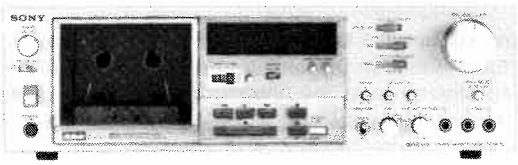
SONY®

STEREO CASSETTE DECK

TC-K81



OPERATING INSTRUCTIONS

Before operating the unit, please read this manual thoroughly.
This manual should be retained for future reference.

OWNER'S RECORD

The model and serial numbers are located at the rear. Record these numbers in the space provided below. Refer to them whenever you call your Sony dealer regarding this product.

Model No. TC-K81 Serial No. _____

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

TABLE OF CONTENTS

FEATURES

Three-head system with S&F (Sendust and Ferrite) heads
Separate record and playback heads with optimum gap and impedance result in distortion-free recording and greatly extended frequency response. Sendust and Ferrite heads provide w[illegible] dynamic range and more durability, and take full advantage of [illegible] new metal tapes. For good tape-to-head contact the heads are mounted in one block, and each head is separately adjusted for precise azimuth alignment. The three-head system also enables you to monitor playback while recording.

Logic-controlled function buttons
"Feather-touch" function buttons controlled by a microprocessor are switched directly from any one mode to another. The record muting button enables you to make a 4-second blank space between selections automatically.

LED peak program meters
The peak meters employ 32 separate LED elements that respond instantly to transient signal peaks over a greater dynamic range from −40 dB up to +8 dB, and are suitable even for extended dynamic range metal tapes. Automatic and manual peak-hold capabilities are provided for more convenient meter reading. This meter is also used for bias and record level calibration.

Metal tape EQ/BIAS position
The increased output level, reduced distortion, added high-frequency response and improved S/N ratio of the new metal tapes are available by the inclusion of this feature.

Bias and record level calibration
Bias current can be adjusted to the optimum level for any tape on the market precisely and effortlessly, which assures the flattest possible response. Furthermore, record level can be calibrated by compensating for the tape sensitivity, which permits optimum [illegible] formance of the Dolby NR system.

Two-motor
Two-motor drive system provides accurate and stable tape transport. A motor for capstan drive is a linear BSL (brushless and slotless) motor having an extremely smooth torque.

Closed-loop dual-capstan tape drive system
Ensures uniform tape tension and stable tape to head contact.

New Dolby IC
Newly-developed Dolby IC further improves the characteristics and reliability of the Dolby NR system.

Timer-activated recording and playback
A timer switch is provided to turn the deck on and off any number of times at any preset time determined by an optional timer.

PRECAUTIONS

On safety

- Operate the unit only on 120 V ac.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- Canadian model only: Removal of the wooden side panels presents a safety hazard. If it becomes necessary to remove them, consult your nearest Sony service facility.

On installation

- Good air circulation is essential to prevent internal heat build-up in the unit. Place the unit in a location with sufficient air circulation.
- Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust or mechanical vibration.
- Place the unit with the front panel facing toward you. Do not operate the unit in an inclined position.

On operation

- If the cassette holder is not closed completely, the function buttons do not operate even with being pressed.
- Do not press the eject button while the tape is running.
- Before turning on the POWER switch, check to see that the timer switch [⏲] is set at OFF. If the power is turned on with this switch set to the REC position, previously recorded material will be erased. The REC and PLAY positions should be used only for timer-activated operation.
- Be sure to set the CAL switch to BIAS or REC LEVEL only when the bias or record level calibration is required.

On head cleaning

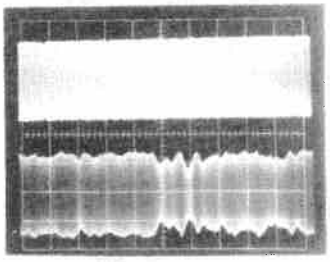
The best performance of your unit is dependent on the periodic cleaning of the heads and all surfaces over which the tape travels. Dirty heads and tape path cause:

Loss of high frequency response
Loss of sound volume
Sound drop-outs

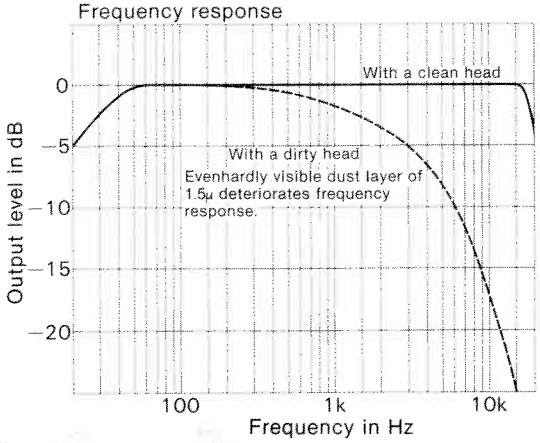
Playback waveform at 10 kHz

With a clean head

With a dirty head (The output level fluctuates.)



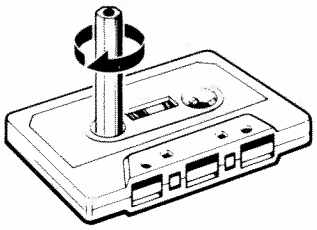
Frequency response



Cleaning should be done every after 10 hours of operation.
For details, see "Maintenance" on page 13.

On cassette

Before inserting a cassette, take up any slack in the tape to prevent it from becoming entangled around the capstan.



If you have any question or problem concerning your unit, please contact your nearest Sony service facility.

FUNCTION OF CONTROLS

The numbers in the photo are keyed to that of each control.

❶ POWER switch
This turns the power on or off. The lamp in the cassette holder and peak program meters will light up when the unit is turned on.

❷ Timer switch [◷]
Automatic recording and playback at any predetermined time is possible using a commercially available timer. For recording, set the timer switch to the REC position ; for playback, set the switch to the PLAY position. See "Timer-activated recording and playback" on page 12.

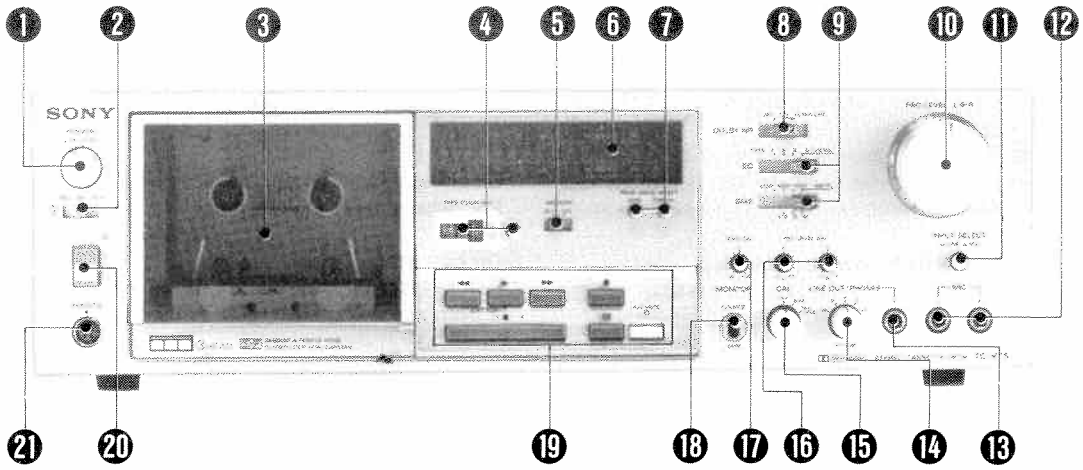
❸ Cassette holder

❹ TAPE COUNTER and reset button
The tape counter is used for numerical reference during recording and numerical indexing of recorded cassettes. To return the numbers to zero, press the reset button.

❺ MEMORY switch
The MEMORY switch is used for precise program relocation, whether at the very beginning of the side or far into the recorded tape. When the cassette is rewound to "000" of the tape counter (actually "999" in order to avoid cutting the starting point of the tape), the tape motion stops and the pressed rewind button is released, or the replay from rewind will begin if the forward button has been pressed together with the rewind button. See "Memory stop/play" on page 10.

❻ LED peak program meters
With the MONITOR selector set at SOURCE, the meters show the recording level of each channel, and at TAPE, the meters show the recorded levels of the tape.
The peak program meter follows the transient peaks of occasional high level inputs that cannot be followed by conventional VU meters, assuring accurate recording level adjustment.
For easy reading, the indication of the highest peak level will be held on the meter scale, while varying levels lower than the peak are separately indicated on the meter.
Also, observe these meters for adjusting the calibration level. At this time, one segment is about 0.5 dB. See "BIAS/REC LEVEL calibration" on page 11.

❼ PEAK HOLD RESET buttons
You can choose the peak level indication in two ways.
By pressing the **AUTO** button, the peak level indication is held for about 1.7 seconds and then a new peak level will be indicated automatically on the meter. To release this button, press the MANUAL button.
By pressing the **MANUAL** button (non-locking), the peak level indication is reset and will not be held until you release the button. After releasing the button, the highest peak level is held on the meter until a higher signal level occurs. This peak level indication is useful to show the highest level in the tape or disc copy, or to know the highest peak level as well as the varying levels in live recording.



⑧ DOLBY NR switch

Through the Dolby* NR (Noise Reduction) recording/playback process, tape hiss (high-frequency noise inherent in any tape) is reduced and signal-to-noise ratio is improved.

During recording, low-level high-frequency signals which may be either partially or totally concealed by tape noise, are boosted, thereby allowing the recorded material to be heard above the tape hiss level.

During playback, the same boosted signals are automatically reduced returning the recorded material to the actual levels at which it started. Simultaneously, the noise level which was mixed with the recorded material is also reduced in volume, eliminating much of the background noise from these low-level high-frequency passages.

With Dolby NR process

ON : Use this position only when recording FM stereo broadcasts. The multiplex filter eliminates the 19 kHz pilot signal and the 38 kHz subcarrier, carried on FM stereo broadcasts, which otherwise may affect the Dolby characteristics. This position is also used for playing back any Dolby recorded tape.

FILTER OFF : For recording programs other than FM stereo broadcasts, such as discs or miked programs. This position is also used for playing back any Dolby recorded tape.

Without Dolby NR process

Set the switch to the OFF position in recording and playback modes.

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

⑨ Tape select switches [EQ, BIAS]

EQ : Select the correct equalization characteristics for the tape to be used in both recording and playback modes.

BIAS : Select the optimum bias current for the tape to be used in the recording mode. This switch does not affect playback.

See "Tape BIAS/EQ recommendations" on page 9.

⑩ REC LEVEL controls

These controls adjust the recording level. The inner knob is for the right channel and the outer for the left channel.

⑪ INPUT SELECT switch

For recording through the MIC jacks, push this switch [⊥⊓ MIC]. For recording through the LINE IN jacks, release it by pushing it again [⊓ LINE].

⑫ MIC jacks

Any low-impedance microphone equipped with a phone plug may be used. If your microphone is equipped with a mini plug, an adaptor for converting to phone plug is required.

⑬ Headphones jack

Headphones may be inserted to monitor the input and recorded signals. Headphone volume is adjustable with the LINE OUT/PHONES level control.

⑭ LINE OUT/PHONES level control

This control governs the output level of the VARIABLE LINE OUT jacks as well as the headphone level. At "0" position, the output level of the VARIABLE LINE OUT jacks is rated at 0.435 V and the headphone level is rated at 77.5 mV (at a load impedance of 8 ohms).

When this control is set to the "3" position, the level is reduced by 3 dB, and by setting it to "6", "12", or "24", the level is reduced by 6 dB, 12 dB, or 24 dB, from the rated output obtained at the "0" position.

This control has no relation to the peak program meters and the output level of the FIXED LINE OUT jacks.

⑮ CAL switch

This switch is used to oscilate the 8 kHz and 400 Hz bias calibration signals at BIAS position and 400 Hz record level calibration signal at REC LEVEL. With this switch at BIAS or REC LEVEL position, input and output signals are cut off internally.

For normal operation, set this switch to OFF. Do not forget to return it to OFF after calibrating the bias and record level.

⑯ REC LEVEL CAL controls

To compensate precisely for the tape sensitivity, adjust the peak program meters with these controls (L and R) to read the REC CAL point, at which point one red LED lights, while recording the 400 Hz calibration signal with the CAL switch at REC LEVEL position.

The center "0" position of these controls is adjusted with Sony HFX, EHF, FeCr and METALLIC cassettes.

⑰ BIAS CAL control

To adjust precisely for the optimum bias current, adjust the peak program meters with this control so that the upper meter which shows playback level of the 8 kHz calibration signal and the lower meter which shows that of the 400 Hz calibration signal deflect to the same point, while recording these signals with the CAL switch at BIAS position. Opimum bias current for any kind of tape is thus obtained.

The center "0" position of this control is adjusted with Sony HFX, EHF, FeCr and METALLIC cassettes.

After calibrating the bias current, compensate for the tape sensitivity.

⑱ MONITOR selector

For recording level adjustment, set this selector to SOURCE, and for playback, set it to TAPE. While recording, the TAPE position monitors the recorded sounds and SOURCE position monitors the sounds to be recorded (source material).

⑲ Function buttons

Direct changing from one mode to another mode is possible. The modes of forward, record and pause are indicated by the illumination of a corresponding lamp.

Rewind button [◀◀]: Press this button to rewind the tape. If pressed together with the forward button, auto play or memory play is possible. See page 10.

Forward button [▶]: Press this button for playing back the tape. For recording, press this button while depressing the record button.

Fast-forward button [▶▶]: Press this button for fast winding of the tape.

Record button [●]: To start recording, while depressing this button, press the forward button.

Stop button [■]: To stop the tape motion, press this button. When a tape is entirely wound in any operating mode, the engaged mode will be shut off automatically.

Pause button [▮▮]: To momentarily pause during recording or playback, press this button. To restart, press it again. Also use this button for releasing the record muting mode. See page 10.

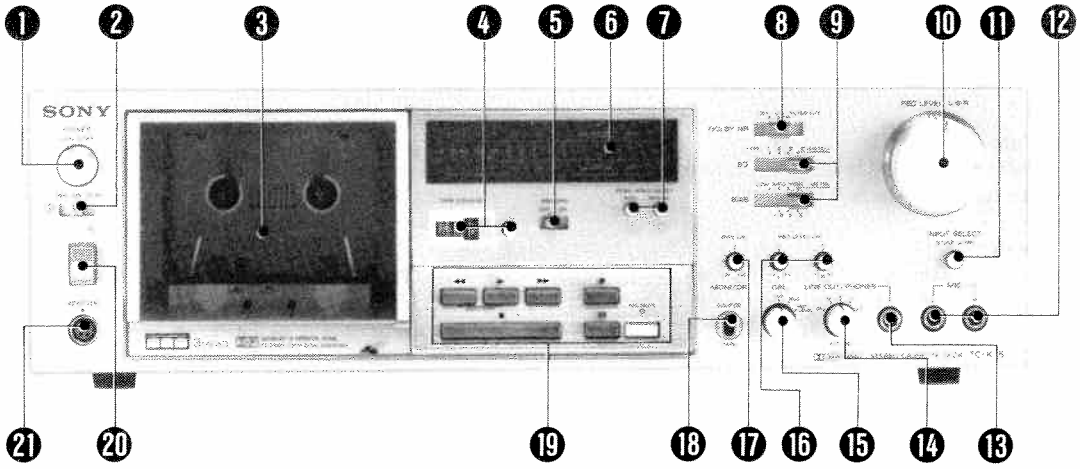
REC MUTE button [○]: Press this button to eliminate unwanted programs and provide an interspacing during recording. The tape movement will pause automatically after four seconds. To provide blanks under four seconds, press this button, and then the pause button after the desired shorter interval to release it. To provide blanks over four seconds, hold this button pressed until the desired interval is secured. Press the pause button to release it. See "Record muting operation" on page 10.

⑳ Eject button [⏏]

Press this button to open the cassette holder. Do not press this button while the tape is in motion, since this may damage the tape.

㉑ REMOTE control jack

Connect the optional remote control unit RM-50 for remote control operation of tape transport functions. The tape deck function buttons are also operative while the remote control is connected. Read the RM-50 instruction manual before using.



CONNECTIONS

- Turn off the amplifier before making connections.
- Be sure to insert the cable connectors firmly into the jacks. Loose connections may cause hum and noise.
- The red plug of the supplied connecting cord should be connected to the red jack (R : right channel) and the other plug to the white jack (L : left channel).

LINE OUT jacks

Either the FIXED or VARIABLE LINE OUT jacks can be used.

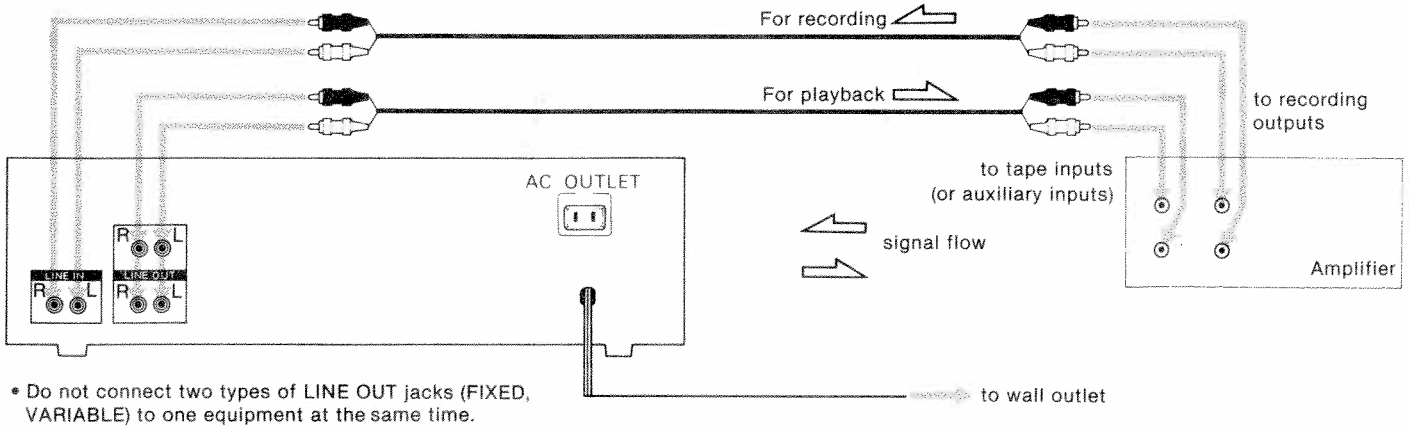
FIXED : The output level is fixed regardless of the adjustment of the LINE OUT/PHONES level control.

VARIABLE : The output level can be varied with the LINE OUT/PHONES level control. We recommend that you use these jacks if you want to match the output level of the tape deck with that of other source equipment connected to the amplifier.

AC OUTLET UNSWITCHED 300 W

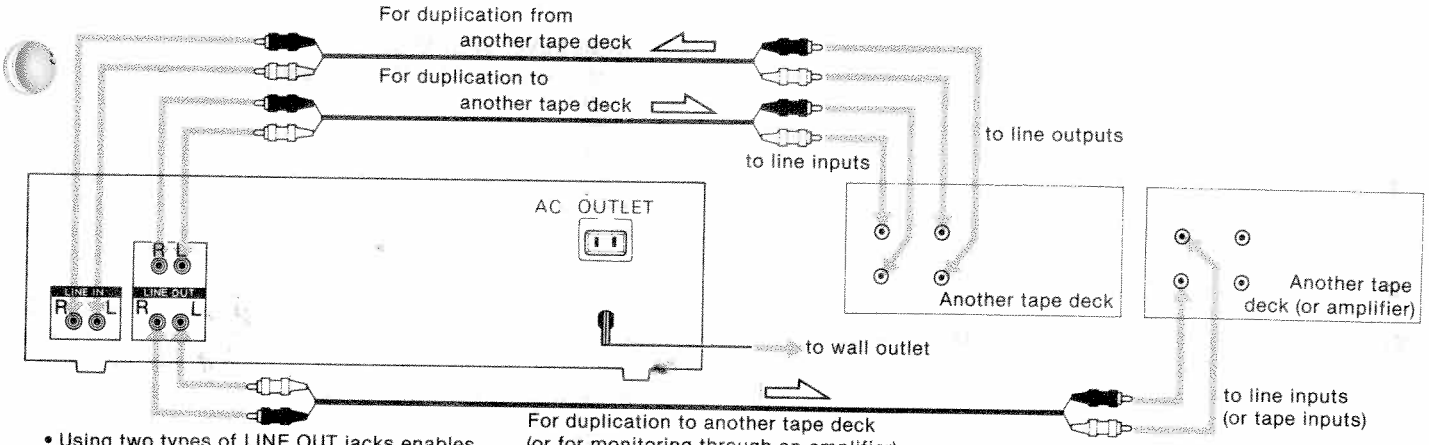
Use to supply ac power to other audio components. This outlet is independent of the tape deck POWER switch. Maximum rated capacity is 300 W.

Amplifier connection



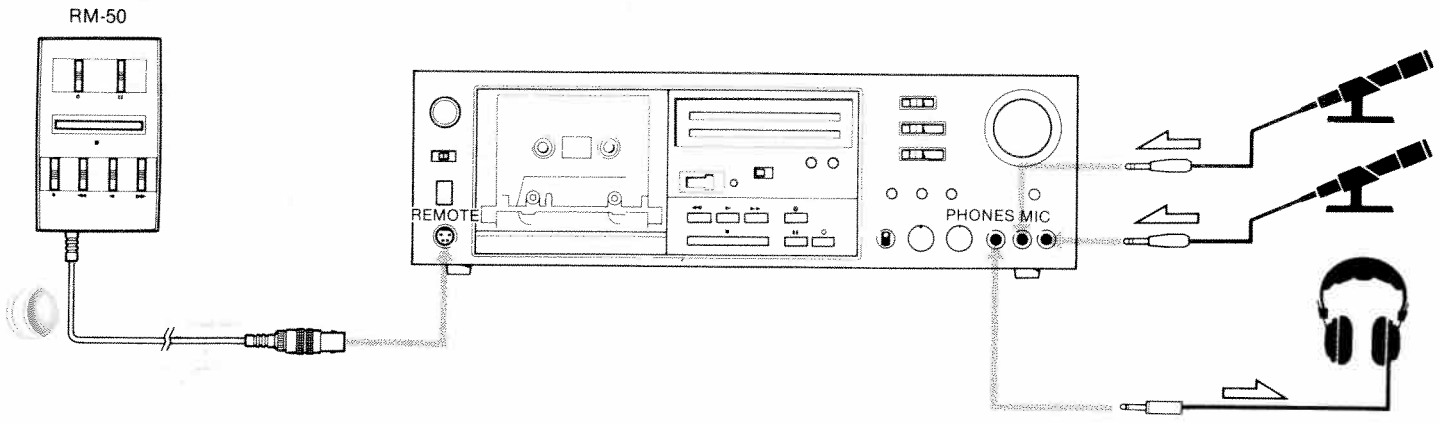
• Do not connect two types of LINE OUT jacks (FIXED, VARIABLE) to one equipment at the same time.

Tape duplication connection



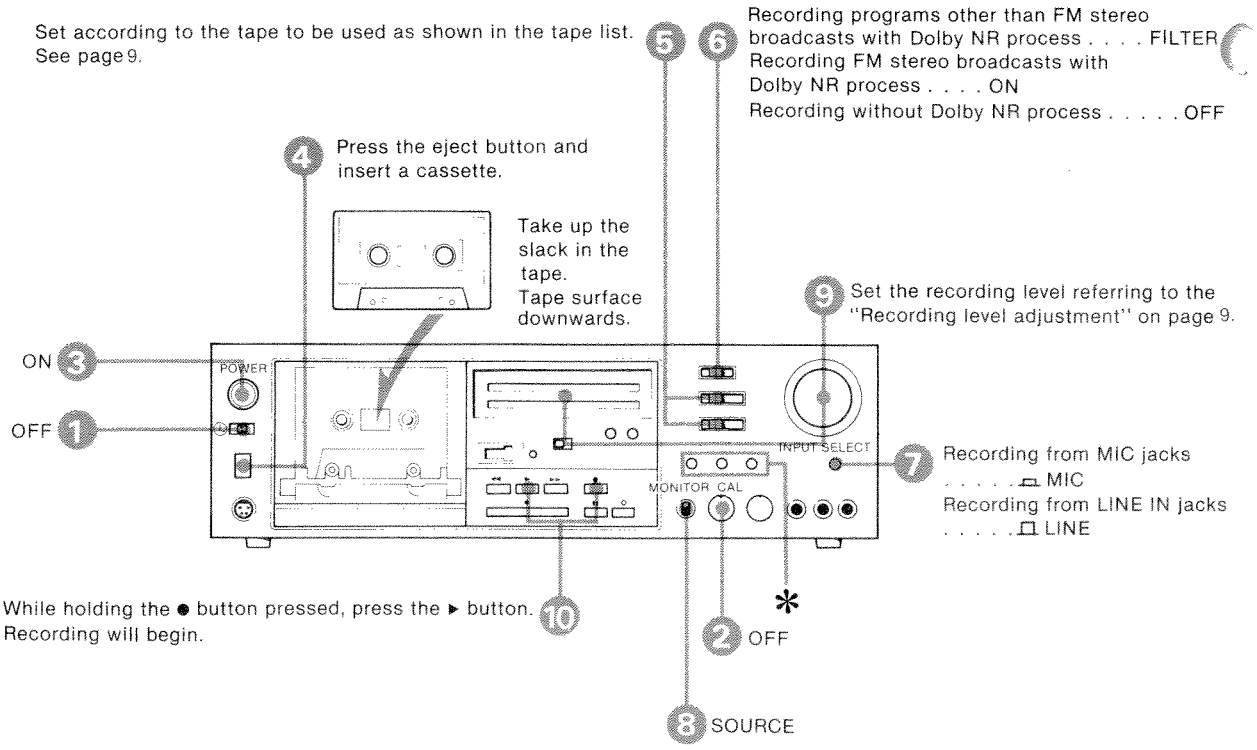
• Using two types of LINE OUT jacks enables you to duplicate a tape on two decks or to duplicate while listening through an amplifier.

Connection on front panel



RECORDING

Follow the numbered diagram to begin recording.



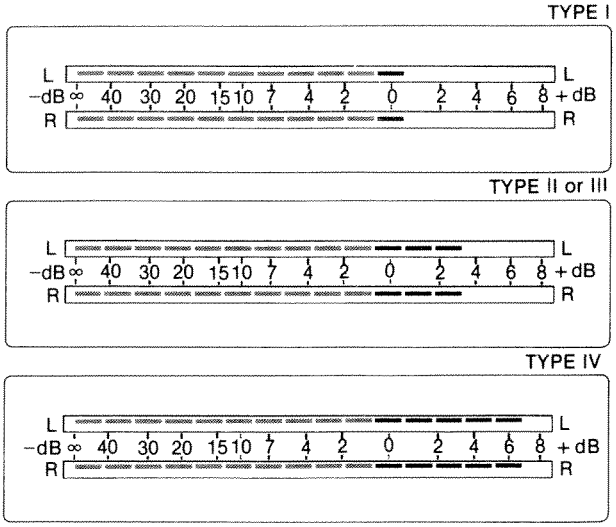
* The above diagram illustrates the recording procedure without calibration. When the BIAS CAL and REC LEVEL CAL controls are set to the "0" position, the operation is the same as that used by conventional tape decks which have no calibration system.
After understanding the basic operation, see "BIAS/REC LEVEL calibration" on page 11 to take full advantage of the tape to be used.
If you already know the optimum settings of both CAL controls for the tape to be used, set the controls to that position before starting to record.

RECORDING NEW MATERIAL WHILE THE TAPE IS RUNNING

To change directly from play to record during playback mode, press the record button while holding the forward button pressed. This operation is useful for after-recording of new material (in spaces made by record muting operation) or re-recording in your dissatisfied spot on a recorded tape.

RECORDING LEVEL ADJUSTMENT

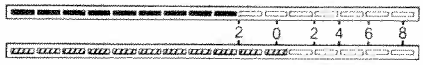
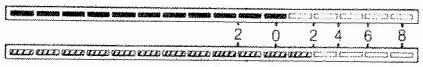
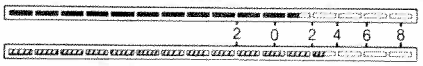
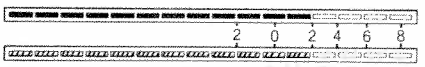
The recording level is adjusted while reading the input level of program source to be recorded on the peak program meter.
The peak program meter instantaneously registers the input signal level while a conventional VU meter has a lag so that it many times does not accurately reflect a strong input of short duration.
This difference in response time is reflected in the different scales of the VU meter and the peak program meter. The −4 dB point on the peak program meter scale corresponds to the 0 VU point on a VU meter scale.
The recording level should be set as high as possible while still avoiding distortion, and this will depend on the type of tape being used. Generally, the recording level is properly set for TYPE I cassettes when the peak program meters deflect to about **0 dB** at the highest signal level ; to about **+ 2 dB** for TYPE II cassettes ; to about **+ 4 dB** for TYPE III cassettes and to about **+ 6 dB** for TYPE IV cassettes.



If the meters deflect continuously the full scale, the setting is too high and will result in distorted recording. If the meters deflect only to about −10 dB, the setting is too low and this will result in noisy recording. However, when recording programs containing strong, sharp pulses, the level may be too high if adjusted in this way, and distorted tapes could result.

Since tape maximum output level of any tape is lower in the higher frequencies than in the lower frequencies, tape saturation at the higher frequencies occurs at lower input levels. Consideration has to be given to the program source to be recorded and to the characteristics of the cassette to be used, since each cassette, even cassettes with the same type tape, has different characteristics.

The following table will give you a starting point in setting the recording level of various kinds of programs using Sony cassettes.

Type of tape	Sony cassettes	mid and high freq. range programs (piano, guitar, etc.) / low and mid freq. range programs (vocal, etc.)
TYPE I	LNX	
	HFX	
	SHF	
TYPE II	EHF	
TYPE III	FeCr	
TYPE IV	METALLIC	

Note

The peak program meters show the input level during recording and the recorded level during playback. If the recording results in distortion at higher levels, when the recording is played back the meter still indicate these distorted passages at lower levels than the actual input levels.

TAPE EQ/BIAS RECOMMENDATIONS

The following list shows our recommended settings, which have been determined through critical listening tests and electrical characteristic measurements, on commercially available cassettes. These settings may be changed to adhere to your personal preference.

For Sony cassettes, be sure to use the recommended settings to obtain the optimum tape characteristics.

Tapes (C-60 and C-90)	BIAS	EQ
AMPEX : 371 PLUS BASF : PERFORMANCE FUJI : FL SCOTCH : DYNARANGE TDK : D	LOW	TYPE I
SONY : SHF, HFX, LNX AMPEX : GRAND MASTER I BASF : PROFESSIONAL I FUJI : FX-I MAXELL : LN, UD, UD-XLI MEMOREX : MRX3 SCOTCH : MASTER I TDK : AD	MED (I/III)	TYPE I
SONY : EHF AMPEX : GRAND MASTER II BASF : PROFESSIONAL II FUJI : FX-II MAXELL : UD-XLII MEMOREX : CrO_2 SCOTCH : MASTER II TDK : SA	HIGH	TYPE II
SONY : FeCr BASF : PROFESSIONAL III SCOTCH : MASTER III	MED (I/III)	TYPE III
SONY : METALLIC Other metal tapes	METAL (IV)	TYPE IV (METAL)

For adjusting the bias current more precisely to the optimum level, see "BIAS/REC LEVEL calibration" on page 11.

RECORD MONITORING

As this tape deck has separate record and playback heads, instantaneous source/tape comparison during recording is possible with the MONITOR selector.

SOURCE : Source sound is heard.

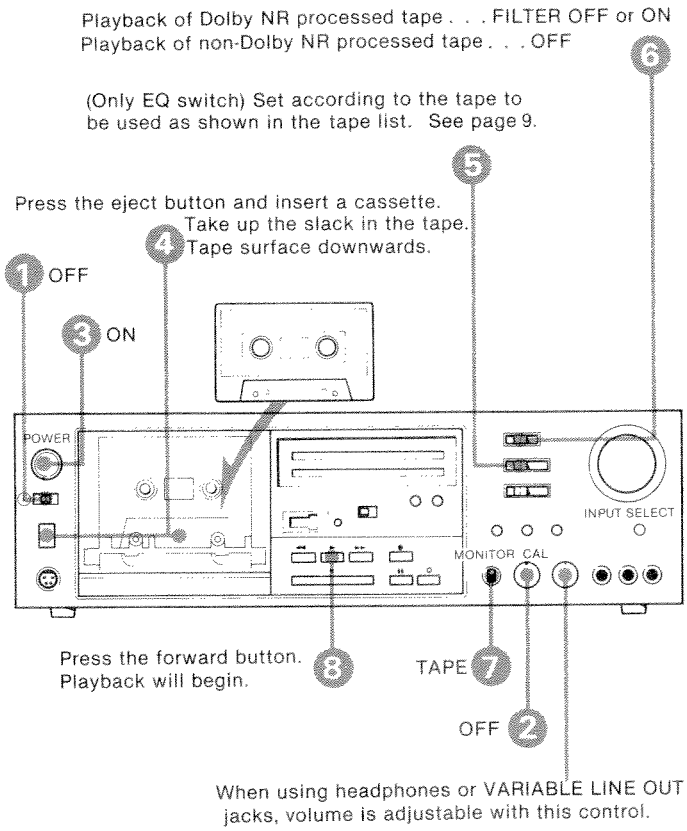
TAPE : Recorded sound is heard.

If the amplifier connection is made through tape deck LINE IN and LINE OUT jacks, and the connected amplifier has a tape-monitor selector, source/tape comparison is possible with the amplifier monitor selector. In this case, the tape deck MONITOR selector should be set at TAPE.

● While recording with a microphone, headphone monitoring is advisable because speaker monitoring may cause a howling effect.

PLAYBACK

Follow the numbered diagram to begin playback.



ERASING

When the tape deck functions in recording mode, the erase head operates and any previously recorded material is automatically erased.

To erase the recorded contents without recording :

❶ Make sure that the tab of the cassette is intact or is replaced by cellophane tape.

❷ Set the REC LEVEL controls fully to "0". (Disconnection of all of the inputs will result in a more complete erasure.)

❸ Set the BIAS switch according to the type of tape to be erased. (METAL position assures good erasing for any type of tape.)

❹ While holding the record button pressed, press the forward button.

RECORD MUTING OPERATION

By pressing the REC MUTE button during recording, four seconds' interspacing is provided automatically, eliminating unwanted program material such as broadcasting commercials. While the record muting is operating, the incoming signal is not recorded on the tape but it continues to register on the meters and feed to the monitor so that you know exactly what is going on.

❶ When the desired program is finished, press the REC MUTE button. The indicator of the pause button blinks on and off, and the tape path will pause automatically after four seconds.

❷ Just before the desired program starts again, press the pause button again to release it. Now the recording will begin again. Repeat these steps as required.

For blanks under four seconds

Press the REC MUTE button, and then the pause button after the desired shorter interval. The record muting mode will be released and recording will start.

For blanks over four seconds

Hold the REC MUTE button pressed until the desired blank interval is secured. Stop pressing the REC MUTE button in order to pause. Press the pause button to start recording.

MEMORY STOP/PLAY

The MEMORY switch is used for precise program re-location whether at the very beginning of the side or far into the recorded tape.

❶ Locate a desired starting point and press the reset button to register this point ("000" shown).

❷ Set the MEMORY switch to ON.

❸ Record or play back the tape.

❹ Rewind the tape in either of the following ways:

• To rewind the tape so that it automatically stops at the memory setting (memory stop), press the rewind button.

• To automatically play the tape from rewind (memory play), press both rewind and forward buttons simultaneously.

At the tape counter reading "999" (one point before the "000" in order to avoid cutting off the starting point of the tape), auto stop or auto play will activate according to the function button setting.

Notes

● To rewind the tape further than the "999" point, press the rewind button again.

● If you keep pressing the rewind button all the way to "999", the tape does not stop (or does not replay) at the tape counter reading "999".

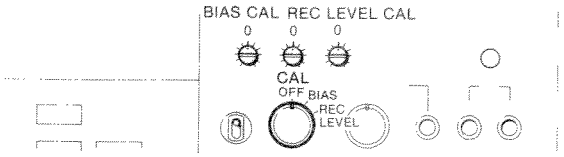
AUTO PLAY

With the MEMORY switch set at OFF position, auto play from the tape beginning right after rewind mode is possible. To rewind the tape, press the rewind button together with the forward button. After the tape is rewound completely, rewind mode is disengaged and the tape repeats to play automatically.

BIAS/REC LEVEL CALIBRATION

Precise and accurate adjustment to the optimum recording characteristics for each cassette to be used is possible by the bias calibration and the record level calibration. The TC-K81 is adjusted at the factory with Sony HFX, EHF, FeCr and METALLIC cassettes. When using other cassettes than these, or to adjust the bias current and compensation for tape sensitivity even more precisely, you should calibrate the bias and record level. At that time first adjust the bias current to the optimum level and then compensate for tape sensitivity.

While the CAL switch is set at BIAS or REC LEVEL, the input and output signals are cut off internally. No sound is heard from the headphones or speakers whatever the position of the MONITOR selector may be.



BIAS CALIBRATION

For adjusting the bias current to the optimum level which results in the best possible frequency response, proceed as follows.

❶ Insert the cassette to be recorded.

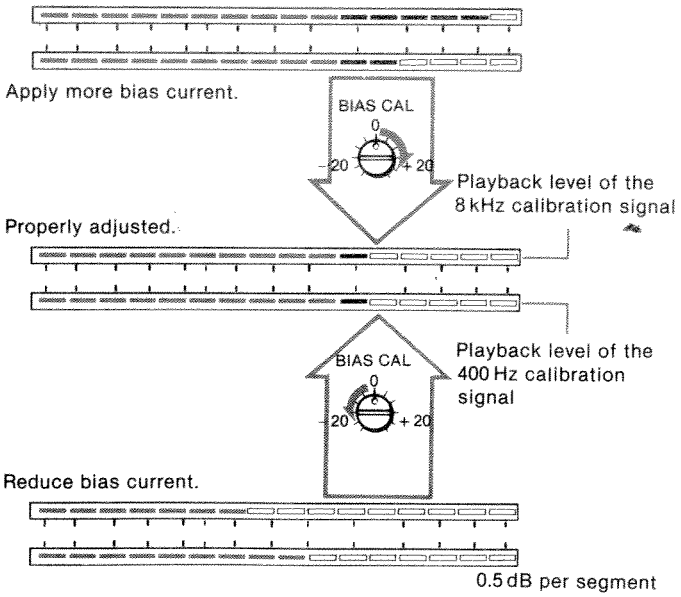
❷ Set the tape select switches (EQ, BIAS) properly according to the type of tape.

❸ Set the CAL switch to BIAS. The 8 kHz and the 400 Hz calibration signals are then produced.

❹ Record the calibration signals by pressing the record button and the forward button.

The upper peak program meter shows the playback level of the 8 kHz signal and the lower that of the 400 Hz signal, whatever the position of the MONITOR selector may be.

Adjust the BIAS CAL control so that both peak program meters deflect to the same point.



● As small variations in bias amplitude have practically no affect on the frequency response of metal tape, the optimum bias setting may not be obtained simply by setting ±20% bias amplitude.

REC LEVEL CALIBRATION

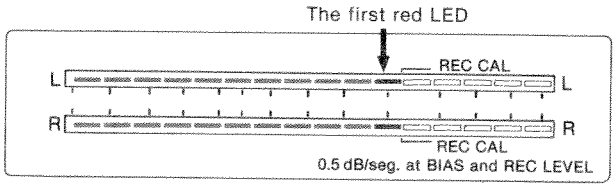
The Dolby characteristics are optimised by a correct record-playback Dolby level setting which is adjusted by compensating for tape sensitivity. By adjusting the calibration level in the following way, the tape sensitivity is automatically compensated for. Be sure make this adjustment after calibrating the bias current, as turning the BIAS CAL control also changes this level.

❶ Set the CAL switch to REC LEVEL. The 400 Hz calibration signal is then produced.

❷ Record the calibration signal by pressing the record button and the forward button.

The peak program meters show the playback level of this signal whatever the position of the MONITOR selector may be.

❸ Adjust the REC LEVEL CAL controls (L and R) so that the peak program meters (L and R) deflect to the "REC CAL" point, at which point the second red LED just goes out and one red LED lights.



0.5 dB per segment

Now, the bias current is adjusted to the optimum level and the compensation for the tape sensitivity is completed. **Be sure to set the CAL switch to OFF.** Otherwise, the input signals continue to be cut off internally.

In order to erase recording of calibration signals, rewind the tape back and then start recording.

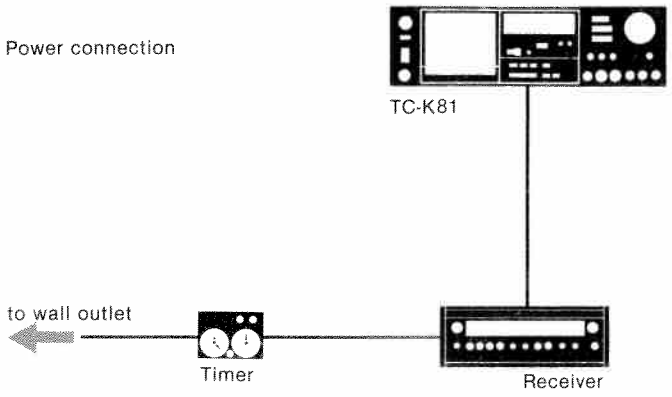
TIMER-ACTIVATED RECORDING AND PLAYBACK

Automatic recording and playback at any desired time is possible using a commercially available timer. Continual operation may be accomplished with a timer designed to turn the deck on and off any number of times.

● Timer operation differs with various models. Before using, read the instruction manual of the timer carefully.

Recording

❶ Make the power connection between the tape deck, receiver and timer. Set the timer so that power is applied to the connected equipment.



❷ Turn on the receiver, and tune in the station of the program to be recorded.
❸ Set the tape deck timer switch [⏲] to OFF.
❹ Insert a cassette. Note that erasure-proof tabs are intact or replaced by plastic tape.
❺ Turn on the tape deck and adjust the recording level.
❻ Set the timer for the desired time. (At this stage, power is interrupted to all the connected equipment.)
❼ Set the tape deck timer switch to REC. The tape deck is now ready for automatic start of recording at the timer-set time.

Playback

❶ The power connection for playback is the same as that for recording.
❷ Set the tape deck timer switch to OFF.
❸ Insert the recorded tape.
❹ Turn on the tape deck, and set the receiver switches for playback.
❺ Set the timer for the desired time. (At this stage, power is interrupted to all the connected equipment.)
❻ Set the tape deck timer switch to PLAY. The tape deck is now ready for automatic start of playback at the timer-set time.

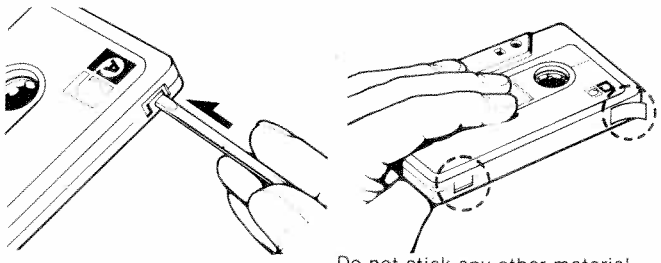
Note

The timer switch is designed to trigger the timer-activated operation for the first time after the power is on, and is inoperative when the operation sequence is reversed. However in the latter case, if a moderate time (more than 3 seconds) is not allowed after the power is on, the timer switch may mistrigger the timer operation.

NOTES ON CASSETTES

To protect cassettes from accidental erasure

Remove the tab as illustrated so that the record mode does not function when the record button is pressed. To record on a cassette once tabs have been removed, simply cover the slot with cellophane or vinyl tape.



To protect side A recording

Do not stick any other material except on the portion marked.

Cassette care

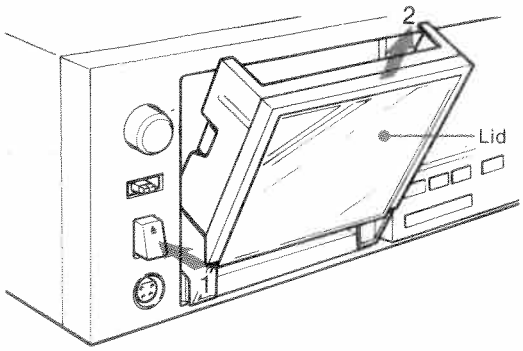
● Avoid touching the tape surface of a cassette, as any dirt or dust may cause contamination of the heads.
● Do not stick thick paper or tape into the cassette, as this may affect proper cassette alignment and prevent proper tape contact with the head.
● Protect cassettes from dust by storing them in their cases. Even minor dirt or dust could cause contamination of the heads resulting in noise and sound drop-outs.
● Keep cassettes away from magnetic equipment such as speakers, amplifiers, etc., as erasure or distortion on your recorded tape could occur.
● Do not expose a cassette to direct sunlight, extremely cold temperature or moisture.
● Avoid fast-winding just before storing a cassette tape, as this may cause stretching of the tape edge if the cassette is left unu over a period of time.

MAINTENANCE

Cleaning of heads and tape path

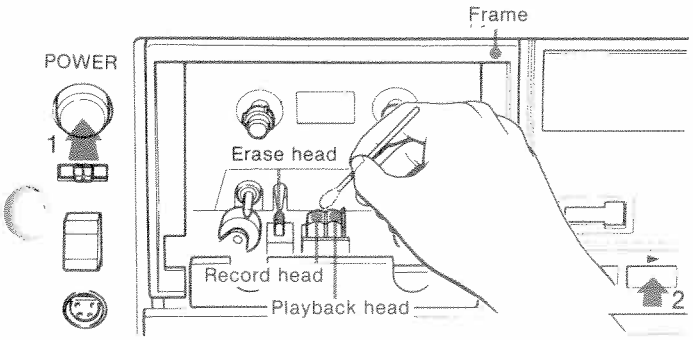
Generally, cleaning after every 10 hours of operation will be sufficient. However, for the highest quality recordings, clean all surfaces over which the tape travels prior to every recording.

❶ Depress the eject button to open the cassette holder and remove the lid.

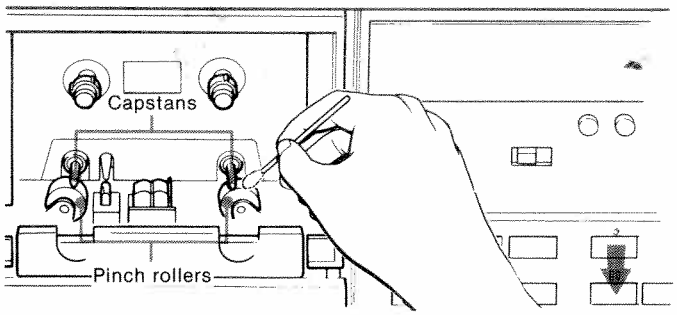


❷ Push the frame in.

❸ Set the POWER switch to ON and press the forward button. Wipe the heads using a cleaning tip slightly moistened with alcohol.

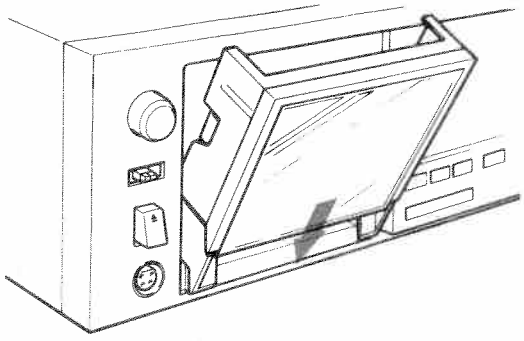


❹ Wipe the pinch rollers as illustrated. Then press the pause button and wipe the capstans.



❺ When the cleaning is finished, press the pause button and then the stop button.

❻ Press the eject button to open the frame, and replace the lid.



● After cleaning the heads and tape path, do not insert a cassette until the cleaning fluid has dried completely.

Demagnetizing heads

Residual magnetism will gradually build up on the heads through continuous use and cause erasure of high frequencies and hiss build-up. The heads and metallic parts of the tape path should be demagnetized after 20 to 30 hours of operation with the use of a commercially available head demagnetizer.

Be sure the unit is turned off while demagnetizing the heads and tape path.

Cleaning the cabinet

Clean the cabinet, panel and controls with a soft cloth lightly moistened with mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

Inside check

Consult your nearest Sony service facility to maintain optimum performance.

SPECIFICATIONS

Recording system 4-track 2-channel stereo

Fast-forward and rewind time
Approx. 80 sec. (with C-60)

Bias frequency 105 kHz

Signal-to-noise ratio DOLBY NR OFF
- With TYPE III cassette (Sony FeCr)
  60 dB at peak level
- With TYPE II cassette (Sony EHF)
  58 dB at peak level

DOLBY NR ON
Improved by 5 dB at 1 kHz, 10 dB above 5 kHz

Total harmonic distortion
0.8% (with Sony METALLIC and FeCr cassette)

Frequency response DOLBY NR OFF
- With TYPE IV cassette (Sony METALLIC)
  20 - 20,000 Hz
  30 - 18,000 Hz (±3 dB)
  30 - 13,000 Hz (±3 dB, 0 VU recording)
- With TYPE III cassette (Sony FeCr)
  20 - 20,000 Hz
  30 - 18,000 Hz (±3 dB)
- With TYPE II cassette (Sony EHF)
  20 - 19,000 Hz
  30 - 17,000 Hz (±3 dB)
- With TYPE I cassette (Sony HFX)
  20 - 17,000 Hz
  30 - 15,000 Hz (±3 dB)

Wow and flutter 0.04% WRMS

Inputs
Microphone inputs (phone jacks)
Sensitivity 0.25 mV (−70 dB)
for a low-impedance microphone
Line inputs (phono jacks)
Sensitivity 77.5 mV (−20 dB)
Input impedance 50 k ohms

Outputs
Variable line outputs (phono jacks)
Maximum output level 0.435 V (−5 dB)
at load impedance 50 k ohms
with LINE OUT level control at "0"
Variable range of output level −5 to −29 dB (5 steps)
Load impedance over 10 k ohms
Fixed line outputs (phono jacks)
Output level 0.435 V (−5 dB) at load impedance 50 k ohms
Load impedance over 10 k ohms
Headphone output
Variable range of output level −20 to −44 dB (5 steps) at load impedance 8 ohms

General

Power requirements 120 V ac, 60 Hz

Power consumption 26 watts

AC outlet Unswitched 300 W

Dimensions U.S.A. model :
Approx. 430 × 130 × 290 mm (w/h/d)
(17 × 5 1/8 × 11 1/2 inches)
Canadian model :
Approx. 460 × 130 × 290 mm (w/h/d)
(18 × 5 1/8 × 11 1/2 inches)
including projecting parts and controls

Weight U.S.A. model : Approx. 6.3 kg (13 lbs 14 oz)
Canadian model : Approx. 7 kg (15 lbs 7 oz)

Supplied accessories
Connecting cord 2
Head cleaning tips ..... 1 set

LED peak program meters

Response range −40 dB to +8 dB

Frequency response 20 Hz - 20,000 Hz ±1.5 dB

Response time 1 millisecond

Decay time (from 0 dB to −20 dB)
750 milliseconds

Overshoot None

Indicator elements 16 elements for each channel

Design and specifications subject to change without notice.

TROUBLE CHECKS

The following checks will assist in the correction of most problems which you may encounter with your unit.
Before going through the check list below, first pay attention to the following fundamental points.
- The power cord must be connected firmly.
- Connection to the amplifier must also be firm.
- Heads, capstan and pinch roller should be cleaned.
- The amplifier controls and switches should be set correctly.

FUNCTION BUTTONS AND TAPE PATH

The function buttons do not activate right after the POWER switch is turned on.
- Logic-controlled function buttons operate approximately four seconds after the POWER switch is turned on.

Recording or playback begins as soon as the POWER switch is turned on.
- The timer switch is set at either REC or PLAY.

The record button does not activate.
- No cassette in the holder.
- The tab is removed from the cassette.

Tape running noise is loud in rewind or fast-forward mode.
- This situation depends upon the cassette used and not a problem.

The automatic shut-off mechanism activates before the end-of-tape.
- The tape is slack.
- The MEMORY switch is set to ON.
- This situation may also be caused by the cassette used.

RECORDING OR PLAYBACK

Recording or playback cannot be made or there is a decrease in sound level.
- The CAL switch is set to BIAS or REC LEVEL.
- When playing back, the MONITOR selector is set to SOURCE.
- Dirty heads.
- Magnetic contamination or build-up on the record and playback heads.
- Improper connection.
- Improper setting of the amplifier controls.

Excessive wow or flutter or drop-out
- Contamination of the capstan or pinch roller.

Insufficient erasure
- Magnetic contamination of the erase head.

Increase of noise or erasure of high frequencies
- Magnetic build-up on the head.

Unbalanced tone in higher frequencies
- Improper setting of the DOLBY NR switch. If recorded with the switch set to ON, play back with it at ON. If recorded with it set to OFF, play back with it at OFF.
- Improper setting of the tape select switches. See page 9. If recorded in the wrong position, adjust the tone of the amplifier in playback.
- Improper adjusting of the BIAS CAL or the REC LEVEL CAL controls.

HOWLING OR HUM NOISE

Oscillation occurs when trying to record from the amplifier.
- Amplifier input selector is set at AUX position while the unit is connected to amplifier AUX jacks. Change the amplifier input selector to the recording source position.

Oscillation occurs when trying to record from microphones.
- The microphone is too near the speaker. Keep the microphone away from the speaker or reduce the amplifier volume.

Hum noise
- The tape deck is stacked just on or below the amplifier.

Should any problem persist after you have made these checks, consult your nearest Sony service facility.

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