

TABLE OF CONTENTS

HITACHI Instruction Manual

Hi8

8mm Video Camera/Recorder
VM-H38A



Hitachi Home Electronics (America), Inc.
3890 Steve Reynolds Blvd., Norcross, GA 30093
Tel. 404-279-5600

HITACHI (HSC) CANADA INC.
3300 Trans Canada Highway, Pointe Claire,
Quebec, H9R 1B1, CANADA
Tel. 514-697-9150

**HITACHI SALES CORPORATION OF
HAWAII, INC.**
3219 Koapaka Street, Honolulu, Hawaii 96819
Tel. 808-836-3621

P4707229 © Hitachi, Ltd. 1992

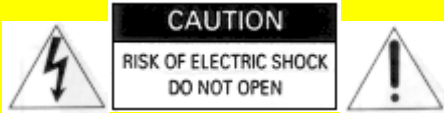
E145554/E72118
Printed in Japan KF-TF(N)

TABLE OF CONTENTS

TABLE OF CONTENTS	2
IMPORTANT SAFEGUARDS	3
FEATURES	5
ACCESSORIES	5
IMPORTANT SAFEGUARDS	6
IMPORTANT SAFETY INSTRUCTIONS FOR AC ADAPTER/CHARGER	9
Hi8	10
ELECTRONIC VIEWFINDER (EVF) POSITION ADJUSTMENT	10
HOW TO ATTACH THE SHOULDER STRAP	11
LOADING BATTERIES FOR DATE/TIME AND REMOTE CONTROL	11
POWER SOURCES	12
CHECKING THE BATTERY	13
CHARGING THE BATTERY	15
INSERTION AND REMOVAL OF CASSETES	16
MAKING A SAMPLE CAMERA RECORDING	17
IDENTIFICATION AND OPERATION OF CONTROLS	19
DATE/TIME SETTING	22
AUTO FOCUS	24
EXPOSURE CORRECTION	25
POWER ZOOM	26
DIGITAL ZOOM	27
FADE-IN/FADE-OUT	28
DIGITAL FILTER	29
ELECTRONIC IMAGE STABILIZER (EIS)	30
MACRO	31
SECOND CLOCK SETTING	32
DISPLAY BUTTON	33
LINEAR TIME COUNTER	33
MEMORY	34
INSTANT REVIEW	35
QUICK EDIT	35
EYEPIECE ADJUSTMENT	36
TITLE RECORDING	36
WIRELESS REMOTE CONTROLLER	39
AUDIO/VIDEO DUBBING	40
RECORDING TV PROGRAMS	41
VIEWING THE PICTURE PLAYED BACK ON YOUR TV	42
STILL	44
FORWARD AND REVERSE SEARCH	44
ATTACHING THE TELE OR WIDE CONVERTER	45
CAMERA/RECORDER TO VCR DUBBING	45
FLYING ERASE HEAD	46
PROGRAMME AE (Auto Exposure)	46
SYNCHRO EDIT	46
ATTACHING THE OPTIONAL DC CAMERA LIGHT (VM-CP4)	48
TROUBLESHOOTING	50
HEAD CLEANING	51
PERIODIC MAINTENANCE	51
SPECIFICATIONS	52
ACCESSORY TO ADD MORE EXCITEMENT	53
HOW TO ORDER	53

IMPORTANT SAFEGUARDS

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.



CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



This symbol warns the user that uninsulated voltage within the unit may have sufficient magnitude to cause electric shock. Therefore, it is dangerous to make any kind of contact with any inside part of this unit.



This symbol alerts the user that important literature concerning the operation and maintenance of this unit has been included. Therefore, it should be read carefully to avoid any problems.

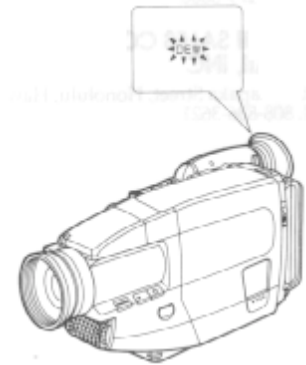
CAUTION: TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference regulations of the Canadian Department of Communications.

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

MOISTURE

Moisture may occur if the video camera/recorder is moved from a cold area to a warm humid area. A flashing "**DEW**" indication in the viewfinder indicates that moisture has condensed on the recorder mechanism, which could result in tape damage. Since condensation builds up gradually, the indication does not appear immediately when condensation starts. When the temperature or humidity of the room changes abruptly, turn the power on and check that the "**DEW**" indication does not appear, then wait for about an hour for safety before using the camera/recorder. When the "**DEW**" indication in the viewfinder is flashing the unit will not operate. When this happens, slide the "**EJECT**" switch, remove the tape, and wait for the moisture to dry... the "**DEW**" indication in the viewfinder will stop flashing.



PRECAUTIONS

Any problems that occur as a result of any of the following conditions will not be covered by our warranty.

Be careful that no water, dust or sand enters the camera/recorder.

When you are not using the camera/recorder, switch off the power and attach the lens cap.

When you shoot at a scene which contains an extremely bright object such as the sun or a light source, a bright vertical bar may appear in the picture. Your camera/recorder is functioning properly, but the solid-state pickup device (C.C.D.) usually causes this as an inherent characteristic. Try to avoid shooting an excessively bright object directly.

Be sure not to leave it in a place where the temperature exceeds 120°F, or the pickup device may be damaged. Dangerous includes:

- Inside a car with the windows closed and in direct sunshine.
- Near heating appliances.

Do not leave the viewfinder lens facing sunlight for a prolonged period, or the phosphorescent surface of the cathode ray tube may be damaged.

Thank you for buying the **Hi8** video camera/recorder. For maximum pleasure and convenience please read these simple instructions before operating your camera/recorder.

WARNING: Many television programs and films are copyrighted. In certain circumstances, copyright law may apply to private in-home video taping of copyrighted materials.

FEATURES

- **Hi8** Hi8
 - Electronic Image Stabilizer (EIS)
 - Digital Filter
 - Digital Zoom up to X16
 - Solid-state camera pickup
 - Program AE (Auto Exposure)
- Fade-in/Fade-out
 - Auto Focus Power Zoom Lens with macro feature
 - Flying Erase Head
 - Time and date
 - Titler
 - Wireless Remote Control

ACCESSORIES

Check that you have the following components and accessories (besides the camera/recorder unit itself) before disposing of the packing material.

1. AV Stereo Output Cord with S plug
2. Battery Pack
3. AC Adapter/Charger
4. Wireless Remote Controller
5. Shoulder Strap
6. External Power Adapter
7. Batteries for Date/Time and Wireless Remote Controller
8. RF Output Adapter
9. 75-ohm Coaxial Cable
10. Video Owner's Manual

- This is a VHS cassette tape which includes instruction on how to operate your VM-H38A camera/recorder.

This tape covers the basic operations of this model and some ideas on how to make better recordings.



- NOTES:
- This unit uses **Hi8** video format cassettes.
 - It records and plays back in the SP mode (14.3 mm/sec.).
 - It cannot record and play back in the LP mode (7.2 mm/sec.).
 - This camera/recorder uses a Hi-Fi stereo sound system. When a tape recorded by this camera/recorder is played by a conventional 8mm camera/recorder, monaural sound is output. When a tape recorded by a conventional 8mm camera/recorder is played by this machine, monaural sound is output.

IMPORTANT SAFEGUARDS

In addition to the careful attention devoted to quality standards in the manufacture of your video product, safety is a major factor in the design of every instrument. But, safety is your responsibility too.

This page lists important information that will help to assure your enjoyment and proper use of a Video Camera/Recorder and accessory equipment. Please read it carefully before operating your video product and keep it in a handy place for future reference.

INSTALLATION

1 Read and Follow Instructions -- All the safety and operating instructions should be read before the video product is operated. Follow all operating and use instructions.



2 Retain Instructions -- The safety and operating instructions should be retained for future reference.

3 Heed Warnings -- Comply with all warnings on the video product and in the operating instructions.

4 Polarized Plug -- This video product is equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. 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 without blade exposure. If you need an extension, use a polarized cord.



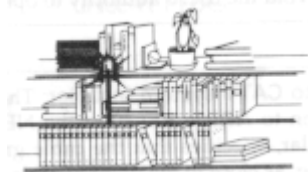
5 Power Sources -- This video product should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your video dealer or local power company. For video products intended to operate from battery power, or other sources, refer to the operating instructions.

6 Overloading -- Do not overload wall outlets and extension cords as this can result in a risk of fire or electric shock. Overloaded AC outlets and extension cords are dangerous, and so are frayed power cords, damaged or cracked wire insulation and broken plugs. They may result in a shock or fire hazard. Periodically examine the cord and have it replaced by your service technician if appearance indicates damage or deteriorated insulation.



7 Power-Cord Protection -- Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.

8 Ventilation -- Slots and openings in the cabinet are provided for ventilation to ensure reliable operation of the video product and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the video product on a bed, sofa, rug or other similar surface. This video product should never be placed near or over a radiator or heat register. This video product should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the video product manufacturer's instructions have been followed.



9 Attachments -- Do not use attachments unless recommended by the video product manufacturer as they may cause hazards.

Caution: Maintain electrical safety. Powerline operated equipment or accessories connected to this unit should bear the UL listing mark or CSA certification mark on the accessory itself and should not have been modified so as to defeat the safety features. This will help avoid any potential hazard from electric shock or fire. If in doubt, contact qualified service personnel.

10 Water and Moisture -- Do not use this video product near water - for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like.

11 Accessories -- Do not place this video product on an unstable card, stand, tripod, bracket, or table. The video product may fall, causing serious injury to a child or adult, and serious damage to the appliance. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the video product. Any mounting of the product should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

11A An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.



12 Outdoor Antenna Grounding -- If an outside antenna or cable system is connected to the video product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See example below:

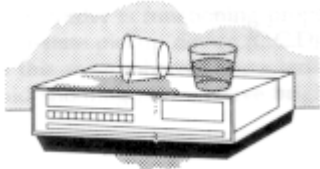
EXAMPLE OF ANTENNA GROUNDING

13 Power Lines -- An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching or approaching such power lines or circuits as contact with them might be fatal. Installing an outdoor antenna can be hazardous and should be left to a professional antenna installer.

USE

14 Cleaning -- Unplug this video product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

15 Object and Liquid Entry -- Never push objects of any kind into this video product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the video product.



16 Lightning -- For added protection for this video product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable-system. This will prevent damage to the video product due to lightning and power-line surges.



SERVICE

17 Servicing -- Do not attempt to service this video product yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

18 Conditions Requiring Service -- Unplug this video product from the wall outlet and refer servicing to qualified service personnel under the following conditions.

- a. When the power-supply cord or plug is damaged
- b. If liquid has been spilled, or objects have fallen into the video product.
- c. If the video product has been exposed to rain or water.
- d. If the video product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the video product to its normal operation.
- e. If the video product has been dropped or the cabinet has been damaged.
- f. When the video product exhibits a distinct change in performance - this indicates a need for service.

19 Replacement Parts -- When replacement parts are required, have the service technician verify that the replacements he uses have the same safety characteristics as the original parts. Use of replacements specified by the video product manufacturer can prevent fire, electric shock or other hazards.

20 Safety Check -- Upon completion of any service or repairs to this video product, ask the service technician to perform safety checks recommended by the manufacturer to determine that the video product is in safe operating condition.

- 1. Save these instructions -- This page contains important safety and operating instructions for AC Adapter/Charger Model VM-AC 82A.
- 2. Before using AC Adapter/Charger, read all instructions and cautionary markings on (1) AC Adapter/Charger, (2) battery and (3) product using battery.
- 3. Also read all instructions on pages 4 and 5.

4. **Caution** -- To reduce risk of injury, charge only rechargeable battery, VM-BP82G or VM-BP82. Other types of batteries may burst causing personal injury and damage.

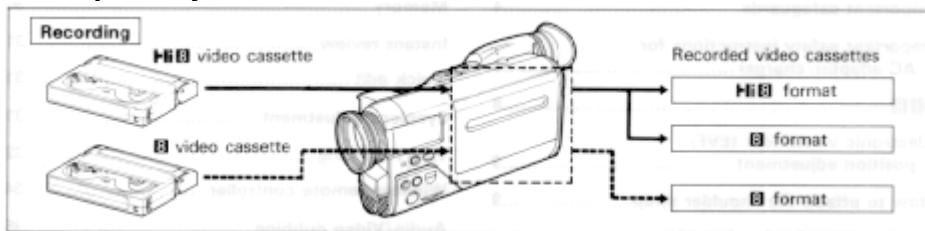
- 5. Do not expose charger to rain or snow.
- 6. Use of an attachment nor recommended or sold by the battery charger manufacturer may result in a risk of fire, electric shock, or injury to persons.
- 7. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.
- 8. Make sure cord is located so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress.
- 9. Do not operate charger with damaged cord or plug - replace them immediately.
- 10. An extension cord should not be used unless absolutely necessary.
Use of improper extension cord could result in a risk of fire and electric shock. If extension cord must be used, make sure:
 - A. The pins on plug of extension cord are the same number, size, and shape as those of plug on charger.
 - B. That extension cord is properly wired and in good electrical condition; and
 - C. That wire size should be met below:
Minimum

AWG size	Length of extension cord (feet)
18	Equal to or less than 100
16	Equal to or less than 150
- 11. Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.
- 12. Do not disassemble charger: take it to a qualified serviceman when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
- 13. To reduce risk of electric shock, unplug charger from outlet before attempting any maintenance or cleaning.

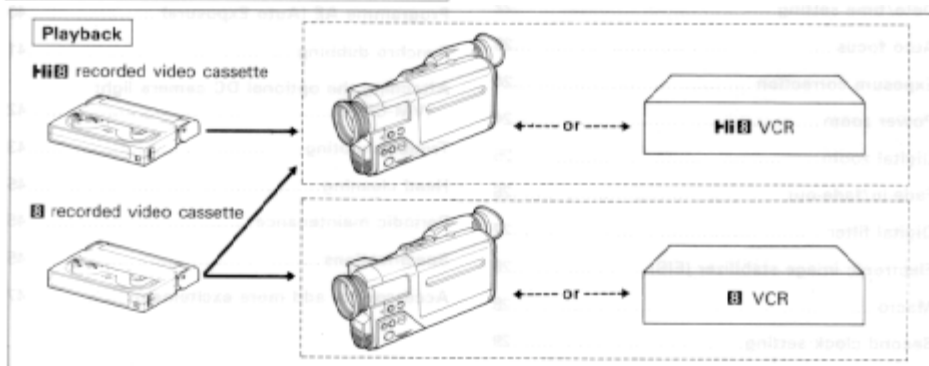
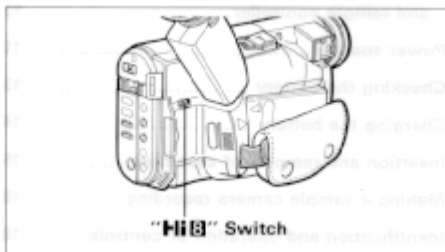
"Note to CATV system installer: This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical".

Hi8 has realized high resolution and high picture quality when compared to the standard **8** format.

Compatibility with conventional video camera/recorder



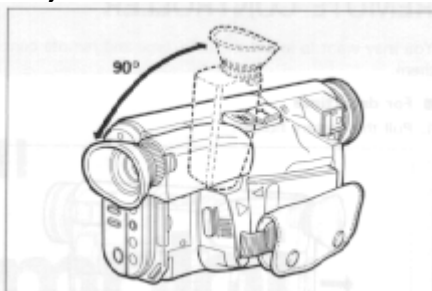
- **Hi8** video cassettes are recorded in the **Hi8** format when the **Hi8** switch of this camera/recorder is set to "AUTO", and recorded in the **8** format when it is set to "OFF".
- **8** video cassettes are recorded in the **8** format regardless of the position of the **Hi8** switch.



- During playback, the recording format is discriminated automatically and video cassettes are played back correctly regardless of the position of the **Hi8** switch.
- Video cassettes recorded in the **Hi8** format cannot be played back by an **8** VCR.

ELECTRONIC VIEWFINDER (EVF) POSITION ADJUSTMENT

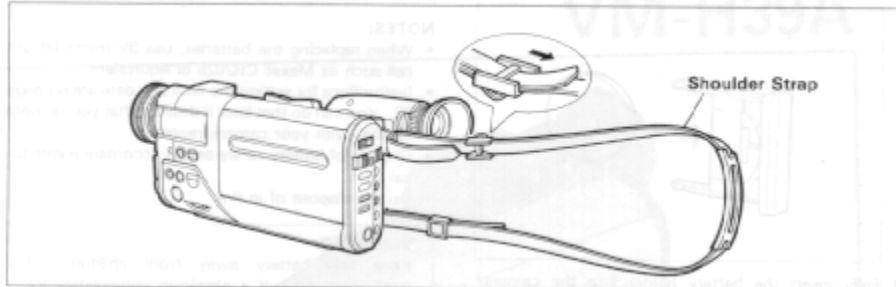
- Adjust the electronic viewfinder to a position where you can see through it easily.



NOTE: Put the viewfinder back to the original position when storing the camera/recorder into the carrying case or carrying the camera/recorder.

HOW TO ATTACH THE SHOULDER STRAP

Attach the shoulder strap (provided), as illustrated.

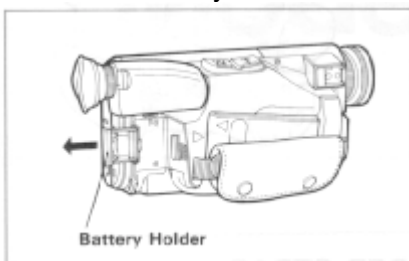


LOADING BATTERIES FOR DATE/TIME AND REMOTE CONTROL

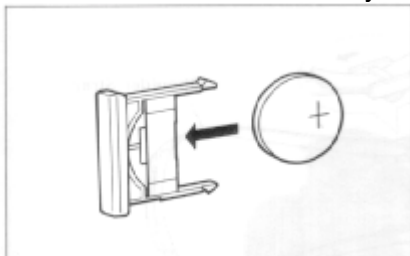
You may want to install the date/time and remote control batteries (provided) immediately to prevent misplacing them.

For date/time

1. Pull the battery holder.



2. Insert the date/time battery with the "+" terminal facing up.

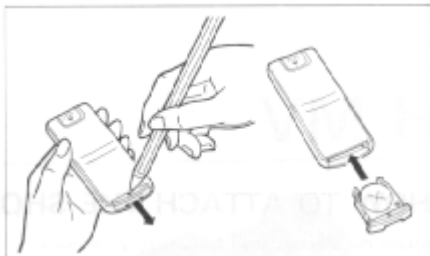


3. Fully insert the battery holder into the camera/recorder.



For remote control

1. Pull the battery holder from the remote control (provided).
2. Place the battery as illustrated, and then attach the holder to the remote control.



NOTES:

- When replacing the batteries, use 3V micro lithium cell such as Maxell CR2025 or equivalent.
- Instructions for setting the date and time are on page 22. You can do that later if desired after you're more familiar with your camera/recorder.
- Dispose of battery safely and in accordance with local laws.
- Do not dispose of in fire.

WARNING:

Keep this battery away from children. If swallowed, consult a physician immediately for emergency treatment.

POWER SOURCES

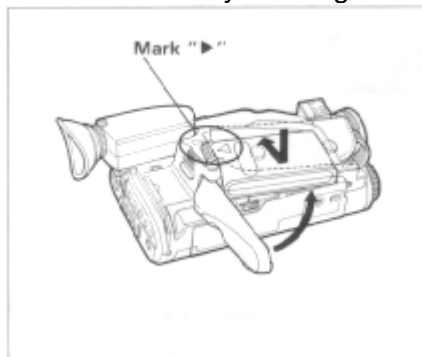
WHEN USING WITH THE BATTERY (provided)

NOTE: The battery must be charged before it can be used for the first time. Refer to "**CHARGING THE BATTERY**" on page 14.

1. Push the "**BATT EJECT**" lever in the direction of the arrow and hold it, then open the grip cover.



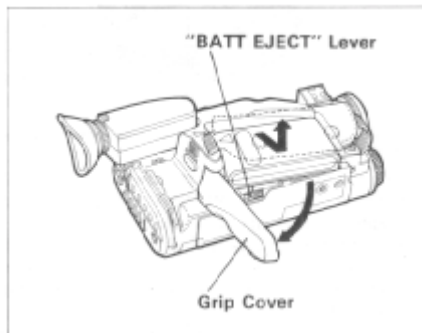
2. To attach the battery, align the "◀" mark on the battery with that of the camera/recorder.
3. Hold the battery flush against the camera/recorder and slide it in the direction of the arrow.



4. Close the grip cover.

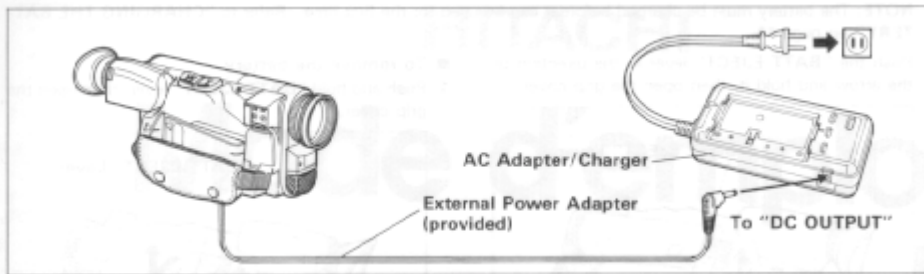
To remove the battery

1. Push and hold "**BATT EJECT**" lever, then open the grip cover.



2. Slide the battery downward and off.

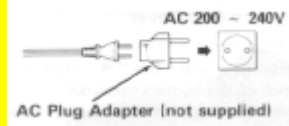
WHEN USING WITH THE AC ADAPTER/CHARGER (provided)




1. Plug the AC adapter/charger power cord into an AC electrical output; the "**POWER**" indicator on the AC adapter/charger will come on.
2. Attach the external power adapter (provided) to the camera/recorder as shown in the figure. Align the marks and hold the external power adapter flush against the camera/recorder. Then attach it using the same procedure used when attaching the battery.
3. Connect the external power adapter plug to the "**DC OUTPUT**" jack of the AC adapter/charger.
4. To remove the external power adapter from the camera/recorder, perform the same procedure as when removing the battery.

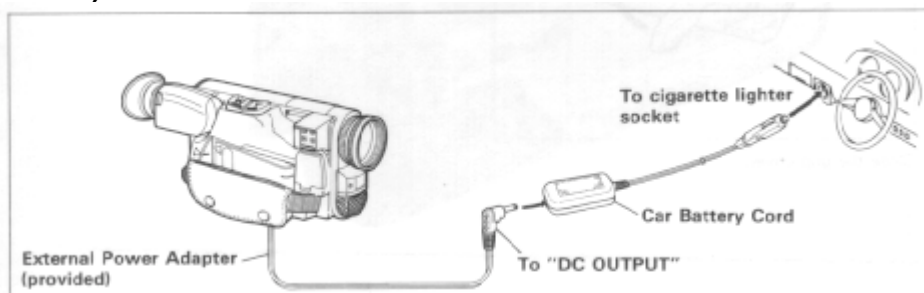
NOTES:

- This AC adapter/charger is universal around the world. If you use the camera/recorder in some foreign countries, an AC plug adapter (not supplied) may be necessary.



- When using the AC adapter/charger to power the camera/recorder, the battery level indicator may display "". This indicator is used for battery operation and has no meaning when using the AC adapter/charger to power the camera/recorder.

WHEN USING WITH THE CAR BATTERY (by using optional car battery cord Hitachi VM-CC80A)



1. Connect the car battery cord to the car's cigarette lighter socket.
2. Connect the external power adapter (provided) to the camera/recorder, as illustrated.
 - Attach it by the same procedure as when attaching the battery.
3. Connect the small plug of the external power adapter to "**DC OUTPUT**" of the car battery cord.

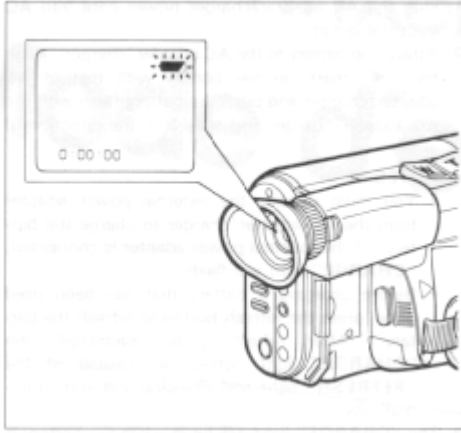
NOTES:

- The car battery cord is designed to be used only with automobiles having a 12/24-volt negative ground system.
- To prevent fire or shock hazard or damage to your camera/recorder, please use only Hitachi's car battery cord model VM-CC80A.

NOTE: Be sure to set the power switch to "**OFF**" position when attaching or detaching a power supply (battery, AC adapter/charger, etc.) to the camera/recorder.

CHECKING THE BATTERY

When the "🔋" indication appears in the viewfinder and flashes while the camera/recorder is being operated with a battery (provided), it indicates that the battery charge is low. Charge it or replace it with a charged battery.



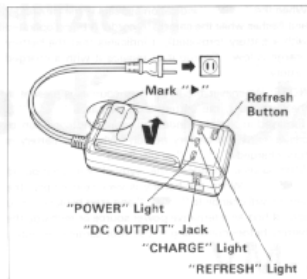
NOTE: Whenever the linear time counter is present in the viewfinder, the battery level indicator "🔋" is displayed in the viewfinder indicating the condition of camera/recorder battery power. When the battery is fully charged, "🔋" is displayed.

After several minutes, the symbol will change to "🔋". When the battery is very near empty, the symbol will change to "🔋" and start blinking. You should find an alternative power source or recharge the battery before continuing to use your camera/recorder.



CHARGING THE BATTERY

1. Plug the AC adapter/charger power cord into AC electrical outlet.
2. Attach the battery to the AC adapter/charger. Align the "◀" mark on the battery with that of AC adapter/charger and push the battery flush with the AC adapter/charger and slide it in the direction of arrow.



NOTES:

- You must remove the external power adapter from the AC adapter/charger to charge the battery. If the external power adapter is connected, **"CHARGE"** light will flash.
- Before charging a battery that has been used once, press the refresh button to refresh the battery. After refreshing is completed, the **"CHARGE"** light comes on instead of the **"REFRESH"** light and charging will start automatically.

3. The **"CHARGE"** light will be lit while the battery is accepting a charge, and will go out when the battery is fully charged.

Skillful use of batteries

Use batteries continuously until "◼" flashes. If you use a battery for a short time and charge it immediately, the usable time of the battery will be shortened.

NOTES:

1. The time required for charging the battery is approx. one hour.
2. When fully charged, the battery should supply approx. 50 minutes of operating time (depending on how much you use zoom and pause).
3. If you repeatedly charge a battery which is not completely discharged the useable time of the battery will become shorter. Refresh such a battery before charging it.
4. It takes about 4 hours to refresh a fully charged battery (VM-BP82G).
5. Charge the battery before use and store it at normal room temperature.
6. The battery should be charged at a temperature of 32°F - 95°F (0°C - 35°C) to prevent damage.
7. Do not operate the battery at temperatures below 14°F (-10°C) or above 95°F (35°C). The battery may be damaged if operated at temperatures above 122°F (50°C). Operation time will decrease at extremely low temperatures.
8. After repeated shargings and use, the operation time will gradually decrease. When operation time becomes too short to be useful, it is time to replace the battery.
9. If the **"POWER"** light on the AC adapter/charger starts flashing, remove the battery and then reattach it. If after several attempts the **"POWER"** light continues to flash, this means your battery cannot take a charge and must be replaced with a new one. The **"POWER"** light will also flash if a hot battery is attached to the AC adapter/charger. Attaching an extremely hot battery to the AC adapter/charger is not recommended; it should be allowed to cool down before being attached.
10. Do not short the battery's terminal.
11. Do not attempt to disassemble or modify the battery. There are no user serviceable parts inside.
12. Throwing the battery into a fire or exposing the battery to excessive heat - over 149°F (65°C) could be hazardous.
13. Set the mark switch of any battery which has already been charged to red as shown in the figure. This lets you discriminate between charged and uncharged batteries easily.

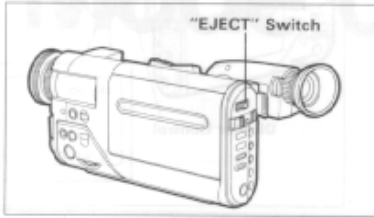


INSERTION AND REMOVAL OF CASSETTES

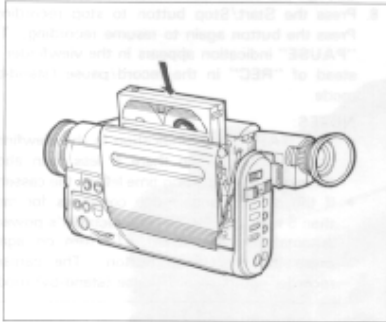
Before inserting or removing a cassette, be sure to connect the power source. When a power source is connected, the cassette can be ejected and removed whether the power is on or off.

Insertion

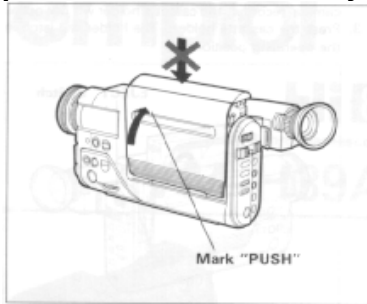
1. Slide the "**EJECT**" switch.
The cassette door will open.



2. Insert a cassette so the transparent window is toward you and the arrow toward the cassette holder. Slide the cassette into cassette holder as far as it will go.



3. Press the cassette holder.
Push the section of the holder marked "**PUSH**" until a click is heard.
The camera/recorder will automatically close the top of the cassette compartment. Do not press the door down, or you may damage your camera/recorder.



Removal

Slide the "**EJECT**" switch and remove the cassette.

8mm Video Cassette

An 8mm Video Cassette has a record-protect tab on the side of the cassette that can be slid to prevent accidental erasure of recorded material.



To prevent accidental erasure, slide the record-protect tab in the direction of the arrow until the red tab is completely visible.



To record on the cassette again, slide the record-protect tab in the direction of the arrow. The red tab will disappear behind the cassette case.

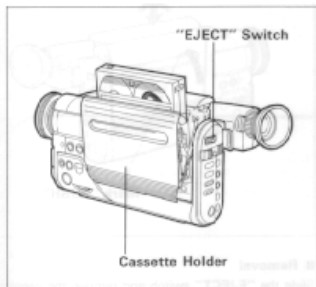


MAKING A SAMPLE CAMERA RECORDING

1. Connect the POWER SOURCE. (See pages 11 and 12.)
2. Slide "**EJECT**" switch and insert the cassette so the transparent window is toward you and the arrow toward the cassette holder. Slide the cassette into cassette holder as far as it will go.

NOTE: If the power source is not connected to the camera/recorder, the cassette holder will not open.

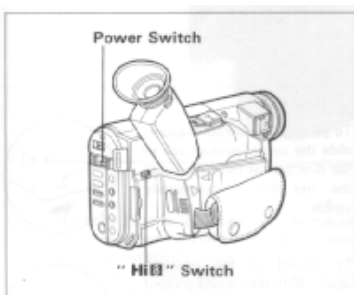
3. Press the cassette holder. The holder will latch in the operating position.



4. Set the "**Hi8**" switch to "**AUTO**".
5. Slide the power switch to "**CAMERA**". The camera/recorder will enter record/pause mode automatically.

NOTES:

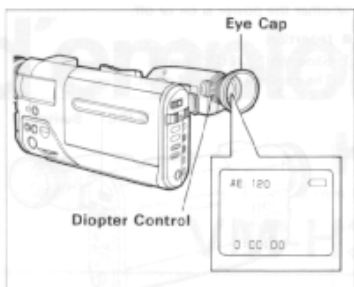
- If the red record-protect tab on the cassette is closed, the "**TAPE**" indication in the viewfinder flashes for several seconds and the camera/recorder will not enter the record/pause mode.



6. Now, press the Start/Stop button to start shooting the picture. "**REC**" indication appears in the viewfinder. You are now recording the picture you see through the viewfinder.
7. Press the Start/Stop button to stop recording. Press the button again to resume recording. The "**PAUSE**" indication appears in the viewfinder instead of "**REC**" in the record/pause (stand-by) mode.

NOTES:

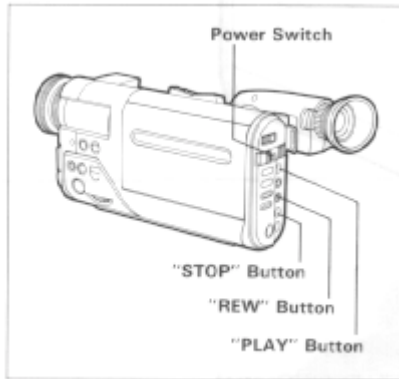
- The "**TAPE END**" indication in the viewfinder starts flashing when there is less than about three minutes recording time left on the cassette.
- If the record/pause mode continues for more than 5 minutes, the camera/recorder's power is automatically turned off. To turn on again, press the Start/Stop button. The camera/recorder enters record/pause (stand-by) mode.



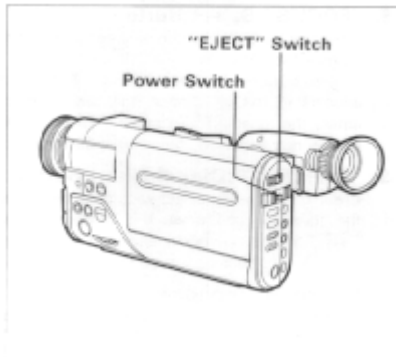
8. After recording, slide the power switch to "**VIDEO**", and the camera/recorder will now be in the stop mode.
9. Press "**REW**" button. The tape will be rewound to the beginning.
10. Press "**PLAY**" button. The picture you just recorded will be seen through the viewfinder.

NOTE: If you connect the camera/recorder to your TV, you can see the picture played back on your TV. Refer to "**VIEWING THE PICTURE PLAYED BACK ON YOUR TV**" on page 37.

11. After playing, press "**STOP**" button.



12. Slide the power switch to "**OFF**" and then slide "**EJECT**" switch to remove cassette.



13. Always remove the power source from the camera/recorder after use. See "**POWER SOURCES**" on page 11.



NOTE: If you have a cassette tape that has already been partially recorded on and you want to record the remaining blank section, see "**QUICK EDIT**" on page 31.

IDENTIFICATION AND OPERATION OF CONTROLS

Left side Illustration

1. Lens

F1.4 (6~48mm) 8:1 power zoom lens features auto focus and auto iris functions.

2. "ZOOM MODE" Button

Use this button to switch the digital zoom feature. Usually press this button so that "ZM:1" appears in the viewfinder. (See "DIGITAL ZOOM" on page 25.)

3. "EIS" (Electronic Image Stabilizer) Button

Press to display (hand) in the viewfinder. EIS corrects slight shaking of the image to be recorded.

4. "B. (Back) LIGHT" Button

When the subject is lit from behind, press and hold this button to compensate for the back-lighting.

5. Cassette Holder

Slide "EJECT" switch to open the cassette holder. Be aware of the cassette direction when inserting.

NOTE: Power source must be connected to open the cassette holder.

6. "FADE" Button

During recording you can add a professional touch to your recordings by fading in and out of scenes. You can select the three fade modes - the white fade, wipe fade and zoom fade.

7. Focus Control

For manual focusing, rotate this control to bring the subject into focus.

8. "FOCUS" Select Button

Press this button to switch between automatic and manual focusing. If this button is pressed and "FOCUS M." appears in the viewfinder, the camera/recorder enters the manual focus mode. When "FOCUS M." is not displayed, focusing is automatic.

9. "D.FILTER (Digital Filter) Button

Press for a special-effect recording by changing the tone. If you press this button to display "(???) in the viewfinder and start recording, for example, the picture will be recorded in sepia.

10. Stereo Microphone

Sensitive to source coming from the direction in which the camera is pointed.

11. Infrared Ray Receiver

Receives infrared rays from the remote control (provided).

12. Record Indicator

This indicator lights up to indicate that the camera/recorder is recording.

13. Eye Cup

Pull out the eye cup all the way when using it and adjust the diopter control so that the subject is seen most clearly in the viewfinder.

Always push in the eye cup after use.

Right side/Rear Illustration

14. Diopter Control

To use the electronic viewfinder without eyeglasses on, turn this control ring for your optimum focus adjustment.

15. Start/Stop Button

This button is used to control the camera/recorder. When the power switch is set to "CAMERA" position, pressing this button starts the tape to begin recording. "REC" appears in the viewfinder.

When this button is pressed again, "PAUSE" appears instead of "REC" and the tape stops and the camera/recorder enters the record/pause (stand-by) mode.

16. Power Zoom Switch

This switch performs zooming electronically.

"W": Picture becomes wider gradually.

"T": Picture becomes telescopic gradually.

17. Camera Light Shoe

Used to attach the camera light.

IDENTIFICATION AND OPERATION OF CONTROLS

18. "AV IN/OUT" Jack (Behind the door)

Use the RF output adapter (provided) to connect this jack to a TV to view the pictures played back by the camera/recorder.

Use the AV input cord (provided) to connect this jack to a TV or VCR to record pictures from the VCR or TV.

19. Hand Strap

Adjust to best fit your hand.

20. Power Supply Attachment Section

Attach the battery (provided) or external power adapter (provided) here.

21. Date/Time Battery Compartment

Pull the battery holder and install the date/time battery (provided).

Bottom view/Remote Control Illustration

22. Power Switch

This turns the camera/recorder on and off and also switches between the camera and VCR modes. Set the switch to "**CAMERA**" to turn the camera's power on and to "**VIDEO**" to turn the VCR's power.

Press and hold the small red button in the switch to switch it.

23. "PLAY" Button

Used for playback of tapes.

NOTE: When the camera/recorder is in record/pause (stand-by) mode, pressing and holding this button will play the tape at normal speed.

24. "F.FWD" Button

Press this button during stop or rewind mode, and fast-forwarding starts.

Press the button during playback of tape, and the tape is played back in the forward direction approximately 9 times faster than the normal speed to confirm the recorded content.

Press "**PLAY**" button to return to normal playback mode or press "**STOP**" button to stop tape movement. Also use "**F.FWD**" button when setting the date/time.

NOTE: You can also visually scan forward when the camera/recorder is in record/pause (stand-by) mode by pressing and holding this button.

25. "REW" Button

Press this button during stop or fast forward mode, and fast-rewinding starts. Press the button during playback of tape, and the tape is played back in the rewind direction approximately 7 times faster than the normal speed to confirm the recorded contents.

Press "**PLAY**" button to return to normal playback mode or press "**STOP**" button to stop tape movement. Also use "**REW**" button when setting the date/time.

NOTE: You can also visually scan backward when the camera/recorder is in record/pause (stand-by) mode by pressing and holding this button.

26. "STOP" Button

The "**STOP**" button is used to stop playback, rewind, and fast forward operations. The "**STOP**" button has no effect during camera record operation. Also use "**STOP**" button when setting the date/time.

27. "PAUSE" Button

When this button is pressed in the playback mode, the tape stops and you can view a still picture. When this button is pressed again, the tape runs to resume playback.

28. "TITLE" Button

Press this button to create and record personalized titles on your videos with the camera/recorder's built-in titler. (See "**TITLE RECORDING**" on page 32.)

29. "REVIEW" Button

Used to review the last few seconds of the recorded segment in the record/pause mode.

30. "RESET" Button

When the linear time counter is displayed in the viewfinder, pressing this button resets the counter to "0:00:00".

31. "DISPLAY" Button

When this button is pressed, the display in the viewfinder will change in sequence.

32. "DATE" Button

Press this button to display the date and time in the viewfinder. Whenever the date and time appear in the viewfinder, they will be recorded on the tape.

33. "EJECT" Button

Operates with the power on or off, if a power source is connected to the camera/recorder.

34. "Hi8" Switch

Use to select **Hi8** or normal **8** for recording. This switch has no effect during playback.

Normally, set it to "AUTO". "Hi8" appears in the viewfinder when the camera/recorder is recording or playing in **Hi8** mode.

35. Grip Cover

Open this cover when attaching the battery or external power adapter.

36. "MIC" Switch

This switch is used to reduce noise that occurs due to wind. Place the switch in the "NORM" position for normal use.

37. Tripod Mount Screw

Use this screw to mount the camera/recorder on a tripod (generally available).

38. "BATT (Battery) EJECT" Lever

Move this lever to open the grip cover when attaching the battery or external power adapter to the camera/recorder or detaching it.

39. Camera/Recorder Control Buttons

These shaded buttons on the remote control function the same as those on the camera/recorder.

40. "PAUSE (START/STOP)" Button

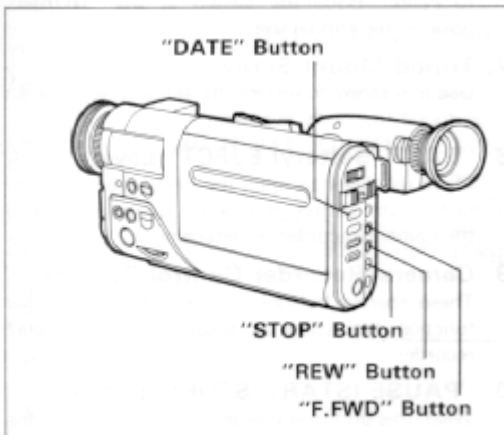
When this button is pressed during recording, the tape stops and the camera/recorder enters the record/pause (stand-by) mode. When this button is pressed again, the tape runs to resume recording. This button may also be used to display a still picture during playback mode.

41. "AV DUB" Button

This button is used to record new audio and video in place of existing audio and video.

DATE/TIME SETTING

¹The date and time can be recorded on your tapes to act as a handy reference when viewing them at a later time. Use the following procedure to set up this display for the current date and time.



1. Load the camera/recorder's date/time battery as described on page 10.
2. Press and hold small red button in the power switch, and then slide it to "**CAMERA**" position.
3. Press "**DATE**" button. Date and time appear in the viewfinder and "1" flashes.



4. Press "**F.FWD**" button to select correct month. Hold button down to advance rapidly. If you go past the month you want to set, press "**REW**" button. When the correct month appears, press "**STOP**" button.



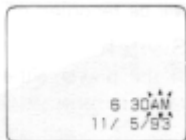
5. Press "**F.FWD**" button to select correct date. Hold button down to advance rapidly. If you go past the date you want to set, press "**REW**" button. When the correct date appears, press "**STOP**" button.



6. Press "**F.FWD**" or "**REW**" button to select year, and then press "**STOP**" button.



7. Press "**F.FWD**" or "**REW**" button as many times as may be required to select correct hour, and then press "**STOP**" button.
8. Repeat step 7 to select minute and AM/PM.



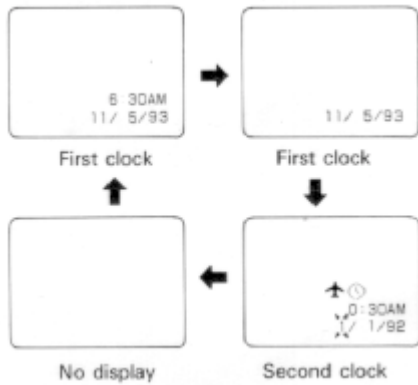
9. After setting AM or PM, press "**STOP**" button again to erase the flashing cursor and start the internal clock.

NOTE: The date/time graphics will be recorded whenever they appear in the viewfinder.

To record date/time graphics

Press the **"DATE"** button repeatedly to select the required date/time graphics in the viewfinder, then start recording.

- The display changes in the following order each time the **"DATE"** button is pressed.



NOTE: Refer to page 29 for setting the second clock.

To correct date/time after starting the date/time

1. Press and hold **"DATE"** button, and then press **"STOP"** button. The month starts flashing.
2. Correct the incorrect digit by using **"F.FWD"**, **"REW"** and **"STOP"** buttons.

To correct date/time during programming

1. Press **"STOP"** button repeatedly until the flashing cursor will be removed from the viewfinder.
2. Follow steps 1 and 2 of **"To correct date/time after starting the date/time"** above.

AUTO FOCUS

• You can always focus the subject automatically if "FOCUS M." is not displayed in the viewfinder.


- The subject at the center of the viewfinder is in focus.





The range of subject with which auto focus can be used


- On "T" side: about 3.6 feet from the lens surface to infinity.
- On "W" side: about 3/8 inches from the lens surface to infinity.

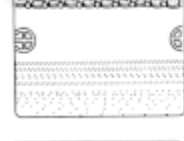
You cannot focus automatically with the following objects. Focus manually.


- 


1. Objects not in the center of the viewfinder.
- 

2. Objects at far and near positions at the same time
- 

3. Objects lit by a spotlight or neon signs, etc.
- 

4. Objects behind glass with water droplets or dust on it.
- 

5. Objects with almost no difference in brightness such as a white wall.
- 

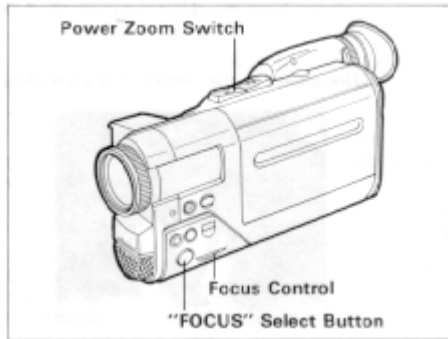
6. Objects moving rapidly.
- 

7. Dark objects

EXPOSURE CORRECTION

MANUAL FOCUSING

1. Press **"FOCUS"** select button to display **"FOCUS M."** in the viewfinder.



- When **"FOCUS M."** is displayed in the viewfinder, you can adjust the focus manually.
 - When **"FOCUS"** select button is pressed again, **"FOCUS M."** disappears and camera returns to the auto focus mode.
2. Zoom in on the object by pressing the power zoom switch on the **"T"** side.
 3. Turn the focus control to focus on the object.

NOTE: If focusing is performed without zooming up first, the picture may become out of focus thwn the zoom-up is done during actual picture taking.

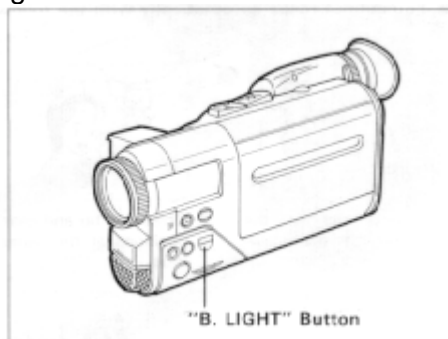
4. Then, zoom back the object as desired

NOTE: After using the manual focus, press **"FOCUS"** select button to switch off **"FOCUS M."** in the viewfinder.

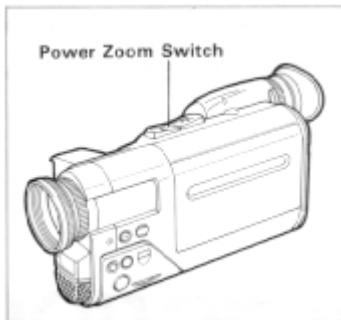
EXPOSURE CORRECTION

This camera/recorder is provided with an auto iris mechanism which automatically adjusts the lens aperature in accordance with the available light. When the object is dark, the iris opens automatically, and it closes when the object is bright. When the power is switched off, the iris is automatically set to the fully closed position.

When the background is brightly lit and the subject appears too dark, press and hold down **"B. LIGHT"** button during recording. While **"B. LIGHT"** button is depressed, you can correct the back light.



POWER ZOOM



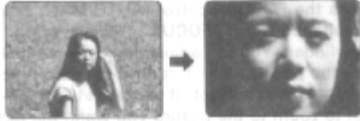
- Press power zoom switch on the "W" side, and the picture gradually widens.



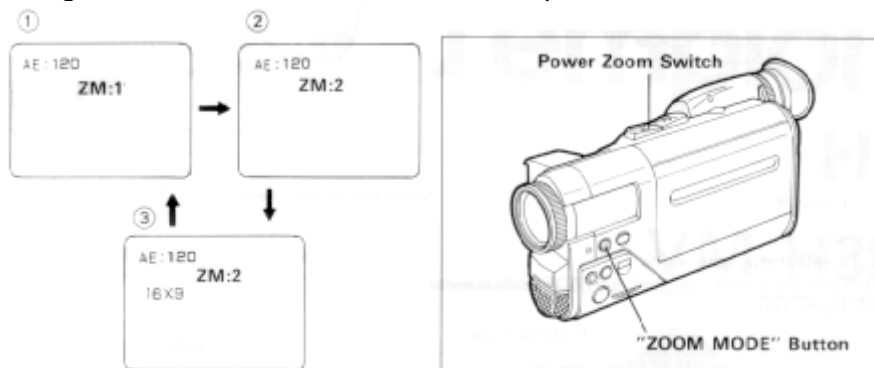
- Press power zoom switch on the "T" side, and the picture gradually becomes telescopic.

DIGITAL ZOOM

This feature allows you to increase the magnification of the image at the center of the screen up to 2 or 8 times greater than the extreme telephoto position.



1. Press **"ZOOM MODE"** button to select **"ZM:1"** or **"ZM:2"**. The display in the viewfinder will change as follows each time the button is pressed.



2. Press and hold **"T"** side of the power zoom switch. The digital zoom functions from the extremely telephoto position of X8.

- **"ZM:1"** enlarges the image from X8 to X16.
- **"ZM:2"** enlarges the image from X8 to X64 and adds mosaic special effect.
- **"ZM:2 with 16X9"** enlarges the image from X8 to X64 and adds mosaic special effect. It also reduces the image width so the playback picture will just fit into a 16X9 TV screen.

Note: Recording in the **"ZM:2 with 16X9"** mode allows playback on a tv with a 16:9 aspect ratio. If you play it on a conventional TV with the 4:3 aspect ratio, the picture becomes thinner.

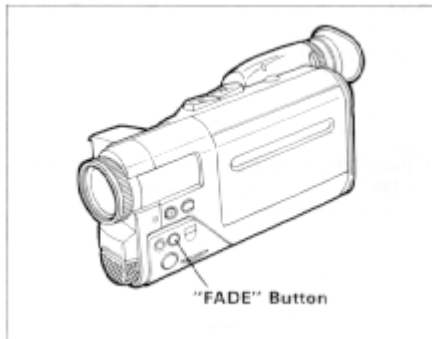
You can control the digital enlargement ratio by pressing the **"T"** or **"W"** side of the power zoom switch. When the zoom ratio falls below X8, the normal zooming function is restored.

NOTE: If you select a zoom ratio over X8, it is displayed, in the viewfinder. At X36, for example, **"X36"** is displayed.

3. After using the digital zoom feature, press the **"ZOOM MODE"** button to select either display or above. If display is selected, the picture image in the viewfinder is different from the subject being shot.

FADE-IN/FADE-OUT

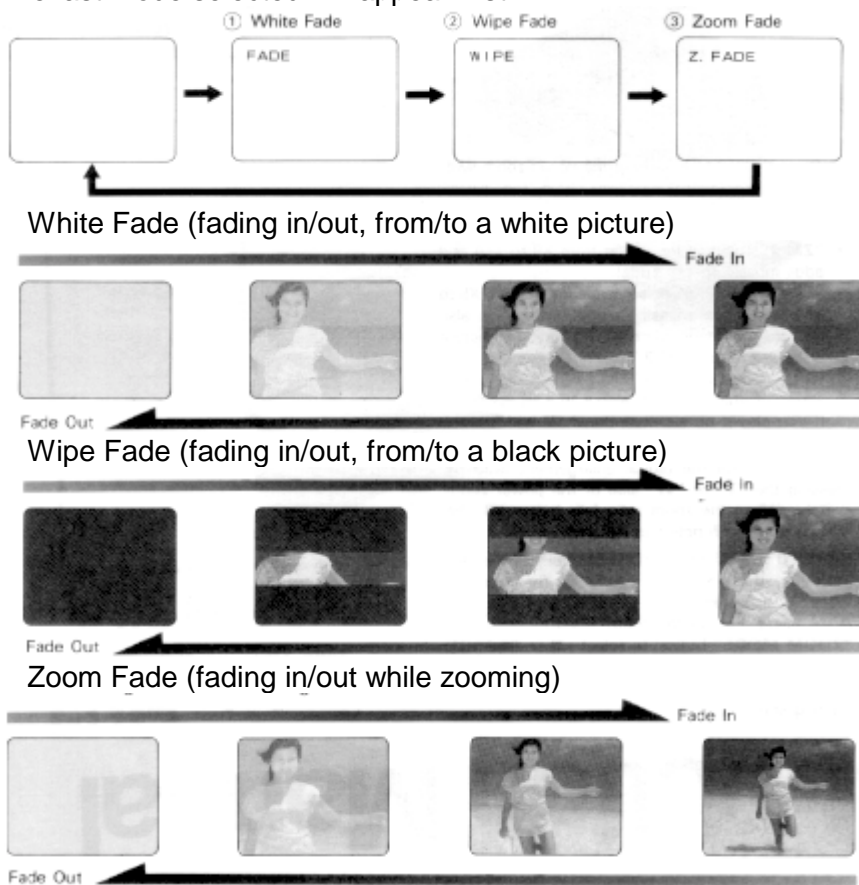
This feature lets you add a professional touch to your home recordings. When you fade into a scene, the recording will start with a blank scene and the picture will gradually appear. The picture gradually disappears when fading out. There are three fade modes.



NOTE: Both picture and sound will gradually appear and disappear. The fade speed is automatically controlled by the camera/recorder.

To select the fade mode

Each time the button is pressed, the FADE mode is switched and displayed in the viewfinder. The last mode selected will appear first.



FADE-IN

1. Press the **"FADE"** button before recording to select the fade mode.
 2. Press the start/stop button to start recording.
- The picture fades in automatically and recording starts.

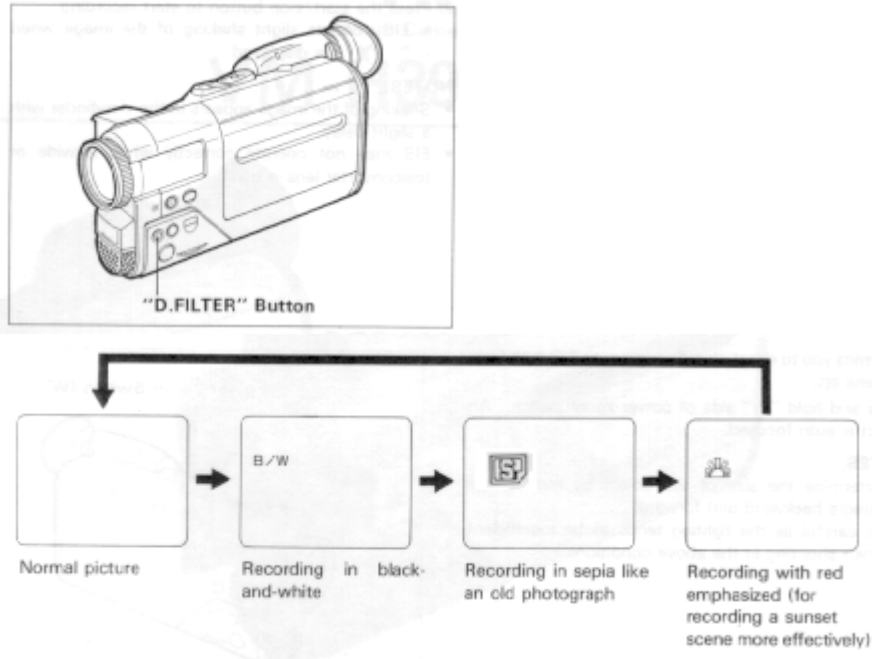
FADE-OUT

1. While the camera/recorder is recording, press the **"FADE"** button to select the fade mode.
 2. Press the start/stop button to stop recording.
- The picture fades out automatically and recording stops.

This function changes the picture that is being recorded to monochrome, sepia and sunset for special-effect recording.

Press the **"D. FILTER"** button to select the required recording mode and then start recording.

- Each time the "D. FILTER" button is pressed, the recording mode is switched. The last mode selected will appear first. Three special-effect recording modes are available.

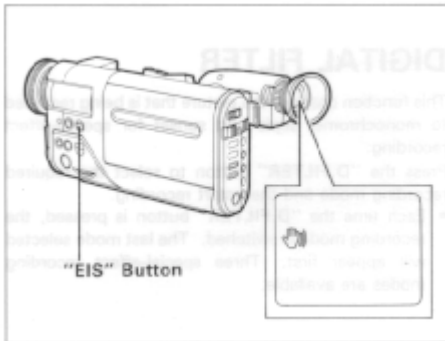
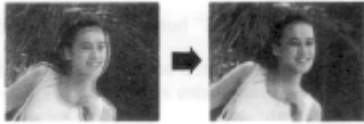
**Notes:**



- The viewfinder in this model is of a black-and white type, so you cannot view the special-effect color in it.
- It is best to check the effects provided by the digital filter on your TV screen in advance before recording with them.

ELECTRONIC IMAGE STABILIZER (EIS)

This function corrects slight shaking of the image in the following record modes.

- Recording by zooming up to a distant subject
- Recording by approaching a small subject.
- Recording while walking around
- Recording in a vehicle or recording a subject behind the window of a vehicle



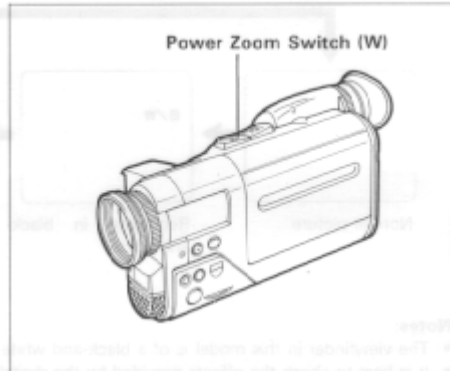
1. Press the **"EIS"** button to engage the electronic image stabilizer and to display the EIS indicator "  ".
 - Press the button again to switch off this function.
2. Press the start/stop button to start recording
 - EIS corrects slight shaking of the image when "  " is displayed.

NOTES:

- Shaking of the image appears in the viewfinder with a slight delay.
- EIS may not operate correctly when a wide or teleconverter lens is used.

MACRO

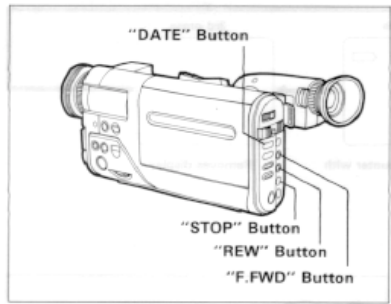
It permits you to shoot objects as close as 3/8 inch from the lens tip.
Press and hold "W" side of power zoom switch. An object is auto focused.

**NOTES:**

- Determine the size of the object by moving the camera backward and forward.
- Be careful as the lighting tends to be insufficient when shooting in the above conditions.

SECOND CLOCK SETTING

Since the camera/recorder has a dual time feature, if you go abroad to a country with a different time, you can record the local time superimposed on the scene being shot.



1. Press the **"DATE"** button repeatedly to select the second clock graphics in the viewfinder.



NOTE: You cannot set the second clock without having set the first clock.

2. Select the month, date year following the same steps as **"DATE/TIME SETTING"** on page 22.



3. Select the correct hour and AM or PM, and then press **"STOP"** button.

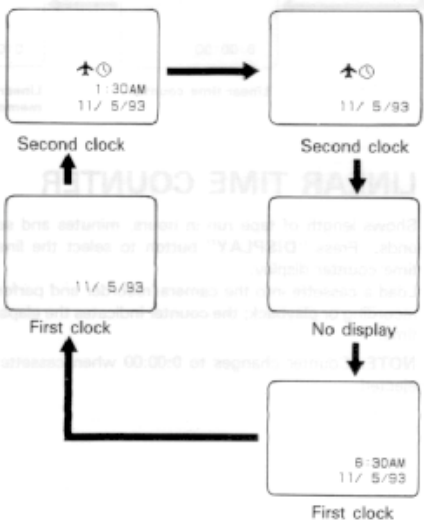


NOTES:

- The minutes of the second clock can not be set. They are the same as those of the first clock.
- The first clock operates even while the second clock is being set.

4. Press the **"DATE"** button to select the date/time graphics you want to record.

- The graphics change in the following order each time the button is pressed.

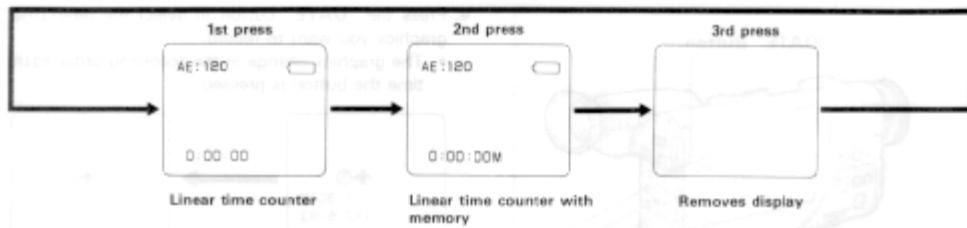


NOTES:

- If you want to correct the second clock during programming or after starting, perform the same procedure as in correcting the first clock on page 22.
- When you correct the minutes of the first clock, the minutes of the second clock are corrected automatically.

DISPLAY BUTTON

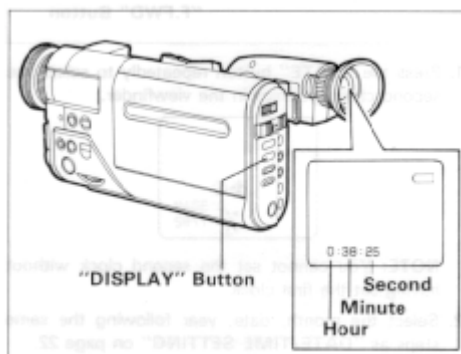
Pressing the **"DISPLAY"** button lets you check several special display in the viewfinder.



LINEAR TIME COUNTER

Shows length of tape run in hours, minutes and seconds. Press **"DISPLAY"** button to select the linear time counter display.

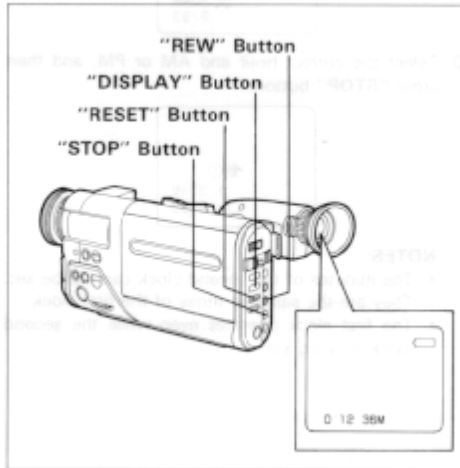
Load a cassette into the camera/recorder and perform recording or playback; the counter indicates the elapsed time.



NOTE: Counter changes to 0:00:00 when cassette is ejected.

MEMORY

When the linear time counter with memory indication appears in the viewfinder, a tape that is being rewind automatically stops when the counter reads approximately **"0:00:00 M"**. This is useful if there is a section of tape you want to review immediately after recording or if you want to return to the same point several times in a row.



1. Press "DISPLAY" button until the linear time counter with memory is displayed.
2. Start playing or recording a tape.
3. At the point you want playback to start. press **"RESET"** button to reset the counter to **"0:00:00 M"**.
4. Continue to play or record.
5. Press **"STOP"** button.
6. Press **"REW"** button. The tape will be rewind to the preselected point, at approximately **"0:00:00 M"** indication.

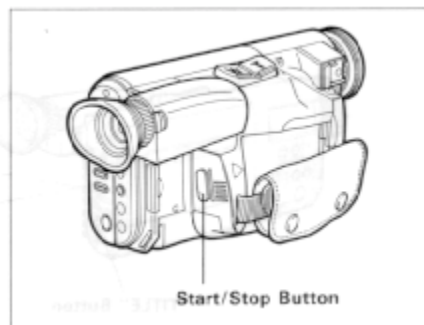
NOTE: The tape will also stop approximately at **"0:00:00 M"** during fast forward mode.

INSTANT REVIEW

1. In record/pause (stand-by) mode, press **"REVIEW"** button, and the last few seconds of the recorded scene is played back in the reverse direction and then played back in the forward direction.

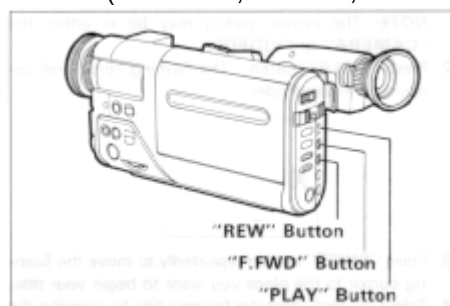


2. When the tape reaches the end of the scene you have just recorded, the camera/recorder returns to the record/pause (stand-by) mode. Recording starts again when the start/stop button is pressed again.



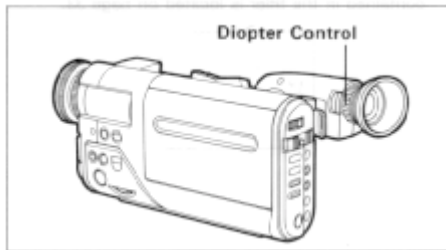
QUICK EDIT

The quick edit feature allows you to search for the end of previously recorded material, or find a particular spot on your tape, to begin your editing, or recording new material. Quick edit is used while the camera/recorder is in the record/pause (stand-by) mode. By holding down the **"F.FWD"**, **"REW"**, or **"PLAY"** button you can visually search or play your tape. Releasing the buttons (**"F.FWD"**, **"REW"**, OR **"PLAY"**) immediately stops the tape at that position.



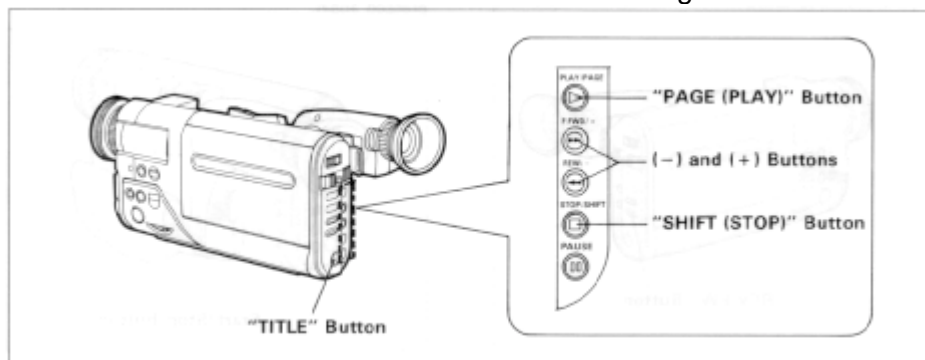
EYEPIECE ADJUSTMENT

To use the electronic viewfinder without eyeglasses on, adjust the diopter control for optimum focus adjustment.



TITLE RECORDING

You can easily create and record personalized titles on your videos with the camera/recorder's built-in titler. The titler will store 2 different title pages in memory. Once a title is stored, it can be displayed and recorded at anytime. Each title page can contain two lines of 16 characters each. The titler contains 47 different characters for creating titles.



Note: Be sure to insert the date/time battery before creating a title.

Creating a Title

1. Attach a power source to the camera/recorder.

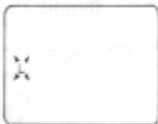
NOTE: The power switch may be in either the "CAMERA" or "VIDEO"

2. Press "**TITLE**" button. The flashing cursor will appear in the viewfinder.

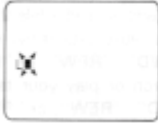


3. Press "**SHIFT**" button repeatedly to move the flashing cursor to the place you want to begin your title.
 4. Select the first character for your title by pressing the (-) or (+) button repeatedly until the desired character appears.

NOTE: Each title can contain up to two lines of 16 characters each. A chart showing the characters contained in the titler is located on page 33.



5. After you have selected the first character, press "**SHIFT**" button to move the flashing cursor to the place you want the next character.



6. Repeat steps 4 and 5 until you have completed the title.



NOTE: Character may flash, however it will be recorded correctly without the flashing.

7. After completing your title, press "**PAGE**" button and create the title on another title page.
 8. After creating the title, press "**TITLE**" button to remove the title graphics from the viewfinder. Now title graphics is stored in memory.

Correcting Errors During Title Storage

1. Press "**SHIFT**" button repeatedly until the character to be corrected will flash.
 2. Press either "-" or "+" button until the correct character appears.

NOTE: The corrected character may flash, however it will be recorded correctly without flashing.

Recording Titles on a Tape in the Camera/Recorder

- 1. Slide the power switch to "VIDEO".
 - 2. Locate the position on the tape that you wish to record the title.
 - 3. Slide the power switch to "**CAMERA**".
 - 4. Press "**TITLE**" button to display the title graphics.
 - 5. Press "**PAGE**" button until the title you wish to record appears in the viewfinder.
 - 6. Press the start/stop button to start the title recording.
 - 7. Press "**TITLE**" button to remove the title graphics from the viewfinder.
- The camera/recorder will now record as normal.

NOTE: If you are planning to video tape an event you must prepare your titles in advance, then by pressing "**TITLE**" button superimpose the title over the scene as it's being recorded. You cannot go back and record titles over existing video without erasing the previously recorded material.

Recording Titles on Another VCR while playing a Tape Back with the Camera/Recorder.

- 1. Connect the camera/recorder and VCR. (See page 40.)
- 2. Select the title you wish to record from page 1 or page 2. The last title selected will appear first. Press "**TITLE**" button to turn title off.
- 3. Set the VCR in the recording mode and camera/recorder in the playback mode.
- 4. Press "**TITLE**" button when you see the scene where you want to record the title.
- 5. Press "**TITLE**" button to erase the display from the viewfinder.

Chart of Characters available in the titler.

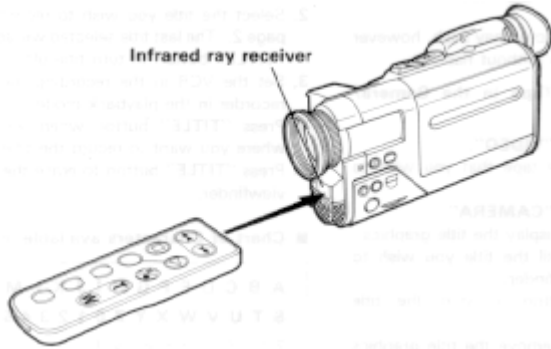
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	0	1	2	3	4	5	6	7	8	9
?	'	.	/	.	-	:	:	<	>	!							

WIRELESS REMOTE CONTROLLER

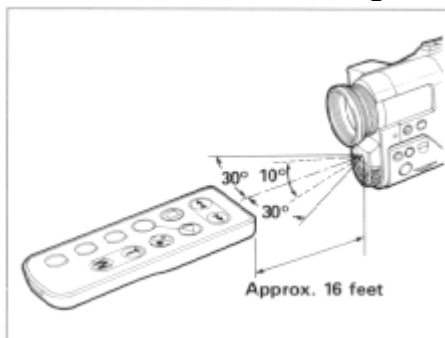
You can operate the camera/recorder with the wireless remote controller (provided) from a distance.

The buttons on the remote controller except for "AV DUB" button have the same functions as the buttons with the same identifications on the camera/recorder.

Aim the remote controller at the receiver of the camera/recorder.



Remote controllable range



Cautions on the remote controller

- Use the remote controller indoors. When the infrared ray receiver is exposed to direct sunlight or strong light such as that from artificial lighting, the remote controller may not operate correctly.
- The remote control code of this camera/recorder is "VCR2". If the remote control code of your VCR is the same, "VCR2", the VCR may malfunction when this remote controller is used.

AUDIO/VIDEO DUBBING

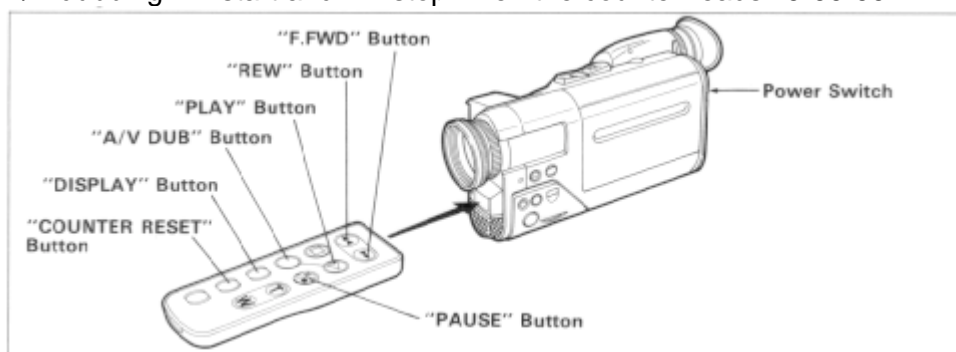
Audio/video dubbing lets you record new audio and video from another VCR on a previously recorded tape in the camera/recorder.

Audio/video dubbing hookup Illustration

NOTES:

- If your VCR has a single (mono) audio output, connect either the left or right audio plug to the audio output of the VCR.
- If no video and audio plugs are connected, new audio and video from the camera/recorder's built-in microphone and camera is dubbed onto the tape.
- If the AV dub/pause mode continues for more than 5 minutes, the camera/recorder will automatically enter the stop mode to protect the tape from damage.
- If your TV has an "**S-VIDEO IN**" jack, connect the "**S-VIDEO**" plug (black) to the TV instead of the "**VIDEO IN**" plug (yellow).

1. Insert a recorded tape.
 2. Be sure that the red record-protect tab is not closed.
 3. Slide the power switch to "**VIDEO**".
 4. Aim the remote controller at the receiver of the camera/recorder.
 5. Press "**PLAY**" button and then "**REW**" or "**F.FWD**" button to search to the approximate area on the tape where you want to begin your dub.
 6. Press "**PLAY**" button again to search for the exact position that you want to stop dubbing, then press "**PAUSE**" button.
 7. Press "**DISPLAY**" button so that the linear time counter with memory appears and then press "**COUNTER RESET**" button to set the counter reading to "**0:00:00M**".
 8. Press "**REW**" button to rewind the tape to the approximate position that you want to start dubbing.
 9. Press "**PLAY**" button, and when the exact position that you start to dub is reached, press "**PAUSE**" button.
 10. Press and hold the "**A/V DUB**" button, and then press the "**PLAY**" button. "**A/V DUB/PAUSE**" appears in the viewfinder, and at the same time the picture to be dubbed appears.
 11. Press "**PAUSE**" button again.
- A/V dubbing will start and will stop when the counter reads "**0:00:00M**".



RECORDING TV PROGRAMS

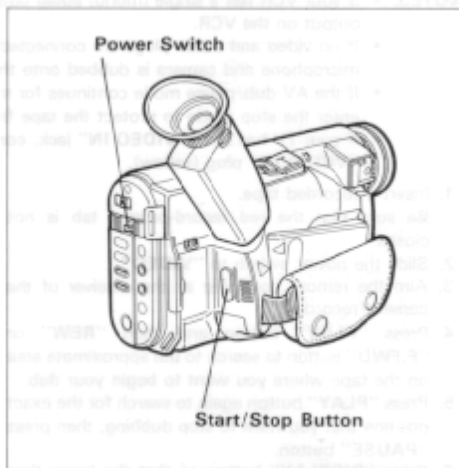
If your TV or VCR has video/audio out jacks, you can record the TV program with camera/recorder.

Recording TV programs Illustration

1. Connect the AV input cord to **"AUDIO OUT"** and **"VIDEO OUT"** of your TV or VCR.
2. Connect the other end to **"AV IN/OUT"** of camera/recorder.
3. Insert the cassette.

NOTE: Power source must be connected to the camera/recorder.

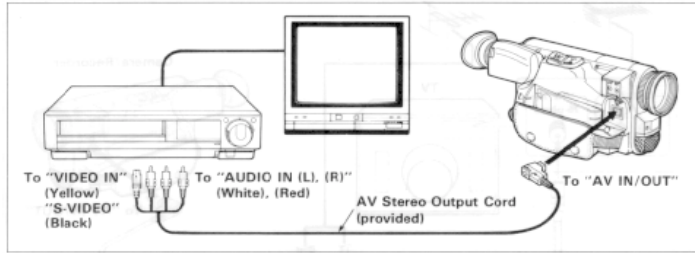
4. Slide the power switch of the camera/recorder to **"CAMERA"**.
5. Turn on your TV or VCR and tune it to the channel you wish to record.
6. Press the start/stop button to start recording. You are now recording the programme you can see on your TV screen.
7. Press the start/stop button once again to stop recording.
8. After recording, slide the power switch to **"VIDEO"**, and the camera/recorder will be now in the stop mode.



VIEWING THE PICTURE PLAYED BACK ON YOUR TV

To play back a tape recorded on your camera/recorder and view it on your TV receiver, you must connect the camera/recorder to the TV receiver using either AV stereo output cord (provided) or RF output adapter (provided).

Example 1: If your TV is already connected to the VCR,

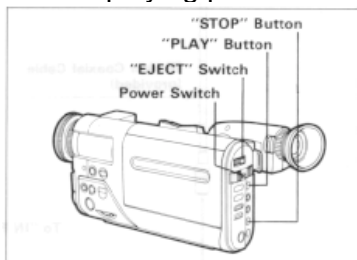


1. Connect the AV stereo output cord (provided) to **"AUDIO IN"** and **"VIDEO IN"** of your VCR.

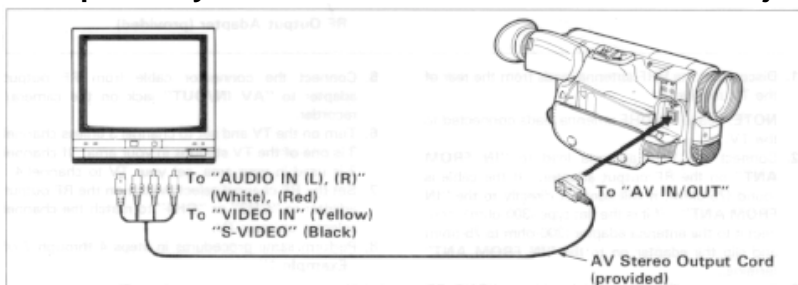
NOTES:

- If your VCR has a single (mono) audio input, connect either the left or right audio plug to the audio input of the VCR.
- If your VCR has an **"S-VIDEO IN"** jack, connect the **"S-VIDEO"** plug (black) to the VCR instead of the **"VIDEO IN"** plug (yellow)

2. Connect the other end to the AV stereo output cord to **"AV IN/OUT"** of your camera/recorder.
3. Select the **"LINE"** of your VCR.
4. Slide **"EJECT"** switch on the camera/recorder and then insert the cassette.
5. Slide the power switch to **"VIDEO"**.
6. Press **"PLAY"** button.
7. After playing press **"STOP"** button.



Example 2: If your TV has "VIDEO IN" and "AUDIO IN" jacks,



1. Connect the AV stereo output cord (provided) to **"AUDIO IN"** and **"VIDEO IN"** of your TV.

NOTES:

- If your TV has a single (mono) audio input, connect either the left or right audio plug to the audio input on the TV.
- If your TV has an **"S-VIDEO IN"** jack, connect the **"S-VIDEO"** plug (black) to the TV instead of the **"VIDEO IN"** plug (yellow).

2. Connect the other end of the AV stereo output cord to **"AV IN/OUT"** of your camera/recorder.
3. Turn on TV.
4. Perform same procedures in steps 4 through 7 of **"Example 1"** above.

Example 3: If your TV is a regular TV,

Camera hookup to regular TV Illustration

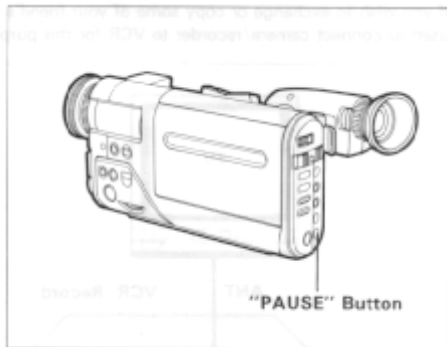
1. Disconnect the VHF antenna leads from the rear of the TV receiver.

NOTE: Leave the UHF antenna leads connected to the TV.

2. Connect the VHF antenna lead to **"IN FROM ANT"** on the RF output adapter. If the cable is round (75-ohm), it will connect directly to the **"IN FROM ANT"**. If it is the flat type (300-ohm), connect it to the antenna adapter (300-ohm to 75-ohm) and slip the adapter on to the **"IN FROM ANT"** terminal.
3. Connect the 75-ohm coaxial cable to **"OUT TO TV"** on the RF output adapter.
4. Connect the other end of the VHF antenna terminal on the TV, as illustrated.
5. Connect the connector cable from RF output adapter to **"AV IN/OUT"** jack on the camera/recorder.
6. Turn on the TV and set to channel 3 unless channel 3 is one of the TV stations in your area. If channel 3 is used in your area, set your TV to channel 4.
7. Set the RF channel select switch on the RF output adapter to **"CH3"** or **"CH4"** to match the channel selector on your TV.
8. Perform same procedures in steps 4 through 7 of **"Example 1"**.

NOTE: If you want to watch a TV program with camera/recorder connected as illustrated, slide the power switch of the camera/recorder to off.

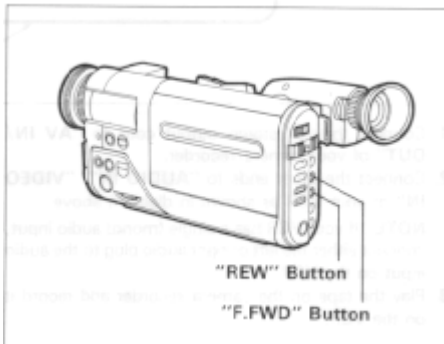
When "**PAUSE**" button is pressed during playback, a still picture can be seen. To start again press "**PAUSE**" button and playback will be resumed.

**NOTES:**

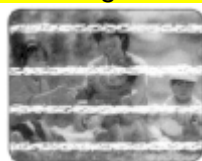
- There will be some noise (interference) in the still picture.
- If the play-pause mode continues for more than 5 minutes, the camera/recorder will automatically enter the stop mode to protect the tape from damage.

**FORWARD AND REVERSE SEARCH**

When you press "**F.FWD**" or "**REW**" button during playback, the tape will be played back at a speed about 9 times (forward search) or 7 times (reverse search) faster than the normal playback speed, and you can easily locate a certain spot on the tape. Press "**PLAY**" button to return to normal playback mode or press "**STOP**" button to stop tape movement.

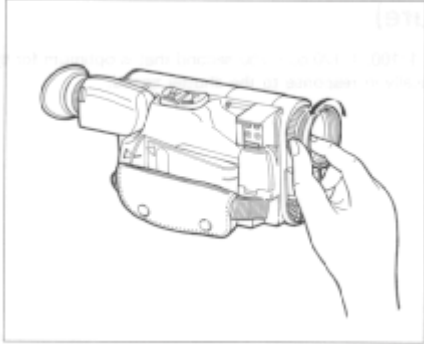
**NOTES:**

- There will be some noise (interference) in the forward or reverse search pictures while visually scanning.

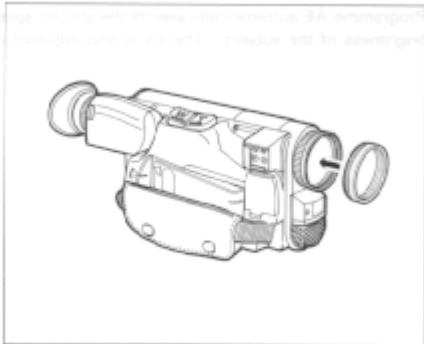


ATTACHING THE TELE OR WIDE CONVERTER

1. To remove the lens hood, turn it counterclockwise.



2. Remove both caps of the tele or wide converter.
3. Screw the lens into the threads on the front of video camera/recorder lens assembly.



CAMERA/RECORDER TO VCR DUBBING

If you wish to exchange or copy some of your friend's favorite home recordings, the following instructions can be used to connect camera/recorder to VCR for this purpose.

Camera to VCR dubbing hookup Illustration

1. Connect the AV stereo output cord to "**AV IN/OUT**" of your camera/recorder.
2. Connect the other ends to "**AUDIO IN**", "**VIDEO IN**" of your VCR as shown in diagram above.

NOTE: If your VCR has a single (mono) audio input, connect either the left or right audio plug to the audio input on the VCR.

3. Play the tape on the camera/recorder and record it on the VCR.

NOTE: If you connect the "**VHF OUT TO TV**" connector of VCR to the "**TV ANT**" connector, as illustrated and set "**VCR/TV**" selector of the VCR to "**VCR**" mode, the picture being dubbed by VCR can be monitored.

FLYING ERASE HEAD

FLYING ERASE HEAD

A rotating erase head which eliminates glitches and rainbow noise that occurs at the joints between recorded segments.

PROGRAMME AE (Auto Exposure)

Programme AE automatically selects the shutter speed 1/60, 1/100, 1/120 or 1/250 second that is optimum for the brightness of the subject. The iris is also adjusted automatically in response to the shutter speed.

SYNCHRO EDIT

Synchro edit allows your camera/recorder to control a compatible VCR (one that has a camera pause jack) while tapes are being copied from the camera/recorder to the VCR. This is convenient when you want to record only selected segments from a previously recorded tape.

Synchro edit hookup Illustration

1. Connect your camera/recorder to a compatible VCR as shown above. An optional synchro edit cord is required

NOTE: If your VCR has a single (mono) audio input, connect either the left or right audio plug to audio input on the VCR.

2. Insert the recorded tape into the camera/recorder.
3. Insert the blank tape into the recording VCR.
4. Press "**PLAY**" button on the camera/recorder and then press "**PAUSE**" button where you want to copy.
5. Press "**RECORD**" button on the VCR. The VCR automatically enters record/pause mode.

NOTE: If the VCR begins to record instead of pausing, you will need to change the position of the switch on the synchro edit cord. Stop the VCR, change the switch, and then press "**RECORD**" button on the VCR again.

6. Pressing **"REVIEW"** button on the camera/recorder puts the camera/recorder in the preview mode for several seconds and then into the playback mode. The recording VCR starts recording automatically.
7. Pressing **"REW"**, **"F.FWD"**, **"STOP"** or **"PAUSE"** on the camera/recorder automatically put the VCR into the record/pause mode. This allows you to search (forward or backward), fast-forward or rewind the tape in the camera/recorder without disturbing the tape in the VCR.
 - To search forward (or backward), press **"F.FWD"** or **"REW"** button. When you press **"PLAY"** button, the camera/recorder will resume normal playback. To begin copying again, press **"PAUSE"** button and then the **"REVIEW"** button.
 - To fast-forward (or rewind) the tape, press **"STOP"** then **"F.FWD"** (or **"REW"**). To begin copying again, press **"STOP"**, then **"PLAY"**, then **"PAUSE"** to pause the camera/recorder, and **"REVIEW"** to begin copying.
8. If you want to stop copying the tape at a certain point, turn on the camera/recorder's memory stop feature, and set the camera/recorder's time counter to **"0:00:00M"** at the point on the tape where you want to stop copying. When the camera/recorder reaches **"0:00:00M"** on the tape, it will automatically stop the VCR from recording, and put the VCR in the record-pause mode.

ATTACHING THE OPTIONAL DC CAMERA LIGHT (VM-CP4)

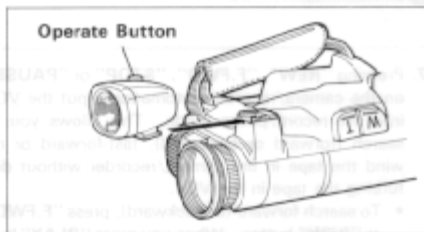
Use the DC camera light if you wish to shoot objects in dark places.

CAUTION: The front and lamp of the DC camera light become very hot during use of the camera light or immediately after use. Be careful that your hand or hair does not touch them.

NOTES:

- When the DC camera light is used, the operation time of the camera/recorder becomes short even if a fully-charged battery pack is attached.
- When the camera/recorder is turned on, a voltage is always generated at the installation terminal of the DC camera light. Never touch this terminal.

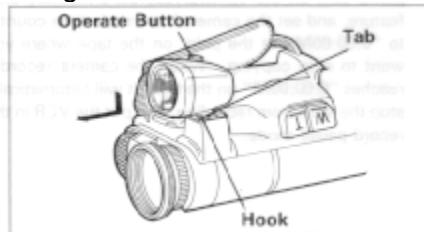
1. Make sure that a fully charged battery pack or AC adapter/charger is attached.
2. Check that the camera/recorder is turned off.
3. Attach the DC camera light to the camera light shoe.



4. Turn on power of the camera/recorder and then press operate button of the DC camera light when required.

NOTE: Turn on the camera light only when you need it because the operation time of the battery pack becomes shorter when the light is on.

5. To remove the camera light, depress the light to release the tab from the hook and then move the light in the direction of the arrow.



NOTES:

- Never touch the terminal of the DC camera light with your hand or short it using metal.
- When the camera light is on, do not allow water to drop on the light.
- When the camera light is on, avoid subjecting the camera light to impacts or sharp vibrations.
- Do not allow the cooling vents to become blocked. Also, do not cover the camera light with paper or other objects, since the air flow will be interrupted, resulting in possible overheating hazard.
- Never use the camera light in the vicinity of explosive or highly inflammable materials.
- When storing the camera light in the camera case following use, be sure to allow it sufficient time to fully cool down before placing it in the case.
- Replace only with VM-CP4L lamp (optional accessory), to reduce the risk of fire.

To replace the lamp of the camera light

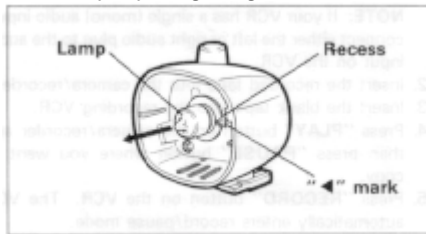
Turn the front case in the direction of the arrow to remove it.



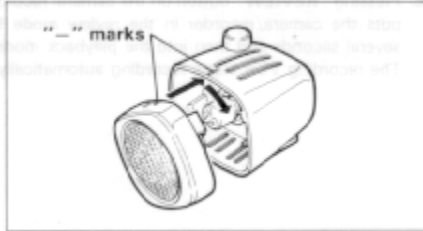
Remove the lamp in the direction of the arrow. Install a new lamp into the camera light

ATTACHING THE OPTIONAL DC CAMERA LIGHT (VM-CP4)

securely by aligning the recess of the lamp and the "◀" mark of the light.



Press the lamp through the hole of the reflective place and re-attach the front case to the camera light by aligning the "-" marks of the front case and camera light, then turn the case in the direction of the arrow.



NOTES:

- Do not touch the lamp directly with your fingers. It may shorten its service life.
- When the lamp is replaced, or when the front case of the camera light is removed, make sure the front case is attached to the camera light properly.

TROUBLESHOOTING

Your camera/recorder is a highly sophisticated instrument. It has been carefully checked and adjusted at the factory under the most rigid quality control and inspection systems. However, should problems develop, check the following points and take necessary corrective measures.

INSERTING OR REMOVING THE CASSETTE	
Symptom	Check Point & Correction
Cassette holder cannot be opened when you slide "EJECT" button	Connect the power source.
Cassette cannot be inserted into cassette compartment.	Load cassette in direction indicated by arrow on cassette.
	Cassette window must be toward outside.


CAMERA RECORDING	
Symptom	Check Point & Correction
Picture does not appear in the viewfinder.	Remove the lens cap.
	Slide the power switch to "CAMERA"
	Disconnect the AV input cable from the camera/recorder.
The camera/recorder cannot go into the recording mode, even when the start/stop button is pressed.	Check the record protect tab on the cassette.
	Make sure that the "FOCUS M" does not appear in the viewfinder. If it is displayed, press "Focus" select button to erase it.
Picture is out of focus.	Auto-Focus does not operate if a special effects filter is attached.

RECORDING TV PROGRAMS OFF THE AIR	
Symptom	Check Point & Correction
The camera/recorder can not be set to the recording mode, even when the start/stop button on the camera/recorder is pressed.	Check the record protect tab on the cassette.
	Set the power switch to "CAMERA" position.
	Connect the camera/recorder and TV (or VCR).

PLAYBACK OF PRE-RECORDED CASSETTE	
Symptom	Check Point & Correction
"PLAY" button cannot be engaged.	Set the power switch to "VIDEO" position.
No picture appears on television screen when "PLAY" button is pressed.	Set the television to the camera/recorder channel (3 or 4) depending upon the selected channel in the RF channel select switch of RF output adapter. (TV is connect to the camera/recorder by using RF output adapter.)
Interference on playback picture.	When you see the playback picture on your TV, adjust fine tuning knob on television set to obtain best picture.
Picture bends at the top of the TV screen.	TV receiver is older type. It needs to be modified to work properly with camera/recorder.
	Tape is damaged, try another cassette.
Color of your TV screen is too bright, too faint or change.	TV set has VIR circuit. Turn off during playback.

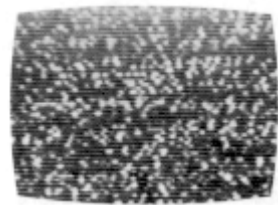
HEAD CLEANING

DEW	
Symptom	Check Point & Correction
“DEW” indication flashes in the viewfinder.	Condensation on the camera/recorder mechanism – wait until the unit has reached normal room temperature and condensation has dried. “DEW” indication will then stop flashing.

BATTERY CONDITION	
Symptom	Check Point & Correction
The "  " indication in the electronic viewfinder	Try another battery or charge the battery.

HEAD CLEANING

- Dirt can accumulate on the video heads after a period of time and may cause the playback picture to become blurred or look like part of the video information is lost. This does not mean that the recorded program has been erased but that head cleaning is required. Use the Maxell 8M-CLT or similar dry type head cleaning tape to clean the video heads.
- If the picture does not clear up after using the head cleaning tape, professional cleaning by a service technician may be necessary.
- Consult your nearest dealer or VCR service center for head cleaning.



PERIODIC MAINTENANCE

The video camera/recorder is a precision electromechanical device which will require periodic maintenance after a period of normal use. We expect that no other maintenance other than head cleaning will be required during the period by most users, unless the video camera/recorder is heavily or seldom used. Normal maintenance is the responsibility of the user, although defective parts are covered during the warranty period. Consult your VCR service center to determine recommendations for normal maintenance based on your location, use patterns and machine age.

SPECIFICATIONS

General	
Power requirements	6V DC
Power consumption	7.2W (When "FOCUS M" is displayed in the viewfinder.)
Dimensions	3-1/8" (W) x 4-1/8" (H) x 9-3/8" (D) 80.5 (W) x 104 (H) x 238 (D) mm
Weight strap's	1.3 lbs (580 g) (without battery pack, lens hood, lens cap hand pad, lithium battery and cassette)
Operating temperature	32°F ~ 104°F
Storage temperature	-4°F ~ 140°F

Video Recorder Section	
Format	8mm
Record/playback system	Four video record/playback heads
Video signal	EIA standard NTSC color
Tape speed	14.3mm/sec
Video input	1.0Vp-p, 75 ohm
Video output	1.0Vp-p, 75 ohm
Audio input	-7.8dBs (316 m Vrms)
Audio output	-7.8dBs (316 m Vrms)
Fast forward/rewind time	Less than 8 minutes with P6-120 cassette

Camera Section	
Scanning	525 lines/60 fields/30 frames
Required minimum illumination	2 lux
Pickup device	1/3" C.C.D.
Lens diameter	34mm

For U.S.A. only

HITACHI
Service Hotline
To locate an authorized
HITACHI service facility
in the continental U.S.A.
DIAL TOLL FREE
7 days a week, 24 hours a day
800 HITACHI
1-800-448-2244

Hitachi Home Electronics (America), Inc.

Hitachi has made every effort to assure you hours of trouble free operation from your unit. However, should you require service, a network of Hitachi Authorized Service Facilities has been established in all 50 states and Puerto Rico. Each facility will provide you with convenient and expedient assistance. Our service "Hotline" operator will direct you to the Hitachi Authorized Service Facility nearest you. Just present proof of purchase and/or delivery receipts to the Hitachi Authorized Service Facility and service will be rendered in accordance with the terms of the limited warranty as stated on your warranty card or operating guide.

Should you have any questions regarding in-warranty service, operation or technical assistance, please contact:

Hitachi Home Electronics (America), Inc.
3890 Steve Reynolds Blvd
Norcross, GA 30093
Tel 404-279-5600

Hitachi Sales Corporation of Hawaii
3219 Koapaka St./Honolulu, HI 96819
Tel 808-836-3621

You're ready to add more excitement to your home videos, and Hitachi's right there with you. With our new line of video accessories, you can go anywhere your imagination takes you. Now that you know how much fun video recording can be, you'll want to add new dimensions to your home videos. With converter lenses, adaptors, extra.

OPTIONAL ACCESSORY chart

If you want to place an order for these items, you can:

1. Call the toll-free number "1-800-HITACHI".
2. Mail to HITACHI with attached form: See page 49.

More Optional Accessories

HOW TO ORDER

U.S.A. only

BY PHONE

To place an order by phone, have your VISA, MASTERCARD, or AMERICAN EXPRESS card ready and call Hitachi's toll-free number anytime: 24 Hrs/day, 7 days a week.

1-800-HITACHI

BY MAIL

To place your order by mail, detach and mail the completed order form with credit card information, money order, or check in U.S. currency (payable to HITACHI HOME ELECTRONICS (AMERICA) INC.) to the following address:

HITACHI HOME ELECTRONICS (AMERICA) INC.

PARTS DIVISION

401 WEST ARTESIA BLVD.

COMPTON, CA 90220
