

SANYO

INSTRUCTION MANUAL

8mm Camcorder

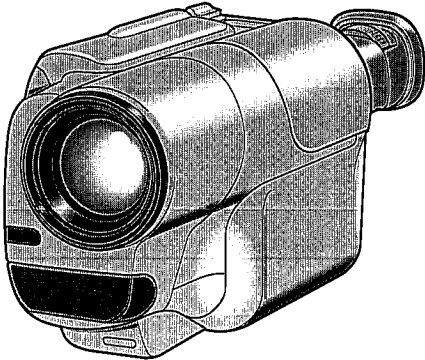
VM-EX400P

VM-EX450P

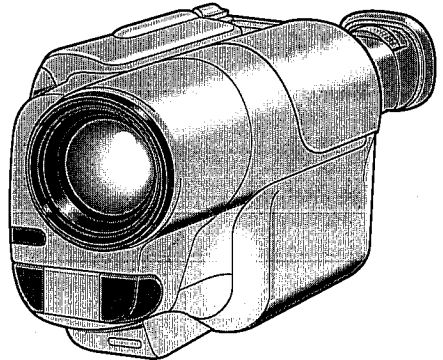
VM-EX480P

VM-EX550P

VM-EX560P



VM-EX400P



VM-EX450P/560P

VM-EX480P/550P

8 PAL

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Specifications

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Please read these instructions carefully before using the unit. Be sure to keep this manual for later reference.

This camcorder can be powered by the supplied AC adaptor or battery pack.

You can also use an AC adaptor/charger (VAR-S12) or alkaline batteries that are sold separately.

About this manual

This manual gives basic connections and operating instructions for 5 PAL models (VM-EX400P, 450P, 480P, 550P, 560P).

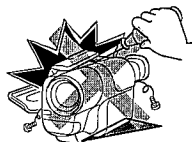
For more information on models variations, please refer to the specifications page.

Precautions

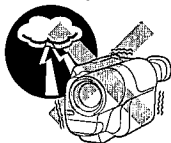
- Do not put any furniture or other heavy object on the power cord, as that may cause a short circuit and start a fire.



- Keep the power cord away from heat sources such as a heater, stove, etc. Protect from dripping and splashing.
- To unplug the power cord, pull from the plug, never the cord.
- Do not open the camcorder case. There are no user serviceable parts inside. Opening the case may damage the camcorder.



- When the cassette compartment is opened, make sure no foreign object falls inside the camcorder, as that may cause damage to the camcorder and/or start a fire when the camcorder is used.
- Keep the camcorder away from children, and make sure they do not put their hand in the cassette compartment.
- Do not use the camcorder outside during a storm or when there is lightning.

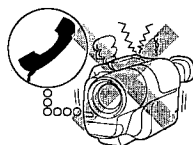


- **Do not use commercially available wet-type video head-cleaning cassettes.**

They may damage the video heads in your unit. For the most suitable head-cleaning cassettes, please consult the dealer where the unit was purchased.

- Do not wrap the camcorder in a cloth, as the temperature inside will rise and damage the unit.

If you notice anything unusual (smoke, strange noise or odour, etc.), stop using the unit and switch it off immediately. Remove the battery pack or disconnect the DC connecting cord, then consult the dealer where the unit was purchased, or contact an authorized service centre.

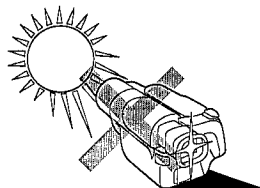


Precautions concerning magnetic fields

Do not leave/use the camcorder near magnets, or magnetic fields as they may damage the recordings on the tape.

Precautions during recording or playback

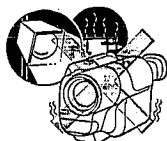
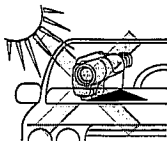
- Do not let direct sunlight hit the lens, as that may cause damage to the unit.



- Do not use the camcorder near transmitting antennas, as this might cause the unit to malfunction.
- When using the camcorder at the beach, do not let it get wet.
- Do not allow sand or dirt to enter the unit.

Do not store the unit in the following locations:

- where it will be subject to direct sunlight (e.g. on a car dashboard, etc.),
- near bright light sources, or where the humidity level is high,



- in a closed car on warm or hot days, or close to a heat source (e.g. heater, stove, etc.),
- in the presence of excessive dirt or dust,
- where it will be subject to strong vibrations, or strong magnetic fields.

Condensation

Condensation is the moisture that forms on the outside of a glass when you fill it with cold water. The first sign of condensation is fogging of the camcorder lens and viewfinder.

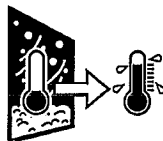


To stop the formation of condensation, wrap the camcorder in a cloth until the fogging on the lens and in the viewfinder disappears.

Do not use the camcorder before condensation has disappeared as that may cause damage to the video heads.

Conditions where condensation might appear

- If the camcorder is suddenly moved from a cold place to a warm, humid one, or vice versa.



- If a heater has been turned on to quickly heat the room, or if the level of humidity is high.
- If taken from an air conditioned room, or car to a hot, humid place.

Condensation warning indicator

If condensation is detected inside the camcorder, the condensation warning indicator will flash in the Viewfinder. (See page 5.)

- As condensation may also appear inside the cassette casing, the cassette warning indicator might also flash when the cassette is loaded. Do not load a cassette in the camcorder if you suspect that condensation has formed inside the cassette.

If condensation has formed

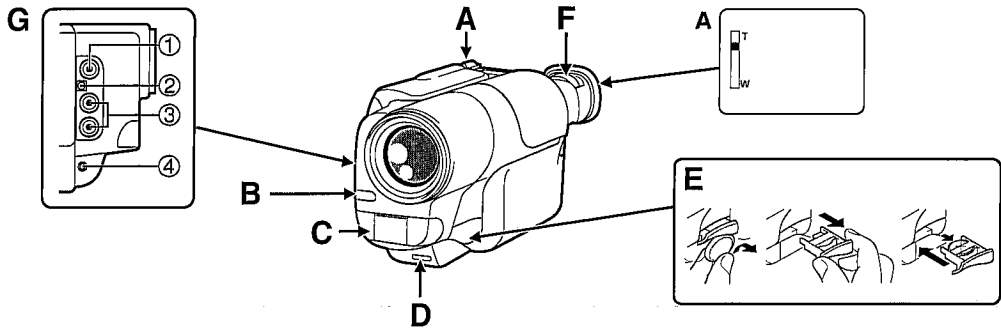
Eject the cassette and wait for 1 – 2 hours for the condensation to dry.

The time required to completely eliminate condensation may vary.

WARNING:

UNAUTHORIZED RECORDING OR USE OF TELEVISION PROGRAMMING, BROADCASTS, VIDEO TAPE, FILM OR OTHER COPYRIGHTED MATERIAL MAY VIOLATE APPLICABLE COPYRIGHT LAWS. **SANYO** ASSUMES NO RESPONSIBILITY FOR UNAUTHORIZED DUPLICATION, USE OR OTHER ACTS WHICH INFRINGE UPON THE RIGHTS OF COPYRIGHT OWNERS.

About the camcorder



A. Power zoom lever (X15)

Press on the **T** side for a close up a shot (zoom-in) and on the **W** side for a wide angle shot (zoom-out). The zoom setting will be indicated, in the viewfinder, by the position of the (■) symbol. The (■) symbol will move according to the pressure on the power zoom lever. The zoom setting display will be cancelled about 3 seconds after the power zoom lever is released.

- When the **POWER/CHARGE** switch is turned off, the zoom will automatically return to the zoom-out position.

B. Remote control sensor

The remote control can be used within a range of 4 m (13 ft) from the front of the sensor.

C. Microphone

- VM-EX450P, 480P, 550P, 560P: Stereo
- VM-EX400P: Monaural

D. Shoulder belt hook

Use a commercially available shoulder belt.

E. Lithium battery tray

Insert the lithium battery in the tray with the (+) sign facing up.

After the lithium battery is installed, the time and date will need to be set. (See page 12.)

F. Eyesight compensation ring

Turn the camcorder on, then while looking into the viewfinder turn the ring, to the right or to the left, to obtain the clearest possible picture.

G. Video/Audio terminals

VM-EX450P, 480P, 550P, 560P

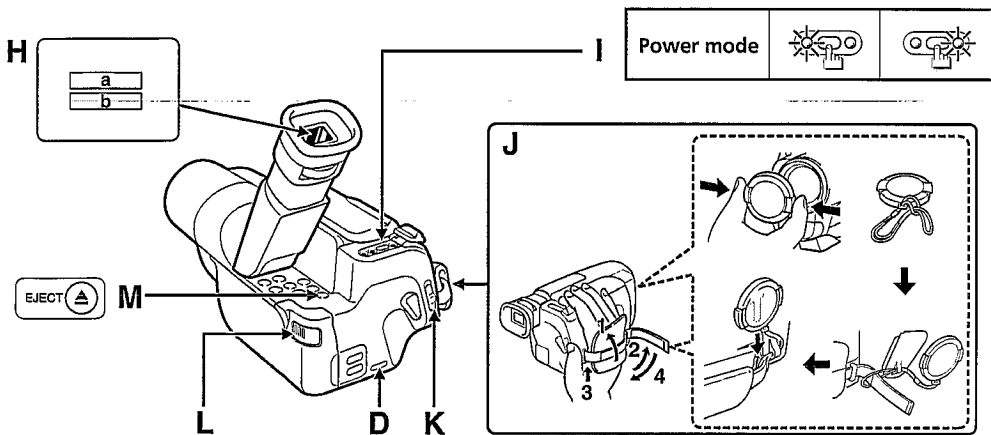
- ① Video output terminal (**VIDEO**)
- ② DC output terminal (for RF converter)
- ③ Audio output terminals (**AUDIO**)
The VM-EX400P is monaural and therefore only has one audio output terminal (white).
- ④ LANC terminal (●)
The VM-EX400P, 450P and 480P do not have a LANC terminal.

■ LANC terminal (●)

The symbol ● identifies the LANC (Local Application Control Bus System) terminal. If you are using an edit controller or a computer for special editing functions, the external equipment is connected to the LANC terminal to precisely control all the tape transport functions of your camcorder. Please refer to the concerned equipment instruction manual for detailed operation.

■ Tripod screw mount





Located under the unit.



H. Viewfinder


- VM-EX400P, 450P, 480P: B/W viewfinder
- VM-EX550P, 560P: Colour viewfinder


Warning indicators (blinking)

- TAPE** : The tape is within about 5 minutes from the end. (b)
- TAPE END** : The tape has reached the end. (a)
-  : The erasure-prevention switch on the cassette is set to the red position (See page 10).
-  : No cassette is loaded. (a)
-  : Condensation has formed inside the unit or the cassette. (a)
-  : Condensation has formed inside the unit or the cassette. (b)

Battery remaining power indicator


The remaining charge of the battery is displayed in the viewfinder.

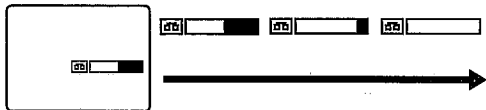
When the remaining charge is low () it is recommended to have a spare recharged battery pack ready.

When this indicator () is displayed, the power will run out in about 5 minutes or less.



Remaining tape display

When the remaining tape reaches about halfway point during recording or playback, the indicator () will be displayed.



I. Power mode button

When the power is turned on, the unit will automatically go into recording pause mode (if a tape is loaded). A different mode (**PLAYER** or **CAMERA**) is selected every time this button is pressed.

J. Grip belt and lens cap

Use the grip belt to hold the camcorder.

K. POWER/CHARGE switch

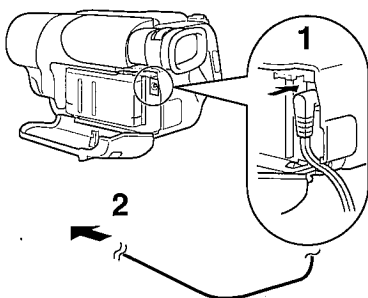
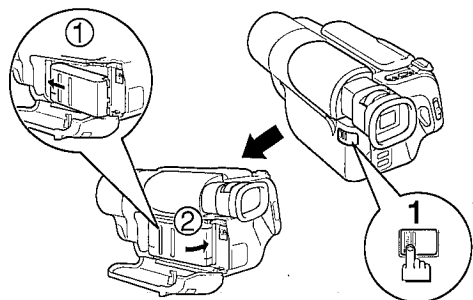
The switch has three positions. Up (**POWER** position) for recording and playback, down (**CHARGE** position) for recharging the battery pack, and centre or power off position.

L. Battery compartment cover open button (PUSH)

Press on the **PUSH** button to open or close the cover.

M. Cassette eject button (EJECT)

Charging the Ni-Cd battery pack



1 Installing the battery pack

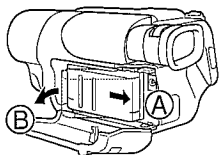
The battery pack has not been charged. Make sure to charge it before using it for the first time.

1 Press the **PUSH** button.

Carefully open the battery compartment cover fully.

2 Insert the top of the battery pack (①), then press down on the other end (②) to install it. Make sure it clicks into place.

To remove the battery pack, slide it toward the back of the camcorder (A), then lift it (B).



Note

- Only thin type battery packs such as the NP-33 or NP-55 models can be used with this camcorder.

Do not use the AC adaptor (VAR-22 or VAR-21) or AC adaptor/charger (VAR-S12) for any purpose other than charging the battery packs (NP-33, NP-55 or NP-65), or supplying power to this camcorder.

2 Connecting the AC adaptor

1 Connect the cord from the AC adaptor to the DC input terminal on the camcorder.

2 Plug the AC adaptor into an AC outlet.


Note

Before closing the battery compartment cover, make sure the AC adaptor cable is correctly set into the opening (see illustration).

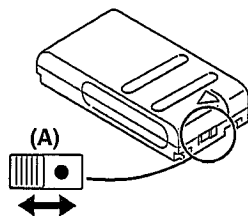
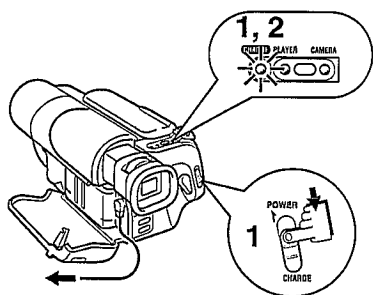
WARNING:

- This AC adaptor (VAR-22 or VAR-21) is specially designed for this camcorder. Never use another type of AC adaptor with this camcorder, and do not use this AC adaptor to power other types of camcorders.
- Not for use with toys.

The AC adaptor can be used in any country where the standard voltage is between 100 V and 240 V AC. In countries where a differently shaped plug is used, a plug adaptor must be used. (See your Sanyo dealer for details.)

For this product use the supplied AC adaptor (conforming to the EIA Japanese standard, with a unified polarity type plug ) . Use of another AC adaptor may cause trouble.

Charging the Ni-Cd battery pack



3 Charging the battery pack

When recharging the battery pack on the camcorder, the **CHARGE** indicator will start flashing approximately 16 hours after the **POWER/CHARGE** switch is set to the **CHARGE** position, as a reminder that the battery pack has been charged and should be removed. Please note that depending on the battery pack model, this may not indicate that it is fully charged. For more details on battery pack charging times, please refer to the "Battery pack charging/operating time" table on next page.

- 1 Set the **POWER/CHARGE** switch to the **CHARGE** position.
The **CHARGE** indicator will light and the battery pack will be recharged.
- 2 After approximately 16 hours, the **CHARGE** indicator will start flashing. Please refer to the table to confirm that the battery pack is fully charged. For recording and playback the **POWER/CHARGE** switch must be set to the **POWER** position.

■ **Before charging the battery pack, make sure to first set the **POWER/CHARGE** switch to the **POWER** position, then to the **CHARGE** position.**

If the battery pack is not used, remove it from the camcorder before storing it.

- When finished, make sure to unplug the AC adaptor power cord from the AC outlet.
- The **CHARGE** indicator will start flashing approximately 16 hours after the **POWER/CHARGE** switch is set to the **CHARGE** position, whether a battery pack is being charged or not.

- If the battery pack is changed halfway during charging, the **CHARGE** indicator will still start flashing approximately 16 hours after the **POWER/CHARGE** switch was first set to the **CHARGE** position, and the second battery pack may not yet be fully charged.
- If there is a problem with the installed battery pack, the **CHARGE** indicator will still light but charging will not be possible. In doubt, first charge the battery pack for short period and confirm that it works properly.
- The battery pack model NP-33 (supplied with the VM-EX400P) is fully charged after 8 hours.

■ Charge condition indicator switch (A)

Use this switch as a reminder of the charge state of the battery. Set the switch to the **RED** position when the battery is discharged. Please note that the battery pack model NP-33 does not have a charge condition indicator switch.

■ Recharging

The battery pack should only be recharged just before it will be used, or one day before at the most.

If the battery pack is recharged and not used, it will slowly lose its charge.

Charging the battery pack is possible within a temperature range of 10 °C to 30 °C (50 °F to 86 °F).

■ Battery pack charging/operating time

The charging and operating times shown in the table below are approximate.

Operating time

Model	NP-33	NP-55
VM-EX400P	57 min.	70 min.
VM-EX450P, 480P	54 min.	67 min.
VM-EX550P, 560P	48 min.	60 min.

Charging time:

Charging time for standard battery packs:

NP-33: approx. 8 hours, NP-55: approx. 10 hours
(for a full recharge)

Note

At low temperatures or when using non standard battery packs, the charging time may vary. Depending on the conditions, the charging time may be up to 12 hours for an NP-33 battery pack, and 16 hours for an NP-55 battery pack.

■ About the Ni-Cd battery pack

In the following cases the operating time of the battery pack will be shorter than normal, even after a full charge:

- If the battery pack is used for the first time.
- If used in low temperature conditions.
- If it is stored in a fully charged or partially charged condition.
- If the charge is completely exhausted and it is stored for a long period (more than 3 months).
- If stored at temperatures above 40 °C (104 °F).

The battery will be restored to its original condition after it has been used until completely discharged and recharged, or after it has been recharged using the Refresh function of the AC adaptor/charger (sold separately) two or three times.

The following operations also require power, and will shorten the operating time.

It is recommended that you have on hand enough charged battery packs to last 2 or 3 times the expected recording time:

- Recording pause mode.
- Loading and unloading the cassette.
- Using the power zoom.

WARNING:

- Do not short-circuit the battery pack terminals, and never try to disassemble or modify the battery pack.
- Do not throw into a fire, as it may explode.
- Do not get wet.
- When not in use, the battery pack should be removed and stored in a cool, dry place.
- Do not drop or subject to violent shock.
- If the terminals are dirty, use a soft cloth or tissue paper to clean them.

■ Storing

Do not store a battery pack where it could reach high temperatures.

If the camcorder is not used for a long period, remove the battery pack. Otherwise, the battery pack will slowly lose its charge.

Note

**CONTAIN NICKEL-CADMIUM BATTERY.
MUST BE RECYCLED OR DISPOSED OF
PROPERLY.**

Using the alkaline batteries

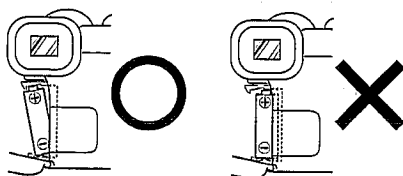
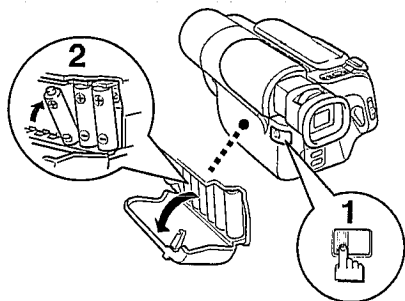


Fig. 1

Fig. 2

Installing the alkaline batteries

Do not use other types of batteries.

1 Press the **PUSH** button.

Carefully open the battery compartment cover fully.

2 Install the batteries as illustrated. First place the (-) side against the bottom terminal, then push the (+) side in gently, until it fits against the top terminal. When the batteries are correctly installed (figure 1), they will be slightly inclined.

Do not forcibly push the batteries completely in as indicated by figure 2. The contact is lost and the power cannot be turned on.

Notes

- When finished using the camcorder, remove immediately the alkaline batteries.
- Even when the camcorder power is switched off, the batteries charge is slowly drained.

If the batteries are left in the camcorder, the provided usage duration that characterise alkaline batteries will be shorter than normal, and this may also cause battery leakage.

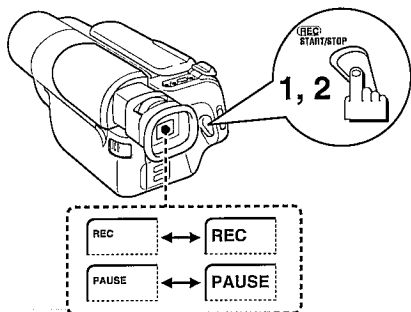
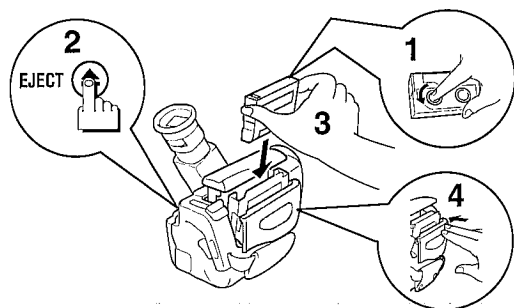
- About the same level of power is drawn from the batteries during recording and during a recording pause.
- Please do not use under cold temperatures. Depending on the type of alkaline batteries used, when the temperature is below 10 °C, the operating duration they provide may not be reliable, or much shorter than normal. It may also be impossible to turn on the camcorder or to use it normally. In such a case, please use the Ni-Cd battery pack. (See page 6.)
- When using alkaline batteries, make sure the Ni-Cd battery pack terminals on the camcorder are not shorted (by a pin, metal scrap, etc.).

WARNING:

To avoid damage to the camcorder, be sure to install the batteries correctly. If not, they may leak and cause a fire or other damages.

- Use "AA" alkaline batteries (marked LR6) only.
- Do not use old and new batteries, or batteries from different manufacturers or of different types at the same time.
- Always insert the batteries according to the (+) and (-) polarity indications in the battery pack compartment.
- Do not recharge the batteries or short the battery terminals.
- Never disassemble, heat or throw in the fire.
- To prevent leakage, do not store the camcorder with the batteries installed, and remove old batteries as soon as they are discharged.

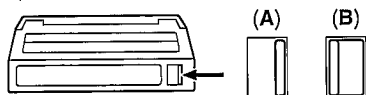
Recording steps



1 Loading a cassette

- 1 Eliminate loose tape inside the cassette by gently turning the left reel at the bottom of the cassette with a finger.
 - 2 Press the **EJECT** button. The cassette holder will open.
 - 3 Insert the cassette fully, with the door toward the bottom and the window facing out.
 - 4 Gently press on the **PUSH** indication on the cassette holder until it clicks into place.
The tape counter is reset to 0:00:00.
- To eject the cassette, press the **EJECT** button.

To prevent accidental recording on a tape with a previous recording you wish to keep, set the erasure-prevention switch to the red position (B).



2 Recording

- 1 Press the **REC START/STOP** button to start recording.
 - 2 To stop recording, press the **REC START/STOP** button again.
- When finished recording, turn the power off.

Notes

- If a recording pause continues for more than 3 minutes, the power is cut to prevent the tape from being damaged.
- For best recording results, record a well lit subject, and as much as possible, keep the sun and other light sources behind you when recording.

Recording review

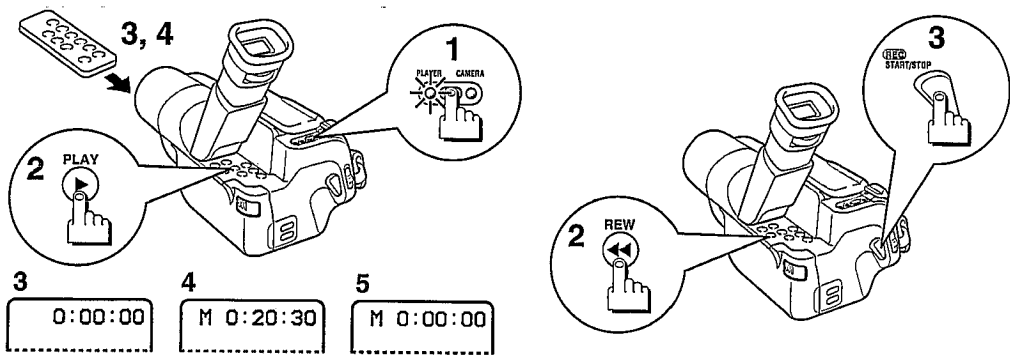
If the camcorder is in recording pause mode, press and release the **REW** button once to review, in the viewfinder, the last few seconds of the recording.

The camcorder will then automatically return to recording pause mode at the exact point where it previously was.

Note

Do not hold the **REW** button as the camcorder will go into scene search mode.

Camcorder operation



Linear time counter

The linear time counter indicates the tape run time in hours, minutes and seconds.

Using the memory function

- 1 Turn the power on and set to **PLAYER** mode.
- 2 Press the **PLAY** button.
- 3 Press the **COUNTER RESET** button on the remote control.
If you reset the counter at the beginning of the tape, you can determine the recording duration.
- 4 Press the **COUNTER MEMORY** button on the remote control.

When "M" is displayed, the "0:00:00" point is memorized (not the point where the **COUNTER MEMORY** button was pressed).

Press the **COUNTER MEMORY** button again to erase the "M" and cancel the memory function.

- 5 Press the **STOP** button. Then, press the **REW** button.

The tape will be rewound and will automatically stop at the counter reading "0:00:00".

Transition recording

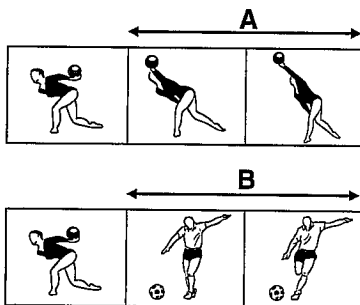
If at the end of a recording, some unwanted pictures and sound have been recorded, they can be eliminated by replacing them with newly recorded pictures and sound.

Example: To replace unwanted pictures (A) by new pictures (B).

- 1 Set the camcorder to recording pause mode.
- 2 Press and hold the **REW** button until the beginning of the unwanted pictures.
- 3 Press the **REC START/STOP** button to start recording the new pictures.

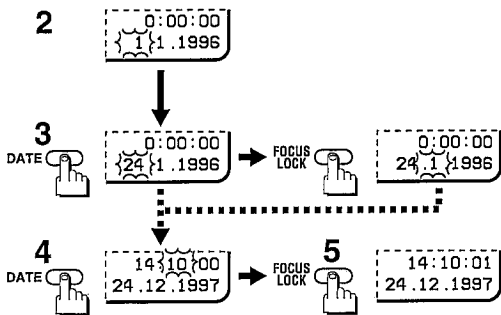
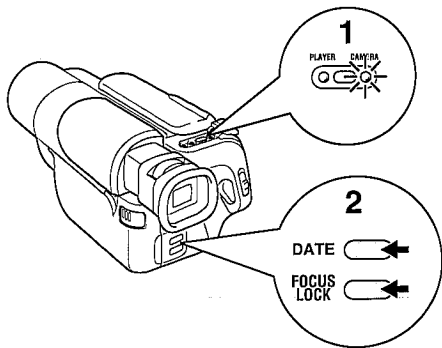
Note

At playback, during scene search operations, white bars will appear at that position.



Notes

- When pressing the **REW** button, the tape might not stop at the exact "0:00:00" location.
- If the tape is rewound past "0:00:00", the counter reading will indicate a negative "--" value.



Setting the date and time

Before setting the date and time, make sure the lithium battery is installed. (See page 4.)

Example: Setting the date and time to 2:10 P.M., December 24, 1997.

- 1 Turn the power on, the **CAMERA** mode is set automatically.
- 2 Press the **DATE** and **FOCUS LOCK** buttons for about two seconds.
 - The reset time (0:00:00) and date (1. 1. 1996) are displayed.
- 3 Press the **DATE** button until the desired day (24) is set, then press the **FOCUS LOCK** button.
- 4 Repeat step 3 to set the month, year and time.
- 5 The seconds counter will start counting from "00" when the **FOCUS LOCK** button is pressed after setting the minutes.

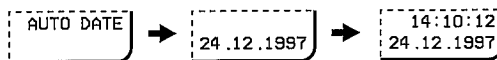
Notes

- The date and time are not displayed in **PLAYER** mode.
- The date and time cannot be set while in recording mode.

Recording the date and time

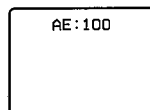
The date and time will be recorded on the tape as displayed in the viewfinder. The date and time will not be displayed if they have not been set.

Press the **DATE** button to select the desired display mode, as shown below.

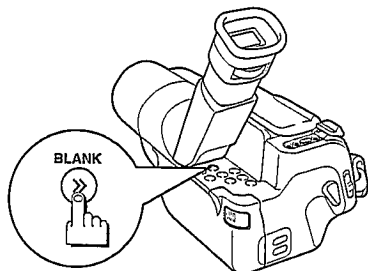
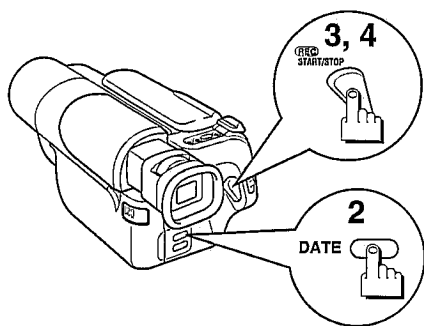


Concerning the programmed AE/shutter speed settings

The optimum shutter speed is automatically set between 1/50 sec. and 1/250 sec. according to the brightness of the subject. Accordingly, **AE:100**, **AE:150** or **AE:250** will be displayed in the viewfinder.



Camcorder operation



■ Auto date function

When this function is set, the date will be inserted the first 15 seconds of the first recording of a day.

Before setting the auto date function, make sure to set the date and time correctly (see page 12).

- 1 Set the camcorder to recording pause mode.
- 2 Press the **DATE** button until the **AUTO DATE** indicator is displayed in the viewfinder.
- 3 Press the **REC START/STOP** button. While the **AUTO DATE** indicator is flashing, the date is recorded.
- 4 Press the **REC START/STOP** button again to set to recording pause mode.

To cancel the auto date function, press the DATE button to erase the AUTO DATE indicator from the viewfinder.

The auto date function will remain selected even if the power is turned off.

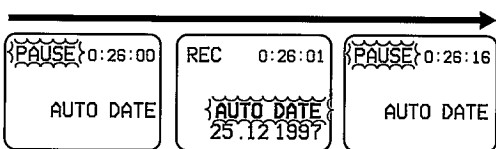
■ Blank search function

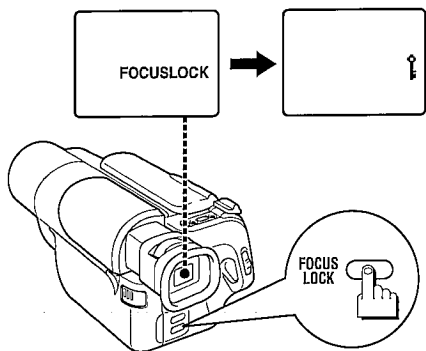
The blank search function lets you easily find the end of the recorded portion on the tape (the beginning of the blank portion).

When in **CAMERA** mode, set to recording pause mode, and when in **PLAYER** mode, set to stop mode, then press the **BLANK** button.

Note

Before starting to record, it is recommended to confirm the stop position of the Blank search function. If previous recordings have been made with blanks in between the recordings, the blank search function may stop between two recordings if the blank is longer than 60 seconds.





■ Focus lock function

The focus setting on this camcorder is fully automatic. When filming a distant subject, press the **FOCUS LOCK** button to set the focus lock function. When this function is set the focus setting will not change even if something comes between the camcorder and the main subject.

When the focus lock function is set "**FOCUSLOCK**" will be displayed for about 5 seconds, then the (🔑) symbol will be displayed on the right side of the viewfinder.

To cancel the focus lock function, press the **FOCUS LOCK** button again. The (🔑) symbol is erased.

In the following recording conditions the focus may not adjust properly. It is recommended to use the focus lock function to get a stable focus setting.



When recording two subjects, one nearby and one distant.



When recording through a dirty or wet window.



When recording subject without contrast (a white wall, etc.).



When recording an horizontally striped subject.

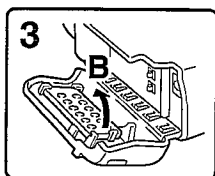
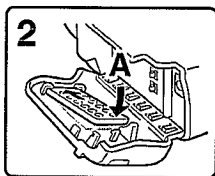
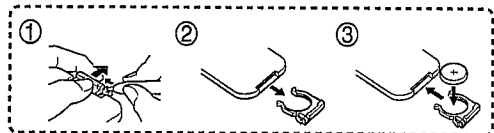
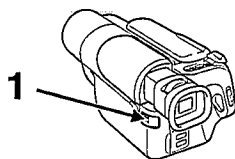
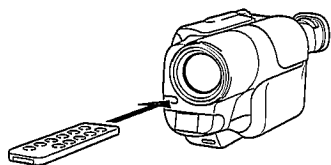


When recording very bright subjects.

Note

When zooming in to record a distant subject, at close-range, the auto focus might not function properly due to the instability of the picture. In that case, use a tripod for stable focused pictures.

Using the remote control



■ Installing the lithium battery

- ① Using the tip of a pen, open the lithium battery tray at the back of the remote control.
- ② Pull out the tray.
- ③ Place a new lithium battery in the tray with the (+) side facing up, then insert the battery tray fully into the remote control.

Direct the remote control toward the remote control sensor, press the desired buttons to operate the camcorder.

Note

Remote control operation is not possible if:

- a strong light or sunlight is directed at the remote control sensor,
- there is an obstacle between the remote control unit and the camcorder.

■ Storing the remote control inside the camcorder

- 1 Press the **PUSH** button.
Carefully open the battery compartment cover fully.
- 2 Place the remote control on the tabs inside the battery compartment cover, then press (A) to install it.
- 3 To remove the remote control, lift (B) carefully.

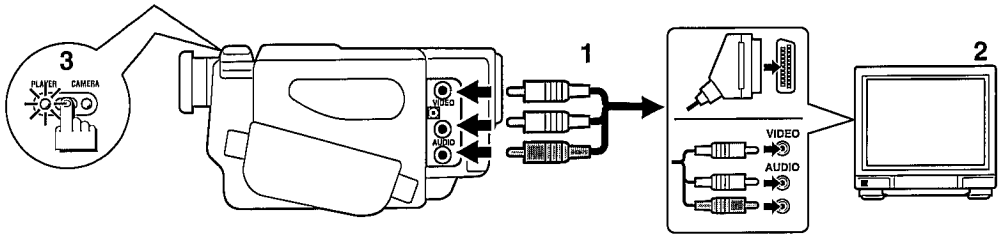
■ Lithium battery

WARNING:

- The lithium battery must only be replaced with a lithium battery model number **SANYO CR2025 [3 V]**. Use of another lithium battery may present the risk of fire or explosion.
- Keep the batteries away from children.
- If a battery is swallowed, see a doctor immediately.
- Dispose of used lithium batteries promptly, in a safe manner that complies with all applicable laws.
- The lithium battery may present the risk of fire or chemical burn if mishandled.
- Do not recharge, disassemble, heat above 100 °C (212 °F) or dispose of in the fire.
- Before use, wipe the battery clean with a dry soft cloth to assure good contact.
- Never use metallic tweezers to hold the battery, and never short circuit the (+) and (-) sides of the battery.

Under normal conditions, the lithium battery should last about 1 year. If the lithium battery is expired "88:88" will flash in the viewfinder.

Playback



Connections

- 1 Connect the camcorder to the TV as indicated in the illustration.
- 2 When connected, make sure to set the **TV/VCR** switch on the TV to "**VCR**".
- 3 Set the **POWER/CHARGE** switch to the power position, then select the **PLAYER** mode.

Picture search

During tape playback, press and hold the **REW** or **FF** button to view the picture at high speed. Release the **REW** or **FF** button to resume normal playback.

Still picture

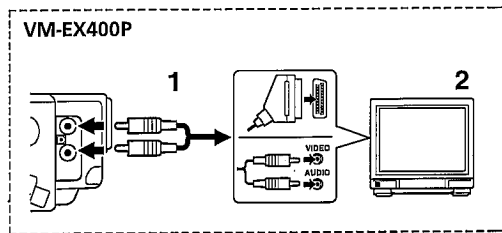
During playback, press the **STILL** button. To resume normal playback press the **STILL** or **PLAY** button.

Scene Search

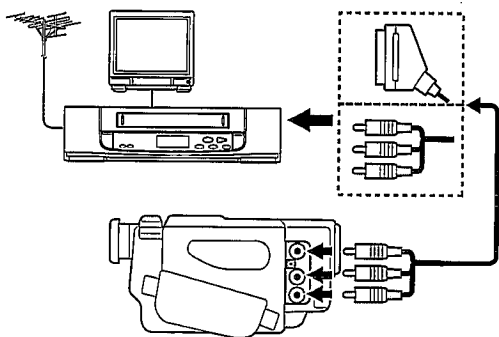
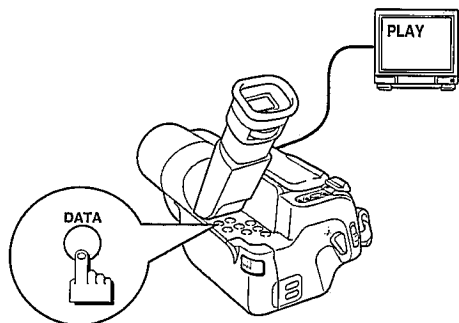
During still picture playback, press and hold the **REW** or **FF** button to watch a reverse or forward picture playback. Release the **REW** or **FF** button to resume normal still picture playback.

Notes

- The sound is muted during playback modes other than normal playback.
- During picture search operations, noise bars (horizontal white lines) or vibration will appear in the picture.
- If still picture playback continues for more than 3 minutes, the unit is switched to stop mode to prevent the tape from being damaged.
- This unit can playback tapes recorded in the LP (long play) mode. During playback, **LP** will be displayed in the viewfinder. Playback quality of tapes recorded in the LP mode will be inferior to that of tapes recorded in the SP mode.



Playback



■ On-screen display

When the camcorder is connected to a TV receiver, the indications appearing in the viewfinder can be displayed on the TV screen by pressing the **DATA** button on the camcorder or remote control. Pressing this button again will cancel the on-screen display.

Note

If the on-screen display is activated during tape copy, it will be recorded on the tape along with the picture and sound.

■ Tape copy

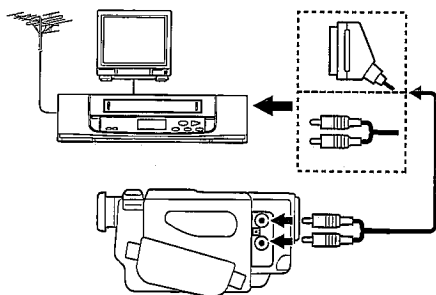
By connecting the camcorder to a VCR, you can copy the recorded tape in your camcorder to a tape that can be played back on your VCR.

For details, please refer to your VCR instruction manual.

Note

Please refer to the accessories listing for the cable and adaptor used for the connections. Accessories not listed in the accessories listing must be bought separately.

VM-EX400P



Maintenance

■ Video head maintenance

When the camcorder has been used for a long time, the sound and picture playback quality deteriorate (as illustrated). If this occurs, the video heads should be cleaned (**dry-type cleaning cassettes only**).

If the playback quality is poor, even after cleaning the video heads, they might need to be replaced.

For detailed information and assistance, please consult your dealer.



Note

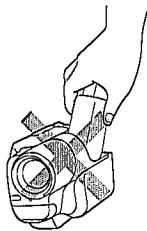
Be very careful when using commercially available video head-cleaning products, as some might not be effective or they may damage the video heads.

Inspection at 1000-hour intervals

For continued trouble free operation and beautiful pictures, it is recommended that the unit be inspected (including cleaning, lubrication and replacement of worn parts as necessary), every 1000 hours of use (approximately). For detailed information and assistance, please consult your dealer.

■ Use the grip belt to carry the camcorder

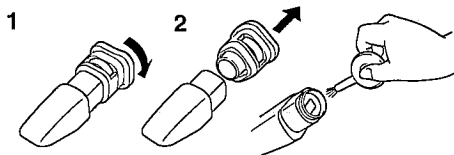
Holding it as shown in the illustration below might damage the camcorder or some of its components. Remove the cassette tape when the unit is not being used.



■ Cleaning the viewfinder

- 1 Turn it towards the left (in the direction of the arrow, as illustrated), then remove it.
- 2 Use an air blower (sold separately) to remove any dust on the viewfinder.

Reassemble in the reverse order of disassembly.



■ Using the camcorder abroad

To watch playback on a TV, you will need to connect the camcorder to a TV that is equipped with audio/video terminals and conforms to the PAL television system.

Main countries using the PAL standard:

Australia, Austria, Belgium, Britain, China, Denmark, Germany, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand

Main countries using the SECAM standard:

Bulgaria, France, Hungary, Iran, Iraq, Luxembourg, Monaco, Poland, CIS

Main countries using the NTSC standard:

Canada, Japan, Korea, Mexico, the Philippines, Taiwan, U.S.A.

Specifications

- Television system** : PAL, CCIR
- Video recording system** : Rotating 2-head, helical-scan system
- Audio recording system** : Rotating head
 - FM stereo system: VM-EX450P, 480P, 550P, 560P
 - FM system: VM-EX400P
- Cassette type** : 8 mm video cassette tape
- Tape speed** : Approx. 20.051 mm/sec. SP mode
Approx. 10.058 mm/sec. LP mode (Playback only)
- Maximum recording time** : 90 minutes (P5-90 cassette) SP mode
- Fast forward/Rewind time** : Approx. 6.5 minutes (P5-90 cassette)
- Image sensor** : CCD solid-state type (320,000 pixels)
- Viewfinder** : 0.55 inch electronic colour viewfinder (VM-EX550P, 560P)
0.6 inch electronic B/W viewfinder (VM-EX400P, 450P, 480P)
- Lens** : 15x zoom F1.4~2.6 (f=4.0 to 60 mm)
- Focus** : Fuzzy logic auto focus
- White balance** : Fuzzy logic auto white balance
- Iris** : Fuzzy logic auto iris
- Minimum subject illumination** : 3 lux
- Subject illumination range** : 3 to 100,000 lux
- Recommended subject illumination** : 300 lux or more
- Power supply** : 6 V: Ni-Cd battery pack
6.5 V: AC adaptor/charger
9 V: AC adaptor
9 V (6 x 1.5 V): Alkaline batteries
- Power consumption** : 5.0 W (VM-EX400P), 5.1 W (VM-EX450P, 480P),
5.7 W (VM-EX550P, 560P) during camera recording
- Operating temperature range** : 0 °C to 40 °C (32 °F to 104 °F)
- Storage temperature range** : -20 °C to 60 °C (-4 °F to 140 °F)
- Dimensions (W x H x D)** : Approx. 225 x 106 x 108 mm
- Weight** : Approx. 760 g (VM-EX400P), 770 g (VM-EX450P, 480P,
550P, 560P) (excluding the battery pack and tape)
- Microphone** : Electret condenser type
- Video output terminal** : Video output 1 Vp-p, 75 ohms unbalanced, negative sync
- Audio output terminal** : Audio output -7 dBs, 2.2 kohms or less

The manufacturer reserves the right to modify product designs and specifications without notice and without incurring any obligation.

1AG6P1P0314-B
ER22P, ER221P, ER231P/E
ER22P, ER221P, ER231P/A
ER221P, ER231P/EDX (0896SJC)



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