

D-85s

Stereo cassette tape deck

Operating guide

BEFORE USING

To obtain the best performance and ensure years of trouble-free use, please read this operating guide carefully.

KEY TO ILLUSTRATIONS

- | | |
|---|--------------------------------|
| ① PAUSE INDICATOR | ⑮ RECORD BUTTON |
| ② METAL TAPE POSITION INDICATOR | ⑯ STOP BUTTON |
| ③ TAPE COUNTER | ⑰ FAST FORWARD BUTTON |
| ④ DOLBY NR INDICATOR | ⑱ PLAYBACK BUTTON |
| ⑤ AUTO/MEMORY REWIND SWITCH | ⑲ REWIND BUTTON |
| ⑥ TIMER SWITCH | ⑳ POWER (MAINS) SWITCH |
| ⑦ DIGITAL PEAK METER | ㉑ PLAY INDICATOR |
| ⑧ RECORDING LEVEL CONTROL | ㉒ RECORDING INDICATOR |
| ⑨ HEADPHONE SOCKET | ㉓ RECORD/PLAYBACK (DIN) SOCKET |
| ⑩ MICROPHONE SOCKETS
(Left/mono and Right) | ㉔ LINE IN SOCKETS |
| ⑪ INPUT SELECT SWITCH | ㉕ LINE OUT SOCKET |
| ⑫ OUTPUT LEVEL CONTROL | ㉖ REMOTE CONTROL SOCKET |
| ⑬ DOLBY NR SWITCH | ㉗ VOLTAGE SELECTOR |
| ⑭ TAPE SELECT SWITCHES | ㉘ CONNECTIONS |
| ⑮ EJECT BUTTON | ㉙ CASSETTE MAINTENANCE |
| ⑯ REC. MUTE BUTTON | ㉚ CLEANING |
| ⑰ PAUSE BUTTON | |

* Noise reduction system manufactured under license from Dolby Laboratories.
"Dolby" and the double-D symbol are trademarks of Dolby Laboratories.

PRECAUTIONS

- This unit is designed so that other units can be stacked on it, but do not stack extremely heavy objects on it.
- Never use any strong detergent or solvent for cleaning the cabinet of this unit, because it could lead to damage of the surface finish.
- Protect the unit against excessive heat (e.g. direct sunshine), dust, shock hazards and moisture.
- Be sure not to open the cabinet.
- Be careful not to damage the power (mains) lead. Be sure to take hold of the plug when pulling it out; do not pull the lead.
- Disconnect the AC power (mains) lead plug from AC outlet when the unit is not to be used for a long period of time or you are away from home.
- Do not stack in such a way that there is danger of blocking the ventilation holes. (Allow space near the ventilation holes if possible.)

IMPORTANT NOTICE

When using with other components, any component which can produce induction noise which can induce hum should be as far as possible from this deck. Bias leakage from this deck during recording may cause beats during reception of AM broadcasts, so be careful in placement of this deck and with respect to the tuner; when beats occur, move them away from each other if possible. There is no problem in FM reception.

FEATURES

- **Smooth Operation by means of the computer IC logic control**
Light feather-touch operation has been made possible by use of the logic control with 2 motors, 2 solenoids and computer IC.
It is possible to change directly from the PLAY mode to the Fast Forward or Rewind mode, and vice versa without damaging the tape.
- **REC/PLAY head suitable for Metal Tape**
The R/P head is a newly developed Sen-dust Alloy head which generates a sufficient strong magnetic field to be used with high retentivity Metal Tape. A special double-gap high density ferrite erase head is employed to completely erase the signal from the tape necessary because of its high retentivity, so that the excellent high frequency characteristics of Metal Tape can be displayed to their fullest. The extension of the frequency response and high frequency dynamic range, the decrease of distortion at high input levels, and sharp improvement of the S/N ratio at high frequencies are advantages of Metal Tape.
- **Computer memory rewind/Auto-rewind function**
Repeating playback from the desired position is possible by means of the function of the computer IC.
The control circuit can be operated by means of the reed switch at the end of the tape to rewind the tape automatically to enter the play mode (Auto-rewind play) or to enter the stop mode (Auto-rewind stop) after rewinding the tape.
It is very convenient because the tape can be returned to the tape start position after it has been listened to or after recording.

- **Computer automatic recording mute function**

When this button is pressed during recording, the unit enters the non-signal mode by means of the function of the computer IC for approx. 4 sec, and then automatically enters the recording pause mode.

This is convenient for cutting narrations or for leaving gaps between tunes.

- **Digital peak meter with 2 colour and highly accurate level indication is used.**

The green and red graph corresponds to the strength of the input/output signal, and it is displayed as such.

Since it has rapid speed of response, the display always indicates the peak level very accurately.

Very accurate level setting is possible.

The series indication of both R/L channels enables the individual reading of left/right levels with ease, and checking the level is also easy.

The peak level is held for approx. 1 sec.

- **Timer mechanism for unattended recording and alarm playback**

With an external audio timer connected, automatic recording and waking up to music in place of an alarm at any desired time is possible.

- **Remote control option**

Remote control operation is possible using the optional remote control device (RB-100).

- **Dolby noise reduction system**

The Dolby noise reduction system improves the tape's S/N ratio by approx. 10 dB without degrading the frequency response.

POWER (MAINS) REQUIREMENT

To Set Power (Mains) Voltage:

1. This unit can be used with a power (mains) voltage of 100 to 110V, 115 to 127V, 200 to 220V or 230 to 250V. Before operating, be sure to check that it is set to your local power (mains) voltage.
2. Turn the voltage selector to your local power (mains) voltage with a screwdriver until the selector clicks.

Notes: 1. Before turning the selector, disconnect the AC power (mains) lead from the AC outlet with this unit in stop mode.

2. Be sure not to turn the selector with a thin screwdriver, etc by force. The selector may be broken and the deck will not operate.

3. When inserting the mains plug into the AC outlet supplying 100 — 110/115 — 127V, insert the plug with adaptor connected to it.

CONNECTIONS

This unit is not equipped with a built-in power amplifier; therefore it must be connected to a playback unit (stereo amplifier). The connection should preferably be done using the US pin jack ②⑦ and ②⑧, if the stereo unit is not provided with US pin jacks, connect via a Record/playback (DIN) socket ②⑥. (See diagram ③①)

Insert the AC power (mains) lead plug into the power (mains) socket of stereo amplifier or into any convenient AC outlet.

- Notes:
- Do not use the DIN lead and US pin-type leads at the same time.
 - Disconnect the AC power (mains) lead plug from AC outlet when the unit is not to be used with AC power (mains) for a long period of time or you are away from home.

TAPE SELECT SWITCHES

3-way selection of equalization and bias is possible. When using ferric-oxide tape (Fe₂O₃), press the "UD-ER (NOR)" tape select switch; when using chrome-oxide tape (CrO₂), press the "UD-EX (CrO₂)" switch; when using Metal Tape, press the "METAL" switch.

By pressing these switches in accordance with the type of tape being used, optimum tape performance can be obtained.

To obtain the best performance from this unit, it is recommended that you use the tapes: HITACHI UD-ER (Normal position) and HITACHI UD-EX (CrO₂ position).


A high recording level with a wide dynamic range can be obtained.


OUTPUT LEVEL CONTROL

The output level should be adjusted by use of the Output level control ⑫, in order to match the input sensitivity of the power amplifier to which the unit is connected.

INPUT SELECT SWITCH

Set this switch ⑪ to match the programme sources to be recorded:

LINE (): Set to this position for recording from the Line-in sockets ⑳.

MIC (): Set to this position for recording from the Microphone sockets ⑩ or Record/Playback (DIN) socket ㉔.

Note: Do not connect the record/playback (DIN) socket and Line-in (or out) sockets simultaneously.

DOLBY NR (Noise Reduction) SWITCH

ON: Set to this position when recording utilizing the Dolby NR system or playing back cassette tapes recorded through a Dolby NR system.

OFF: Set to this position when playing back cassette tapes not recorded through a Dolby NR system or making a recording not utilizing the Dolby NR system.

REMOTE CONTROL SOCKET

By connecting the remote controller (RB-100) to the Remote control socket ㉑, the movement of the tape can be controlled by this controller.

TIMER SWITCHES (TIMER)

Set these switches to OFF when a timer is not used.

Set to REC or PLAY for recording when you are absent or for timer PLAY. (Refer to "Recording and playback using a timer" on Page 8 for details.)

Note: If the timer switch is set to REC or PLAY when the power switch is turned ON, REC or PLAY indicator flashes for 3 sec to warn you.

COMPUTER AUTOMATIC RECORDING MUTE FUNCTION

When the REC MUTE button ⑮ is pressed during recording, the unit enters the non-signal mode for approx. 4 sec, and then automatically enters the recording pause mode.

Press the playback button ㉒ to continue recording.

When the REC MUTE button ⑮ is pressed continuously, the non-signal mode continues for more than 4 sec; when it is released, the unit automatically enters the recording pause mode.

This is convenient for cutting narrations or leaving gaps between tunes.

HEADPHONES

Connect headphones to the Headphone socket ⑨ to monitor the recording or to enjoy the playback material with a stereo headphone.

CASSETTE INSERTION

When the Eject button ⑮ is pressed, the cassette holder comes out toward you gradually. Insert the cassette with the exposed tape downward until it is locked, then close the cassette holder.

For cassette removal, press the Eject button ⑮ with the unit in the STOP mode and the cassette holder opens toward you for easy removal.

When the cassette is fully recorded or played back, it may be turned over to side 2 (or B) for an equal time of recording or playback.

RECORDING

Recording from a stereo system

1. Connect this unit and the stereo system using pin jack cords.
 2. Set the Power switch ⑳ to ON, insert the cassette with the side to be recorded toward you and close the cassette holder.
 3. Change over the Tape select switch ⑭ to match the tape.
 4. Set the Input select switch ⑪ to "LINE".
 5. Set the Dolby NR switch ⑬ to ON. (Set to OFF for recording without the Dolby NR circuit).
 6. Set the Auto/Memory rewind switch ⑤ to the desired position (Refer to "Auto/Memory rewind switch" on Page 7) and press the reset button of tape counter ③ so that the reading is "000".
 7. When the Pause button ⑰ is pressed while pressing the Record button ⑱, it enters the stand-by recording mode.
Adjust the Record level control ⑧ so that the indication Digital peak meter ⑦ does not exceed +3 dB at maximum input.
 8. Start recording by pressing the Playback button ㉑.
 9. When it is desired to stop recording temporarily during recording, press the Pause button ⑰. Press the Playback button ㉑ to continue recording.
 10. Press the REC MUTE button ⑯ to cut the sound being recorded.
4 sec later, the unit automatically enters the recording pause mode.
Press the playback button to continue recording.
 11. Press the Stop button ⑲ when the recording is completed.
When the recording is done up to the end of tape, operation is according to the position of the Auto/Memory rewind switch ⑤.
- Caution: Do not turn the Power switch ㉓ ON/OFF abruptly during recording as it may cause mis-operation.

Recording from microphone

Insert two microphones into the Microphone sockets ⑩.

Carry out the following procedure the same as "for recording from a stereo system."

For monaural recording, connect one microphone plug to the Microphone socket ⑩ marked with L/mono.

Note: Set the Input select switch ⑪ to "MIC".

Notes for recording

1. Do not use the DIN lead and US pin-type leads at the same time, or the noise may be occurred.
2. A DIN lead can be used only with the amplifier. Accordingly, recording and playback are not possible by connecting the two tape decks.

Cautions on the use of Metal Tape

1. Some Metal Tape is incompletely coated with magnetic powder which causes level fluctuation, so it is recommended to clean the head, capstan and pinch-roller after it is used several times. (When cleaning, be careful not to apply too much force to the head because it may cause the high frequency characteristics to deteriorate.)
2. Metal Tape recorded on this deck can be played back on another decks which does not have a Metal select switch position. In this case, set the tape selector to Chrome or FeCr for playback.

PLAYBACK

1. Turn the Power switch ②③ ON and insert the tape to be played back.
2. Change over the Tape select switch ⑭ matching it to the tape.
3. Set the Dolby noise reduction switch ⑬ to "ON" or "OFF" depending on whether or not the tape was recorded with Dolby NR system.
4. Set the Auto/memory rewind switch ⑤ to the desired position.
5. Press the Playback button ②① to start playback. Adjust volume, tone and balance with the stereo amplifier controls.
6. When it is desired to stop the tape during playback, press the Pause button ⑰. Press the Playback button ②① to start playing again.
7. Press the Stop button ⑱ when playing is completed. When the tape is played up to the end, operation will depend on the position of the Auto/memory rewind switch ⑤.

Operate this unit with the volume knob of the stereo system set to the position used when listening to broadcasts or records, and adjust to obtain the same volume using the Output level control ⑫.

Caution: When the Output level control ⑫ is set to minimum, no sound comes out and, no sound will come out if the stereo system is operated incorrectly.

AUTO/MEMORY REWIND SWITCHES

Auto-rewind function

Stop, rewind or play can be done automatically depending on the setting of the Auto/memory rewind switches.

Set these switches so it is effective during recording, playing and rewinding.

OPERATION MODE	AUTO/MEMORY REWIND SWITCH SETTING	AT TAPE END
Recording	OFF	Stop (AUTO STOP)
	STOP	Rewind to start ➡ stop (AUTO STOP)
	PLAY	* Rewind to start ➡ play ➡ rewind ➡ play....(repeated)
Playback	OFF	Stop (AUTO STOP)
	STOP	Rewind to start ➡ stop (AUTO STOP)
	PLAY	* Rewind to start ➡ play ➡ rewind ➡ play.... (repeated)
Rewind	OFF	Stop (AUTO STOP)
	STOP	
	PLAY	* Play ➡ rewind ➡ play (repeated)
Fast Forward	OFF	Stop (AUTO STOP)
	STOP	Rewind to start ➡ stop (AUTO STOP)
	PLAY	* Rewind to start ➡ play ➡ rewind ➡ play....(repeated)

* Tape is played back 16 times by Auto-rewind function.

Computer memory rewind function

When the rewind button is pressed during the recording or playback, tape is rewound to the position previously specified (the position where the playback button was pressed previously).

The unit operates according to the setting of the Auto/Memory rewind switches after rewinding.

PLAY - Playback starts after rewinding.

STOP - STOP mode is entered after rewinding.

Note: When tape is rewound, to its end, the computer memory rewind function is released and the unit operates according to the setting of the auto-rewind switches.

FAST FORWARD AND REWIND

To advance a tape rapidly to any desired point, press the Fast forward button ⑳. To stop the tape movement, press the Stop button ⑲.

In the case of Fast Forward, when the tape is wound to the end, it stops automatically regardless of the position of the Auto/memory switch ⑤.

Tape may be rewound rapidly by pressing the Rewind button ㉒.

To stop the movement, press the Stop button ⑲.

When the Auto/memory rewind switch ⑤ is set to "PLAY" during rewind, the deck automatically enters the PLAY mode. When it is set to "STOP" or "OFF", the deck automatically enters the "STOP" mode.

RECORDING AND PLAYBACK USING AN EXTERNAL AUDIO TIMER

When this tape deck is used with the audio timer, timer recording or playback at the desired time is possible.

Timer recording of radio broadcasts

1. Insert the power cord of this unit into the socket of the amplifier. (Insert the power cord of the amplifier into the socket of the timer.)
2. Set the timer to the desired time.
(Refer to the instruction manual of the timer for setting the timer.)
3. Turn the power for the amplifier and tuner ON.
4. Operate as described in items 1 — 7 in "RECORDING", adjust the recording level and press the STOP button.
5. Set the Auto/memory rewind switch ⑤ to OFF or STOP.
Note: Do not set this switch ⑤ to "PLAY" during timer recording.
6. Set the Timer switch ⑥ to "REC".
Note: If this switch ⑥ is set to "PLAY" and the timer functions, the deck enters the playback mode, so recording cannot be done.
When it is set to "OFF", the deck does not operate at the set time. Be careful.
(Now, preparation is complete.)
7. Recording starts automatically at the set time, the timer operates and the power is switched on.

Timer PLAY

1. Insert the tape you desire to play back, adjust the volume knob of the amplifier to determine the level and press the Stop button ⑯.
2. Connect the timer in the same way as in the "Timer recording of radio broadcasts" and set the timer to the desired time.
3. With the Timer switch ⑥ set to "PLAY", PLAY starts automatically at the set time.

Cautions

- Do not use a cassette with its erasure prevention tabs snapped. When a cassette with its tabs snapped is used, the unit operates in the PLAY mode when the timer operates.

Be careful because the chance to make a unique recording might be missed.

Be sure to set the Timer switches (TIMER) to "OFF" except for TIMER recording/playback. When the Timer switches (TIMER) are set to REC or PLAY, recording or play starts automatically a few second after the power switch is turned ON.

Be careful; when the erasure prevention tabs are present the previously recorded tape will be erased. Do not open/close the cassette lid for several seconds after the power is switched ON to protect the mechanism.

Cautions on use of timer

- Do not use timer recording or playback when you are absent for a long time.

ERASING

When a recording is being made, any sound already on the tracks is automatically erased before the new recording is made. Erasure is accomplished only when the recorder is in the recording mode.

If you wish to erase a tape without making a new recording, set the Recording level controls ⑧ at minimum, and the Tape select switches ⑭ to the proper position. Press the Playback button ⑳ while pressing the Record button ⑱.

For erasing with less noise, set the Recording level Control ⑧ to the minimum positions, and remove input cords etc.

MAINTENANCE

In order to keep this unit in optimum operational condition, clean the heads, capstan and pressure roller periodically with a head cleaning stick moistened in alcohol, or methylated spirit. (See diagram ㉓) When the Eject button ⑮ is pressed, the cassette holder comes out toward you gradually. The cassette lid can be removed by lifting it while holding both of its side edges.

Never use a sharp or metallic instrument or tool for cleaning these parts. The easiest cleaning can be performed by using a Hitachi head cleaning cassette. Hitachi Ultra-Dynamic Cassettes are provided with a piece of head cleaning tape on both ends of the tape; therefore, all accumulated dirt and oxide particles are removed automatically at the beginning and the end of the tape.

Demagnetization: The head is inevitably magnetized slightly after being used for a long time. As a result, high-frequency sound may be lacking or noise may be generated. Perform demagnetization of the head occasionally with a head eraser. In this case, do not touch the tape running surface of the head directly with the metallic part of the eraser, but use the eraser after protecting the head with cloth or gauze.

CASSETTE TAPES

Recording Protection: If the plastic tabs on the rear of the cassette are punched out (by a screwdriver or similar tool), the recordings can be protected against accidental erasure.

When only one side of the cassette is to be protected, with the blank side of the cassette towards you, punch out the tab on right. (See diagram ㉔)

Precautions: If a tape is played several times continuously, especially if a thin tape (C-90, C-120) is used, the tape might be wound too tightly on the reel and cause the tape speed to fluctuate. In order to avoid this, it is recommended to tap the cassette several times lightly on a table-top which will loosen the tape on the reel. But the tape should not be too loose. Especially after fast forwarding or rewinding a C-90 or C-120 cassette, the slack should be taken up by inserting a pencil or other object in the spindle hole and tightening the tape.

4-Track Recording/Playback: After recording or playing back one side of the cassette, remove the tape by depressing the Eject button ⑮, turn the cassette over and insert it again. Then, the tape can be used again for the same recording time as the first side.

DOLBY* NR (Noise Reduction) SYSTEM

Due to the slow speed of cassette recorders, tape hiss occurs. This is not audible at maximum output level but considerably degrades the playback quality of low level passages of recorded material. By using the Dolby NR system (named after the inventor), it is now possible to substantially reduce tape hiss so that it is practically inaudible during playback.

With the Dolby NR system, during recording, the level of the low passages is increased considerably; during playback these passages are reduced to their original level. Therefore, the tape hiss is also reduced by the same amount and is not audible during playback.

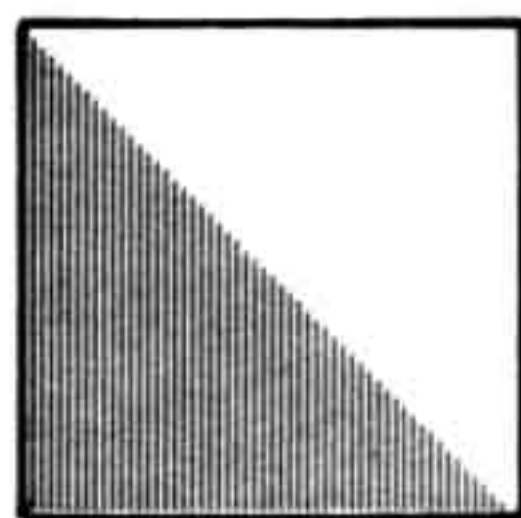
Before playback of a cassette, it should be ascertained if the Dolby NR switch ⑬ is set in the proper position.

- * Cassettes recorded through the Dolby NR circuit must be played back in the Dolby NR mode (if played back with normal playback equalization, the sound seems too sharp).
- * Normal recordings should not be played back through the Dolby NR system (if played back with the Dolby NR equalization, the sound will seem "muddy").

The optimum adjustment of the recording and playback calibration is important for satisfactory functioning of the Dolby NR system. This adjustment is done at factory prior to shipment using a special measuring device.

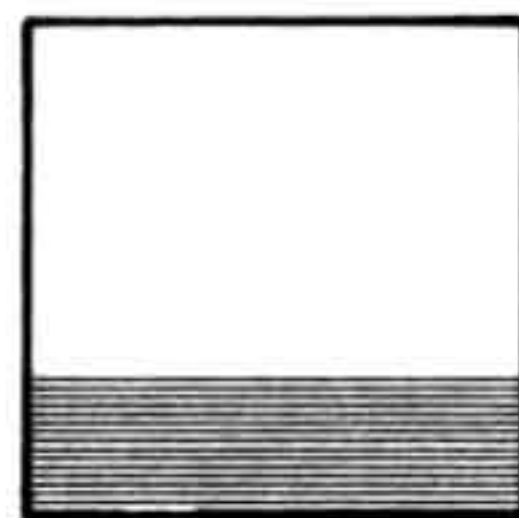
HOW THE DOLBY NR SYSTEM WORKS

Making an ordinary recording:



1. Music

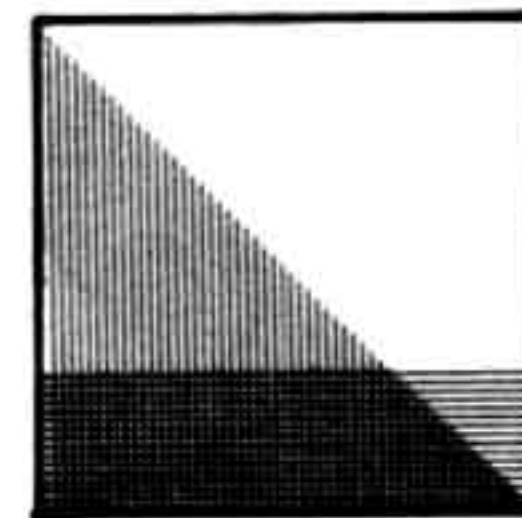
Music is composed of sounds of different loudness separated by intervals of silence. Loud and soft sounds are here shown as long and short lines. The music shown by this diagram starts loud and gradually becomes very quiet.



2. Noise

Any recording tape, even of the best kind, makes a constant hissing noise when played.

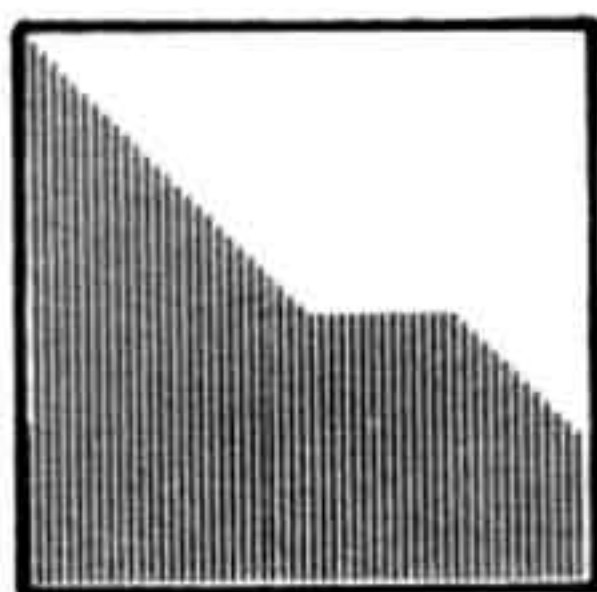
At the very slow speeds and narrow track widths used in tape cassettes, tape noise is much more noticeable than it is in professional tape recordings, although even there it is a problem.



3. Music and Noise

When a tape recording is played, noise from the tape obscures the quietest musical sounds and fills the silence when no sound should be heard at all. Only when the music is loud the noise is not usually heard; however, tape noise is so different from music that is sometimes can be heard even then.

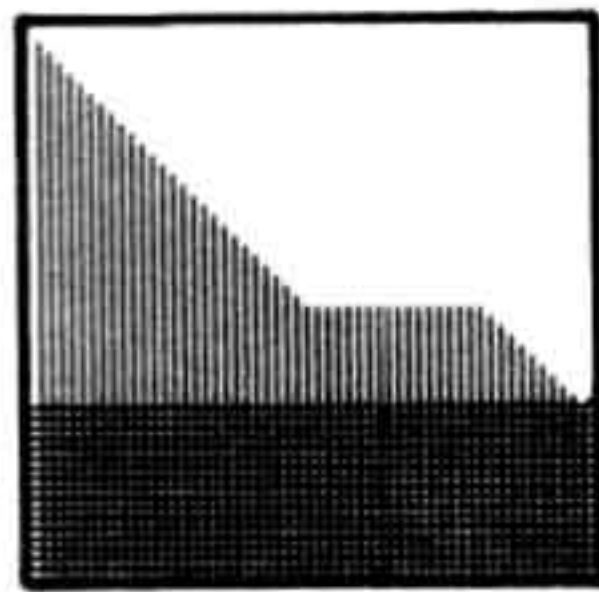
Making a Dolby system recording:



1. *What the Dolby System does first.*

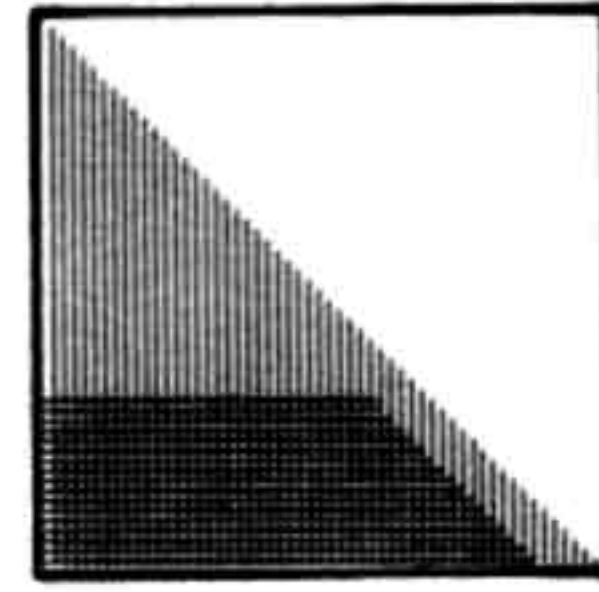
Before the recording is made, the Dolby system "listens" to the music to find the places where a listener might later be able to hear the noise from the tape.

This happens mainly during the quietest parts of the music. When it finds such a passage, the system automatically increases the volume so that music is recorded at a higher level than it would be normally.



2. *The Recording.*

In a Dolby system recording, the parts of the music which have been made louder stand out clearly from the noise. As a result, Dolby system recording sound brilliant and unusually clear even when played back without the special Dolby system circuit.



3. *What the Dolby System does during playback.*

When tapes are played on a high-fidelity tape recorder equipped with the Dolby system circuit, the loudness is automatically reduced in all of the places at which it was increased before recording. This restores the music to its original level again.

At the same time, the noise which has been mixed with the music is reduced in level and this is by the same amount usually enough to make it inaudible.

SPECIFICATIONS

Semiconductors:	Module: 1 ICs: 6 Transistors: 33 Diodes: 32 Varistor: 1 LED: 5
Track System:	4 track 2 channel
Tape:	Cassette tape (C-30, 60, 90)
Tape Speed:	4.75 cm/s
Recording system and Bias Frequency:	AC bias, 85 kHz
Erasing System:	AC erase
Erase Ratio:	65 dB (at 1 kHz) or more
Frequency Response:	UD-ER (NOR): 20 Hz to 17 kHz 30 Hz to 15 kHz (According to DIN 45 500) UD-EX (CrO ₂): 20 Hz to 18 kHz 30 Hz to 16 kHz (According to DIN 45 500) METAL: 20 Hz to 19 kHz 30 Hz to 17 kHz (According to DIN 45 500)
S/N (Signal to Noise Ratio):	Dolby NR ON: 67 dB (A weighted, Reference 3%) T.H.D. Metal Tape 67 dB According to DIN 45 500 Dolby NR OFF: 59 dB (A weighted, Reference 3%) T.H.D. Metal Tape 59 dB (According to DIN 45 500)
Wow and Flutter:	0.04% (WRMS) 0.13% (According to DIN 45 500)
Input Sensitivity and Impedance:	Microphone: 0.38 mV (Suitable microphone impedance 300 ohms to 5 kohms) Line in: 60mV, 50 kohms Record/playback (DIN): 0.3mV, 3.3 kohms
Output level:	0.5V or more (adjustable)
Output Load Impedance:	Line out: 50 kohms Record/playback (DIN): 50 kohms Headphone: 8 ohms to 2 kohms (Suitable)
Distortion:	Less than 1.0% (1 kHz, -3 dB)
Crosstalk:	60 dB (at 1 kHz) or more
Powre (Mains) Supply:	AC 100 — 110V, 115 — 127V, 200 — 220V, 230 — 250V, 50/60 Hz
Power (Mains) Consumption:	21W
Dimensions:	11.0(H) x 43.5(W) x 26.9(D) cm
Weight:	5.3 kg

* Specifications are subject to change without notice for performance improvement.

