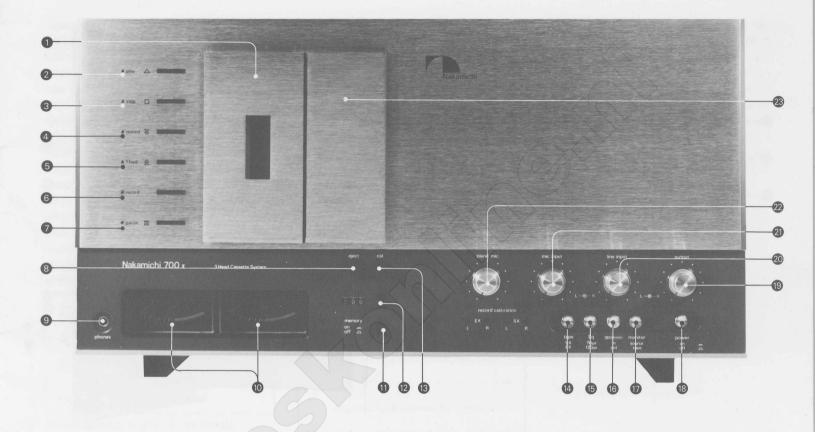
Nakamichi
Operating Instructions

700<sub>II</sub>

### **Control Functions**



#### 1 cassette lid:

The lid will open when the "eject" button is pushed.

### 2 playback button:

Tape runs at the standard speed and when the button is touched, playback of the pre-recorded tape will commence.

### 3 stop button:

### 4 rewind button:

Moves tape rapidly from upper to lower reel. Touch the "stop" button or allow auto-stop to function.

#### 6 fast forward button:

Moves tape rapidly from lower to upper reel. When tape reaches the end, touch the "stop" or allow auto-stop function.

### 6 record button:

Starts recording when touched simultaneously with the "play" button.

### pause button:

Temporarily halts the cassette mechanism during play or record when touched

#### 8 eject button:

#### 9 headphone jack:

The headphones should have an impedence of 8 ohm.

### peak level meters:

The meters indicate a wide range from -40 dB to +10 dB, the 0 dB of which conforms to the Dolby NR standard level.

### tape start memory switch:

"Remembers" any starting point on the tape. By setting the counter to 000 at the start of play or record and depressing the "memory" button before rewinding, the Nakamichi 700 can be programmed to stop automatically from the rewind mode when the counter reaches 999.

@ index tape counter:

### adjustment lid button:

When the lid is opened, you will find the adjustment functions for "azimuth alignment" "test tone" and "pitch cont."

### 14 tape selector switch:

Selects the proper recording bias for Nakamichi SX and EX tapes. High Coercivity tapes, such as Nakamichi SX, are to be used in the SX position. Low-Noise/High-Density/High-Output tape, such as Nakamichi EX or EXII, are to be used in the EX position.

### © Ea selector switch:

Selects the proper record and playback equalization for various types of tape. It allows the choice of either 120 microsecond or 70 microsecond time constant independently of bias.

### 16 Dolby NR switch:

Activates Dolby Noise Reduction circuitry which reduces tape noise (hiss) by as much as 10 dB when used during record and playback.

We thank you very much for your purchase of the Nakamichi 700**II**. This recorder is designed especially for the most critical audiophile and maintains almost same high performance as the Nakamichi 1000**II**.

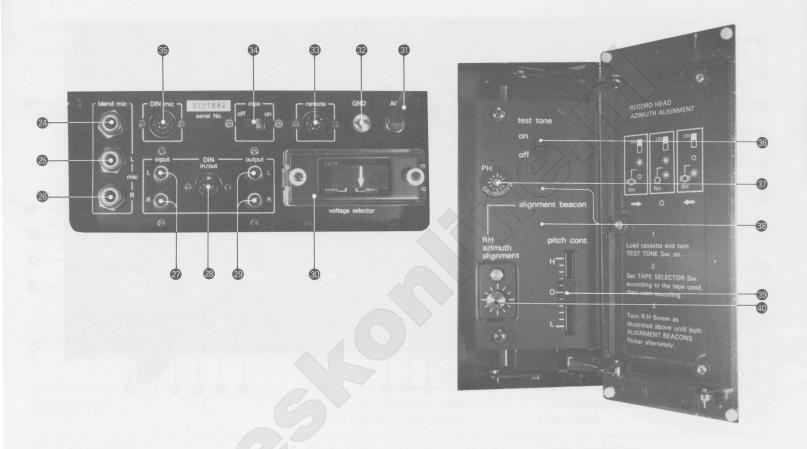
Before using this recorder, please read this instruction manual very carefully so that all functions and features will fully be used with the highest performance. WARNING — TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

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.	7001	_
Serial	Number:		

### Contents:

Control functions	2
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Level calibration	6
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Playback techniques	9
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### monitor switch:

"source"

The input signal from the sound source can be directly monitored by adjusting the sound volume with the "line output" controls. Adjust volume to the proper recording level with the "line input/ mic input" controls.

"tape"

To playback a recorded tape, set the switch to "tape". In recording, instantaneous off-the-tape monitoring is possible so that it permits instant comparision of the recording with the input signal.

### ® power switch:

Turn the power on by depressing "power" switch. The level meters will light up to indicate that the power has been turned on.

### 19 line output level controls:

The "output" level of monitoring sound from the tape or sound source can be controlled during recording and playback.

- @ line input level controls:
- 2) mic input level controls:
- @ blend mic level control:
- adjustment lid:
- @ blend mic input jack:
- mic input jack L:
- @ mic input jack R:
- 1 line input jacks
- DIN in/out socket:
- @ line output jacks:
- 30 voltage selector plug:
- 3 AC power supply cord:
- @ ground terminal:
- @ remote control socket:
- @ 19 kHz mpx filter switch:
- ® DIN mic input socket:
- test tone switch:
- playback head azimuth alignment screw:

### @ alignment beacon:

Serves to adjust the "azimuth alignment" of a recording head according to tape in use.

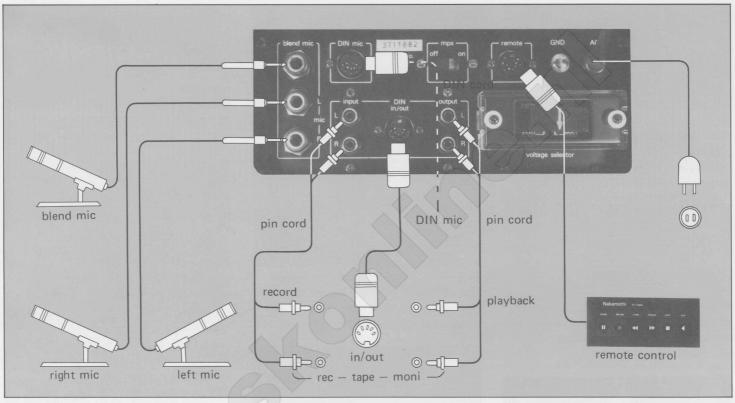
### @ pitch control:

Standard tape speed of 1-7/8 ips. is set at click position at the center. Any speed within the range of  $\pm 6\%$  (half tone) can be selected by turning the knob to "L" direction for lower pitch and "H" direction for higher pitch.

The tape speed of 1-7/8 ips. is always maintained in recording, regardless of the position of the "pitch cont" knob.

record head azimuth alignment screw:

### Connections



### Connecting the line output/input:

- 1. Connect the accompanying pin plug cords between the line "output" terminals of your Nakamichi 700**I** and the tape monitor terminals of your stereo amplifier.
- 2. Connect another pair of the pin plug cords between the "line input" terminals of your Nakamichi 700 m and the tape recording terminals of your stereo amplifier

3. If your stereo amplifier or music system has a "DIN" connector socket, connect a single "DIN" cable between the "DIN" connector socket on the rear panel of the Nakamichi 700 II and its counter part on the amplifier or music system.

### Caution:

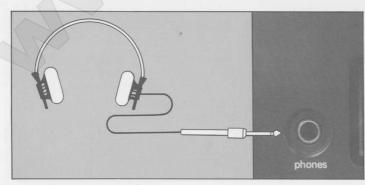
of your Nakamichi 700**II** and the tape Do not use the "line input/output" recording terminals of your stereo amplifier. terminals and "DIN" connector socket simultaneously.

### Microphone connection:

Microphone should be of low impedance type of 600 ohms.

Connection for the microphones with DIN connectors:

"DIN" connector must be of SM type.



Headphone connection:

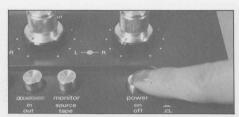
The headphones should have an impedance of 8 ohms.



### Connection to digital timer:

Connect the socket of a timer to "remote" position. If you also desire to use a remote control, connect the socket of the remote control to the remote position of the timer.

### Playback Procedures



• Turn on the "power" switch. The level meters and the cassette compartment window will illuminate to indicate power supply to the deck. Also the "stop" button will light.



2 Push the "eject" button and load a cassette, then close the cassette compartment lid.



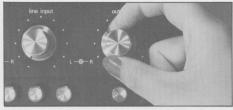
3 Set the "monitor" switch to "tape".



4 Set the "Eq" switch as required for the type of tape in use. (The "tape" switch has no effect during playback.)



**5** Touch the "play" button to start the tape.



6 Adjust the sound volume with the "output" level controls.



To stop the tape, touch the "stop" button. If you push the "eject" button, the cassette compartment lid will open to expose the cassette.



It is not necessary to touch the "stop" button each time you rewind or fast forward the tape during playback.

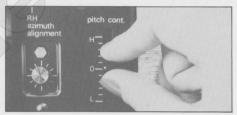
Also you can change to the playback mode directly from the rewind or fast forward mode without causing damages to the tape.



If you playback the tape recorded under the Dolby NR system, be sure to set the "Dolby NR" switch to "in".



When you touch the "pause" button, the tape will stop momentarily.



pitch control:

The standard tape speed of 1-7/8 ips is set at click position in the center. Any speed within the range of  $\pm 6\%$  (half tone) can be selected by turning the knob to "L" direction for lower pitch and "H" direction for higher pitch.

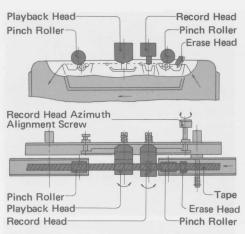
The tape speed of 1-7/8 ips is always maintained in recording, regardless of the position of the "pitch control" knob.

Note:

\* The Nakamichi 700**II** is so designed that the lid will not open, even if you push the "eject" button while the tape is running.

\* When the tape reaches its end, it will stop automatically.

# **Before Recording**



As shown in the above Fig, the Nakamichi 700 I is of a 3-head type wherein each of erase, record and playback heads is individually installed. A part of a cassette housing in which a tape runs serves as a guide for tape run. As a case may be according to each plastic moulding, high frequency part may be lowered because of the unfavourable azimuth alignment of head slit between record and playback

Accordingly, it is recommended that you perform an accurate azimuth alignment when you change a tape to another. Head azimuth alignment

Record head

- 1 Load a cassette into the cassette compartment.
- 2 Turn the "test tone" switch "on".
- 3 Touch the "record" button and then the "play" button to start the tape.
- 4 Set the "monitor" switch to "tape".
- 5 Adjust the "RH azimuth alignment" screw so that the both "alignment beacon" flickers, alternately. If only the upper "alignment beacon" flickers, turn the "RH" screw clockwise.

But if only the lower "alignment beacon" flickers, turn it counter-clockwise.

#### Caution

It takes about 0.3 second until the "alignment beacon" responds to the turning of "RH" screw. It is necessary to turn the "RH" screw little by little with a reasonable interval. If you turn it to the wrong direction, the alignment beacons will not flicker. Turning direction must be carefully determined according to the

above instructions.



It is not the fault of the deck! Anti-tape spill device:

The Nakamichi 700 is equipped with the tape spill sensing system which stops all the functions of the unit instantaneously when spill of the tape is about to start. In case the function of the unit stops automatically, please check the cassette first. The tape spill usually occurs with a second class cassette tape, the housing of which is being moulded with less precision, and physical property of tape itself is rather poor. Also a thinner tape such as C-120 cassette often causes heavy friction inside the cassette housing which will also be sensed by the said device.

### Head maintenance:

(1) Playback head

No adjustment is necessary with respect to the playback head azimuth, since it is adjusted prior to delivery from our factory.



(2) Head cleaning

All parts that come into contact with the tape must be frequently cleaned. Even the best tape formulations leave a deposit of oxide sheddings on the heads, pinch roller and capstan. Failure to perform a periodic cleaning of these parts can result in signal dropout, loss of high frequencies and wow and flutter. A cleaning kit is

supplied with the Nakamichi 700II, but some Q-tips and isopropyl alcohol (preferably undiluted) will perform guite adequately.



Demagnetizing

All metal parts that come into contact with the tape must be occasionally demagnetized to prevent the built-up of residual magnetism that can add hiss to and partially erase the high frequencies on a tape being played. Although the heads and capstan of Nakamichi cassette decks require demagnetization much less frequently than most other tape decks, it should nevertheless be performed once every 50 hours of use to be on the safe side. DM-10 Nakamichi demagnetizer is recommended for this purpose since it is specially designed for ease of use with cassette decks, but any properly designed demagnetizer will do. Remove all tapes from the vicinity of the tape deck before proceeding. Make sure the tape deck is "off". Turn the demagnetizer on and slowly bring the tip as close as possible to the record and play heads (it is not necessary to demagnetize the erase head). Do not make contact with the head unless the tip of the demagnetizer is covered with thin vinyl or rubber to avoid scratching the surface of the head (a piece of vinyl tape may be used to cover the tip if it is not already covered). Move the demagnetizer tip slowly in a random pattern about the surface of the head for at least 10 seconds and then slowly move it toward the capstan. Repeat with the capstan, and then slowly withdraw the demagnetizer. Turn it off after it is at least 2 feet from the deck. Never turn the demagnetizer off while it is close to the head or capstan as this may semi-permanently magnetize the metal part.

### **Level Calibration**

### Dolby NR calibration:

The Dolby NR standard level (200 nW/bm) of the Nakamichi  $700\,\mathrm{I\!I}$  is set to 0 dB. Particularly, when you record with Dolby NR "in", adjust the 0 dB signal of the built-in 400 Hz test tone to 0 dB according to type of the tapes to be used.

Open the adjustment lid by pushing the "cal." button positioned next to the "eject" button.



1 Set the "Dolby NR" switch to "in".



2 Set the "monitor" switch to "source".



3 Set the "test tone" switch to "on".



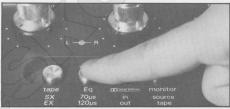
4 Level meters indicate 0 dB.



**5** If away from 0 dB, adjust the "test tone level" to obtain 0 dB.



6 According to each tape to be recorded, set the "tape" selector switch for "EX" or "SX".



Set the "Eq" switch as required for the type of tape in use.



8 Start the tape and record 400 Hz.



9 Set the "monitor" switch to "tape".





• If the levels are not within 1 dB of "0 dB", adjust the appropriate level calibration controls (Left or Right, EX or SX) clockwise or counter-clockwise (Fig. A or Fig. B) to obtain a 0 dB reading on both meters.

### Note:

The deck must be in the record mode with the "monitor" switch in the "tape" position in order to perform this calibration.

## Recommended Cassette Tapes

Position of tape Eq switch	Brand Type or Model		or Model
	Nakamichi	SX	C-60, C-90
SX	Maxell	UDXL-II	C-60, C-90
tape	TDK	SA	C-60, C-90
70μs tape Eq sx 70μs EX 120μs			
	Nakamichi	EX	C-60, C-90
EX .	Nakamichi	EXII	C-60, C-90
L —⊚— R	Fuji	FX	C-60, C-90
tape	Maxell	UD	C-60, C-90
120μs	Maxell	UDXL-I	C-60, C-90
Eq tape Eq SX 70µs EX 120µs	TDK	Audua	C-60, C-90

The various cassette tapes available on the market represent a wide range of tape characteristics. For optimum results with any tape the bias and equalization of the cassette deck must be properly selected to match the characteristics of that tape.

Shown above are the cassette tapes which are currently recommended for use in Nakamichi decks and the proper bias and equalization settings for each. Tapes other than Nakamichi are listed in alphabetical order.

### tape switch (bias):

Bias is an inaudible high frequency signal applied to the tape during the recording process. It reduces distortions and non-linearities inherent in magnetic tape recording. For many years there was basically one type of tape so that only engineers needed to concern themselves with bias. Today there are a multitude of tape formulations and almost as many differing biasing requirements. Nakamichi EX tape and other premium low-noise/high-output tapes require a certain amount of bias,

which is most often referred to as 'normal' ferric bias in recent terminology. High coercivity tapes, such as Nakamichi SX, require approximately 45% greater bias. Your Nakamichi cassette deck has been factory adjusted to provide the proper bias for Nakamichi EX and EXII tapes in the "EX" position of the tape selector switch and for Nakamichi SX in the "SX" position. Certain other tapes (shown in the table below) pose similar bias requirements and, therefore, can be used in the EX and SX positions with excellent results.

#### Eq switch:

Equalization (Eq) is the method by which optimum signal-to-noise ratios and frequency responses are obtained for the various tape formulations. Like bias, the proper Eq must be selected for each kind of cassette tape. Unlike bias, Eq concerns not only the recording process but playback as well. The "Eq" switch, therefore, must be properly set for record and playback.

There are two equalization "curves" now recognized as standards throughout the

cassette industry. All ferric oxide tapes, including the new low-noise/high-output formulations, utilize the 120 microsecond equalization time constant. High coercivity tapes, such as Nakamichi SX, utilize the more recently established 70 microsecond time constant. Select the proper time constant with the "Eq" switch for record and playback by referring to the table below.

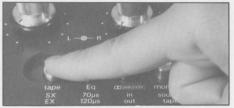
Special uses of the Eq switch: Because of excellent high frequency performance made possible by Nakamichi's advanced magnetic heads, it is possible to use combinations of bias and Eq other than those recommended in the table above. For example, if you wish to record a tape to send to person who does not have 70 microsecond equalization on his cassette machine, and you wish to make the recording on Nakamichi SX tape or an equivalent, you may record with the "tape" switch set for "SX", but the "Eq" switch set for "120µs". Another possible reason for doing this is to gain high frequency headroom, albeit at the loss of S/N, to record source material with an unusually high proportion of high frequencies. Or, you may wish to do just the reverse: that is, record on Nakamichi EXII or an equivalent with the "tape" switch set for "EX" but the "Eq" switch set for " $70\mu$ s". This yields a 4-5 dB improvement in S/N but with a corresponding loss in high frequency headroom. Be sure to mark your cassette with the Eq used during record in order that you will be able to select the proper Eq for subsequent playback.

### **Record Procedures**



1) Push the "eject" button and load a cassette, then close the cassette compartment lid.

(Refer azimuth alignment, level calibration on pages 5, 6.)



2 Set the "tape" selector switch according to the type of tape in use, to "SX" for the Nakamichi SX tape and to "EX" for the other tapes such as Nakamichi "EX, EXII" tapes.



3 Set the "Eq" switch as required for the type of tape in use (see preceding page).



Set the "monitor" switch to "source" and adjust the recording volume levels with the "line input/mic input" level controls.



**6** Set the "Dolby NR" switch to "in" for recordings free from hiss noise.



6 Push the reset button to reset the tape counter to "000". If you set the tape counter to "000" at the start of each recording and set the "memory" switch to "on", then the tape will be rewound to the preset point and stop at the touch of the "rewind" button.



Touch the "record" button and then touch the "pause" button while keeping your finger tip on the former. The red lamp will light to show that the deck is in the recording mode. At another touch on the "play" button, the tape will instantly start running to record.

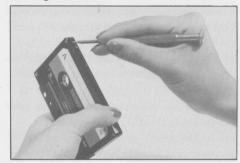
Touch the "pause" button whenever you want to stop the tape without cancelling the recording mode.

- **3** Touch the "stop" button to release the recording mode and the tape will stop.
- **19** The "monitor" switch can be switched over to "tape" or "source" at any time during recording.



When recording from FM stereo broadcasting, set the "mpx" filter at the jack panel to "on".

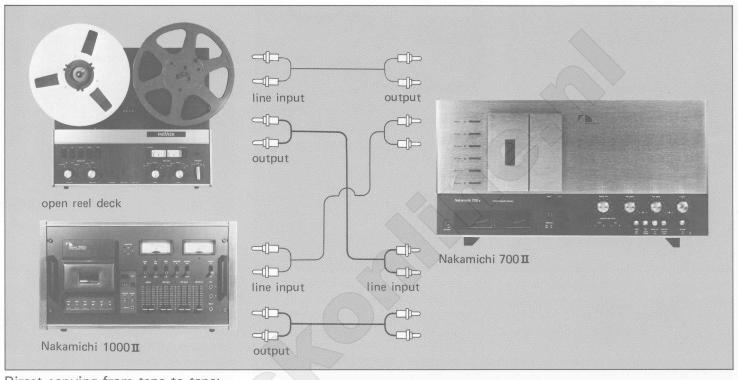
A cassette has "tabs" as shown below on the side opposite to that exposing the bare tape. If you break them off with a screwdriver or the likes, the cassette will prevent activation of the record mode, thus eliminating the possibility of erasing a valuable recorded cassette by mistake. Take advantage of this feature when you want to preserve a cassette into which you have made important recordings. If you wish to preserve the recording in only one side, break only one of the tabs, referring to the Fig below.



Note:

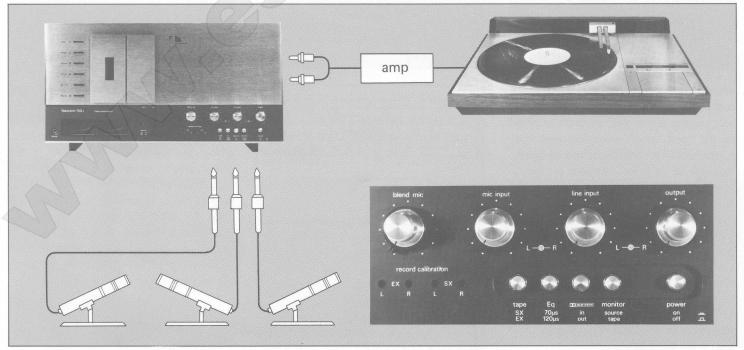
Should you ever want to make a recording into a cassette with such tabs already broken, seal the tab openings with masking tape or plug it with an erasure rubber, etc.

# Additional Recording and Playback Techniques



Direct copying from tape to tape: You can perform Hi-Fi recording from

open reels and high quality cassette deck, alike the original source.



Record mixing:

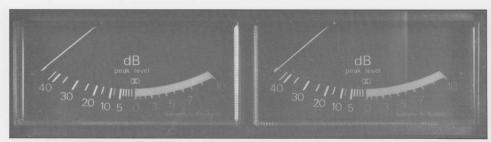
The Nakamichi  $700\,\mathrm{I}$  also serves as a small type mixer through 5 different individual volume controls, namely

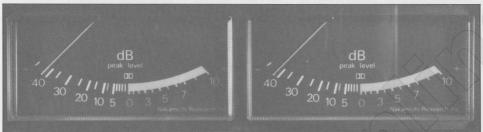
"line input" "L" and "R", "mic input" "L" and "R", and the "blend mic". As shown in the Fig. above, the mixing of a disc record with microphones and also

microphones left, right with "blend (L+R) mic" can be conducted.

### Peak Level dB Meter

## Cassette Lid Removal and Lubrication



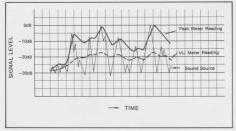


The Nakamichi 700 II incorporates true peak reading level meters which cover a wide range of -40 to +10 dB. Since the peak level meters are able to accurately indicate sudden musical peaks, it is

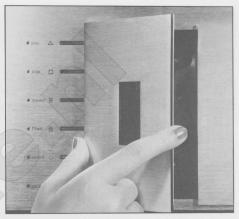
possible to record with the needles reaching 0 dB (occasionally even a bit higher depending on the type of tape in use and the type of source material being recorded) without distorting the recording.



When dubbing onto the Nakamichi 700 II from a 15 ips/2 track open reel recorder, it is suggested that the red mark at -8 dB on the "peak level" meters be used as a guideline for the setting of record levels. Play a 0 dB or 0 VU test tone on the open reel deck. Set the input levels on the Nakamichi to the red mark (-8 dB). This will provide compensation for the fact that the 15 ips/2 track recorder has greater headroom. Exact levels may deviate from this suggested starting point since open reel recorders vary in available headroom as do the recording practices of open reel users. For 7-1/2 ips open reel tapes try -5 dB as a starting point and -2 dB for 3-3/4 ips.



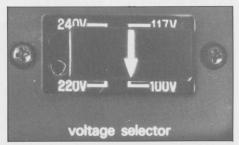
The advantage of peak level meters over conventional VU meters is illustrated by the diagram at above. The VU meters found on many open reel and cassette tape decks are not "fast" enough to give accurate indications of musical peaks. The illustration points to the fact that there can be as much as 8 dB difference between a peak reading meter and a VU meter on an instantaneous signal even though the two meters give the same reading on a continuous signal.



Removing the cassette lid: Push the "eject" button. Pull the lid to the right until it gets unlocked. To fix it on, push the lid to the left until it gets locked.

### Lubrication:

The moving parts of the Nakamichi  $700\,\mathrm{I\!I}$  transport are fitted with oil-less bearings. It is not necessary for the user to provide lubrication.



### Power supply voltage:

While your Nakamichi 700 II is set to the power supply voltage of your country prior to shipment from our factory, it may be re-set to one of the four voltages: 100, 117, 220, and 240 V... should you ever move to an area where the power supply voltage is different. No adjustment is necessary with respect to the frequency of the power.

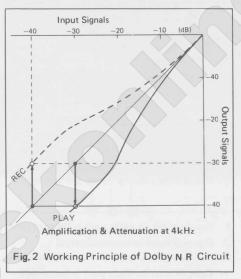
# The Dolby Noise Reduction System

Your Nakamichi 700 II incorporates the Dolby Noise Reduction System (Under license from Dolby Laboratories, Inc.). originally developed to produce a master tape from which to cut records with a high signal-to-noise ratio.

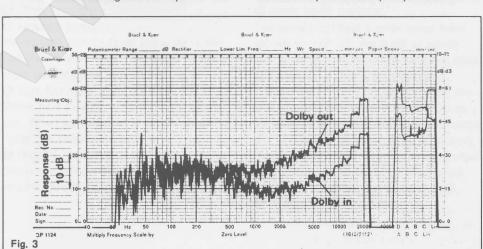
Noise heard from a recorded cassette primarily comprises tape noise and the noise produced by the playback equalizer amplifier of the cassette tape deck, is largely distributed over a 2 kHz to 10 kHz range. Such noise can be effectively reduced by amplifying signals within this range at the time of recording, then attenuating them in playback, through a process as illustrated in Fig. 1

This treatment is given such signals regardless of their strengths, however, strong high-frequency signals can not be recorded. So it is necessary to change the gain of this special circuit with respect to the strength of the high-frequency signals. The Dolby NR circuit makes this possible. For instance, if high-frequency signals of —40 dB enter the Dolby circuit from input terminals, it delivers signals of —30 dB for recording on the tape.

Conversely, if high-frequency signals of  $-30~\mathrm{dB}$  enter the same circuit from the playback head (Fig. 2), it delivers signals of  $-40~\mathrm{dB}$  for reproduction from the stereo amplifier. Thus input/output signals are attenuated by 10 dB, with equivalent reduction in the level of tape noise and equalizer amplifier noise. The circuit is designed so that it dose not affect signals of  $-5~\mathrm{dB}$  or greater.



As is clear from the foregoing explanation, the signal-to-noise ratio of sound improves by about 10 dB if it is recorded and reproduced through the Dolby NR circuit, enabling you to enjoy clean, transparent hi-fi stereo sound. This system is inter international, and recordings made under it can be reproduced by any cassette or



reel-to-reel tape decks equipped with the same system, regardless of their makes.

# **Trouble Shooting Chart**

Condition	Probable cause	Plug in power cord firmly. Wind tape up. Take out cassette and reset it carefully.  Load cassette. Place a piece of adhesive tape over the tab opening. Release pause mode.	
Tape does not run.	<ol> <li>Power cord is unplugged.</li> <li>Tape is loose inside cassette.</li> <li>Cassette lid is not firmly closed.</li> </ol>		
Record lamp does not light.	<ol> <li>Cassette is not loaded.</li> <li>Cassette tabs are broken off.</li> <li>"pause" button is touched.</li> </ol>		
Hissing sound is heard in playback.	1. Head is magnetized.	Demagnetize head with a head demagnetizer.	
Tape travel is unsteady.	<ol> <li>Capstan shaft and/or pinch roller are dirty.</li> <li>Tape winding inside cassette or tape guides are faulty.</li> </ol>	Clean those parts.  Replace cassette.	
Previously recorded sound remains.	1. Erase head is contaminated.	Clean the erase head and pinch roller.	
Reproduced sound is distored.	<ol> <li>Program material itself is distorted.</li> <li>Recording volume levels are too high.</li> </ol>	Examine program material.  Adjust appropriate recording level controls.	
Cannot record.	<ol> <li>Connection to each part is incorrected.</li> <li>Record head is contaminated.</li> </ol>	Check connections. Clean head.	
Cannot reproduce.	<ol> <li>Connection to each part is incorrect.</li> <li>"monitor" switch is set to "source".</li> <li>Playback head is contaminated.</li> </ol>	Check connections. Switch over to "tape". Clean head.	
Treble tones are weak.	Record head azimuth is not adjusted.     precisely	Adjust azimuth to match the cassette used.	
Large hum noise is heard in recording or playback.	<ol> <li>Disturbing induction field exists nearby the deck.</li> <li>Connector cord grounding is defective.</li> </ol>	Keep away from amplifier, transformer, fluorescent lamp, etc. Use the perfect connector cord.	

## **Specifications**

Wow & flutter .....less than 0.1%(DIN 45507 weighted peak) less than 0.05% Wrms (Dolby NR in, SX or EXII tape) Signal to Noise Ratio ..... better than 65 dB (Dolby NR in, Wrms, CCITT, 400 Hz, 3% distortion) Total harmonic distortion ..... less than 1.5% (at 400 Hz, 0 dB) Erasure . . . . . . . . . . . . better than 60 dB (at 1 kHz, saturation level) Channel separation ..... better than 35 dB (at 1 kHz, 0 dB) Cross talk ..... better than 60 dB (at 1 kHz, 0 dB) Input: Mic input ..... 0.2 mV 10 kΩ Blend mic ..... 0.2 mV 10 kΩ DIN mic input ..... 0.2 mV 10 kΩ Line ..... 50 mV 50 k $\Omega$ DIN Radio ..... 5 mV 20 kΩ Output: Headphones ..... 40 mW/ 8Ω(1 kHz, 0 dB) Weight ..... 28 lbs approx.

- Specifications and appearance design are subject to change for further improvement without notice.
- Dolby NR under license from Dolby Laboratories Inc.
- The word "DOLBY NR" and the Double-D-Symbol are trademarks of Dolby Laboratories Inc.

### Repairs

Please read the Warranty Card accompanying this unit very carefully. We sincerely trust that you will never experience difficulties with your Nakamichi 700 II, but should it ever require servicing, please consult your Nakamichi dealer or the Nakamichi dealer closest to you. As there are no user serviceable parts inside the unit, please do not attempt your own repairs.

Thank you for your confidence in Nakamichi products.



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