

Nakamichi BX-300

Discrete Head Cassette Deck

Owner's Manual



CAUTION

TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user of the presence of uninsulated "dangerous voltage" within the product's enclosure; that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user of the presence of important operating and maintenance (servicing) instructions, in the literature accompanying the appliance.

WARNING

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient the receiving antenna
- relocate this equipment with respect to the receiver
- move this equipment away from the receiver
- plug this equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful: "How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Congratulations!

You have chosen an excellent cassette deck. The Nakamichi BX-300 incorporates a wealth of original Nakamichi technology, such as the Discrete Three-Head system, a Direct-Drive Asymmetrical, Diffused-Resonance Dual Capstan Transport etc. The deck is designed to deliver outstanding performance in every basic aspect, while providing a reasonable choice of useful features.

In order to take full advantage of this unit's superior performance, please read this manual in its entirety and retain it for future reference.

Thank you.

Nakamichi Corporation.

Please record the Model Number and Serial Number in the space provided below and retain these numbers. Model Number and Serial Number are located on the rear panel of the unit.
Model Number: Nakamichi BX-300
Serial Number: _____

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Connections

After consulting the instructions for your amplifier or receiver, use the shielded cables with RCA plugs (provided with the deck) to make connections as shown in the chart. Take care not to mix up left and right channels. While making connections, the power to the deck and to the amplifier should be switched off.

Headphones

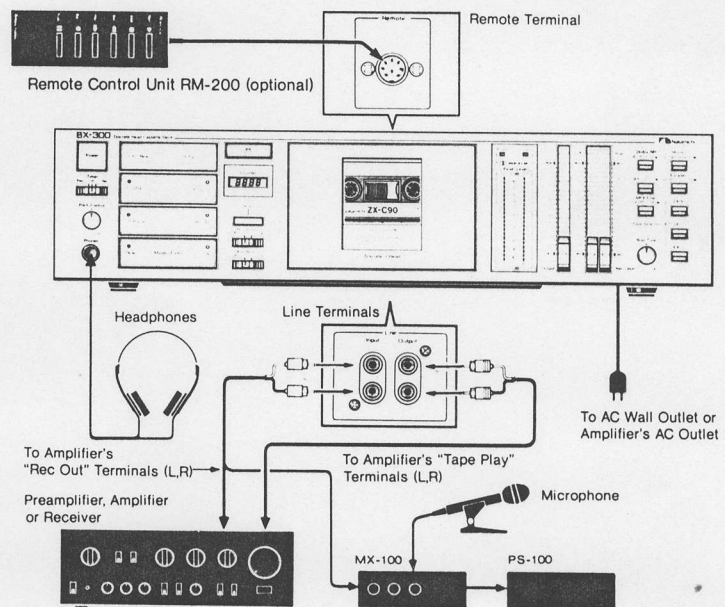
Standard stereo headphones with an impedance of 8-150 ohms may be connected to the headphone jack.

Microphone Connections

The BX-300 possesses only line input facilities. When microphones are to be used for recording, a separate microphone mixer with a line output must be connected to this deck's line input terminals. Nakamichi offers the optional MX-100 Microphone Mixer, which provides three inputs for left, right and center blend (L+R) microphones. To power the MX-100, the separate PS-100 Power Supply is required.

Remote Control

The optional remote control unit RM-200 permits operation of the deck's tape transport functions from any convenient location.



Safety Instructions

The following safety instructions have been included in compliance with safety standard regulations. Please read them carefully.

1. Read Instructions—All the safety and operating instructions should be read before the appliance is operated.
2. Retain instructions—The safety and operating instructions should be retained for future reference.
3. Heed Warnings—All warnings on the appliance and in the operating instructions should be adhered.
4. Follow Instructions—All operating and use instructions should be followed.
5. Water and Moisture—The appliance should not be used near water—for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.
6. Carts and Stands—The appliance should be used only with a cart or stand that is recommended by the manufacturer.
7. Wall or Ceiling Mounting—The appliance should be mounted to a wall or ceiling only as recommended by the manufacturer.
8. Ventilation—The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa, rug or similar surface that may block the ventilation openings; or placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.
9. Heat—The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) which produce heat.
10. Power Sources—The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.
11. Grounding or Polarization—Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.
12. Power-Cord Protection—Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
13. Cleaning—The appliance should be cleaned only as recommended by the manufacturer.
14. Nonuse Periods—The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.
15. Object and Liquid Entry—Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.
16. Damage Requiring Service—The appliance should be serviced by qualified service personnel when:
 - A. The power-supply cord or the plug has been damaged; or,
 - B. Objects have fallen, or liquid has been spilled into the appliance; or,
 - C. The appliance has been exposed to rain; or,
 - D. The appliance does not appear to operate normally or exhibits a marked change in performance; or,
 - E. The appliance has been dropped, or the enclosure damaged.
17. Servicing—The user should not attempt to service the appliance beyond that described in the operating instruction. All other servicing should be referred to qualified service personnel.

On Cassette Tapes

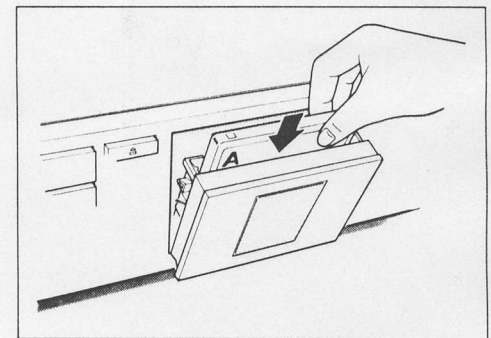
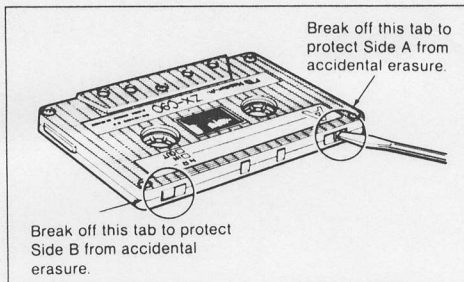
Precautions

1. C-120 cassettes (playing time one hour per side) contain extremely thin tape which breaks or snarls easily, is sometimes subject to stretching and also is of low sensitivity. Therefore, C-120 cassettes are not recommended for high-fidelity recording.
2. Do not pull out the tape from the cassette housing.
3. Be careful not to turn the cassette reels with the fingers, causing tape slackening.
4. Store cassette tapes away from heat, high humidity, dust, and magnetic fields such as caused by speakers, TV sets etc.

Cassette Tabs

You can protect valuable recordings from accidental erasure and re-recording by completely removing the appropriate tab on the top edge of the cassette. The tab for each side is located on the top left-hand corner as you face the side. Use a small screwdriver, and push the tab down to break it off. Do not leave the broken tab in the recess. If you wish at a later date to record over a side for which the

tab has been removed, cover the tab opening with a piece of adhesive tape.



(2) Removal of a Cassette

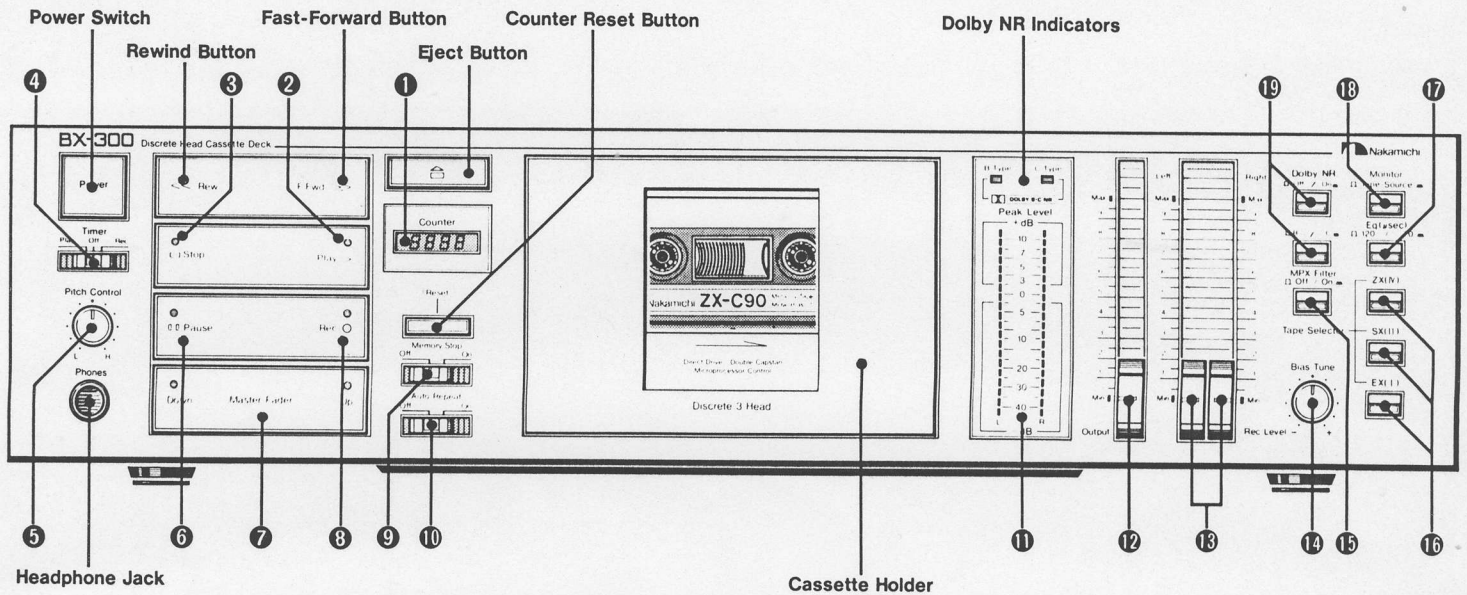
1. Press the Stop button.
2. When the Eject button is pushed, the cassette holder opens.
3. Remove the cassette.

Cassette Insertion and Removal

(1) Insertion of a Cassette

1. When the Eject button is pushed in the stop mode, the cassette holder opens.
 2. Insert the cassette into the holder with the exposed tape facing down and the label of the desired side facing you.
 3. Gently push the cassette holder back into the panel.
- For protection of the tape and tape transport, do not press the Eject button in any mode other than the stop mode.

Controls and Features



(1) Tape Counter

Starting from "0000", tape travel is indicated in the range from "9999" to "-999". To reset the counter indication to "0000", press the Counter Reset button.

(2) Play Button

Press the section marked with > to start playback or to start recording from the record-standby mode. During operation, the indicator lights up.

(3) Stop Button

Press the section marked with □ to completely stop the tape transport from any mode. The indicator lights up.

(4) Timer Switch

This switch is used for timer-activated recording or playback. In ordinary operation, it must be set to "Off". (→p. 5)

(5) Pitch Control

Serves to alter tape speed during playback over a range of approx. ±6% (one semitone).

(6) Pause Button

Press the section marked with □□ to temporarily interrupt tape travel during recording or playback. During operation, the indicator lights up. To start the tape again, press the Play button.

(7) Master Fader Buttons

These buttons serve to perform fade-in and fade-out during recording. (→p. 6)

(8) Record Button

Simply by pressing the section marked with ○, the deck enters the record-standby mode (record/pause) and the recording indicator lights up. When the button is pressed once more during recording, the Rec Mute function is activated for as long as the button is kept depressed. (→p. 6)

(9) Memory Switch

With this switch set to "On", the tape stops automatically when the counter indication "0000" is reached during rewind or fast-forward.

(10) Auto Repeat Switch

By setting this switch to "On", auto repeat playback is performed. (→p. 6)

(11) Peak Level Meters

Provide exact indication of peak levels in the range of -40 to +10 dB.

(12) Output Level Control

Serves to adjust the line output and the headphone output level.

(13) Input Level Controls

Serve to adjust the recording level for left and right channels.

(14) Bias Tune Control

Serves for fine adjustment of the bias current. (→p. 6)

(15) MPX Filter Switch

Used to suppress the 19-kHz multiplex carrier signal, which could interfere with proper Dolby NR operation when recording from FM stereo broadcasts. At other times, the switch should be set to "Off".

(16) Tape Selector Switches

In recording, the correct switch must be selected for the tape in use. (→p. 6)

(17) Equalizer Switch

Serves to select correct equalization in recording and playback for the tape in use. (→p. 6)

(18) Monitor Switch

For playback of a tape and for off-the-tape monitoring during recording, this switch must be set to "Tape". For record level setting etc., the switch must be set to "Source". This switch is also used during bias fine adjustment. (→p. 6)

(19) Dolby NR Switches

To use the Dolby NR system, set the upper switch to "On" and select either the B-type or the C-type system with the lower switch. The respective indicator lights up.

■ Dolby NR System

This cassette deck provides a choice between the Dolby B-type and the Dolby C-type noise reduction systems. The Dolby B-type NR provides approximately 10 dB of noise reduction in the high frequencies. The Dolby C-type NR is a further refined system, which achieves a S/N ratio improvement of about 20 dB in the range from 2 kHz to 8 kHz, where noise is most readily audible.

For playback of a tape which was recorded with the B-type NR, set the Dolby NR switch to "B". For playback of a tape recorded with Dolby C-type NR, set the switch to "C".

Precautions Before Operation

- (1) This deck incorporates a muting circuit which is active for about 4 seconds after the power was switched on, until all circuits have become stable.
- (2) If the power is switched on while the Timer switch is set to "Rec" or "Play", recording or playback will start automatically. In order to prevent accidental erasure of a tape, be sure to set the Timer switch to "Off" when the timer function is not desired.
- (3) If during playback or recording the power to the deck was switched off by an external timer or the like, it may

afterwards not be possible to depress the Eject button. Do not apply excessive force in such a case. Set the Timer switch of the deck to "Off", and then switch the power to the deck back on. The cassette can now be removed.

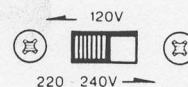
- (4) This cassette deck incorporates a special circuit designed to take up any tape slack when a cassette is inserted. Upon closing the cassette compartment or switching on the power, the left spindle will rotate and the tape counter indication may change slightly. This behavior is normal and not a fault with the deck.

(5) Voltage Selector

AC voltage is factory-set for the country in which you purchased your cassette deck. The voltage selector permits re-setting of mains voltage in case the deck is to be used in a different country.

Note:

Safety regulations in certain countries prohibit inclusion of a voltage selector. This feature, therefore, may be absent from your deck.



Operation

Playback

- (1) Set the Equalizer switch to the required position for the tape in use.
- (2) Set the Dolby NR switches to the same position as used for recording.
- (3) Set the Monitor switch to "Tape".
- (4) Press the Play button to start playback.
- (5) Adjust the desired listening level with the Output Level control.

- During playback, this deck's Peak Level meters display the level recorded on the tape. Readings are not affected by turning the Output Level control.
- With this deck you can go from any mode into any other (for example from playback to rewind, from rewind to fast-forward, etc.) without having to press the Stop button.

Record Level Setting

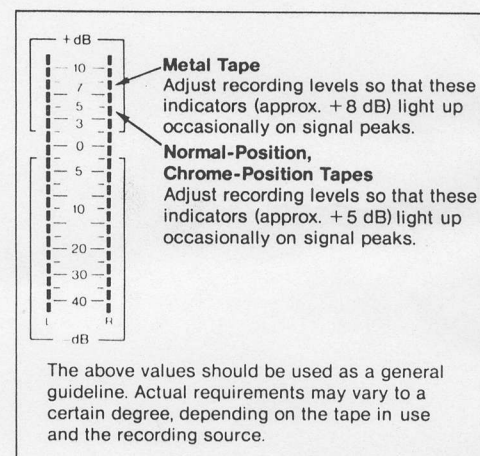
For good recordings, it is essential to maintain a high signal-to-noise ratio. If the record level is set too low, tape hiss will impair the playback sound quality. If it is set too high, the tape will be driven into distortion. Refer to the chart below to set recording levels.

Recording

- (1) Set the Tape Selector switches and the Equalizer switch to the required positions for the tape in use. (→p. 6)
- (2) Select the desired position of the Dolby NR switches. For recording from FM broadcasts, set the MPX Filter switch to "On".
- (3) Simply press the Record button to put the deck into the record-standby (record/pause) mode.
- (4) Set the Monitor switch to "Source" and adjust the recording level with the Rec

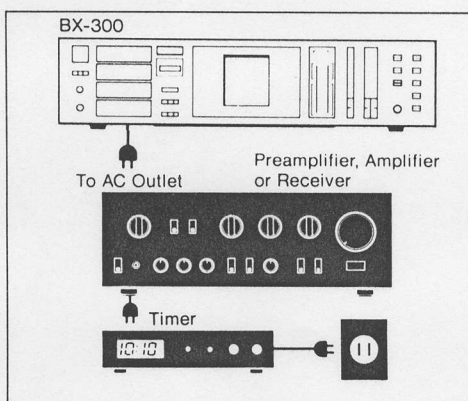
Level controls while watching the indication of the Peak Level meters.

- (5) Press the Play button to start recording.
- (6) To check the quality of the recording in progress, you can monitor the playback signal by setting the Monitor switch to "Tape". In the "Source" position, the input signal before recording is heard. For short-term interruption of recording, press the Pause button to set the deck to the record-standby mode. To resume recording, press the Play button again.



Timer Recording or Playback

- (1) Establish connections as shown in the chart, and switch on the power to all components.
- (2) For timer-activated recording, set the recording level to suit the expected signal. For timer-activated playback, set the Output control to the desired level.
- (3) For timer-activated recording, set this deck's Timer switch to "Rec". For timer-activated playback, set the switch to "Play".
- (4) Set the timer to the desired operation time.
- (5) At the pre-selected time, the timer will supply power to the components, and recording or playback will start automatically.



Notes:

- Be sure to set this deck's Timer switch to "Off" when timer recording or playback is not to be carried out.
- If the record-protection tabs of the inserted cassette are removed, timer-activated recording is not possible and the deck will go into the stop mode.

Special Features

1. Rec Mute

By pressing the Record button once more during recording, the recording signal is muted for as long as the button is kept depressed. When the Monitor switch is set to "Source", the line and headphone output are not muted, so that it is possible to continuously monitor the input signal.

2. Master Fader

This feature permits smooth and easy fades during recording without having to move the input level control. By pressing the "Down" section of the Master Fader button, the recording level is gradually reduced to zero. After the level was reduced by pressing "Down", pressing the "Up" section will automatically raise it again to the previous setting. You can choose between two fading speeds. If you keep the button depressed, the fading is comparatively fast. If you release the button immediately after pressing it, the fading is slower. The respective fading mode is indicated by the brightness of the indicators.

Note:

- The operation of the fader control can be changed from "Up" to "Down" or from "Down" to "Up", but it cannot be stopped midway.

- The Master Fader is operative only in the record and record-standby modes. When these modes are released, the setting automatically becomes "Up".

3. Auto Repeat Playback

(1) Auto Repeat of One Complete Side

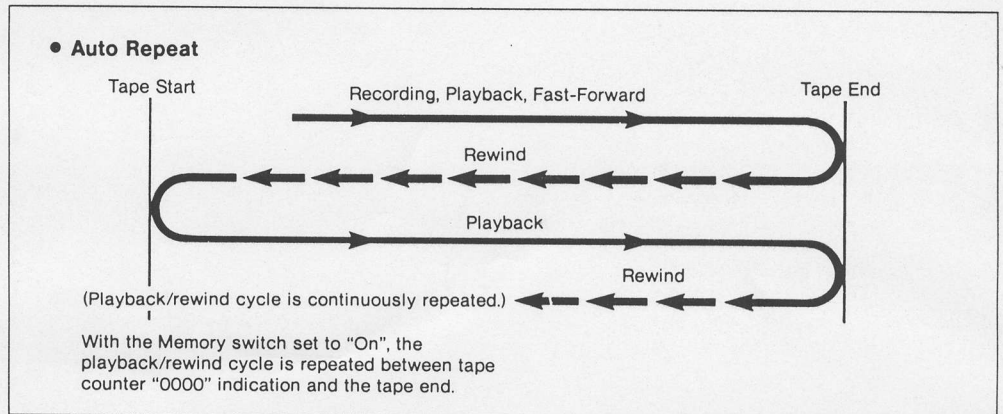
With the Auto Repeat switch set to "On", the following operating sequence is repeated when the tape end is reached during recording, playback or fast-forward: **automatic rewind to the tape start** → **playback from the beginning** → **automatic rewind when tape end is reached** → **playback from the beginning** ...

Repeat playback will also be performed if the beginning of the tape is reached in rewind.

(2) Auto Repeat Between Tape Counter "0000" and Tape End

The auto repeat function can also be used in conjunction with the Memory switch. When the Auto Repeat switch and the Memory switch are both set to "On", auto repeat will be performed between the tape counter "0000" indication and the tape end.

- When the Timer switch is set to "Rec" or "Play", the auto repeat function is inoperative.



Matching the Cassette Deck to Various Cassette Tapes

Tape Selector	Eq (μ sec)	Brand/Designation
Normal Position TYPE EX(I)	120 μ sec	Nakamichi EX II Fuji FR-I, GT-I Maxell XL I, XL I-S TDK AD, AD-X
Chrome (Cobalt) Position TYPE SX(II)	70 μ sec	Nakamichi SX, SX II Fuji FR-II, GT-II Maxell XL II, XL II-S TDK SA, SA-X
Metal Position TYPE ZX(IV)	70 μ sec	Nakamichi ZX Fuji FR Metal Maxell MX TDK MA, MA-R

This cassette deck was calibrated at the factory with Nakamichi reference tapes. To obtain optimum results and fully realize this deck's potential, the use of Nakamichi tapes is recommended. When using other tapes, you should choose tapes from the list, whenever possible.

■ Bias Tune Control

This deck provides a Bias Tune control which permits fine adjustment of the bias current after the standard values have been set with the Tape Selector switches. Reducing the bias current extends high-frequency response, but distortion tends to increase. Reversely, increasing the bias current reduces distortion but curtails high-frequency response. When using tapes from the above list, the bias

tune control should be left in the center click-stop position. When using other tapes, adjust the bias while comparing the sound of the input signal and the recorded signal. This comparison can best be done by recording FM interstation noise or a similar signal at about -30 dB to -20 dB and switching the Monitor switch back and forth between "Source" and "Tape".

- (1) If the recorded signal sounds brighter than the original source, turn the Bias Tune

control to the right (+).

- (2) If the recorded signal sounds duller than the original source, turn the Bias Tune control to the left (-).
- (3) By repeating steps (1) and (2) and monitoring the results, adjust the Bias Tune control to minimize any sound quality differences.

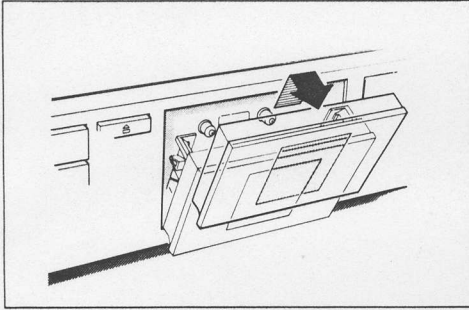
Maintenance

Cleaning

It is very important to regularly clean the head surfaces and transport section, etc.

Contamination caused by tiny particles shedded from the tape onto these parts can become the cause of drop-outs and severely degrade high-frequency response and wow-and-flutter characteristics. Perform cleaning about once every 10 hours of use.

- (1) Remove the cassette holder cover and push the cassette holder back in.

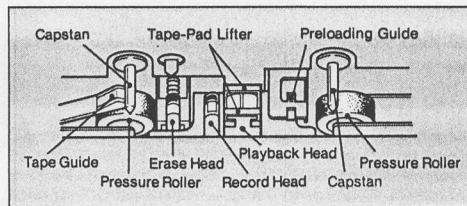


- (2) Press the Play button and clean the revolving pressure rollers by holding a cotton-tipped stick lightly against the roller on the side turning away from the capstan.

Be careful that the cotton tip does not get caught between the roller and the capstan.

- (3) Press the Pause button to release the pressure rollers from the capstans. Now clean the capstans and the surfaces of the heads and tape guides with a cotton-tipped stick. Be careful not to apply too much force. Take special care not to damage the tape and preloading guides and the tape-pad lifter.

- After cleaning, make sure that no cotton strands are left on any of the cleaned parts.
- In case of severe contamination, moisten the cotton tip with a small amount of commercially available cleaning fluid designed especially for this purpose. After cleaning with a cleaning fluid, wait until any residue has completely dried off before playing a tape.



Demagnetizing

After a longer period of use, there can be a build-up of residual magnetism in the heads and capstans. Such residual magnetism can induce noise and partially erase the high frequencies of a tape being played. To prevent this, you should demagnetize these parts about once every 50 hours of use with the Nakamichi DM-10 Demagnetizer (optional) or any other properly designed demagnetizer. For details, refer to the instruction manual of the demagnetizer. Always switch the power to the deck off before using the demagnetizer.

Lubrication

All important moving parts of this cassette deck are fitted with long-life, oil-less bearings. Periodic lubrication is therefore not necessary.

Cleaning the Faceplate

Clean the faceplate only by wiping it with a soft, dry cloth. Never use alcohol, solvents, ammonia or abrasive cleaning agents.

Troubleshooting

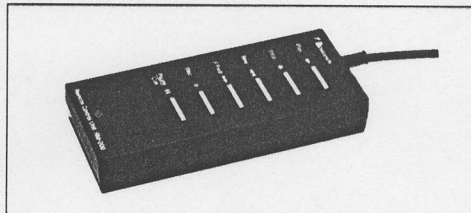
Condition	Probable Cause	Remedy
Tapes does not run.	1. Cassette holder not completely locked.	1. Press Eject button and then close cassette holder firmly.
Record mode cannot be entered.	2. Cassette tabs have been removed.	2. Place adhesive tape over tab opening or use new cassette.
Excessive playback hiss.	3. Head is magnetized.	3. Demagnetize head.
Uneven sound levels, drop-outs, excessive wow/flutter.	4. Heads and/or capstans and pressure rollers dirty.	4. Clean these parts.
Imcomplete erasure.	5. Faulty cassette.	5. Replace cassette.
Distorted record/playback sound.	6. Erase head dirty.	6. Clean head and pressure rollers.
	7. Program material itself is distorted.	7. Check program material.
	8. Recording levels are too high.	8. Wide dynamic range permits some short-term overload, but excessive recording levels will cause distortion. Adjust recording levels.
	9. Heads dirty.	9. Clean heads.
Record mode is entered, but cannot record.	10. Wrong setting of Tape Selector switches.	10. Select correct setting for the tape in use.
	11. Input disconnected.	11. Check connections
Cannot playback	12. Head dirty.	12. Clean head.
	13. Output disconnected.	13. Check connections.
Dull high frequencies.	14. Head dirty.	14. Clean head.
	15. Heads dirty.	15. Clean heads.
Hum heard during recording or playback.	16. Tape Selector switches and/or Equalizer switch not set correctly.	16. Select correct positions for tape in use.
	17. Strong induction fields near deck.	17. Keep deck away from amplifier, transformers, fluorescent lamps, etc.
	18. Signal cable or connector grounding faulty.	18. Replace signal cables.

Specifications

Track Configuration.....	4 tracks/2-channel stereo
Heads.....	3 (erase head × 1, record head × 1, playback head × 1)
Motors.....	< Tape Transport > FG servo brushless, slotless, coreless, DD motor (capstan drive) × 1 DC motor (reel drive) × 1 < Mechanism > DC motor (cam drive) × 1
Power Source.....	100,120,120/220-240, 220 or 240 V AC, 50/60 Hz (According to country of sale)
Power Consumption.....	27W max.
Tape Speed.....	1-7/8 ips. (4.8 cm/sec.) ± 0.5%
Wow-and-Flutter.....	Less than ± 0.048% WTD Peak Less than 0.027% WTD RMS
Frequency Response.....	20 Hz—20,000 Hz ± 3 dB (recording level - 20 dB, ZX, SX, EXII tape)
Signal-to-Noise Ratio.....	Dolby C-Type NR on < 70 μs, ZX tape > Better than 70 dB (400 Hz, 3% THD, IHF A-WTD RMS) Dolby B-Type NR on < 70 μs, ZX tape > Better than 64 dB (400 Hz, 3% THD, IHF A-WTD RMS)
Total Harmonic Distortion.....	Less than 0.9% (400 Hz, 0 dB, ZX tape) Less than 1.0% (400 Hz, 0 dB, SX, EXII tape)
Eraseure.....	Better than 60 dB (100 Hz, +10 dB)
Separation.....	Better than 36 dB (1 kHz, 0 dB)
Crosstalk.....	Better than 60 dB (1 kHz, 0 dB)
Bias Frequency.....	105 kHz
Input (Line).....	50 mV/30 kohms
Output (Line).....	1.0 V (400 Hz, 0 dB, output level control at max.) 2.2 kohms
(Headphones).....	5 mW into 8 ohms (400 Hz, 0 dB, output level control at max.)
Fast-Wind Time.....	Approx. 80 seconds (with C-60 cassette)
Dimensions.....	430 (W) × 100 (H) × 250 (D) millimetres 16-15/16 (W) × 3-15/16 (H) × 9-7/8 (D) inches
Approximate Weight.....	5.6kg, 12 lb 6 oz

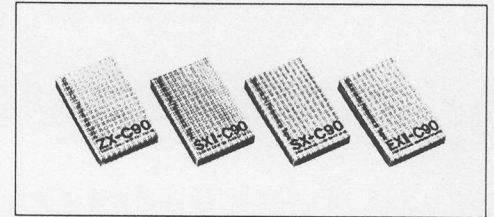
- Specifications and design are subject to change for further improvement without notice.
- Noise Reduction System manufactured under license from Dolby Laboratories Licensing Corporation.
- The word "DOLBY" and the Double-D-Symbol are trademarks of Dolby Laboratories Licensing Corporation.

RM-200 Remote Control Unit

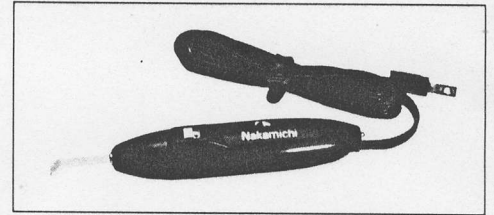


Optional Accessories

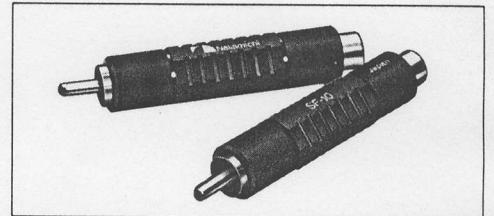
- ZX Metalloy Cassette Tape
C-60, C-90
- SX II Super Ferricobalt Cassette Tape
C-60, C-90
- SX Ferricobalt Cassette Tape
C-60, C-90
- EX II Ferricrystal Cassette Tape
C-60, C-90



DM-10 Head Demagnetizer



SF-10 Subsonic Filter



SP-7 Stereo Headphones



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