

**SONY®**

STEREO CASSETTE DECK

# TC-K777ES II

## OPERATING INSTRUCTIONS

Page 2

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

## MODE D'EMPLOI

Page 20

Avant la mise en service de l'appareil, lire attentivement ce mode  
d'emploi et le conserver pour toute référence future.

## BEDIENUNGSANLEITUNG

Seite 36

Vor Inbetriebnahme lesen Sie bitte diese Bedienungsanleitung  
aufmerksam durch.

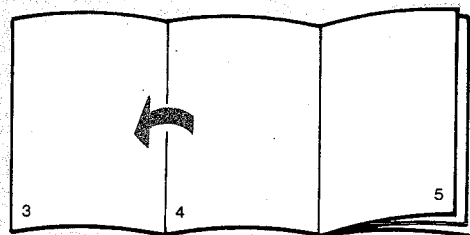
Bewahren Sie diese Anleitung zum späteren Nachschlagen gut  
auf.



As you read, fold back this page and refer to the photo on page 3.

Déplier cette page au moment de la lecture du mode d'emploi pour se référer à la photo de la page 3.

Klappen Sie beim Lesen diese Seite heraus, um das Foto sehen zu können.



## FUNCTION OF CONTROLS

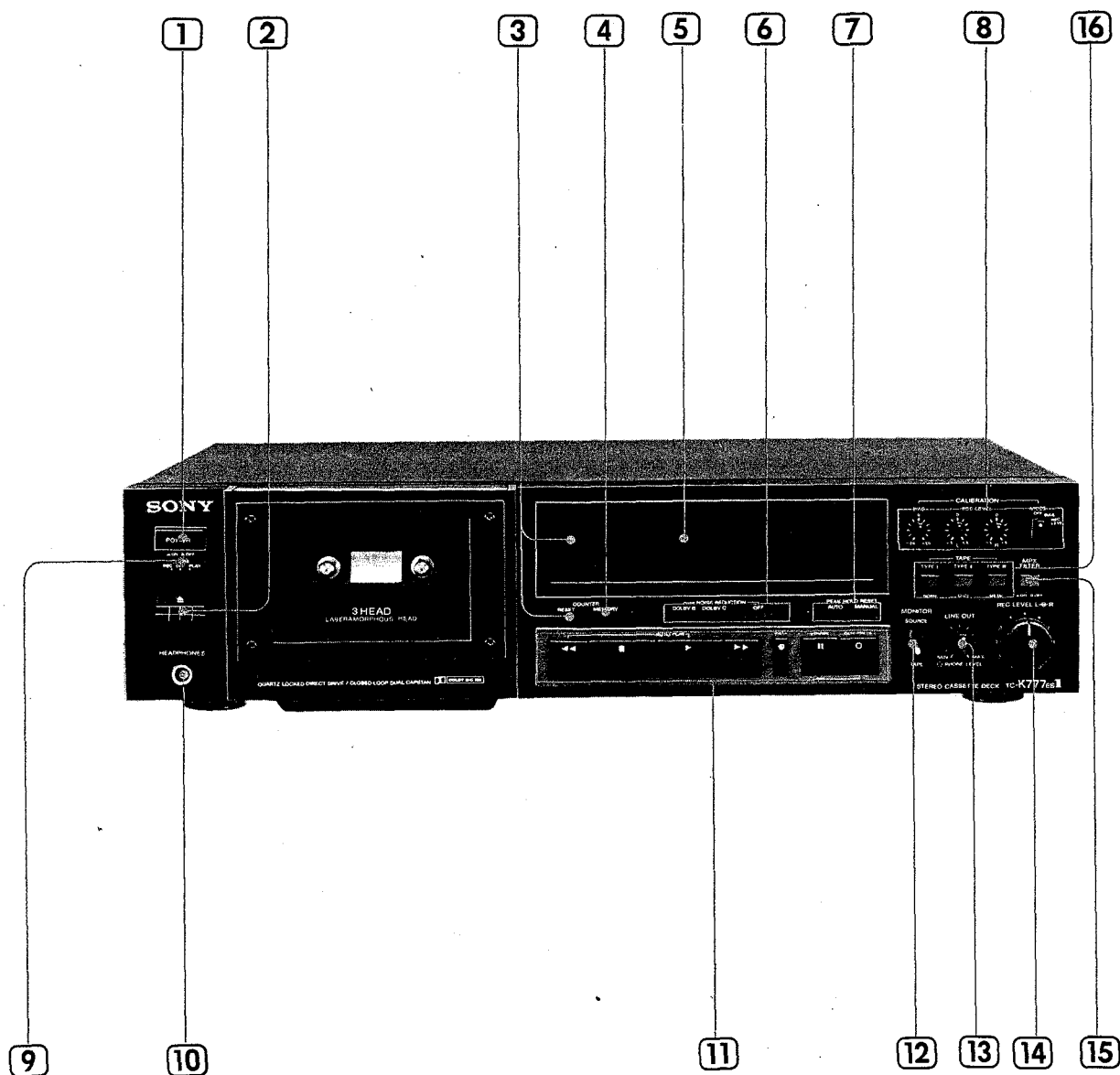
The numbers in the photo are keyed to the following explanations.

## FONCTIONS DES COMMANDES

Les numéros de la photo renvoient à ceux du texte explicatif.

## FUNKTION DER BEDIENUNGSELEMENTE

Die Nummern im Photo stimmen mit denen im Abschnitt „Funktion der Bedienungselemente“ überein.



## 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

Separate record and playback heads allow optimum gap settings and impedance ratings for distortion-free recording and greatly extended frequency response. 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 the recorded tape while actually recording.

### LA (LaserAmorphous) heads

The record and playback heads are made of a special amorphous magnetic alloy developed by Sony, and its cores are solidly welded by laser. This new highly-durable head provides a wider dynamic range and a more extended frequency response, especially in the high-frequency range. The head is designed to take full advantage of the potential of the metal tapes.

### Closed-loop 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 motors for the capstan and reel drives are linear torque BSL (brushless and slotless) 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 belts or idlers.

### Bias and record level calibration

Bias current can be precisely adjusted to the optimum level for any tape on the market, assuring the flattest possible frequency response. Furthermore, the sensitivity of the tape can be compensated for, permitting optimum performance of the Dolby NR system.

### Vibration-free aluminum alloy chassis

The chassis of the tape transport mechanism is made of 3 mm (1/8 in.) thick aluminum alloy plate, which suppresses resonance of the chassis and greatly reduces the transmission of vibration to the tape.

The chassis of the amplifier section is of copper-plated steel having 5 sides, which prevents eddy-current from circulating and reduces harmonic distortion.

### High-quality amplifier section

This cassette deck incorporates a dc amplifier design which assures true fidelity down to the dc region.

The electronic components used have been carefully selected to provide the highest possible sound quality, as exemplified by the gold-plated input and output jacks.

## PRECAUTIONS

### Multi-purpose display monitor

Only pertinent information is indicated on the display monitor so recording level adjustment and bias and recording level calibration are simplified.

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

### Useful functions

- Record muting function allows you to easily insert a moderately long blank space between selections.
- Auto play permits one step rewind and playback from the beginning of the tape and the memory function allows you to easily locate any desired point on the tape.
- Remote control operation is possible using the optional RM-88 remote control unit.
- A timer switch is provided to turn the deck on and off any number of times at a preset time set on an optional timer.

### On safety

- Operate the unit only on 220 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.

### 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.

## FUNCTION OF CONTROLS

Each numbers in the text is keyed to that of the photo on page 3.

### ① POWER switch

Depress this switch to turn on the power. The lamp in the cassette holder, the display of the peak program meters and the tape counter will light up. The **II** indicator lamp of the PAUSE button will blink for about 3 seconds, indicating that the function buttons are inoperative during this period. Press this switch again to turn the power off.

### ② **▲ (eject) button**

Press this button to open the cassette holder.

### ③ Tape counter and COUNTER RESET button

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

### ④ 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 switch again. The word "MEMORY" will disappear.

### ⑤ 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 recorded levels with the MONITOR switch set at TAPE. When the CALIBRATION MODE switch is set to BIAS, the display changes to the scale used for bias calibration and when the switch is set to REC LEVEL, the display changes to the scale for record level calibration.

### ⑥ NOISE REDUCTION switches and indicators

To record or play back using the Dolby\* B-type NR system, press the DOLBY B switch. To record or play back using the Dolby C-type NR system, press the DOLBY C switch. The corresponding indicator lights up.

To record or play back without the Dolby NR process, press the OFF switch.

For details about the Dolby NR system, see page 16.

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

### ⑦ PEAK HOLD RESET buttons

You can choose either of two ways to have the peak level indicated:

- When the **AUTO** button is pressed down, successive peaks are held for about 2.5 seconds, except when a higher peak occurs before 2.5 seconds have passed, in which case that peak is immediately indicated.
- When the non-locking **MANUAL** button is pressed, the peak level will be held on the scale until a higher peak occurs, when that peak will be held. To reset the peak held on the meter, just press this button. You will find this method of indicating the peak input 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 intermittent input levels during live recording.

### ⑧ CALIBRATION section

These dials are used for the bias and recording level calibration. See page 14.

### ⑨ 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 this switch to REC. To playback, set it to PLAY. See "Timer-activated recording and playback" on page 12.

### ⑩ 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 OUT/PHONE LEVEL control.

### ⑪ Function buttons

It is possible to switch directly from one mode to another.

- ◀◀ **(rewind) button**: Press this button to rewind the tape. This button is also used, with the **▶** button, to initiate auto play. See "Auto play" on page 11.
- ▶ **(forward) button**: Press this button to play the tape back. To record, press this button while holding the **●** button down.
- ▶▶ **(fast-forward) button**: Press this button to advance the tape rapidly.
- **(record) button**: Press this button together with the **▶** 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 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 muting mode.

**○ REC MUTE (record muting) button:** Press this button to eliminate unwanted material and to insert a blank space during recording. See "Record muting" on page 10.

**12 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.

**13 LINE OUT/PHONE LEVEL control**

This control governs the output level of the VARIABLE LINE OUT jacks as well as the headphone level. The output level is reduced as it is turned to the left. These settings do not affect the peak program meters or the output level of the FIXED LINE OUT jacks.

**14 REC LEVEL (recording level) controls**

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

**15 MPX FILTER switch**

Normally set this switch to OFF.

When recording FM stereo broadcasts with the Dolby NR system, set it to ON if the 19 kHz pilot signal and the 38 kHz subcarrier have not been adequately suppressed by the FM tuner or receiver. The word "FILTER" will be displayed on the monitor.

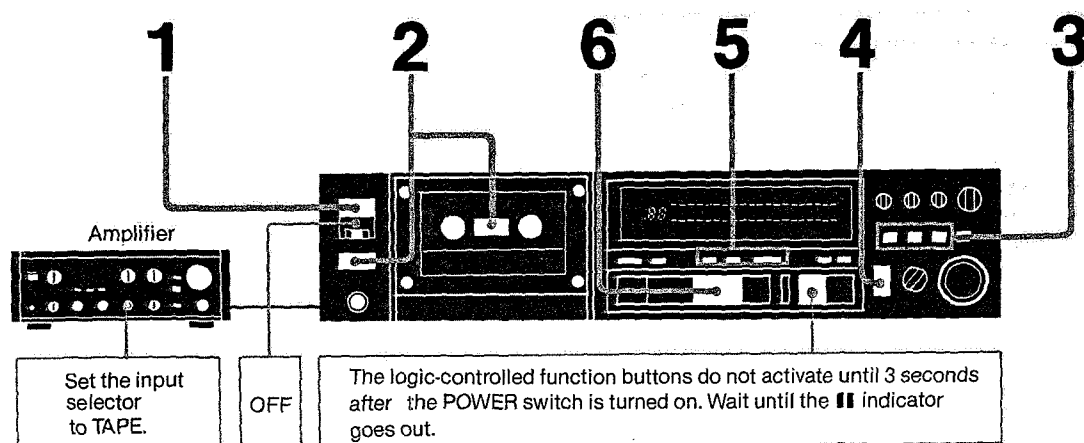
If the tuner or the receiver suppresses such signals adequately (most high-quality tuners and receivers will), you do not have to set this switch to ON.

**16 TAPE select buttons**

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

## PLAYBACK

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



1 Press (ON).

2 Press the ▲ button and insert a cassette with the tape surface downwards.

3 Depress the appropriate TAPE button. See the tape list below.

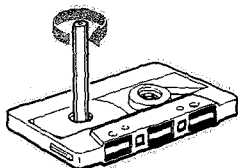
4 Set the MONITOR switch to TAPE.

5 Select the same Dolby NR system used when the cassette was recorded.  
Dolby B-type NR ON ... Press B.  
Dolby C-type NR ON ... Press C.  
Dolby NR OFF ... Press OFF

6 Press the ► button. Playback will begin.

### Note on cassettes

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



### Note on the TIMER switch

If the power is turned on when this switch is set to the REC or PLAY position, recording or playback will start automatically after 3 seconds. To avoid accidental erasure of previously-recorded material, check that the TIMER switch is set to OFF before turning on the POWER switch.



## RECOMMENDED SETTINGS FOR TAPE SELECT BUTTONS

### Tape list

Type of tape	Tapes (C-60 and C-90)
TYPE I (NORMAL)	<b>SONY: HF, EF, CHF, HF-S</b> Other TYPE I equivalent tapes (For 120 $\mu$ s and Normal Bias)
TYPE II (CrO <sub>2</sub> )	<b>SONY: UCX, UCX-S</b> <b>UX, UX-S, UX-ES, UX-PRO</b> Other TYPE II equivalent tapes (For 70 $\mu$ s and High Bias)
TYPE IV (METAL)	<b>SONY: METAL-ES</b> Other TYPE IV equivalent tapes (For 70 $\mu$ s and METAL Bias)

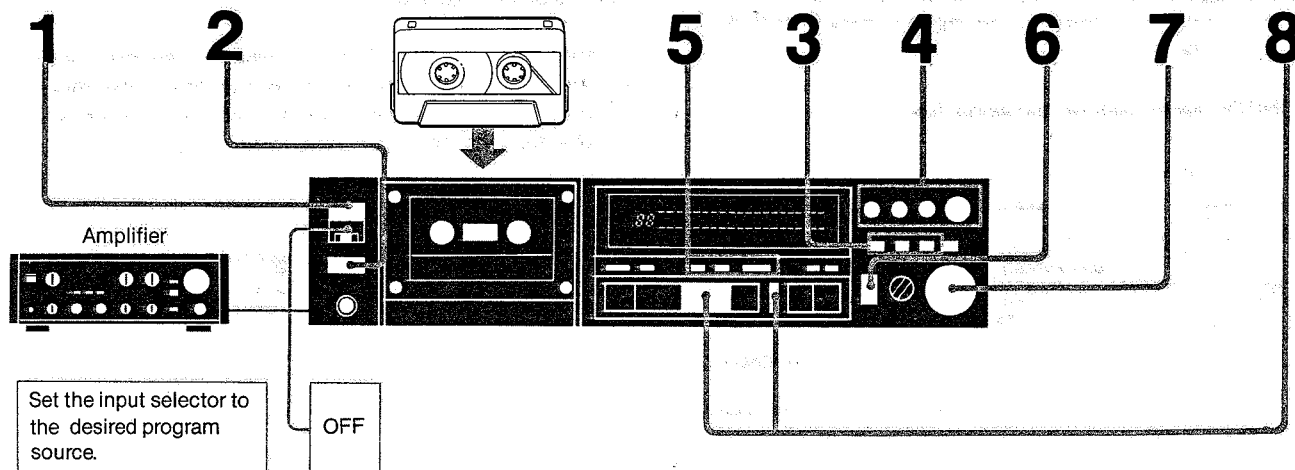
With this unit, recording of TYPE III cassette is not possible. To play back TYPE III cassette, depress the TYPE II or IV button.



## RECORDING

### TO RECORD

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



1 Press (ON).

2 Press the  $\blacktriangle$  button and insert a cassette.

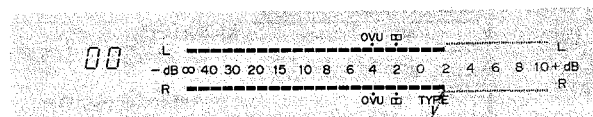
3 Depress the appropriate TAPE button. See the tape list on page 8.

4 Calibrate the bias and recording levels to align with the characteristics of the cassette to be used. See page 14.

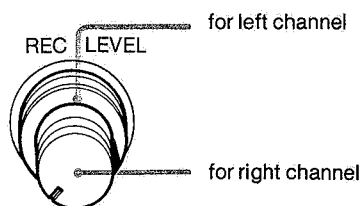
5 Select the Dolby NR system. Dolby B-type NR ON ... Press B. Dolby C-type NR ON ... Press C. Dolby NR OFF ... Press OFF

6 Set the MONITOR switch to SOURCE.

7 Play the program source and adjust the recording level.



Adjust the REC LEVEL controls so that the meters deflect only left end of the red line at the highest signal level. For details, see "Recording level adjustment" on page 15.



8 While holding the  $\bullet$  button down, press the  $\blacktriangleright$  button. Recording will begin.

### TO RECORD MATERIAL ONTO A SPECIFIC PORTION OF TAPE

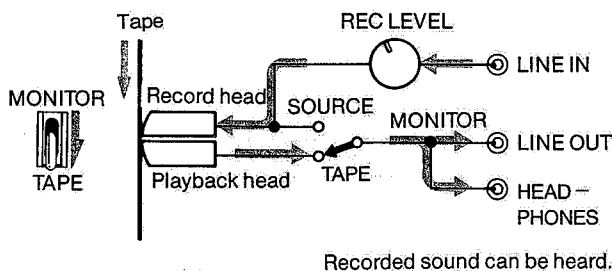
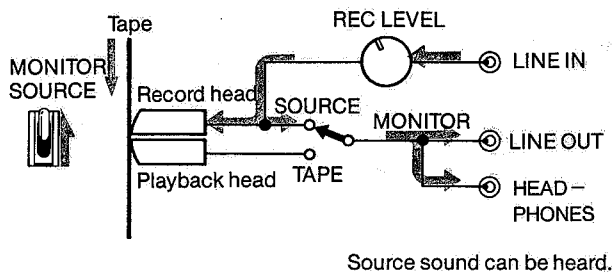
When you want to re-record a specific portion of tape or to insert new material between two points on a tape you will find it handy to be able to change directly from the playback to the record mode by pressing the  $\bullet$  button while holding the  $\blacktriangleright$  button down.

## RECORD MONITORING

As this 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 switch. You can check the recording level and whether there is any contamination on the heads that is affecting the recording.

- If the connected amplifier has a tape monitor selector, source/tape comparison is possible with the amplifier monitor selector. In this case, set the tape deck MONITOR switch to TAPE.

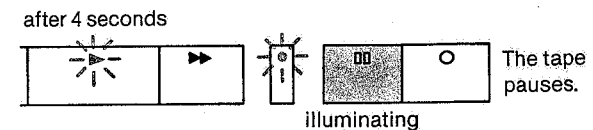
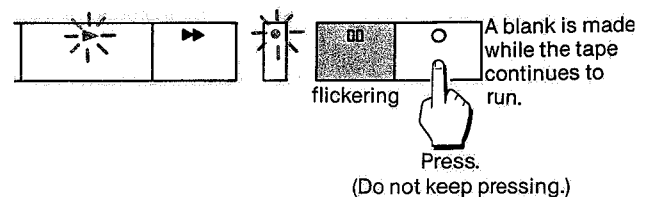
### MONITOR switch setting and signal flow



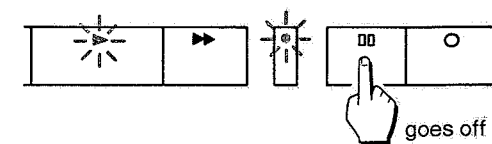
## RECORD MUTING

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.

- 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.



- 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

Hold down 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 ◀◀ button and the ▶▶ button simultaneously.  
After the tape is completely rewound, the tape will automatically replay.

## MEMORY STOP/PLAY

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 indicated.
- 3 Play back or record on the tape.
- 4 Rewind the tape in either of the following ways:  
For memory stop: Press the ◀◀ button. The tape stops automatically when it is rewound to the ".00" point.  
For memory play: Press the ◀◀ button and the ▶▶ button simultaneously. The tape will replay automatically after rewinding up to the ".00" point.  
If you wish to rewind further than the ".00" point, press the ◀◀ button again.

## USING THE DIGITAL LINEAR 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 index the whole tape

Before recording or playback, set the counter to ".00" by pressing the COUNTER RESET button.

As the tape runs, the figures of the counter change. Note the numbers and the program being recorded or played back. Any point of the tape can thus be readily located later by reference to these numbers.

00

### To determine the remaining recording time

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

To rewind the tape to the ".00" point, use the memory stop function.

230

2 min. 30 sec. remain.

### To check the amount of recording time possible on one side of a cassette

At the beginning of the tape set the counter to ".00," press the ▶▶ button and let the tape run to the end. The digits on the counter will show the approximate available recording time.

3015

30 min. 15 sec.

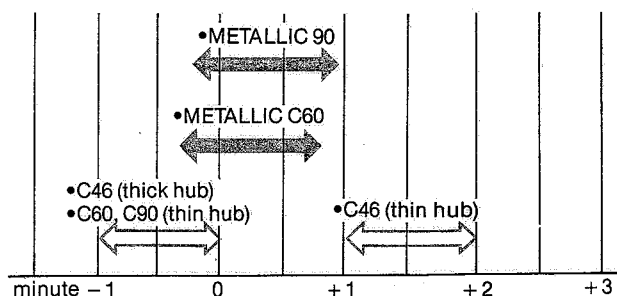
### Note

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 elapsed time. The accuracy will vary depending on the type of tape being used.

This counter has been designed using Sony cassettes as the standard.



The counter indication is less than the actual tape running time.

The counter indication is more than the actual tape running time.

### Notes

- It is a good idea to check the accuracy of the counter when it is used with tapes other than Sony tapes, or with tapes of a special length.
- Be careful not to try to record on the leader tape.

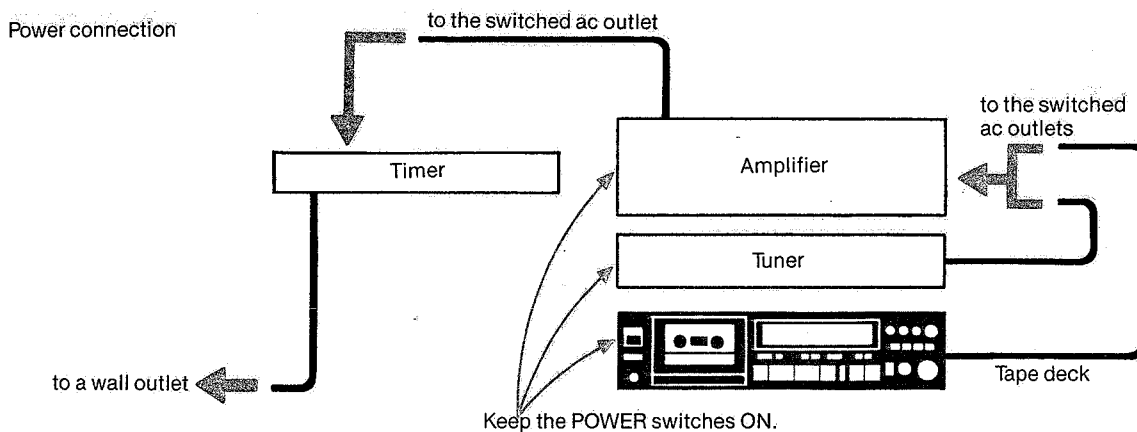
## TIMER-ACTIVATED RECORDING AND PLAYBACK

### Note

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. If you want to change the setting of the switch, turn the power

off first. Do not change the setting of the TIMER switch during the three second stand-by period immediately after the power is turned on.

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. As timers work in different ways, be sure to read the timer's instruction manual carefully.



### To record a broadcast using a timer

- 1 Connect the tape deck, amplifier, tuner and timer. Set the timer so that power is supplied to the connected equipment.
- 2 Turn on the tuner and amplifier and tune in the station which will broadcast the program you want to record.
- 3 Set the tape deck's TIMER switch to OFF.
- 4 Insert a cassette. Make sure that the tab is intact or that plastic tape covers the tab 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.

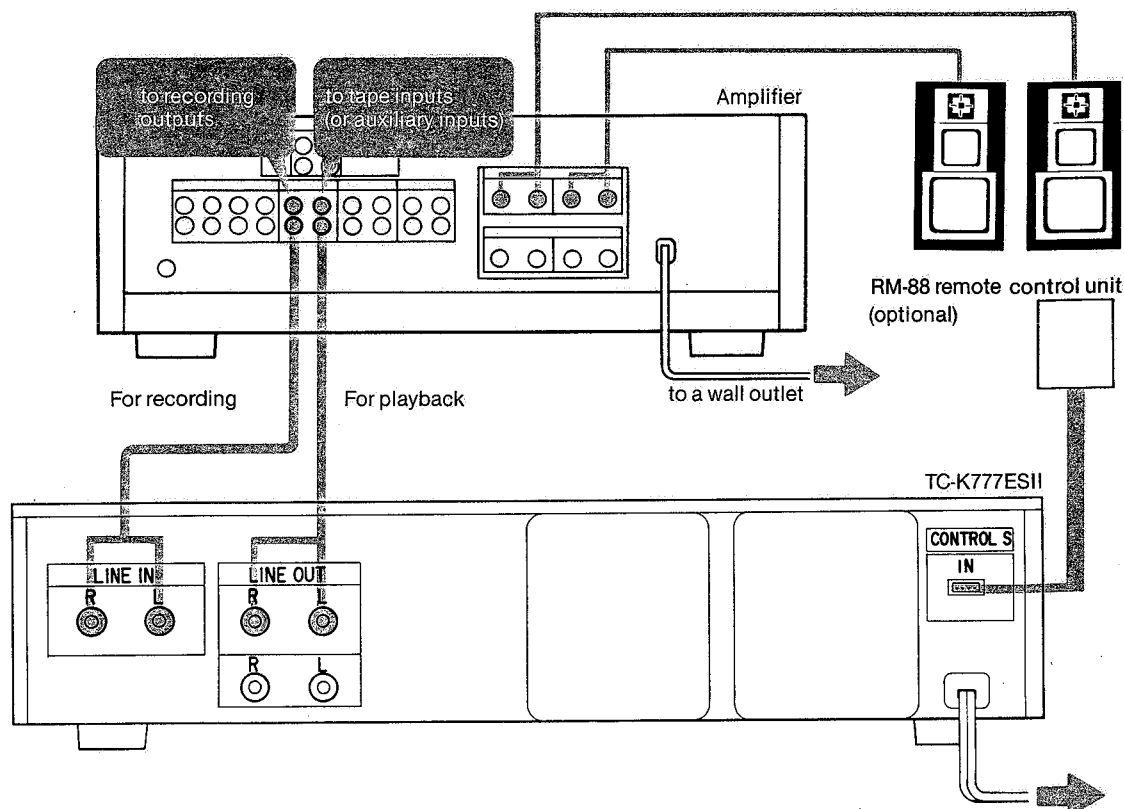
- 1 Set the tape deck's TIMER switch to OFF.
- 2 Turn on the amplifier and set the appropriate switches for playback.
- 3 Turn on the tape deck and insert the recorded cassette.
- 4 Set the timer for the desired time. (At this point power to the connected equipment will be cut off.)
- 5 Set the tape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

## CONNECTION

### Notes

- Turn the amplifier off before making any connection.
- Be sure to insert the plugs firmly into the jacks. Loose connection 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).
- Put the supplied jack caps on the jacks which are not to be used.



### LINE OUT jacks

Either 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 OUT/PHONE LEVEL control.

**VARIABLE:** The output level from these jacks can be adjusted by the LINE OUT/PHONE 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.

### REMOTE control connector (4-pin)

Connect the optional RM-88 remote control unit to operate the tape transport functions from a distance. Read the instruction manual of your remote control unit before operating it.

### Power cord

The white mark on one of the power cord leads will help you to operate the cassette deck and other components in the system "in phase" by matching the ac power cord polarities with ac outlet polarities. In most cases, the marked plug on the cassette deck's power cord should be inserted into the negative potential of the ac outlet.

# ADVANCED OPERATION

## BIAS/RECORDING LEVEL CALIBRATION

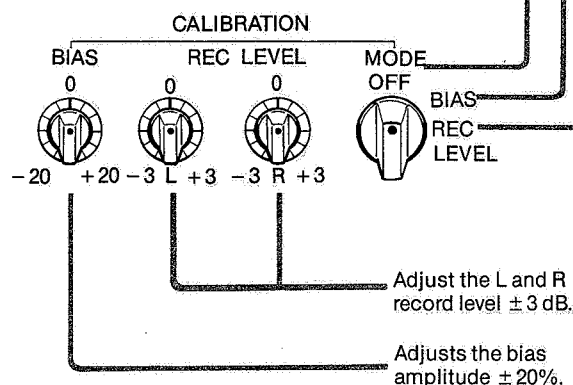
There are many different cassettes on the market and their characteristics vary. The appropriate equalization characteristics and bias current will be obtained when the appropriate TAPE button is pressed. With this cassette deck you can adjust the recording characteristics much more precisely using the bias and recording level calibrating function.

### CALIBRATION SECTION

**REC LEVEL:** For record level calibration. A 400 Hz calibration test tone is provided. The scale for record level calibration will be displayed.

**BIAS:** For bias calibration. 8 kHz and 400 Hz calibration test tones are provided. The scale for bias calibration will be displayed on the display monitor.

**OFF:** Set to this position except when calibrating.

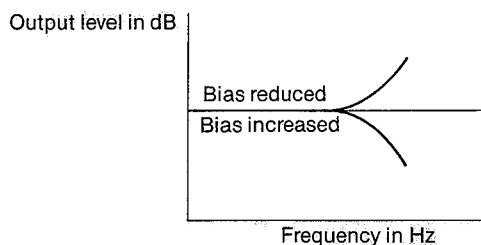
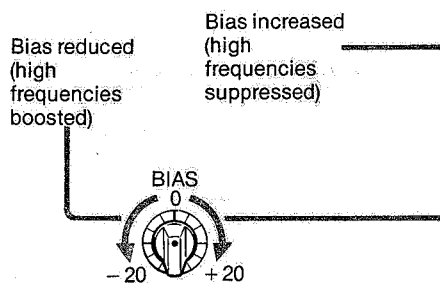


- When the CALIBRATION MODE switch is set at BIAS or REC LEVEL, the input and output signals are cut off internally and no sound is heard, regardless of the position of the MONITOR switch.
- After setting the MODE switch to BIAS or REC LEVEL, wait 2 or 3 seconds until the test tone level becomes constant.
- This cassette deck is factory-adjusted using the Sony HF-S, UCX-S and METAL-ES cassettes as the standard. However, we recommend that you calibrate the bias and recording level also when using these cassettes, since there may be slight variations in their characteristics.

### BIAS CALIBRATION

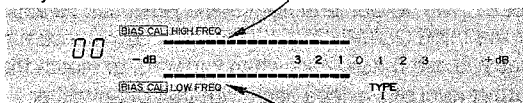
Too high a bias level gives a rolled-off high-frequency response, and too little bias reduces the signal-to-noise ratio and increases distortion.

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 TAPE button according to the type of tape.
- 3 Set the MODE switch to BIAS.
- 4 Record the calibration test tones by pressing the ● button and the ► button.  
The meter shows the playback level of the calibration test tone, regardless of the position of the MONITOR switch.

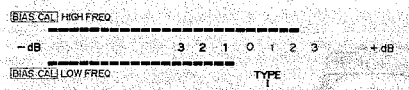
Playback level of the 8 Hz calibration test tone



Playback level of the 400 Hz 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 larger.)



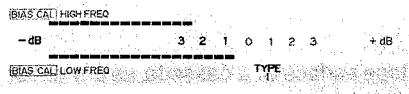
The bias level is properly adjusted. (The deflections of the upper and lower meters are the same.)



Apply more bias current.



The bias level is high.  
(The deflection of the upper meter is smaller.)



Reduce bias current.



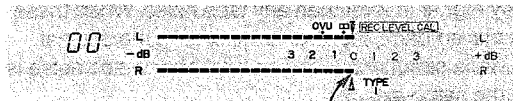
- As small variations in bias amplitude have practically no effect on the frequency response of metal tape, the optimum bias setting may not be obtained within the  $\pm 20\%$  range of the BIAS control.

## RECORDING LEVEL CALIBRATION

The Dolby NR function is most effective when the recording level and the playback level are the same. Before making a recording, first calibrate the bias level, then calibrate the recording level as follows. Tape sensitivity will be compensated for automatically.

- Set the CALIBRATION MODE switch to REC LEVEL.
- Record the calibration test tone by pressing the ● button and the ► 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 (L and R) so that the meters deflect to the indicated point.



Let the meters deflect to this point.

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

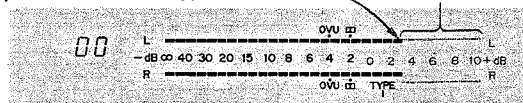
Be sure to set the CALIBRATION MODE switch to OFF.  
In order to erase the recorded calibration test tones, rewind the tape and start recording.

## RECORDING LEVEL ADJUSTMENT

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. This level will depend on the type of tape being used.

When the TAPE button is pressed, the range above the saturation level of the selected type of tape is 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: Saturation level of Type I cassette  
Range in which saturation occurs.



Since the saturation level of any tape is lower 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 such as digital source programs. Consideration has to be given to the program source to be recorded as well as to the characteristics of the cassette to be used, since each cassette, even cassettes using the same type of tape, may have different characteristics.

## DOLBY NR (NOISE REDUCTION) SYSTEM

### The basis of the Dolby NR system

During recording, low-level high-frequency signals, which tend to be obscured by tape hiss, are boosted so that they are substantially higher in level than any tape noise. When these signals are played back, the level is lowered to the original input level, while simultaneously the level of any tape noise is reduced to the same extent.

The Dolby B-type NR system thus reduces tape noise by 10 dB at 5 kHz. The C-type system reduces noise by 20 dB at 5 kHz. The Dolby C-type NR system also begins to take effect at frequencies lower than the B-type system.

### Anti-saturation network

Normally, recording tape will saturate more easily at the higher frequencies. The Dolby C-type NR system incorporates a high frequency anti-saturation network. During recording, the anti-saturation network automatically reduces high-level high-frequency signals. When these signals are played back, the level is automatically boosted to the original input level. At 10 kHz, the tendency of the tape to saturate is reduced by 4 dB by the use of this network.

### Playback of Dolby NR encoded tapes

For the best sound, lowest distortion, and most effective noise reduction, it is essential that a tape recorded using either the B-type or the C-type Dolby NR system be played back using the same system that was used during the recording process. We recommend that you label the cassettes you record as being either non-Dolby NR, Dolby B NR, or Dolby C NR.

Fig. 1 Encoding characteristics

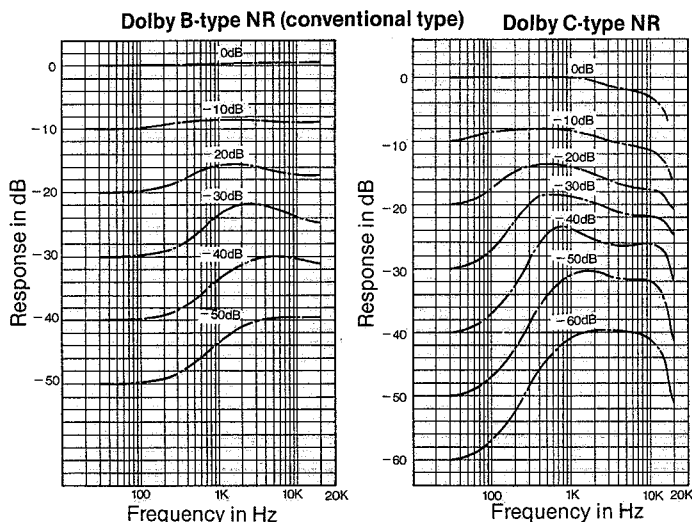


Fig. 2 Noise improvement

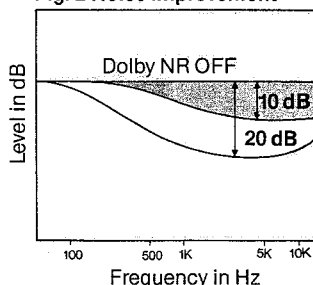
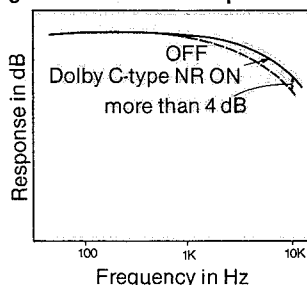


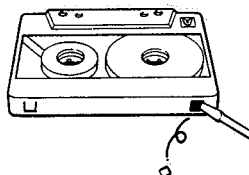
Fig. 3 Saturation level improvement



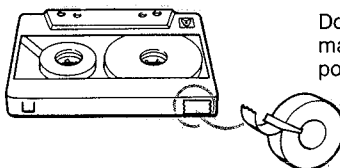
## NOTES ON CASSETTES

### 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 plastic 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 will contaminate the heads.
- Do not stick thick 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 erasures 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.



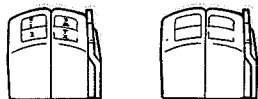
## MAINTENANCE

### 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.

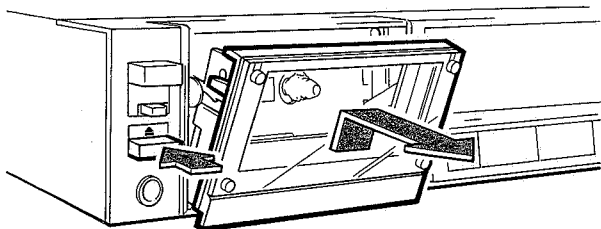
Dirty heads and a dirty tape path cause:

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



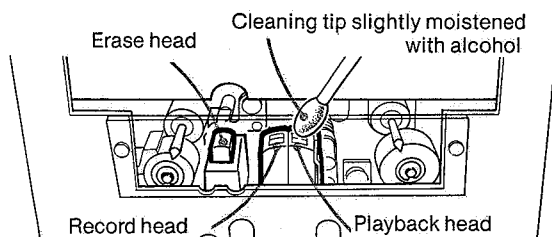
We recommend cleaning after every 10 hours of operation. To make the best possible recordings, however, you should clean all surfaces over which the tape travels before every recording.

- 1 Press the button to open the cassette holder. Remove the window as illustrated.

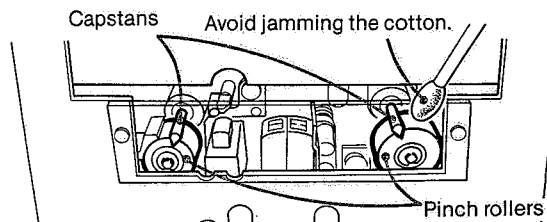


- 2 Push the frame in.

- 3 Set the POWER switch to ON and press the button. Wipe the heads with a cleaning tip slightly moistened with the cleaning fluid or alcohol.

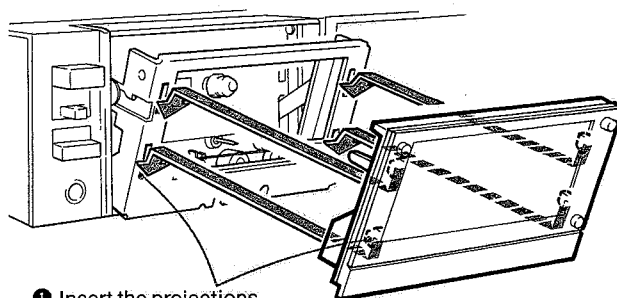


- 4 Wipe the pinch rollers as illustrated. Then press the PAUSE button and wipe the capstans.

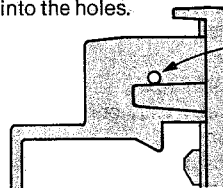


- 5 When finished cleaning, press the PAUSE button to release it, then press the button.

- 6 Press the button to open the frame, and replace the window.



- 1 Insert the projections into the holes.



- 2 Make sure that the window is pressed down until this projection is positioned under the circle as illustrated.

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 hiss. At this 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

Bias frequency 105 kHz

Signal-to-noise ratio (NAB, at peak level)

Dolby NR switch Cassette	OFF	B-TYPE ON	C-TYPE ON
TYPE IV (Sony METAL-ES)	61 dB	68 dB	74 dB
TYPE II (Sony UCX-S)	59 dB	66 dB	72 dB
TYPE I (Sony HF-S)	57 dB	64 dB	70 dB

Total harmonic distortion

0.7% (with Sony METAL-ES cassettes)

Frequency response

DOLBY NR OFF

• With TYPE IV cassette (Sony METAL-ES)

10–20,000 Hz

15–19,000 Hz ( $\pm 3$  dB)

15–14,000 Hz ( $\pm 3$  dB, 0 VU recording)

15–19,000 Hz (DIN)

• With TYPE II cassette (Sony UCX-S)

10–20,000 Hz

15–18,000 Hz ( $\pm 3$  dB)

15–18,000 Hz (DIN)

• With TYPE I cassette (Sony HF-S)

10–19,000 Hz

15–17,000 Hz (DIN)

Wow and flutter

0.02% WRMS (NAB)

$\pm 0.055\%$  (DIN)

Inputs

Line inputs (phono jacks)

Sensitivity 77.5 mV

Input impedance 47 k ohms

Outputs

Fixed line outputs (phono jacks)

Output level 0.44 V at a load impedance of 47 k ohms

Load impedance over 10 k ohms

Variable line outputs (phono jacks)

Maximum output level 0.44 V at a load impedance of 47 k ohms with LINE OUT level control at "MAX"

Variable from 0.44 V to 0V

Load impedance over 10 k ohms

Headphone output

Output level variable from 1.6 mW to 0 mW at a load impedance of 32 ohms

### General

Power requirements

220 V ac, 50/60 Hz

Power consumption

38 watts

Dimensions

Approx. 430 × 110 × 390 mm (w/h/d)

(16<sup>7</sup>/<sub>8</sub> × 4<sup>3</sup>/<sub>8</sub> × 15<sup>3</sup>/<sub>8</sub> inches)

including projecting parts and controls

Weight

Approx. 10.8 kg (23 lbs 13 oz)

Supplied accessories

Connecting cord (2)

### LED peak program meters

Response range –40 dB to +10 dB

Frequency response

20–20,000 Hz  $\pm 1.5$  dB

Response time 1 millisecond

Decay time (from 0 dB to –20 dB)

750 milliseconds

Overshoot none

Indicator elements 30 elements for each channel

While the information given is correct at the time of printing, small production changes in the course of our company's policy of improvement through research and design might not necessarily be indicated in these specifications. We ask you to check with your appointed Sony dealer if clarification on any point is required.

### Note

This appliance conforms with EEC Directives 76/889 and 82/499 regarding interference suppression.

## 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, capstans and pinch rollers 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.**

- Logic-controlled function buttons operate approximately 3 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 ● button and the ► button do not activate.**

- The cassette holder is not fully closed.

**The ● button does not activate.**

- No cassette in the holder.
- 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 counter function is in operation.
- This situation may also be caused by a deformed cassette shell.

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

- This situation depends upon the cassette used and is 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 record and playback heads.
- Improper connection.
- Improper setting of the amplifier controls.
- The tape is played back with the MONITOR switch set to SOURCE.

**Excessive wow or flutter or drop out**

- Contamination of the capstans or pinch rollers.

**Incomplete erasure**

- Contamination of the erase head.

**Increase of noise or erasure of high frequencies**

- Magnetic build-up on the heads.

**Unbalanced tone in higher frequencies**

- Improper setting of the NOISE REDUCTION switches.
- When playing back, set the switches to the same position used when recording.
- Improper setting of the TAPE select buttons. If recorded with the wrong button pressed, adjust the tone controls of the amplifier in playback.

### NOISE

**Hum noise**

- The tape deck is stacked on or under the amplifier. Separate the units.

## AVERTISSEMENT

Afin d'éviter tout risque d'incendie ou d'électrocution, ne pas exposer l'appareil à la pluie ou à l'humidité.

Afin d'écarter tout risque d'électrocution, garder le coffret fermé. Ne confier l'entretien de l'appareil qu'à un personnel qualifié.

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## CARACTERISTIQUES

### Système à trois têtes

La séparation des têtes d'enregistrement et de lecture a permis d'obtenir des réglages d'entrefer et des taux d'impédance de haute précision et partant, des enregistrements sans distorsion et une réponse en fréquence très étendue. Pour optimiser le contact entre la bande et les têtes, celles-ci ont été réunies dans une structure monobloc et ajustées de façon individuelle pour que l'azimut soit précisément aligné pour chacune d'elles. Le système à trois têtes permet également de contrôler la bande pendant qu'elle est enregistrée.

### Têtes laser amorphe (LA)

Les têtes d'enregistrement et de lecture sont construites dans un alliage magnétique amorphe spécialement conçu par Sony; la soudure des noyaux a été accomplie au laser. Ces nouvelles têtes conçues pour défier le temps procurent une gamme dynamique large et une réponse en fréquence beaucoup plus étendue, spécialement dans la gamme des hautes fréquences. Elles sont par ailleurs conçues pour tirer les meilleures performances des bandes métal.

### Système d'entraînement à double cabestan et boucle fermée

Deux paires de cabestans et de galets presseurs garantissent à la bande une tension uniforme et un contact stable entre la bande et la tête; ces aspects techniques réduisent grandement le pleurage et scintillement et les bruits de modulation.

### Stabilité de la vitesse du défilement

Les moteurs de cabestans et de bobines sont de type linéaire BSL (sans balai ni fente) et se distinguent par un couple d'une grande souplesse. Le régime du moteur de cabestan est régulé par un oscillateur au quartz. Le défilement de la bande est directement commandé par l'axe du moteur de cabestan de façon à éliminer au maximum les variations de vitesse causées par courroies et poulies intermédiaires interposées.

### Calibrage de la polarisation et du niveau d'enregistrement

Le courant de polarisation peut être réglé de façon précise pour tous les types de bande, assurant ainsi une réponse en fréquence la plus plate possible. La sensibilité de la bande peut donc être compensée, et l'on peut tirer le meilleur parti du système du réducteur de bruit Dolby NR.

### Châssis en alliage aluminium à l'épreuve des vibrations

Le châssis du mécanisme de transport de la bande est une plaque en alliage aluminium de 3 mm (1/8 pouce) d'épaisseur permettant de supprimer la résonance inhérente aux châssis conventionnels et réduisant considérablement la transmission des vibrations à la bande.

Le châssis de la section amplificateur est une pièce d'acier plaquée cuivre à 5 faces empêchant la circulation des courants parasites et réduisant la distorsion harmonique.