

# The Harman-Kardon CAD5

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Professional stereo tape  
cassette deck  
with Dolby Noise Reduction  
System



HARMAN-KARDON CAD5 PROFESSIONAL TAPE  
CASSETTE DECK WITH DOLBY SYSTEM

## *Congratulations!*

You are now the owner of one of the most advanced and versatile professional stereo cassette tape decks ever designed for home use.

The CAD5 with the Dolby Noise Reduction System has been engineered expressly for the recording enthusiast with professional features and performance that are on a par with, or exceed, the most versatile reel to reel recorders.

Perhaps no other electronic concept in recent years has caused so much talk, or has been so well received as the Dolby noise reduction system. The Dolby system has been commercially available for a number of years and it is presently being used by every major recording company in the world. This system has permitted recording engineers to broaden the limits of signal-to-noise range in tape by another 10 to 15 decibels.

Up to now it has been difficult to achieve noise-free recordings and playback from a tape cassette because of special inherent problems. During the past year, several new low-noise cassettes have appeared which have helped achieve better noise figures, but even with these new uniform oxide and higher saturation tapes, noise still persists as a problem.

This is why the Dolby noise reduction system is such a remarkable achievement and a definite asset to recording enthusiasts. It permits a greater dynamic range giving the sound greater impact and clarity.

Dolby's system is essentially a compression-expansion configuration, which compresses the signal during its initial phase and

expands it to match the initial compression during the second phase, but it accomplishes all this without any apparent effect on the signal.

The Dolby B system employed in our Harman-Kardon CAD5 operates on both record and playback. It boosts low-level, high frequency signals prior to recording, then attenuates these same signals in a precisely equalized mirror image during playback. When this is accomplished, all of the additional noise that may have been added by the cassette recorder is eliminated or reduced to an inaudible level.

The CAD5 enables the recording enthusiast to make cassette recordings with a tremendous gain in signal-to-noise ratio . . . as much as 10 db! It also gives him the ability to dub tapes over and over again with no increase in noise. It takes only a few minutes of listening to a Dolby processed tape on the CAD5 to sense the incredible clarity and naturalness of sound. It is not simply the absence of tape hiss during the quieter passages, but the absence of all types of effects, inaudible or unidentifiable in themselves, that contribute to this cleaner sound.

The versatility of the CAD5 makes it completely compatible for use with Dolby or non-Dolby tapes. You may record tapes without the Dolby system for use with standard cassette recorders or you may playback tapes made on a standard cassette recorder.

We know you are eager to install and use your tape recorder but we sincerely urge you to read this instruction book. The few minutes that it will take to familiarize yourself with the proper techniques for using this fine tape recorder will prove rewarding and will ensure many years of uninterrupted enjoyment with it.

## **WARRANTY AND SERVICE POLICY**

**POLICY** — We warrant each unit to be free from defects in material and workmanship under normal use and service, and in accordance with the conditions set forth below. Should a defect occur within the period specified, and provided that the unit is returned to either HARMAN-KARDON or an authorized HARMAN-KARDON warranty station, transportation prepaid, and which our examination shall disclose to our satisfaction to be defective, we will for a period of ninety (90) days from date of purchase either replace or repair and install any defective parts of the cassette tape recorder free of charge.

**REGISTRATION** — To obtain service under the terms of this policy, it is necessary to return the enclosed warranty card for factory validation within ten (10) days from the date of purchase.

This card will be assigned a "warranty registration number" and returned to you. If service is required within the warranty period, it is mandatory that the validated card or the warranty registration number is presented or your warranty will not be honored.

**EXCEPTIONS** — This warranty does not include any obligation as to:

- a) repair or replacement of the enclosure due to damage incurred after initial delivery;
- b) transportation charges to and from the factory or an authorized warranty station.

This warranty is not applicable to any instrument which shall have been repaired or altered in any way so as, in our judgment, to affect its stability or reliability or has been subject to neglect, misuse, abuse, negligence, or accident; or which has had the serial number altered, effaced or removed. Neither shall this warranty apply to any instrument which has been connected other than in accordance with instructions furnished by us.

**SERVICE** — HARMAN-KARDON has a special customer service division to answer all questions pertinent to the installation and operation of your unit. Please feel free to write to us at any time and we shall endeavor to offer prompt and complete advice.

If your problem cannot be resolved through our combined efforts, we may wish to refer you to a local authorized repair agency or we may prefer to authorize the return of your unit to the factory. In the event it must be returned, an authorization form and proper packing instructions will be forwarded to you. This authorization form, together with the warranty registration number, **MUST BE RETURNED** with your unit.

**UNDER NO CIRCUMSTANCES SHOULD YOUR UNIT BE SHIPPED TO THE FACTORY WITHOUT PRIOR AUTHORIZATION.**

This warranty is in lieu of all warranties, expressed or implied, and of all other obligations or liabilities on our part, and we neither assume nor authorize any representative or other person to assume for us any other liability in connection with the sale of this instrument.

## **INSTALLATION**

**POWER REQUIREMENTS** — Connect the AC line cord to any outlet supplying 117 volt, 50 or 60 Hz AC current. The voltage may vary between 105 and 125 volts.

### **AUDIO CONNECTIONS**

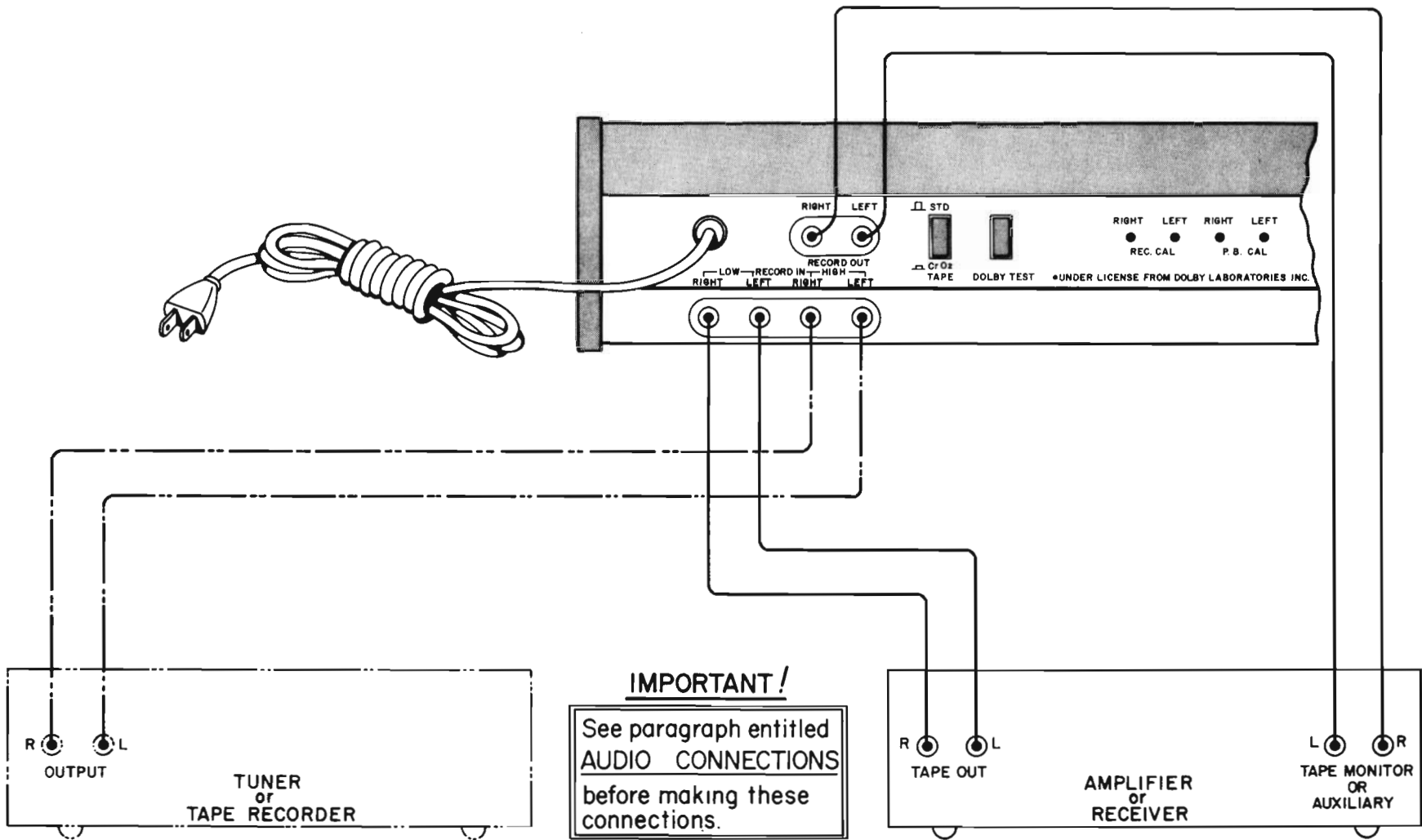
**PLAYBACK** — Connect the LEFT and RIGHT RECORD OUT jacks on the CAD5 to the auxiliary or tape monitoring jacks on your amplifier or receiver.

**RECORD** — The CAD5 has two sets of line inputs. The LEFT and RIGHT RECORD IN-LOW jacks will be the proper input jacks to use in most cases. They should be connected to the TAPE OUT jacks on your amplifier or receiver. If, however, you wish to record from a tuner or another tape recorder, both of which usually have a relatively high output, you should then connect this equipment to the LEFT and RIGHT RECORD IN-HIGH jacks. If there is any doubt as to which inputs to use, connect your equipment to the RECORD IN-HIGH

jacks first. Refer to the paragraph entitled "RECORDING PROCEDURE" and make an experimental recording. If you have no problem reaching the proper recording level, as indicated by the VU meters, the connections may be left as is. If, on the other hand, you cannot reach the proper recording level, it will be necessary to reconnect the outputs from your equipment to the RECORD IN-LOW jacks on the CAD5.

**MICROPHONES** — A HARMAN-KARDON microphone may be purchased as an added accessory for use with your CAD5. If you wish to use another microphone, it **MUST** be a **LOW IMPEDANCE** type (between 500 and 1000 ohms).

**CABLES** — The cables supplied with the CAD5 are of sufficient length for most installations. However, it may be necessary to use longer cables. In such cases a maximum of six feet of high-quality, low-capacitance, shielded audio cable may be used for each connection.



## OPERATION

**TAPE COUNTER** — The three-digit tape counter is provided as a means of relocating any given point on a tape once it has been recorded. When a recording is being made, simply log the reading on the counter at the beginning of each selection. You will then be able to wind the tape to the same point at any future date. The pushbutton allows you to reset the counter to zero so that you will always be able to use the same frame of reference.

**STEREO-MONO SWITCH** — This switch must be placed in the STEREO position when making a stereophonic recording. When placed in the MONO position while recording, the switch will allow the inputs to either or both channels to be recorded simultaneously on both tape tracks. The result will be a monaural recording of all inputs to the CAD5. The STEREO-MONO switch has no effect during playback.

**RECORD BUTTON** — This button is used to activate the record mechanism and must be depressed simultaneously with the PLAY/RECORD button in order to start the tape in motion when recording.

**REWIND BUTTON** — In this mode of operation the recorder will rapidly wind tape from the take-up reel onto the supply reel until all the tape is on the supply reel or until the STOP/CASSETTE EJECT button is depressed.

**STOP/CASSETTE EJECT BUTTON** — This button serves a dual function. It is used to stop tape motion and to eject the cassette. When the button is depressed half way it will stop the motion of the tape and return all other buttons, with the exception of the PAUSE button, to their unused positions.

IMPORTANT! When changing from function to function using the REWIND, PLAY/RECORD, or FAST FORWARD buttons, it is IMPERATIVE that you first depress the STOP button in order to avoid serious damage to the recorder mechanism.

When the button is fully depressed, the cassette will be lifted out of the recorder mechanism by the loading platform and presented to the operator for removal from the CAD5. The same button is also used to open the trap door when preparing to insert a cassette.

**PLAY/RECORD BUTTON** — This button is used to record when depressed in conjunction with the RECORD button and to play a previously recorded tape when depressed by itself.

**FAST FORWARD BUTTON** — This button performs a function identical to that of the REWIND button with the exception that the tape moves from the supply reel to the take-up reel.

**PAUSE BUTTON** — This button is used in conjunction with the PLAY/RECORD button. When depressed, the PAUSE button will interrupt the motion of the tape while playing or recording without affecting the position of the PLAY/RECORD button.

**LEVEL METERS** — In the playback mode of operation the level meters provide visual indication of the signal being fed to the RECORD OUT jacks. In the record mode the level meters are used to monitor the level of the signal being recorded on the tape. They should be used along with the OVERLOAD light and RECORD LEVEL controls to maintain the proper recording level.

**RECORD LEVEL CONTROLS** — These controls are used to adjust the level of the incoming program material while recording. The position of each control can be read on the accompanying scale. When the control is moved to a higher setting, the signal being fed to the tape will also reach a higher level and vice versa.

**POWER SWITCH** — The power for the CAD5 is delivered through this switch. It must be placed in the ON position in order to operate the recorder.

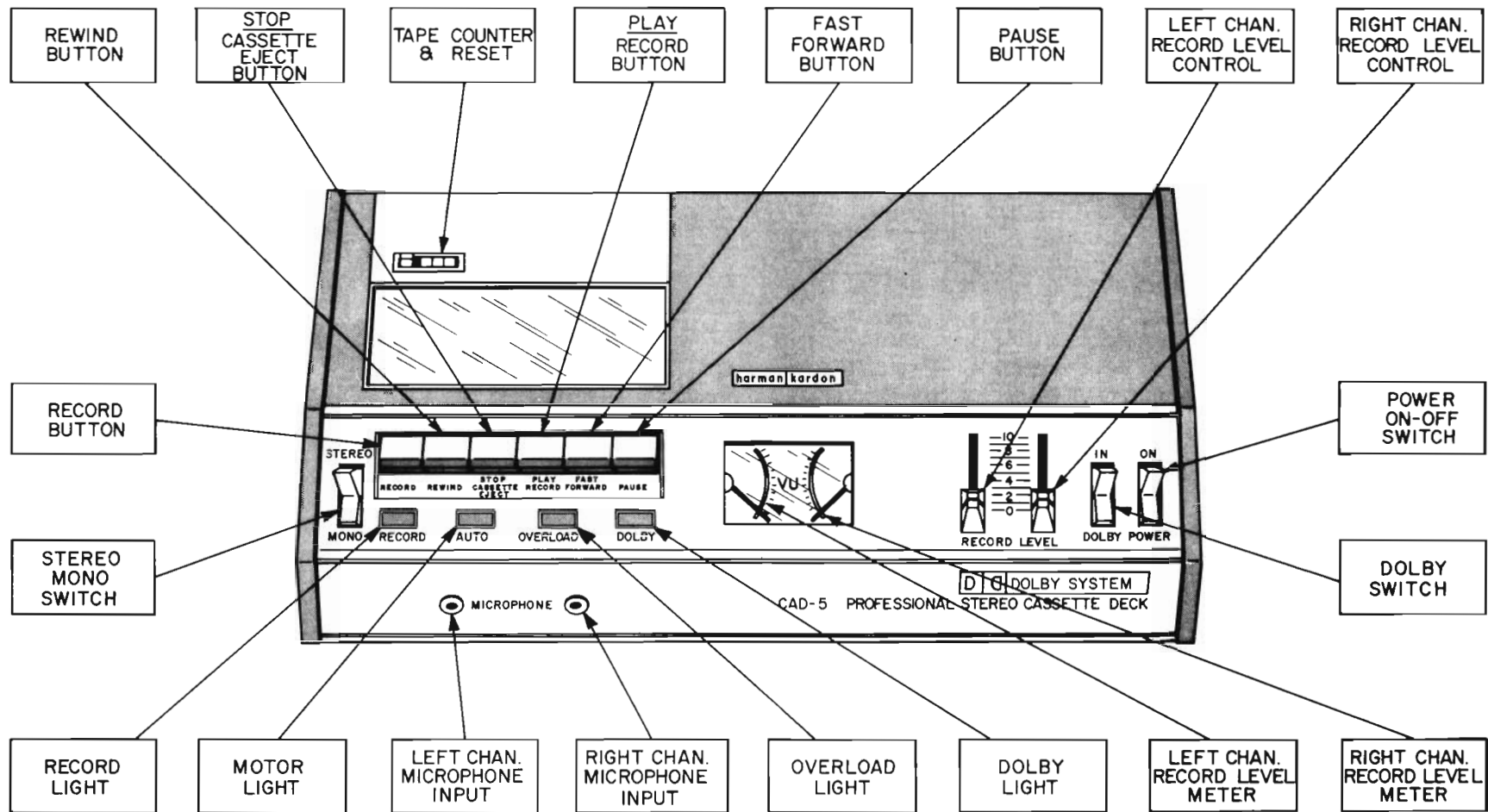
**AUTOMATIC SHUTOFF** — To protect the CAD5 motor and drive mechanism against unnecessary wear an automatic shutoff device has been built into the mechanism. When the supply hub stops for any reason the motor and drive mechanism will automatically shut off after a short period of time. At the same time the AUTO light will be extinguished. It will be necessary to depress the STOP button before any other drive function may be initiated. NOTE: Since the automatic shutoff device does not affect the electronic portion of the CAD5, it will still be necessary to turn off the entire recorder using the POWER switch. IMPORTANT! If the recorder is in the play or record mode when the AUTO light is extinguished, the STOP button must be depressed soon afterward! Otherwise the capstan will impress a "flat" in the rubber pinch roller and the introduction of annoying flutter and wow will result.

**DOLBY SWITCH** — When placed in the IN position this switch activates the Dolby system in both the record and playback mode. Before using this switch please refer to the paragraph "DOLBY RECORDING ADJUSTMENTS".

**INDICATOR LIGHTS** — There are four indicator lights on the front panel of your CAD5. When lit, these lights give a visual indication of the following:

1. RECORD — The CAD5 is in the process of making a recording.
2. AUTO — The motor and drive mechanism are operative.
3. OVERLOAD — The record level controls are set too high.
4. DOLBY — The Dolby system is ON.

NOTE: When the PAUSE button is depressed the indicator lights will continue to operate.



**THE CASSETTE** — Cassette is French for cartridge. It is a self-contained reel-to-reel tape housed in a plastic enclosure for easy handling and storage. Most record album manufacturers are presently duplicating their albums on cassette tape. Blank cassettes containing 60, 90 and 120 minutes of recording time are also available for making your own recordings. The CAD5 has been designed to give optimum performance with high-quality 60 and 90 minute cassettes. Tape tension and capstan tolerance have been carefully adjusted to the specific tape thickness of C-60 and C-90 tapes. It is for this reason that we do not recommend the use of C-120 cassettes.

**ACCIDENTAL ERASURE PROTECTION** — The cassette is provided with a recording safety feature which protects your pre-recorded cassette, or one you may have just recorded, against accidental erasure.

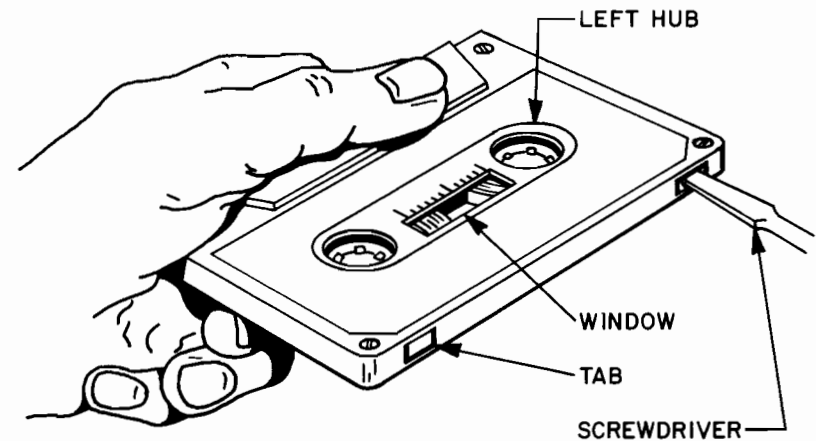
The safety feature employed consists of two removable tabs, one for each side of the tape, appearing in the rear of the cassette housing. These tabs will have been removed on any prerecorded tapes you may have purchased and evidence of their removal will be the two, small square indentations appearing on either side of the rear of the plastic housing.

Once you have made your own recording on a blank cassette, and you wish to protect against accidental erasure, it will be necessary for you to remove one or both of these tabs to protect either or both sides of your recorded cassette against accidental erasure, as follows:

- 1) If both sides have been recorded, merely insert a fine screwdriver in the opening around each tab and gently pry the tab off. Be sure the tab falls free from the cassette.
- 2) If one side only has been recorded, place the cassette on a table as removed from the recorder, with the side just recorded facing up and the exposed tape area facing you. The correct tab to be removed will be in the lefthand corner of the cassette.

**NOTE:** If at some future date you wish to make a recording over a previously protected tape, simply place a piece of adhesive tape over the tab opening. This will permit you to make a new recording. Removal of the adhesive tape following the recording will again insure against accidental erasure.

**CASSETTE STORAGE** — The plastic storage container in which the cassette is purchased is dust-proof and will provide ample protection for the cassette. Store the cassette at room temperature, away from any source of heat, and away from any magnetic fields (e.g., speaker magnets, transformers, or electric motors).

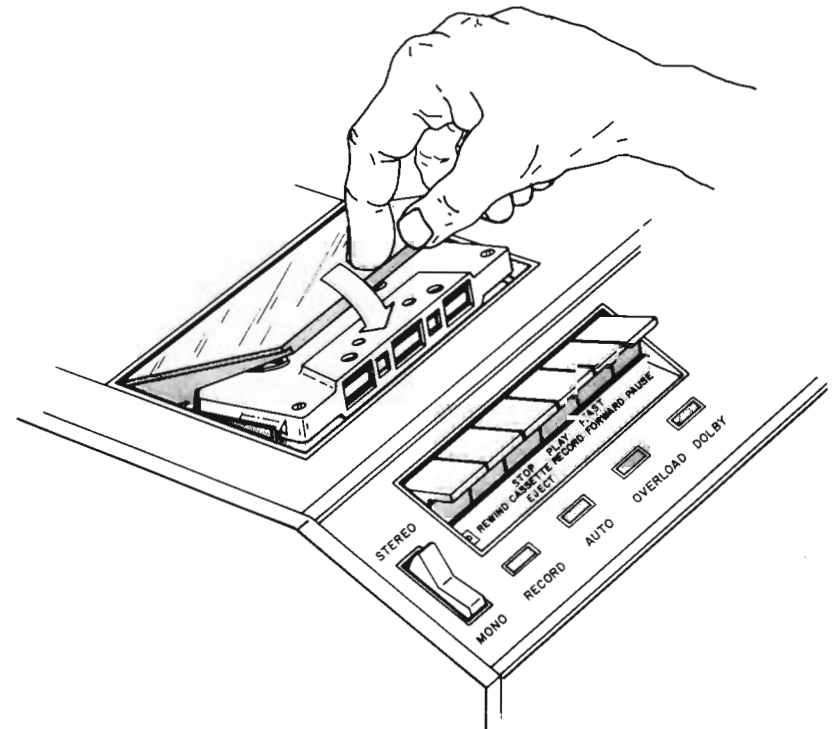
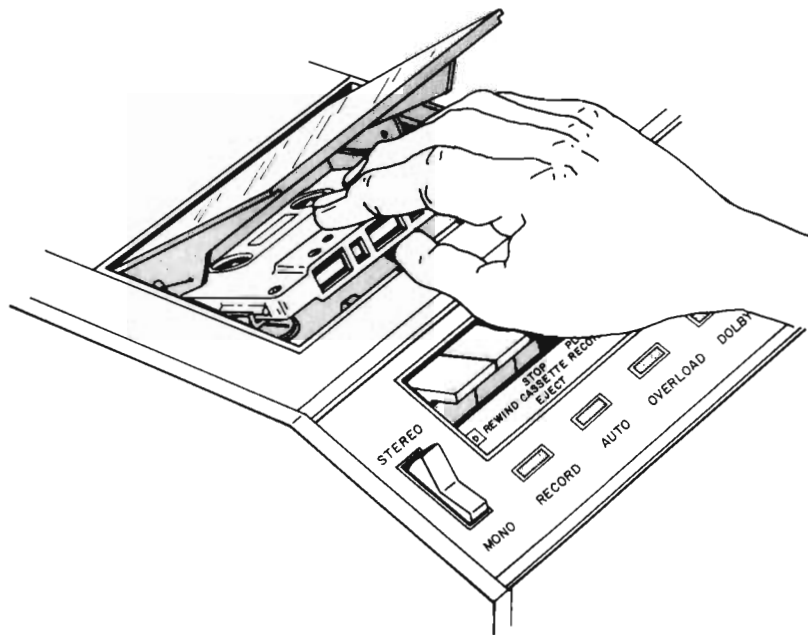
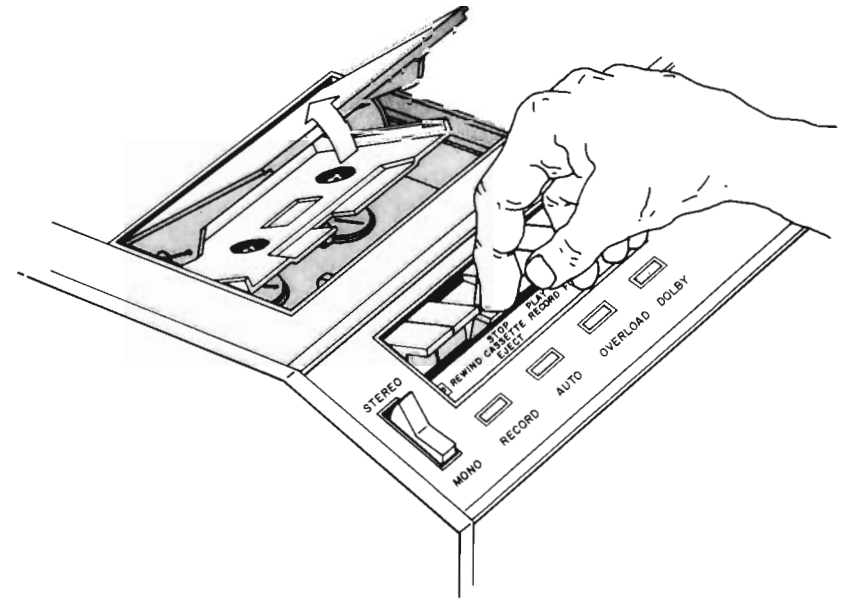




**CASSETTE INSERTION AND REMOVAL** — To load a tape cassette into the recorder, depress the STOP/CASSETTE EJECT button all the way down. This will open the trap door and raise the loading platform to the correct loading height. Remove the cassette from its container and position it so that the front (exposed tape area) is facing you and the full hub of tape, as viewed through the cassette window, is on your left. Deposit the cassette as far back on the loading platform as possible and push the trap door down until it clicks shut.

**IMPORTANT:** The trap door **MUST** be closed to insure proper seating of the cassette.

To remove the cassette from the CAD5 depress the STOP/CASSETTE EJECT button all the way down and remove the cassette from the loading platform.



## RECOMMENDED RECORDING TECHNIQUES

Before making any recordings there are a number of useful hints and techniques we would like to recommend to insure the best possible quality of recording.

1. Whenever purchasing a new tape, either blank or pre-recorded there is a possibility that long storage on a dealer's shelf could have caused the tape to adhere to itself. This would produce "tight spots" in the tape which could introduce fluctuations in the feed process thus affecting the wow and flutter. We therefore suggest that before using any tape which has been stored for a period of time, that you insert it into your cassette recorder and depress the FAST FORWARD button allowing the tape to wind completely in the forward direction. When it is completely wound, repeat the process using the REWIND button. This will now assure a uniform wind on the tape and will have eliminated any possible tight spots.
2. If you plan to record a specific broadcast or record, we suggest that you practice the recording technique, in advance of your final recording session. This will allow you to establish the proper operating levels for the program material to insure that your final recording will be of the highest quality.
3. For good high quality recordings, particularly with the Dolby system, the peak excursion of the level meters should not exceed  $-2\text{dB}$ . It is very possible that during the recording of very low passages the level meters may appear as though they were not recording, however the meters could read as low as  $-20\text{dB}$  and yet this will still result in a good quality recording.
4. A professional recorded cassette should not be re-wound after making a recording unless you plan to play the recording at that time.  
A more uniform and even wind of the tape is always accomplished when any tape machine is moving at the "PLAY" speed as opposed to the FAST FORWARD or REWIND speeds, therefore if you make a recording or play a pre-recorded tape, they should always be stored in the "PLAYED" position.

**TAPE SWITCH** — You may use either standard ferrous oxide tape or the newer chromium dioxide tape with the CAD5. When making a recording, be sure to place the TAPE switch, located on the rear panel, in the position corresponding to the type of tape being used. During playback, the position of this switch has no effect and may be in either position.

## RECORDING PROCEDURE

- 1) Carefully check the cassette you plan to use for recording to be certain that the tabs provided on the rear to protect against accidental erasure are present or that you have placed a piece of adhesive tape in their place in instances where you plan to record over a pre-recorded tape.
- 2) Insert the cassette into the recorder.
- 3) Locate the point on the tape at which you wish to begin the recording.
- 4) Prepare your tuner, receiver, amplifier, turntable, etc., for recording.

NOTE: If you are using microphones, be sure they are properly inserted into the MICROPHONE receptacles. You must also be sure that your speaker volume is low enough to prevent the microphones from picking up the sound while recording. You may also choose to record using a microphone as the program source for one channel and the equipment connected to one of the RECORD IN receptacles as the program source for the other channel. This is known as sound-with-sound recording.

- 5) Select the appropriate position of the STEREO-MONO, DOLBY and TAPE switches.
- 6) Place the POWER switch in the ON position.
- 7) Depress the PAUSE button. This will keep the tape in the proper position while the other controls are being set to record.
- 8) Simultaneously depress the RECORD and PLAY/RECORD buttons. If the RECORD button fails to depress easily, refer to step 1) again.
- 9) Move the RECORD LEVEL controls from the O position toward the higher numbered positions until the meter pointers read as high as  $-2\text{dB}$  on their peak excursions.
- 10) When the controls are properly set and the program material is ready for recording, depress the PAUSE button once again.
- 11) The CAD5 is now in the process of recording. Keep a close watch on the level meters during recording and make any necessary adjustments to insure the highest possible quality of recording.
- 12) If you wish to interrupt the recording process to avoid unwanted program material, the PAUSE button may be used without upsetting the other controls.
- 13) When the recording is complete depress the STOP button to stop the recording process.

## PLAYBACK PROCEDURE

- 1) Prepare your amplifier or receiver for tape playback.
  - 2) Place the POWER switch of the CAD5 in the ON position.
  - 3) If the tape you are playing was recorded with the Dolby system, the Dolby switch should be placed in the ON position. If it is a non-Dolby tape, the Dolby switch should be OFF. It should be noted that a dolbized tape played on a non-Dolby system will sound somewhat brighter but otherwise is completely compatible.
  - 4) Insert the cassette into the recorder.
  - 5) Depress the RECORD/PLAYBACK button to begin playback.
- NOTE: The position of the RECORD LEVEL controls will have no effect during playback.
- 6) If you wish to interrupt the playback of a cassette for a short time, simply depress the PAUSE button. To resume playing, depress the PAUSE button again.
  - 7) Once the tape has finished playing or if you wish to stop the tape at a point other than the end, depress the STOP/CASSETTE EJECT button. Remove the cassette from the recorder and place it in its container.

## DOLBY ADJUSTMENTS

In order to achieve optimum performance from the Dolby system it may be necessary to adjust the RECORD and PLAYBACK levels of the Dolby system. If this is required we have provided two RECORD ADJUST CONTROLS (left and right) and two PLAYBACK ADJUST CONTROLS (left and right) on the rear panel of the CAD5.

## DOLBY PLAYBACK ADJUST

These controls have been pre-set at the factory and under normal conditions should never have to be re-adjusted. If, however, you should desire to check these playback levels it will be necessary to obtain a special Dolby level set tape. This may be purchased direct from Harman-Kardon at a cost of \$5.95 plus \$0.50 for shipping and handling. Please address your inquiry together with a check for the amount indicated to: Harman-Kardon Inc.

55 Ames Ct.  
Plainview, N.Y. 11803  
Att: Customer Service Dept.

and ask for Dolby level set tape. Complete instructions for the use of this level set tape will be included.

## DOLBY RECORDING ADJUST

Due to the differences in tape from manufacturer to manufacturer, the Record Calibration controls may have to be adjusted to assure optimum performance of the Dolby system with the tape of your choice. After these adjustments have been made, it should not be necessary to readjust unless another brand of tape is used.

The RECORD LEVEL controls in the CAD5 have been adjusted for use with TDK-SD type tape. If any other brand is used the following procedure should be followed.

- 1) Insert a blank tape cassette.
- 2) Turn on the POWER switch.
- 3) Turn off the DOLBY switch located on the front panel and place the STEREO-MONO switch in the STEREO position.
- 4) Select the position of the TAPE switch on the rear panel which corresponds to the type of tape being used.
- 5) Set the tape counter to its zero position.
- 6) Simultaneously depress the RECORD and PLAY/RECORD buttons. The CAD5 will then be recording.
- 7) Push in the DOLBY TEST button located on the rear panel and hold it in this position for approximately 30 seconds.  
NOTE: The position of the RECORD LEVEL controls have no effect while the DOLBY TEST button is used. They may be left in any position.
- 8) Release the DOLBY TEST button and depress the STOP/CASSETTE EJECT button half way down in order to stop the tape.
- 9) Rewind the tape until the zero position is reached on the tape counter.
- 10) Depress the PLAY/RECORD button and play back the tone you have just recorded.

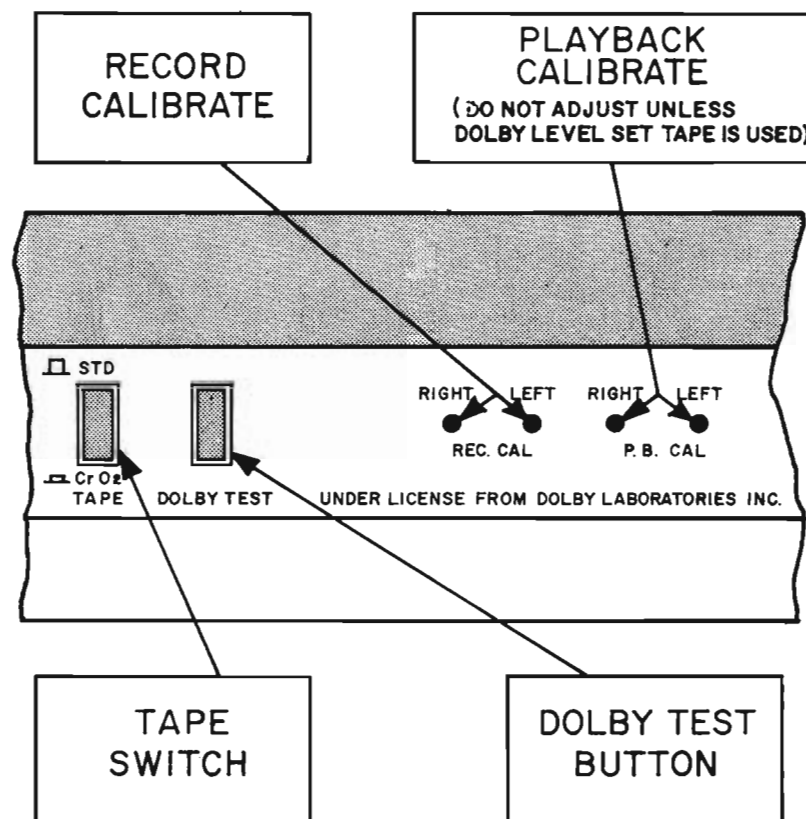
11) Observe the position of the left and right level meters during playback. The optimum level is "O VU". If some level other than "O VU" is indicated by the meters, adjustment is necessary.

12) To make this adjustment, insert a small screwdriver into the corresponding LEFT or RIGHT REC CAL hole in the rear panel and rotate the control slightly clockwise if the level meter indicated less than "O VU" during playback or counterclockwise if the level meter read greater than "O VU".

13) Repeat the entire procedure until a reading of "O VU" is obtained in step 11.

14. The CAD5 is now adjusted for optimum performance of the Dolby system.

15) Note: This procedure must be repeated each time you change brands of tape.



## MAINTENANCE

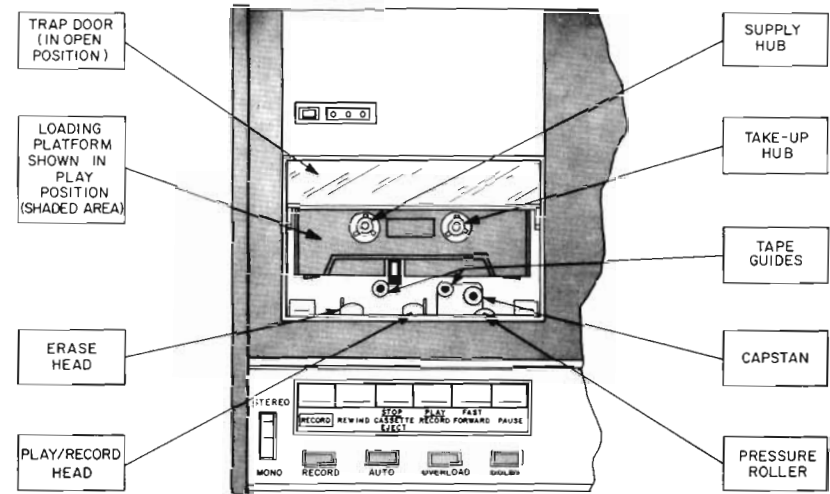
**CLEANING** — In any tape recorder as the tape passes over the tape heads, capstan, pressure roller, and tape guides, small particles of tape oxide are deposited on these parts. After a period of time the tape oxide and other dust particles build up to the point where they become detrimental to the operation and fidelity of the recorder. For this reason it is important that you clean the parts mentioned above with a "Q" tip slightly dampened with isopropyl alcohol (common household rubbing alcohol) after every ten hours of use or less.

**CAUTION:** This is the **ONLY** way to clean the CAD5! **DO NOT** use any other types of alcohol, cleaning fluids, tools, or tape head cleaning cassette. They may seriously damage the heads or the associated drive mechanisms.

**DEMAGNETIZING** — The tape heads, capstan, and tape guides build up a residual magnetic field due to the magnetic field in the tape that passes over them. When the level of magnetism reaches a certain point it will adversely affect your tapes. A demagnetizer may be purchased at a moderate cost from any electronic supplier carrying tape recording accessories. Follow the instructions supplied with the demagnetizer very carefully! It is advisable to demagnetize each time you have finished cleaning the recorder.

**LUBRICATION** — The CAD5 has been fully lubricated at the factory. No other lubrication should be necessary for some time. If lubrication should become necessary at some future date, be sure to have this done by a qualified technician only.

**HUM** — In any high fidelity installation hum may be caused by interconnecting associated equipment. If the addition of the CAD5 to your system is accompanied by previously nonexistent hum, reverse the AC line plug in its socket. If this does not help, you may have defective interconnecting cables or the cables may be located too near a strong AC field, such as a television, power transformer, AC motor, or power lines.



# MAINTENANCE RECORD

In order to keep an accurate record of the maintenance of your CAD5 we have provided this log sheet. Simply note the date and approximate hours of use each time your CAD5 is cleaned or demagnetized.

Date	Approximate Hours of Use	Cleaned	Demagnetized	Date	Approximate Hours of Use	Cleaned	Demagnetized