

Nakamichi 600 Cassette Console
Operating Instructions

We thank you for your purchase of
this Nakamichi 600 Cassette Console.
We believe it will provide you
with many years of superior performance.

The Nakamichi 600 typifies our design
philosophies in that it represents achievements
heretofore considered impossible or impractical;
it is a product that only
Nakamichi Research could have developed.

Such uniqueness almost always
increases the responsibilities of you, the owner,
in that special care must be taken to assure
you are getting the maximum performance from your machine.
We ask you to very carefully read through
this instruction manual before attempting
to operate your Nakamichi 600.

Thank you.

NAKAMICHI RESEARCH INC.

Control Functions

TAPE START MEMORY

"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 600 can be programmed to stop automatically from the rewind mode when the counter reaches 999.

TAPE COUNTER RESET BUTTON

Resets the tape counter to 000 every time it is depressed.

TAPE COUNTER

Indicates the relative position of the tape. May be used to index the locations of selections recorded on the tape.

CASSETTE LID

Allows easy insertion and removal of the cassette. Provides an unobstructed view of the cassette and provides ample access to heads, pressure roller and capstan for cleaning and demagnetizing.

STOP/EJECT BUTTON

Stops the mechanism from any function when initially depressed. A second push ejects the cassette from the well.

If the transport is already in the stop mode, the first push will eject the cassette.

REWIND BUTTON

RECORD BUTTON

PLAY BUTTON

FAST FORWARD BUTTON

Note: An interlock mechanism renders all transport control buttons inoperative while the cassette lid is open.

PAUSE / MOMENTARY STOP BUTTON

Temporarily halts the cassette mechanism during play or record when depressed. Resumes play or record when depressed for a second time. Furthermore, by utilizing the pause button while the Nakamichi 600 is OFF, the user may program unattended record or playback functions with the use of an external timer. The Nakamichi 600 will automatically release itself from the pause mode 3 to 5 seconds after the power is turned on.

OUTPUT LEVEL CONTROL

Controls the output voltage (volume) of the Nakamichi 600 during record or play. Has no effect on the record levels during record. In the maximum (fully clockwise) position the output for each channel will be 580 mV at a meter reading of 0 dB.

BIAS CALIBRATION CONTROLS

Allows adjustment of record bias for EX and SX positions and for left and right channels separately. Adjustments are made with the small screwdriver found in the accessory kit included with the machine (see page 5 for adjustment procedure).

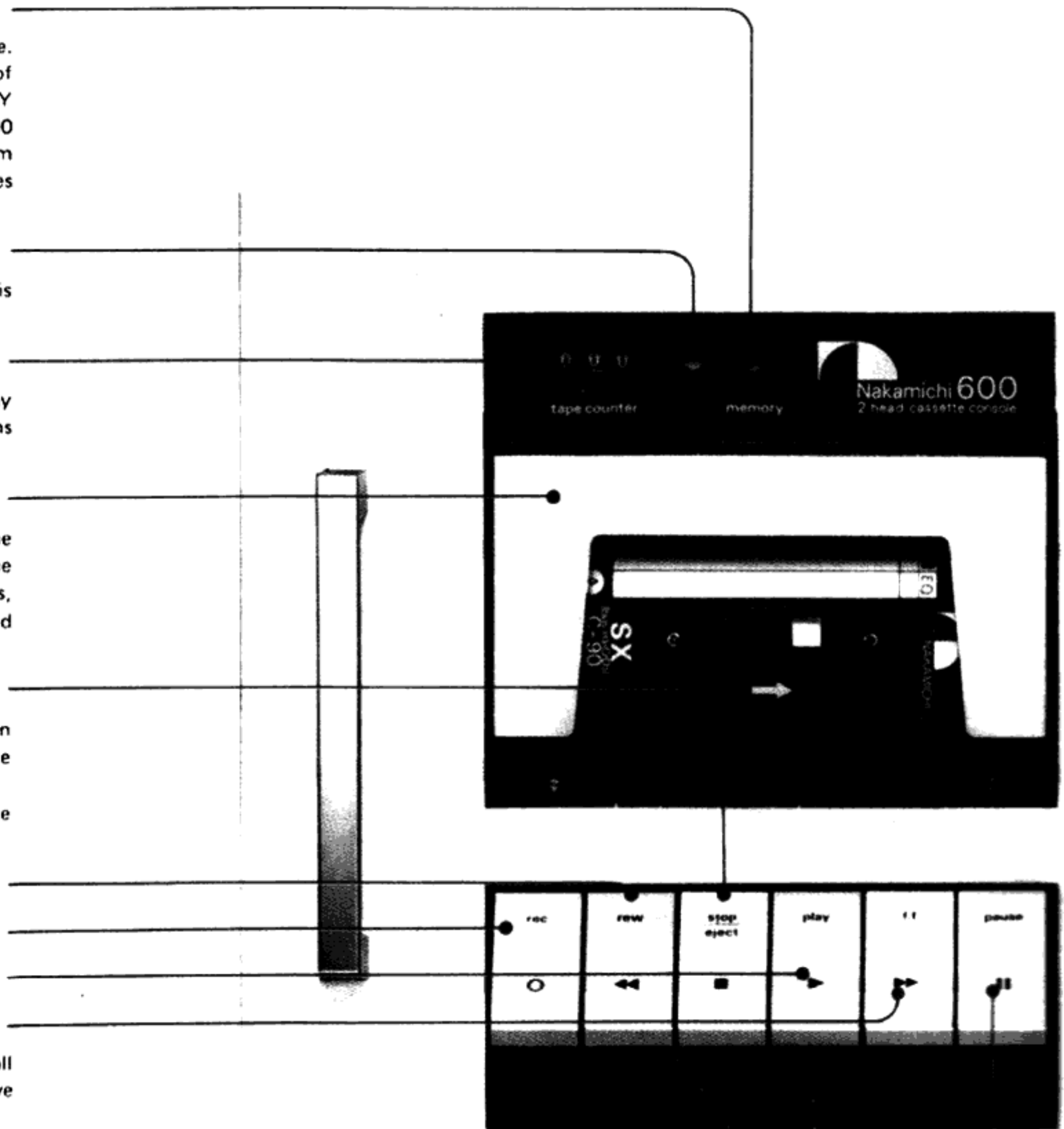
RECORD LEVEL CALIBRATION CONTROLS

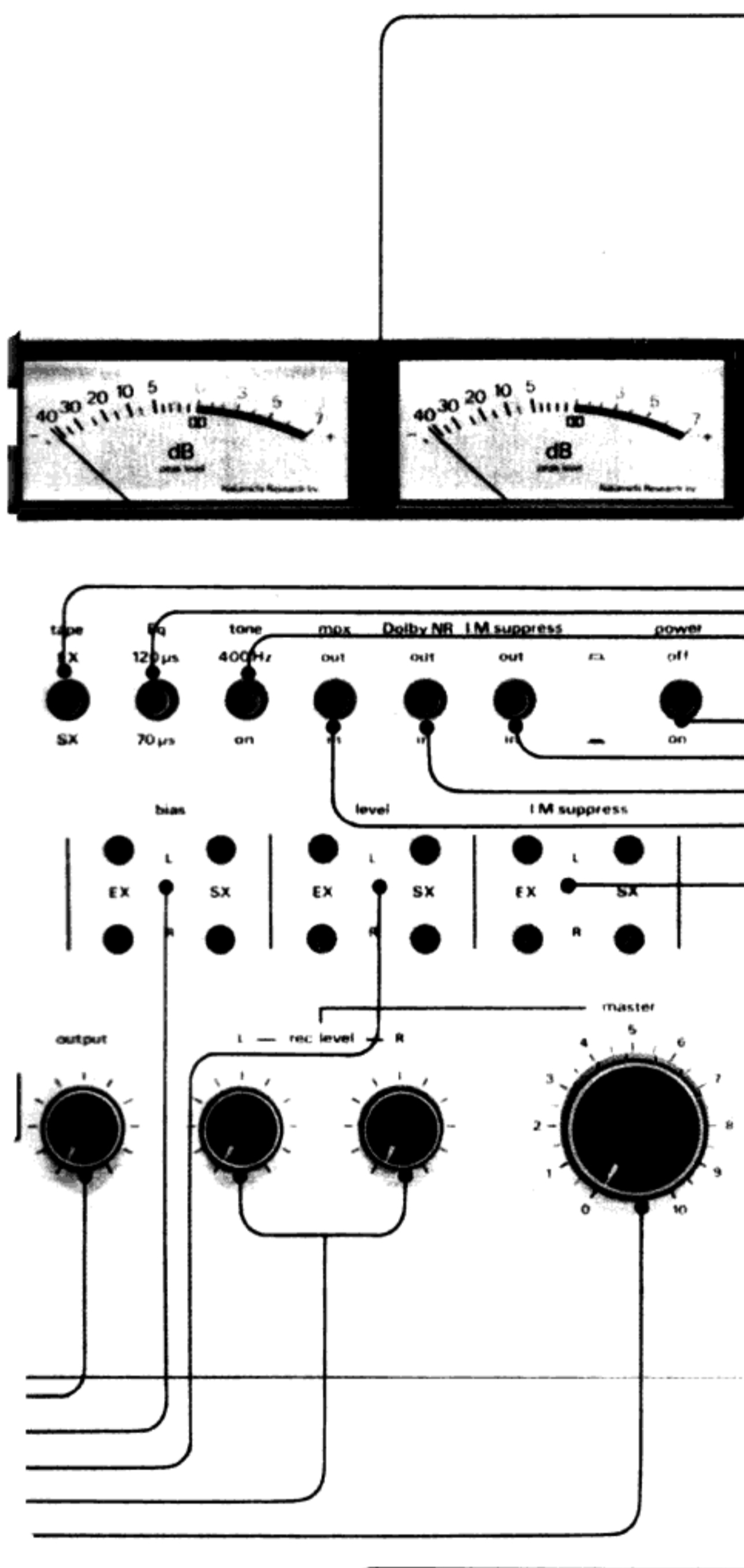
Allows adjustment of record level for proper Dolby tracking with tapes of different sensitivities. A 400 Hz tone is recorded at 0 dB (by depressing 400 Hz TONE button) and then played back. This process is repeated after adjusting the record level calibration controls until the playback level is also 0 dB (see page 8 for adjustment procedure).

LEFT AND RIGHT INPUT LEVEL CONTROLS

MASTER INPUT LEVEL CONTROL

Once the proper balance between the left and right channels has been set using the left and right input level controls, the overall record level may be adjusted for both channels simultaneously with the Master input level control.





PEAK LEVEL METER

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 tapes, such as Nakamichi EX or EX II, are to be used in the EX position (see page 5 for recommended tapes). This switch also selects the appropriate IM Suppressor Calibration for playback.

EQ (EQUALIZATION) SELECTOR SWITCH

Selects the proper record and playback equalization for various types of tape. It allows the choice of either the 120 microsecond or 70 microsecond time constant independently of bias (see diagram as well as page 5).

400Hz TEST TONE SWITCH

Activates a low distortion 400 Hz single tone which is recorded onto the tape at 0 dB (200 nWb/m). The test tone is used to perform routine calibrations, such as record level, as well as more elaborate adjustments.

POWER SWITCH

I.M. SUPPRESSOR SWITCH

Activates Intermodulation Suppressor circuitry which during playback reduces distortions inherent in the tape recording process. It has no effect during record.

DOLBY NOISE REDUCTION SWITCH

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

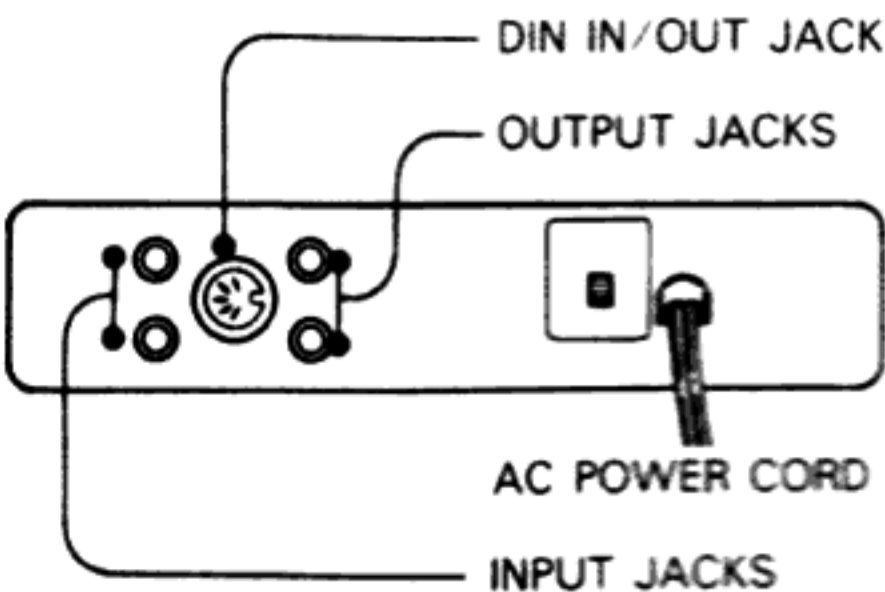
MPX FILTER SWITCH

Filters out the 19 kHz carrier signal when recording from FM stereo. The 19 kHz signal can "fool" the Dolby Noise Reduction circuitry into misbehavior. The filter should be "OUT" when recording anything other than FM Stereo broadcasts.

I.M. SUPPRESSOR CALIBRATION CONTROLS

Allows adjustment of the Intermodulation Suppressor for different types of tape. A 400 Hz playback tone is adjusted for minimum total harmonic distortion. Since proper adjustment requires external test instruments, it is strongly recommended that this procedure be carried out by qualified service personnel only (see page 7 for detailed adjustment procedure).

Connections



Input jacks of tape deck to "tape out" or "Rec out" jacks of amplifier, preamplifier or receiver.

Output jacks of tape deck to "tape in" or "tape play" jacks of amplifier, preamplifier or receiver.

OR

DIN In/Out jack of tape deck to DIN In/Out jack of amplifier, preamplifier or receiver.

Observe "left" and "right" indications.

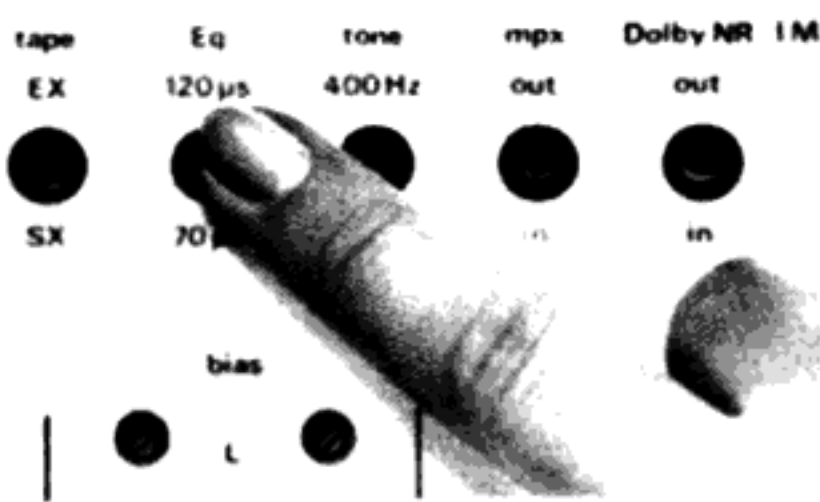
We recommend the use of RCA type connecting cables unless your amplifier or music system accepts only DIN connections.

Playback Procedure

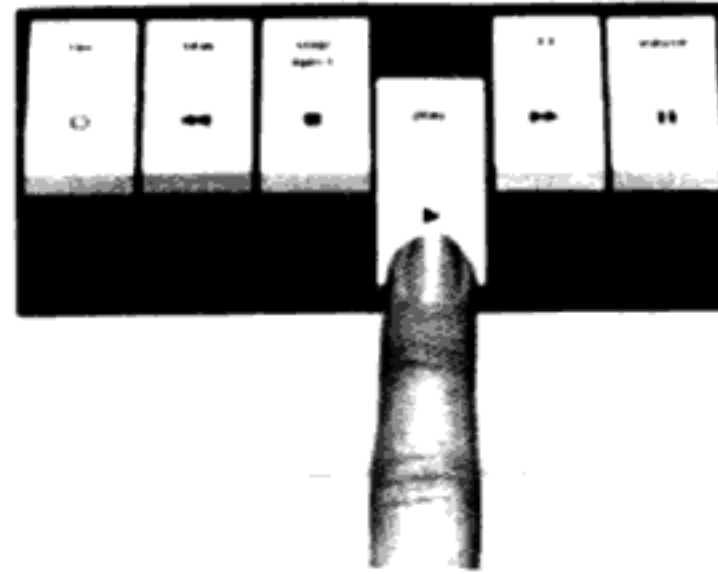
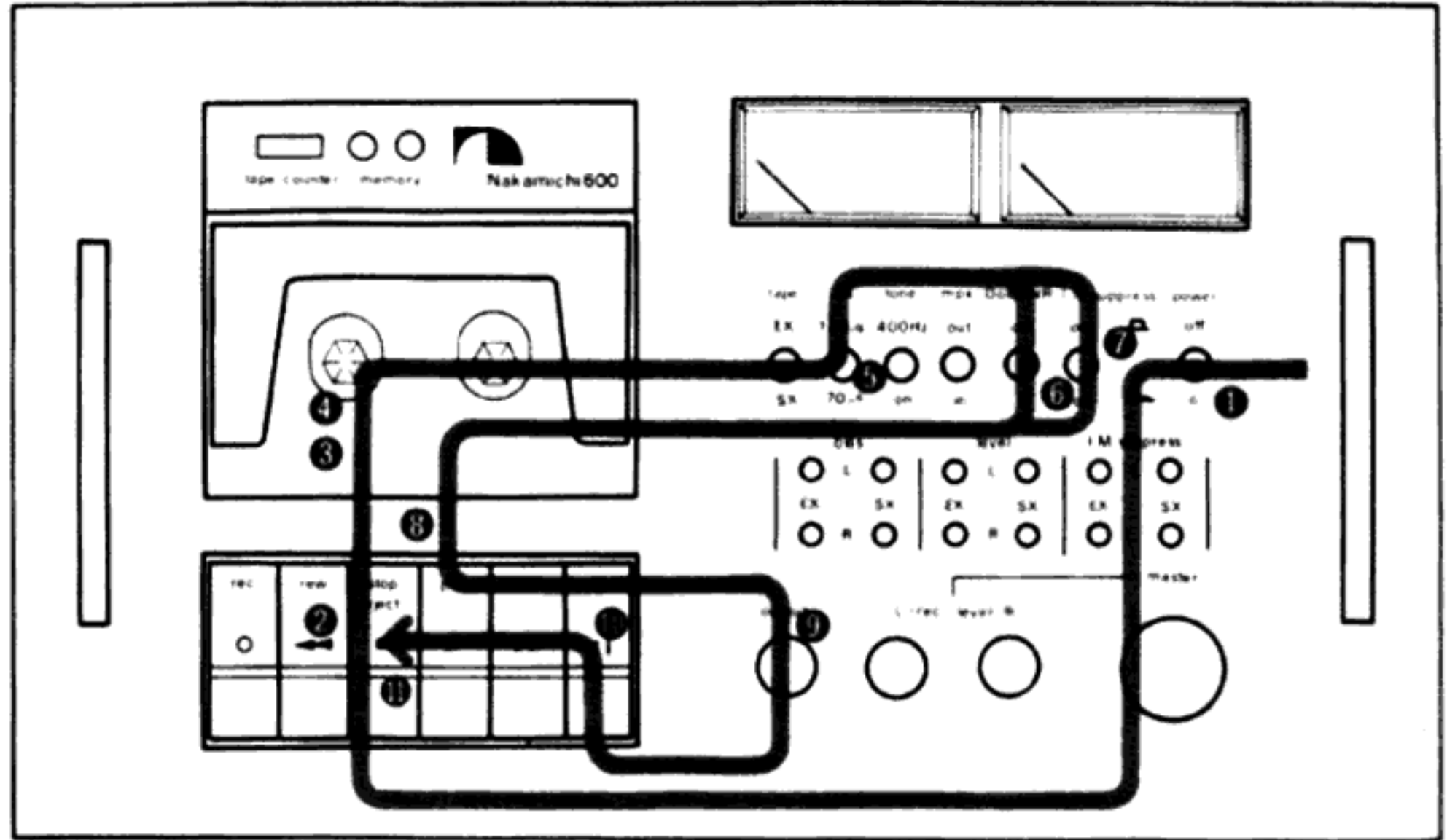
1. Turn the power on by depressing **POWER** switch. The level meters will light up to indicate that the power has been turned on.
2. Depress the **STOP/EJECT** button to open the cassette lid.



3. Insert cassette into lid as shown in the photograph.
4. After making sure that the cassette is fully inserted press down lightly on the lid to lock it closed.



5. Set the EQ (Equalization) to either 70 or 120 microseconds, whichever is appropriate for the tape about to be played (see page 5 for further instructions on EQ) as shown in the photograph.
6. When playing tapes recorded with the Dolby Noise Reduction System, depress the **DOLBY N.R.** switch to the **IN** position.
7. If the IM Suppressor is to be used, depress the **IM SUPPRESS** switch to the **IN** position. Also make sure the **TAPE** switch is in the proper position for the cassette tape to be played (see page 5).



8. Depress the **PLAY** button.
9. Adjust the **OUTPUT LEVEL** control to the desired volume level.
10. Depress the **PAUSE** button to temporarily stop the motion of the tape. Depressing the button for a second time will return the transport to the **PLAY** mode.



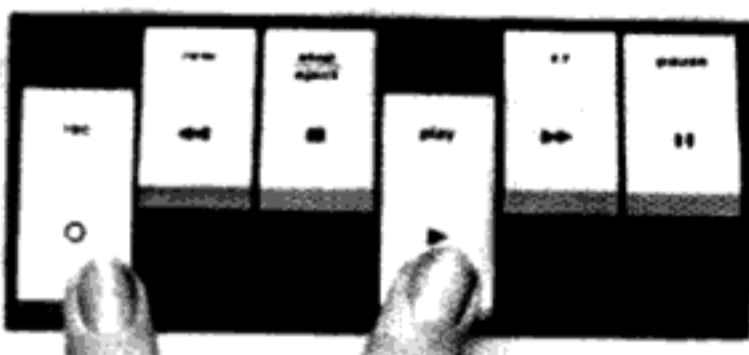
11. Depress the **STOP/EJECT** button to release the transport from the **PLAY** mode. Depressing the button again will eject the cassette from the well (see photograph).
12. Should the tape be allowed to play to the end of the side, the transport will automatically return to the **STOP** mode a few seconds after reaching the end of the tape.

NOTE: 1. If AC power is turned off while the tape deck is in the **PLAY** mode (either by the power switch or at the source), the transport will automatically return to the **STOP** mode. This is not the case if the **PAUSE** button is engaged. The transport will remain in the **PLAY/PAUSE** mode even if the power is interrupted.

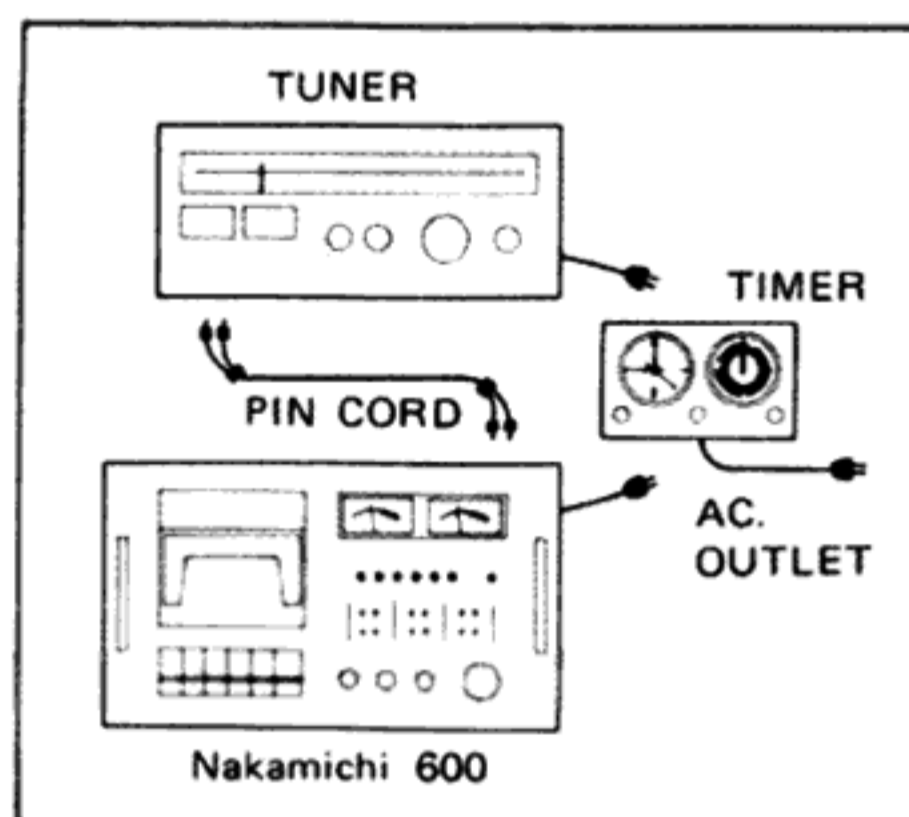
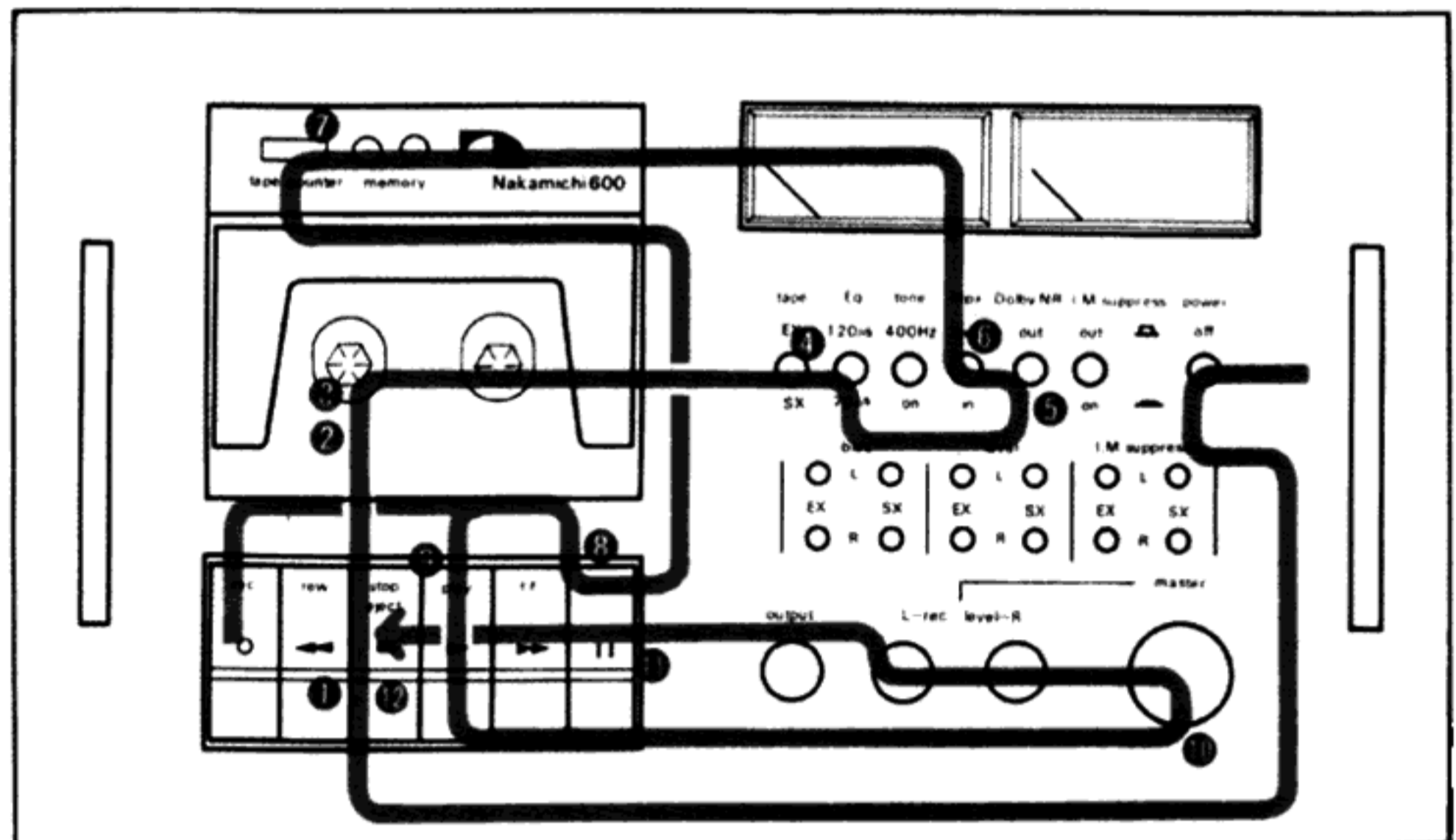
NOTE: 2. The IM Suppressor works only in the playback mode. It may be left on during record, but it will have no effect on the recording in progress.

Record Procedure

1. Depress the STOP/EJECT button to open the cassette lid.
2. Insert cassette into lid.
3. After making sure that the cassette is fully inserted press down lightly on the lid to lock it closed.
4. Set the TAPE (bias) and EQ switches as required for the particular tape being used as shown in the photograph (see page 5 for recommended settings).
5. Depress the DOLBY N.R. switch if the recording is to be made with the Dolby Noise Reduction System.
6. If the recording is going to be that of an FM Stereo broadcast, depress the MPX FILTER switch.
7. Set the TAPE COUNTER to 000 by depressing the COUNTER RESET button.
8. Depress the PAUSE button.



9. Depress the RECORD button. While it is held fully depressed, depress the PLAY button until both lock into place.
10. Adjust the recording levels as follows:
 - turn the MASTER INPUT LEVEL control to about 7 or 8;
 - turn the LEFT and RIGHT INPUT LEVEL controls while watching the Peak Level Meters until the channels are balanced;
 - final record level adjustments can be made with the MASTER INPUT LEVEL control (fade-in and fade-out effects can be accomplished with this control).
11. Start the tape in motion by depressing and releasing the PAUSE button.
12. To stop recording, push the STOP/EJECT button.



Procedure for Unattended Record or Playback

1. With the power "OFF" and the cassette inserted, depress the RECORD button. While it is held fully depressed, depress the PLAY button until both lock into place (Depress only the PLAY button for unattended playback).
2. Depress the PAUSE button.
3. Set the external timer to the desired starting time and make the proper power connections between it and the tape deck (see diagram).
4. Turn the POWER SWITCH on the Nakamichi 600 ON.
5. 3 to 5 seconds after the timer

starts the power to the tape deck, the transport will automatically release itself from the PAUSE mode and begin to record (or play).



NOTE: To preserve a cassette recorded as outlined above and to prevent its accidental erasure at some future time, punch out the plastic tab in the upper left hand corner of the cassette housing using a sharp instrument as shown in the photograph. This will make it impossible to record on that side of the cassette. If both sides of the cassette are to be protected from accidental erasure, punch out both tabs. If you desire to record again on a side of a cassette after its tab has been removed, you may do so by covering the hole with adhesive tape.





Bias and Equalization



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.

TABLE OF RECOMMENDED CASSETTE TAPES FOR NAKAMICHI 600

Position of TAPE Switch (bias)	Position of EQ. Switch	TAPE Switch	EQ. Switch	Brand	Type or Model
SX	70 μ sec.	on 	on 	NAKAMICHI TDK	SX C-60, C-90 SA C-60, C-90
EX	120 μ sec.	off 	off 	NAKAMICHI NAKAMICHI FUJI MAXELL MAXELL TDK	EX C-60, C-90 EX II C-60, C-90 FX C-60, C-90 UD C-60, C-90 UDXL C-60, C-90 Audua C-60, C-90

Shown above are the recommended cassette tapes 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 nonlinearities 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 low-noise/high-output/high-density type tapes require some 10% greater bias than normal ferric oxide

tapes for optimum results. High-coercivity tapes, such as Nakamichi SX, require approximately 45% greater bias. The Nakamichi 600 is factory adjusted to provide the proper bias for Nakamichi EX and EX II 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 of Recommended Cassette Tapes) pose similar bias requirements and, therefore, can be used in the EX and SX positions with excellent results.

EQUALIZATION 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 the playback process 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 conventional ferric oxide tapes and the newer low-noise/high-output formulations (including Nakamichi EX and EX II) 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 of Recommended Cassette Tapes.

NOTE: Because of the uniquely excellent high frequency performance of the Nakamichi 600 (thanks mainly to the Nakamichi Crystal Permalloy Focused Field head), it is possible, for special applications, to record and playback with Nakamichi EX, EX II and similar tapes using the 70 microsecond time constant. Although this represents a departure from standard practice, it provides a greatly improved signal-to-noise ratio by sacrificing a small amount of high frequency headroom.

Bias Adjustment Procedure

Proper bias adjustment requires the use of an external signal generator or audio oscillator (an AC VTVM is optional). It should not be necessary to perform this adjustment unless a cassette tape with characteristics quite different from those of Nakamichi EX or SX are to be used (see Table of Recommended Cassette Tapes on page 5 of this manual). The generator is connected to the input of the tape deck and tones of frequencies

from approximately 1 KHz to 18 KHz are recorded on the cassette tape at a level of -20 dB. If the bias is correct for the tape in use, the tones, when played back, should register -20 dB on the meters. If the record/playback frequency response is not flat (± 2 dB) within the above specified frequency range, the BIAS CALIBRATION controls should be adjusted and the above process repeated until flat response is obtained. The Nakamichi 600 provides separate BIAS CALIBRATION controls for the EX and SX positions, and for the left and right channels.

An alternate method, which is more difficult, is to record pink noise using a pink noise generator at -20 dB and to adjust the bias until the sound of the played-back pink noise most closely resembles the sound of the pink noise generator itself when reproduced over a high quality monitor system.



NOTE:

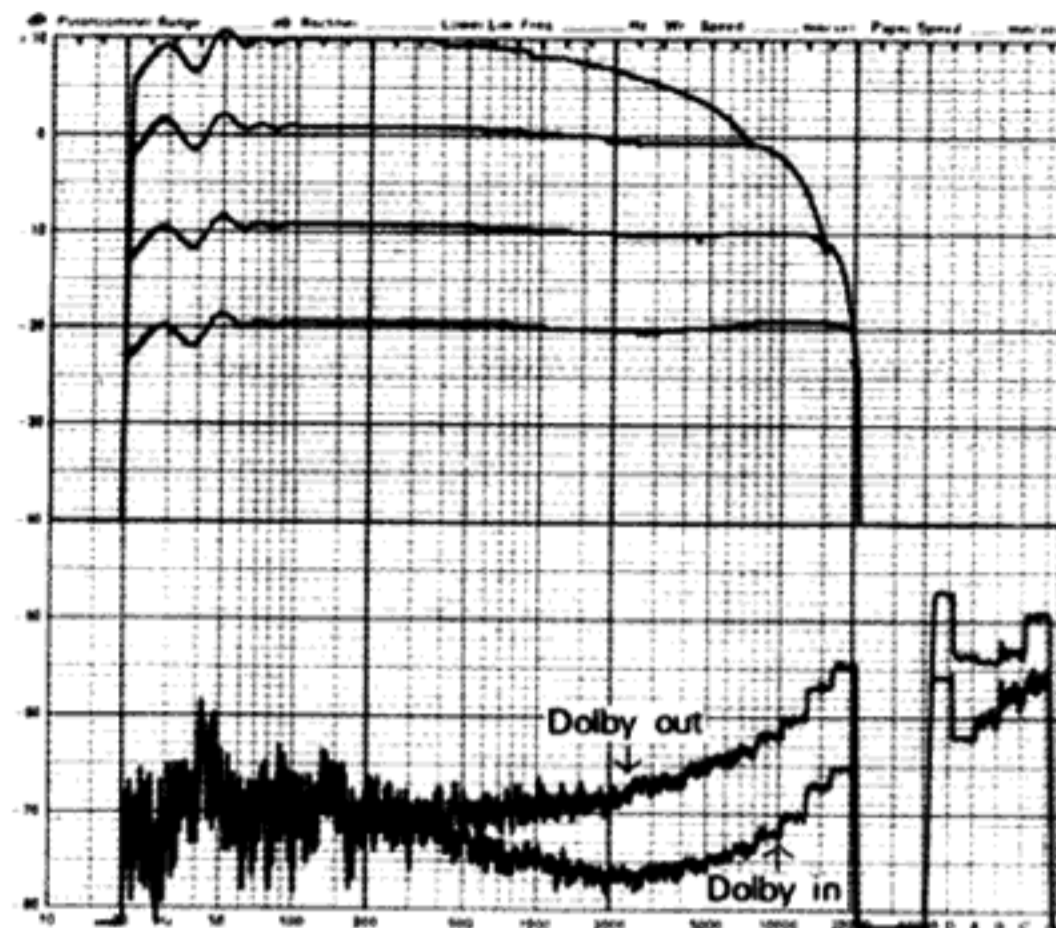
1. The companion model to the Nakamichi 600, the Nakamichi 610 Control Preamp, has built-in tone and pink noise generators which may be used to perform the bias adjustments.
2. Do not attempt to adjust the bias to match inferior quality cassette tapes. Even if acceptable frequency response can be obtained, it will usually be at the expense of significantly higher distortion.
3. It is strongly recommended that the record/playback distortion be checked by a competent technician following any alteration of the bias.

Nakamichi 600

Frequency Response

Noise Level

Tape SX
 Bias SX
 Eq 70 μ s
 T.H.D. 1.2%
 (I.M. Suppressor out)
 OdB 200 nWb/m

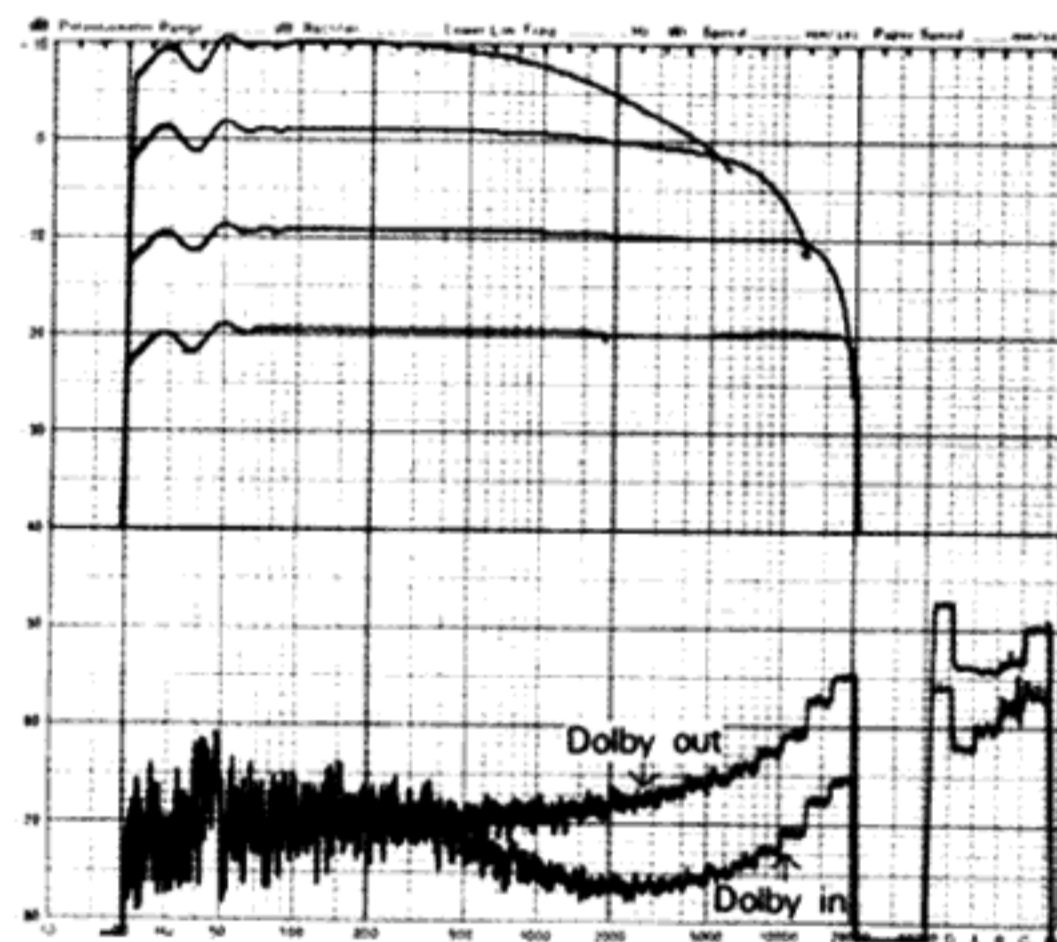


Nakamichi 600

Frequency Response

Noise Level

Tape EX II
 Bias EX
 Eq 70 μ s
 T.H.D. 1.2%
 (I.M. Suppressor out)
 OdB 200 nWb/m

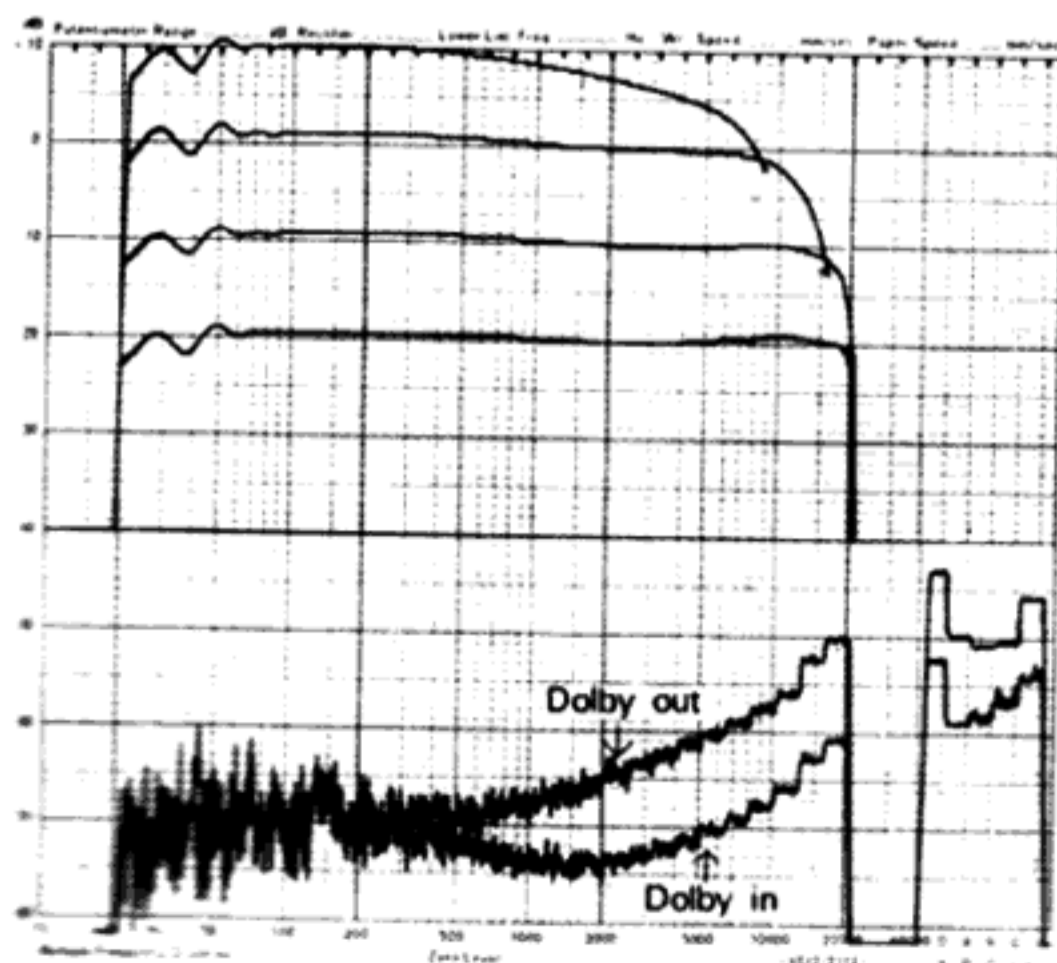


Nakamichi 600

Frequency Response

Noise Level

Tape EX II
 Bias EX
 Eq 120 μ s
 T.H.D. 1.2%
 (I.M. Suppressor out)
 OdB 200 nWb/m



I.M. Suppressor Calibration Procedure

The Dolby Noise Reduction System

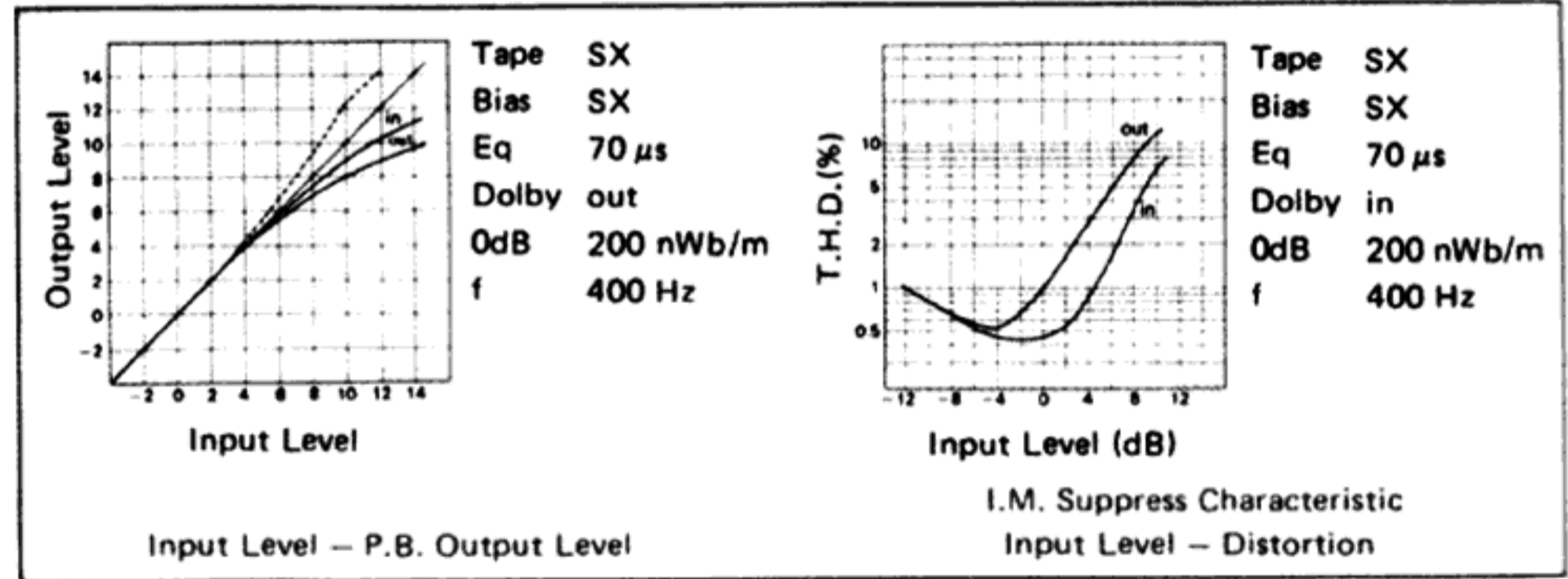
The unique Intermodulation Suppressor circuitry found on the Nakamichi 600 allows recording at higher levels than normally possible by reducing the saturation and distortion one encounters at higher recording levels. A 400 Hz test tone recorded on Nakamichi SX tape will not reach 3% distortion until the recording level is +7 dB on the meter, a phenomenally high level especially when one takes into account the fact the 0 dB level on the Nakamichi 600 is already a few dB higher than on most cassette decks. The I.M. Suppressor works on the principle that the saturation and distortion characteristics of any given tape are predictable and that these factors can be reduced by special compensation techniques. This means, however, that the I.M. Suppressor must be adjusted to match the characteristics of the tape to

be used. If a tape with characteristics substantially different from those of Nakamichi EX or SX is to be used, the I.M. Suppressor should be re-adjusted as follows:

- 1) Connect the output of the Nakamichi 600 to a distortion analyzer.
- 2) Record the 400 Hz TEST TONE onto the tape.

- 3) REWIND and then PLAY the tone with the IM Suppressor IN. Adjust the appropriate I.M. SUPPRESS CALIBRATION control (left or right, EX or SX position) for minimum distortion.

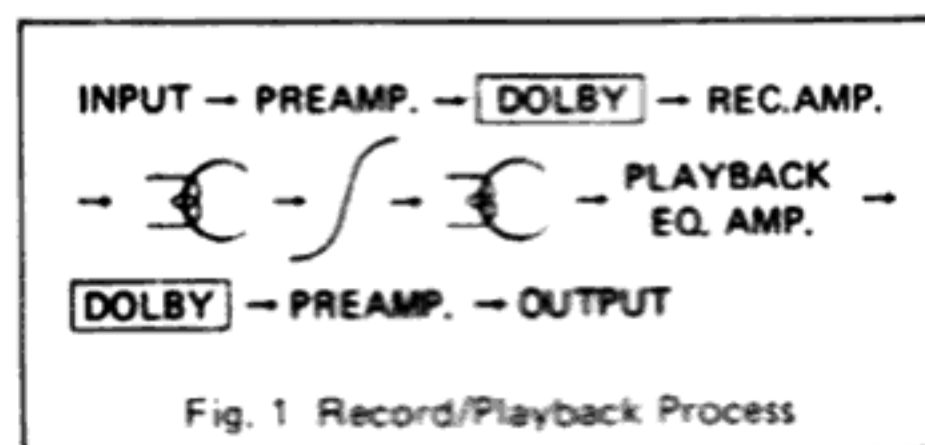
NOTE: The IM Suppressor need not be re-calibrated for any of the tapes listed in the Table of Recommended Cassette Tapes on Pg. 5.



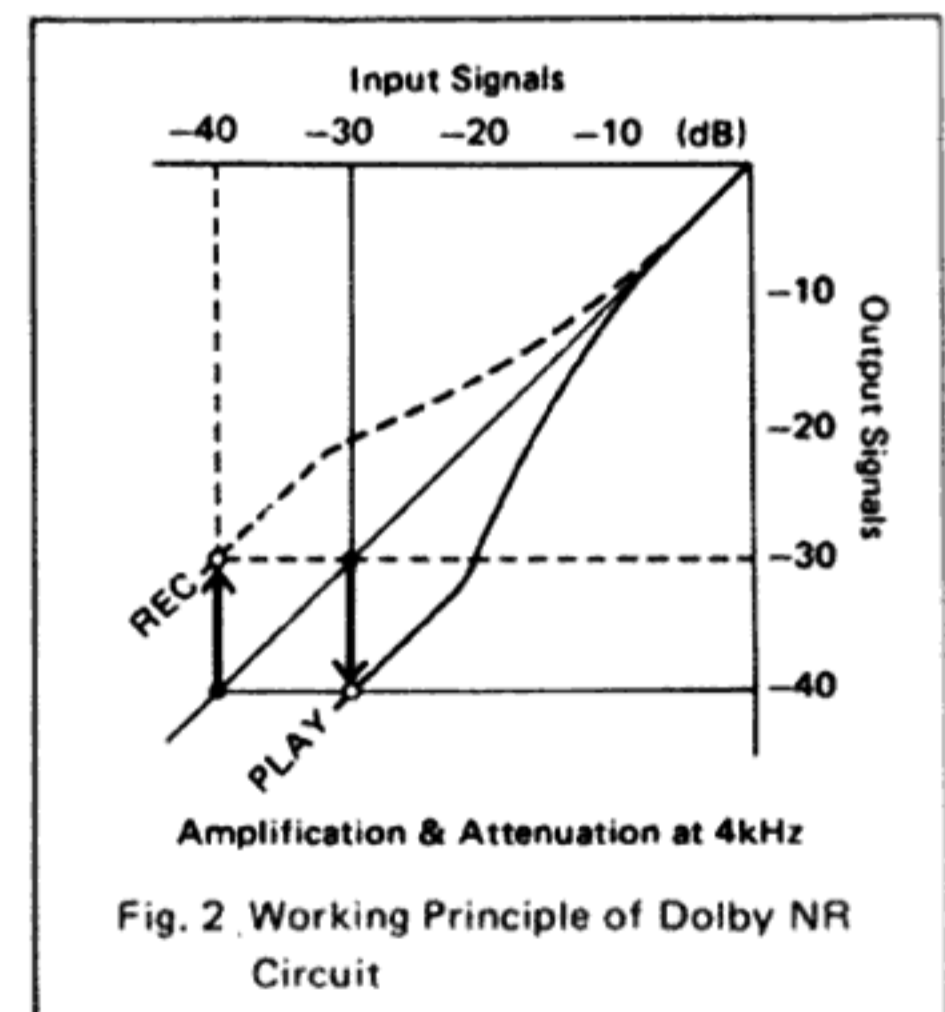
The Dolby Noise Reduction System The Nakamichi 600 Cassette Console incorporates the "B-Type" Dolby Noise Reduction circuitry under license from Dolby Laboratories, Inc. It is a system that significantly reduces the "hiss" noise, which, although inherent in magnetic tape recording, is particularly noticeable in cassette recording because of the narrow track width and slow tape speed.

Such tape noise is generally distributed over a frequency range of 2 KHz to 10 KHz. Very basically, the Dolby system reduces the noise by amplifying the signals in this range during record and attenuating them during playback as shown in Fig. 1.

In actuality, however, the system is quite



a bit more complicated because it is clear that if all high frequency signals were boosted during record, the tape would become grossly saturated and the sound would be very distorted. The Dolby system, therefore, is selective in its boosting: a special threshold sensing circuit makes sure that only the low level high frequency signals are amplified (the lower the level, the greater the boost). This same circuit is applied in reverse during the playback process to restore flat frequency response. In attenuating the boosted signals it also reduces the noise. If high frequency signals (at 4 kHz) of -40dB, for example, enter the Dolby circuit during record, they will be boosted to a level of -30dB before being recorded onto the tape. Then, during playback, high frequency signals entering the Dolby circuit at a level of -30dB will be attenuated to a level of -40dB. The accompanying reduction in the recorded noise will be 10dB. The circuit, however, will not affect signals greater than -5dB (see Fig. 2).

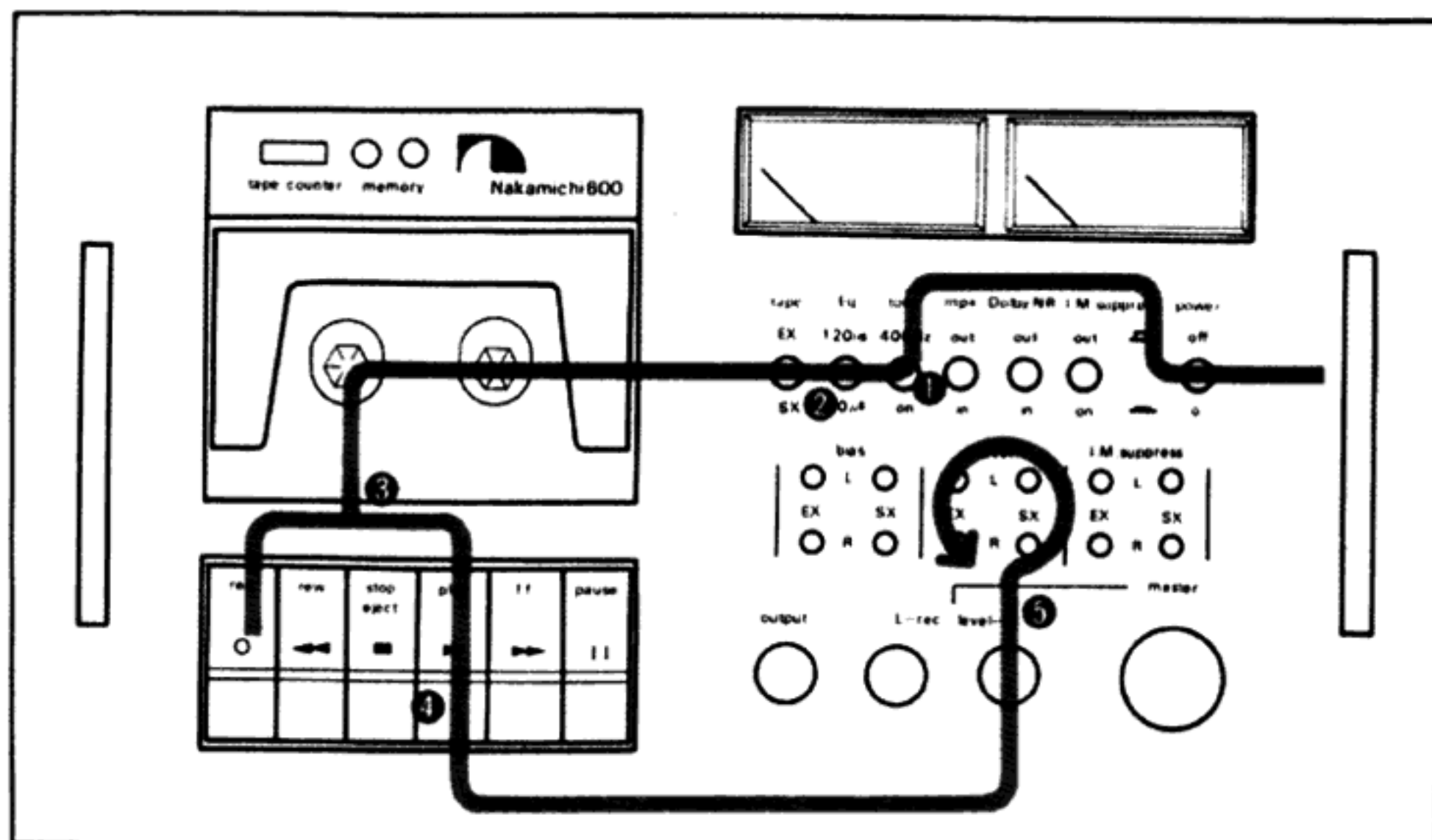


As is clear from the foregoing explanation, it is possible to gain an overall improvement in signal-to-noise ratio of approximately 10dB if a tape is recorded and played with the Dolby system. The system, furthermore, is internationally standardized so that any tape recorded on any machine with Dolby NR can be played on any other machine with Dolby NR.

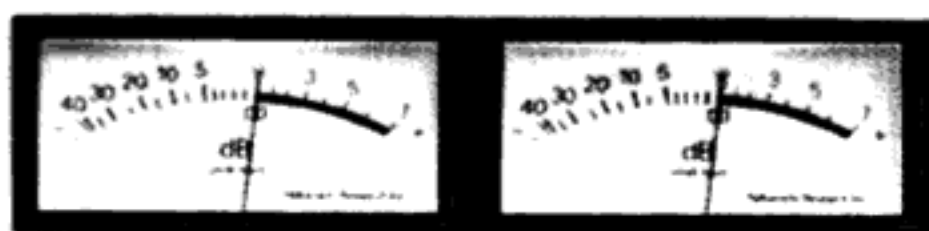
Record Level Calibration Procedure

The proper operation of the Dolby Noise Reduction circuitry depends on the accurate setting of the signal levels to be Dolby processed. This is particularly true with Nakamichi cassette decks because the electronics are built and calibrated to high precision standards and because the Dolby circuitry is called on to augment an already excellent system.

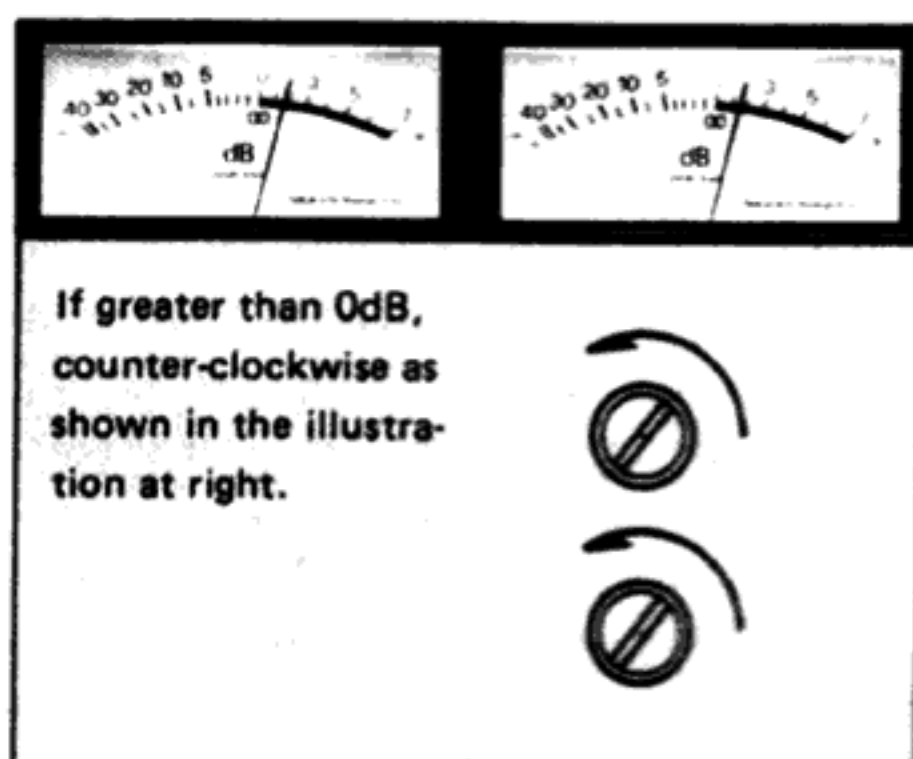
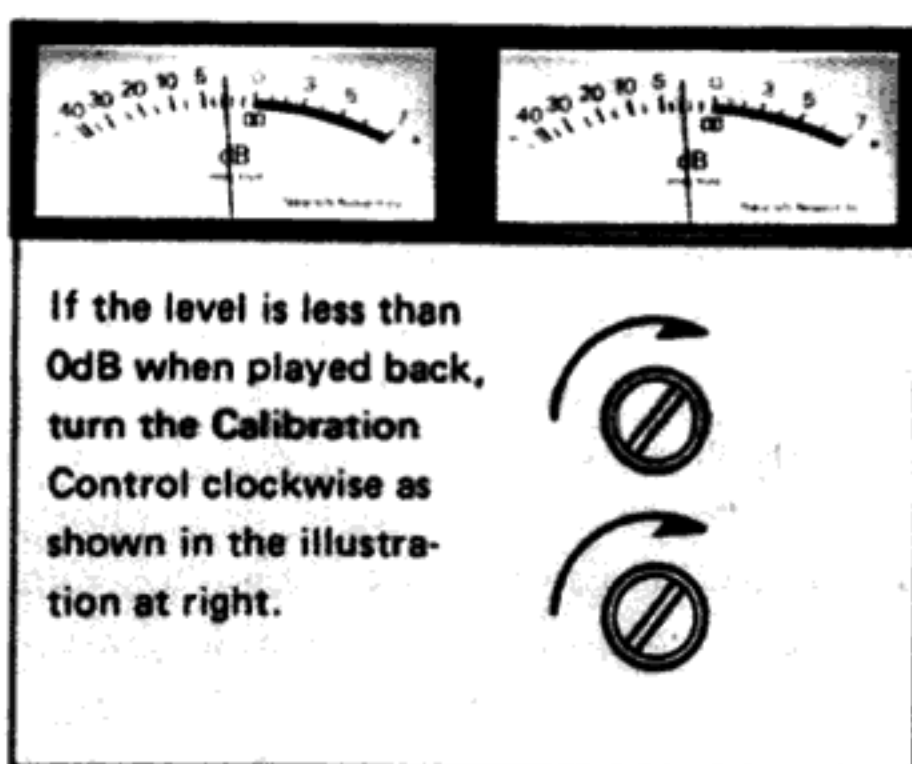
Although the playback levels have been calibrated at the factory, it is still necessary for the user to adjust the record levels since some tapes have higher output than others. Nakamichi EX II, for example, has approximately 1½ dB higher output than Nakamichi EX. No external test instruments are required for record level calibration — the procedure is outlined below:



- 1) Turn on the 400 Hz TEST TONE by depressing the switch so marked.
- 2) Set the TAPE and EQ switch as required for the tape in use.



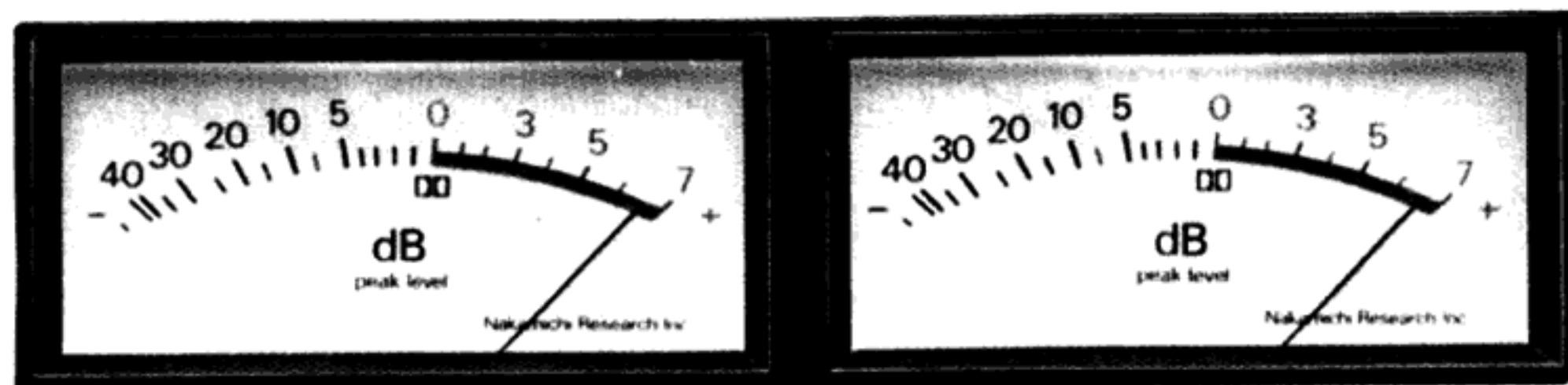
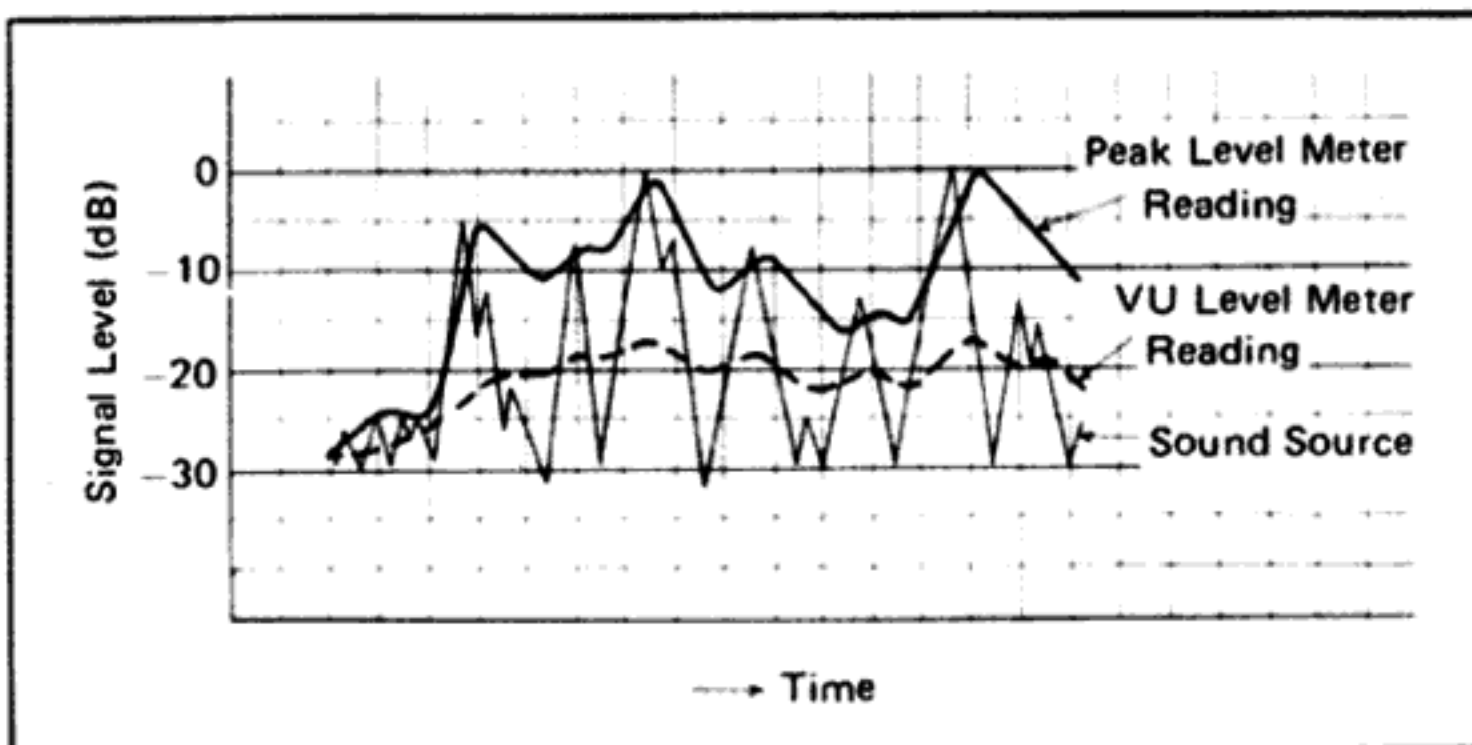
- 3) Begin recording the test tone. The peak meters will indicate 0 dB.
- 4) REWIND the tape and PLAY the tone. If the peak level meters both indicate 0 dB at this point, there is no need for adjustment.
- 5) If either peak level meter indicates less than 0dB, stop the tape, then slightly turn the RECORD LEVEL CALIBRATION control for the appropriate channel (and tape type) clockwise. If either meter indicates greater than 0 dB, slightly turn the appropriate RECORD LEVEL CALIBRATION control counterclockwise.
- 6) Record and playback the 400 Hz TEST TONE once again. If the meters do not indicate 0 dB upon playback, repeat steps 3 through 5 above until they do.



NOTE: The RECORD LEVEL CALIBRATION controls affect the record sensitivity. Do not expect the meter indications to change while you are adjusting the RECORD LEVEL CALIBRATION control, either in record or playback. It is only after you have adjusted the controls, re-recorded the tone and played it back (in that order) that you will for the first time notice any change in the meter readings.

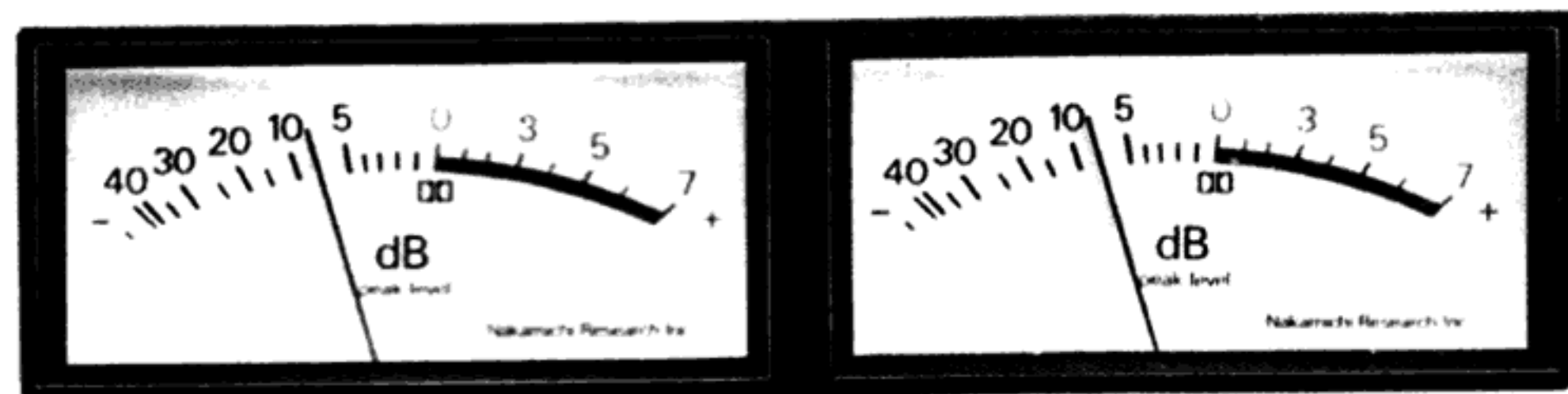
Recording with Peak Level Meters

1) Conventional VU level meters (found on the greater majority of tape recorders) cannot indicate the true peaks of a given program source because they are designed to provide "averaged" readings. It is possible with certain kinds of program material, therefore, to overload the tape even though the VU level meters give no signs of overload. The Peak Level Meters on the Nakamichi 600 give accurate indications of all program peaks so that they may be relied upon for distortion-free recordings.



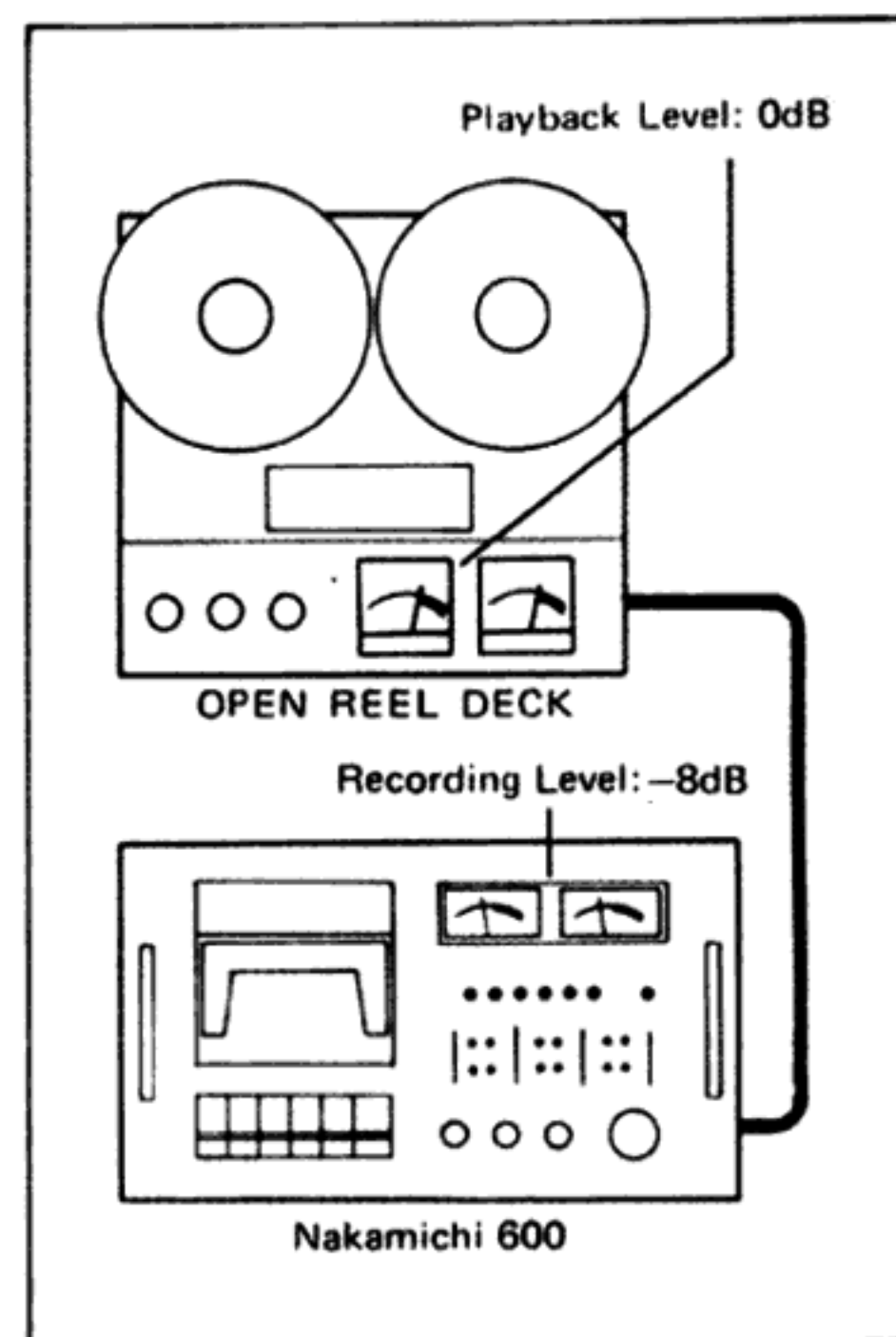
2) Thanks to the headroom increase gained by using the I.M. Suppressor, it is possible to record at levels approaching +7 dB (full scale on the Peak Level Meters) thus increasing the overall signal-to-noise ratio. Certain program sources (musical or otherwise) with an

abnormally high amount of high frequency material may require slightly more conservative recording levels, but with the greater majority of sources the peaks may be allowed to reach +7 dB without worry of overloading the tape.



3) When dubbing onto the Nakamichi 600 from a 2-track/15 ips open reel tape, it is suggested that the red mark at -8 dB on the Nakamichi's Peak Level Meters be used as a guideline for setting recording levels. Play a 0 dB or 0 VU test tone on the open reel deck.

Set the record levels on the Nakamichi 600 to the red mark (-8 dB). This will provide ample compensation for the fact that the open reel deck operating at 2-track/15 ips has greater headroom.

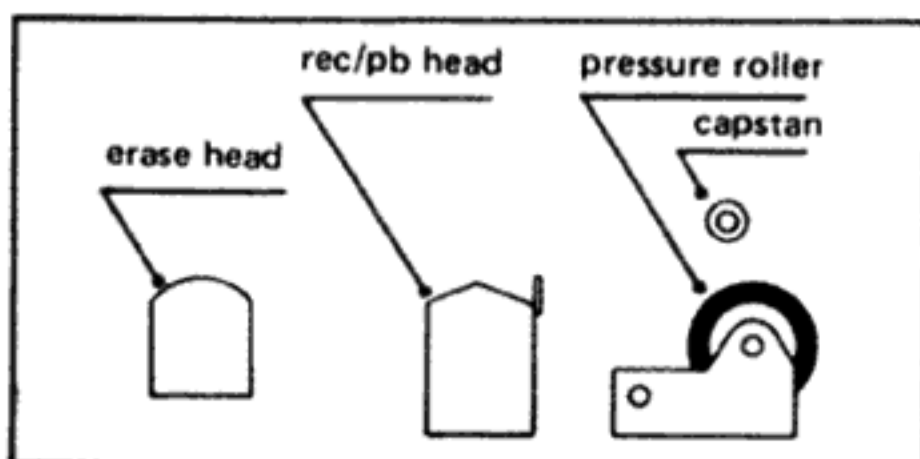




CLEANING

All parts that come into contact with the tape must be frequently cleaned. Even the best tape formulations leave a deposit of oxide shavings on the heads, pressure roller and capstan. Failure to perform a periodic cleaning of these parts can result in signal dropouts, loss of high frequencies and excessive wow/flutter. A cleaning kit is supplied with the Nakamichi 600, but some Q-tips and methanol alcohol (preferably undiluted) will perform quite adequately.

Dip the Q-tip in alcohol and squeeze off the excess. Rub the Q-tip over the surface of the heads as shown in the photo. To clean the capstan and pressure roller, put the deck into the play mode with the power on. Apply the moist Q-tip to the right side of the rubber pressure roller (applying to the left side may cause cotton to become caught between the roller and the capstan). Move the Q-tip about so as to clean the entire surface of the roller. Then, put the machine into the pause mode and repeat the process with the capstan.



DEMAGNETIZING

All metal parts that come into contact with the tape must be occasionally demagnetized to prevent the build-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. A 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/play head (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 (approximately 60 cm) 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.

LUBRICATION

The moving parts of the Nakamichi 600 transport are fitted with oil-less bearings. It is not necessary for the user to provide lubrication.

Repairs

Please read the Warranty Card accompanying this unit very carefully. We sincerely trust that you will never experience difficulties with your Nakamichi 600, 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.

Trouble Shooting Chart

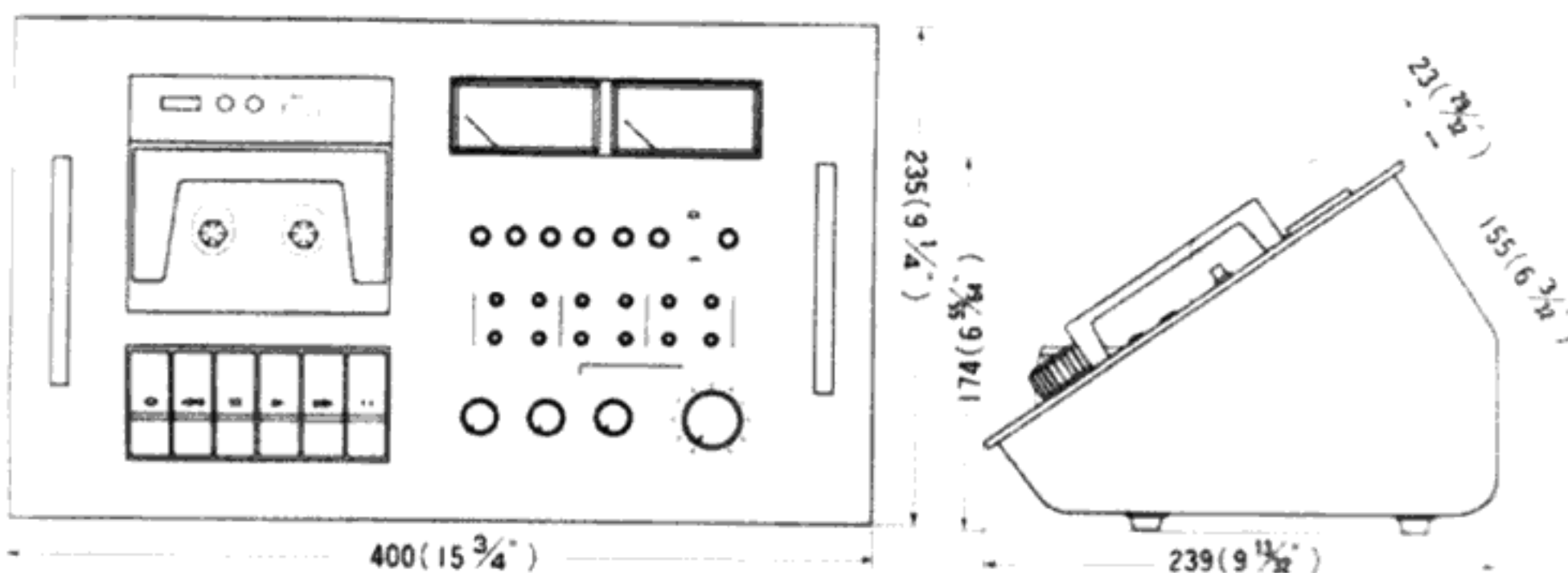
Condition	Probable Cause	Remedy
Tape does not run.	<ol style="list-style-type: none">1. Power cord is unplugged.2. Tape is loose inside cassette.3. Cassette lid is not firmly closed.	<p>Plug in power cord firmly. Wind tape up. Eject cassette and reset it carefully.</p>
Hissing sound is heard in playback.	<ol style="list-style-type: none">1. Head is magnetized.	Demagnetize head with head demagnetizer.
Tape travel is unsteady.	<ol style="list-style-type: none">1. Capstan shaft and/or pinch roller are dirty.2. Tape winding inside cassette or tape guides are faulty.	<p>Clean those parts. Replace cassette.</p>
Previously recorded sound remains.	<ol style="list-style-type: none">1. Erase head is contaminated.	Clean erase head and pinch roller.
Reproduced sound is distorted.	<ol style="list-style-type: none">1. Program material itself is distorted.2. Recording volume levels are too high.	<p>Examine program material. Adjust appropriate recording level controls.</p>
Cannot record.	<ol style="list-style-type: none">1. Connection to each part is incorrect.2. Record head is contaminated.3. Cassette tabs are broken off.	<p>Check connections. Clean head. Place a piece of adhesive tape over the tab opening.</p>
Cannot reproduce.	<ol style="list-style-type: none">1. Connection to each part is incorrect.2. Playback Record head is contaminated.	<p>Check connections. Clean head.</p>
Large hum noise is heard in recording.	<ol style="list-style-type: none">1. Disturbing induction field exists nearby the deck.2. Connector cord grounding is defective.	<p>Keep away from amplifier, transformer, fluorescent lamp, etc. Replace connector cord.</p>

Specifications and Optional Accessories

Specifications:

Power Source	100-117, 220-240 V 50/60 Hz
Power Consumption	15 W Max.
Tape Speed	1-7/8 ips. (4.76 cm/sec.) ±1%
Wow and Flutter	Less than 0.12% WTD Peak
Frequency Response	40-18,000 Hz ±3 dB (SX, EX Tapes, -20 dB Rec. Level)
Signal to Noise Ratio	Better than 60 dB 400 Hz, 0 dB WTD rms.
(Dolby In, SX Tape, WTD)	Better than 68 dB 400 Hz, 3% THD WTD rms. with IM Suppressor
Total Harmonic Distortion	Less than 1.5% 400 Hz 0 dB Less than 0.5% 400 Hz 0 dB with IM Suppressor-In (SX, EXII Tapes)
Erase	Better than 60 dB below saturation level at 1 KHz
Separation	Better than 35 dB at 1 KHz, 0 dB
Crosstalk	Better than 60 dB at 1 KHz, 0 dB
Bias Frequency	105 KHz
Transistors	57
Diodes	27
IC's	1
Input	60 mV, 50 K ohms
Output Level	580 mV (400 Hz, 0 dB, Output Level at Max)
Dimensions	15.75 (W) x 6.70 (H) x 9.33 (D) inches 400 (W) x 170 (H) x 237 (D) m/m
Approximate Weight	14.3 lbs (6.5 Kgs)

- Specifications and appearance design are subject to change for further improvement without notice.
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Optional Accessories



SX Cassette Tape C-60, C-90



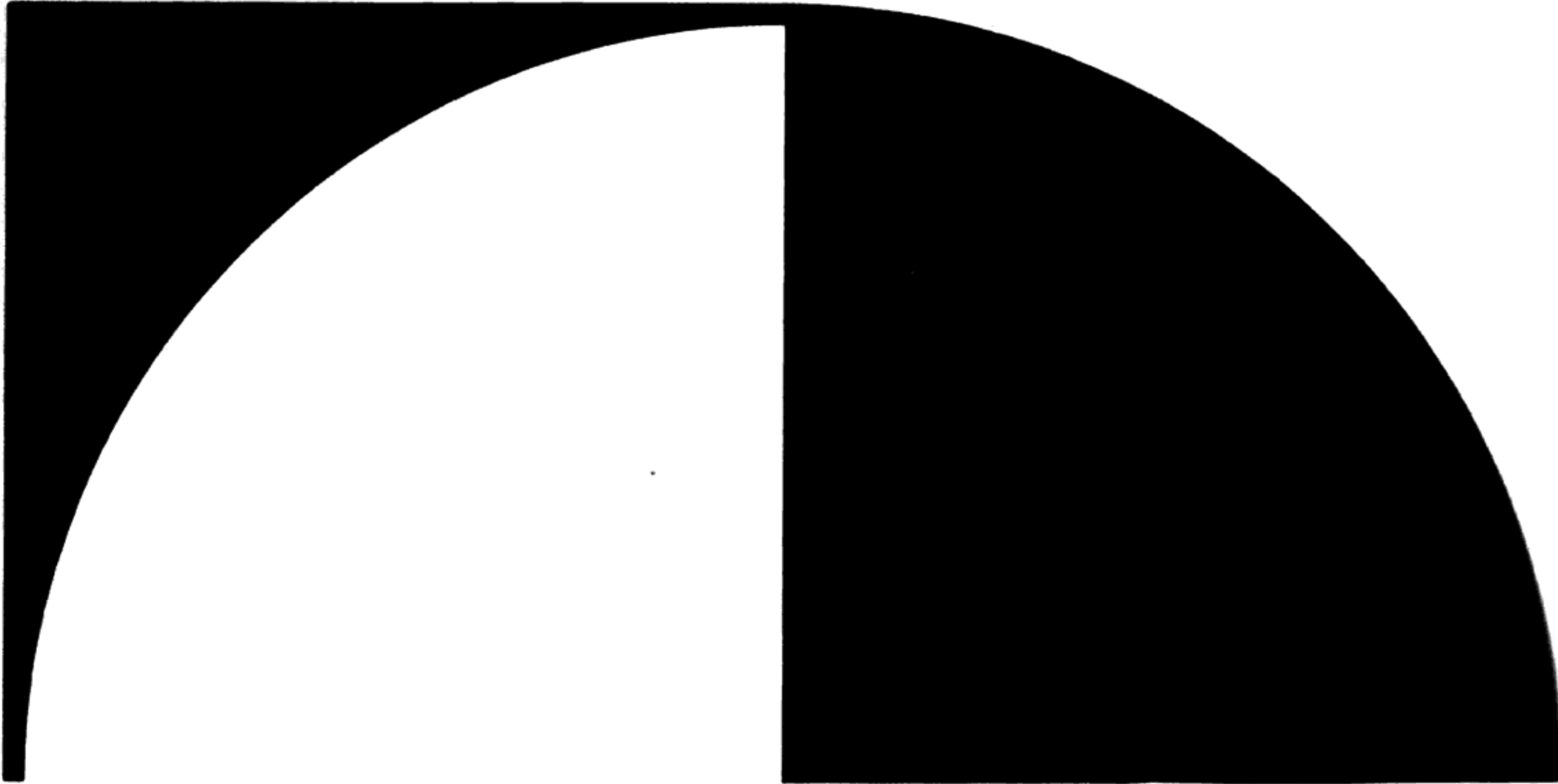
EX Cassette Tape C-60, C-90



EXII Cassette Tape C-60, C-90



Head Demagnetizer



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