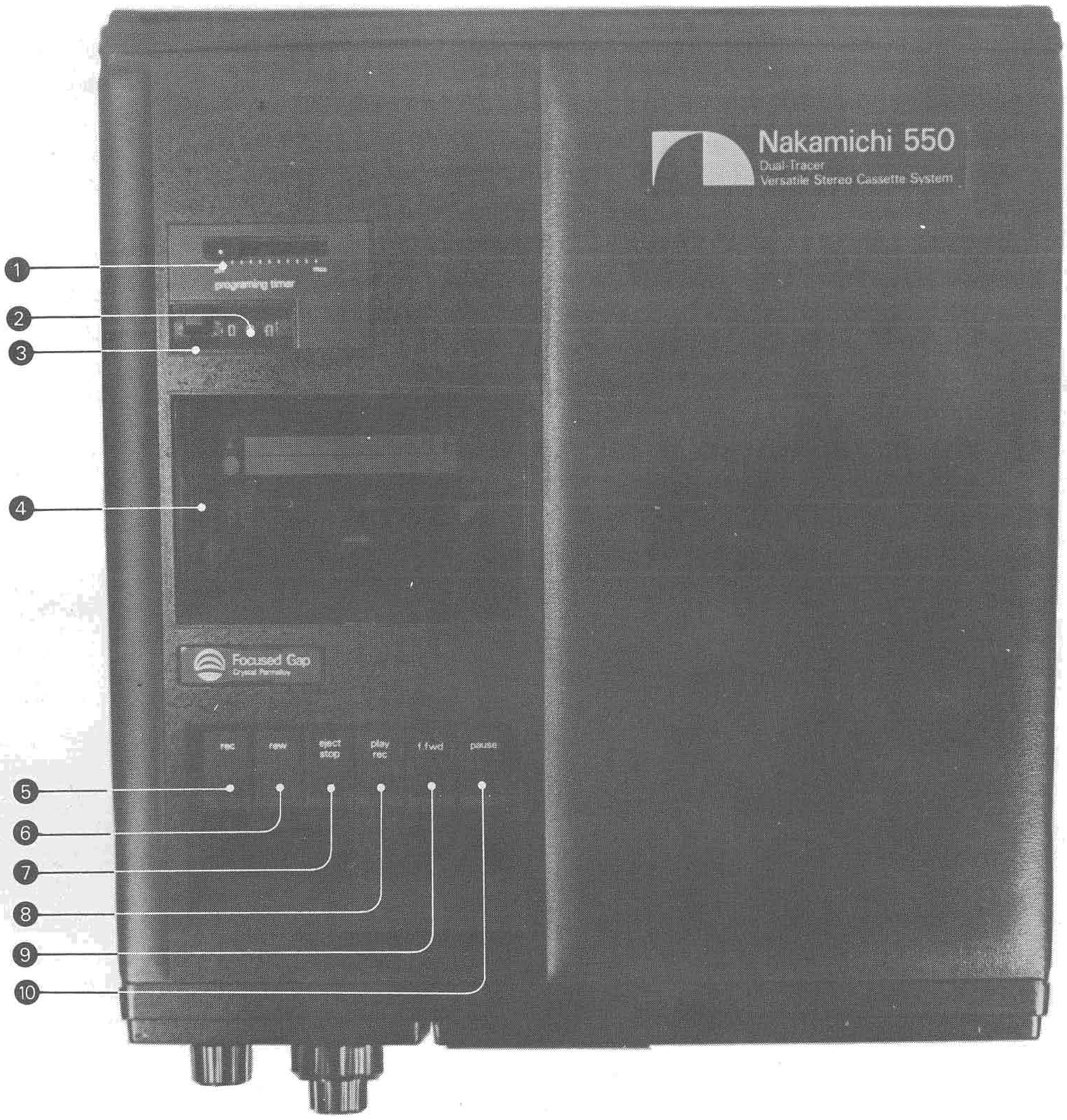
Nakamichi 550

Dual-Tracer The Versatile Cassette System
Operating Instructions

Welcome to the Nakamichi Revolution.
You have just purchased one of the most advanced cassette systems available today, the Nakamichi 550 Dual-Tracer.
With its newly developed Focused-Gap head and servo-controlled tape transport, the Nakamichi 550 is capable of a level of performance that is only exceeded by our own Tri-Tracer machines, the Nakamichi 700 and 1000.
We urge you to examine this instruction manual carefully. The brief time you spend familiarizing yourself with the many features and capabilities of the 550 will not only enable you to appreciate the flexibility designed into it, but will help you secure recordings of outstanding quality.

Contents

Control Functions



❶ Programing Timer
Set the slider to the desired program length (proposed duration of recording) and when the specified time has elapsed, the front panel Tape Alarm, an LED, flashes to alert the user.

❷ Index Counter
Provides an indication of amount of tape played and remaining, as well as indicating tape motion.

❸ Index Counter Reset Button
When depressed it resets the counter to "000".

❹ Cassette Lid
Pressing the eject/stop button raises the lid.

❺ Record Button
Recording is initiated by first depressing the record button and then the play button which sets tape in motion.

❻ Rewind Button
Used to provide rapid transport of tape from right to left reel hub.

❼ Eject/Stop Button
A light pressure stops tape in any mode. It must always be depressed before going from one function to another. An additional pressure opens the cassette lid and ejects the cassette.

❽ Play Button
Activates playback and transports tape at normal speed. Must be used in conjunction with record button when recording.

❾ Fast Forward Button
Winds tape at high speed from left to right reel hub.

❿ Pause Button
Stops tape momentarily without switching off recording circuits or disengaging tape transport mechanism. Can be used in both record and playback and is especially useful in setting record levels. First press stops tape and second starts it again.

⓫⓬ Input Level Controls
Controls recording levels for left and right channels individually. Also controls rear panel line inputs.

⓭ Blend Mic Level Control
Adjusts input level of third mic (blend) input and permits professional quality mixing.

⓮ Headphone Level Control
Special level control permits headphone monitoring from low to almost realistic sound levels.

⓯ Tape Alarm Lamp
Used in conjunction with the programing timer, it flashes when the preset time period has elapsed.

⓰ Headphone Jack
Accepts standard 8 ohm phones and is used for source monitoring or for playback.

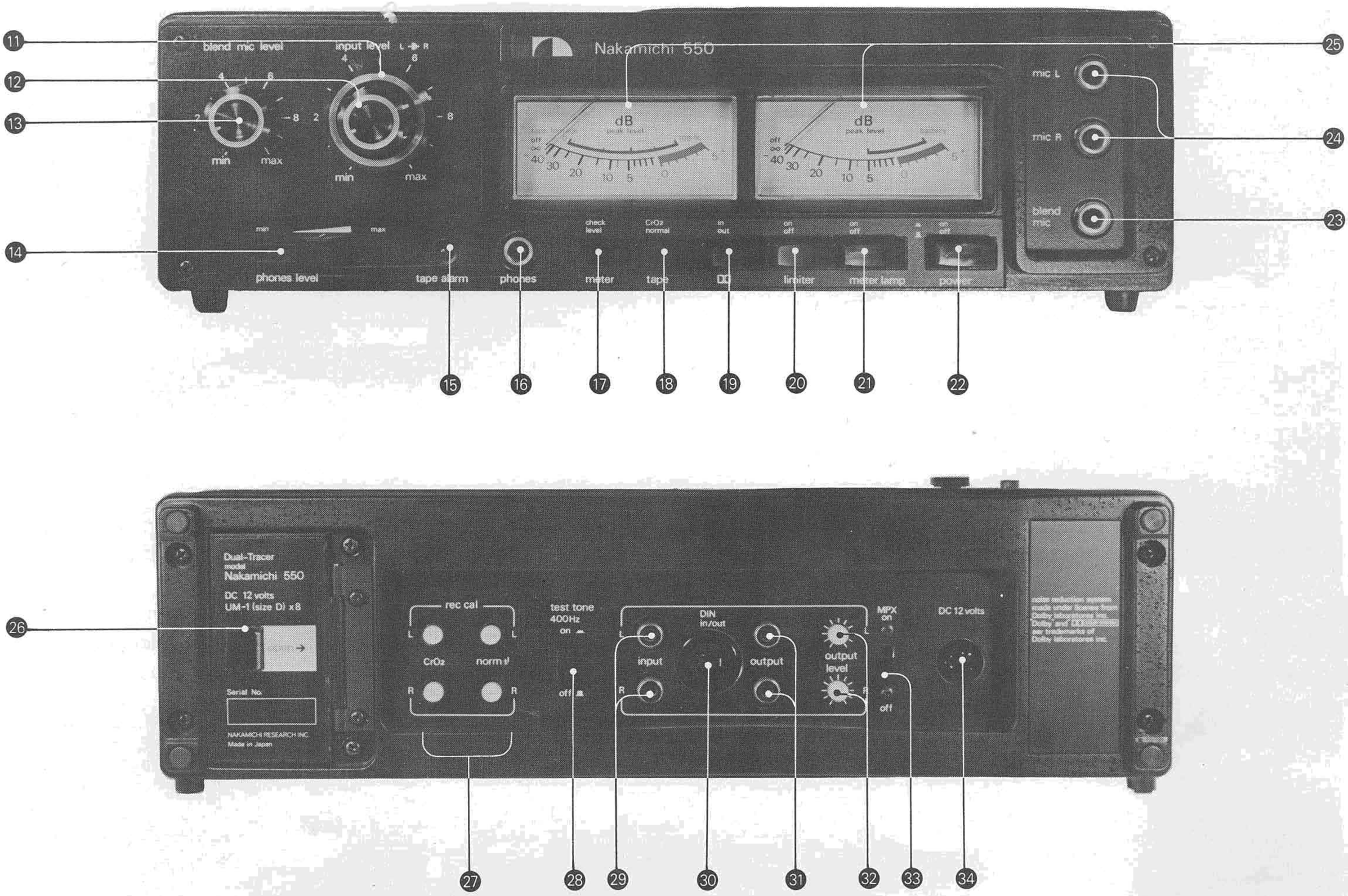
⓱ Meter Function Switch
Normally the meters function as peak level indicators, but they may be switched to read battery condition (right) and tape footage remaining (left).

⓲ Tape Selector Switch
Simultaneously sets both bias and equalization for CrO2 or normal.

⓳ Dolby NR Switch
Activates Dolby NR circuitry for recording and playback when depressed. The "out" position is for non-Dolby record and playback.

⓴ Limiter Switch
Introduces peak limiting to prevent tape overload and distortion. Operates only on very strong signals.

㉑ Meter Lamp
Provides meter illumination under poor light conditions.



22 Power On/Off Switch

Applies power from internal batteries, car batteries or AC line (with suitable adaptor).

23 Blend Mic Input

24 Mic Inputs L&R

25 Level Meters

Peak reading meters with a unique −40dB to +5dB extended range. Can be switched to indicate battery condition and elapsed tape time.

26 Battery Compartment

Accepts eight standard "D" cells

27 Record Calibration Controls

Permits calibration of Dolby NR system to match characteristics of different recording tapes.

28 Test Tone Switch

Provides a 400Hz Dolby test tone at 0 dB reference level (refer to page 7 for use).

29 Line Inputs

Permits connection of amplifier or associated equipment through standard phono jacks.

30 DIN Input/Output Socket

Inputs and outputs may be made through standard DIN connector cord.

31 Line Outputs

Playback through associated high fidelity system is provided via standard phono jacks.

32 Line Output Level Controls

Matches output level of recorder to other components in a high fidelity system.

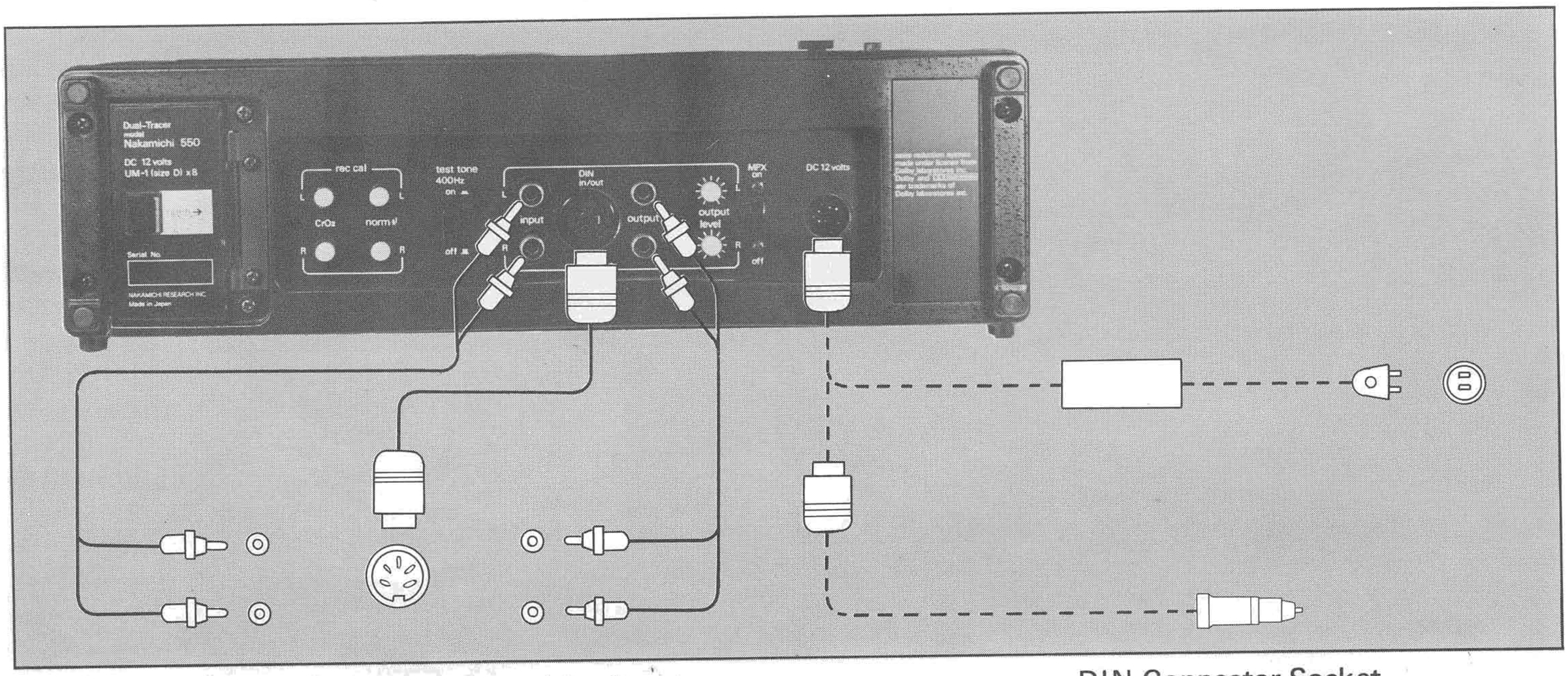
33 MPX Filter Switch

Should be set to "on" when recording from tuner. For all other sources it should be in off position.

34 External Power Source Socket

Permits recorder to be powered from car battery (12V) or AC line (adaptors provided). Internal power supply is automatically disconnected.

Connections



Line Outputs

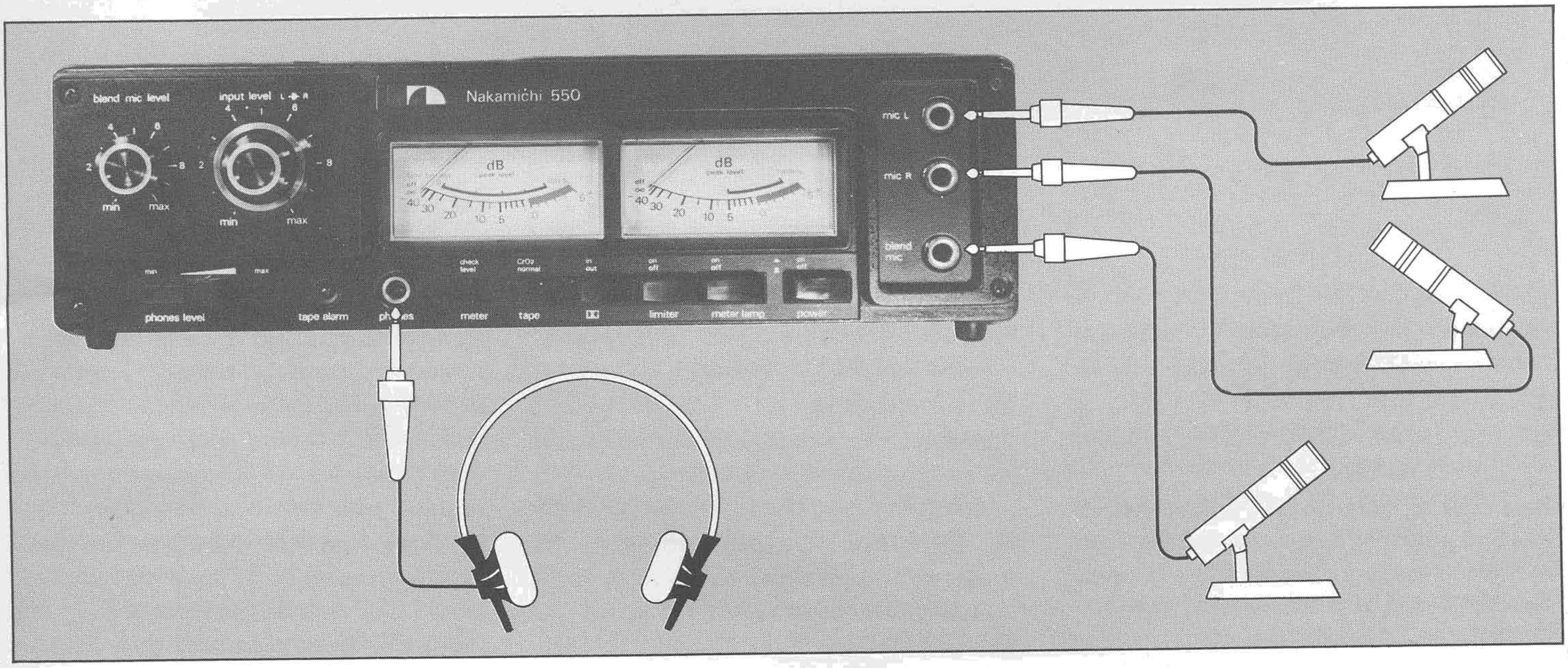
Connect the line outputs (L&R) to the corresponding inputs of your amplifier marked "tape monitor" or "auxiliary" with pin cords provided.

Line Inputs

Connect the line inputs to the tape recording outputs of your amplifier with pin cords provided.

DIN Connector Socket

If your amplifier is equipped with a DIN connector, it may be connected to the recorder with the appropriate DIN cord. If DIN cord is used, do not use pin cords or vice versa.

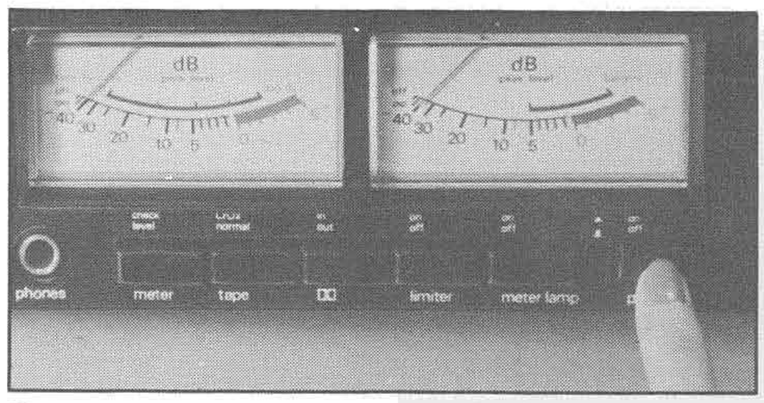


Microphones and Headphones

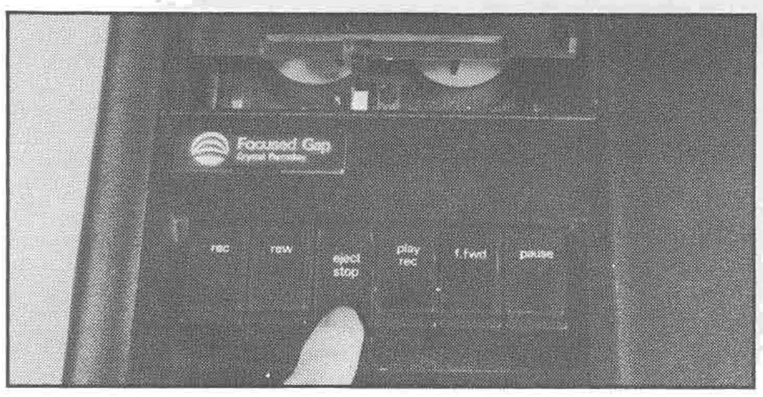
The above illustration shows how to connect a pair of microphones for stereo recording, as well as the blend microphone. Microphones should be of good quality with an output impedance of 600 ohms.

Stereo headphones with an 8 ohm impedance may be connected as shown. Output is controlled by adjacent headphone level control.

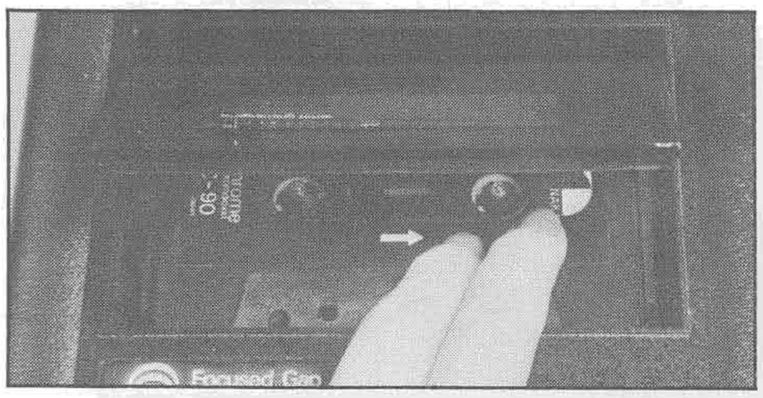
Playback Procedures



❶ Turn unit on by depressing power switch.

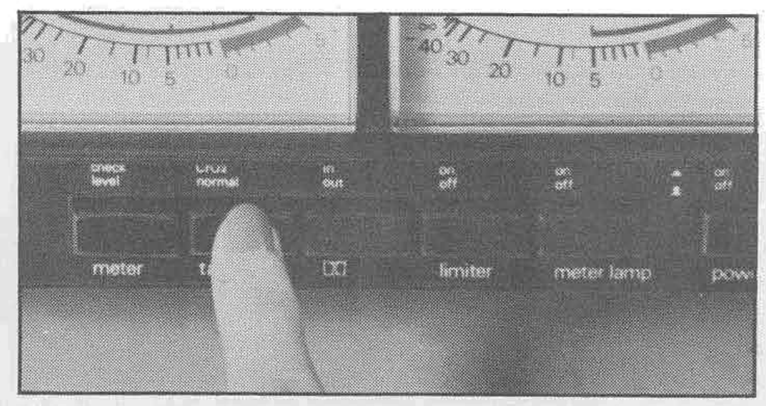


❷ Push eject/stop button all the way down to open cassette compartment.

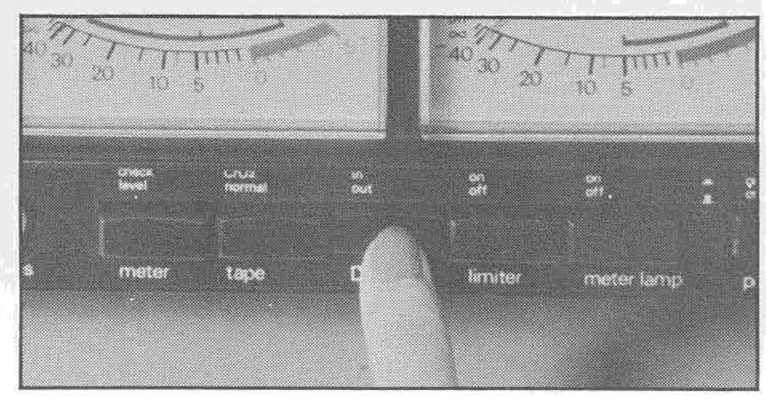


❸ Insert cassette with open end facing front and the full reel of tape on lefthand side.

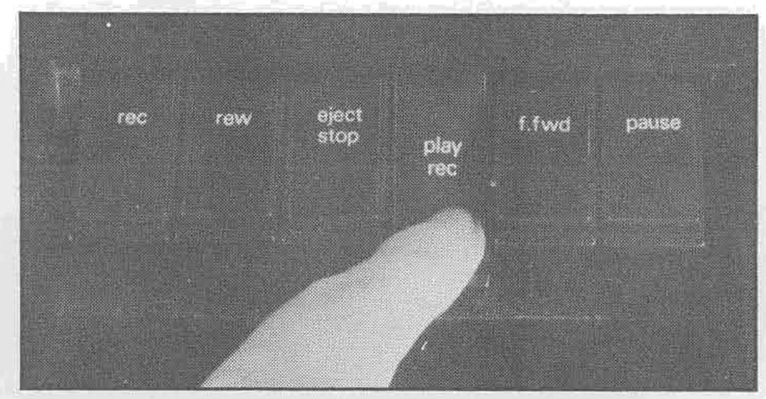
❹ Press lid down until it locks in place.



❺ Set tape selector switch for either CrO2 or normal.

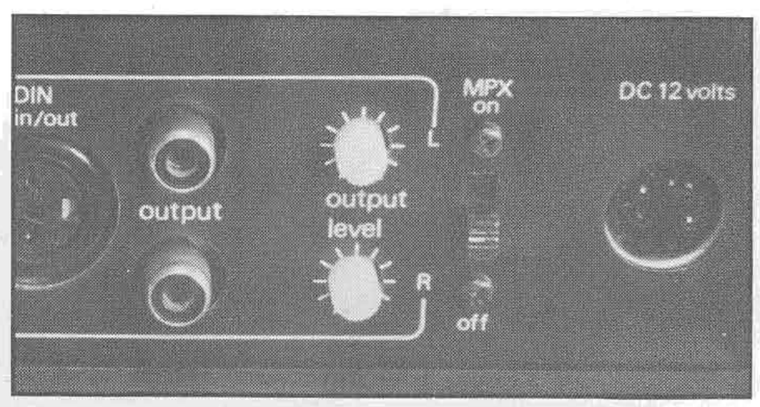


❻ If tape has been processed through Dolby NR circuitry, set Dolby switch to "in".

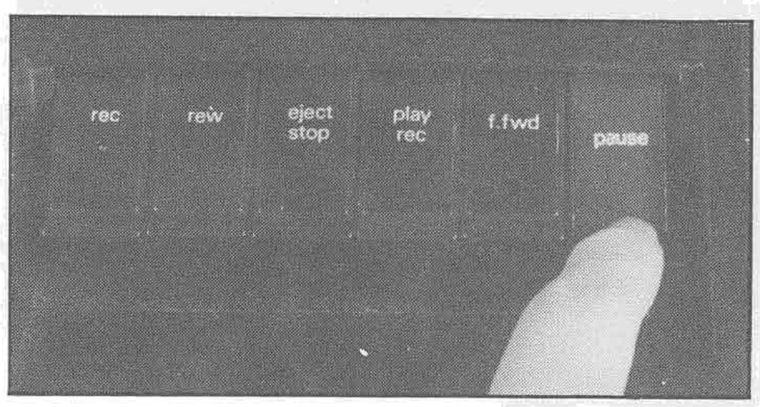


❼ Depress play button to set tape in motion.

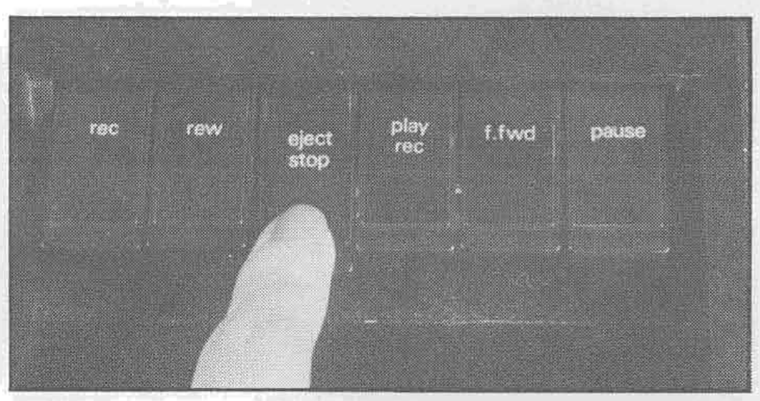
❽ Adjust headphone level control to suitable volume.



❾ If recorder is used in conjunction with high fidelity system, set output levels at rear of recorder to match level of associated equipment.



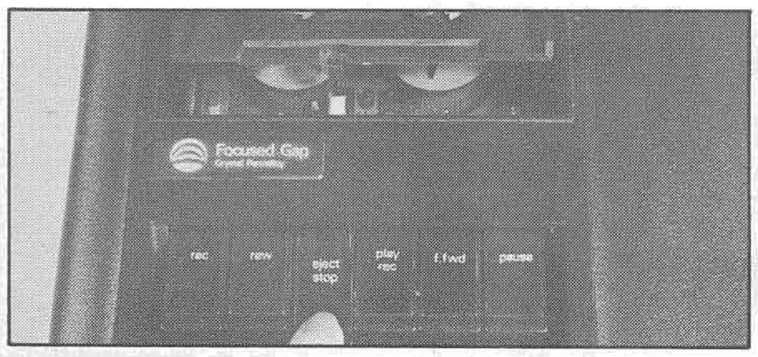
❿ Playback may be momentaily interrupted by pressing pause button. To resume playback, press again.



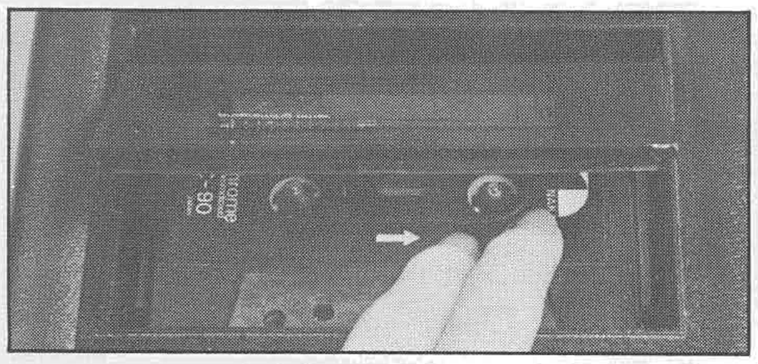
⓫ To stop tape push eject/stop button down. Further pressure on the button will eject cassette.

⓬ When end-of-tape is reached, tape transport automatically shuts itself off and is disengaged from cassette.

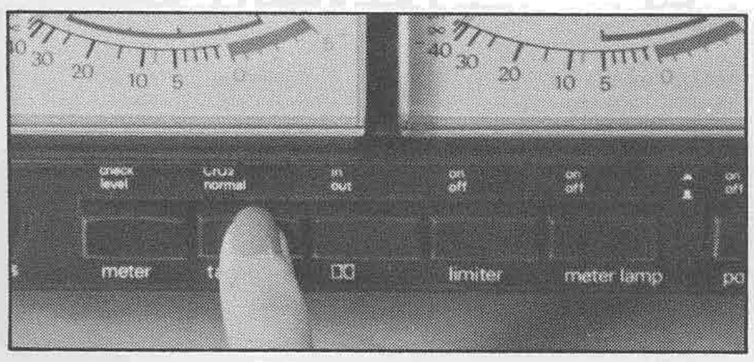
Recording Procedures



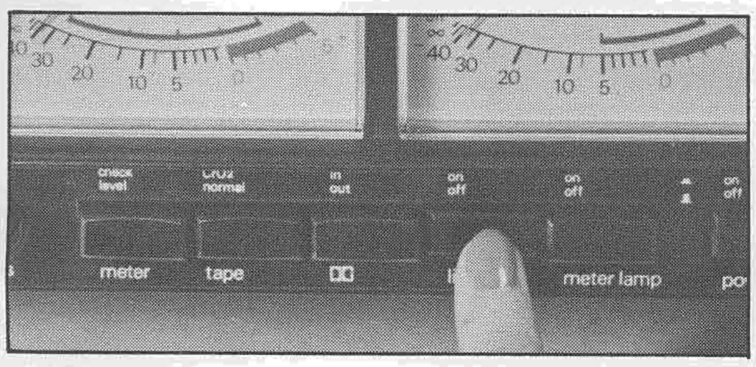
❶ Set power switch to "on" and push eject/stop button all the way down to open cassette compartment.



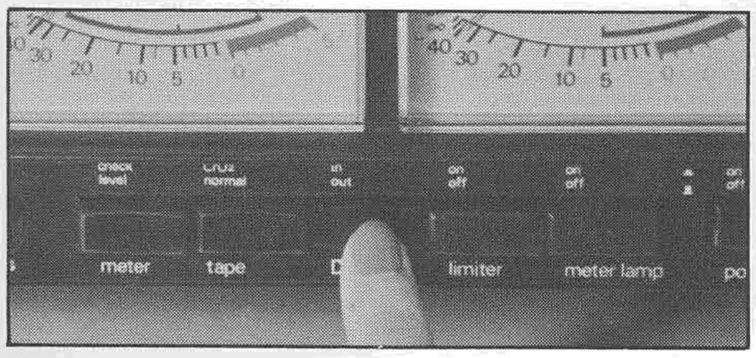
❷ Insert cassette with open end facing front and the full reel of tape on lefthand side. Close lid.



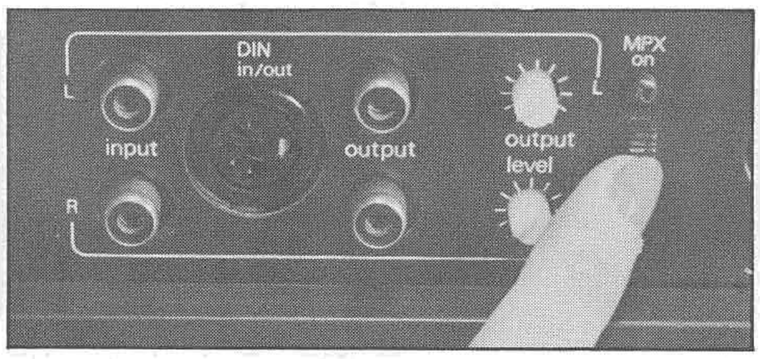
❸ Set tape selector switch for either CrO2 or normal.



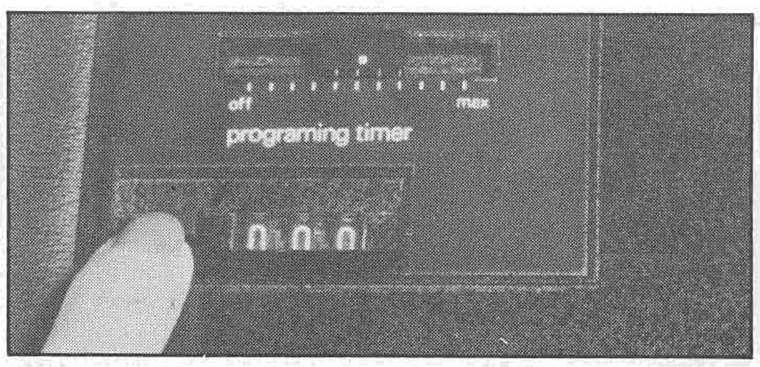
❹ To avoid tape overload during live recordings, set front panel limiter switch to "on".



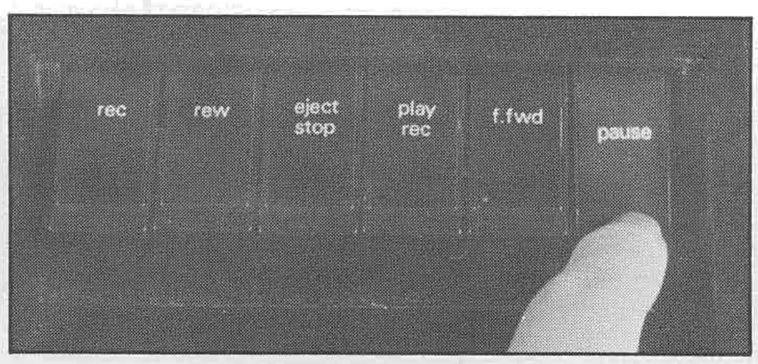
❺ Set Dolby switch to "in" to activate noise reduction circuitry. Refer to Dolby NR calibration procedures.



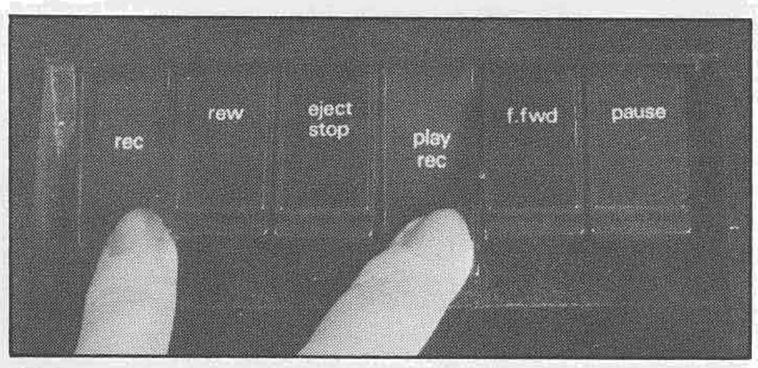
❻ When recording FM stereo broadcasts set rear panel MPX switch to "on".



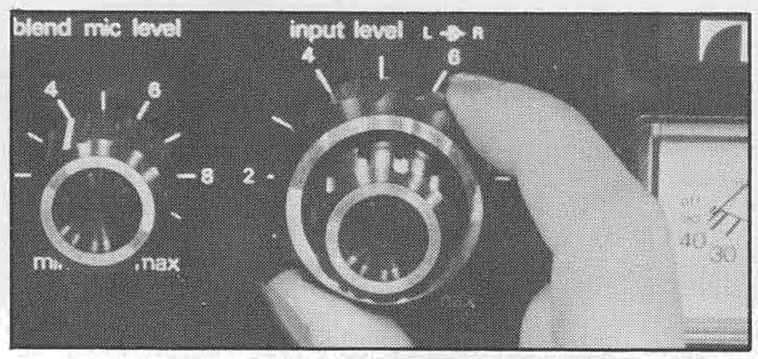
❼ Reset index counter to "000" by dēpressing reset button.



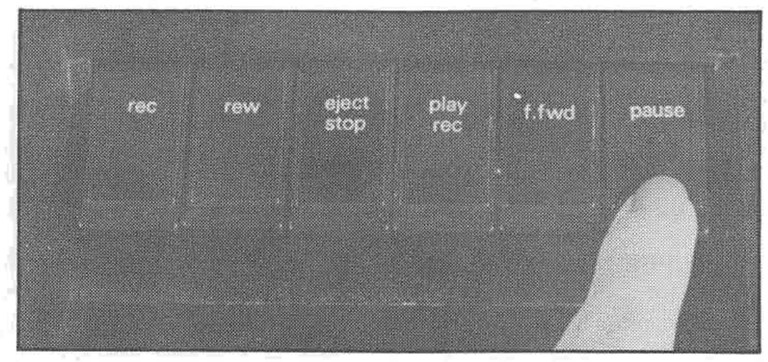
❽ Depress pause button.



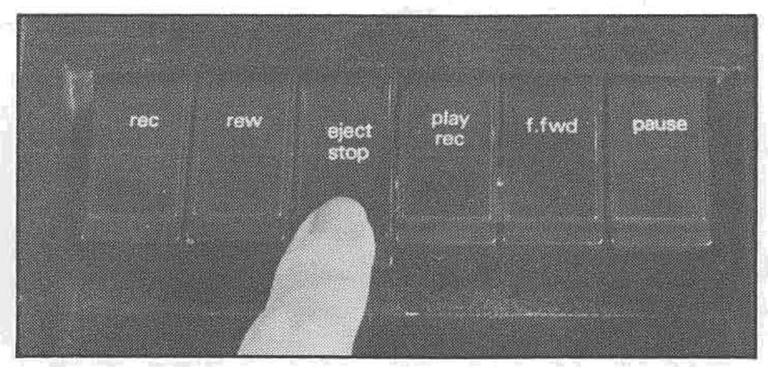
❾ Place in record mode by depressing both record and play buttons.



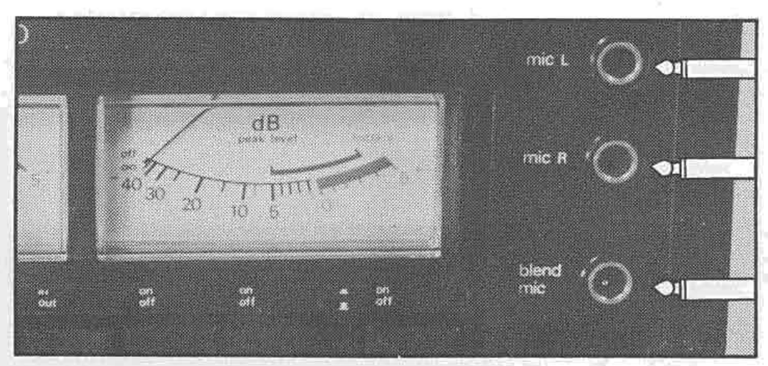
❿ Adjust input level controls to read 0 dB during loudest passages.



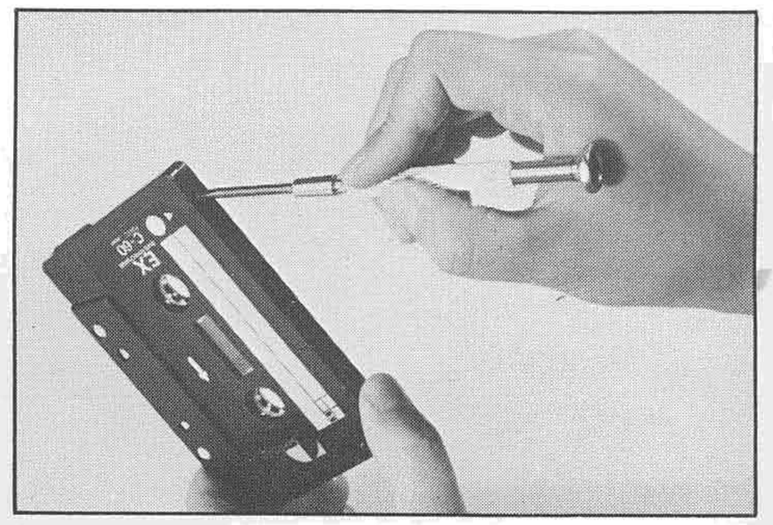
⓫ When levels have been set, press pause button to start recording.



⓬ At conclusion of recording depress stop button.

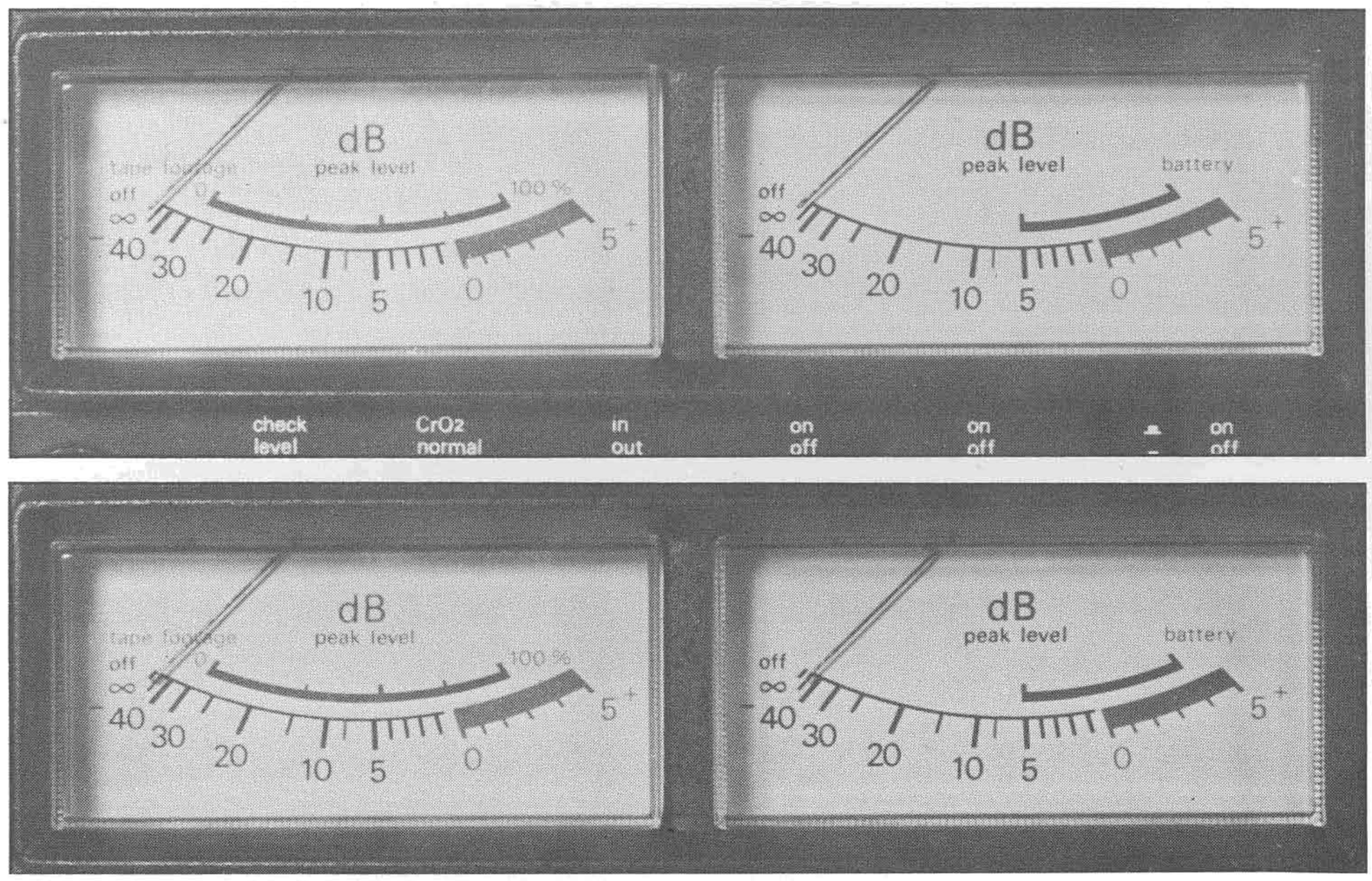


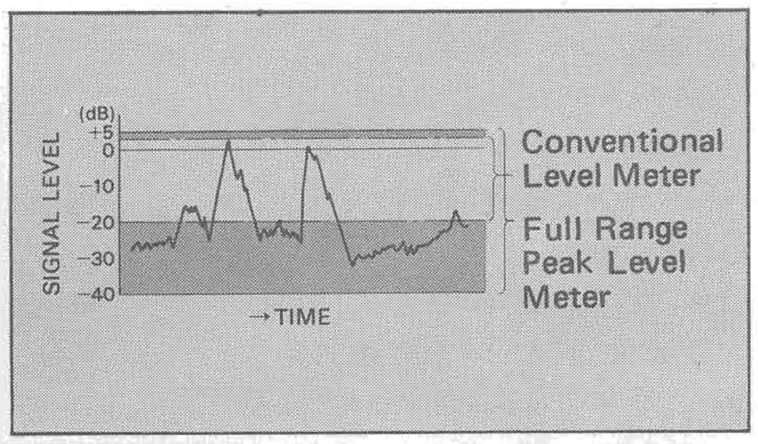
⓭ When mics are plugged in, line inputs are automatically disconnected. For the best possible signal to noise ratio the mic inputs are shorted in the absence of a microphone.



To preserve valuable recordings break off the tabs at the rear of the cassette housing, as illustrated. The lefthand tab affects side A (1) and the righthand tab side B (2). This procedure activates the recorders built-in record safety interlock and prevents accidental re-recording.

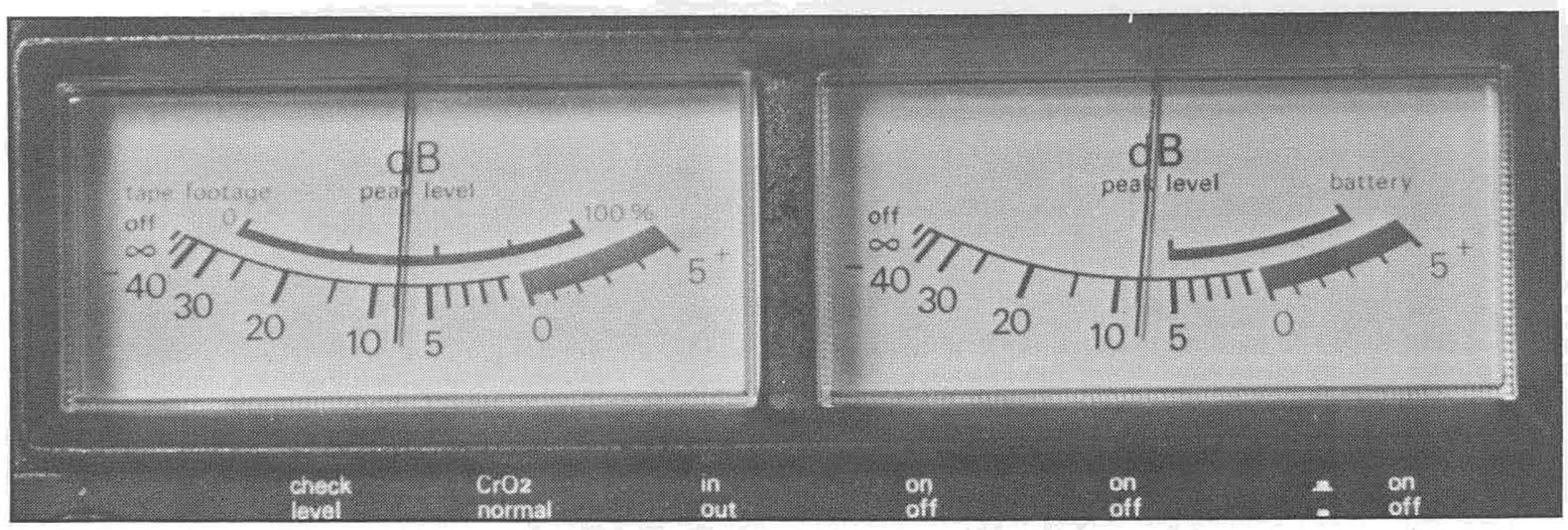
Peak Level dB Meter





A conventional VU meter which doesn't respond to signal levels below -20 dB cannot indicate the presence of a true pianissimo at -35 dB. However, the Nakamichi's Peak Level meter will not only accurately reflect these low level signals, but will also respond instantaneously to large amplitude signals.

The extraordinary dynamic range of the Nakamichi 550 Dual-Tracer permits the use of 45 dB (-40 dB to +5 dB) peak reading meters. These professional full-range meters (which are exclusive with Nakamichi) have a very fast attack time and a slow release time. Thus they more accurately reflect true signal conditions and are extremely helpful in preventing tape overload during live recording sessions. When the recorder is switched on, the meters advance from "off" to the position marked " ∞ ".



The -8 dB position on the meter is marked in red. This marking corresponds to 0 dB on a two track 15 ips open reel recorder and should be used as a reference point when making transfers from such a machine to the Nakamichi 550.
Since the tape saturation point of the open reel machine is higher than that of the cassette recorder, the lower level setting on the 550 will enable you to avoid the distortion which would result if you did not compensate for the different tape saturation levels.

In those instances where the signal level of the original is very low, the level control on the Nakamichi 550 may be advanced to improve the signal-to-noise ratio.

The Dolby Noise Reduction System

In addition to its exceptionally quiet electronics, the Nakamichi 550 Dual-Tracer incorporates the Dolby NR System (under license from Dolby Laboratories, Inc.). The Dolby System is a complementary noise reduction system. Unlike playback-only devices, which even in their most sophisticated form must alter the characteristics of the material, the Dolby System is used before and after the recording. The process selects the quietest signals during recording (under -5 dB), where noise might be heard and subtly increases their level automatically. Loud signals are not processed in any way. During playback, the low level components are reduced by an exactly complementary amount. Thus the original signal dynamics are re-established exactly, and at the same time most of the noise introduced during the recording process is eliminated.

In this way, an improvement of up to 10 dB in the signal-to-noise ratio may be realized. Recordings made with the Dolby System are unusually clean and transparent and emerge from a background of velvety silence. In fact, they compare favorably, in most respects, with recordings made on professional reel-to-reel machines. Commercially processed Dolby cassettes, as well as those made on other Dolby equipped machines can be reproduced on the Nakamichi 550.

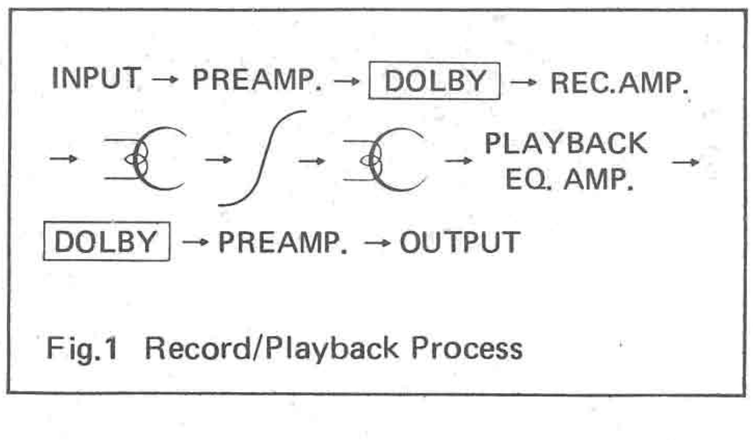


Fig.1 Record/Playback Process

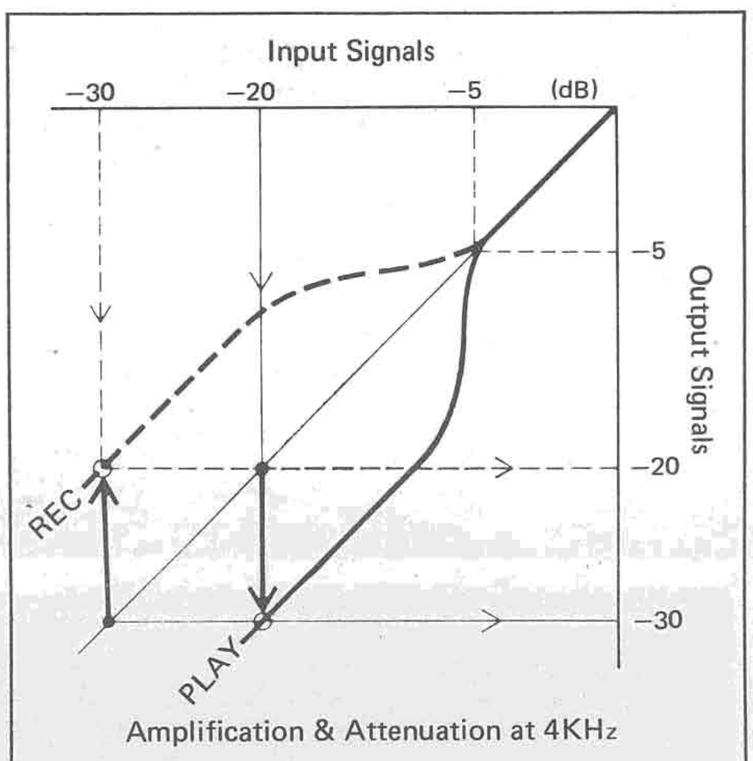
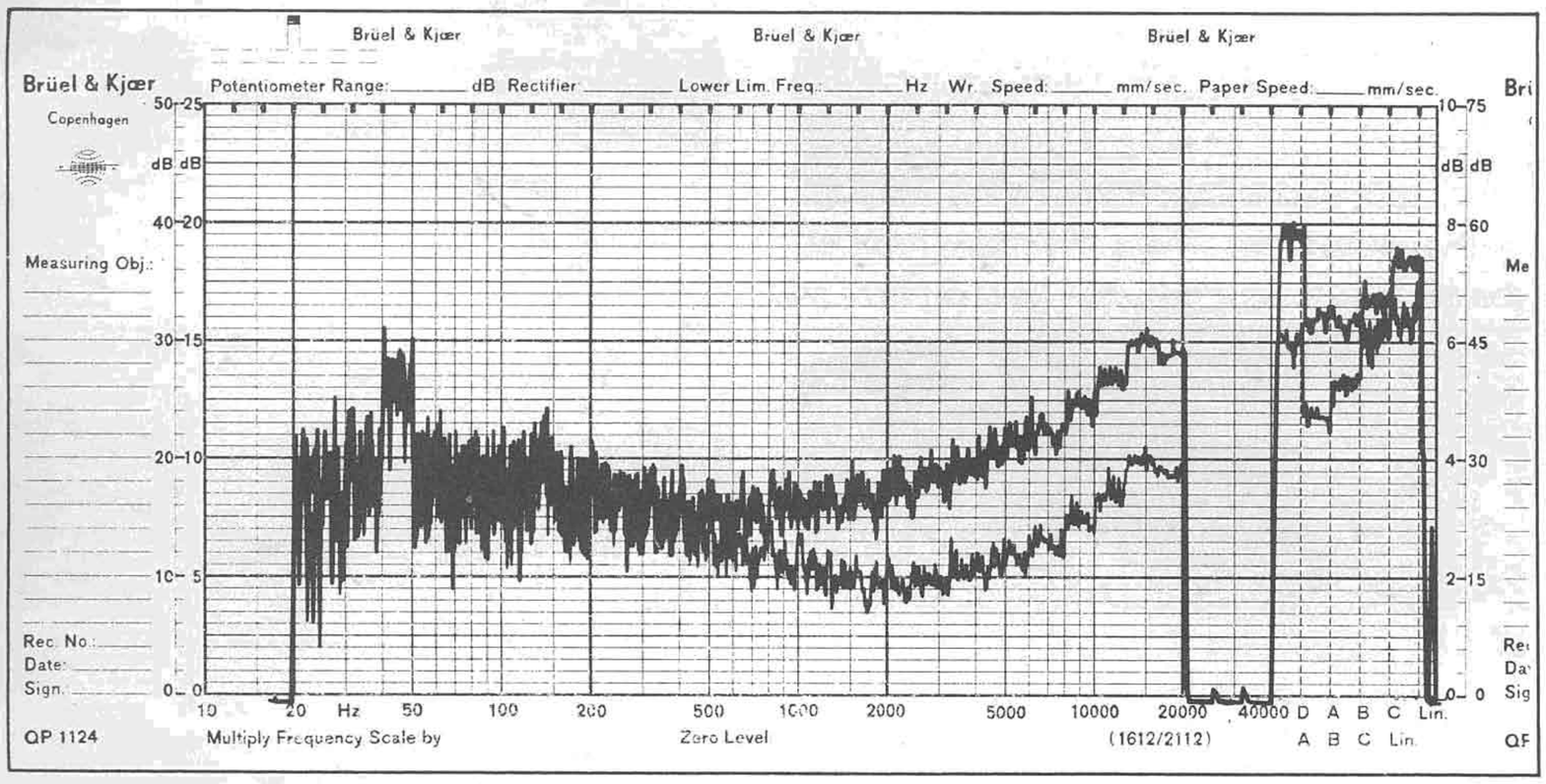
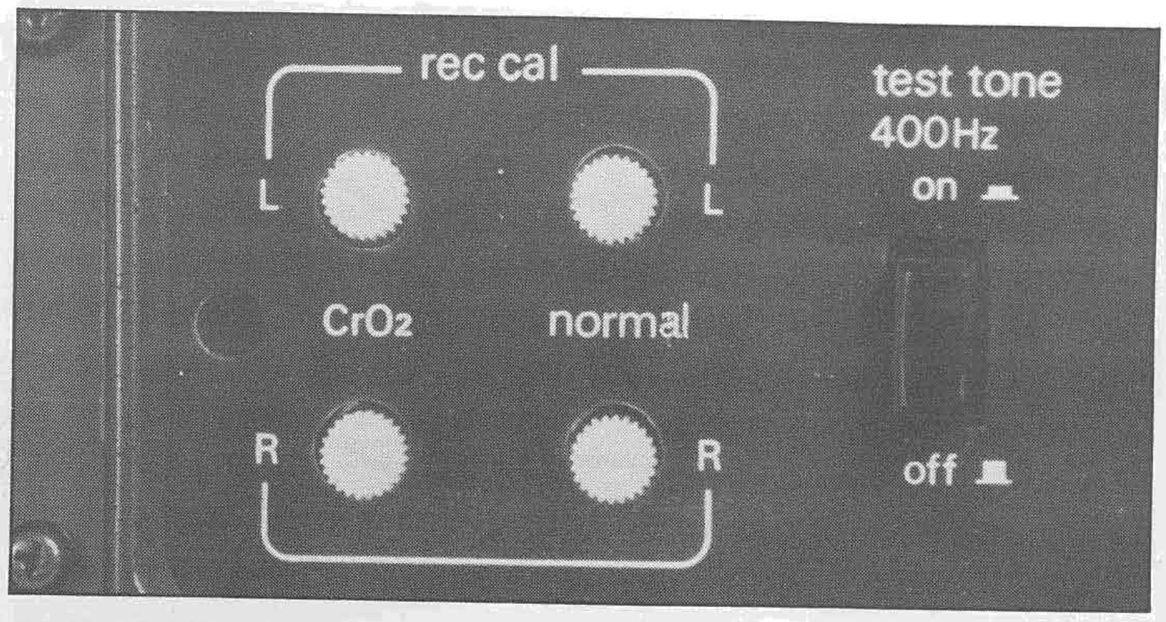


Fig.2 Working Principle of Dolby Circuit

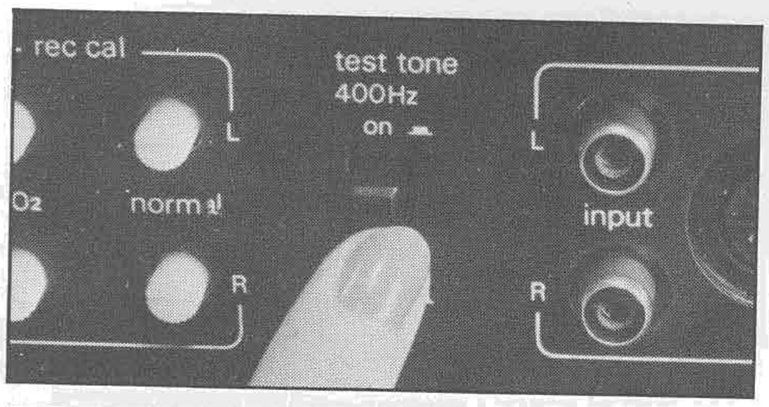


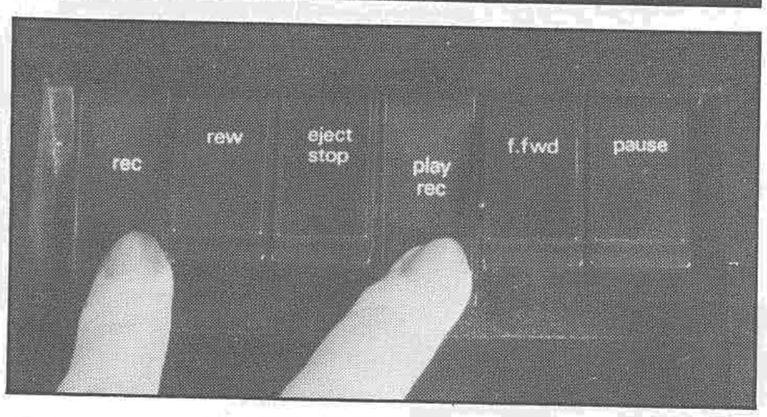
Dolby NR Level Calibration

The Dolby circuits of the Nakamichi 550 have been set at the factory to provide optimum performance with the recommended tapes. However, different tapes require different settings. Therefore, the 550 provides a simple means for re-adjusting these settings when necessary.

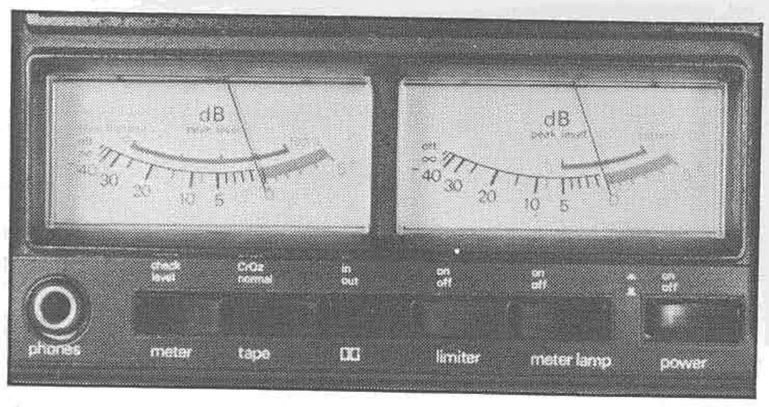


❶Set front panel Dolby switch to "in" and tape selector switch to appropriate position.

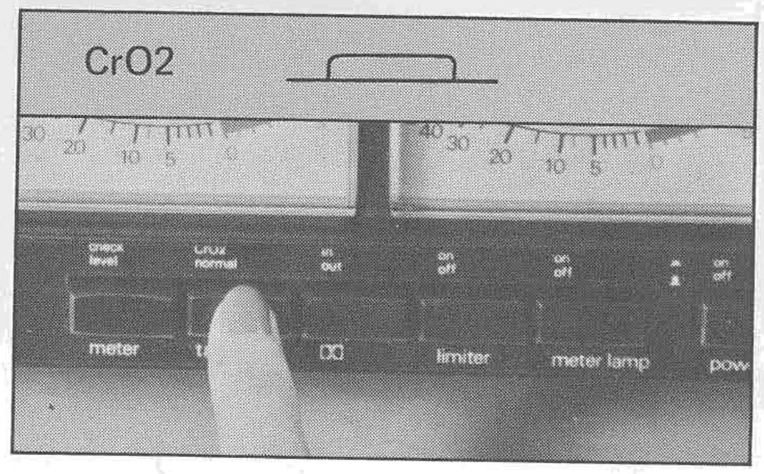


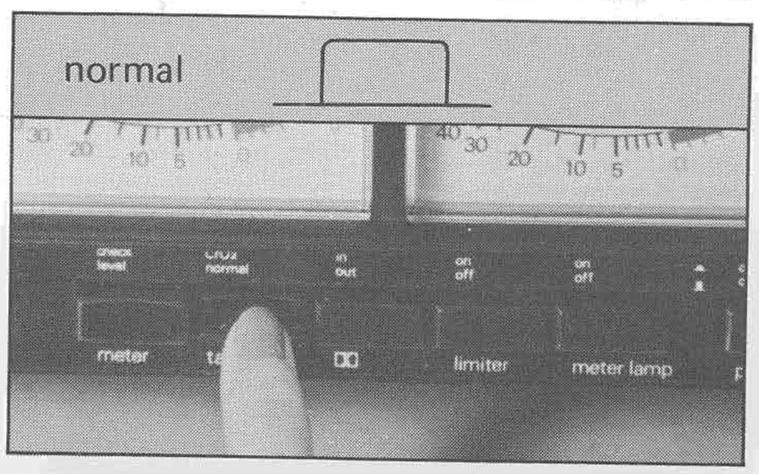


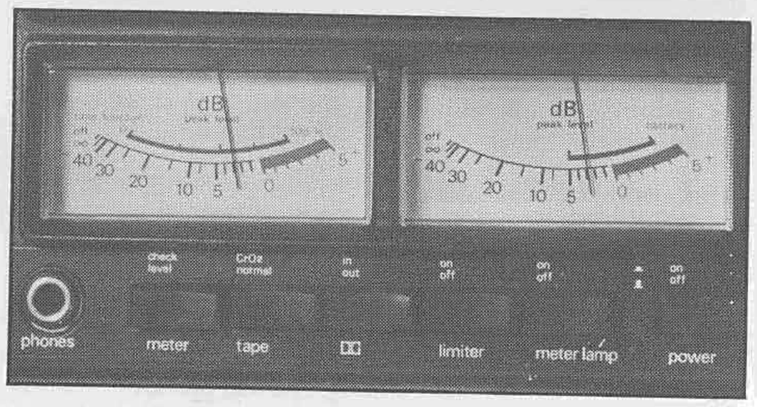
❷ Insert cassette in cassette compartment, lower lid and press Pause button. Depress 400 Hz Dolby test tone button on rear panel of recorder. RESET index counter to "000". Place machine in record mode.

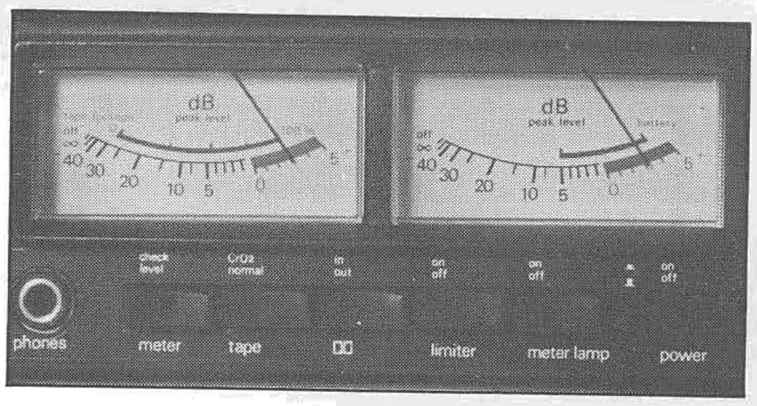


❸ Record test tone for 15 seconds. Stop machine and rewind. Playback recorded test tone and note meter reading. If it varies from 0 dB, the rear panel calibration controls should be adjusted as follows.

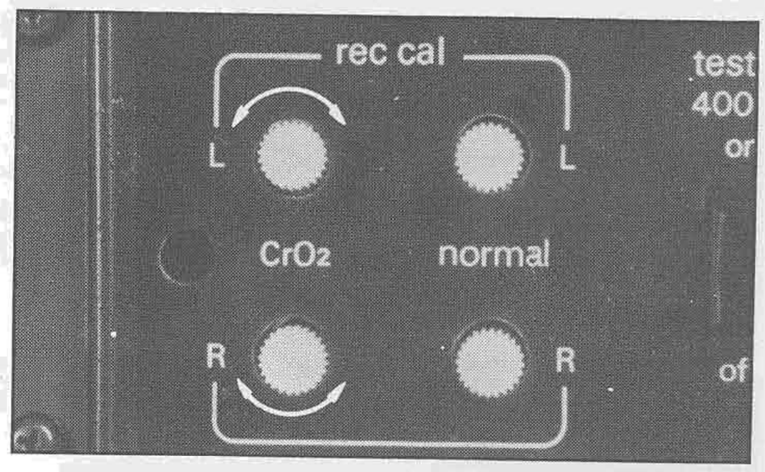


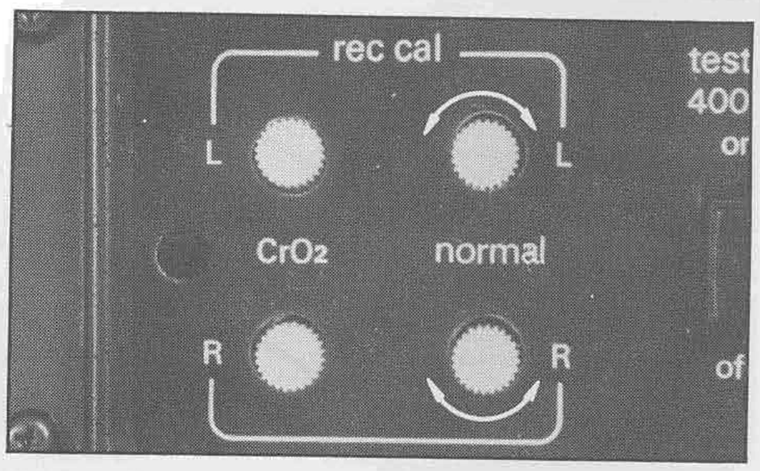


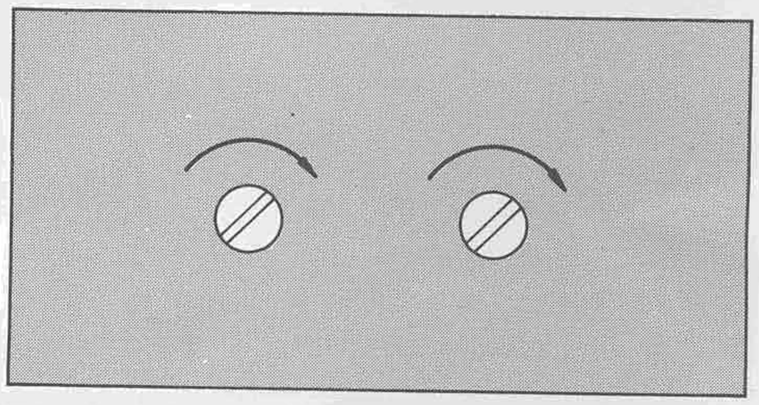


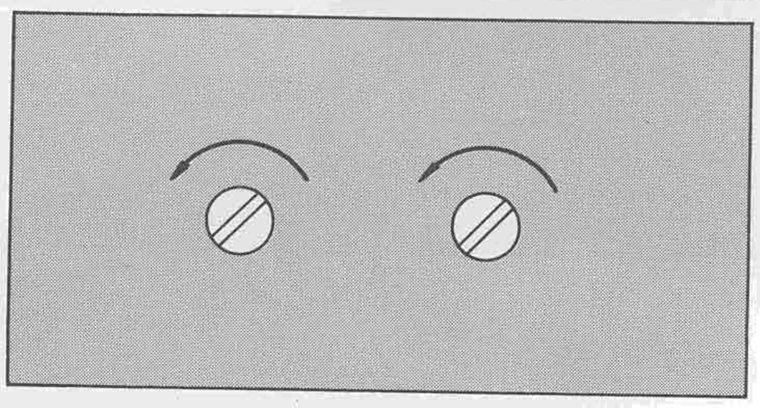


❹ If level is below 0 dB, rotate appropriate calibration control clockwise. If meter reads high, rotate control counter clockwise.



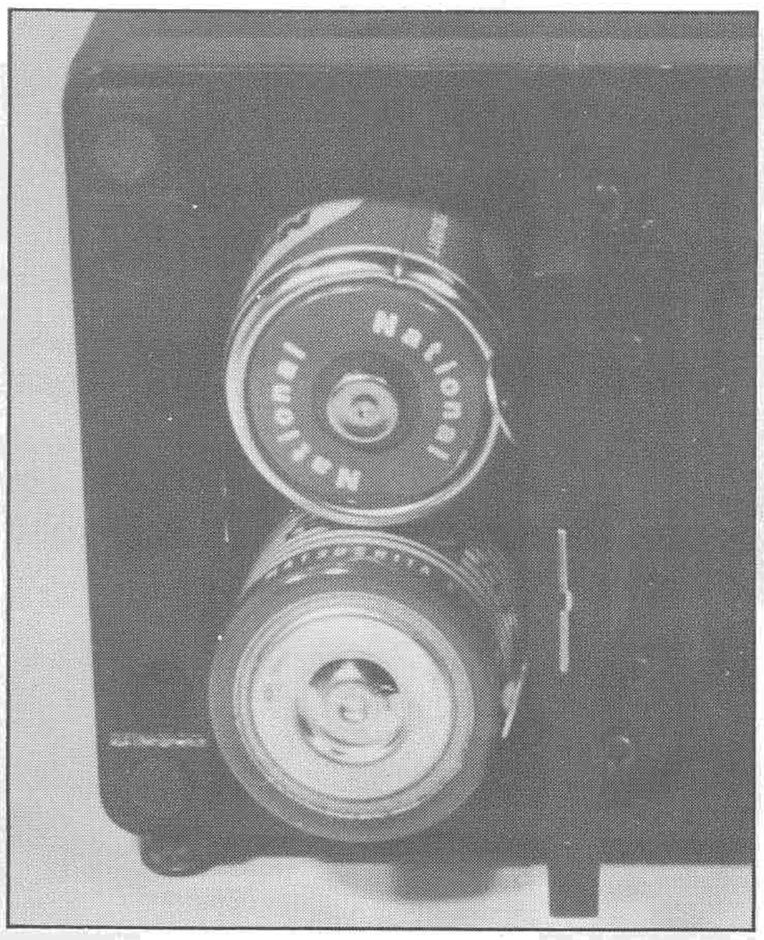


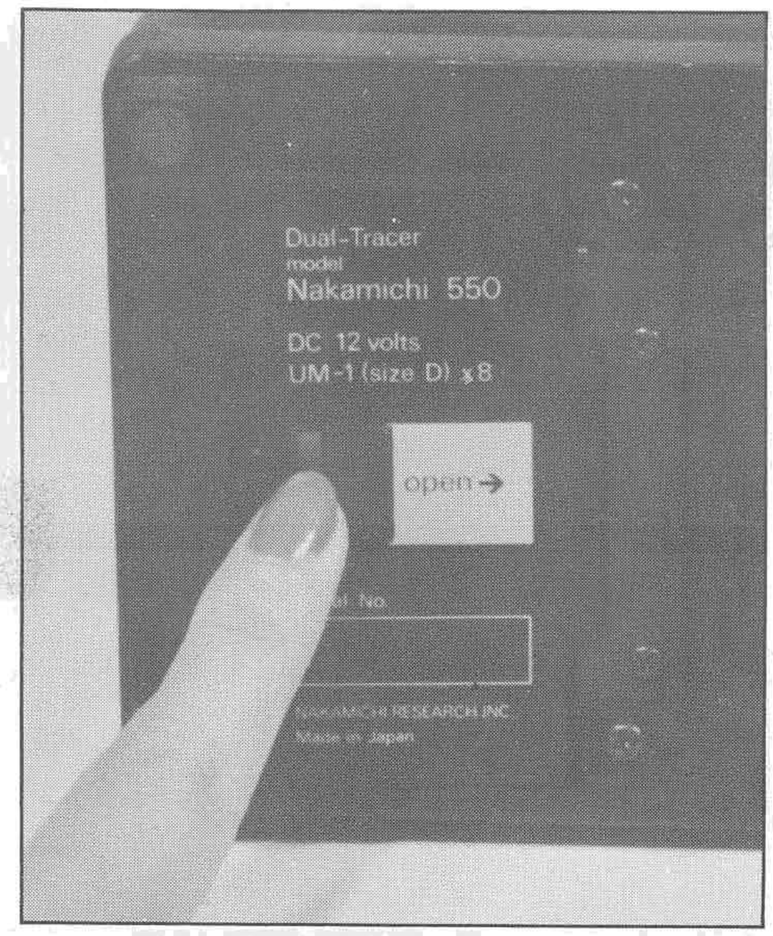




❺Repeat procedure for each channel until both meters read 0dB. Do not forget to turn off 400 Hz test tone.

Power Sources





Battery Compartment

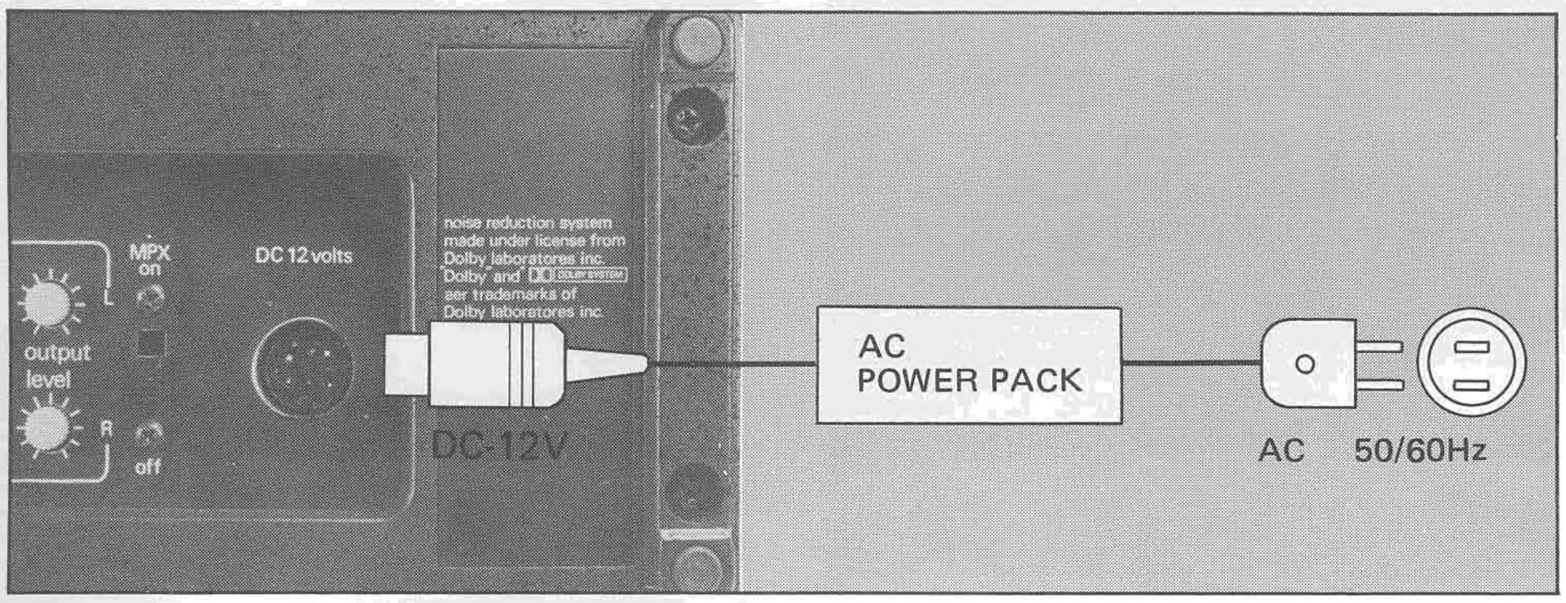
Open battery compartment on recorder's rear panel. Inside the compartment is a diagram. Please observe indicated polarity before carefully inserting the eight "D" cell batteries called for. Normal flashlight or alkaline batteries may be used.

Battery Life

Up to 15 hours of continuous use is possible with a fresh set of batteries. Intermittent use will provide correspondingly longer life.
If recorder is not used for a long time or is used primarily on AC current, it is advisable to remove batteries to avoid possible leakage.

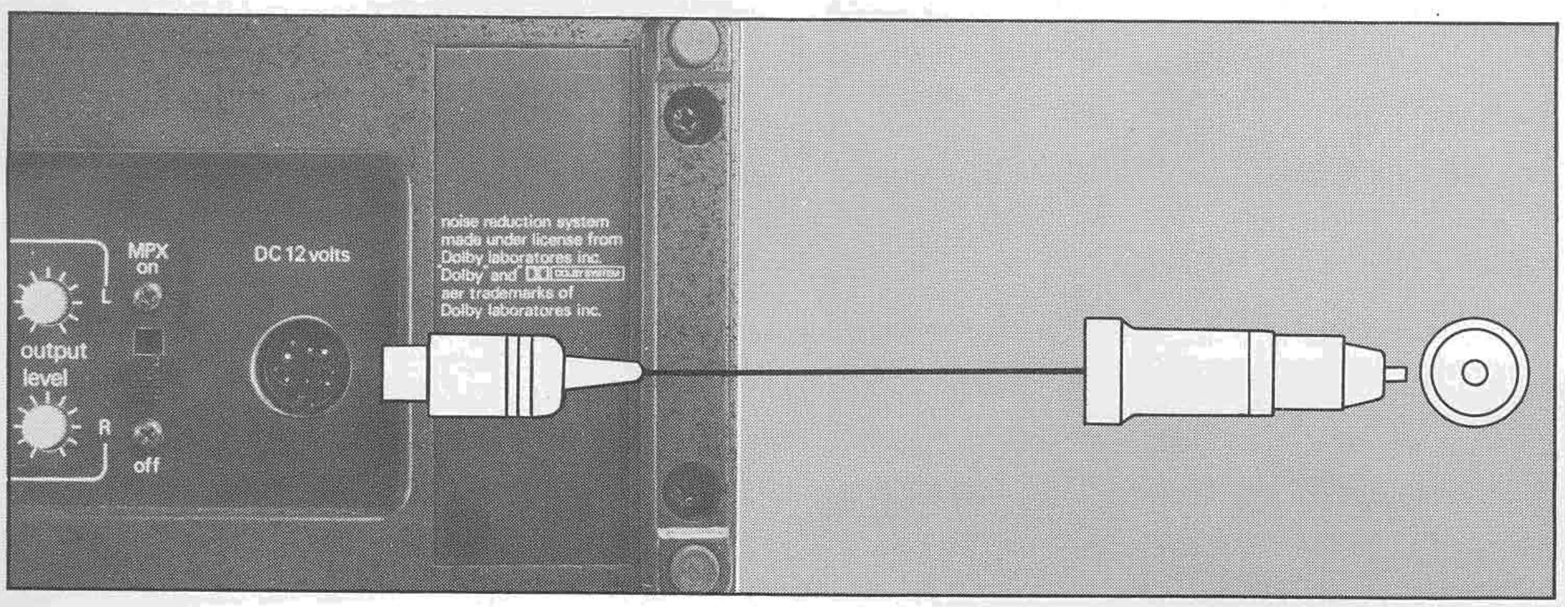
AC Operation

The Nakamichi 550 comes equipped with an external AC power supply. If you wish to run the recorder off AC, plug end of adaptor with four prong plug into rear panel socket marked DC 12V and the other end into any convenient AC outlet.



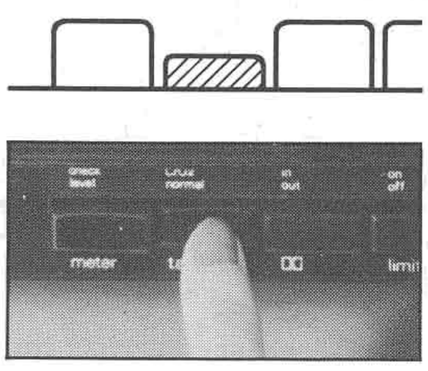
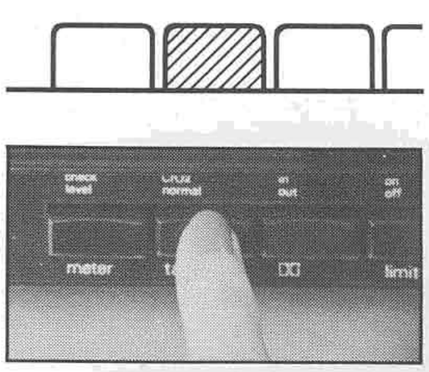
Car or Boat Battery Operation

A separate adaptor permitting operation from 12V car or boat batteries is also provided. To use, plug four prong plug into rear panel DC 12V socket and the other end into cigarette lighter socket of car or boat.



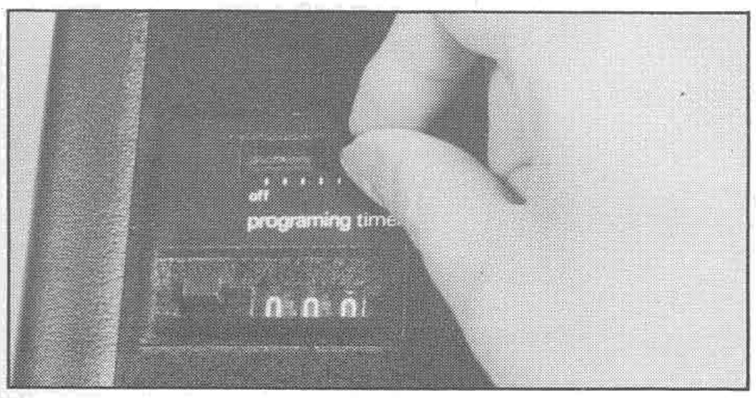
Recommended Cassette Tapes and Tape Selector Switch

The tape seclector switch of the Nakamichi 550 Dual-Tracer has been specially designed to change both bias and equalization at the same time. It can be set for either "Normal" (high-density, low noise) or "CrO2" tapes.
To realize the full potential of your 550 Dual-Tracer, we recommend that you use the following cassette tapes.

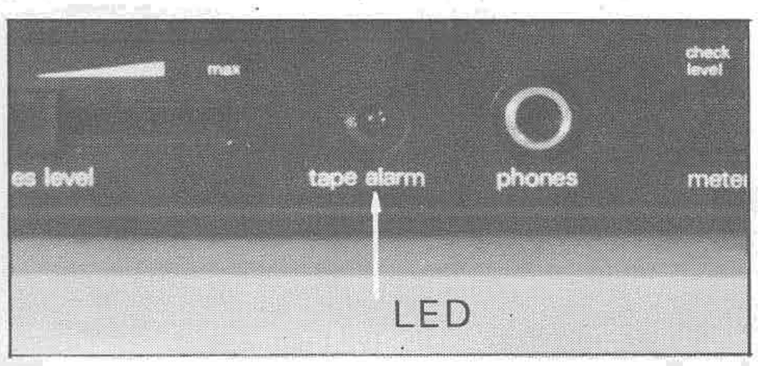
Position of Tape Selector Switch	Brand	Type or Model	
CrO2 	Nakamichi TDK SONY	Chrome KR CRO	C-60, C-90 C-60, C-90 C-60, C-90
Normal 	Nakamichi Maxell	EX UD	C-60, C-90 C-46, C-60, C-90

Special Operating Features
Additional Recording Techniques

Programing Timer

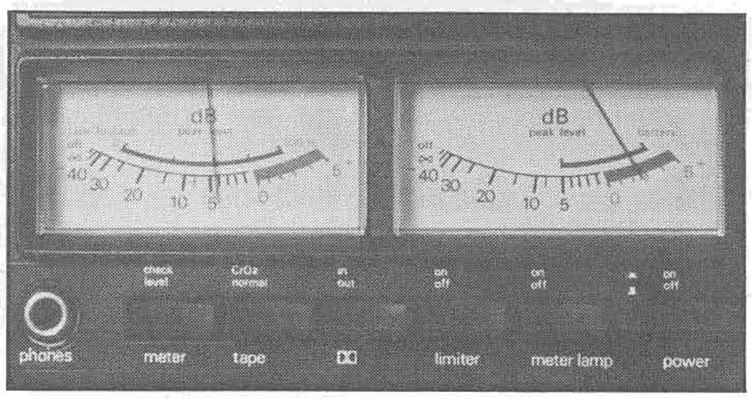


❶ This unique feature permits you to program recorder operation for a predetermined time period.



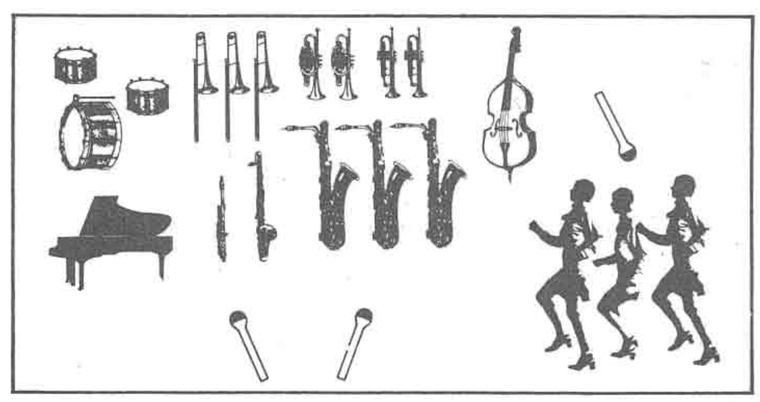
❷ For example, if slider control is moved to mid-point setting, the recorder will operate for 15 minutes with a C60 cassette (22.5 minutes with a C90), before the front panel tape alarm (LED) signals the elapsed time.

Tape Footage and Battery Indicators

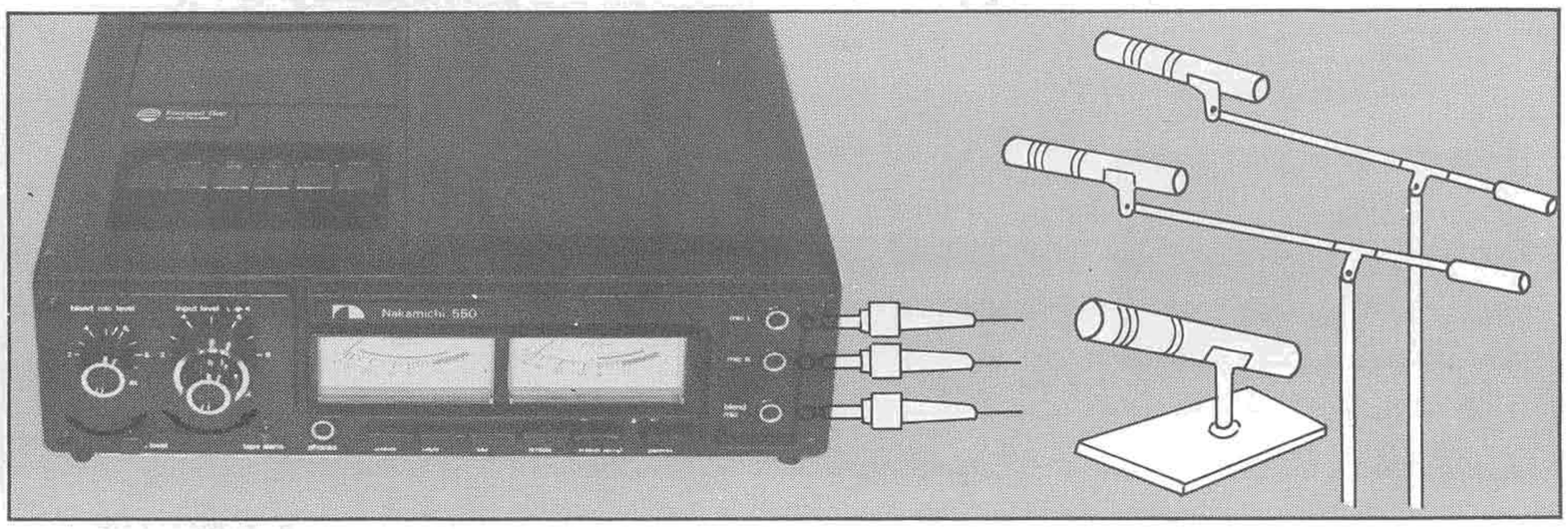


When the front panel meter switch is depressed, the right channel meter indicates battery condition, while the left channel meter shows the amount of tape (percentage) remaining.

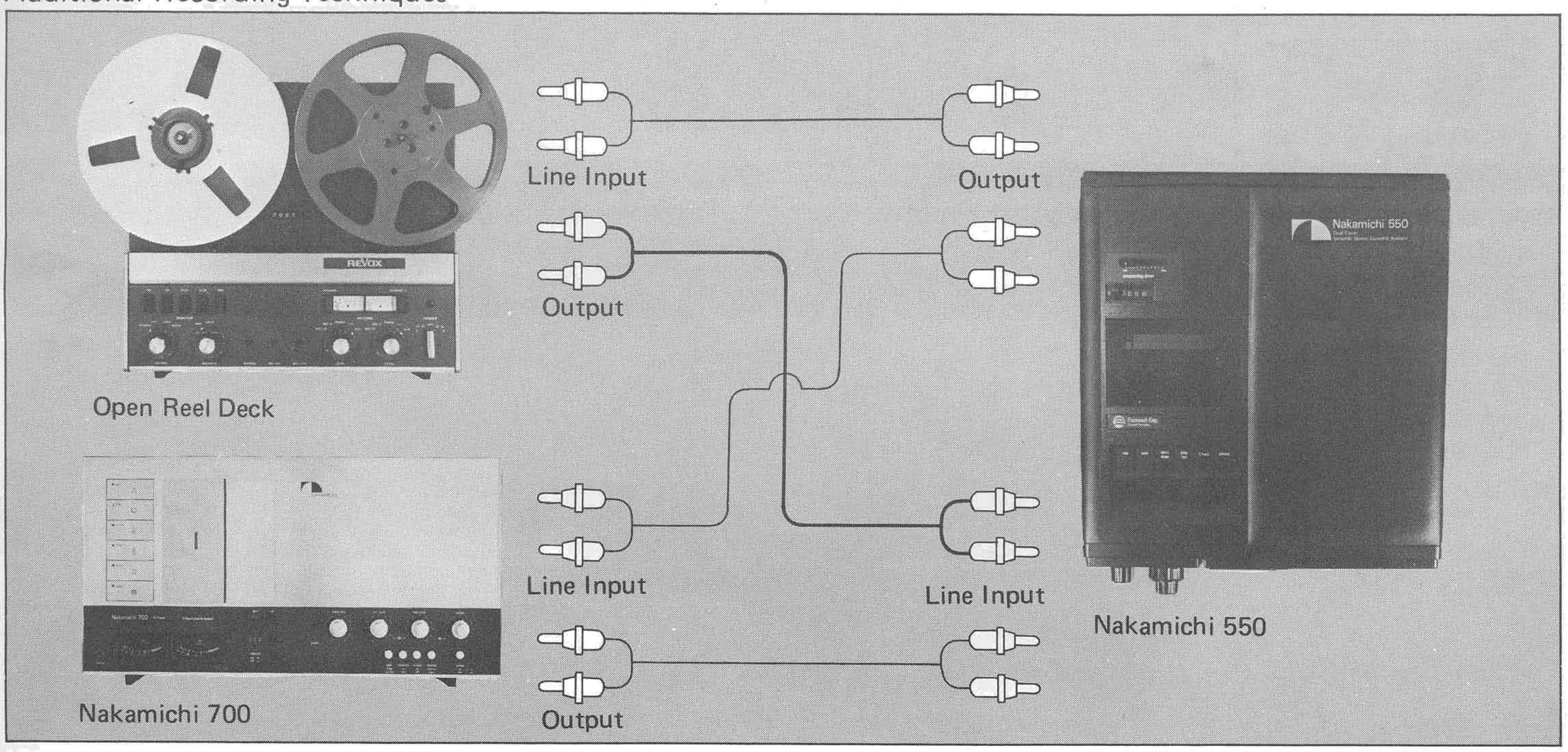
Three Point Mic Input



In addition to the standard (L&R) mic inputs, a third blend mic input is available. Each input has its own level control, thus permitting professional quality mixing. The blend mic is particularly useful for highlighting solo instruments and voices.



Additional Recording Techniques



Direct Copying from Tape to Tape

The exceptional performance capabilities of the Nakamichi 550 Dual-Tracer make it possible to achieve nearly perfect transfers from reel-to-reel and high quality cassette decks such as our own 700 and 1000 Tri-Tracers. Please refer to Peak Level Meter section for more information.

Trouble Shooting Chart

Symptom	Probable Cause	Remedy
Tape transport inoperative (1)	Battery Operation	
	❶ No power	❶ Check power switch
	❷ No batteries	❷ Install batteries
	❸ Polarity reversed	❸ Check battery diagram, install properly.
	❹ Batteries run down	❹ Check battery condition with built-in meter. Replace if necessary.
	AC Operation	
	❶ No power	❶ Check power switch. Check connections to and from adaptor.
	Car Battery Operation	
	❶ No power	❶ See above
	❷ Polarity reversed	❷ Check polarity. Adaptor is set for negative ground. See instructions printed on adaptor.
	❸ Adaptor fuse blown	❸ See instructions on adaptor.
Tape transport inoperative (2)	❶ Tape loose inside cassette.	❶ Remove and rewind by hand.
	❷ Lid not securely closed	❷ Eject cassette and reinsert carefully.
Record button will not depress.	❶ Cassette not loaded	❶ Insert cassette
	❷ Cassette tab bent or broken	❷ Replace cassette or cover tab hole with masking tape.
Excessive noise in playback	❶ Head magnetized	❶ Demagnetize head and tape path.
Excessive wow and flutter	❶ Defective cassette	❶ Replace cassette
	❷ Head, capstan or pinch roller dirty	❷ Clean tape path including head, capstan, pinch roller and tape guides.
	❸ Cassette lid defective	❸ Replace (see warranty and repair instructions).
Incomplete erasure of previous recording	❶ Dirty erase head	❶ Clean erase head and pinch roller.
Distortion in record and playback	❶ Distorted input signal	❶ Check source
	❷ Record level too high.	❷ Reduce input level
	❸ Incorrect bias and equalization setting	❸ Check position of tape selector switch.
Won't record	❶ Wrong connection	❶ Check connections
	❷ Dirty record head	❷ Clean head
Won't playback	❶ Wrong connection	❶ Check connection
	❷ Head dirty	❷ Clean thoroughly

Trouble Shooting Chart

Symptom	Probable Cause	Remedy
Tape transport inoperative (1)	Battery Operation	
	❶ No power	❶ Check power switch
	❷ No batteries	❷ Install batteries
	❸ Polarity reversed	❸ Check battery diagram, install properly.
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	AC Operation	
	❶ No power	❶ Check power switch. Check connections to and from adaptor.
	Car Battery Operation	
	❶ No power	❶ See above
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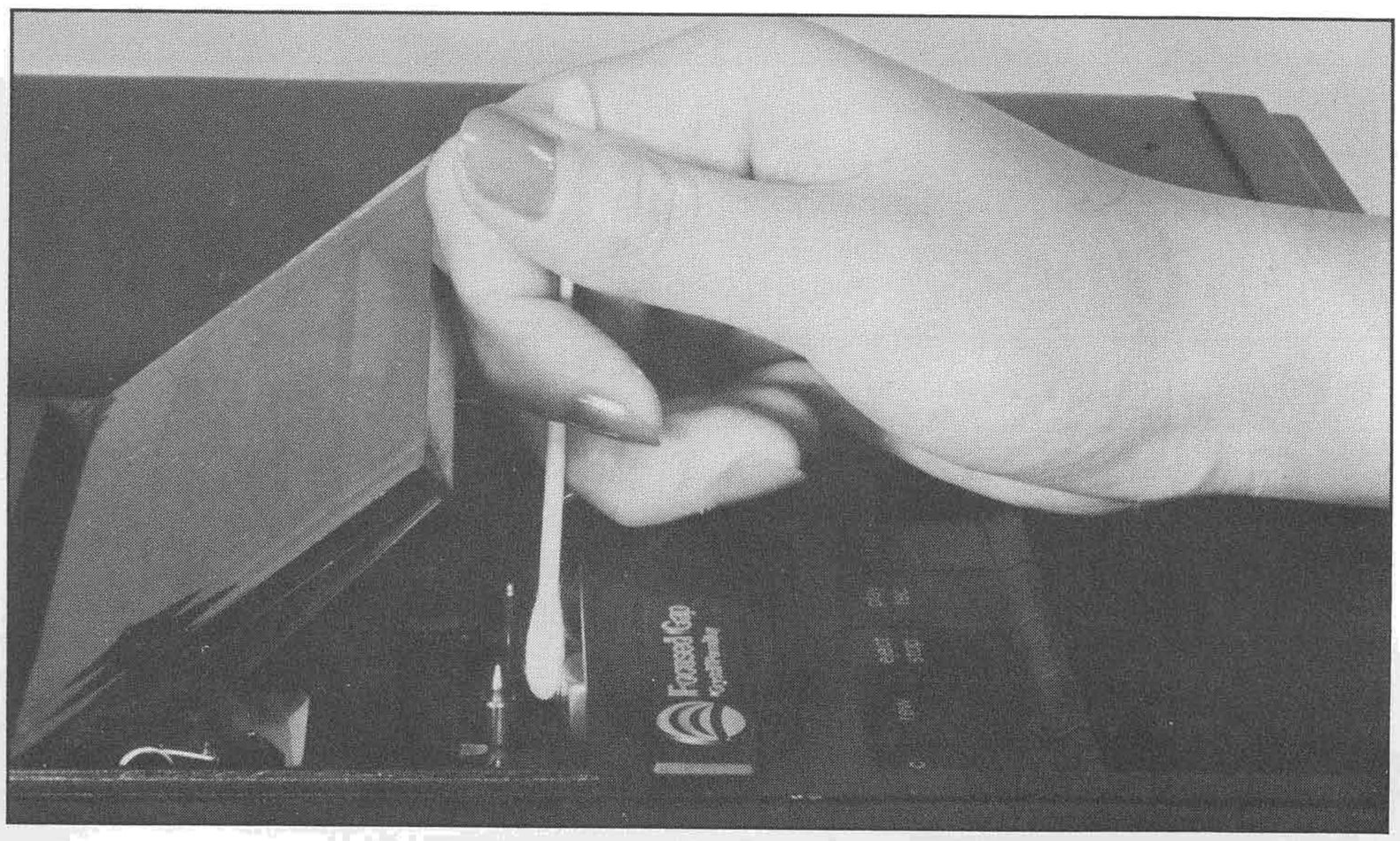
	❷ Record level too high.	❷ Reduce input level
	❸ Incorrect bias and equalization setting	❸ Check position of tape selector switch.
Won't record	❶ Wrong connection	❶ Check connections
	❷ Dirty record head	❷ Clean head
Won't playback	❶ Wrong connection	❶ Check connection
	❷ Head dirty	❷ Clean thoroughly

Symptom	Probable Cause	Remedy
Won't record high frequencies	❶ Head magnetized	❶ Demagnetize
	❷ Head dirty	❷ Clean head
	❸ Tape selector switch improperly set.	❸ Check and correct
	❹ Non-Dolby tape played with Dolby "in"	❹ Switch Dolby out
	❺ Normal tape recorded in CrO2 position	❺ Set tape selector switch to normal
Loud hum in record and playback	❶ Hum induced by adjacent equipment	❶ Move recorder away from hum field
Batteries run down too quickly	❶ Meter lights have been left on	❶ Set meter switch to off; use only when necessary
	❷ Power switch left on	❷ Switch off when not in use
	❸ Old batteries or poor quality	❸ Use good quality, fresh batteries
Oscillating noise during recording	❶ Test tone switch left on.	❶ Defeat test tone

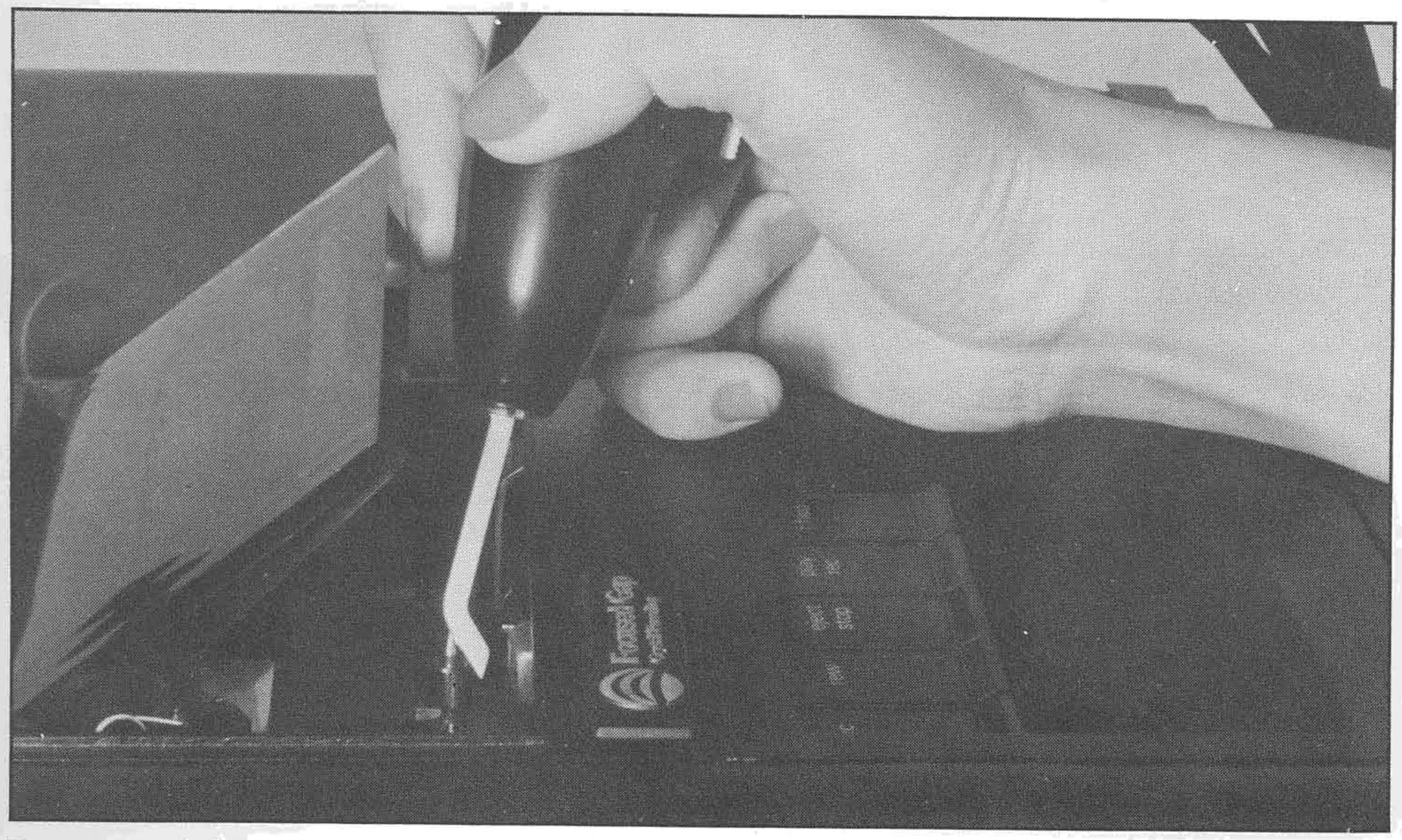
Maintenance



Head Cleaning

To maintain optimum performance, it is vital that the tape path and especially the heads be kept scrupulously clean.
The heads should be cleaned periodically along with the pinch roller and capstan shaft. A special cleaning kit is provided for that purpose.

Simple preventive maintenance will help avoid all of the problems associated with dirty heads, such as reduced high frequency response, drop outs, increased wow and flutter and generally degraded performance.
Note: Do not clean or touch head surfaces with hard or metallic objects.



Demagnetizing

It is normal for tape heads to become slightly magnetized after prolonged use. Therefore, it is recommended that the heads, as well as the other metal parts in the tape path, be demagnetized at least once every 50 hours of use. To avoid scratching heads, it is advisable to cover the probe of the demagnetizer with plastic tape.

Lubrication

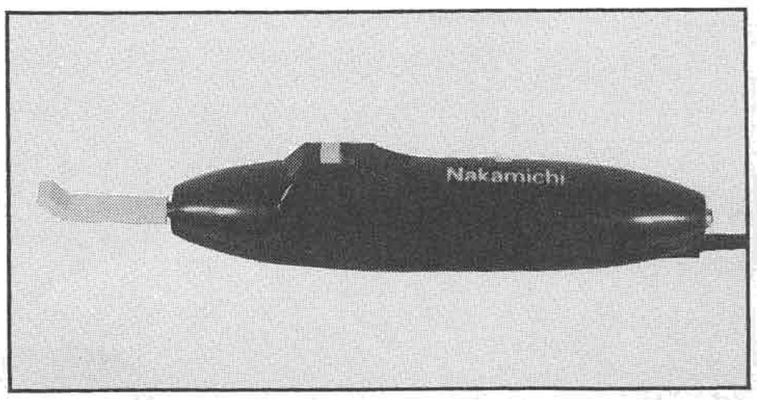
The bearings of the Nakamichi 550 are self lubricating and do not require any additional lubrication.

Specifications

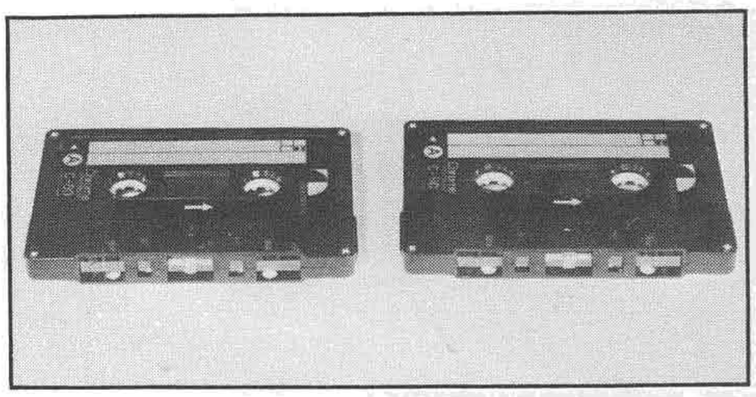
Power Supply		DC 12V (D Size Dry Battery x 8, Car Battery, AC with AC pack)
Tape Speed		1-7/8 ips ± 1.5%
Wow Flutter		0.13% WTD Peak
Frequency Response		40-17,000Hz ± 3 dB (High Density Low Noise tape) 40-16,000Hz ± 3 dB (CrO2 tape)
Signal to Noise Ratio		Better than 60 dB (Dolby In Wrms CCITT 400 Hz 3% Distortion)
Total Harmonic Distortion		Less than 2% (1 KHz 0 dB)
Erasure		Better than 60 dB (1 KHz 0 dB)
Channel Separation		Better than 35 dB (1 KHz 0 dB)
Cross Talk		Better than 60 dB (1 KHz 0 dB)
Bias Frequency		105 KHz
Input	Mic	0.2 mV 600 ohm (-72 dBm)
	Line	70 mV 150 K ohm
Output	Line	580 mV
	Headphone	100 mW (1 KHz 0 dB)
Battery Life		15 Hrs (Continuous use)
Size		12-1/4" (W) x 3-1/2 (H) x 13-3/4 (D) 311 m/m (W) x 89 m/m (H) x 350 m/m (D)
Weight		11-1/4 lbs (5.1 Kg) (Without Batteries)

- Specifications and appearance designs are subject to change for further improvement without notice.
- Dolby NR under license from Dolby Laboratories Inc.

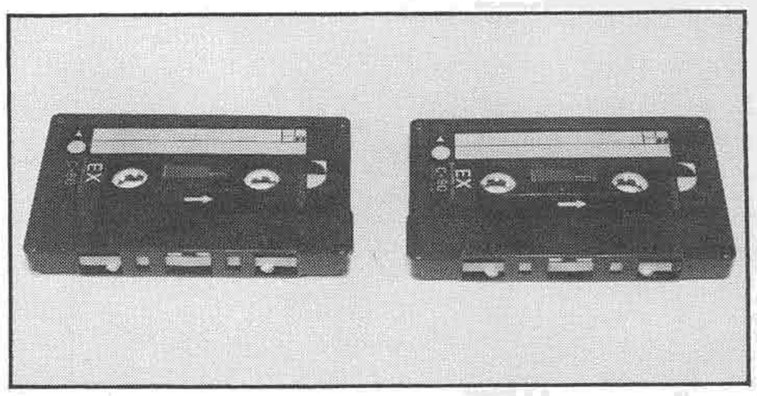
Optional Accessories



Head Demagnetizer



CrO2 Cassette Tape C-60, C-90



EX Cassette Tape C-60, C-90

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