (2.6X18), +B	
139	4-971-743-02	SPRING, TENSION	
M191	A-4660-646-A	MOTOR (LOADING) ASSY	

4-4. BASE UNIT SECTION
(MBU-2)



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les components 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
151	4-967-679-01	SPRING (OP), LEAF	
152	4-967-675-01	GEAR (SL-A)	
153	1-654-446-11	OWH FLEXIBLE BOARD	
154	4-967-676-01	GEAR (SL-B)	
155	4-967-677-01	GEAR (SL-C)	
156	4-967-678-01	SHAFT (OP)	
⚠157	8-583-009-01	DEVICE, MINI DISK KMS-210A/J-N	
* 158	A-4673-174-A	BD BOARD, COMPLETE	
159	A-4660-650-A	CHASSIS ASSY, SUB (M102)	
HR901	1-500-175-11	HEAD, OVER LIGHT (RF322-74A)	
M101	A-4660-651-A	MOTOR (SLED) ASSY	
S102	1-762-148-11	SWITCH, PUSH (2 KEY) (REFLECT/PROTECT)	

SECTION 5
ELECTRICAL PARTS LIST

BD

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- –XX and –X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL: Metal-film resistor.
  METAL OXIDE: Metal oxide-film resistor.
  F: nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ, for example:
  uA··· : μA···, uPA··· : μPA···, uPB··· : μPB···, uPC··· : μPC···, uPD··· : μPD···
- CAPACITORS
  uF : μF
- COILS
  uH : μH

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

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

Les components 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
*	A-4673-174-A	BD BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C102	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C103	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C104	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C105	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C106	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C107	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C108	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C109	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C111	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C112	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C113	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C114	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C115	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C116	1-163-019-00	CERAMIC CHIP	0.0068uF	10%	50V
C117	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C119	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C121	1-126-395-11	ELECT	22uF	20%	16V
C122	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C123	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C124	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C125	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C126	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C127	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C128	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C129	1-107-823-11	CERAMIC CHIP	0.47uF	10%	16V
C130	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C131	1-104-760-11	CERAMIC CHIP	0.047uF	10%	50V
C132	1-107-682-11	CERAMIC CHIP	1uF	10%	16V
C133	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C134	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C135	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C136	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C141	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C142	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C143	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C144	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C151	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C152	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C155	1-104-916-11	TANTAL. CHIP	6.8uF	20%	20V
C160	1-104-601-11	ELECT CHIP	10uF	20%	10V
C161	1-104-601-11	ELECT CHIP	10uF	20%	10V
C163	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C164	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C166	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C167	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C168	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C169	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C170	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C171	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C175	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C176	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C177	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C178	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C181	1-104-913-11	TANTAL. CHIP	10uF	20%	16V
C182	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C183	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C184	1-107-836-11	ELECT CHIP	22uF	20%	8V
C185	1-164-611-11	CERAMIC CHIP	0.001uF	10%	500V
C186	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C191	1-126-395-11	ELECT	22uF	20%	16V
C192	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C193	1-164-346-11	CERAMIC CHIP	1uF		16V
C194	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
		< CONNECTOR >			
CN101	1-766-508-11	CONNECTOR, FFC/FPC (ZIF) 22P			
CN102	1-766-510-21	CONNECTOR, FFC/FPC 30P			
CN103	1-766-509-21	CONNECTOR, FFC/FPC 18P			
CN104	1-766-898-21	HOUSING, CONNECTOR(PC BOARD)4P			
		< DIODE >			
D101	8-719-988-62	DIODE	1SS355		
D155	8-719-031-17	DIODE	1SS322-TE85L		
D161	8-719-421-15	DIODE	MA8027-L		

BD

Ref. No.	Part No.	Description			Remark
D181	8-719-033-60	DIODE F1P2STP			
D183	8-719-033-60	DIODE F1P2STP			
		< IC >			
IC101	8-752-068-60	IC CXA1981R			
IC102	8-759-243-19	IC TC7SU04F			
IC121	8-752-375-06	IC CXD2535AR			
IC122	8-759-243-19	IC TC7SU04F			
IC151	8-759-179-60	IC MPC17A38VMEL			
IC171	8-759-504-12	IC X24C01S			
IC172	8-759-149-73	IC uPC842G2			
IC181	8-759-095-65	IC TC74ACT540FS			
IC182	8-759-243-19	IC TC7SU04F			
IC191	8-759-822-99	IC L88MS05T-FA			
		< COIL / RESISTOR >			
L101	1-414-234-11	INDUCTOR, FERRITE BEAD			
L102	1-414-234-11	INDUCTOR, FERRITE BEAD			
L103	1-414-234-11	INDUCTOR, FERRITE BEAD			
L105	1-414-234-11	INDUCTOR, FERRITE BEAD			
L106	1-414-234-11	INDUCTOR, FERRITE BEAD			
L110	1-216-295-00	METAL CHIP	0	5%	1/10W
L121	1-414-234-11	INDUCTOR, FERRITE BEAD			
L122	1-412-039-51	INDUCTOR CHIP	100uH		
L151	1-412-622-51	INDUCTOR CHIP	10uH		
L152	1-412-622-51	INDUCTOR CHIP	10uH		
L153	1-412-039-51	INDUCTOR CHIP	100uH		
L154	1-412-039-51	INDUCTOR CHIP	100uH		
L155	1-410-980-51	INDUCTOR CHIP	1mH		
L161	1-414-234-11	INDUCTOR, FERRITE BEAD			
L162	1-414-234-11	INDUCTOR, FERRITE BEAD			
L195	1-233-316-11	FILTER, CHIP EMI			
		< TRANSISTOR >			
Q101	8-729-905-12	TRANSISTOR	DTA144EU		
Q151	8-729-905-18	TRANSISTOR	DTC144EU		
Q162	8-729-101-07	TRANSISTOR	2SB798-DL		
Q163	8-729-905-12	TRANSISTOR	DTA144EU		
Q164	8-729-924-19	TRANSISTOR	DTA123JU		
Q181	8-729-018-75	FET	2SJ278MY		
Q182	8-729-017-65	FET	2SK1764KY		
		< RESISTOR >			
R101	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R102	1-216-077-00	METAL CHIP	15K	5%	1/10W
R103	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R104	1-216-049-00	METAL CHIP	1K	5%	1/10W
R105	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R106	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R107	1-216-113-00	METAL CHIP	470K	5%	1/10W
R114	1-216-025-00	METAL CHIP	100	5%	1/10W
R116	1-216-069-00	METAL CHIP	6.8K	5%	1/10W
R117	1-216-113-00	METAL CHIP	470K	5%	1/10W
R120	1-216-025-00	METAL CHIP	100	5%	1/10W
R121	1-216-097-00	METAL CHIP	100K	5%	1/10W
R122	1-216-073-00	METAL CHIP	10K	5%	1/10W
R123	1-216-037-00	METAL CHIP	330	5%	1/10W
R124	1-216-025-00	METAL CHIP	100	5%	1/10W
R125	1-216-025-00	METAL CHIP	100	5%	1/10W
R128	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R129	1-216-037-00	METAL CHIP	330	5%	1/10W
R130	1-216-041-00	METAL CHIP	470	5%	1/10W
R131	1-216-073-00	METAL CHIP	10K	5%	1/10W
R132	1-216-097-00	METAL CHIP	100K	5%	1/10W
R133	1-216-133-00	METAL CHIP	3.3M	5%	1/10W
R134	1-216-037-00	METAL CHIP	330	5%	1/10W
R135	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R136	1-216-041-00	METAL CHIP	470	5%	1/10W
R137	1-216-025-00	METAL CHIP	100	5%	1/10W
R139	1-216-017-00	METAL CHIP	47	5%	1/10W
R140	1-216-017-00	METAL CHIP	47	5%	1/10W
R142	1-216-073-00	METAL CHIP	10K	5%	1/10W
R143	1-216-073-00	METAL CHIP	10K	5%	1/10W
R144	1-216-295-00	METAL CHIP	0	5%	1/10W
R145	1-216-121-00	METAL CHIP	1M	5%	1/10W
R146	1-216-037-00	METAL CHIP	330	5%	1/10W
R147	1-216-025-00	METAL CHIP	100	5%	1/10W
R148	1-216-045-00	METAL CHIP	680	5%	1/10W
R151	1-216-097-00	METAL CHIP	100K	5%	1/10W
R152	1-216-295-00	METAL CHIP	0	5%	1/10W
R153	1-216-295-00	METAL CHIP	0	5%	1/10W
R161	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R162	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R163	1-216-057-00	METAL CHIP	2.2K	5%	1/10W
R164	1-216-045-00	METAL CHIP	680	5%	1/10W
R165	1-216-097-00	METAL CHIP	100K	5%	1/10W
R166	1-220-250-11	METAL CHIP	10	5%	1/2W
R167	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R168	1-218-236-91	METAL CHIP	1	10%	1/4W
R170	1-216-073-00	METAL CHIP	10K	5%	1/10W
R171	1-216-073-00	METAL CHIP	10K	5%	1/10W
R172	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R174	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R176	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R178	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R181	1-216-073-00	METAL CHIP	10K	5%	1/10W
R182	1-216-089-00	METAL CHIP	47K	5%	1/10W

Ref. No.	Part No.	Description			Remark
R183	1-216-089-00	METAL CHIP	47K	5%	1/10W
R184	1-216-296-00	METAL CHIP	0	5%	1/8W
R186	1-216-296-00	METAL CHIP	0	5%	1/8W
R195	1-216-295-00	METAL CHIP	0	5%	1/10W
		< VARIABLE RESISTOR >			
RV101	1-241-397-11	RES, ADJ, METAL GLAZE 47K			
RV102	1-241-395-11	RES, ADJ, METAL GLAZE 10K			
RV105	1-241-395-11	RES, ADJ, METAL GLAZE 10K			
		< SWITCH >			
S101	1-572-467-31	SWITCH, PUSH (1 KEY) (LIMIT)			
S102	1-762-148-11	SWITCH, PUSH (2 KEY) (REFLECT/PROTECT)			
**********					
*	1-653-411-11	DETECTION SW BOARD			
		**********			
		< CONNECTOR >			
CN193	1-770-010-21	CONNECTOR, BOARD TO BOARD 4P			
		< SWITCH >			
S191	1-762-149-11	SWITCH, PUSH (1 KEY) (LOAD OUT DET)			
S192	1-762-149-11	SWITCH, PUSH (1 KEY) (LOAD IN DET)			
S193	1-762-149-11	SWITCH, PUSH (1 KEY) (CHUCKING IN DET)			
**********					
*	A-4673-240-A	DIGITAL BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C201	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C202	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C203	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C205	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C206	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C207	1-126-395-11	ELECT	22uF	20%	16V
C208	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C209	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C210	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C221	1-126-395-11	ELECT	22uF	20%	16V
C222	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C223	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C224	1-126-204-11	ELECT CHIP	47uF	20%	16V
C225	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C226	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C227	1-126-204-11	ELECT CHIP	47uF	20%	16V
C228	1-163-229-11	CERAMIC CHIP	12PF	5%	50V
C229	1-163-229-11	CERAMIC CHIP	12PF	5%	50V

Ref. No.	Part No.	Description			Remark
C230	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C231	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C232	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C233	1-126-395-11	ELECT	22uF	20%	16V
C235	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C236	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C241	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C251	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C252	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C253	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C254	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C255	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C256	1-163-275-11	CERAMIC CHIP	0.001uF	5%	50V
C257	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C258	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C261	1-126-395-11	ELECT	22uF	20%	16V
C262	1-126-395-11	ELECT	22uF	20%	16V
C263	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C264	1-164-695-11	CERAMIC CHIP	0.0022uF	5%	50V
C265	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C266	1-126-395-11	ELECT	22uF	20%	16V
C267	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C268	1-126-395-11	ELECT	22uF	20%	16V
C270	1-126-204-11	ELECT CHIP	47uF	20%	16V
C271	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C272	1-163-227-11	CERAMIC CHIP	10PF	0.5PF	50V
C273	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C274	1-126-395-11	ELECT	22uF	20%	16V
C277	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C281	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C282	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C283	1-126-204-11	ELECT CHIP	47uF	20%	16V
C284	1-126-204-11	ELECT CHIP	47uF	20%	16V
C285	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C286	1-126-204-11	ELECT CHIP	47uF	20%	16V
C287	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C288	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C289	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C290	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C291	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C292	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C293	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C294	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C295	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C296	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C297	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C299	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C300	1-163-038-00	CERAMIC CHIP	0.1uF		25V

DIGITAL

Ref. No.	Part No.	Description		Remark
C301	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C302	1-126-204-11	ELECT CHIP	47uF 20%	16V
C304	1-126-204-11	ELECT CHIP	47uF 20%	16V
C305	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C307	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C309	1-163-227-11	CERAMIC CHIP	10PF 0.5PF	50V
C310	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C311	1-126-395-11	ELECT	22uF 20%	16V
C312	1-126-395-11	ELECT	22uF 20%	16V
C313	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C314	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C315	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C316	1-163-133-00	CERAMIC CHIP	470PF 5%	50V
C317	1-163-133-00	CERAMIC CHIP	470PF 5%	50V
C318	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C319	1-163-227-11	CERAMIC CHIP	10PF 0.5PF	50V
C320	1-163-031-11	CERAMIC CHIP	0.01uF	50V
C321	1-163-227-11	CERAMIC CHIP	10PF 0.5PF	50V
C322	1-163-227-11	CERAMIC CHIP	10PF 0.5PF	50V
C325	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C326	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C328	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C330	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C331	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C333	1-163-038-00	CERAMIC CHIP	0.1uF	25V
C335	1-163-251-11	CERAMIC CHIP	100PF 5%	50V
C527	1-163-038-00	CERAMIC CHIP	0.1uF	25V
		< CONNECTOR >		
* CN201	1-766-899-11	CONNECTOR 22P		
CN202	1-766-510-21	CONNECTOR, FFC/FPC 30P		
CN221	1-766-509-21	CONNECTOR, FFC/FPC 18P		
* CN222	1-770-154-11	PIN, CONNECTOR 6P		
* CN223	1-766-899-11	CONNECTOR 22P		
* CN251	1-770-154-11	PIN, CONNECTOR 6P		
* CN281	1-770-153-11	PIN, CONNECTOR 8P		
		< DIODE >		
D201	8-719-016-74	DIODE 1SS352		
D251	8-719-974-98	DIODE HVM17-01		
		< FERRITE BEAD >		
FB201	1-550-907-21	BEAD, FERRITE (CHIP)		
FB252	1-550-907-21	BEAD, FERRITE (CHIP)		
FB254	1-550-907-21	BEAD, FERRITE (CHIP)		
FB256	1-550-907-21	BEAD, FERRITE (CHIP)		
FB257	1-550-907-21	BEAD, FERRITE (CHIP)		
FB340	1-543-948-11	BEAD, FERRITE (CHIP)		
FB344	1-550-907-21	BEAD, FERRITE (CHIP)		
		< IC >		
IC201	8-759-292-58	IC M37610MD-050FP		
IC221	8-752-371-17	IC CXD2536R		
IC222	8-759-294-78	IC MSM514400BSJADR1-K		
IC241	8-759-040-83	IC BA6287F		
IC251	8-759-158-96	IC TC9246F-TP1		
IC258	8-759-242-70	IC TC7WU04F		
IC261	8-759-331-35	IC AK5340-VS		
IC262	8-759-097-92	IC NJM2100V		
IC263	8-759-252-90	IC TLV2362IPW-ELM1500		
IC281	8-752-359-50	IC CXD2564AM		
IC282	8-759-908-17	IC TL082CPS		
		< COIL >		
L221	1-410-389-31	INDUCTOR CHIP	47uH	
L241	1-412-622-51	INDUCTOR CHIP	10uH	
L251	1-412-332-41	INDUCTOR CHIP	2.2uH	
L258	1-412-336-41	INDUCTOR CHIP	4.7uH	
L281	1-412-336-41	INDUCTOR CHIP	4.7uH	
L282	1-412-336-41	INDUCTOR CHIP	4.7uH	
L285	1-410-387-11	INDUCTOR CHIP	33uH	
L287	1-412-336-41	INDUCTOR CHIP	4.7uH	
		< TRANSISTOR >		
Q261	8-729-421-19	TRANSISTOR UN2213		
Q321	8-729-421-19	TRANSISTOR UN2213		
		< RESISTOR >		
R201	1-216-097-00	METAL CHIP	100K 5%	1/10W
R202	1-216-097-00	METAL CHIP	100K 5%	1/10W
R203	1-216-025-00	METAL CHIP	100 5%	1/10W
R204	1-216-097-00	METAL CHIP	100K 5%	1/10W
R205	1-216-073-00	METAL CHIP	10K 5%	1/10W
R206	1-216-073-00	METAL CHIP	10K 5%	1/10W
R207	1-216-073-00	METAL CHIP	10K 5%	1/10W
R208	1-216-097-00	METAL CHIP	100K 5%	1/10W
R209	1-216-097-00	METAL CHIP	100K 5%	1/10W
R210	1-216-073-00	METAL CHIP	10K 5%	1/10W
R211	1-216-097-00	METAL CHIP	100K 5%	1/10W
R212	1-216-295-00	METAL CHIP	0 5%	1/10W
R213	1-216-073-00	METAL CHIP	10K 5%	1/10W
R214	1-216-073-00	METAL CHIP	10K 5%	1/10W
R215	1-216-097-00	METAL CHIP	100K 5%	1/10W
R216	1-216-073-00	METAL CHIP	10K 5%	1/10W
R217	1-216-073-00	METAL CHIP	10K 5%	1/10W
R218	1-216-073-00	METAL CHIP	10K 5%	1/10W

Ref. No.	Part No.	Description			Remark
R219	1-216-073-00	METAL CHIP	10K	5%	1/10W
R220	1-216-073-00	METAL CHIP	10K	5%	1/10W
R221	1-216-097-00	METAL CHIP	100K	5%	1/10W
R222	1-216-097-00	METAL CHIP	100K	5%	1/10W
R223	1-216-097-00	METAL CHIP	100K	5%	1/10W
R224	1-216-097-00	METAL CHIP	100K	5%	1/10W
R225	1-216-097-00	METAL CHIP	100K	5%	1/10W
R226	1-216-041-00	METAL CHIP	470	5%	1/10W
R227	1-216-033-00	METAL CHIP	220	5%	1/10W
R228	1-216-033-00	METAL CHIP	220	5%	1/10W
R229	1-216-295-00	METAL CHIP	0	5%	1/10W
R230	1-216-033-00	METAL CHIP	220	5%	1/10W
R231	1-216-295-00	METAL CHIP	0	5%	1/10W
R232	1-216-295-00	METAL CHIP	0	5%	1/10W
R233	1-216-033-00	METAL CHIP	220	5%	1/10W
R234	1-216-295-00	METAL CHIP	0	5%	1/10W
R236	1-216-295-00	METAL CHIP	0	5%	1/10W
R241	1-216-021-00	METAL CHIP	68	5%	1/10W
R242	1-216-021-00	METAL CHIP	68	5%	1/10W
R251	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R252	1-216-651-11	METAL CHIP	1K	0.5%	1/10W
R253	1-216-121-00	METAL CHIP	1M	5%	1/10W
R256	1-216-041-00	METAL CHIP	470	5%	1/10W
R257	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R258	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R259	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R260	1-216-679-11	METAL CHIP	15K	0.5%	1/10W
R261	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R262	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W
R263	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R264	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R265	1-216-639-11	METAL CHIP	330	0.5%	1/10W
R266	1-216-639-11	METAL CHIP	330	0.5%	1/10W
R267	1-216-639-11	METAL CHIP	330	0.5%	1/10W
R268	1-216-639-11	METAL CHIP	330	0.5%	1/10W
R269	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R270	1-216-691-11	METAL CHIP	47K	0.5%	1/10W
R271	1-216-073-00	METAL CHIP	10K	5%	1/10W
R272	1-216-033-00	METAL CHIP	220	5%	1/10W
R273	1-216-073-00	METAL CHIP	10K	5%	1/10W
R274	1-216-073-00	METAL CHIP	10K	5%	1/10W
R275	1-216-073-00	METAL CHIP	10K	5%	1/10W
R276	1-216-073-00	METAL CHIP	10K	5%	1/10W
R281	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R282	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R283	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R284	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R285	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R286	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R287	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R288	1-216-683-11	METAL CHIP	22K	0.5%	1/10W
R289	1-216-695-11	METAL CHIP	68K	0.5%	1/10W
R290	1-216-695-11	METAL CHIP	68K	0.5%	1/10W
R291	1-216-695-11	METAL CHIP	68K	0.5%	1/10W
R292	1-216-695-11	METAL CHIP	68K	0.5%	1/10W
R293	1-216-295-00	METAL CHIP	0	5%	1/10W
R294	1-216-033-00	METAL CHIP	220	5%	1/10W
R295	1-216-073-00	METAL CHIP	10K	5%	1/10W
R303	1-216-097-00	METAL CHIP	100K	5%	1/10W
R304	1-216-097-00	METAL CHIP	100K	5%	1/10W
R305	1-216-295-00	METAL CHIP	0	5%	1/10W
R306	1-216-295-00	METAL CHIP	0	5%	1/10W
R307	1-216-097-00	METAL CHIP	100K	5%	1/10W
R308	1-216-097-00	METAL CHIP	100K	5%	1/10W
R309	1-216-097-00	METAL CHIP	100K	5%	1/10W
R310	1-216-097-00	METAL CHIP	100K	5%	1/10W
R311	1-216-295-00	METAL CHIP	0	5%	1/10W
R312	1-216-073-00	METAL CHIP	10K	5%	1/10W
R313	1-216-097-00	METAL CHIP	100K	5%	1/10W
R314	1-216-097-00	METAL CHIP	100K	5%	1/10W
R315	1-216-097-00	METAL CHIP	100K	5%	1/10W
R316	1-216-097-00	METAL CHIP	100K	5%	1/10W
R317	1-216-097-00	METAL CHIP	100K	5%	1/10W
R318	1-216-049-00	METAL CHIP	1K	5%	1/10W
R319	1-216-049-00	METAL CHIP	1K	5%	1/10W
R320	1-216-073-00	METAL CHIP	10K	5%	1/10W
R321	1-216-073-00	METAL CHIP	10K	5%	1/10W
R323	1-216-097-00	METAL CHIP	100K	5%	1/10W
R325	1-216-097-00	METAL CHIP	100K	5%	1/10W
R326	1-216-097-00	METAL CHIP	100K	5%	1/10W
R327	1-216-073-00	METAL CHIP	10K	5%	1/10W
R328	1-216-097-00	METAL CHIP	100K	5%	1/10W
R329	1-216-097-00	METAL CHIP	100K	5%	1/10W
R330	1-216-097-00	METAL CHIP	100K	5%	1/10W
R331	1-216-097-00	METAL CHIP	100K	5%	1/10W
R332	1-216-097-00	METAL CHIP	100K	5%	1/10W
R333	1-216-097-00	METAL CHIP	100K	5%	1/10W
R334	1-216-097-00	METAL CHIP	100K	5%	1/10W
R335	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R336	1-216-049-00	METAL CHIP	1K	5%	1/10W
R337	1-216-097-00	METAL CHIP	100K	5%	1/10W
R338	1-216-073-00	METAL CHIP	10K	5%	1/10W
R339	1-216-097-00	METAL CHIP	100K	5%	1/10W
R341	1-216-295-00	METAL CHIP	0	5%	1/10W
R342	1-216-295-00	METAL CHIP	0	5%	1/10W
R343	1-216-041-00	METAL CHIP	470	5%	1/10W
R345	1-216-097-00	METAL CHIP	100K	5%	1/10W

DIGITAL DISPLAY

Ref. No.	Part No.	Description			Remark
R346	1-216-097-00	METAL CHIP	100K	5%	1/10W
R347	1-216-121-00	METAL CHIP	1M	5%	1/10W
R350	1-216-041-00	METAL CHIP	470	5%	1/10W
R353	1-216-295-00	METAL CHIP	0	5%	1/10W
R355	1-216-295-00	METAL CHIP	0	5%	1/10W
R359	1-216-295-00	METAL CHIP	0	5%	1/10W
R361	1-216-295-00	METAL CHIP	0	5%	1/10W
R362	1-216-296-00	METAL CHIP	0	5%	1/8W
R381	1-216-295-00	METAL CHIP	0	5%	1/10W
R383	1-216-295-00	METAL CHIP	0	5%	1/10W
R384	1-216-295-00	METAL CHIP	0	5%	1/10W
R386	1-216-295-00	METAL CHIP	0	5%	1/10W
		< VIBRATOR >			
X201	1-760-493-11	VIBRATOR, CERAMIC (CHIP TYPE) (8MHz)			
X203	1-760-173-11	VIBRATOR, CRYSTAL (45MHz)			
**********					
*	A-4673-242-A	DISPLAY BOARD, COMPLETE			
		**********			
*	4-956-134-01	HOLDER (FL TUBE)			
		< CAPACITOR >			
C705	1-162-306-11	CERAMIC	0.01uF	30%	16V
C706	1-162-294-31	CERAMIC	0.001uF	10%	50V
C707	1-162-294-31	CERAMIC	0.001uF	10%	50V
C708	1-164-159-11	CERAMIC	0.1uF		50V
C709	1-124-234-00	ELECT	22uF	20%	16V
C710	1-162-282-31	CERAMIC	100PF	10%	50V
C711	1-164-159-11	CERAMIC	0.1uF		50V
C713	1-162-302-11	CERAMIC	0.0022uF	30%	16V
C714	1-162-302-11	CERAMIC	0.0022uF	30%	16V
C715	1-161-494-00	CERAMIC	0.022uF		25V
C716	1-161-494-00	CERAMIC	0.022uF		25V
C717	1-126-163-11	ELECT	4.7uF	20%	50V
C718	1-164-159-11	CERAMIC	0.1uF		50V
C719	1-164-159-11	CERAMIC	0.1uF		50V
C720	1-164-159-11	CERAMIC	0.1uF		50V
C721	1-162-294-31	CERAMIC	0.001uF	10%	50V
		< CONNECTOR >			
CN701	1-770-204-11	CONNECTOR, FFC/FPC 22P			
CN741	1-766-200-11	SOCKET, CONNECTOR PIN 5P			
CN751	1-766-806-11	HOUSING, CONNECTOR 3P			
		< FLUORESCENT INDICATOR TUBE >			
FL701	1-517-353-11	INDICATOR TUBE, FLUORESCENT			

Ref. No.	Part No.	Description			Remark
		< IC >			
IC701	8-759-297-23	IC M66004M8FP			
IC702	8-741-810-59	IC SBX1810-59			
		< RESISTOR >			
R705	1-249-435-11	CARBON	33K	5%	1/4W
R708	1-249-429-11	CARBON	10K	5%	1/4W
R709	1-249-429-11	CARBON	10K	5%	1/4W
R721	1-247-807-31	CARBON	100	5%	1/4W
R722	1-247-807-31	CARBON	100	5%	1/4W
R723	1-247-807-31	CARBON	100	5%	1/4W
R724	1-247-807-31	CARBON	100	5%	1/4W
R741	1-249-429-11	CARBON	10K	5%	1/4W
R751	1-249-429-11	CARBON	10K	5%	1/4W
R752	1-249-421-11	CARBON	2.2K	5%	1/4W
R753	1-249-423-11	CARBON	3.3K	5%	1/4W
R754	1-249-425-11	CARBON	4.7K	5%	1/4W
R755	1-249-429-11	CARBON	10K	5%	1/4W
R756	1-249-435-11	CARBON	33K	5%	1/4W
R761	1-249-429-11	CARBON	10K	5%	1/4W
R762	1-249-421-11	CARBON	2.2K	5%	1/4W
R763	1-249-423-11	CARBON	3.3K	5%	1/4W
R771	1-249-429-11	CARBON	10K	5%	1/4W
R772	1-249-421-11	CARBON	2.2K	5%	1/4W
R773	1-249-423-11	CARBON	3.3K	5%	1/4W
R774	1-249-425-11	CARBON	4.7K	5%	1/4W
R775	1-249-429-11	CARBON	10K	5%	1/4W
R776	1-249-435-11	CARBON	33K	5%	1/4W
		< SWITCH >			
S701	1-467-891-11	ENCODER, ROTARY (⏮ AMS ⏭)			
S751	1-554-303-21	SWITCH, TACTILE (EDIT NO)			
S752	1-554-303-21	SWITCH, TACTILE (YES)			
S753	1-554-303-21	SWITCH, TACTILE (▯▯)			
S754	1-554-303-21	SWITCH, TACTILE (▷)			
S756	1-554-303-21	SWITCH, TACTILE (DISPLAY)			
S761	1-554-303-21	SWITCH, TACTILE (PLAY MODE)			
S762	1-554-303-21	SWITCH, TACTILE (REPEAT)			
S763	1-554-303-21	SWITCH, TACTILE (CLOCK SET)			
S771	1-554-303-21	SWITCH, TACTILE (●)			
S772	1-554-303-21	SWITCH, TACTILE (■)			
S774	1-554-303-21	SWITCH, TACTILE (⏭)			
S775	1-554-303-21	SWITCH, TACTILE (⏮)			
S776	1-554-303-21	SWITCH, TACTILE (⏏)			
**********					

Ref. No.	Part No.	Description			Remark
*	1-654-134-11	HP BOARD			
		********			
		< CAPACITOR >			
C701	1-164-159-11	CERAMIC	0.1uF		50V
C703	1-162-294-31	CERAMIC	0.001uF	10%	50V
C704	1-162-294-31	CERAMIC	0.001uF	10%	50V
		< JACK >			
J701	1-568-519-41	JACK, LARGE TYPE (PHONES)			
		< COIL >			
L701	1-412-473-21	INDUCTOR	0uH		
L702	1-412-473-21	INDUCTOR	0uH		
L703	1-412-473-21	INDUCTOR	0uH		
		< RESISTOR >			
R713	1-249-393-11	CARBON	10	5%	1/4W
R714	1-249-393-11	CARBON	10	5%	1/4W
		< VARIABLE RESISTOR >			
RV701	1-223-752-11	RES, VAR, CARBON 1K/1K (PHONES LEVEL)			
**********					
*	1-653-412-11	MOTOR BOARD			
		**********			
		< CONNECTOR >			
* CN191	1-568-944-11	PIN, CONNECTOR 6P			
CN192	1-770-011-41	CONNECTOR, BOARD TO BOARD 4P			
**********					
	1-654-446-11	OWH FLEXIBLE BOARD			
		**********			
**********					
*	A-4673-238-A	POWER BOARD, COMPLETE			
		**********			
*	1-535-303-00	WIRE, JUMPER			
*	3-309-144-21	HEAT SINK			
*	4-363-146-21	HEAT SINK, V.OUT			
*	4-962-200-01	PLATE (TR), GROUND			
	7-685-646-79	SCREW +BVTP 3X8 TYPE2 IT-3			
	7-682-548-09	SCREW +BVTT 3X8 (S)			
		< CAPACITOR >			
C501	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C502	1-163-031-11	CERAMIC CHIP	0.01uF		50V

Ref. No.	Part No.	Description			Remark
C503	1-124-572-11	ELECT	100uF	20%	63V
C504	1-165-319-11	CERAMIC CHIP	0.1uF		50V
C505	1-104-773-11	ELECT	22000uF	20%	16V
C506	1-124-898-11	ELECT	4700uF	20%	16V
C507	1-124-916-11	ELECT	22uF	20%	63V
C508	1-126-950-11	ELECT	330uF	20%	35V
C511	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C512	1-124-903-11	ELECT	1uF	20%	50V
C513	1-124-994-11	ELECT	100uF	20%	10V
C514	1-126-101-11	ELECT	100uF	20%	16V
C515	1-126-939-11	ELECT	10000uF	20%	16V
C516	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C521	1-124-907-11	ELECT	10uF	20%	50V
C522	1-124-907-11	ELECT	10uF	20%	50V
C523	1-163-033-00	CERAMIC CHIP	0.022uF		50V
C524	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C531	1-124-907-11	ELECT	10uF	20%	50V
C532	1-110-489-11	DOUBLE LAYER	1F		5.5V
C533	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C534	1-124-927-11	ELECT	4.7uF	20%	100V
C535	1-124-903-11	ELECT	1uF	20%	50V
C541	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C542	1-124-994-11	ELECT	100uF	20%	10V
C551	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C552	1-124-994-11	ELECT	100uF	20%	10V
C561	1-126-023-11	ELECT	100uF	20%	16V
C562	1-126-023-11	ELECT	100uF	20%	16V
C563	1-124-903-11	ELECT	1uF	20%	50V
C564	1-124-903-11	ELECT	1uF	20%	50V
C565	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C566	1-124-903-11	ELECT	1uF	20%	50V
C567	1-124-994-11	ELECT	100uF	20%	10V
C568	1-124-994-11	ELECT	100uF	20%	10V
C571	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C572	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C573	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C574	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C575	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C576	1-164-004-11	CERAMIC CHIP	0.1uF	10%	25V
C577	1-124-910-11	ELECT	47uF	20%	50V
C578	1-124-910-11	ELECT	47uF	20%	50V
C579	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C580	1-163-025-11	CERAMIC CHIP	0.001uF		50V
C591	1-126-024-11	ELECT	220uF	20%	16V
C592	1-126-024-11	ELECT	220uF	20%	16V
C611	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C612	1-163-239-11	CERAMIC CHIP	33PF	5%	50V
C613	1-126-233-11	ELECT	22uF	20%	50V

POWER

Ref. No.	Part No.	Description			Remark
C614	1-126-233-11	ELECT	22uF	20%	50V
C617	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C618	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C621	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C622	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C623	1-124-477-11	ELECT	47uF	20%	25V
C624	1-163-031-11	CERAMIC CHIP	0.01uF		50V
C625	1-163-038-00	CERAMIC CHIP	0.1uF		25V
⚠C641	1-162-599-12	CERAMIC	0.0047uF	20%	400V
⚠C642	1-162-599-12	CERAMIC	0.0047uF	20%	400V
⚠C643	1-162-599-12	CERAMIC	0.0047uF	20%	400V
⚠C644	1-162-599-12	CERAMIC	0.0047uF	20%	400V
⚠C645	1-162-599-12	CERAMIC	0.0047uF	20%	400V
		< CONNECTOR >			
CN501	1-770-203-11	CONNECTOR, FFC/FPC 22P			
CN591	1-506-468-11	PIN, CONNECTOR 3P			
* CN611	1-564-708-11	PIN, CONNECTOR (SMALL TYPE) 6P			
* CN641	1-580-230-21	PIN, CONNECTOR (PC BOARD) 3P			
		< DIODE >			
D501	8-719-210-33	DIODE	EC10DS2		
D502	8-719-210-33	DIODE	EC10DS2		
D503	8-719-210-33	DIODE	EC10DS2		
D504	8-719-210-33	DIODE	EC10DS2		
D505	8-719-210-33	DIODE	EC10DS2		
D506	8-719-422-43	DIODE	MA8051-H		
D521	8-719-210-33	DIODE	EC10DS2		
D522	8-719-210-33	DIODE	EC10DS2		
D523	8-719-016-74	DIODE	1SS352		
D531	8-719-016-74	DIODE	1SS352		
D532	8-719-210-39	DIODE	EC10QS-04		
D551	8-719-016-74	DIODE	1SS352		
D552	8-719-016-74	DIODE	1SS352		
D581	8-719-820-05	DIODE	1SS181		
D582	8-719-016-74	DIODE	1SS352		
		< IC >			
IC501	8-759-633-42	IC	M5293L		
IC511	8-759-274-37	IC	BA3963		
IC521	8-759-233-64	IC	TC74HCU04AF		
IC531	8-759-327-15	IC	M62005L		
IC541	8-759-504-46	IC	PQ05RF1		
IC551	8-759-520-49	IC	PQ30RV21		
IC561	8-759-631-40	IC	M5294P		
IC571	8-759-982-04	IC	RC5532M		
IC591	8-759-981-86	IC	RC4556MA		
IC621	8-759-242-85	IC	TOTX176 (DIGITAL OUT)		
IC622	8-759-242-84	IC	TORX176 (DIGITAL IN)		
IC623	8-759-243-19	IC	TC7SU04F		
		< JACK >			
J581	1-573-520-11	JACK, PIN 4P (LINE IN/OUT)			
		< FERRITE BEAD / COIL >			
L621	1-543-962-21	BEAD, FERRITE (CHIP)			
L622	1-410-389-31	INDUCTOR CHIP	47uH		
L623	1-410-389-31	INDUCTOR CHIP	47uH		
		< LINE FILTER >			
⚠LF641	1-424-485-11	FILTER, LINE			
		< TRANSISTOR >			
Q531	8-729-807-87	TRANSISTOR	2SB1295-UL6		
Q532	8-729-421-19	TRANSISTOR	UN2213		
Q551	8-729-901-06	TRANSISTOR	DTA144EK		
Q581	8-729-901-06	TRANSISTOR	DTA144EK		
Q583	8-729-422-29	TRANSISTOR	2SD601A-S		
Q584	8-729-422-29	TRANSISTOR	2SD601A-S		
Q585	8-729-422-29	TRANSISTOR	2SD601A-S		
Q586	8-729-422-29	TRANSISTOR	2SD601A-S		
		< RESISTOR >			
R504	1-216-025-00	METAL CHIP	100	5%	1/10W
R505	1-216-025-00	METAL CHIP	100	5%	1/10W
R506	1-216-089-00	METAL CHIP	47K	5%	1/10W
R521	1-216-025-00	METAL CHIP	100	5%	1/10W
R522	1-216-049-00	METAL CHIP	1K	5%	1/10W
R523	1-216-073-00	METAL CHIP	10K	5%	1/10W
R524	1-216-089-00	METAL CHIP	47K	5%	1/10W
R525	1-216-109-00	METAL CHIP	330K	5%	1/10W
R531	1-216-073-00	METAL CHIP	10K	5%	1/10W
R532	1-216-049-00	METAL CHIP	1K	5%	1/10W
R533	1-216-013-00	METAL CHIP	33	5%	1/10W
R551	1-216-675-11	METAL CHIP	10K	0.5%	1/10W
R552	1-216-687-11	METAL CHIP	33K	0.5%	1/10W
R553	1-216-073-00	METAL CHIP	10K	5%	1/10W
R554	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R561	1-216-089-00	METAL CHIP	47K	5%	1/10W
R571	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R572	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R573	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R574	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R575	1-216-105-00	METAL CHIP	220K	5%	1/10W
R576	1-216-105-00	METAL CHIP	220K	5%	1/10W
R577	1-216-037-00	METAL CHIP	330	5%	1/10W
R578	1-216-037-00	METAL CHIP	330	5%	1/10W

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Ref. No.	Part No.	Description			Remark
R579	1-216-037-00	METAL CHIP	330	5%	1/10W
R580	1-216-037-00	METAL CHIP	330	5%	1/10W
R582	1-216-097-00	METAL CHIP	100K	5%	1/10W
R583	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R584	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R585	1-216-037-00	METAL CHIP	330	5%	1/10W
R586	1-216-037-00	METAL CHIP	330	5%	1/10W
R587	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R588	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R591	1-216-033-00	METAL CHIP	220	5%	1/10W
R592	1-216-033-00	METAL CHIP	220	5%	1/10W
R593	1-216-033-00	METAL CHIP	220	5%	1/10W
R594	1-216-033-00	METAL CHIP	220	5%	1/10W
R595	1-216-089-00	METAL CHIP	47K	5%	1/10W
R596	1-216-089-00	METAL CHIP	47K	5%	1/10W
R597	1-216-077-00	METAL CHIP	15K	5%	1/10W
R598	1-216-077-00	METAL CHIP	15K	5%	1/10W
R599	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R600	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R601	1-216-077-00	METAL CHIP	15K	5%	1/10W
R602	1-216-077-00	METAL CHIP	15K	5%	1/10W
R603	1-216-017-00	METAL CHIP	47	5%	1/10W
R604	1-216-017-00	METAL CHIP	47	5%	1/10W
R605	1-216-017-00	METAL CHIP	47	5%	1/10W
R606	1-216-017-00	METAL CHIP	47	5%	1/10W
R617	1-216-001-00	METAL CHIP	10	5%	1/10W
R618	1-216-001-00	METAL CHIP	10	5%	1/10W
R619	1-216-081-00	METAL CHIP	22K	5%	1/10W
R620	1-216-081-00	METAL CHIP	22K	5%	1/10W
R621	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R622	1-216-089-00	METAL CHIP	47K	5%	1/10W
R623	1-216-121-00	METAL CHIP	1M	5%	1/10W
R625	1-216-065-00	METAL CHIP	4.7K	5%	1/10W
R634	1-216-089-00	METAL CHIP	47K	5%	1/10W

****

* 1-654-135-11 POWER SW BOARD
****

< CONNECTOR >

CN742 1-766-203-11 PLUG, CONNECTOR PIN (PC BOARD) 5P

< DIODE >

D701 8-719-313-40 LED SEL1516W (ON/STANDBY)

< TRANSISTOR >

Q701 8-729-422-57 TRANSISTOR UN4111

Ref. No.	Part No.	Description			Remark
		< RESISTOR >			
R701	1-249-429-11	CARBON	10K	5%	1/4W
R702	1-249-429-11	CARBON	10K	5%	1/4W
R711	1-249-411-11	CARBON	330	5%	1/4W
R712	1-249-415-11	CARBON	680	5%	1/4W
R764	1-249-425-11	CARBON	4.7K	5%	1/4W
		< SWITCH >			
S703	1-762-234-11	SWITCH, SLIDE (TIMER)			
S764	1-554-303-21	SWITCH, TACTILE (POWER)			

****

* 1-654-136-11 REC BOARD
****

< CAPACITOR >

C712 1-164-159-11 CERAMIC 0.1uF 50V

< CONNECTOR >

CN752 1-766-805-11 CONNECTOR, BOARD TO BOARD 3P

< RESISTOR >

R706 1-249-417-11 CARBON 1K 5% 1/4W
R707 1-249-429-11 CARBON 10K 5% 1/4W

< VARIABLE RESISTOR >

RV702 1-223-799-11 RES, VAR, CARBON 20K/20K (REC LEVEL)

< SWITCH >

S702 1-572-624-11 SWITCH, SLIDE (INPUT)

****

MISCELLANEOUS
****

25 1-769-120-11 WIRE (FLAT TYPE) (22 CORE)
52 1-769-119-11 WIRE (FLAT TYPE) (18 CORE)
53 1-769-118-11 WIRE (FLAT TYPE) (30 CORE)
54 1-769-123-11 WIRE (FLAT TYPE) (22 CORE)
⚠56 1-558-945-21 CORD, POWER (POLAR. SPT-1) (US, Canadian)
⚠56 1-696-586-11 CORD, POWER (UK)
⚠56 1-751-275-11 CORD, POWER (AEP)
⚠157 8-583-009-01 DEVICE, MINI DISK KMS-210A/J-N
HR901 1-500-175-11 HEAD, OVER LIGHT (RF322-74A)
M101 A-4660-651-A MOTOR (SLED) ASSY
M102 A-4660-650-A CHASSIS ASSY, SUB
M191 A-4660-646-A MOTOR (LOADING) ASSY
S102 1-762-148-11 SWITCH, PUSH (2 KEY) (REFLECT/PROTECT)
⚠TR641 1-423-516-11 TRANSFORMER, POWER (US, Canadian)
⚠TR641 1-449-922-11 TRANSFORMER, POWER (AEP, UK)

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Ref. No.	Part No.	Description	Remark
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-473-028-11	REMOTE COMMANDER (RM-D3M)	
	1-558-271-11	CORD, CONNECTION	
	1-574-264-11	CORD, LIGHT PLUG (Canadian, AEP, UK)	
	3-707-584-21	COVER, BATTERY (FOR RM-D3M)	
	3-759-626-11	MANUAL, INSTRUCTION (ENGLISH, FRENCH, SPANISH, PORTUGUESE) (Canadian, AEP, UK)	
	3-759-626-21	MANUAL, INSTRUCTION (ENGLISH) (US)	
	3-759-626-41	MANUAL, INSTRUCTION (GERMAN, DUTCH, SWEDISH, ITALIAN) (AEP)	
*	4-925-389-01	CUSHION	
*	4-972-233-11	INDIVIDUAL CARTON	

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****
HARDWARE LIST
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#1	7-682-548-09	SCREW +BVTT 3X8 (S)
#3	7-621-775-20	SCREW +B 2.6X5
#4	7-685-646-79	SCREW +BVTP 3X8 TYPE2 N-S
#5	7-685-104-19	SCREW +P 2X6 TYPE2 NON-SLIT
#6	7-685-645-79	SCREW +BVTP 3X6 TYPE2 N-S
#7	7-627-852-08	SCREW, PRECISION +P 1.7X2.5
#8	7-685-105-19	TPG +P 2X8, TYPE 2, NON-SLIT
#9	7-685-533-19	SCREW +BTP 2.6X6 TYPE2 N-S
#10	7-685-871-01	SCREW +BVTT 3X6 (S)

9-959-307-11
907

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

English
94L180494-1
Printed in Japan

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