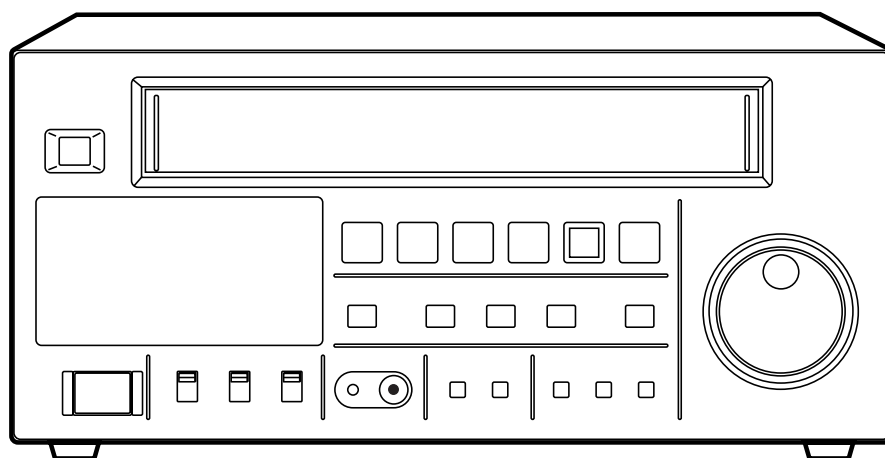


VIDEO CASSETTE RECORDER

MODEL

HS-MD3000E

INSTALLATION AND OPERATION MANUAL



Video Cassette Recorder



Only video cassette tapes with the **S**VHS mark or the VHS mark may be used with this model.

The included power cord is used for 220 - 230 V, 50 Hz. Do not connect any outlet or power supply having a different voltage or frequency.

This instruction manual is important to you.
Please read it before using your video cassette recorder.

This video cassette recorder complies with the requirements of the EC Directive 89/336/EEC, 93/42/EEC and 93/68/EEC.

The electro-magnetic susceptibility has been chosen at a level that gains proper operation in residential areas, on business and light industrial premises and on small-scale enterprises, inside as well as outside of the buildings. All places of operation are characterised by their connection to the public low voltage power supply system.



“CLASSIFIED BY UNDERWRITERS LABORATORIES INC.® WITH RESPECT TO ELECTRIC SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL 2601-1 AND CAN/CSA C22.2 NO. 601.1.”

According to Clause 5 in UL 2601-1 sec 6.8.1 or EN60601-1 sec 6.8.1, this unit is classified by the following;

- The type of protection against electric shock:
EQUIPMENT energized from an external electrical power source:
CLASS I EQUIPMENT
- The degree of protection against harmful ingress of water:
Ordinary EQUIPMENT (enclosed EQUIPMENT without protection against ingress of water)
- The degree of safety of application in the presence of a FLAMMABLE ANAESTHETIC MIXTURE WITH AIR or WITH OXYGEN OR NITROUS OXIDE:
EQUIPMENT not suitable for use in the presence of a FLAMMABLE ANAESTHETIC MIXTURE WITH AIR or WITH OXYGEN OR NITROUS OXIDE
- The mode of operation:
CONTINUOUS OPERATION

This product is to be employed with medical equipment, just for reference purpose, not for medical diagnostic purpose.

When you dispose of the unit or accessories, you must obey the law in the relative area or country and the regulation of the medical facility.

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION:

TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

Safety Precautions

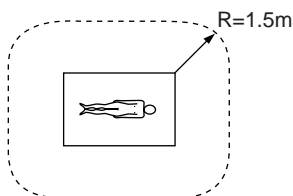
TECHNICAL DESCRIPTIONS

The supplier will make available on request such circuit diagrams, component part lists, descriptions, calibration instructions or other information which will assist the USER's appropriately qualified technical personnel to repair those parts of the EQUIPMENT which are classified by the manufacturer as repairable.

NOTICE FOR MEDICAL USE

- Accessories connected to signal input and/or output parts must be certified according to the appropriate IEC 601-1 and/or IEC 601-1-1 harmonized national standard.
Furthermore all configurations shall comply with the system standard IEC 601-1-1. Everybody who connects additional equipment to the signal input part, or signal output part configures a medical system, and is therefore responsible that the system complies with the requirements of the standard IEC 601-1-1. If in doubt, consult the technical service department or your local representative.
- Caution for use in patient environment

Patient Environment



Leakage current of this unit may be exceeded the allowable value when conductively connected to other equipment. To avoid increment of the leakage current, separation device shall be applied.

THIS APPARATUS MUST BE EARTHED (GROUNDED)

To ensure safe operation the three-prong plug must be inserted only into a standard three-prong power point which is effectively earthed through the normal house-hold wiring.

Extension cords used with the equipment must be three-core and be correctly wired to provide connection to earth. Wrongly wired extension cords are a major cause of fatalities.

The fact that the equipment operates satisfactorily does not imply that the power point is earthed and that the installation is completely safe. For your safety, if in any doubt about the effective earthing of the power point, consult a qualified electrician.

DO NOT REMOVE PANEL COVER BY UNSCREWING

To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. And do not insert fingers or any other objects into the video cassette holder.

CAUTION:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

Caution:

Do not install or place this unit in a bookcase, built in cabinet or in another confined space in order to keep well ventilated condition. Ensure that curtains and any other materials do not obstruct the ventilation condition to prevent risk of electric shock or fire hazard due to overheating.

The transportation and storage environmental conditions are:

Temperature : -20°C - +60°C (-4°F - +140°F)

Humidity : Max. 90%RH

Atmospheric pressure : 500 hPa - 1060 hPa

Note The above transportation environmental conditions indicate the storage environmental conditions during transport.

Remove the battery if equipment is not likely to be used for some time. Consult your dealer to remove it.

INFORMATION

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of these measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a different circuit than the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

INFORMATION

This Class B digital apparatus complies with Canadian ICES-003.

INFORMATION

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Caution and Care

CONDENSATION IS THE ENEMY OF VIDEO RECORDERS

■ What is condensation?

1. When a very cold drink is poured into a glass, the water droplets which form on the outer surface of the glass are an example of condensation.
2. If the VCR is exposed to a rapid increase in temperature (such as warming a cold room or after transporting it from a cold location to a warm one) condensation may form on the tape transport mechanism inside the VCR. By heating the inside of the VCR, it can dry up the moisture and prevent damage to the VCR or video tape from condensation. To do this, plug the VCR in and switch the VCR POWER to ON. Leave the VCR on for at least 2 hours before using it for recording or playback.

■ Condensation is likely to occur when:

1. The VCR is moved inside from outdoors or from a cold room to a warm one.
2. A cold room is heated quickly.
3. Humidity is high.

Note

- Avoid using the VCR where cold air (e.g., from an air conditioner) will blow directly on it.

Do not place anything containing water on top of the VCR; (e.g., vases, cups, etc.).

Heavy object (e.g., TV) should never be placed on the VCR

DO NOT TOUCH OR INSERT ANY OBJECT INSIDE THE VCR

Touching the inside of the cabinet or inserting foreign objects of any kind not only creates a safety hazard but can also cause extensive damage.

PROTECT THE POWER CORD

Damage to the power cord may cause fire or shock hazard. When unplugged, hold by the plug only and pull out carefully.

UNPLUG THE POWER CORD DURING A LONG ABSENCE

Turn off the power and unplug the power cord during a long absence.

MAINTAIN GOOD VENTILATION

Do not obstruct the ventilation holes on the VCR. For maximum ventilation, place the unit on a hard level surface only, and ensure it is not covered during use.

WHEN NOT IN USE

When you finish operating the VCR, always unload the cassette and turn OFF the VCR POWER.

CABINET CARE

Do not use petroleum-based cleaners. Clean with a soft cloth moistened with soap and water and wipe dry. PVC cables or leads should not be left in contact with the cabinet surface for long periods.

INSTALLATION LOCATION

For excellent performance and lasting reliability, install in a location that is:

1. Well ventilated, out of direct sunlight and away from direct heat.
2. A solid, vibration-free surface.
3. Free from high humidity, excessive dust and away from magnetic fields.

Note

Do not move the VCR without first removing the tape.

CARE OF THE VIDEO CASSETTE TAPES

- Avoid vibration or shock.
- Do not place near a strong magnetic field (e.g., a motor, transformer or magnet).
- Do not place or store in direct sunlight.
- Avoid dusty places.
- Place the cassette in its case and store vertically.
- Do not store tape in high humidity.

WHEN DISPOSING OF THE VCR

When you dispose of the VCR, you must obey the law in the relative area or country and the regulation of the medical facility. When disposing, remove the battery which is installed in the VCR for backup.



WARNING:

The included power cord is used for 220 - 230 V, 50 Hz.

Do not connect any outlet or power supply having a different voltage or frequency.

Features

- S-VHS Mode**
- Hi-Fi Audio Recording**
- Digital Frame/Field Still Picture**
- Digital Noise Reduction**
- Digital Y/C Separation**
- Digital Time Base Corrector**
- Swift and Reliable Mechanism**
 - Optical Sensor System
 - Software Servo System
- Automatic Head Cleaning**

- Easy Menu Setting on Screen with Multi Languages**
- All or Part Front Panel Lock**
- Versatile Searching Function**
 - Blank Search
 - Index Search
 - Time Date Search
- Audio Dubbing**
- Multiple Remote Control**
 - RS-232C/34-pin Parallel/USB Interface (optional)
- Low Power Consumption**
- Compact and Light Weighted New Chassis**



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Others

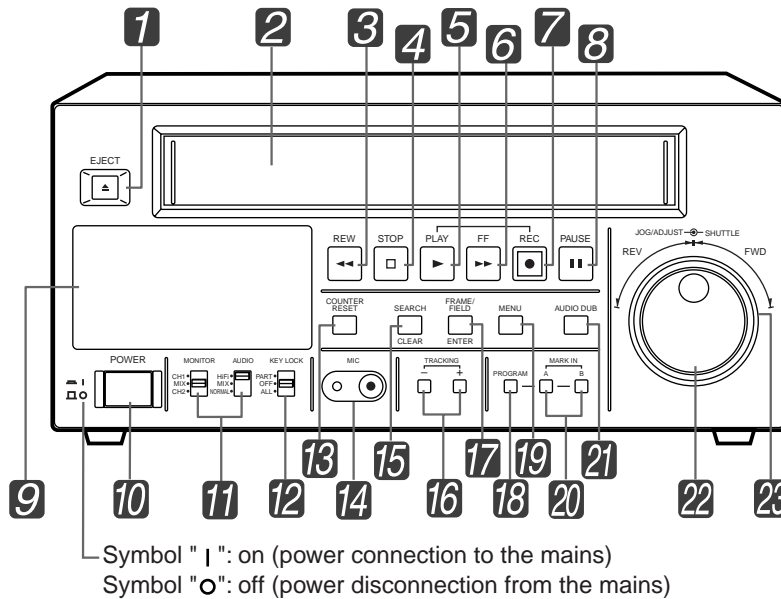
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Accessories

- 1 User's manual
- 1 Power cord

Controls and Functions

Front View



1 EJECT button

Press to remove the cassette.

2 Cassette Loading Slot

Cassette is inserted in this slot for loading.

3 REW button

Press to rewind the tape.

4 STOP button

Press to stop all tape related functions. When pressing while the tape is stopped or the tape is not loaded, the Counter display on the fluorescent display will be changed to the clock. The Counter display will automatically reappear after 5 seconds.

5 PLAY button

When the VCR is in stop mode, press to playback a previously recorded tape.

6 FF button

Press to forward the tape.

7 REC button

Press this button and PLAY button at the same time to begin recording. During playback, press to monitor the signal from S-VIDEO/VIDEO IN and AUDIO IN L/R connector.

8 PAUSE button

During recording, press to stop the tape movement temporarily. Press again to continue the recording. During playback, press to obtain a still picture.

9 Fluorescent Display

➔ page 4

10 POWER button

Press to turn the VCR POWER on or off.

Note

- When turning the VCR off during the tape is in operation (fast forwarding, rewinding, playing or recording, etc.), press STOP first to stop the tape and then press POWER to turn off.

11 AUDIO switch

Use to select the audio signal output from the AUDIO OUT CH-1/L and CH-2/R terminals on the rear panel.

connector AUDIO switch setting	AUDIO OUT (CH-1/L)	AUDIO OUT (CH-2/R)
Hi-Fi	Hi-Fi audio CH-1	Hi-Fi audio CH-2
MIX	Both Hi-Fi audio CH-1 and normal audio	Both Hi-Fi audio CH-2 and normal audio
NORMAL	normal audio	normal audio

MONITOR switch

Use to select the audio signal output from the MONITOR connector on the rear panel.

CH-1 : use to select audio signal from AUDIO OUT CH-1/L.
MIX : use to select audio signal from both AUDIO OUT CH-1/L and CH-2/R.

CH-2 : use to select audio signal from AUDIO OUT CH-2/R.

12 KEY LOCK switch

Use to lock the VCR into the current mode.

PART : use to lock all buttons except STOP button, REC+PLAY button, EJECT button, PAUSE button and POWER button. "LOCK" illuminates on the fluorescent display.

OFF : use to release the lock.

ALL : use to lock all buttons except POWER button. "LOCK A" illuminates on the fluorescent display.

13 COUNTER RESET button

Press to reset the counter to "0:00:00". Also, use to erase the points memorized by MARK IN A/B buttons.

Note

- Press the button for about 2 seconds.

14 MIC IN jack

Input jack for a microphone. The audio signal from a microphone is recorded to the normal audio channel.

MIC level indicator

During recording, illuminates according to the sound level.

15 SEARCH/CLEAR button

Press to display the <SEARCH FUNCTION> menu.
When setting the current time on MENU 3, use to select the setting item in the upward direction.

16 TRACKING buttons

Press to reduce/eliminate the noise during playback.

17 FRAME/FIELD/ENTER button

During playback, still picture or playback using the shuttle ring, press to display the freeze frame picture.

During freeze frame picture, press to switch the picture in the following order. When FREEZE MODE in MENU 2 is set to FRAME, the freeze frame picture is switched in the order of frame still → the first field → the second field → frame still → ... When FREEZE MODE in MENU 2 is set to FIELD, the freeze frame picture is switched in the order of the first field → the second field → frame still → the first field → ...

Also, use to set the menus.

18 PROGRAM button

Press to set the programmed playback.

19 MENU button

When the VCR is turned on, press to display or exit the menus.

Note

- Press the button for about 2 seconds.

20 MARK IN A/B buttons

Press to memorize the current counter.

21 AUDIO DUB button

Use for audio dubbing. During still picture, press to pause audio dubbing. Press PAUSE button to resume audio dubbing. Press this button and PLAY button at the same time to start audio dubbing from stop mode.

22 JOG dial

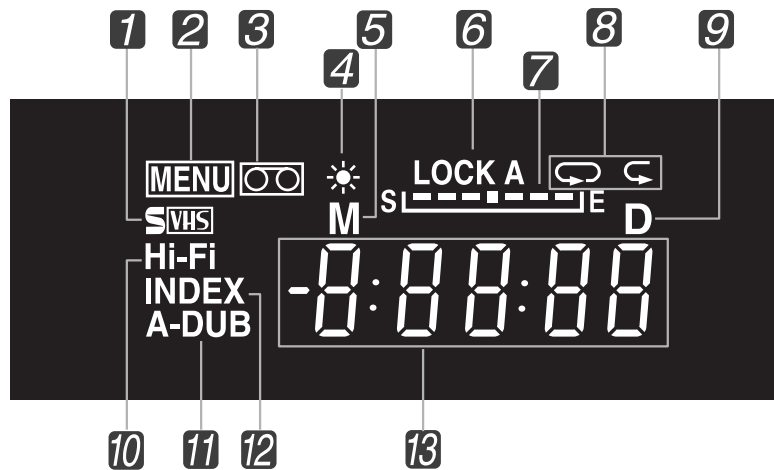
Use to forward or reverse a tape field-by-field.
Also use to set the menus.

23 SHUTTLE ring

Use for special effects playback.

Controls and Functions (Cont.)

Fluorescent Display



1 S-VHS (S-VHS) indicator

Illuminates during playback a tape recorded in S-VHS mode. Also illuminates when "S-VHS" in "MENU 2" is set to "AUTO" and a S-VHS tape or no tape is loaded.

2 MENU (MENU) indicator

Illuminates when the menu is displayed on the monitor.

3 (Cassette Status) indicator

Illuminates when a tape is inserted.

4 (Daylight Saving Time) indicator

Illuminates during the period set by "DAYLIGHT SET" in "MENU 3".

5 M (Counter Memory Stop) indicator

Illuminates during the counter memory stop.

6 Lock/Lock All indicator


LOCK : illuminates when all buttons (except STOP button, REC+PLAY button, EJECT button, PAUSE button and POWER button) are locked.

LOCK A : illuminates when all buttons (except POWER button) are locked.

7 S-----E (Tape Remaining) indicator

Indicates the absolute position on the tape. **S** indicates the beginning of the tape and **E** indicates the end of the tape.

8 (Repeat) indicator

 : illuminates when playback between two marks on the tape marked with MARK A and B buttons once.

 : illuminates when playback between two marks on the tape marked with MARK A and B buttons repeatedly.

9 D (Automatic Tracking) indicator

Illuminates when the VCR adjusts the tracking automatically.

10 Hi-Fi (Hi-Fi Audio) indicator

Illuminates during playback the tape recorded Hi-Fi audio. Also illuminates when "Hi-Fi AUDIO" in "MENU 2" is set to "ON".

11 A-DUB (Audio Dubbing) indicator

Illuminates during audio dubbing.

12 INDEX (Index Search) indicator

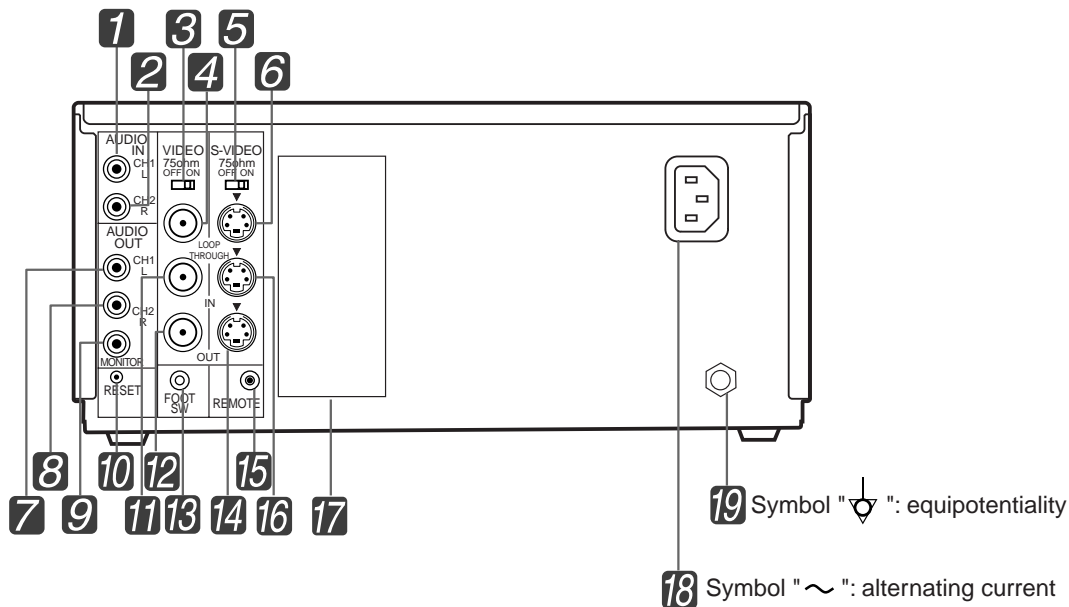
Flashes when recording an index signal and illuminates during the index number setup and the index search. (Index number is shown on the monitor.)

13 Counter/Clock display

While the VCR is turned on, indicates the relative position on the tape. (The Counter stops counting where no recording is made on the tape.)

When pressing STOP button while the tape is stopped or the tape is not loaded, the Counter display will be changed to the clock (24-hour format). The Counter display will automatically reappear after 5 seconds.

Rear View



Warning:
 The included power cord is used for 220 - 230 V, 50 Hz.
 Do not connect to any outlet or power supply having a different voltage or frequency.

Note Ensure the power cord is not plugged into the outlet before connecting to any rear terminals.

- 1 AUDIO IN (CH-1/L) connector**
CH-1/L audio input connector (RCA jack).
- 2 AUDIO IN (CH-2/R) connector**
CH-2/R audio input connector (RCA jack).
- 3 75ohm termination switch for VIDEO IN LOOP THROUGH connector**
Switch it to OFF when the monitor is connected to VIDEO IN LOOP THROUGH connector. Switch it to ON when no equipment is connected to VIDEO IN LOOP THROUGH connector.
- 4 VIDEO IN LOOP THROUGH connector**
The signal from the VIDEO IN connector is looped out to this connector.
- 5 75ohm termination switch for S-VIDEO IN LOOP THROUGH connector**
Switch it to OFF when the monitor is connected to S-VIDEO IN LOOP THROUGH connector. Switch it to ON when no equipment is connected to S-VIDEO IN LOOP THROUGH connector.
- 6 S-VIDEO IN LOOP THROUGH connector**
The signal from the S-VIDEO IN connector is looped out to this connector.
- 7 AUDIO OUT (CH-1/L) connector**
CH-1/L audio output connector (RCA jack).
- 8 AUDIO OUT (CH-2/R) connector**
CH-2/R audio output connector (RCA jack).
- 9 MONITOR connector**
Monitor audio output connector (RCA jack). The audio signal selected by MONITOR switch on the front panel is output from this connector.

- 10 RESET button**
page 19
- 11 VIDEO IN connector**
Input connector for video signal (BNC connector).
- 12 VIDEO OUT connector**
Output connector for video signal (BNC connector).
- 13 FOOT SW jack**
The foot switch which is used to control recording is connected to here. The foot switch shall comply with any of the following standards UL544, UL187, UL2601-1, CSA125, CSA114 or CSA601-1.
- 14 S-VIDEO OUT connector**
Output connector for video signal (S-VIDEO connector).
- 15 REMOTE jack**
Remote control is possible by connecting the remote control unit (R-3001) here.
- 16 S-VIDEO IN connector**
Input connector for video signal (S-VIDEO connector).
- 17 Battery Box and RS-232C/34-pin options**
Battery is stored here. Also install optional RS-232C/34-pin interface board to here.
- Note**
 - This VCR contains a special battery. Consult your dealer to replace it.
- 18 AC power socket**
This socket connects to the power cord. Insert the cord firmly.
- 19 Potential equalization connector**
This is used to equalize the potential of the equipment connected to the unit. For details, refer to the installation instruction of the equipment to be connected.

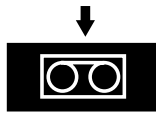
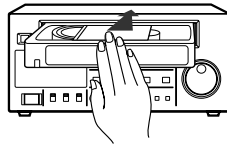
Loading/Unloading a Tape

Tapes can be loaded into your VCR as long as the VCR is plugged into an outlet and turned on. Use only video cassette tapes marked **S-VHS** or **VHS**.

Important notice:
 • Use **S-VHS** tapes when **S-VHS** in **MENU 2** is set to **AUTO**.

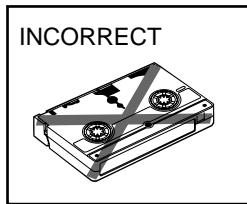
Loading

1. Insert the tape into the cassette slot by holding it so that the long narrow edge with the contents label faces towards you.
 - The Cassette Status indicator illuminates on the fluorescent display when the tape is inserted.



Note

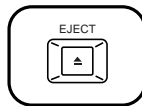
- Your VCR has a protection circuit which will eject the tape if it is loaded improperly. If the VCR ejects the tape, remove it completely and check that the long narrow edge with the contents label is facing towards you, and the clear plastic window that shows the video tape is facing upwards. Wait a few seconds, and try inserting the tape again.



- When the tape loaded, VCR's function varies by the setting of TAPE IN in MENU 1. Page 15 for TAPE IN setting.

Unloading

1. Press **EJECT** button on the front panel of the VCR.
2. Remove the tape.

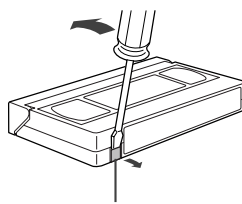


Note

- You cannot eject a tape while the VCR's all buttons are locked and the Lock All indicator (LOCK A) is illuminating or while the menu is displayed on the monitor.

Preventing accidental erasure

Tapes come with an erase prevention tab which, when removed, prevents the tape's contents from being erased or recorded over.



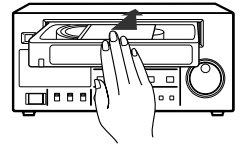
erase prevention tab

Note

- We recommend that you take any broken or torn tapes to a professional for repair. The adhesives on many common types of tape could damage the head of your VCR.

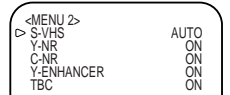
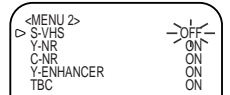
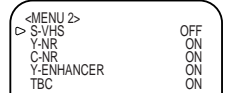
Manual Recording

1. Turn on the VCR and peripheral devices.
2. Load a tape with an erasure prevention tab intact.

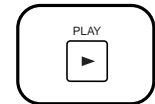
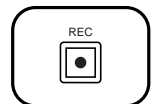


Step 3 to 6 for selecting S-VHS or VHS recording mode.

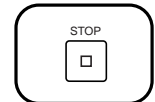
3. Press **MENU** button until **MENU 2** appears on the monitor.
4. Turn **JOG** to select **S-VHS** and press **ENTER** button.
5. Turn **JOG** to select **AUTO** or **OFF** and press **ENTER** button.
 - When set to **AUTO** and the S-VHS tape is loaded, the recording will be made on S-VHS mode. The S-VHS indicator illuminates on the fluorescent display.
 - When set to **OFF**, the recording will be made on VHS mode.



6. Press **MENU** button several times to exit the menu.
7. Press **REC** button and **PLAY** button at the same time to begin recording.



8. Press **STOP** button to stop recording.



Note

- Even if S-VHS in MENU 2 is set to AUTO, the recording will be made on VHS mode when the VHS tape is loaded.

Info.


- Press the **PAUSE** button to momentarily stop recording. Press it again to resume recording.



- When the tape reaches its end during recording, VCR's function varies by the setting of REC TAPE END. Page 15 for REC TAPE END setting.

Audio recording/playback

When an AUDIO IN (CH-1/L) or AUDIO IN (CH-2/R) is connected, the normal audio signal is recorded on the linear track. Set NORMAL AUDIO IN in MENU 2 for selecting the audio signal to be recorded. When a microphone is connected to MIC IN terminal, the audio signal from the microphone is recorded regardless of the NORMAL AUDIO IN setting. To record Hi-Fi audio, set Hi-Fi AUDIO in MENU 2 to ON.

 page 15 and 16 for NORMAL AUDIO IN and Hi-Fi AUDIO setting.

When playback the recorded audio signal, use MONITOR switch or AUDIO switch on the front panel to select the audio signal to be played back.

connector AUDIO switch setting	AUDIO OUT (CH-1/L)	AUDIO OUT (CH-2/R)
Hi-Fi	Hi-Fi audio CH-1	Hi-Fi audio CH-2
MIX	Both Hi-Fi audio CH-1 and normal audio	Both Hi-Fi audio CH-2 and normal audio
NORMAL	normal audio	normal audio

MONITOR switch setting	The sound to be played back
CH-1	Audio signal of AUDIO OUT CH-1/L
MIX	Audio signal of both AUDIO OUT CH-1/L and CH-2/R
CH-2	Audio signal of AUDIO OUT CH-2/R

- Note**
- Audio may be distorted when setting AUDIO switch to MIX during playback.

Rewinding a tape

Press **REW** button.
To stop rewinding, press **STOP** button.

Fast forwarding a tape

Press **FF** button.
To stop fast forwarding, press **STOP** button.

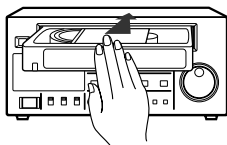
Info.


- The fast forward/rewind time of a E-180/SE-180 tape is approximately 2 minutes, however, the time varies by the type of a tape you use.

Playback

1. Turn on the VCR and peripheral devices.

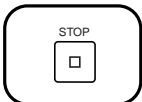
2. Load a pre-recorded tape.




3. Press **PLAY** button to start playback.
• If noise occurs during playback, adjust the tracking,  page 9.



4. Press **STOP** button to stop playback.



 page 10-11 to find a picture you wish to view.

Info.

- When you press REC button during playback, the signal from S-VIDEO/VIDEO IN and AUDIO IN L/R connector is monitored.



When the tape reaches its end during playback/fast forwarding

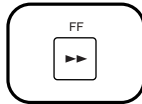
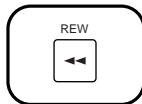
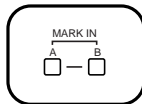
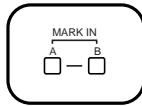
VCR's function varies by the setting of TAPE END in MENU 1.

 page 15 for TAPE END setting.



Programmed Playback

This function allows you to repeatedly playback the desired portion of the tape which is marked with MARK IN A/B buttons on the front panel.



1. Load the cassette.
2. Search for a point where the programmed playback is to be started.
3. Press **MARK IN A** button during playback, recording or stop mode.
 - The current counter is memorized.
4. Search for a point where the programmed playback is to be stopped.
5. Press **MARK IN B** button during playback, recording or stop mode.
 - The current counter is memorized.
6. Press **PROGRAM** button on the front panel to set the programmed playback mode.
 - Press **PROGRAM** button until  appears on the fluorescent display when you want to playback between two memorized points once.
 - Press **PROGRAM** button until  appears on the fluorescent display when you want to playback between two memorized points repeatedly.
7. Press **REW** button or **FF** button.
 - The programmed playback is started.



Checking the memorized points

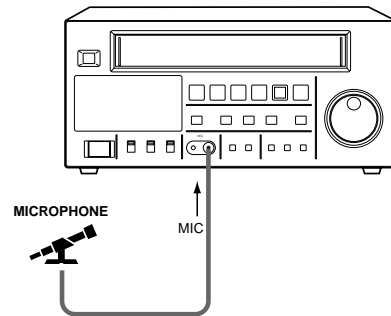
Press **MARK IN A** or **B** while  or  is displayed on the fluorescent display or the menu is displayed on screen. When pressing MARK IN A and B buttons at the same time, the difference between counters memorized by MARK IN A and B buttons appears on the fluorescent display.

Erasing the memorized points

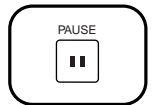
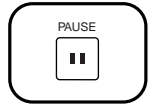
Press **COUNTER RESET** button. This button will not function while  or  is displayed on the fluorescent display.

Audio Dubbing

This function allows you to record the audio signal from microphone onto an already recorded tape. When the microphone is not connected, the audio signal selected in NORMAL AUDIO IN in MENU 2 is recorded.



1. Load the recorded cassette.
2. Press **PLAY** to playback the tape.
3. Press **PAUSE** button at the point where the audio dubbing is to be started, and then press **AUDIO DUB** button.
 - The audio dubbing is paused and A-DUB illuminates on the fluorescent display.
4. Press **PAUSE** button again.
 - The audio dubbing is started.
 - ⇒ To stop audio dubbing, press **STOP** button.



Starting audio dubbing from stop mode

Press **AUDIO DUB** button and **PLAY** button at the same time while the VCR is stopped.

Info.

- The specification of MIC IN terminal of the VCR is: 0.775mV (rms), 600 Ω, mini jack.

Additional Features

Memory backup in case of power failure

This VCR includes a built-in backup memory, so the preset day and present time and the counter display will remain in memory even if there is a power failure. However, if the power cord is disconnected or the VCR is turned off for a long period of time, the present time may not be accurate. In this case, set the clock again.

Info.

- When the memory backup feature does not work, consult your dealer to replace the battery.

Lock function

All or some buttons on the front panel of VCR is locked, and kept in the current condition when the KEY LOCK switch on the front panel is set. Set the switch to:

- PART**: All buttons except STOP button, REC+PLAY button, EJECT button, PAUSE button and POWER button are locked. LOCK illuminates on the fluorescent display.
- ALL**: All buttons are locked except POWER button. LOCK A illuminates on the fluorescent display.
- OFF**: All buttons are not locked.

Special Effects Playback

The following convenient functions are available. Audio output is muted during 1/5, 1/10 and still picture.

Still picture

- Press **PAUSE** button during playback for freeze field picture. Press **FRAME/FIELD** button during playback, still picture or playback using the shuttle ring for freeze frame picture.
 - Press **PAUSE** button again to resume the playback.

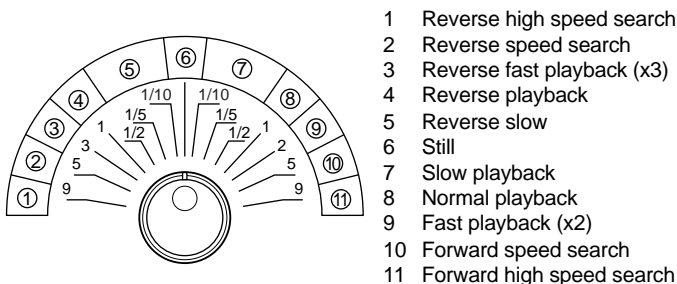
Note

- The freeze frame picture will be switched by pressing **FRAME/FIELD** button. When FREEZE MODE in MENU 2 is set to FRAME, the freeze frame picture is switched in the order of frame still → the first field → the second field → frame still → ... When FREEZE MODE in MENU 2 is set to FIELD, the freeze frame picture is switched in the order of the first field → the second field → frame still → the first field → ...
- When pressing **FRAME/FIELD** button during still picture or playback using the shuttle ring, it takes few seconds to switch the picture.

page 15 for FREEZE MODE setting.

Shuttle ring

By turning the SHUTTLE ring during playback, still picture, fast forwarding, rewinding or stop mode, you can obtain a variety of playback as shown below.



- Turn **SHUTTLE** to the right or left during playback, still picture, fast forwarding, rewinding or stop mode.
 - The playback speed varies by the angle of SHUTTLE ring.
 - When the SHUTTLE ring is released, the playback speed will be fixed to the speed of the released position.
 - When the SHUTTLE ring is came back to the centre position, the playback picture stays at still.

Reference page

Field playback

- To forward fields one by one, turn **JOG** during still picture.
 - Turn to the right to forward.
 - Turn to the left to reverse.

To forward fields continuously, keep turning **JOG** during still picture.

- Keep turning to the right to forward fields continuously.
- Keep turning to the left to reverse fields continuously.

To stop field playback, release **JOG**.

- The playback picture stays at still.

Note

- A few noise bars or vertical movement may appear during field playback.
- Noise bars may appear on the picture while switching between forward and reverse field playback.

Tracking Adjustment

Automatic tracking

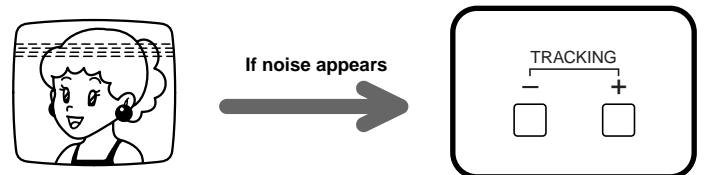
When the tape is loaded and the playback is started, the VCR automatically adjusts the playback picture to reduce or eliminate noise. When the automatic tracking is in operation, Automatic Tracking indicator (**D**) illuminates on the fluorescent display.

Manual tracking

If automatic tracking does not eliminate noise, adjust the tracking manually. If tracking is adjusted manually, Automatic Tracking indicator (**D**) on the fluorescent display turns off.

How to adjust tracking manually during playback

- Press **TRACKING** button (**+**) or (**-**) to achieve the best picture.



How to adjust during fast playback, reverse playback

- During playback, still picture, fast forwarding, rewinding or stop mode, turn **SHUTTLE** to obtain the respective playback mode and release **SHUTTLE** to fix the playback speed.
- Press **TRACKING** button (**+**) or (**-**) to achieve the best picture.

Initializing the automatic tracking

To continue automatic tracking, press both **TRACKING** buttons (**+**) and (**-**) together during playback.

Note

- Adjust the tracking at each type of playback (fast playback, reverse playback), since the method of tracking adjustment varies.
- TRACKING** button will not function during slow playback.
- Although the tracking is adjusted during reverse playback, the noise may remain on screen.
- The noise bars will move continuously when a **TRACKING** button is depressed.

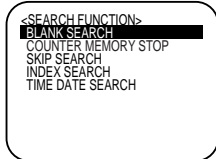
Searching Techniques

The various search function helps you to find a picture you wish to view.

Blank search

Fast forwards a tape to a beginning point of a blank section and stops.

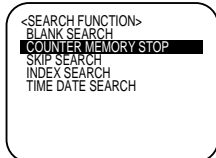
- Press **SEARCH** button once.
 - <**SEARCH FUNCTION**> menu appears and **BLANK SEARCH** is highlighted.
- Press **ENTER** button.
 - The VCR starts fast forwarding.
 - During blank search, "BLANK SEARCH" is displayed on the monitor.
 - ⇒ To quit while searching, press **STOP** button.
 - ⇒ To exit the <**SEARCH FUNCTION**> menu without searching, press **STOP** button.



Counter memory stop

Fast forwards or rewinds a tape till the counter on the fluorescent display reaches to the value memorized by **MARK IN A** button. When the counter is not memorized, the VCR will stop at the point "0:00:00".

- Press **SEARCH** button several times.
 - <**SEARCH FUNCTION**> menu appears and **COUNTER MEMORY STOP** is highlighted.
 - The Counter Memory Stop indicator (**M**) illuminates on the fluorescent display.
- Press **ENTER** button.
 - The VCR starts fast forwarding or rewinding the tape.
 - During counter memory stop, "→" and the counter value memorized by **MARK IN A** button are displayed on the monitor (when the counter is not memorized, "0:00:00" is displayed).
 - ⇒ To quit while searching, press **STOP** button.
 - ⇒ To exit the <**SEARCH FUNCTION**> menu without searching, press **STOP** button.



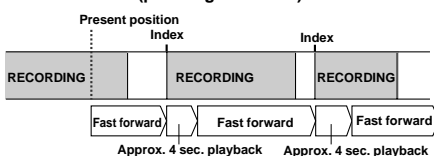
Note

- When the counter on the fluorescent display indicates the same value as the searched one, **COUNTER MEMORY STOP** of the **SEARCH FUNCTION** menu cannot be selected.

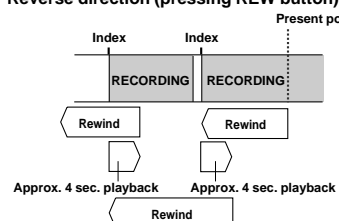
Skip search

During fast forwarding or rewinding, the VCR plays back a tape for about 4 seconds where an index signal is recorded. This process is repeated until the end or beginning of the tape is reached.

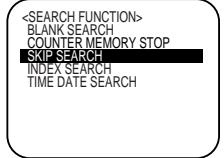
Fast forward direction (pressing FF button)



Reverse direction (pressing REW button)



- Press **SEARCH** button several times.
 - SKIP SEARCH** is highlighted.
- Press **FF** or **REW** button.
 - Pressing **FF** button proceeds the search in the forward direction.
 - Pressing **REW** button proceeds the search in the reverse direction.
 - During skip search, "SKIP SEARCH" is displayed on the monitor.
 - ⇒ To quit while searching, press **STOP** button.
 - ⇒ To exit the <**SEARCH FUNCTION**> menu without searching, press **STOP** button.
- When you find a picture you wish to view, press **PLAY** button.



Note

- The index signal may be difficult to locate in some recording conditions.

Info.

- Skip search or index search may not function if the interval between two index marks is too short.

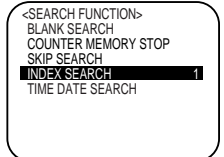


- Page 15 for the setting of recording the index signal.

Index search

During fast forwarding or rewinding, the VCR will search for an index signal you have selected. When the index signal is found, the VCR will start playback.

- Press **SEARCH** button several times.
 - INDEX SEARCH** is highlighted.
 - The Index Search indicator (**INDEX**) illuminates on the fluorescent display.
- Turn **JOG** to select an index number (between 1 and 255) you wish to find.
 - ⇒ To exit the <**SEARCH FUNCTION**> menu without searching, press **STOP** button.
- Press **FF** or **REW** button.
 - Pressing **FF** button proceeds the search in the forward direction.
 - Pressing **REW** button proceeds the search in the reverse direction.
 - The index number shown on the monitor will decrease one by one as each index signal goes by.
 - ⇒ To quit while searching, press **STOP** button.



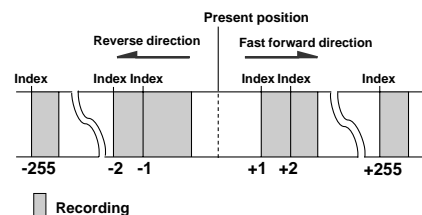
Note

- The index signal may be difficult to locate in some recording conditions.

Info.

How to count index number

- Index number is the count from the present position. The index number of one recording before the present position is "-1". One after is "+1".
- ±255 index numbers are count at the maximum.



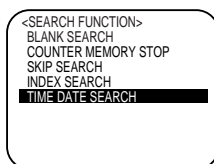
- Page 15 for the setting of recording the index signal.

Time date search

You can easily find a picture recorded at specific date and time.

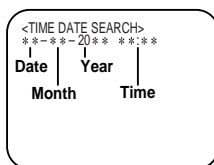
1. Press **SEARCH** button several times.

- **TIME DATE SEARCH** is highlighted.



2. Press **ENTER** button.

- **<TIME DATE SEARCH>** menu appears.



3. Press **ENTER** button again.

- 10-digit of **Date** display will flash.

4. Turn **JOG** to set **Date** (10-digit and 1-digit) you wish to find and press **ENTER** button.

- ⇒ To exit the **<TIME DATE SEARCH>** menu without searching, press **SEARCH** or **STOP** button.

5. Set **Month**, **Year**, *10-hour digit*, *1-hour digit*, *10-minute digit* and *1-minute digit* of **Time** in a similar fashion.

- When Date, Month, Year or Time is set to **, the VCR searches all available settings. For example, when you set Month to **, the VCR searches all months.

6. Press **FF** or **REW** button.

- Pressing **FF** button proceeds the search in the forward direction.
- Pressing **REW** button proceeds the search in the reverse direction.
- When the recorded picture is found, the VCR starts playback.

- ⇒ To quit while searching, press **STOP** button.

Note

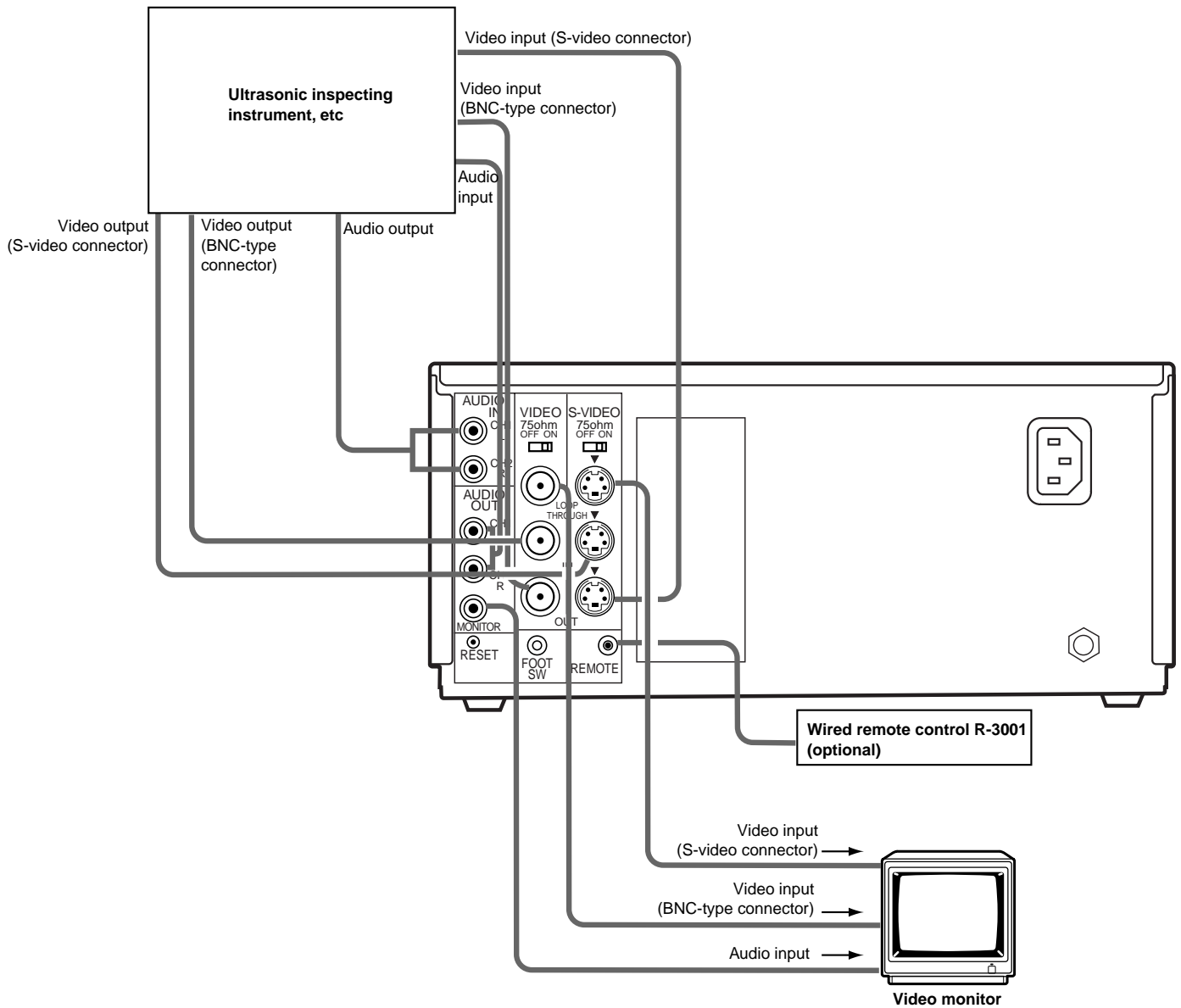
- To carry out the time date search, set TIME CODE REC in MENU 1 to ON when the tape is recorded.
- A time code is written on a tape when the recording is started and at each minute during recording.
- The time date search may not function correctly, if you use a tape with a poor recording quality.
- The time date search will not function when using a tape recorded with other VCRs, a tape recorded without setting the day and present time or a tape recorded without writing a time code.

Info.

- When the desired part of the tape is not found in the selected direction, the VCR automatically searches in the opposite direction.

Connections

Connecting with ultrasonic inspecting instrument, video monitor, etc



Note

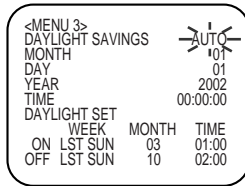
- To monitor the playback picture, connect the video monitor to VIDEO OUT connector.
- Set the 75ohm termination switch for S-VIDEO IN LOOP THROUGH connector to OFF when the video monitor or another audio and video device is connected to S-VIDEO IN LOOP THROUGH connector.
Set the 75ohm termination switch for VIDEO IN LOOP THROUGH connector to OFF when the video monitor or another audio and video device is connected to VIDEO IN LOOP THROUGH connector.

Clock Setting

Example : Setting the day and present time to 8:25 p.m., 9 July, 2002.

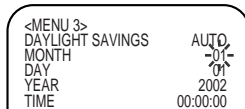
1. Press **MENU** button several times until **MENU 3** appears on the monitor.
 - <MENU 3> appears.

2. Press **ENTER** button.
 - **DAYLIGHT SAVINGS** will flash.



3. Turn **JOG** to set **DAYLIGHT SAVINGS** and press **ENTER** button.
 - When set to **AUTO**, the clock moves forward one hour during the period set on the **DAYLIGHT SET**.
 - When set to **AUTO** and the clock is put forward one hour, the Daylight Saving Time symbol (☀) is shown next to the hour digit of **TIME** on screen.

4. Turn **JOG** to show "07" for **MONTH** and press **ENTER** button.



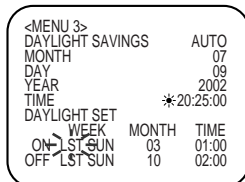
5. Set **DAY**, **YEAR**, **TIME** (hour digits, 10-minute digit and 1-minute digit) in a similar fashion.



6. Press **ENTER** button while the 1-minute digit of **TIME** is flashing.

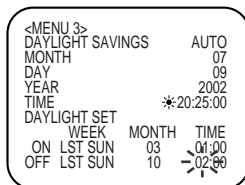
When setting **DAYLIGHT SAVINGS** to **AUTO**, set the period to follow the daylight saving time by step 7 to 10.

7. Turn **JOG** to set **WEEK** of **DAYLIGHT SET ON** and press **ENTER** button.



8. Set **MONTH**, **TIME** (hour digits) for **DAYLIGHT SET ON** in a similar fashion.

9. Turn **JOG** to set **WEEK** of **DAYLIGHT SET OFF** and press **ENTER** button.



10. Set **MONTH**, **TIME** (hour digits) for **DAYLIGHT SET OFF** in a similar fashion.

- The setting is now complete.

11. Press **MENU** button several times to exit the menu.

Note

- **DAYLIGHT SET** will not appear when **DAYLIGHT SAVINGS** is set to **OFF**.

Info.

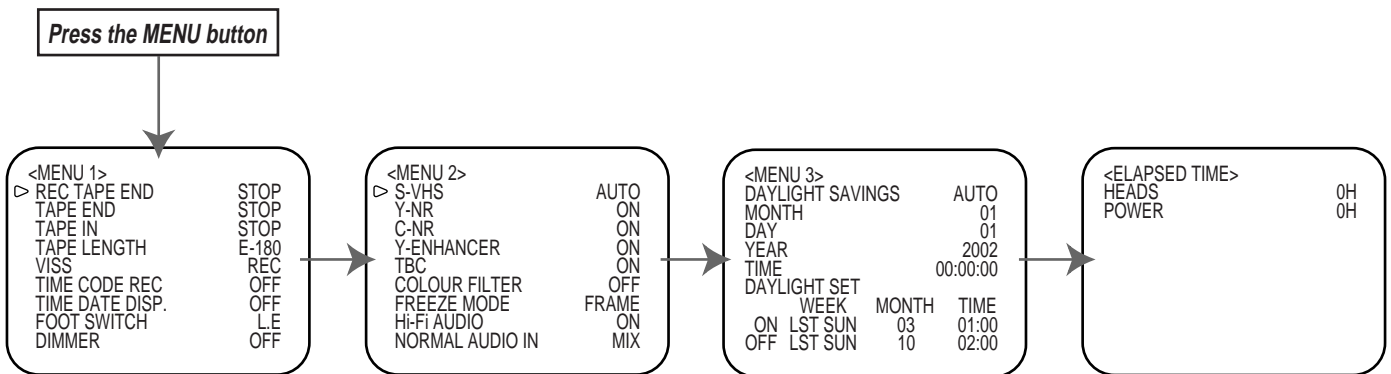
- Press **CLEAR** button to select the selected item in the upward direction.

Setting the current time to exact second

Set the clock as described to the left, but set minute digits to one or two minutes ahead of the reference time being used. When the reference time reaches 00 seconds of the minute you have set, press **ENTER** button while the 1-minute digit of **TIME** (when **DAYLIGHT SAVINGS** is set to **OFF**) or the hour digit of **TIME** for **DAYLIGHT SET OFF** (when **DAYLIGHT SAVINGS** is set to **AUTO**) is flashing. The VCR's clock now corresponds to the reference time to the nearest second.

Menu Settings

Menu Chart

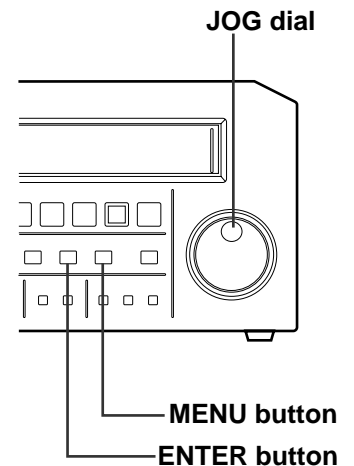


VCR operations can be set through menus. Set MENU1 and MENU2 by the following steps.

1. Press **MENU** button.
 - Each time you press the button, the display will be switched in the order of **<MENU 1>** → **<MENU 2>** → **<MENU 3>** → **<ELAPSED TIME>** → exit the menu → **<MENU 1>**...

Note

- Press **MENU** button for about 2 seconds to display the menu.
2. Turn **JOG** to the left or right to select the desired item.
 - When turned to the right, the cursor moves downward.
 - When turned to the left, the cursor moves upward.
 3. Press **ENTER** button, then the setting item flashes.
 4. Turn **JOG** to the left or right to change the setting.
 5. Press **ENTER** button to set.
 6. Press **MENU** button several times to exit the menu.



Info. Use of JOG dial for menu setting

- Put a finger to the dimple and turn round and round.
- Turning to the right changes the setting item to forward direction and turning to the left changes the setting item to backward direction.
- When the setting item is not flashing, turn to the right to move the cursor (▷) downwards and turn to the left to move it upwards.

LANGUAGE SELECTION

The menu which appears on screen offers 7 languages. This menu appears by pressing MENU button, when the VCR is turned on for the first time after the purchase, or when RESET button is pressed during use.

- Press **MENU** button.
 - The menu as shown to the right appears.
- Turn **JOG** to select the desired language.
- Press **ENTER** button.
 - <MENU 1>** in the selected language appears on screen.
- Press **MENU** button several times to exit.



Note

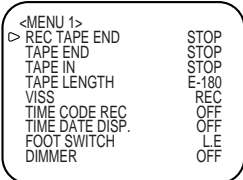
- After first time setup and selecting the language to be used, the only way to go back and access the main menu in the seven languages is to PRESS the **RESET** button found on the rear panel. The **RESET** button can be accessed with a small pointed object. The **RESET** button is pressed, repeat steps 1 to 4 above.

MENU 1

Setting operation of VCR when the tape reaches its end during recording (REC TAPE END)

The VCR's function when the tape reaches its end during recording is as follows.

- STOP** : The tape stops.
- REW** : Rewinds the tape to the beginning and stops.
- EJECT** : Ejects the tape.



Setting operation of VCR when the tape reaches its end during playback/fast forwarding (TAPE END)

The VCR's function when the tape reaches its end during playback/fast forwarding is as follows.

- STOP** : The tape stops.
- REW** : Rewinds the tape to the beginning and stops.

Setting operation of VCR when the tape is loaded (TAPE IN)

The VCR's function when the tape is loaded to the VCR is as follows.

- STOP** : The tape stops.
- REW** : Rewinds the tape to the beginning and stops.

Setting the tape length (TAPE LENGTH)

- E-180** : Select when using a E-180 or SE-180 tape.
- E-240** : Select when using a E-240 or SE-240 tape.

Recording the index signal (VISS)

- OFF** : The index signal is not recorded.
- REC** : The index signal is recorded when the recording starts from STOP mode. When the recording starts from the REC PAUSE mode, the index signal is not recorded.
- REC/PAUSE** : The index signal is recorded when the recording starts from STOP or REC PAUSE mode.

Recording the time code (TIME CODE REC)

- ON** : The time code is recorded.
- OFF** : The time code is not recorded.

Displaying the time code (TIME DATE DISP.)

- OFF** : The time code is not displayed.
- TOP** : The time code is displayed on the top of the screen.
- BOTTOM** : The time code is displayed on the bottom of the screen.

Note

- The time code is displayed only during playback.

Setting the operation mode of the FOOT SWITCH terminal (FOOT SWITCH)

- L.E** : Operates when the low edge of the input signal is input.
- H.E** : Operates when the high edge of the input signal is input.
- L.L** : Operates when the low level of the input signal is input.

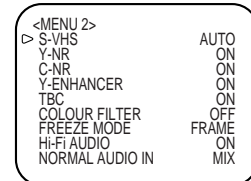
Setting the brightness of the fluorescent display (DIMMER)

- ON** : Select to darken the fluorescent display.
- OFF** : Select not to darken the fluorescent display.

MENU 2

Setting the S-VHS/VHS mode (S-VHS)

- AUTO** : Records in S-VHS mode when using S-VHS cassette.
- OFF** : Records in VHS mode when using either S-VHS cassette or VHS cassette.



Setting Y-NR (Y-NR)

- ON** : Turns on the digital luminance noise reducer.
- OFF** : Turns off the digital luminance noise reducer.

Setting C-NR (C-NR)

- ON** : Turns on the digital chroma noise reducer.
- OFF** : Turns off the digital chroma noise reducer.

Setting Y-ENHANCER (Y-ENHANCER)

- ON** : Turns on the digital enhancer.
- OFF** : Turns off the digital enhancer.

Adjusting the picture when playing back a tape (TBC)

- ON** : The vibration or distortion in the playback picture is reduced.
- OFF** : The playback picture is not adjusted.

Setting COLOUR FILTER (COLOUR FILTER)

- ON** : Reduces the noise in the chrominance signals caused by the high level of noise in the luminance signals.
- OFF** : Turns off the COLOUR FILTER.

Setting the freeze frame picture (FREEZE MODE)

- FRAME** : When the freeze frame picture is displayed, the frame still picture is displayed initially.
- FIELD** : When the freeze frame picture is displayed, the first field still picture is displayed initially.

Setting the Hi-Fi audio recording (HI-FI AUDIO)

- ON** : Hi-Fi audio is recorded.
- OFF** : Hi-Fi audio is not recorded.

Menu Settings (Cont.)

Setting the audio signal recorded on the linear track (NORMAL AUDIO IN)

- MIX** : The audio signal from CH1 and CH2 are mixed and recorded.
- CH1** : The audio signal input from CH1 terminal is recorded.
- CH2** : The audio signal input from CH2 terminal is recorded.

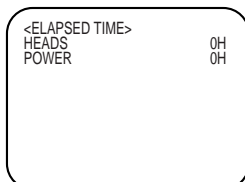
Note

- When a microphone is connected to MIC IN jack, the signal from MIC IN jack will take precedence.

ELAPSED TIME

Displaying the elapsed time of VCR heads (HEADS)

Displays the total time the VCR heads have been used, up to 9,999 hours.



Displaying the elapsed time of VCR (POWER)

Displays the total time the VCR has been used, up to 99,999 hours.

Note

- When setting menus, the following display that corresponds to the selected menu item will be illuminated on the fluorescent display.

Language select	ENGLISH		001:00
	DEUTSCH		001:01
	FRANÇAIS		001:02
	ESPAÑOL		001:03
	NEDERLANDS		001:04
	ITALIANO		001:05
	РУССКИЙ		001:06
MENU 1	REC TAPE END	STOP	101:00
		REW	101:01
		EJECT	101:02
	TAPE END	STOP	102:00
		REW	102:01
	TAPE IN	STOP	103:00
		REW	103:01
	TAPE LENGTH	E-180	104:00
		E-240	104:01
	VISS	OFF	105:00
		REC	105:01
		REC/PAUSE	105:02
	TIME CODE REC	OFF	106:00
		ON	106:01
	TIME DATE DISP.	OFF	107:00
		TOP	107:01
		BOTTOM	107:02
	FOOT SWITCH	L.E	108:00
		H.E	108:01
		L.L	108:02
	DIMMER	OFF	109:00
		ON	109:01

MENU 2	S-VHS	OFF	201:00
		AUTO	201:01
	Y-NR	OFF	202:00
		ON	202:01
	C-NR	OFF	203:00
		ON	203:01
	Y-ENHANCER	OFF	204:00
		ON	204:01
	TBC	OFF	205:00
		ON	205:01
	COLOUR FILTER	OFF	206:00
		ON	206:01
	FREEZE MODE	FRAME	207:00
		FIELD	207:01
	Hi-Fi AUDIO	OFF	208:00
		ON	208:01
	NORMAL AUDIO IN	MIX	209:00
		CH1	209:01
		CH2	209:02

MENU 3	DAYLIGHT SAVINGS	OFF	301:00
		AUTO	301:01
	MONTH		302:01 - 302:12
	DAY		303:01 - 303:31
	YEAR		304:02 - 304:32
	TIME	(hour digits)	305:00 - 305:23
		(10-minute digit)	306:00 - 306:05
		(1-minute digit)	307:00 - 307:09
	DAYLIGHT SET ON		
	WEEK	1ST	308:00
		2ND	308:01
		3RD	308:02
		4TH	308:03
		LST	308:04
		SUN	309:00
		MON	309:01
		TUE	309:02
		WED	309:03
		THU	309:04
		FRI	309:05
		SAT	309:06
	MONTH		310:01 - 310:12
	TIME	(hour digits)	311:00 - 311:23
	DAYLIGHT SET OFF		
	WEEK	1ST	312:00
		2ND	312:01
		3RD	312:02
		4TH	312:03
		LST	312:04
		SUN	313:00
		MON	313:01
		TUE	313:02
		WED	313:03
		THU	313:04
		FRI	313:05
		SAT	313:06
	MONTH		314:01 - 314:12
	TIME	(hour digits)	315:00 - 315:23

ELAPSED TIME	HEADS POWER	0000H - 9999H
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SEARCH FUNCTION	BLANK SEARCH	
	COUNTER MEMORY STOP	M
	SKIP SEARCH	
	INDEX SEARCH	INDEX
	TIME DATE SEARCH	

Before Calling for Service

When you find any problem with this VCR, first check the following. If you still cannot solve the problem, stop using the VCR, unplug it from an outlet and contact your dealer.

Symptom	Check list/Remedy
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Installation

No power supplied to VCR.	<ul style="list-style-type: none"> Is the power cord plugged into a power outlet?
The VCR POWER is ON but the VCR does not operate.	<ul style="list-style-type: none"> Is the Lock or Lock All indicator (LOCK/LOCK A) illuminated? → Set KEY LOCK switch on the front panel to OFF to unlock the VCR. Is the MENU indicator (MENU) illuminated? → Press MENU button several times to turn off the MENU indicator. Safety devices are in operation. → Press RESET button on the rear panel using a pointed instrument. And then turn the power on again.
No picture is obtained on the MONITOR screen.	<ul style="list-style-type: none"> Is the monitor connected correctly? → Check the connection. Is the connecting cable properly connected, or is the cable defective? → Check the connection and also check for cable damage.

Function/operation

No operation when any tape operation button is pressed.	<ul style="list-style-type: none"> Is the Lock or Lock All indicator (LOCK/LOCK A) illuminated? → Set KEY LOCK switch on the front panel to OFF to unlock the VCR. Is the MENU indicator (MENU) illuminated? → Press MENU button several times to turn off the MENU indicator. Is a cassette inserted?
A tape cannot be loaded.	<ul style="list-style-type: none"> Is the Lock All indicator (LOCK A) illuminated? → Set KEY LOCK switch on the front panel to OFF to unlock the VCR.

Recording

Recording does not work by pressing the REC and PLAY button.	<ul style="list-style-type: none"> Is the Lock All indicator (LOCK A) illuminated? → Set KEY LOCK switch on the front panel to OFF to unlock the VCR. Is the MENU indicator (MENU) illuminated? → Press MENU button several times to turn off the MENU indicator. Has the cassette's erasure prevention tab been broken off? → Load the cassette with its erasure prevention tab intact. Has the tape run out? → Rewind the tape or load a new tape.
Recording cannot be stopped by pressing the STOP button.	<ul style="list-style-type: none"> Is the Lock All indicator (LOCK A) illuminated? → Set KEY LOCK switch on the front panel to OFF to unlock the VCR.

Playback

No operation when the PLAY button is pressed.	<ul style="list-style-type: none"> Is the Lock or Lock All indicator (LOCK/LOCK A) illuminated? → Set KEY LOCK switch on the front panel to OFF to unlock the VCR. Is the MENU indicator (MENU) illuminated? → Press MENU button several times to turn off the MENU indicator. Is a cassette inserted? Has the tape run out?
Noise bars in the picture during playback.	<ul style="list-style-type: none"> → Adjust the tracking by pressing TRACKING button on the front panel.
Clear pictures during recording but during playback the picture is not clear.	<ul style="list-style-type: none"> The video heads may be clogged. → Clean the video heads by using the video head cleaning cassette available in most local retail store. If the picture is not clear after using the video head cleaning cassette, please consult your dealer.

Warning Display

Self-diagnostic function

This VCR uses a self-diagnostic function to detect an internal malfunction. When a malfunction occurs in the VCR, the indication corresponding to each malfunction illuminates on the fluorescent display.

The type of malfunction corresponding to the indication and countermeasures are given below.

If the error is not cleared even after taking the remedial action described below, switch off the power, disconnect the power cable from the power outlet, and contact your dealer immediately.

Fluorescent display	Cause	Remedial action
Err 03	Lack of video signal input	This error may occur when the recording is started with no video signal input or when the video signal stops during recording. Check the video signal.
Err 05	Reel	These errors may occur if there is something wrong with the state of the video cassette. Eject the cassette tape and load it again.
Err 06	Loading	
Err 07	Capstan	
Err 08	Drum	
Err 09	Tape	
Err 10	Power	This error may occur if there is something wrong with the power circuit. Turn off the VCR power. Wait a few seconds and turn it back on.
Err 11	Torn tape	This error may occur when the cassette tape is torn. Check the cassette tape.

Maintenance

SPECIFICATION	RECOMMENDED TIME OF REPLACEMENT
UPPER DRUM ASSY	EVERY 1,000 HOURS
CAPSTAN MOTOR, CAPSTAN BRAKE UNIT, IDLER UNIT, REEL DISK, ASSY GEAR PULLEY, BRAKE BELT (SP, TU), CLEANING ROLLER	EVERY 4,000 HOURS
PINCH ARM UNIT, REEL BELT	EVERY 4,000 HOURS OR 3 YEARS
ASSY DRUM, A/C HEAD UNIT, LOADING MOTOR ASSY, FE HEAD	EVERY 10,000 HOURS
BATTERY	5 YEARS AFTER MANUFACTURING

Specifications

General

Power Source	: AC 100 - 230 V ± 10%, 50/60 Hz (The included power cord is used for 220 - 230 V, 50 Hz.)
Power Consumption	: 0.4 - 0.2A
Television System	: CCIR standard 625 lines, 50 field PAL-type colour system
Colour Signal	: Low frequency conversion, sub-carrier phase shift recording
Tape Format	: S-VHS/VHS 1/2" width high-density video cassette tape
Tape Speed	: 23.39mm/s
Recording Time	: 3 hours with E-180/SE-180 tape
Fast Forward/Rewind Time	: Approx. 120 seconds with E-180/SE-180 tape
Operating Temperature	: 41 °F to 104 °F (5 °C to 40 °C)
Relative Humidity	: Max. 80 %
Dimensions (Jog dial included)	: 10.6 (W) x 14.4 (D) x 4.9 (H) (in.) 270 (W) x 366 (D) x 125 (H) (mm)
Weight	: 14.3 lbs (6.5 kg)
Head	: 4 video heads 2 Hi-Fi audio heads 1 flying erase head
Luminance Signal	: Frequency modulation recording
Audio Track	: 1 track
Audio/Control	: 1 stationary head
Erase	: 1 full-track head
Motors	: 3 motors-drum/capstan direct drive system
Battery Backup	: Lasts 5 years (after manufacturing)

Audio

Input	: <Line In (CH-1, CH-2)>346 mV (rms), 47 kΩ, 2 RCA plugs <MIC In>0.775 mV (rms), 600 Ω, mini jack
Output	: <Line Out (CH-1, CH-2)>346 mV (rms), 1 kΩ, 2 RCA plugs <MONITOR Out (monaural)>346 mV (rms), 1 kΩ, RCA plug
Signal-to-Noise Ratio	: Better than 43 dB
Frequency Response	: 70 Hz - 12 kHz (normal audio only) 20 Hz - 20 kHz (Hi-Fi audio only)
Channels	: 2 Hi-Fi audio channels 1 normal audio channel
Dynamic Range	: More than 90 dB (with Hi-Fi audio only)

Video

Input	: 1.0 V (p-p), 75 Ω, BNC plug Y:1.0 V (p-p), 75 Ω, C:0.300 V (p-p), 75 Ω, S-video connector
Output	: 1.0 V (p-p), 75 Ω, BNC plug Y:1.0 V (p-p), 75 Ω, C:0.300 V (p-p), 75 Ω, S-video connector
Signal-to-Noise Ratio	: Better than 45 dB (VHS)
Horizontal Resolution	: More than 400 lines (S-VHS mode) More than 240 lines (VHS mode)

Connector

REMOTE Jack	: Jack for connecting the remote control unit
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Weight and dimensions shown are approximate.
Design and specifications are subject to change without notice.

Note

If the VCR is not working correctly or showing an unusual indication on the fluorescent display, press **RESET** button at the rear panel with a pointed instrument. When pressed, Date/Present time and Counter display will be set to the default setting. When using the VCR again, set the day and present time.

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