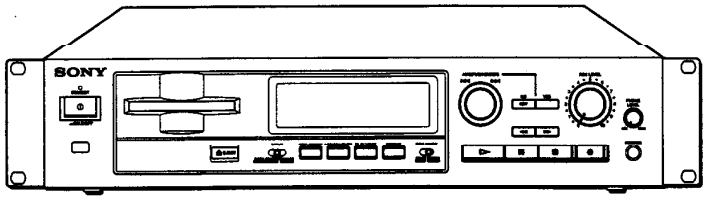
MDS-E58

SERVICE MANUAL

J Model
AEP Model
US Model



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Model Name Using Similar Mechanism	NEW
MD Mechanism Type	KMK-260AAA/J2N
Optical Pick-up Type	KMS-260A/J1N

SPECIFICATIONS

形式	ミニディスクデジタルオーディオシステム
ディスク	ミニディスク
記録方式	磁界変調オーバーライト方式
再生読み取り方式	非接触光学式読み取り（半導体レーザー使用）
レーザー	半導体レーザー（λ=780nm）
最長再生時間	最大74分（MDW-74使用時）
回転数	約400rpm～900rpm（CLV）
エラー訂正方式	アドバンスド クロスインターリーブ リード ソロモンコード（ACIRC）
サンプリング周波数	44.1kHz
コーディング	アダプティブ トランスフォーム アコースティック コーディング（ATRAC）
変調方式	EFM
チャンネル数	ステレオ2チャンネル
周波数特性	5～20,000Hz±0.5dB
S/N比	再生時92dB以上
ワウフラッター	測定限界値（±0.001% W. PEAK）以下

入力端子

端子名	端子形状	入力インピーダンス	基準入力レベル	最大入力レベル
アナログIN	ピンジャック	47kΩ	−4dBs	+12dBs
デジタルIN OPTICAL	角形光コネクタージャック	発光波長 660nm	—	—
デジタルIN COAXIAL	ピンジャック	75Ω	0.5 Vp-p ±20%	—

出力端子

端子名	端子形状	出力レベル	負荷インピーダンス
PHONES	ステレオ標準ジャック	0～10mW レベル可変	32Ω
アナログOUT	ピンジャック	最大+8dBs	10kΩ以上
デジタルOUT OPTICAL	角形光コネクタージャック	発光パワー −18dBm	発光波長 660nm
デジタルOUT COAXIAL	ピンジャック	0.5 Vp-p (75Ω時)	75Ω

OdBs=0.775Vrms

電源・その他

電源	AC 100V、50/60Hz
消費電力	13W
最大外形寸法	482×91×285mm（幅／高さ／奥行、最大突起部含む）
質量	約 4kg

付属品

- リモコン RM-D5MJ（1）
- 単3形（R6）乾電池（2）
- 接続コード　コントロールS用コード（1）
- ソニーご相談窓口のご案内（1）
- 保証書（1）

仕様および外観は、改良のため予告なく変更することがありますが、ご了承ください。

System	MiniDisc digital audio system
Disc	MiniDisc
Laser	Semiconductor laser (λ = 780 nm) Emission duration: continuous
Laser output	Less than 44.6 μW* * This output is the value measured at a distance of 200 mm from the objective lens surface on the Optical Pick-up Block with 7 mm aperture.
Laser diode properties	Material: GaAlAs
Revolutions (CLV)	400 rpm to 900 rpm
Error correction	Advanced Cross Interleave Reed Solomon Code (ACIRC)
Sampling frequency	44.1 kHz
Coding	Adaptive Transform Acoustic Coding (ATRAC)
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 92 dB during playback
Wow and flutter	Below measurable limit

Inputs

	Jack type	Input impedance	Rated input	Maximum input
LINE (ANALOG)IN	Phono jacks	47 kilohms	−4 dBu	+12 dBu
DIGITAL OPTICALIN	Square optical connector jack	Optical wave length: 660 nm	—	—
DIGITAL COAXIALIN	Phono jacks	75 ohms	0.5Vp-p ±20%	—

Outputs

	Jack type	Rated output	Load impedance
PHONES	Stereo phone jack	0–10 mW The level varies.	32 ohms
LINE (ANALOG) OUT	Phono jacks	Maximum +8 dBu	Over 10 kilohms
DIGITAL OPTICAL OUT	Square optical connector jack	Optical power −18 dBm	Wave length: 660 nm
DIGITAL COAXIAL OUT	Phono jacks	0.5Vp-p (at 75 ohms)	75 ohms

OdBu=0.775Vrms

General

Power requirements	Refer to warning letter.
Power consumption	20 W
Dimensions (approx.) (w/h/d) incl. projecting parts	482 × 91 × 285 mm (19 × 3 5/8 × 11 1/4 in.)
Mass (approx.)	4 kg (8 lbs 14 oz)

Supplied accessories See page 4.

Optional accessories
Optical cable: FOC-15A, etc.
Coaxial digital connecting cable: VMC-10, etc.
Recordable MDs: MDW-60 (60 min), MDW-74 (74 min)

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Design and specifications are subject to change without notice.

MINIDISC RECORDER

SONY®

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the equipment manufacturer.
Discard used batteries according to manufacture's instructions.

ADVARSEL!

Lithiumbatteri - Eksplosionsfare ved fejlagtig håndtering.
Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batteri tilbage til leverandøren.

ADVARSEL

Eksplosionsfare ved feilakting skifte av batteri.
Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten.
Brukte batterier katterier kasseres i henhold til fabrikantens

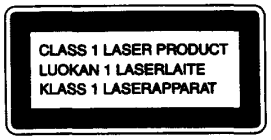
VARNIG

Explosionsfara vid felaktigt batteribyte.
Använd samma batterityp eller en likvärdig typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt gällande föreakrifter.

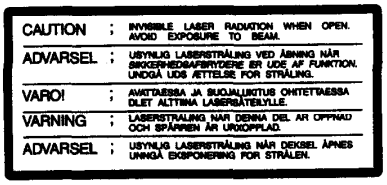
VAROITUS

Parist voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin.
Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

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



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



This caution label is located inside the unit.

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

12094

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:
Check the antenna terminals, metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE

The AC leakage from any exposed metal part to earth Ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 0.5 mA (500 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 2V AC range are suitable. (See Fig. A)

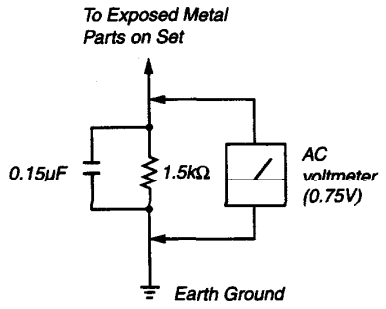


Fig. A. Using an AC voltmeter to check AC leakage.

TABLE OF CONTENTS

Notes on chip component replacement

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

Flexible Circuit Board Repairing

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

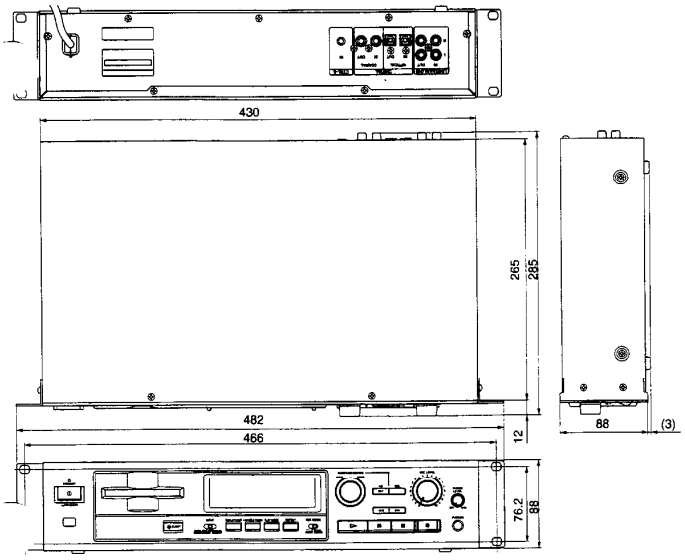
SAFETY-RELATED COMPONENT WARNING !!

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.

CAUTION

Danger of explosion if battery is incorrectly replaced.
Replace only with the same or equivalent type recommended by the manufacturer.
Discard used batteries according to the manufacturer's instructions.

Dimensions

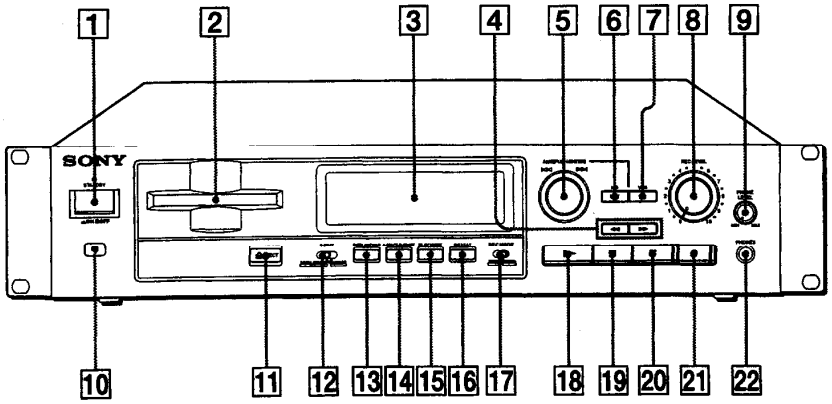


Unit : mm

Mounting the recorder

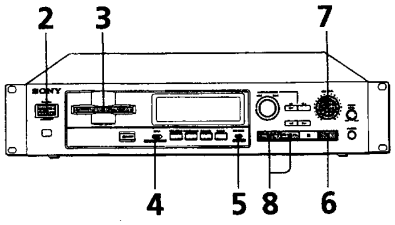
This recorder can be attached to a standard 19 inch rack (type EIA). After detaching the four feet on the bottom of the recorder, mount the recorder on the rack.

Index of Parts and Controls



1 ⏻/STANDBY (power) switch (6, 8, 30)
2 Disc compartment (6, 8)
3 Display
4 ◀◀/▶▶ (fast forward/rewind) buttons (17, 25)
5 AMS control (8, 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27)
6 EDIT/NO button (10, 12, 20, 21, 22, 23, 24, 25, 27)
7 YES button (20, 21, 22, 24, 25, 27)
8 REC LEVEL control (7, 11, 30)
9 PHONE LEVEL control (8)
10 Remote sensor
11 ⏏ EJECT button (7, 10, 19)
12 INPUT selector (6, 9, 10, 12)
13 DISPLAY/CHAR button (9, 14, 15, 24, 25)
14 A.SPACE/A.PAUSE button (20)
15 PLAY MODE button (18, 19)
16 REPEAT button (17, 18)
17 REC MODE selector (6, 10)
18 ▷ (play) button (7, 8, 10, 11, 17, 18, 19, 20)
19 ⏸ (pause) button (7, 8, 11, 23)
20 ■ (stop) button (7, 8, 10, 13, 18, 19, 20, 21, 22, 23, 24, 25, 27)
21 ● (record) button (7, 12)
22 PHONES jack (8)

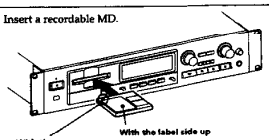
Recording on an MD



1 Turn on the mixer and program source.

2 Press ⏻.

3 Insert a recordable MD.



If the MD has a recorded material on it, the recorder will automatically start recording from the end of the last recorded track.

4 Set INPUT to the corresponding input connector.

To record through		Set INPUT to
DIGITAL IN	COAXIAL	DIGITAL COAX
	OPTICAL	DIGITAL OPT
LINE (ANALOG) IN		ANALOG

5 Set REC MODE to the mode you want to record in.

To record in	Set REC MODE to
Stereo sound	STEREO
Monaural sound*	MONO

* In the monaural recording, you can record about two times longer than in the stereo recording.

Monitor audio during recording
Even if you set REC MODE to MONO, the monitor signal does not become monaural

6 Press ●.
The recorder stands by for record.

7 When recording the analog input signal, adjust the recording level with REC LEVEL.
The fourth dot is satisfactory for most purposes. For details, refer to "Adjusting the Recording Level" on page 11.

8 Press ▷ or ⏸.
Recording starts.

9 Start playing the program source.

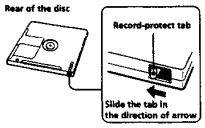
When "TOC" flashes in the display
The recorder is currently updating the Table Of Contents (TOC) Do not turn off the power, move the recorder, or pull out the AC power cord, while "TOC" is flashing Changes to an MD made through recording are saved only when you update the TOC by ejecting the MD

Do not turn off the power or disconnect the recorder from the power source immediately after recording.
If you do, recorded material may not be saved to the MD To save the material, after recording, press ⏏ EJECT to take out the MD "TOC" will flash in the display at this time.
After "TOC" stops flashing and is unlit, you can turn off the power or pull out the AC power cord

To	Press
Stop recording	■
Pause recording*	⏸ Press the button again or press ▷ to resume recording
Take out the MD	⏏ EJECT after stopping recording

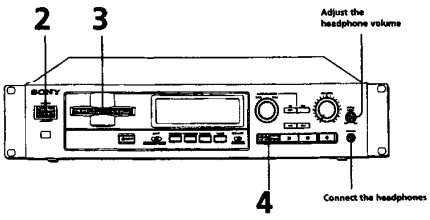
* Whenever you pause recording, the track number increases by one For example, if you paused recording while recording on track 4, the track number increases by one and recording continues on the new track when restarted

To protect an MD 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



Note
If you switch REC MODE during recording or recording pause, recording stops

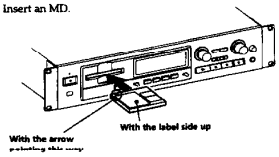
Playing an MD



1 Turn on the mixer and adjust the fader or level control of the corresponding channel.

2 Press ⏻.

3 Insert an MD.



4 Press ▷.
The recorder starts playing.

To	Do the following:
Stop playing	Press ■.
Pause playing	Press ⏸ Press the button again or press ▷ to resume playing.
Go to the next track	Turn AMS clockwise (or press ⏭ on the remote)
Go to the preceding track	Turn AMS counterclockwise (or press ⏮ on the remote)
Take out the MD	Press ⏏ EJECT

You can locate and play back a track while the recorder is stopped
1 Turn AMS (or press ⏮ or ⏭ on the remote) until the number of the desired track appears.
2 Press AMS or ▷.

To use headphones
Connect them to PHONES jack. Use PHONE LEVEL to adjust the volume.

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 an MD against accidental erasure" on page 7)

If "Din Unlock" flashes in the display
- The digital program source which you set with INPUT in Step 4 on page 6, is not connected
  To continue, connect the program source properly
- The program source is not on
  Turn on the program source

Depending on the source being recorded, track numbers are marked in the following ways:
- When recording from a CD or MD with INPUT set to DIGITAL and the source connected through DIGITAL IN: The recorder automatically marks track numbers in the same sequence as the original If, however, a track is repeated two or more times (e g by single-track repeat play) or two or more tracks with the same track number (e g from different MDs or CDs) are played, the track or tracks are recorded as a single, continuous track with a single track number
  If the source is an MD, track numbers may not be marked for tracks of less than 4 seconds.
- When recording from a source connected through LINE (ANALOG) IN with INPUT set to ANALOG, and "LEVEL- SYNC" does not light up (see "Marking Track Numbers While Recording" on page 12) or when recording from DAT or satellite broadcasts connected through DIGITAL IN with INPUT set to DIGITAL: 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 22) or mark track numbers during recording by using the Track Marking Function on page 12.
  If "LEVEL-SYNC" appears in the display, the recorder automatically marks track numbers when recording analog source or digital recording of DAT or satellite broadcasts (see "Marking track numbers automatically" on page 12)
- When recording from DAT or satellite broadcasts with INPUT set to DIGITAL, the recorder automatically marks a track number whenever the sampling frequency of the input signal changes

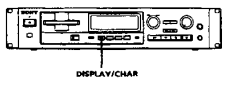
When "TOC" flashes in the display
The recorder is currently updating the Table Of Contents (TOC) Do not turn off the power, move the recorder, or pull out the AC power cord. Changes to an MD made through recording are saved when you update the TOC by ejecting the MD

If "Cannot Copy" appears in the display
The recorder uses the SCMS (Serial Copy Management System)
MDs recorded through digital input connector cannot be copied onto other MDs or DAT tapes through the digital output connector (see page 33)

When recording digital signals that have been emphasized (in the higher frequencies)
The signal is automatically de-emphasized (with attenuation proportional to the degree of emphasis) and the level of the de-emphasized signal is indicated on the peak level meters

When the recorder is recording or in recording pause, digital signals input through DIGITAL IN are output to DIGITAL OUT with the same sampling rate.
To change the digital input signal to another sampling rate for output (without recording it to an MD), use Input Monitor Function (see page 18).

Useful Tips for Recording



Checking the remaining recordable time on the MD

- When you press DISPLAY/CHAR repeatedly while recording, the display changes as follows: elapsed recording time, remaining recordable time on the MD, track name.
- When you press DISPLAY/CHAR repeatedly while the recorder is stopped, the display changes as follows: total recorded time, remaining recordable time on the MD, disc name (see page 15)

(Continued)

Monitoring the input signal (Input Monitor)

Before starting recording, you can monitor the selected input signal through the recorder's output connectors.

1 Press ⏏EJECT to remove the MD.

2 Set INPUT according to the input signal you want to monitor.

When INPUT is set to ANALOG
The analog signal input through *LINE (ANALOG) IN* is output to DIGITAL OUT after A/D conversion, and then to the LINE (ANALOG) OUT connectors and PHONES jack after D/A conversion.

When INPUT is set to DIGITAL
The digital signal input through DIGITAL IN is output to DIGITAL OUT, and then to the LINE (ANALOG) OUT connectors and PHONES jack after D/A conversion.

Note
Even if you set REC MODE to MONO, the monitor signal does not become monaural.

3 Press ●.
If INPUT is set to ANALOG, "AD-DA" appears in the display.
If INPUT is set to DIGITAL, "-DA" appears in the display.

If "Auto Cut" appears in the display (Auto Cut)

There has been no sound input for 30 seconds while INPUT is set to DIGITAL and the source is connected through *DIGITAL IN*. The 30 seconds of silence are replaced by a blank of about 3 seconds and the recorder changes to recording pause.

You can turn off the Auto Cut Function
For details, see "If "Smart Space" appears in the display" below

If "Smart Space" appears in the display (Smart Space)

When there has been an extended silence of up to 30 seconds in length, and the signal is input again, the silence is replaced by a blank of about 3 seconds and the recorder continues recording.

Note
However, if you begin recording during such an extended silent portion, the smart space function will not be activated

To turn off the Smart Space Function and Auto Cut Function
1 While the recorder is stopped, press EDIT/NO twice to display "Setup Menu".
2 Turn AMS until "S. Space" menu appears in the display, then press AMS.
3 Turn AMS until "S. Space Off" appears in the display, then press AMS
4 Press EDIT/NO.

To turn on the Smart Space Function and Auto Cut Function again
1 Carry out Steps 1 and 2 in "To turn off the Smart Space Function and Auto Cut Function" above.
2 Turn AMS until "S. Space On" appears in the display, then press AMS.
3 Press EDIT/NO.

Notes
- When you turn off the Smart Space Function, the Auto Cut Function is also turned off automatically.
- The Smart Space Function and Auto Cut Function are factory set to on.
- The Smart Space Function does not affect the order of the track numbers being recorded, even if the blank space occurs in the middle of a track.
- If you turn off the recorder or disconnect the AC power cord, the recorder will recall the last setting (on or off) of the Smart Space and Auto Cut Functions the next time you turn on the recorder.

Playing back tracks just recorded

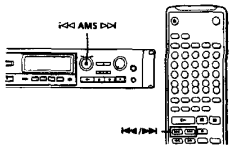
Follow this procedure to play back tracks that have just been recorded.

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

Recording Over Existing Tracks

Follow the procedure below to record over existing material just as you would on an analog cassette tape.



1 Carry out Steps 1 to 5 in "Recording on an MD" on page 6.

2 Turn AMS (or press I◀◀ or ▶▶I) until the number of the track to be recorded over appears.

3 To record from the start of the track, continue from Step 6 in "Recording on an MD" on page 7.

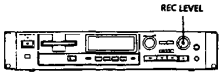
While "TRACK" flashes in the display
The recorder is recording over an existing track, and stops flashing when it reaches the end of the recorded portion.

To record from the middle of the track
1 After Step 2 above, press ▷ to start playback.
2 Press ■ where you want to start recording.
3 Continue from Step 6 in "Recording on an MD" on page 7.

Note
You cannot record from the middle of an existing track when "PROGRAM" or "SHUFFLE" is displayed lit.

Adjusting the Recording Level

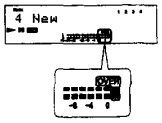
When recording with INPUT set to ANALOG and the signal input through LINE (ANALOG) IN jacks, use REC LEVEL to adjust the recording level before starting recording.
You cannot adjust the recording level during digital recording.



1 Carry out Steps 1 to 6 in "Recording on an MD" on pages 6 and 7

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.

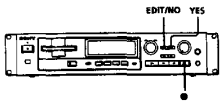


4 Stop playing the program source.

5 To start recording, follow the procedure starting from Step 8 in "Recording on an MD" on page 7.

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 ● 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 ways:
- When recording from CDs or MDs with INPUT set to 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 marked as they are found on the original
- **In the case other than the above**
While "LEVEL-SYNC" appears in the display, 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:

To display "LEVEL-SYNC"
1 While the recorder is stopped, press EDIT/NO twice to display "Setup Menu".
2 Turn AMS until "LevelSync?" appears in the display, then press AMS
3 Turn AMS until "LevelSync ON" appears in the display, then press AMS
4 Press EDIT/NO

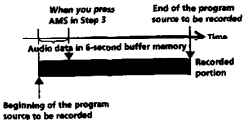
To cancel Automatic Track Marking
1 Carry out Steps 1 and 2 in "To display "LEVEL-SYNC"" above.
2 Turn AMS until "LevelSync OFF" appears in the display, then press AMS
3 Press EDIT/NO

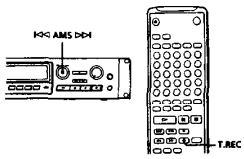
When you want to mark track numbers after you've finished recording
Use the Divide Function (see "Dividing Recorded Tracks" on page 22)

Note
If you turn off the recorder or disconnect the AC power cord, the recorder will recall the last setting (LevelSync ON or OFF) of the Automatic Track Marking Function the next time you turn on the recorder

Starting Recording With 6 Seconds of Prestored Audio Data (Time Machine Recording)

When recording from an FM or satellite broadcast, the first few seconds of material are often lost due to the time it takes you to ascertain the contents and press the record button. To prevent the loss of this material, the Time Machine Recording Function constantly stores 6 seconds of the most recent audio data in the buffer memory so that when you begin recording the program source, the recording actually begins with the 6 seconds of audio data stored in the buffer memory in advance, as shown in the illustration below:





1 Carry out Steps 1 to 6 in "Recording on an MD" on pages 6 and 7.
The recorder changes to recording pause.

2 Start playing the program source you want to record.
The most recent 6 seconds of audio data is stored in the buffer memory.

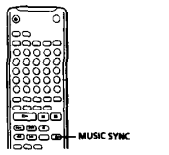
3 Press T.REC (or T.REC) to start Time Machine Recording.
Recording of the program source starts with the 6 seconds of audio data stored in the buffer memory.

To stop Time Machine Recording
Press ■

Note
The recorder starts storing audio data when the recorder is in recording pause and you start playing the program source. With less than 6 seconds of playing of the program source and audio data stored in the buffer memory, Time Machine Recording starts with less than 6 seconds of audio data

Synchro-Recording With Audio Equipment of Your Choice

By using the MUSIC SYNC button on the remote, you can automatically start a Synchronized recording with the signal input from the program source through the input jacks.
The method of marking track numbers differs, depending on the program source being recorded and how the recorder is connected to the program source. (See "Notes on Recording" on page 9.)



1 Carry out Steps 1 to 5 in "Recording on an MD" on page 6

2 Press MUSIC SYNC.
The recorder changes to recording pause.

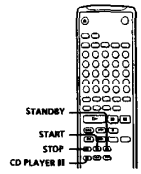
3 Start playing the program source you want to record.
The recorder starts recording automatically.

To stop Music Synchro-Recording
Press ■

Note
During Music Synchro-Recording, the Smart Space Function and the Auto Cut Function turn on automatically regardless of their settings (ON or OFF) and type of input (digital or analog).

Synchro-Recording With a Sony CD Player

Connecting your recorder to a Sony CD player, 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 a digital input cable, track numbers are automatically marked as on 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 (ANALOG) IN, track numbers are automatically marked when you select "LevelSync ON" (see "Marking Track Numbers While Recording" on page 12).
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 Turn on the CD player and the mixer.

Carry out 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 ■ on the remote of the CD player instead

7 Press STOP to stop synchro-recording.

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

You can use the remote of the CD player during synchro-recording
When you press ■, the CD player stops and the recorder pauses for recording.
When you press ■, the CD player pauses and the recorder pauses for recording.
To restart synchro-recording, press ▷.

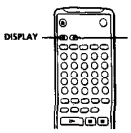
You can change CDs during synchro-recording
Carry out the following steps instead of Step 7 above
1 Press ■ on the remote or the CD player
The recorder pauses for recording
2 Change the CD.
3 Press ▷ on the remote of the CD player
Synchro-recording restarts.

You can also do synchro-recording with a Sony video CD player
Using the procedure for synchro-recording with a Sony CD player, you can do synchro-recording with a Sony video CD player also.
To select the video CD player, press button number 2 while pressing down the POWER button before starting the procedure
To select the CD player again, press button number 1 while pressing down the POWER button
The recorder is factory-set to CD player for synchro-recording.

You can check the remaining recordable time on the MD
Press DISPLAY/CHAR (or DISPLAY) (see page 15).

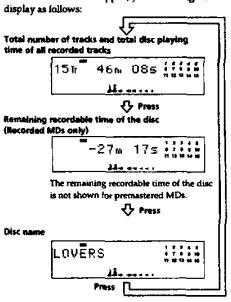
Using the Display

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

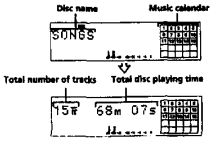


Checking the total track number, total disc playing time, remaining recordable time of the disc and the title of the disc

Each time you press DISPLAY/CHAR (or DISPLAY) while the recorder is stopped, you can change the display as follows:



When you insert an MD, the disc name, total number of tracks, and total disc playing time appear in the display as follows:

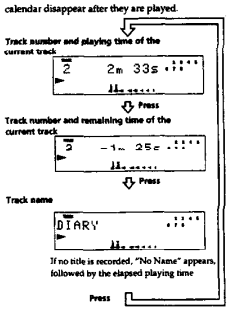


The disc name appears, followed by the total number of tracks (Tr) and total disc playing time.
A music calendar showing all the track numbers appears within a grid if the MD is a premastered disc, or without a grid if the MD is a recordable disc.
If the total track number exceeds 25, ▶ appears to the right of number 25 in the music calendar.
To label a recordable disc and its tracks, see "Labeling Recordings" on page 24.

Note
When you insert a new MD or turn off the recorder and turn it on again, the last item displayed will reappear.
However, if you disconnect the AC power cord, the display will show the total number of tracks and total disc playing time of all recorded tracks the next time you turn on the recorder, no matter what the last display was

Checking remaining time and the title of a track

Each time you press DISPLAY/CHAR (or 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.

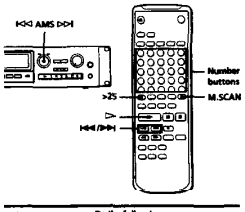


(Continued)

You can check the track name at any time while playing an MD
Press SCROLL on the remote
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 using AMS (Automatic Music Sensor), ⏮/⏭, number buttons or M.SCAN on the remote.



To locate	Do the following:
The next or succeeding tracks	During playback, turn AMS clockwise (or press ⏭ repeatedly) until you find the desired track.
The current or preceding tracks	During playback, turn AMS counterclockwise (or press ⏮ repeatedly) until you find the desired track
A specific track directly	Press number buttons to enter the track number.
A specific track by using AMS	1 Turn AMS until the desired track number appears while the recorder is stopped. (The track number is flashing.) 2 Press AMS or ▷.
By scanning each track (music scan)	1 Press M.SCAN before you start playing. 2 When you find the desired track, press ▷ to start playing

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

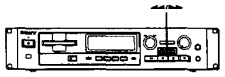
You can change the playing time during music scan
1 While the recorder is stopped, press EDIT/NO to display "Setup Menu."
2 Turn AMS until "M. Scan" menu appears in the display, then press AMS
3 Turn AMS to select the length of the M.SCAN play within the range of 6 to 20 seconds, using steps of about one second, then press AMS
4 Press EDIT/NO.

To pause playing at the beginning of a track
Turn AMS (or press ⏮ or ⏭) after pausing playback.

To go quickly to the beginning of the last track
Turn AMS counterclockwise (or press ⏮) while the display shows the total number of tracks and total disc playing time, remaining recordable time of the disc, or disc name (see page 15)

Locating a Particular Point in a Track

You can also use ⏮ and ⏭ to locate a particular point in a track during playback or playback pause.



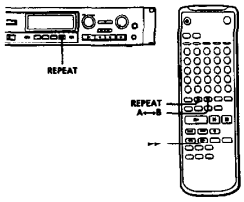
To locate a point	Press
While monitoring the sound	⏭ (forward) or ⏮ (backward) and keep pressing until you find the desired point
Quickly by observing the display during playback pause (high speed search)	⏭ or ⏮ and hold until you find the desired point. There is no sound output during this operation

When "OVER" appears during high speed search
If the disc reaches the end while you are pressing ⏭ during playback pause, "OVER" appears in the display. Press ⏮ (or press ⏮) or turn AMS (or press ⏮) counterclockwise to go back.

Notes
- 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.
"REPEAT" appears in the display.
The recorder repeats the tracks as follows:

When the MD is played in	The recorder repeats
Normal play (page 8)	All the tracks
Shuffle Play (page 18)	All the tracks in random order
Program Play (page 19)	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 normal play, press REPEAT several times until "REPEAT 1" appears in the display.

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

To cancel A-B repeat
Press REPEAT or ■

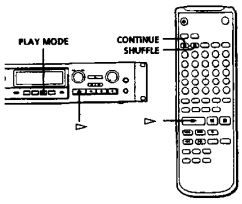
Setting new starting and ending points
You can repeat the portion immediately after the currently specified portion by changing the starting and ending points

1 Press A↔B while "REPEAT A-B" appears.
The current ending point B becomes the new starting point A and "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
"REPEAT A-B" lights continuously and the recorder starts playing the newly specified portion repeatedly

Note
If you turn off the recorder or disconnect the AC power cord, the recorder will recall the last setting of the Repeat Function the next time you turn on the recorder
The A-B Repeat settings, however, are lost.

Playing Tracks 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 when the recorder is stopped.

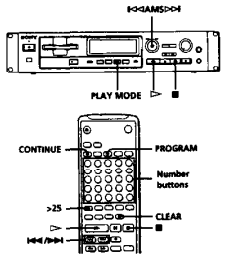
2 Press ▷ to start Shuffle Play.

To cancel Shuffle Play
When the recorder is stopped, 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 ▶▶|).
- To play from the beginning of the current track again, turn AMS counterclockwise (or press |◀◀). You cannot use AMS (or |◀◀) 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 when the recorder is stopped.

2 Carry out 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 16).

If you've made a mistake
Press CLEAR, then press the correct 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.

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

4 Press ▷ to start Program Play.

To cancel Program Play
When the recorder is stopped, 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 to repeat.

The program remains even after Program Play ends
When you press ▷, you can play the same program again

Notes
- The program created by the Program Play Function is lost when you press ⏏EJECT to take out the MD.
- The program created by the Program Play Function is lost when you turn off the recorder or disconnect the AC power cord
- The display shows "- -m - -s" instead of the total playing time when the total playing time of the program exceeds 160 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.

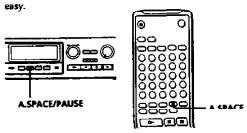
Changing the track order

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 this button, the last track will be cleared.
Add tracks to the end of the program	Carry out Steps 2 and 3 in "Creating Your Own Program"
Change the whole program completely	1 Press PLAY MODE (or press CONTINUE) so that "PROGRAM" disappears while the recorder is stopped 2 Carry out Steps 1 to 3 in "Creating Your Own Program"

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 playback later.

Press A.SPACE/PAUSE (or A.SPACE) repeatedly until "A.SPACE" appears in the display.

To cancel Auto Space
Press A.SPACE/PAUSE (or 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/PAUSE (or A.SPACE) repeatedly until "A.PAUSE" appears in the display.

To restart playback
Press ▷ or ■

To cancel Auto Pause
Press A.SPACE/PAUSE (or A .SPACE) repeatedly until "A.PAUSE" disappears.

Note
If you turn off the recorder or disconnect the AC power cord, the recorder will recall the last setting of the Auto Space and Auto Pause Functions the next time you turn on the recorder

Notes on Editing

You can edit the recorded tracks after recording, using the following functions:
- Erase Function allows you to erase recorded tracks simply by specifying the corresponding track number.
- Divide Function allows you to divide tracks at specified points so that you can quickly locate those points afterwards, using the AMS function.
- Combine Function allows you to combine two consecutive tracks into one.
- Move Function allows you to change the order of tracks by moving a specific track to a desired track position.
- Title Function allows you to create titles for your recorded MDs and tracks.

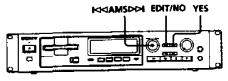
If "Protected" appears in the display
The recorder could not edit because the record-protect slot on the MD is open. Edit after closing the slot (see page 7)

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. "TOC" flashes while the recorder is updating the TOC. When the recorder finishes updating the TOC, "TOC" goes off

Erasing Recordings (Erase Function)

Follow the procedures below to erase:
- A single track
- All tracks
- Part of a track

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

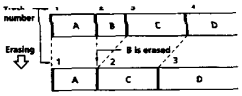


Erasing a single track

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 the order of high to low track numbers to prevent the renumbering of tracks that have not been erased yet

Example: Erasing B



1 While the recorder is stopped or during playback pause, press EDIT/NO to display "Edit Menu."

2 Turn AMS until "Erase?" appears in the display, then press AMS.

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

4 Press AMS or YES.
When the track selected in Step 3 has been erased, "Complete" appears for a few seconds and the total number of tracks in the music calendar decreases by one.

5 Repeat Steps 1 to 4 to erase more tracks.

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

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

You can delete the disc name, all recorded tracks, and titles of the recordable MD at once.

1 While the recorder is stopped or during playback pause, press EDIT/NO to display "Edit Menu."

2 Turn AMS until "All Erase?" appears in the display

3 Press AMS or YES.
"All Erase??" appears and all tracks in the music calendar start flashing.

4 Press AMS or 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.

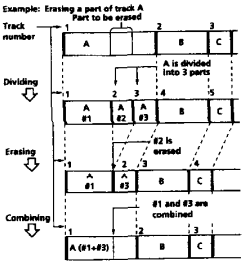
To cancel the Erase Function
Press EDIT/NO or ■ and "All Erase?" or "All Erase??" disappears.

You can undo the Erase Function
See "Undoing the Last Edit" on page 27

Erasing a part of a track

By using the Divide (see page 22), Erase (see page 20) and Combine (see page 23) Functions, you can erase specific portions of a track.

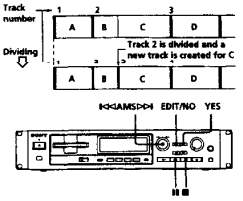
Example: Erasing a part of track A



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 II at the point where you want to create a new track.
The recorder pauses playing.

2 Press EDIT/NO to display "Edit Menu."

3 Turn AMS until "Divide?" appears in the display, then press AMS.
"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. (If the starting position is correct, proceed with Step 5.)

4 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 seconds within a track.

5 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 ■ or EDIT/NO.

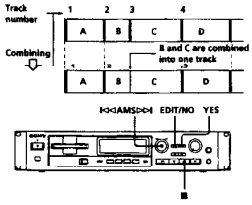
You can undo a track division
Combine the tracks again (see "Combining Recorded Tracks" on page 23) then redivide the tracks if necessary.

You can divide a track while recording
Use the Track Marking Function (see page 12)

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 decreases by one and all tracks following the combined tracks are renumbered.

Example: Combining B and C



1 While the recorder is stopped or during playback pause, press EDIT/NO to display "Edit Menu."

2 Turn AMS until "Combine?" appears in the display, then press AMS.

3 Turn AMS until the number of the former track of the two to be combined appears in the display, then press AMS.
"Rehearsal" alternates with "Track ok?" in the display. The place where the two tracks will join (i.e., the end of the former track and the beginning of the latter track) repeatedly plays back and the respective track number flashes in the music calendar.

4 If the track is the wrong one, press EDIT/NO or ■, then start again from Step 1.

5 If the place is correct, press AMS or 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 latter track is erased.

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

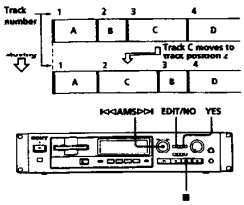
You can undo a track combination
Divide the tracks again (see "Dividing Recorded Tracks" on page 22), then repeat the combine function with the correct tracks if necessary.

Note
If "Impossible" 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 old track positions are automatically renumbered.

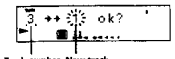
Example: Moving track C to track position 2



1 While the recorder is stopped or during playback pause, press EDIT/NO to display "Edit Menu."

2 Turn AMS until "Move?" appears in the display, then press AMS

3 Turn AMS until the track number you want to move appears in the display, then press AMS.



Track number to be moved | New track position

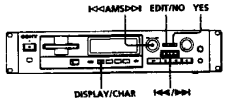
4 Turn AMS until the new track position appears

5 Press AMS or YES.
After you have moved the track, "Complete" appears for a few seconds.

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 during play, pause, record, or stop mode. If the track is playing or recording, be sure to finish labeling before the track ends. If the track ends before you've completed the labeling procedure, only the characters already entered are recorded automatically.

1 While the recorder is stopped or during playback pause, press EDIT/NO to display "Edit Menu."

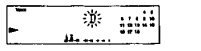
2 Turn AMS until "Name in?" appears in the display, then press AMS.

3 Turn AMS to select "Disc" or track number, then press AMS.
When you label an MD, select "Disc" and when you label a track, select the track number. Note that during recording, the recorder changes to character typing mode and a cursor starts flashing.

4 Press DISPLAY/CHAR to select the character type as follows:

To select	Press DISPLAY/CHAR repeatedly until
Uppercase letters	"A" appears in the display
Lowercase letters	"a" appears in the display
Numbers	"0" appears in the display

5 Turn AMS to select the character.



The selected character flashes.
Letters, numbers, and symbols appear in sequential order as you turn AMS.
You can use the following symbols in titles:
! " # $ % & ' ( ) * + , – . / : ; < = > ? @ _ `
You can press DISPLAY/CHAR to change the character type at any time during this step (see Step 4.)

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

7 Repeat Steps 4 to 6 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 4 to 6 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

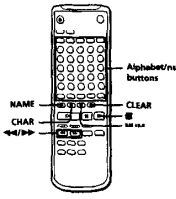
8 Press YES.
This completes the labeling procedure and the title appears on the left side of the display.

To cancel labeling
Press ■

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

(Continued)

Labeling tracks and MDs 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, recording the track to be labeled, or stopped after locating the track to be labeled
An MD	Stopped with no track number appearing in the display

2 Select the character type as follows:

To select	Press
Uppercase letters	CHAR repeatedly until "Selected ABC" appears in the display
Lowercase letters	CHAR 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 title is to be
A track title	Playing, pausing the track whose title is to be changed, or stopped after locating the track whose title is to be changed
A disc name	Stopped with no track number appearing in the display

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

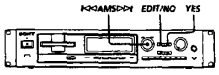
3 Enter the *new* title.
Carry out Steps 4 to 7 of "Labeling Recordings" on page 24, or Steps 2 to 4 of "Labeling tracks and MDs with the remote" on page 26.

4 Press NAME.

Undoing the Last Edit (Undo Function)

You can use the Undo Function to cancel the last edit and restore the contents of the MD to the condition that existed before editing was done. Note, however, that you cannot undo an edit if you do any of the following after the edit:

- *Press the ● button on the front panel.*
- *Press the ● button, the MUSIC SYNC button, or the CD SYNC (REMOTE) button on the remote.*
- Turn off the power or eject the MD.
- Disconnect the AC power cord.



1 While the recorder is stopped or during playback pause, press EDIT/NO to display "Edit Menu."

2 Turn AMS until "Undo?" appears in the display, then press AMS.
"Undo?" does not appear if no editing has been done.
One of the following messages appears in the display, depending on the type of editing to be undone:

Editing done:	Message:
Erasing a single track	"Erase Undo ?"
Erasing all tracks on an MD	
Dividing a track	"Divide Undo ?"
Combining tracks	"Combine Undo ?"
Moving a track	"Move Undo ?"
Labeling a track or an MD	"Name Undo ?"
Changing an existing title	

3 Press YES again.
"Complete" appears for a few seconds and the contents of the MD are restored to the condition that existed before the edit.

To cancel the Undo Function
Press EDIT/NO or ■

Function of Control Terminal

Control terminal (CTRL-S)
Mini jack type

When a system controller with CTRL-S terminal is connected to the control terminal of this recorder, it can operate as a remote .

Control functions
The system controller which is connected to the control terminal operates the same as the supplied remote RM-D7M

Note
When the system controller is connected to the control jack, the remote can not be used because its infrared rays are stopped.

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 33.)
Cannot EDIT	An attempt was made to edit the MD during Program, Shuffle, or Normal Play
Dm Unlock	The connected digital sound source is turned off or the recorder is not connected properly to the sound source.
Disc Error	Defected MD is inserted
Disc Full	The MD is full (see "System Limitations" on this page)
Impossible	You cannot record or edit the MD due to the system limitations.
Name Full	The titling capacity of the MD has reached its limit (about 1,700 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.
STANDBY (flashing)	The contents previously recorded are not saved correctly on the MD, or the program created by Program Play is not stored in the recorder's memory

System Limitations

The recording system in your *MiniDisc recorder is radically different from those used in cassette and DAT* recorders 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 20)
- 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.

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 ⏻ 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 (ANALOG) IN.) Turn REC LEVEL to adjust the recording level properly (see *page 11*)
➡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 cord has been disconnected during recording. Data recorded to that point may be lost. Repeat the recording procedure.

The recorder does not work during synchro-recording.
➡The currently selected CD player type (CD player or video CD player) does not match the CD player being used. Reset the CD player type (see page 14)

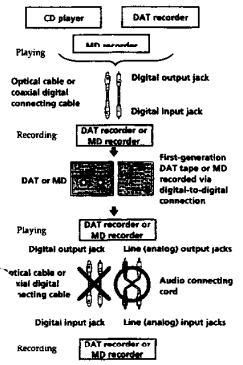
The sound has a lot of static.
➡Strong magnetism from a television or a similar device is interfering with operations. Move the recorder away from the source of strong magnetism

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

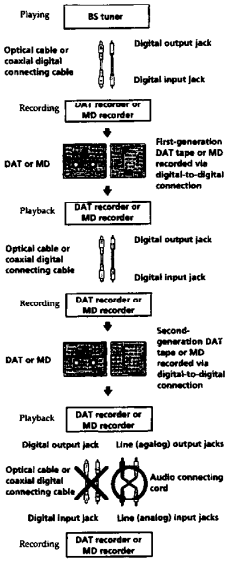
Guide to the Serial Copy Management System

MD recorder uses the Serial Copy Management System, which allows only first-generation digital copies to be made of premastered software via the recorder's digital input jack. An outline of this system appears below:

1 You can record from digital program sources (CDs, DATs or premastered MDs) onto a DAT tape or recordable MD via digital input jack on the DAT or MD recorder
You cannot, however, record from this recorded DAT tape or MD onto another DAT tape or recordable MD via the digital input jack on the DAT or MD recorder.



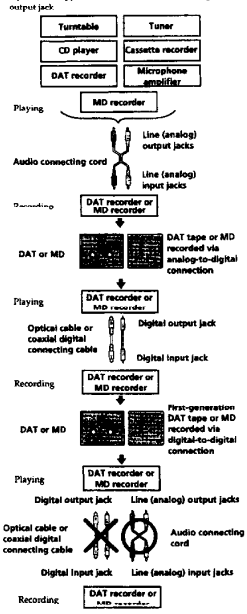
2 You can record the digital input signal of a digital satellite broadcast onto a DAT tape or recordable MD via the digital input jack on the DAT or MD recorder which is capable of handling a sampling frequency of 32 kHz or 48 kHz. You can then record the contents of this recorded DAT tape or MD (first-generation) onto another DAT tape or recordable MD via digital input jack on the DAT or MD recorder to create a second-generation digital copy. Subsequent recording from the second-generation copy onto another recordable DAT tape or MD is possible only through the analog input jack on the DAT or MD recorder. Note, however, that on some BS tuners, second-generation digital copying may not be possible



(Continued)

Additional Information

3 You can record a DAT tape or MD recorded via the DAT or MD recorder's analog input jack onto another DAT tape or MD via the DAT or MD recorder's digital output jack
You cannot, however, make a second-generation DAT tape or MD copy via the DAT or MD recorder's digital output jack



2-1. PRECAUTIONS FOR USE OF TEST MODE

① As loading related operations will be performed regardless of the test mode operations being performed, be sure to check that the disc is stopped before setting and removing it.
Even if the EJECT button is pressed while the disc is rotating during continuous playback, continuous recording, etc., the disc will not stop rotating.
Therefore, it will be ejected while rotating.
Be sure to press the EJECT button after pressing the NO button and the rotation of disc is stopped.

② The erasing-protection tab is not detected in the test mode. Therefore, If any operation is made in the recording laser emission mode or if ●REC button is pressed, the recorded contents will be erased regardless of the position of the tab. When using a disc that is not to be erased in the test mode, be careful not to enter the continuous recording mode and traverse adjustment mode.

2-1-1. The Modes and Button Operation in which the Recording Laser is Emitted

1. Continuous recording mode (CREC MODE)
2. Traverse adjustment mode (EFBAL ADJUST)
3. Laser power adjustment mode (LDPWR ADJUST)
4. Laser power check mode (LDPWR CHECK)
5. When pressing the ●REC button.

2-2. SETTING THE TEST MODE

While pressing both the REC and the YES buttons, turn on the POWER switch.

. EXITING THE TEST MODE

After pressing the REPEAT button, turn off the POWER switch.

2-4. BASIC OPERATIONS OF THE TEST MODE

All operations are performed using the AMS knob, YES button, and NO button.
The functions of these buttons are as follows.

Function name	Function
AMS knob	Changes parameters and modes
YES button	Proceeds onto the next step. Finalizes input.
O button	Returns to previous step. Stops operations.

2-5. SELECTING THE TEST MODE

Thirteen test modes are selected by turning the AMS knob.

Display	Contents
TEMP ADJUST	Temperature compensation offset adjustment
LDPWR ADJUST	Laser power adjustment
LDPWR CHECK	Laser power check
FBAL ADJUST	Traverse adjustment
FBIAS ADJUST	Focus bias adjustment
FBIAS CHECK	Focus bias check
CPLAY MODE	Continuous playback mode
CREC MODE	Continuous recording mode
S curve CHECK	S curve check *
EEP MODE	Non-volatile memory mode *

For detailed description of each adjustment mode, refer to "3. Electrical Adjustments".
If a different adjustment mode has been selected by mistake, press the NO button to exit from this mode.

* The EEP MODE is not used in servicing.
If set accidentally, press the NO button immediately to exit this mode.

2-5-1. Operating the Continuous Playback Mode

1. Entering the continuous playback mode
   ① Set the disc in the unit. (The recordable discs or playback only discs can be used.)
   ② Rotate the AMS knob and display "CPLAY MODE".
   ③ Press the YES button to change the display to "CPLAY MID".
   ④ When access completes, the display changes to "C1 = □□□□ AD = □□".
   Note : The numbers "□" displayed show you error rates and ADER.
2. Changing the playback segments
   ① Press the YES button during continuous playback to change the display as below and more the segments to be played back.
   "CPLAY MID" →"CPLAY OUT"→ "CPLAY IN" ┐
   ↑ ┘
   ② When access completes, the display changes to "C1 = □□□□ AD = □□".
   Note : The numbers "□" displayed show you error rates and ADER.
3. Ending the continuous playback mode
   ① Press the NO button. The display will change to "CPLAY MODE".
   ② Press the EJECT button to remove the disc.
   Note : The playback start addresses for IN, MID, and OUT are as follows. In case you want to display the address of the playback position on the display, press the DISPLAY/CHAR button and display "CPLAY (□□□□)".
   IN 40h cluster
   MID 300h cluster
   OUT 700h cluster

2-5-2. Operating the Continuous Recording Mode

1. Entering the continuous recording mode
   ① Set a recordable disc in the unit. (Refer to Note 3)
   ② Rotate the AMS knob and display "CREC MODE".
   ③ Press the YES button to change the display to "CREC MID".
   ④ When access completes, the display changes to "CREC (□□□□)" and **REC** lights up.
   Note : The numbers "□" displayed shows you the recording segment addresses.
2. Changing the recording segment
   ① When the YES button is pressed during continuous recording, the display changes as below and you can change the segment to be recorded.
   The **REC** display is turned off during segment change.
   "CPLAY MID" → "CPLAY OUT"→ "CPLAY IN" ┐
   ↑ ┘
   ②When access completes, the display changes to "CREC (□□□□)" and **REC** lights up.
   Note : The numbers "□" displayed shows you the recording segment addresses.
3. Ending the continuous recording mode
   ① Press the NO button. The display changes to "CREC MODE" and **REC** goes off.
   ② Press the EJECT button to remove the disc.
   Note 1 : The recording start addresses for IN, MID, and OUT are as follows.
   IN 40h cluster
   MID 300h cluster
   OUT 700h cluster
   Note 2 : The NO button can be used to stop recording anytime.
   Note 3 : During the test mode, the erasing-protection tab will not be detected. Therefore be careful not to enter the continuous recording mode when a disc not to be erased is set in the unit.
   Note 4 : Do not perform continuous recording for 5 minutes or longer.
   Note 5 : During continuous recording, be careful not to apply vibration to the unit.

2-5-3. Non-Volatile Memory Mode (EEP MODE)

This mode reads and writes the contents of the non-volatile memory.
It is not used in servicing. If a unit enters the EEP mode by mistake or accidentally, press the NO button immediately to exit it.

2-6. FUNCTIONS OF OTHER BUTTONS

Function	Contents
▷	Sets continuous playback when pressed in the STOP state. When pressed during continuous playback, the tracking servo turns ON/OFF.
■	Stops continuous playback and continuous recording.
▶▶	The sled moves to the outer circumference only when this is pressed.
◀◀	The sled moves to the inner circumference only when this is pressed.
●	Turns recording ON/OFF when pressed during continuous playback.
A·SPACE/A·PAUSE	Every pressing of this button toggles between the pit and the groove modes.
PLAY MODE	Switches the spindle servo mode (Either CLV S or A).
DISPLAY/CHAR	Every pressing of this button switches the display.

Note : The erasing-protection tab is not detected during the test mode. Recording will start regardless of the position of the erasing-protection tab when the ● REC button is pressed.

2-7. TEST MODE DISPLAYS

Each time the DISPLAY/CHAR button is pressed, the display changes in the following order.

MODE display→Error rate display→Address display→Auto gain display→IVR display

auto gain display and the IVR display are not used for servicing.

MODE display

"TEMP ADJUST", "CPLAY MODE", etc., are displayed.

2. Error rate display

Error rates are displayed as follows.

C1 = □□□□ AD = □□□□

C1 = : Indicates C1 error

AD = : Indicates ADER

3. Address display

Addresses are displayed as follows. (MO : Recordable disc, CD : Disc for playback only)

h = □□□□ s = □□□□ (MO pit and CD)

= □□□□ a = □□□□ (MO groove)

h = : Header address

s = : SUBQ address

a = : ADIP address

* "_" is displayed when the address cannot be read.

4. Auto gain display

Auto gains are displayed as follows.

AG F = □□ T = □□

F= Focus auto gain acquired value.

T= Tracking auto gain acquired value.

MEANINGS OF OTHER DISPLAYS

Display	Contents		
	Turns on	Turns Off	Flashing
▶	During continuous playback	STOP	
▮▮	Tracking servo OFF	Tracking servo ON	
REC	Recording mode ON	Recording mode OFF	
CLOCK	CLV LOCK	CLV UNLOCK	
TRACK	Pit	Groove	
DISC	High reflection	Low reflection	
DATE	CLV S	CLV-A	
A·SPACE	ABCD adjustment completed		
A – B	Focus auto gain successful Tracking auto gain successful		Focus auto gain successful Tracking auto gain failed

3-1. PRECAUTIONS FOR CHECKING LASER DIODE EMISSINON

To check the emission of the laser diode during adjustments, never view directly from the top as this may lose your eye-sight.

3-2. PRECAUTIONS FOR ADJUSTMENTS

1) Set the test mode when performing adjustments.
   After completing the adjustments, exit the test mode.
2) Perform the adjustments in the order shown.
3) Use the following tools and measuring devices.
   - Test disc (CD for playback only)
     1DYS-1 (Parts No. 4-963-646-01)
   - Laser power meter
     LPM-8001 (Parts No. J-2501-046-A)
   - Oscilloscope (Measure after performing CAL of prove.)
   - Digital voltmeter
   - Thermometer
4) When observing several signals on the oscilloscope, etc., make sure that VC and ground do not connect inside the oscilloscope.
   (VC and ground will become short-circuited.)

3-3. CREATING CONTINUOUSLY RECORDED DISC

- This disc is used in focus bias adjustment and error rate check.
  The following describes how to create a continuous recording disc.

1. Insert a disc (blank disc) commercially available.
2. Rotate the AMS knob and display "CREC MODE".
3. Press the YES button again to display "CREC MID".
   Display "CREC (0300)" and start to recording.
4. Complete recording within 5 minutes.
5. Press the NO button and stop recording .
6. Press the EJECT button and remove the disc.

The above has been how to create a continuous recorded data for the focus bias adjustment and error rate check.

Note :

- Be careful not to apply vibration during continuous recording.

3-4. TEMPERATURE COMPENSATION OFFSET ADJUTMENT

Save the temperature data at that time in the non-volatile memory as 25 °C reference data.

Note :

1. Usually, do not perform this adjustment.
2. Perform this adjustment in an ambient temperature of 22 °C to 28 °C. Perform it immediately after the power is turned on when the internal temperature of the unit is the same as the ambient temperature of 22 °C to 28 °C.
3. When D101 has been replaced, perform this adjustment after the temperature of this part has become the ambient temperature.

Adjusting Method :

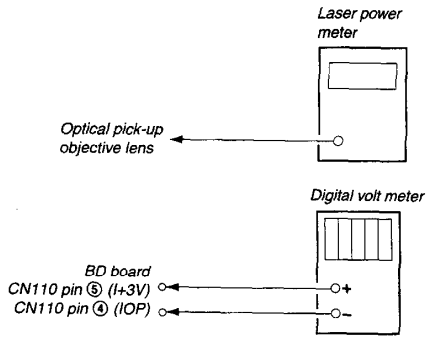
1. Rotate the AMS knob and display "TEMP ADJUST".
2. Press the YES button and select the "TEMP ADJUST" mode.
3. "TEMP = □□" and the present temperature data will be displayed.
4. To save the data, press the YES button.
   When not saving the data, press the NO button.
5. When the YES button is pressed, "TEMP = □□ SAVE" will be displayed and turned back to "TEMP ADJUST" display then. When the NO button is pressed, "TEMP ADJUST" will be displayed immediatelly.

Specification Value :

The "TEMP = □□" value should be within "E0 - EF", "F0 - FF", "00 - 0F", "10 - 1F" and "20 - 2F".

3-5. LASER POWER ADJUSTMENT

Connection :



Adjusting Method :

1. Insert the laser power meter into the disc insertion slot and set it on top of the objective lens of the optical pick-up. (When it cannot be set properly, press the ◀◀ button or ▶▶ button and move the optical pick-up.)
   Connect the digital volt meter to CN110 pin ⑤ (I+3V) and CN110 pin ④ (IOP).
2. Rotate the AMS knob and display "LDPWR ADJUST".
   (Laser power : For adjustment)
3. Press the YES button once and display "LD 0.9 mW $ □□".
4. Rotate the AMS knob so that the reading of the laser power meter becomes 0.80 to 0.96 mW.
   Set the range control on the laser power meter to 10mW, then press the YES button to save the adjustment result in the non-volatile memory.
   ("LD SAVE $ □□" will be displayed for a moment.)

5. Then "LD 7.0 mW $ □□" will be displayed.
6. Rotate the AMS knob so that the reading of the laser power meter becomes 6.8 to 7.2 mW, press the YES button and save the adjustment result in the non-volatile memory.
("LD SAVE $ □□" will be displayed for a moment.)

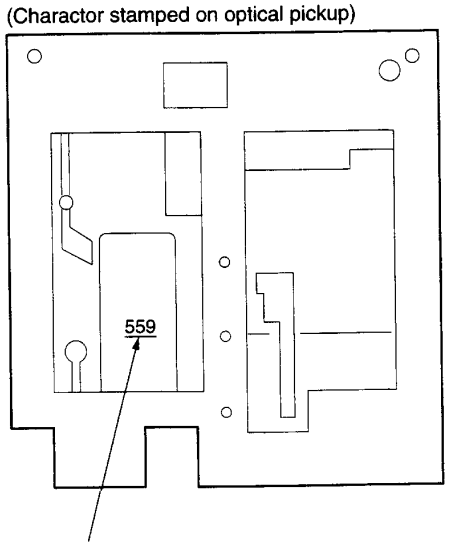
Note : Do not perform the emission with 7.0 mW more than 15 seconds continuously.

7. Then, rotate the AMS knob and display "LDPWR CHECK".
8. Press the YES button and display "LD 0.9 mW $ □□".
Check that the reading of the laser power meter becomes 0.81 to 0.95 mW.
9. Press the YES button once more and display "LD 7.0 mW $ □□".
Check that the reading the laser power meter and digital volt meter satisfy the specification value.

Specification Value :

Laser power meter reading : 7.0 ± 0.2 mW
Digital voltmeter reading : The stamped value on the optical pick-up ± 4mA

(Charactor stamped on optical pickup)

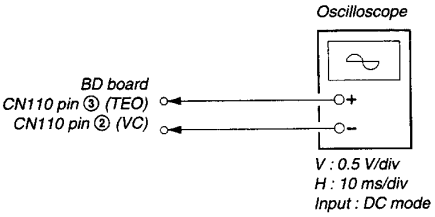


Iop = 55.9 mA in this case
Iop (mA) = Digital voltmeter reading (mV)/1 (Ω)

10. Press the NO button and display "LDPWR CHECK" and stop the laser emission.
(The NO button is effective at all times to stop the laser emission.)

3-6. TRAVERSE ADJUSTMENT

Connection :



Adjusting method :

1. Connect an oscilloscope to CN110 pin ③ (TEO) and CN110 pin ② (VC) of the BD board.
2. Load a disc (any available on the market). (Refer to Note 1.)
3. Press the ◀◀ button or ▶▶ button and move the optical pick-up outside the pit.
4. Rotate the AMS knob and display "EFBAL ADJUST".
5. Press the YES button and display "EFB = □□ MO-R".
(Laser power READ power/Focus servo ON/tracking servo OFF/spindle (S) servo ON)
6. Rotate the AMS knob so that the waveform of the oscilloscope becomes the specified value.
(When the AMS knob is rotated, the □□ of "EFB= □□" changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.
(Read power traverse adjustment)

(Traverse Waveform)

Specification A = B

7. Press the YES button and save the result of adjustment to the non-volatile memory ("EFB = □□ SAVE" will be displayed for a moment. Then "EFB = □□ MO-W" will be displayed).
8. Rotate the AMS knob so that the waveform of the oscilloscope becomes the specified value.
(When the AMS knob is rotated, the □□ of "EFB- □□" changes and the waveform changes.) In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.
(Write power traverse adjustment)

(Traverse Waveform)

Specification A = B

9. Press the YES button, and save the adjustment results in the non-volatile memory. ("EFB = □□ SAVE" will be displayed for a moment.)

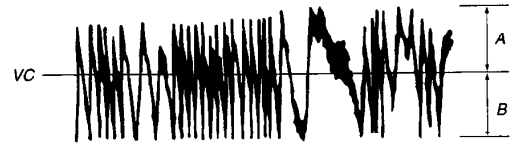
10. "EFB = □□ MO-P" will be displayed.
    The optical pick-up moves to the pit area automatically and servo is imposed.
11. Rotate the AMS knob until the waveform of the oscilloscope moves closer to the specified value.
    In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

(Traverse Waveform)

Specification A = B

12. Press the YES button, and save the adjustment results in the non-volatile memory. ("EFB = □□ SAVE" will be displayed for a moment.)
    Next "EFBAL CD" is displayed. The disc stops rotating automatically.
13. Press the EJECT button and remove the disc.
14. Load the check disc TDYS-1.
15. Press the YES button and display "EFB = □□ CD". Servo is imposed automatically.
16. Rotate the AMS knob so that the waveform of the oscilloscope moves closer to the specified value.
    In this adjustment, waveform varies at intervals of approx. 2%. Adjust the waveform so that the specified value is satisfied as much as possible.

(Traverse Waveform)

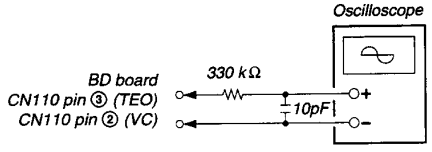


Specification A = B

17. Press the YES button, display "EFB = □□ SAVE" for a moment and save the adjustment results in the non-volatile memory.
    Next "EFBAL ADJUST" will be displayed.
18. Press the EJECT button and remove the check disc TDYS-1.

Note 1 : MO reading data will be erased during if a recorded disc is used in this adjustment.

Note 2 : If the traverse waveform is not clear, connect the oscilloscope as shown in the following figure so that it can be seen more clearly.



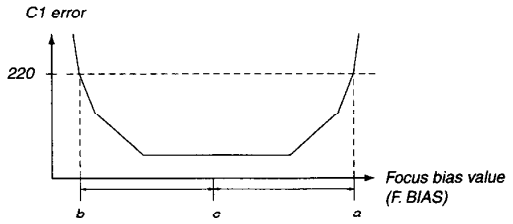
3-7. FOCUS BIAS ADJUSTMENT

Adjusting Method :

1. Load a continuously recorded disc (Refer to "3-3. Creating Continuously Recorded Disc".).
2. Rotate the AMS knob and display "CPLAY MODE".
3. Press the YES button and display "CPLAY MID".
4. Press the NO button when "C1 = □□□□ AD = □□" is displayed.
5. Rotate the AMS knob and display "FBIAS ADJUST".
6. Press the YES button and display " □□□□/□□ a = □□".
   The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the two digits after [a =] indicate the focus bias value.
7. Rotate the AMS knob in the clockwise direction and find the focus bias value at which the C1 error rate becomes 220 (Refer to Note 2).
8. Press the YES button and display " □□□□/□□ b = □□".
9. Rotate the AMS knob in the counterclockwise direction and find the focus bias value at which the C1 error rate becomes 220.
10. Press the YES button and display " □□□□/□□ c = □□".
11. Check that the C1 error rate is below 50 and ADER is below 2. Then press the YES button.
12. If the "(□□)" in "□□ - □□ - □□ (□□)" is above 20, press the YES button.
    If below 20, press the NO button and repeat the adjustment from step 2.
13. Press the EJECT button to remove the continuously recorded disc.

Note 1 : The relation between the C1 error and focus bias is as shown in the following figure. Find points a and b in the following figure using the above adjustment. The focal point position C is automatically calculated from points a and b.

Note 2 : As the C1 error rate changes, perform the adjustment using the average vale.



3-8. ERROR RATE CHECK

3-8-1. CD Error Rate Check

Checking Method :

1. Load a check disc TDYS-1.
2. Rotate the AMS knob and display "CPLAY MODE".
3. Press the YES button and display "CPLAY MID".
4. The display changes to "C1 = □□□□ AD = □□".
5. Check that the C1 error rate is below 20.
6. Press the NO button, stop playback, press the EJECT button, and remove the test disc.

3-8-2. MO Error Rate Check

Checking Method :

1. Load a continuously recorded disc (Refer to "3-3. Creating Continuously Recorded Disc".).
2. Rotate the AMS knob and display "CPLAY MODE".
3. Press the YES button and display "CPLAY MID".
4. The display changes to "C1 = □□□□ AD = □□".
5. Check that the C1 error rate is below 50 and ADER is below 2.
6. Press the NO button, stop playback, press the EJECT button, and remove the continuously recorded disc.

3-9. FOCUS BIAS CHECK

Change the focus bias and check the focus tolerance amount.

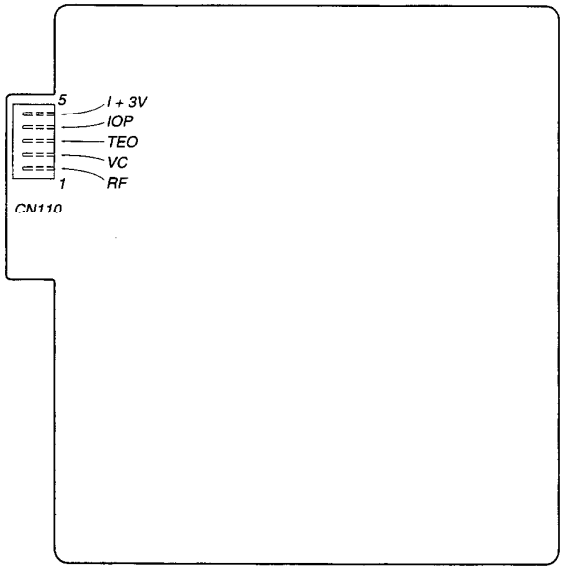
Checking Method :

1. Load a continuously recorded disc (Refer to "3-3. Creating Continuously Recorded Disc".).
2. Rotate the AMS knob and display "CPLAY MODE".
3. Press the YES button twice and display "CPLAY MID".
4. Press the NO button when "C1 = □□□□ AD = □□" is displayed. Rotate the AMS knob and display "FBIAS CHECK".
5. Press the YES button and display " □□□□/□□ c = □□". The first four digits indicate the C1 error rate, the two digits after [/] indicate ADER, and the 2 digits after [c =] indicate the focus bias value. Check that the C1 error is below 50 and ADER is below 2.
7. Press the YES button and display " □□□□/□□ b = □□". Check that the C1 error is not below 220 and ADER is not above 2 every time.
8. Press the YES button and display " □□□□/□□ a = □□". Check that the C1 error is not below 220 and ADER is not above 2 every time.
9. Press the NO button, next press the EJECT button, and remove the continuously recorded disc.

Note 1 : If the C1 error and ADER are above 2 at points a (step 8. in the above) or b (step 7. in the above), the focus bias adjustment may not have been carried out properly. Perform the adjustment from the beginning again.

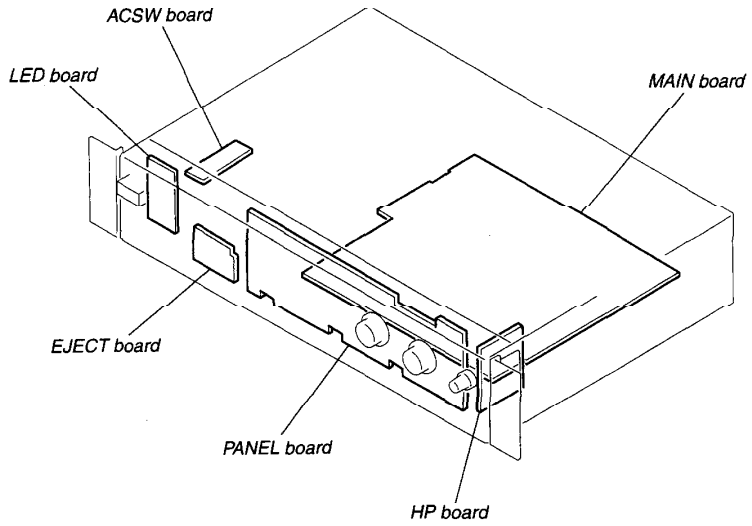
3-10. ADJUSTING POINTS AND CONNECTING POINTS

[BD BOARD] (SIDE A)



SECTION 4
DIAGRAMS

4-1. CIRCUIT BOARDS LOCATION



THIS NOTE IS COMMON FOR WIRING BOARDS AND SCHEMATIC DIAGRAMS

For schematic diagrams

- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytics and tantalums.
- All resistors except chips are in Ω and 1/4W or less unless otherwise specified.
- △ : internal component.
- ▭ : panel designation
- B+ : B+ Line
- B– : B– Line

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

- ▭ : adjustment for repair.
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- no mark : STOP
- ( ) : Play the test disc (TDYS-1).
- * : can not be measured.
- Voltages are taken with a VOM (Input impedance 10 MΩ).
  Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope.
  Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.
- Signal path.
  : PB
  : REC
  : PB (Digital out)
  : REC (Digital in)

For printed wiring boards

- ○—— : parts extracted from the component side.
- ▒▒▒ : Pattern on the side which is seen.
  (Other patterns are not shown.)

• IC307 A/D, D/A CONVERTER (CXD8607N)

Pin No.	Pin Name	I/O	Description
1	INRP	I	R channel analog (+) input
2	INRM	I	R channel analog (–) input
3	REFI	I	A/D converter reference voltage input (+3.2 V)
4	AV_{DD}	–	+5 V power supply (A/D, analog system)
5	AV_{SS}	–	Ground (A/D, analog system)
6	APD	I	A/D converter's analog circuit block, power down. "L": power down
7	NU	–	Not used
8	NU	–	
9	TEST1	I	Test terminal (fixed to "L")
10	LRCK1	I	A/D converter LRCK input
11	BCK1	I	A/D converter BCK input
12	ADDT	O	A/D converter data output
13	V_{35A}	–	+3.3 V power supply
14	$V_{SS1\ (LF)}$	–	GND (A/D, digital system)
15	MCKI	I	A/D converter master clock input (256 fs)
16	DPD	I	A/D converter digital circuit block, power down. "L": power down/reset
17	$V_{SS2\ (LF)}$	–	GND (D/A, digital system)
18	INIT	I	D/A converter initialization. "L": initialize
19	MODE	I	Mode flag input
20	SHIFT	I	Shift clock input
21	LATCH	I	Latch clock input
22	256CK	O	256 fs clock output
23	V_{35D}	–	+3.3 V power supply
24	V_{SS2}	–	GND (D/A, digital system)
25	512CK	O	512 fs clock output
26	BCK2	I	D/A converter BCK input
27	DADT	I	D/A converter data input
28	LRCK2	I	D/A converter LRCK input
29	V_{DD2}	–	+5 V power supply (D/A, digital system)
30	R1	O	R channel PLM output 1
31	AV_{DDR}	–	+5 V power supply (D/A, R channel, analog system)
32	R2	O	R channel PLM output 2
33	AV_{SSR}	–	GND (D/A, R channel, analog system)
34	XV_{DD}	–	+5 V power supply (X'tal system)
35	XOUT	O	X'tal oscillation output terminal (22 MHz)
36	XIN	I	X'tal oscillation input terminal (512 fs) (22 MHz)
37	XV_{SS}	–	GND (X'tal system)
38	AV_{SSL}	–	GND (D/A, R channel, analog system)
39	L2	O	L channel PLM output 2
40	AV_{DDL}	–	+5 V power supply (D/A, L channel, analog system)
41	L1	O	L channel PLM output 1
42	V_{DD2}	–	+5 V power supply (D/A, digital system)
43	V_{DD1}	–	+5 V power supply (D/A, digital system)
44	V_{DD1}	–	
45	V_{SS1}	–	GND (A/D, digital system)
46	TEST2	I	Test terminal (fixed to "L")
47	TEST3	I	
48	$V_{SS1\ (LF)}$	–	GND (A/D, digital system)
49	NU	–	Not used
50	NU	–	
51	$AV_{SS\ (LF)}$	–	GND (A/D, analog system)
52	LV_{DD}	–	+5 V power supply (A/D, buffer system)
53	LV_{SS}	–	GND (A/D, buffer system)
54	REFO	O	A/D converter reference voltage output (+3.2 V)
55	INLM	I	L channel analog (–) input
56	INLP	I	L channel analog (+) input

• IC401 SYSTEM CONTROL (HD6433048F)

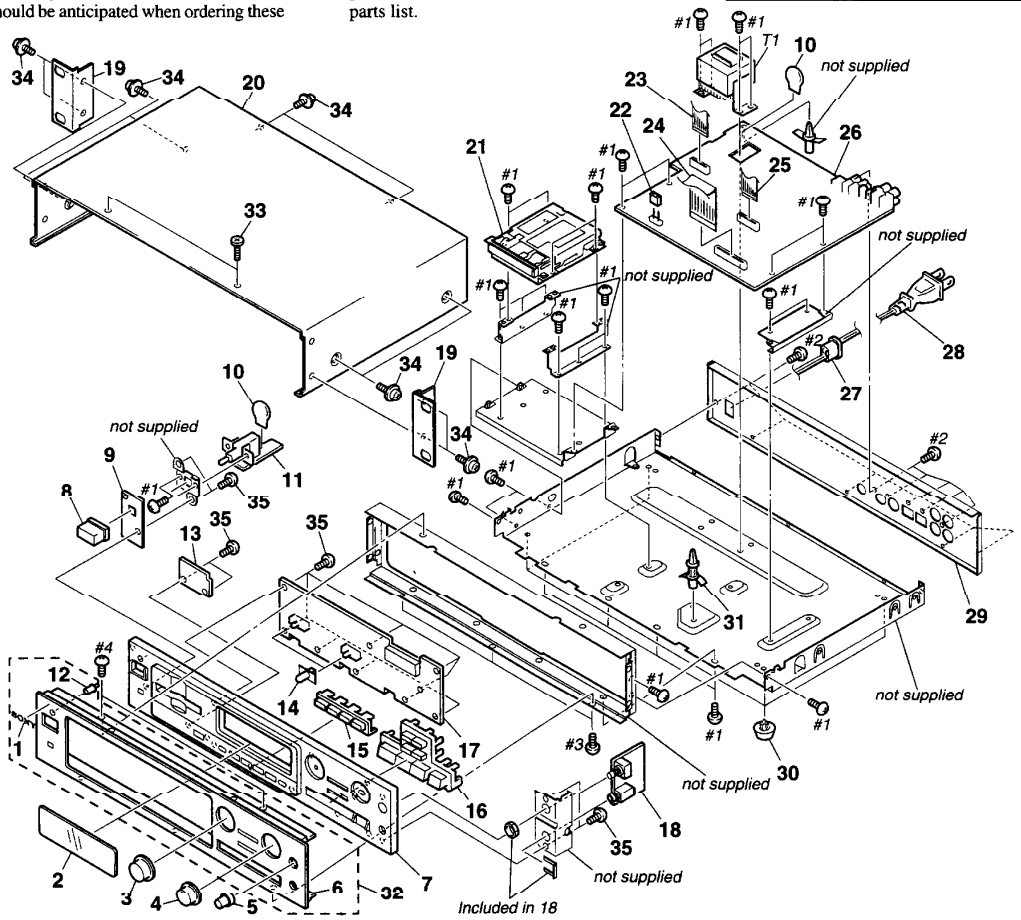
Pin No.	Pin Name	I/O	Description
1	3.3V	–	+3.3 V power supply
2	PIN1	O	Not used
3	PIN2	O	
4	PIN3	O	
5	PIN4	O	
6	PIN5	O	
7	POUT1	O	
8	POUT2	O	
9	POUT3	O	
10	RESO	O	Not used
11	GND		GND
12	232COUT	O	Not used
13	TXD	O	Data signal output to MD (mechanism microprocessor)
14	232CIN	I	Not used (fixed to "L")
15	RXD	I	Data signal input from MD (mechanism microprocessor)
16	RTS	O	Data signal output to MD (mechanism microprocessor)
17	CTS	I	Data signal input from MD (mechanism microprocessor)
18	EMPH	I	Emphasis signal input from MD (mechanism microprocessor). Emphasis on: "H"
19	–	–	Not used
20	–	–	
21	–	–	
22	GND	–	GND
23	–	–	Not used
24	–	–	
25	–	–	
26	–	–	
27	ADDATA	O	Data signal output to A/D D/A converter
28	LRCLK	O	Clock signal output to A/D D/A converter
29	LATCH	O	Latch signal output to A/D D/A converter
30	DARST	O	Reset signal output to A/D D/A converter. During reset: "L"
31	DINSEL	O	Digital input switch. "H": COAX, "L": OPT
32	AMUTE	O	LINE OUT muting output. During muting: "L"
33	–	–	Not used
34	–	–	
35	3.3V	–	+3.3 V power supply
36	LEDTOC	O	Not used
37	LEDPA	O	
38	LEDSP	O	
39	LEDSTBY	O	When the LED drive output signal for the STANDBY LED (D701), is in the STANDBY mode, "H" is output
40	FLDAT	O	Serial data signal output to display driver
41	FLCLK	O	Serial clock signal output to display driver
42	FLLET	O	Chip select signal output to display driver
43	–	–	Not used
44	–	–	
45	LCD1	O	Not used
46	LCD2	O	
47	LCD3	O	
48	LCD4	O	
49	LCD5	O	
50	LCD6	O	

Pin No.	Pin Name	I/O	Description
51	LCD7	O	Not used
52	LCD8	O	
53	LCDE	O	
54	LCDRW	O	
55	LCDRS	O	
56	CSO	O	Connected to E^2-PROM
57	GND	–	GND
58	SKO	O	Connected to E^2-PROM
59	DAO	O	
60	DAI	I	
61	–	–	Not used
62	3.3V	–	+3.3 V power supply
63	RESET	I	System reset signal input. Reset: "L"
64	GND	–	GND
65	GND	–	GND
66	XIN	I	Clock input (6 MHz)
67	XOUT	O	Clock output (6 MHz)
68	3.3V	–	+3.3 V power supply
69	WCO	O	Connected to E^2-PROM
70	–	–	Not used
71	–	–	
72	–	–	
73	3.3V	–	+3.3 V power supply
74	3.3V	–	+3.3 V power supply
75	3.3V	–	+3.3 V power supply
76	3.3V	–	+3.3 V power supply
77	3.3V	–	+3.3 V power supply
78	KEY1	I	Key input (D/A) input
79	KEY2	I	
80	KEY3	I	
81	SW1	I	Slid switch input (D/A input)
82	SW2	I	
83	GND	–	GND
84	KANA	I	Kana-character selection. "L": kana supported
85	IU/2U	I	Fixed to "L"
86	GND	–	GND
87	PDOWN	I	POWER DOWN signal input. Power down: "L"
88	–	–	Not used
89	JOG1	I	Jog dial pulse input from rotary encoder (S701)
90	JOG2	I	
91	SERCS IN	I	Remote control signal
92	GND	–	GND
93	CTR IN	I	CTRL-S signal
94	SERCS SEL	I	Selection between remote controller light reception or CTRL-S "H": CTRL-S, "L": remote controller light reception
95	REC IN	I	Not used
96	REC/PAIN	I	
97	PLAYIN	I	
98	PLY/PAIN	I	
99	ENDOUT	O	
100	PAUSE OUT	O	

SECTION 5
EXPLODED VIEW

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list 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.



Ref. No.	Part No.	Description	Remarks
1	4-942-568-41	EMBLEM (NO.5), SONY	
* 2	4-983-651-01	WINDOW (DISPLAY)	
3	2-346-608-02	KNOB (AMS)	
4	2-346-609-01	KNOB (REC)	
5	3-367-431-01	KNOB (BAL)	
6	2-346-619-02	PANEL, FRONT	
7	X-2335-522-1	PANEL (MOLD) ASSY	
8	4-969-330-31	BUTTON (POWER)	
* 9	A-4591-118-A	LED BOARD, COMPLETE	
* 10	4-374-846-01	COVER, CAPACITOR, CAP TYPE	
* 11	A-4591-121-A	ACSW BOARD, COMPLETE	
12	4-951-617-01	INDICATOR	
* 13	A-4591-119-A	EJECT BOARD, COMPLETE	
14	3-917-216-11	KNOB (TIMER)	
15	2-346-607-01	BUTTON (SUB)	
16	2-346-606-01	BUTTON (MAIN)	
	A-4591-117-A	PANEL BOARD, COMPLETE	
18	A-4591-120-A	HP BOARD, COMPLETE	
* 19	2-346-610-01	BRACKET (RACK-2U)	
* 20	2-346-147-02	CASE	
21	8-583-043-02	DEVICE,MINIDISK KMK-260AAA/J2N (J)	
21	8-583-043-03	DEVICE,MINIDISK KMK-260AAA/J2N (AEP, US)	

Ref. No.	Part No.	Description	Remarks
22	1-569-972-21	SOCKET, SHORT 2P	
23	1-777-238-11	WIRE (FLAT TYPE) (16 CORE)	
24	1-777-276-11	WIRE (FLAT TYPE) (29 CORE)	
25	1-777-033-11	WIRE (FLAT TYPE) (19 CORE)	
* 26	A-4591-122-A	MAIN BOARD, COMPLETE (J)	
* 26	A-4591-153-A	MAIN BOARD, COMPLETE (AEP, US)	
27	3-703-244-00	BUSHING (2104), CORD (AEP)	
* 27	3-703-571-11	BUSHING (S) (4516), CORD (J,US)	
⚠28	1-783-531-41	CORD, POWER (POLAR.SPT-1) (US)	
⚠28	1-751-275-11	CORD, POWER (AEP)	
⚠28	1-790-345-21	CORD, POWER (J)	
* 29	2-346-613-01	PANEL, BACK	
30	3-670-155-11	LEG	
31	4-924-098-01	HOLDER, PC BOARD	
32	A-4587-675-A	PANEL ASSY, FRONT	
33	2-338-688-01	SCREW, STEP TAPPING	
34	3-704-366-01	SCREW (CASE) (M3X8)	
35	4-951-620-01	SCREW (2.6X8), +BVTP	
⚠T1	1-431-685-21	TRANSFORMER, POWER (AEP)	
⚠T1	1-431-686-21	TRANSFORMER, POWER (US)	
⚠T1	1-431-687-21	TRANSFORMER, POWER (J)	