

SONY

STEREO CASSETTE DECK

TC-K777



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 dealer regarding this product.

Model No. TC 677

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.

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FEATURES

Three-head system with S & F (Semi-autom and Ferrite) heads

Separate record and playback heads allow optimum gap settings and impedance settings for distortion-free recording and greatly enhanced frequency response. Semi-autom and Ferrite heads take full advantage of metal tapes to provide a wider dynamic range than is possible with conventional tapes. For great tape-to-tape 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 the recorded tape while actually recording.

Cassette-tape dual-capstan-tape drive system

Two pairs of capstans and pinch rollers ensure uniform tape tension and stable tape-to-head contact. As a result, wow and flutter and modulation noise are greatly reduced.

Very stable tape speed

The motor for the capstan and reel drives are linear torque DC, brushless and velocity motors with an extremely smooth torque. The speed of the capstan motor is regulated by a crystal oscillator. The shaft of the capstan motor drives the tape directly to eliminate any fluctuation in the tape speed which might be caused by belt-drive idlers.

Wide and accurate level calibration

Level control can be precisely adjusted to the optimum level for any tape on the market, assuring the fullest possible frequency response. Furthermore, the sensitivity of the tape can be compensated for, permitting optimum performance of the built-in level system.

High-quality amplifier section

The TC-1111 incorporates an amplifier design which assures that fidelity goes to the 20 region.

The recording section and the playback section of the right and left channels are physically separated with the signal paths of the right and left channels parallel at all times, and the channel circuits themselves are well separated to eliminate interference.

The electronic components used in the TC-1111 have been carefully selected to provide the highest possible sound quality. An example is the precision-machined enclosed gears and the use of a newly-developed steel PET.

Multipurpose display monitor

Only pertinent information is indicated on the display monitor as recording level adjustment and record level calibration are completed.

An electronic tape counter provides a guide as to how much recording time is left.

Useful functions

▶ **Efficient mating function** allows you to easily insert a moderately long blank space between sections.

▶ **Auto stop** permits one stop record and playback from the beginning of the tape and the memory function allows you to readily locate any desired point on the tape.

▶ **Remote control operation** is possible using the optional RM-50 or RM-60 remote-control unit.

▶ A **clear switch** is provided to turn the deck on and off any number of times at a preset time set on an optional timer.

PRECAUTIONS

On safety

- ▶ Operate the unit only on AC if an.
- ▶ Do not plug any power-cable or liquid into the cabinet, unless the unit and have it checked by qualified personnel before operating it any further.
- ▶ Wiping 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.

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 near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust or mechanical vibration.
- ▶ Install the unit with the front panel facing toward you. Do not install the unit in an inclined position.

On operation

- ▶ If the cassette holder is not closed completely, the function buttons will not operate.
- ▶ 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 may be erased. The REC and PLAY positions should be used only for timer-activated operation.



On cassette

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



FUNCTION OF CONTROLS

The numbers in the photo are keyed to the following explanations.



➊ POWER Switch

Depress this switch to turn on the power. The lamp in the cassette holder, the display of the peak program meter and the tape counter will light up. The indicator lamp of the eject button will blink for about 4 seconds, indicating that the function button isn't in operation during this period.
Press this switch again to turn the power off.

➋ TIMER Switch

You can set the unit to record or play back at a predetermined time by connecting any commercially available timer. To record, set the timer switch to **RECORD**. To playback, set it to **PLAY**. See "Timer-activated recording and playback" on page 18.

➌ Eject Button (EJ)

Press this button to open the cassette holder.

➍ HEADPHONES Jack

Headphones may be inserted either to monitor the input signals to be recorded or to listen to a recording in the playback mode. Headphone volume is adjustable with the LINE OUTPUT/PHONE level control.

➎ Cassette Holder

➏ Tape Counter and COUNTER RESET Button

The tape counter shows the tape-rewinding time. Press the COUNTER RESET button to reset the tape counter to "00."

➐ MEMORY Button

Press to rewind the tape to the "00" point on the tape counter. The word "MEMORY" is displayed below the tape counter. Pressing the **▶** button together with the **⏪** button automatically starts playback from "00".

When you do not use the memory function, press this button again. The word "MEMORY" will disappear.

➑ Multi purpose Display Monitor

When the CALIBRATION MODE switch is at the OFF position, the peak program meter scale is displayed. The meter shows the recording level of each channel with the MONITOR switch set at SOURCE and the record level with the MONITOR switch set at TAPE. When the CALIBRATION MODE switch is set to ON, the display changes to the scale used for tone calibration and when the switch is set to REC LEVEL, the display changes to the scale for record level calibration.

➒ Function Buttons

It is possible to switch directly from one mode to another. The indicator lamps light when the tape deck is in the forward, record or pause mode.

Rewind Button (REW): Press this button to rewind the tape. The record button is also used, with the forward button, to initiate auto-play. See "Auto play" on page 13.

Forward Button (▶): Press this button to play the tape back. To record, press this button while holding the record button down.

Fast forward Button (FF): Press this button to advance the tape rapidly.

Record Button (RECORD): Press this button together with the forward button to start recording. Also press this button before adjusting the recording level.

Stop Button (■): To stop the tape, press this button. The tape will stop automatically when it is completely wound up in either direction.

Pause Button (||): To pause for a moment during recording or playback, press this button. This button is also used to control more precisely the start of recording and to release the record freezing mode.

Record Muting Button (REC MUTE): Press this button to eliminate unwanted material and to insert a blank space during recording. The tape will automatically stop after four seconds. To insert a blank less than four seconds long, press this button, then press the pause button to release the record muting mode when you want to resume recording. To insert a blank more than four seconds long, hold this button down for as long as you want the blank to be. Press the eject button to resume recording. See "Record muting" on page 14.



● CALIBRATION Section

These knobs are used for the bias and record level calibration. See page 11.

● Recording Level Controls (REC LEVEL)

These controls adjust the recording level. The knob nearest the panel is for the left channel and the other knob for the right channel. To adjust the level of the left or right channel only, turn the appropriate knob while holding the other level.

● DOLBY NR Switch

To record with the Dolby NR™ (Noise Reduction) process, depress this switch to the OFF position (as 1). To record without the Dolby NR process, press again and release this switch to the ON position (as 2).

When playing back, set this switch to the same position used in recording.

* The Dolby NR system reduces tape hiss and improves the signal-to-noise ratio. During recording, low-level high-frequency signals, which tend to be obscured by tape hiss, are boosted so that they are audible when you play back. When these signals are present back, the level is lowered to the original input level so that the level of any tape hiss is reduced to its normal value.

*Dolby™ and the double S symbol are both marks of the Dolby Laboratories, sound reduction system manufacturers under license from Dolby Laboratories.

● LINE OUTPUTS (LINE) Level Control

This control governs the output level of the VARIABLE LINE OUT jacks as well as the HEADPHONE level. At the "0" position, the output level of the VARIABLE LINE OUT jacks is rated at 0.48V and the HEADPHONE level is rated 17.5mV (at a load impedance of 8 ohms). When this control is set to the "2" position, the level is reduced by 3 dB, and by setting it to "6," "12," or "24," the level is reduced by that amount, i.e., by 9 dB, 15 dB, or 21 dB, from the rated output obtained at the "0" position.

These settings do not affect the peak program meters or the output level of the HEADPHONE OUT jacks.

● MONITOR Switch

When adjusting the recording level, set this switch to SOURCE to allow monitoring of the sound to be recorded. During playback, set this switch to TAPE to allow monitoring of the recorded sound. During recording, use this switch to monitor either the source or the recorded sound.

● TAPE Select Buttons

Depress the TAPE buttons corresponding to the type of tape being used. The type of tape will be displayed on the display monitor.

● PEAK HOLD RESET Button

You can choose either of two ways to store the peak level in memory:

● When the AUTO button is pressed down, successive peaks are held for about 2.5 seconds, except when a higher peak occurs before 0.5 seconds have passed, in which case that peak is immediately indicated.

● When the non-latching (MANUAL) button is pressed, the peak level will be held on the scale until a higher peak occurs, when the peak will be held. To reset the peak held on the meter, just press the button. You will find this method of indicating the peak level useful when you want to know the highest peak of a tape or disc, or when you want to know both the highest peak as well as the intermediate input levels during the recording.

● MPX FM/PM Button (on the rear panel)

Normally set this switch to OFF.

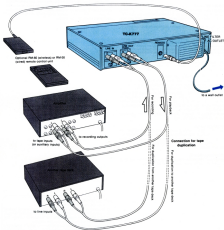
When recording FM stereo broadcasts with the Dolby NR system, set it to ON if the 18kHz pilot signal and the 0Hz/60 subcarrier have not been adequately suppressed by the FM tuner or receiver. The word "FM/PM" will be displayed on the monitor.

If the tuner or the receiver suppresses such signals adequately (most high-quality tuners and receivers will), you do not have to set this switch to ON.

CONNECTIONS

Notes

- Turn the amplifier off before making any connection.
- Be sure to insert the plugs 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 silver plug to the white jack (L - left channel).



CONNECTIONS USING TWO TYPES OF LINE OUT JACKS

To use another tape deck to duplicate a tape being played without disconnecting the amplifier:



You can duplicate tapes while listening to speakers.

Duplication by two tape decks:



You can duplicate a tape on two decks at the same time.

REMOTE Control Connector

Connect the optional RM 00 (wireless) or RM 00 (wired) remote control unit to operate the tape transport functions from a distance. Read the instruction manual of your remote control unit before operating it.

LINE OUT Jacks

Since the **FIXED** or **VARIABLE** LINE OUT jacks can be used, **FIXED**: The output level from these jacks is fixed regardless of the setting of the LINE OUTPUT/AMPLIFIER level control.

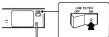
VARIABLE: The output level from these jacks can be adjusted by the LINE OUTPUT/AMPLIFIER level control. We recommend that you use these jacks when you want to match the output level of the tape deck with that of any other equipment connected to the amplifier.

AC OUTPUT (SHORTCIRCUIT RESIST)

Use to supply an power to other audio components. This output is independent of the tape deck POWER switch. Maximum rated capacity is 500 watts.

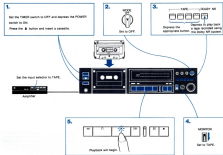
LINE FILTER Switch

The line filter reduces the noise produced by an household electric appliances (such as a refrigerator, a fluorescent light, or an air conditioning unit) and transmitted by the ac power cord (mains lead). Since the line filter has an effect on the tone quality, we recommend that you set the LINE FILTER switch to the only when the line noise is so loud that it might be heard on recording.



PLAYBACK

The numbers in this diagram indicate the sequence to be followed.



RECOMMENDED SETTINGS FOR TAPE SELECT BUTTONS

Tape select with 6-Buttons		Tape
MODE: OFF, OFF SWITCH: ON, OFF / SWITCH: ON/OFF 1	MODE: SOUND MEMORY 1 FILE: FILE REVERSE: OFF, TR: 40	TYPE 1 OFF/OFF
MODE: OFF SWITCH: ON/OFF / SWITCH: ON/OFF 2	MODE: SOUND MEMORY 2 FILE: FILE REVERSE: ON, TR: 20	TYPE 2 OFF/OFF
MODE: FILE SWITCH: ON/OFF 1	MODE: PROFESSIONAL 1 FILE: FILE REVERSE: OFF/OFF	TYPE 3 OFF/OFF
MODE: OFF/OFF	Other data tapes	TYPE 4 OFF/OFF

RECORDING

TO RECORD

The numbers in this diagram indicate the sequence to be followed.

1.

Set the **TRASH** switch to OFF and depress the **POWER** switch to ON.
Press the **RECORD** button and insert a cassette.

2.

For the calibration see page 12.



Set to "0" when recording without calibration.
Set to "OFF" if you have the optimum position set to that position.

3.



Depress the appropriate buttons to record along with left system.



Set the input selector to the desired program source.



6.



Recording will begin.

Press **RECORD** button.

4.

RECORD



Set to SOURCE.

5.

Play the program source and adjust the recording level.



Adjust the REC LEVEL controls so that the peak program source defines only left end of the red line at the highest signal level.

REC LEVEL



TO RECORD MATERIAL INTO A SPECIFIC PORTION OF TAPE

When you want to re-record a specific portion of tape or to insert new material between two points on a tape you will find it handy to be able to change directly from the playback to the record mode by depressing the record button while holding the forward button down.

BIAS/FREQ LEVEL CALIBRATION

There are many different cassette on the market and their characteristics vary. The appropriate equalization characteristics and bias current will be obtained when the appropriate (FREQ) button is pressed. With the F0-BYP cassette deck you can adjust the recording characteristics much more precisely using the bias and record level controlling function.

CALIBRATION SECTION

OFF Set to this position except when calibrating.

BIAS For bias calibration.

A bias level and the calibration test tones are provided. The scale for bias calibration will be displayed on the display monitor.

REC LEVEL For record level calibration.
A REC level calibration test tone is provided. The scale for record level calibration will be displayed.



Adjust the bias amplitude $\pm 20\%$.

Adjust the L and R record level $\pm 20\%$.

The "0" positions are factory preset with Bias MPX, EMP, FxCI and MPX/CI cassettes.

When the CALIBRATION (BIAS) switch is set at BIAS or REC LEVEL, the input and output signals are cut off internally and no sound is heard, regardless of the position of the MONITOR switch.

BIAS CALIBRATION

Too high a bias level gives a reflected high-frequency response, and too little bias reduces the signal-to-noise ratio and increases distortion.

To adjust the bias current to the level which results in the best possible frequency response, proceed as follows.

1. Insert the cassette to be recorded.
2. Press the appropriate TAPF button according to the type of tape.
3. Set the MONI switch to BIAS.
4. Record the calibration test tones by pressing the **L** button and the **R** button.

The meter shows the playback level of the calibration test tone, regardless of the position of the MONITOR switch.

Playback level of the L and R calibration test tones



Playback level of the REC calibration test tone

5. Adjust the BIAS control so that the upper and lower meters deflect to the same point.

The bias level is low.

(The deflection of the upper meter is large.)



Apply these bias current.



The bias level is properly adjusted.



The bias level is high.

Reduce bias current.

(The deflection of the lower meter is large.)



As the point variations of bias amplitude from practically no effect on the frequency response of the cassette, the optimum bias setting may not be obtained within the $\pm 20\%$ range of the BIAS control.

RECORDING LEVEL ADJUSTMENT

REC LEVEL CALIBRATION

The **Bottom Fill** function is most effective when the recording level and the playback level are the same. Before making a recording, first calibrate the test level, then calibrate the record level as follows. Tape sensitivity will be compensated for automatically.

1. Set the **CALIBRATION MODE** switch to **REC LEVEL**.
2. Record the calibration test tone by pressing the **RECORD** button and the **TEST** button.
The meters show the playback level of the calibration test tone regardless of the position of the **MONITOR** switch.
3. Adjust the **REC LEVEL** controls (A and B) so that the meters reflect to the indicated point.



Let the meters reflect to this point.

The bias current is now adjusted to the optimum level and the tape sensitivity is compensated for.

Be sure to set the CALIBRATION MODE switch to OFF.

In order to erase the recorded calibration test tones, rewind the 1824 and 1824 RECORDING.

Adjust the recording level while monitoring on the peak program meters the input level of the program source to be recorded. If the recording level setting is too high, the recording will be distorted, and if the setting is too low, the recording will be noisy. The recording level should be set as high as possible while still avoiding distortion. The level will depend on the type of tape being used. When the **TAPE** button is pressed, the range shows the saturation level of the selected type of tape as indicated by the red line. Generally speaking, adjust the recording level by making sure that the meters deflect only to the left end of the red line at the highest signal level.

Example: Type I cassette



Since the saturation level of any tape increases in the higher frequencies than in the lower frequencies, the recording level may still be too high if adjusted in this way if the program to be recorded contains many high frequency signals. Consideration has to be given to the program source to be recorded as well as to the character (type) of the cassette to be used. Since each cassette, even marked recording the same type of tape, may have different characteristics. The following table will provide you with a starting point in setting the recording level of various kinds of programs when using **TYPE CASSETTES**.

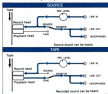
Type of tape	Typical cassette	Low and mid freq. range programs (pop, etc.)	Mid and high freq. range programs (jazz, guitar, etc.)
I	HFII	+ 3 dB	+ 1 dB
	SHF	+ 4 dB	+ 2 dB
II	SHF	+ 2 dB	+ 0 dB
III	FuCo	+ 0 dB	+ 0 dB
IV	METALLIC	+ 0 dB	+ 0 dB

RECORD MONITORING

As the tape deck has separate record and playback heads, you can easily compare the source and the recorded sounds in the recording mode by using the MONITOR function. You can check the recording level and whether there is any contamination on the heads that is affecting the recording.

■ If the connector amplifier has a tape monitor selector, manual tape comparison is possible with the amplifier monitor selector. In this case, set the tape deck selector (switch) to [TAPE].

MONITOR switch setting and signal flow



ERASING

When the tape deck functions in recording mode, the erase head automatically erases any previously recorded material.

To erase without recording:

1. Make sure that the rubber tab of the cassette is in place, or that the tab slot is covered with plastic tape.
2. Set the REC LEVEL control fully to "0". (Disconnecting all inputs will result in a more complete erasure.)
3. Press the appropriate [E] (E) button according to the type of tape to be erased. (The [TRM] or button assures good erasing for all types of tape.)
4. While holding the record button [R] down, press the forward button [F].

CHECKING THE AVAILABLE TAPING TIME

— The use of the tape counter —

The first two digits of this tape counter show the approximate recording or playback time in minutes, and the last two digits show the seconds.

To check how much longer you can record

Stop the tape and press the COUNTER RESET button to set the counter to "00." Press the [E] button and let the tape run to the end. The digits on the counter will show the approximate remaining recording time.

To return the tape to the "00" point, use the memory stop function (page 15).

To check the available recording time on one side of a cassette

At the beginning of the tape set the counter to "00." Press the [E] button and let the tape run to the end. The digits on the counter will show the approximate available recording time.

Note

Do not turn off the power while measuring the time because the numbers will return to "00" when the power is turned on again.

The accuracy of the counter

This counter is not actually a digital clock, so that the displayed figures are not exactly equal to the actual time spent. The accuracy will vary depending on the type of tape being used.

This counter has been designed using C-60 cassettes as a standard. Make sure that the displayed time is greater than the required actual time when using a C-45 or C-90 cassette.

RECORD MUTING

By pressing the REC MUTE button during recording, four seconds of muting 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.

1. Press the REC MUTE button when the segment you do not want to record begins. The indicator of the pause button (⏸) will blink, and the tape path will pause automatically after four seconds.



The record muting is automatic.



A blink is made while the tape continues to run.



The tape is in the pause mode.

2. When you want to resume recording, press the pause button.

To insert a blank less than four seconds long:

Press the REC MUTE button to mute recording. Press the pause button when you want to resume recording.

To insert a blank over four seconds long:

First press the REC MUTE button for as long as you want the blank segment on the tape to be. After four seconds, the indicator of the pause button will blink more rapidly. When you release the REC MUTE button, the tape deck will be in the pause mode. When you want to resume recording, press the pause button to release the pause mode.

AUTO PLAY

To rewind the tape and play from the beginning of the tape use the auto play function. The tape deck can automatically replay a tape immediately after rewinding.

1. Check that the word "MEMORY" is not displayed on the tape counter. If it is displayed, press the MEMORY button.
2. When you rewind the tape, press the REW button and the F button simultaneously.

After the tape is completely rewound, the tape will automatically replay.

MEMORY STOPPLAY

To rewind the tape to a desired point use the memory stop function. To play from a desired point use the memory play function. You can easily locate any particular point on a tape.

1. At the desired point on the tape, press the COUNTER RESET button to turn the tape counter to "00".
2. Press the MEMORY button. The word "MEMORY" will be displayed.



COUNTER
RESET
MEMORY
PLAY

3. Play back or record on the tape.
4. Rewind the tape in either of the following ways:

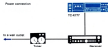
For memory stop: Press the REW button. The tape stops automatically when it is rewound to the "00" point.

For memory play: Press the REW button and the F button simultaneously. The tape will replay automatically after rewinding up to the "00" point.

If you wind forward further than the "00" point, press the REW button again.

TIMER-ACTIVATED RECORDING AND PLAYBACK

By connecting any commercially available timer to the tape deck, the deck can be set to play back or record automatically at any desired time. An timer works in different ways, so be sure to read the timer's instruction manual carefully.



To record a broadcast using a timer

1. Connect the tape deck, receiver and timer. Set the timer so that power is supplied to the connected equipment.
2. Turn on the receiver and tune in the station which will broadcast the program you want to record.
3. Set the tape deck's **TIMER** switch to **REC**.
4. Insert a cassette. Make sure that the tab is intact or that plastic tape covers the tape slot.
5. Turn on the tape deck and adjust the recording level.
6. Set the timer for the desired time. (At this point power to the connected equipment will be cut off.)
7. Set the tape deck's timer switch to **REC**.
The tape deck is now ready to start recording at the time set on the timer.

To play back using a timer

The connections between equipment are the same as for recording using a timer.

1. Set the tape deck's **TIMER** switch to **OFF**.
2. Turn on the receiver and set the appropriate switches for play back.
3. Turn on the tape deck and insert the recorded cassette.
4. Set the timer for the desired time. (At this point power to the connected equipment will be cut off.)
5. Set the tape deck's timer switch to **PLAY**. The tape deck is now ready to start playback at the time set on the timer.

Notes

The tape deck's timer switch will function properly only if the tape deck is turned on after the switch is set to **REC** or **PLAY**. Do not change the setting of the timer switch during the four second stand-by period immediately after the power is turned on. If you want to change the setting of the switch, turn the power off first.

NOTES ON CASSETTES

To protect cassettes from accidental erasure

Remove the tab as illustrated so that the record mode does not function when the construction is pressed. To reinsert a cassette with ERM (Erase-Resist Memory) removed, simply cover the slot with plastic tape.



To prevent side A recording

Do not stick any other material except in the plastic window

Cassette care

- Avoid touching the tape surface of a cassette, as any dirt or dust will contaminate the heads.
- Do not stick thin labels or tape on the cassette, as this may affect proper cassette alignment and prevent the tape from making proper contact with the heads.
- Keep cassettes away from equipment with magnets, such as speakers and amplifiers, because their magnets could cause erasure or distortions of your recorded tapes.
- Protect cassettes from dust by storing them in their cases. Even minor dirt or dust could contaminate the heads, resulting in noise and sound drop-outs.
- Do not expose cassettes to direct sunlight, extremely cold temperature or moisture.
- Avoid fast winding just before storing cassettes, as this may stretch the tape edge if the cassettes are left unused over a period of time.

MAINTENANCE

Cleaning of heads and tape path

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

Dirty heads and a dirty tape path cause:

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



We recommend cleaning after every 10 hours of operation. To make the best possible recordings, however, you should clean all our faces over which the tape travels before every recording.

1. Press the eject button (▲) to open the cassette holder. Remove the cassette as illustrated.



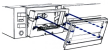
2. Push the frame in.
3. Set the PHONES switch to OFF and press the forward button (▶). Wipe the heads with a cleaning cloth slightly moistened with the cleaning fluid or alcohol.



4. Align the pinch rollers as illustrated. Then press the pause button (⏸) and wipe the capstans.



5. When finished cleaning, press the pause button to release it, then press the stop button (■).
6. Press the open button to open the frame, and replace the tape.



7. After cleaning the heads and tape path, do not insert a cassette until the areas cleaned are completely dry.

Demagnetizing heads

After 20 to 30 hours of use, enough residual magnetism will have built up on the heads to begin to cause loss of high frequencies and loss. At the time you should demagnetize the heads and all metal parts in the tape path with a commercially available head demagnetizer. Be sure that the tape deck is turned off while you demagnetize.

Cleaning the cabinet

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

SPECIFICATIONS

Recording system	4-track 2-channel stereo
Fast-forward and rewind time	Approx. 30 sec. (with C-60 cassette)
Base frequency	100 kHz
Signal-to-noise ratio	(DOLBY NR-101 OFF) <ul style="list-style-type: none">• With TYPE III cassette (Sony METALLIC)<ul style="list-style-type: none">90 dB at peak level• With TYPE II cassette (Sony FeO)<ul style="list-style-type: none">80 dB at peak level• With TYPE I cassette (Sony CrF)<ul style="list-style-type: none">70 dB at peak level• With TYPE I cassette (Sony HF1)<ul style="list-style-type: none">70 dB at peak level

DOLBY NR-101
Improved by 3 dB at 1 kHz,
10 dB above 5 kHz

Total harmonic distortion	0.1% (with Sony METALLIC and FeO cassettes)
Frequency response	DOLBY NR-101 OFF <ul style="list-style-type: none">• With TYPE III cassette (Sony METALLIC)<ul style="list-style-type: none">20 - 21,000 Hz20 - 20,000 Hz (±0.5dB)20 - 15,000 Hz (±0.5dB, 0 Hz recording)• With TYPE II cassette (Sony FeO)<ul style="list-style-type: none">10 - (1,000 Hz)20 - (20,000 Hz) (±0.5dB)• With TYPE I cassette (Sony CrF)<ul style="list-style-type: none">10 - 20,000 Hz20 - 15,000 Hz (±0.5dB)• With TYPE I cassette (Sony HF1)<ul style="list-style-type: none">10 - 20,000 Hz20 - 15,000 Hz (±0.5dB)

Wow and flutter	0.02% (PMPP)
Inputs	Line inputs (phono jacks) <ul style="list-style-type: none">Sensitivity 175 mV (±0.5dB)Input impedance 10 k ohms
Outputs	Fixed line outputs (phono jacks) <ul style="list-style-type: none">Output level 0.480 V (±0.5dB) at a load impedance of 10 k ohmsLoad impedance over 10k ohms Variable line outputs (phono jacks) <ul style="list-style-type: none">Maximum output level 0.480 V (±0.5dB) at a load impedance of 10k ohms with LBAE (OFF) level control at "0"Variable in five steps from -0.50 to -3.0 dBLoad impedance over 10k ohms Headphone output <ul style="list-style-type: none">Output level variable in five steps from -20.0 dB to -10.0dB at a load impedance of 8 ohms

EQ peak program feature	
Response range	-40 dB to +6 dB
Frequency response	20 - 20,000 Hz (±0.5 dB)
Response time	1 millisecond
Delay time (from 0 dB to -20 dB)	750 milliseconds
Overhead	none
Indicator elements	80 elements for each channel

General	
Power requirements	120V ac, 60 Hz
Power consumption	41 watts
As output	Unbalanced 000V
Dimensions	Approx. 430 x 105 x 200mm (width) (H x W x D)
Weight	Including packaging parts and controls Approx. 5.0 kg (11 lbs 2 oz)
Supplied accessories	
Connecting cord 2
Headcleaning tape 1 set

(Design and specifications subject to change without notice.)

TROUBLE CHECKS

The following trouble checks will help you correct the most common problems encountered with a tape deck. Should any problem persist after you have made these checks, consult your nearest Sony service facility.

Before proceeding with these trouble checks, first check these basic points:

- The power cord must be firmly connected.
- Amplifier connections must be firmly made.
- Heads, capstan and pinch roller should be clean.
- The amplifier controls and switches should be set correctly.

FUNCTION BUTTONS AND TAPE TRANSPORT PROBLEMS

The function buttons do not activate right after the POWER switch is turned on.

- Unprogrammed function buttons operate approximately 4 seconds after the POWER switch is turned on.

Recording or playback begins as soon as the POWER switch is turned on.

- The stop switch is set at either REC or PLAY.

The record button and the forward button do not activate.

- The cassette folder is not fully closed.

The record button does not activate.

- No cassette in the folder.
- The tab has been removed from the cassette.

The automatic shut-off mechanism activates before the end of the tape.

- The tape is slack.
- The MEMORY switch is set to ON.
- This situation may also be caused by a deformed cassette shell.

Tape transport noise seems excessively loud in record or fast-forward mode.

- This situation depends upon the cassette used and not a problem.

RECORDING AND PLAYBACK PROBLEMS

Recording or playback cannot be made or there is a decrease in sound level.

- Contamination or magnetic build-up on the recording/playback heads.
- Improper connection.
- Improper setting of the amplifier controls.

Excessive wow or flutter or drop-out.

- Contamination of the capstan or pinch roller.

Incomplete erasure.

- Contamination of the erase head.

Increase of noise or distortion of high frequencies.

- Magnetic build-up on the heads.

Unbalanced tone in higher frequencies.

- Improper setting of the POLARITY select switch. If a cassette is recorded with the switch set to ON, play back with it at OFF. If a cassette is recorded with the switch set to OFF, play back at OFF.
- Improper setting of the TONE select switch. If recorded with the switch in the wrong position, adjust the tone controls of the amplifier in playback.

NOISE (IN RECORD MODE)

Distortion occurs when trying to record from microphones.

- The microphone is too near the loudspeakers. Move the microphone away from the loudspeakers or reduce the amplifier volume.

Blank tapes.

- The tape deck is stacked on or under the amplifier. Relocate it.

