

RCA

Digital Camcorder User's Guide

Changing Entertainment. Again.



CC9381

Important Information

WARNING

To reduce the risk of fire or electric shock, do not expose this product or AC charger to rain or moisture.

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

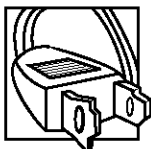
To reduce the risk of electric shock, do not remove cover (or back). No user serviceable parts inside. Refer servicing to qualified service personnel.



This symbol indicates "dangerous voltage" inside the product that presents a risk of electric shock or personal injury.



This symbol indicates important instructions accompanying the product.



CAUTION: To prevent electric shock, match wide blade of plug to wide slot, fully insert.

ATTENTION: Pour éviter les chocs électriques, introduire la lame la plus large de la fiche dans la borne correspondante de la prise et pousser jusqu'au fond.

To reduce risk of injury, charge only rechargeable batteries recommended by the manufacturer for this product. Other types of batteries may burst causing damage and personal injury.

CAUTION

If the AC adapter is misplaced or needs to be replaced, obtain the same type of adapter from an RCA dealer.

FCC Regulations state that unauthorized changes or modifications to this equipment may void the user's authority to operate it.

Product Registration

Please fill out the product registration card and return it immediately. Returning this card allows us to contact you if needed.

Keep your sales receipt for proof of purchase to obtain warranty parts and service and attach it here. Record the serial number and model numbers located on the bottom of the camcorder.

Model No. _____

Serial No. _____

Purchase Date. _____

Purchased From. _____

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Connections & Setup

Chapter Overview:

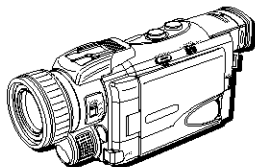
- Parts Checklist
- Buttons and Controls
- Getting Started
- Powering the Camcorder
- Using the Shoulder Strap
- Attaching the Lens Hood
- Setting the Date and Time
- Setting the Tape Recording Speed

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Parts Checklist

Make sure the box includes the items shown here:



Camcorder



*Battery pack
Part # 252762*



*AC adapter/
battery charger
Part # 252767*



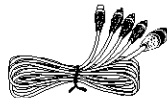
*Power cord for
adapter/charger
Part # 254598*



*CR2025 type
lithium cell*



*Power connector
Part # 254335*



*Audio/ Video/
S-video cable
Part # 254336*



*Shoulder strap
Part # 254338*



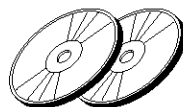
*Lens hood
Part # 254415*



*Lens Cap
Part #254233*



*Zoom microphone
Part # 254414*



*Imaging software and
driver CD-ROMs (2)*



*16MB MultiMediaCard
Part # 254416*



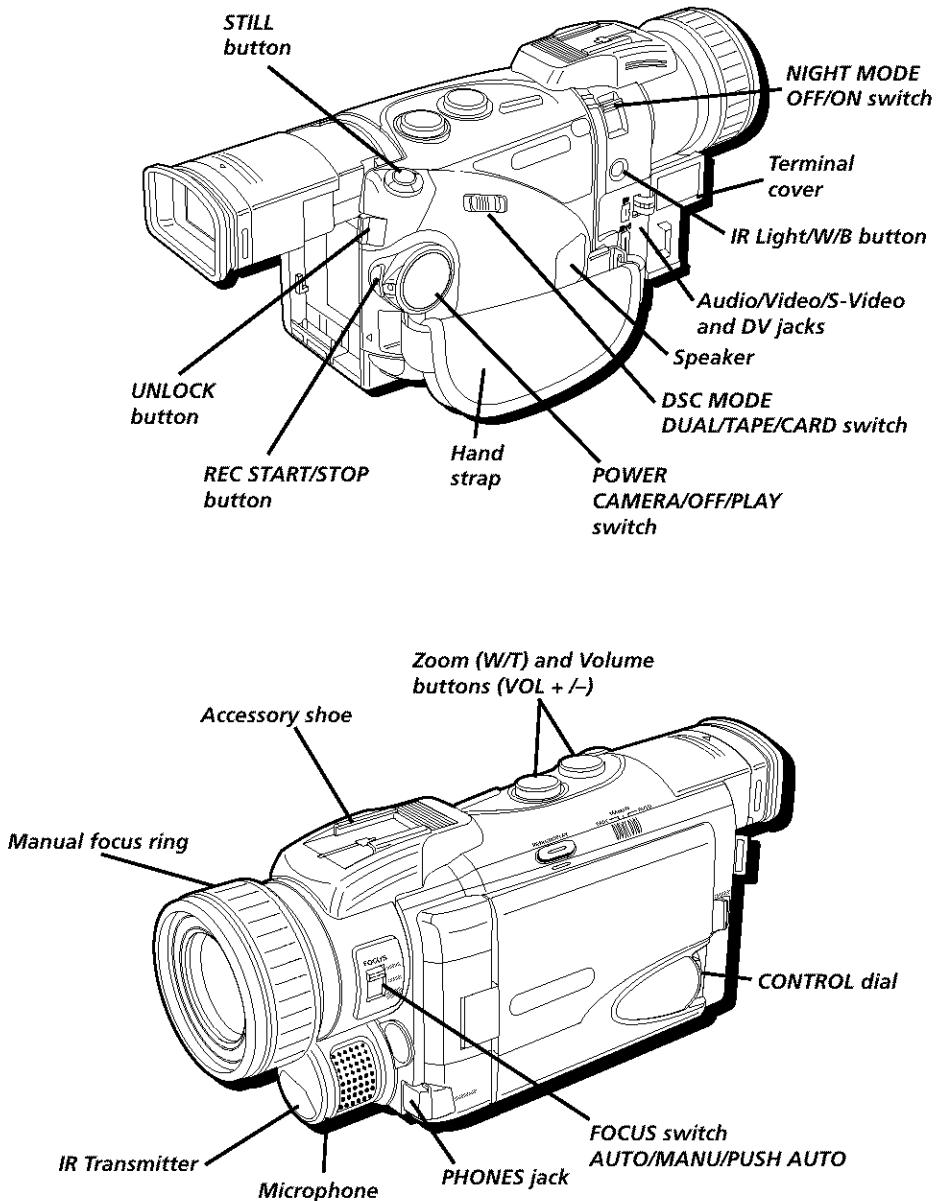
*Card Reader/Writer
Part # 254417*



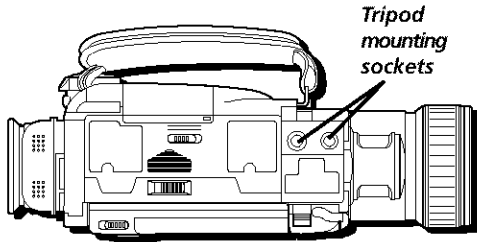
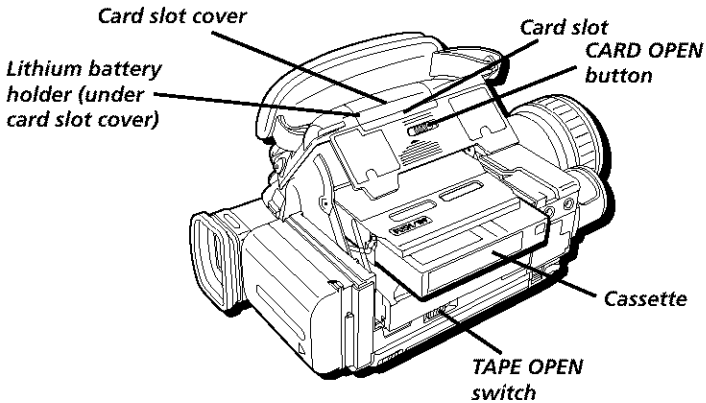
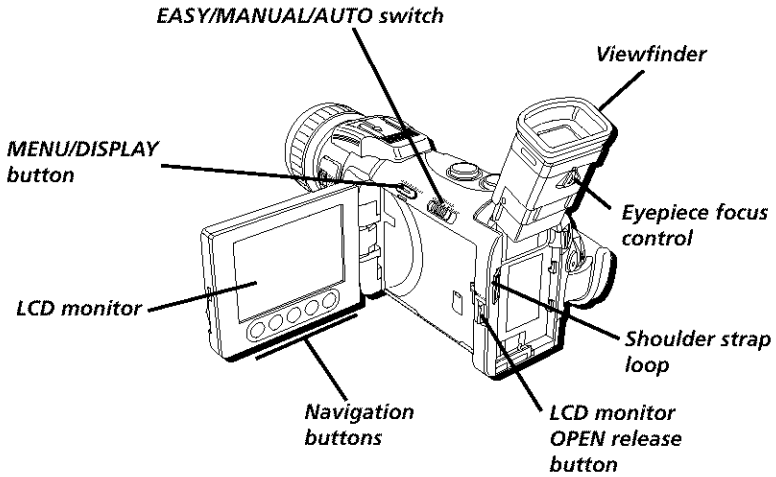
Ferrite Cores

Caution: Only use the power supply provided with this unit. Using other power supplies may damage the unit.

Buttons and Controls



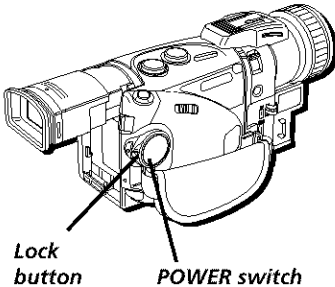
Connections & Setup



Camcorder Bottom View

Using Some Basic Controls

Some of the camcorder's basic controls are described here.



POWER CAMERA-OFF-PLAY Switch

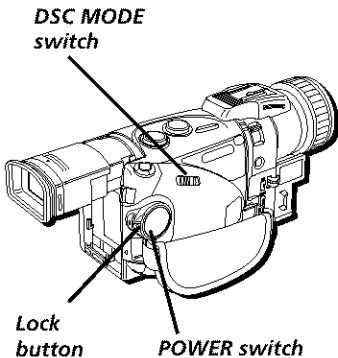
To turn the power on, hold down the Lock button and set the POWER switch to CAMERA or PLAY.

To turn the power off, set the POWER switch to OFF without pressing the Lock button.

Selecting the Camcorder Mode

This camcorder can be used as a video camera for recording and playing back video on tape or as a digital still camera that records and plays back still images on a memory card.

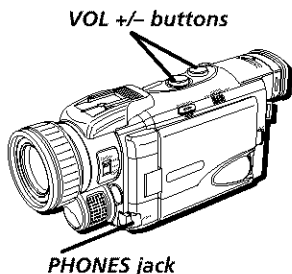
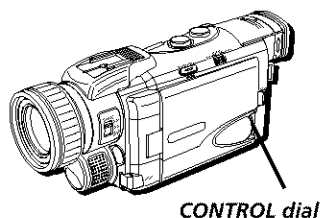
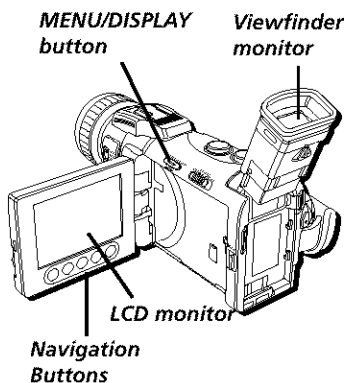
The DSC MODE (TAPE/DUAL/CARD) switch along with the POWER (CAMERA/PLAY/OFF) switch tells the camcorder what you want it to do.



- **DSC MODE switch in TAPE and POWER switch in CAMERA:** Use to record moving video and still images on a tape.
- **DSC MODE switch in DUAL and POWER switch in CAMERA:** Use this mode to record both moving video and still images on the tape and still digital pictures on the memory card.
- **DSC MODE switch in CARD and POWER switch in CAMERA:** Use this mode to record still digital pictures on the memory card.
- **DSC MODE switch in TAPE (or DUAL) and POWER switch in PLAY:** Use this mode to playback moving video on a tape.
- **DSC MODE switch in CARD and POWER switch in PLAY:** Use this mode for playback of still images recorded on the memory card.

Caution:

- *Do not switch the DSC MODE switch during playback or recording, as this may cause damage to the tape or card.*



Open the jack cover, and connect stereo earphones with a 3.5 mm plug to the PHONES jack.

MENU/DISPLAY Button

The MENU/DISPLAY button is used to turn the menu screens and on-screen indicators on and off in the viewfinder and LCD monitor.

- Press the MENU/DISPLAY button repeatedly to turn the menus and displays on or off.

CONTROL Dial

The CONTROL dial is used to adjust the settings on the mode and menu screens in the viewfinder and/or LCD monitor. These settings can also be adjusted using the navigation buttons on the LCD monitor.

The instructions for adjusting mode and menu settings in this manual use the navigation buttons.

- To adjust the menu settings with the CONTROL dial, follow the rules below. This method lets you adjust settings using only the viewfinder.
 1. Rotate the CONTROL dial to highlight the desired item.
 2. Press the CONTROL dial in to select the highlighted item.

Using Optional Stereo Earphones

You can monitor the sound using optional stereo earphones during recording or playing back tapes.

- Before connecting stereo earphones, turn the camcorder volume down to the lowest setting.
- The built-in speaker automatically turns off when stereo earphones are connected to the PHONES jack.
- When recording on a tape, you cannot adjust the volume with the VOL +/- buttons.

Getting Started

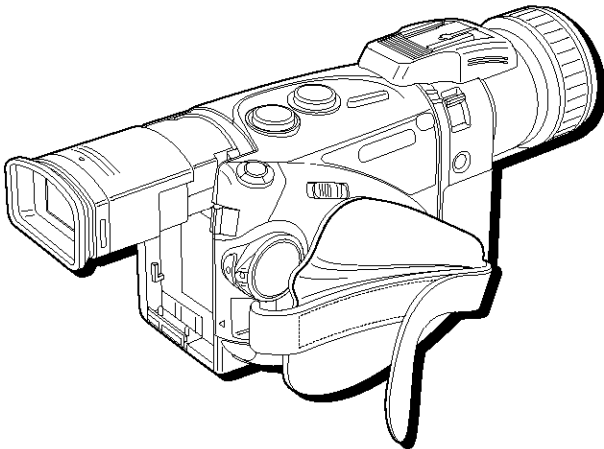
This section describes the basics on how to set up your camcorder to record for the first time. Refer to the other sections for detailed operation and feature options.

Unpack the Camcorder and Accessories

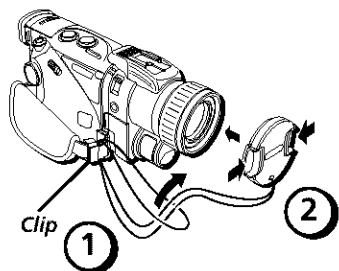
- The items shown in *Parts Checklist* are packed with the camcorder. If any pieces are missing or appear damaged, contact your dealer immediately.
- Remove the plastic film that covers the front and side logos on the camcorder. Use your fingernail, not anything sharp, to remove.
- Save all packing materials and box in case the camcorder ever needs to be shipped or stored.

Adjust the Hand Strap

1. Lift the flap on the hand strap and separate the Velcro strip.
2. Insert your hand so your fingers can comfortably reach the buttons.
3. Adjust the strap to fit snugly.
4. Refasten the strap, and fold the flap back down.



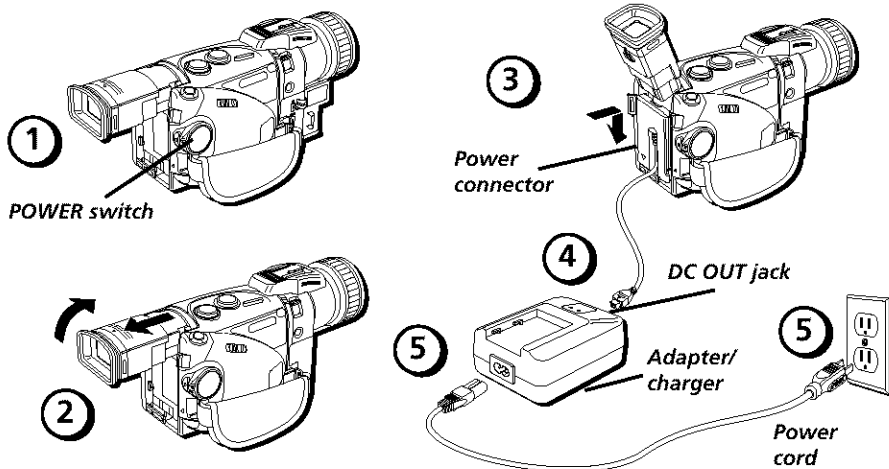
Attach the Lens Cap to the Camcorder



1. To prevent losing the lens cap, attach the string to the camcorder *as shown* and attach the lens cap to the clip on the handstrap during recording.
2. When you are finished recording, press in the sides of the lens cap and place it over the lens of the camcorder.

Attach a Power Supply

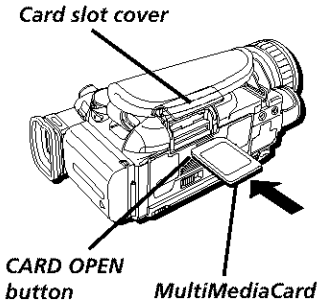
Since the battery must be charged before it can be used the first time, you need to use an AC outlet to power the camcorder.



1. Place the POWER switch to the OFF position.
2. Pull out the viewfinder completely and lift up.
3. Align the reference mark on the power connector with the mark on the camcorder. Hold the top of the power connector flush against the camcorder, and press the bottom of the power connector in and slide it down until it locks into place.
4. Connect the power connector's small plug with the arrow facing up into the DC OUT jack on the adapter/charger.
5. Connect the power cord to the adapter/charger, and insert the power cord's plug into a working AC outlet.

Insert and Remove a Memory Card

This camcorder uses only MultiMediaCards (one supplied) or SD memory cards (commercially available) for storage of still images.



Insert a Card

1. Place the POWER switch to the OFF position.
2. Hold the camcorder *as shown*, and slide the CARD OPEN button to open the card slot cover.
3. Insert a card into the slot with the label facing up and the notched corner facing the lens. Fully insert the card into the slot.
4. Close the card slot cover.

Remove a Card

1. Perform steps 1 and 2 above.
2. Press the center of the card edge in to release the card.
3. Pull the card straight out of the slot.

Caution

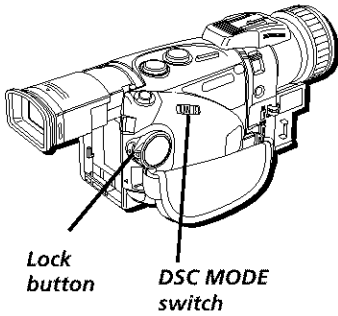
- *Do not remove the card from the camcorder while data is being recorded on the card. This may result in deletion of images or damage to the card.*

SD Memory and MultiMediaCards

SD memory cards and MultiMediaCards are used for recording still images with this camcorder. Other type cards will not work in this camcorder.

These images can then be transferred to a computer using the supplied reader/writer (*see page 130*).

For details on MultiMedia and SD cards, see pages 144-146.



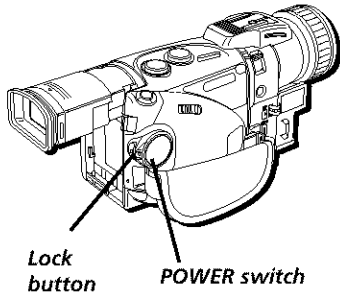
Set the DSC MODE (DUAL/TAPE/ CARD) Switch to DUAL

The camcorder operates as both a video camera for recording on tape and a digital camera for recording still pictures.

Caution: Do not change the DSC MODE switch during recording or playback as it may cause damage to your tape or memory card.

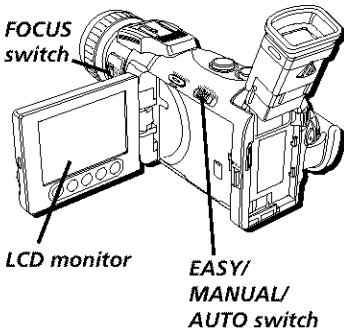
- Set the DSC MODE switch to DUAL to record both video on tape and still pictures on the MultiMediaCard.
- Set the DSC MODE switch to TAPE to record video on tape.

Turn on Camcorder and Set to Full-Auto Mode



1. Press in the Lock button and set the POWER switch to the CAMERA position. The camcorder enters the record-standby mode.

Note: The camcorder automatically turns off to save battery power if you leave it in record-standby mode for more than five minutes. To turn it back on, set the POWER switch to OFF. Press in the Lock button and set the POWER switch to CAMERA.



2. Set the EASY/MANUAL/AUTO switch to AUTO to have the camcorder automatically select the best settings for your recording. *AUTO* appears in the viewfinder or in the LCD monitor.

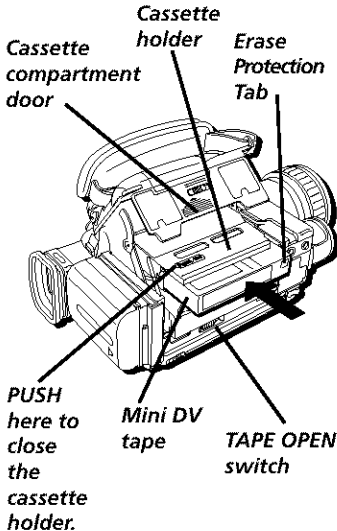
Notes:

- Any manual setting is cancelled.
 - Details about the User Modes using the EASY/MANUAL/AUTO switch are on page 35.
3. Set the FOCUS switch to AUTO to have the camcorder automatically focus for you.

Mini DV NTSC

Mini DV Cassettes

This camcorder is designed to work exclusively with digital video cassettes. Only cassettes marked with a Mini DV logo can be used with this unit. Also keep in mind that this camcorder is not compatible with other digital media tape formats.



Insert a Cassette Tape

1. Make sure the camcorder is connected to a power supply.
2. Press in the Lock button and set the POWER switch to the CAMERA position.
3. Hold the camcorder *as shown*. Slide and hold the TAPE OPEN switch in the direction of the arrow and open the cassette compartment door completely.

Important: The cassette holder extends and opens automatically. Do not open or close the cassette compartment door while the holder is opening.

Be careful not to touch the inside of the cassette holder as you may hurt yourself.

4. Fully insert a Mini DV tape with the tape window facing up and the Erase Protection tab facing out.

Note: Make sure the Erase Protection tab is in the position that allows recording. If not, slide the tab. Some tapes have removable tabs. If the tab has been removed, cover the hole with adhesive tape.

5. Gently push on the area marked PUSH until the cassette holder locks into place.

Important: The cassette holder retracts automatically. Wait until it is completely retracted before closing the cassette holder cover.

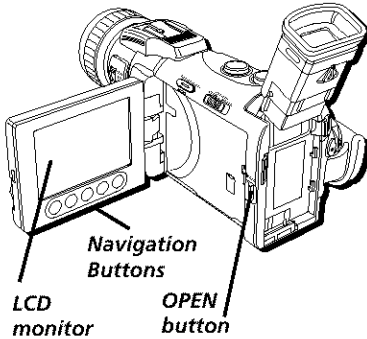
6. To close the cassette compartment door, press the center of the door until it locks into place.

Important: If the battery is low, you may not be able to close the cassette holder. Do not apply force. Replace the battery with a fully charged one or connect the power supply.

Notes:

- You can't open the cassette tape holder unless a power supply is attached.
- The cassette tape holder can't be opened while the camcorder is in the record mode.

Use the LCD Monitor or Viewfinder to See What's Recording



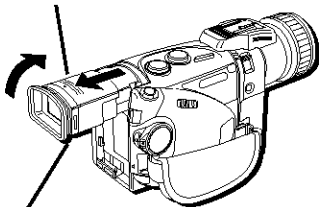
Using the LCD Monitor

1. Remove the lens cap.
2. Slide the OPEN button in the direction of the arrow and open the LCD monitor 90°.
3. You can tilt the monitor up to 180° for convenient viewing while recording.
4. The brightness of the LCD monitor can be adjusted using the on-screen menus (see page 33).

Notes:

- Adjusting the monitor brightness does not affect the recorded image on the tape.
- When the monitor is open, the viewfinder automatically turns off. When the monitor is closed, the viewfinder automatically turns on.
- If the vertical rotation of the monitor is between 135° and 180° when in one of the CAMERA modes, both the monitor and viewfinder are on.

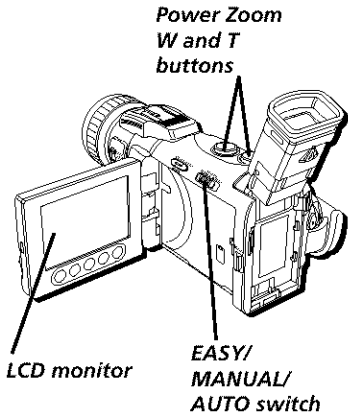
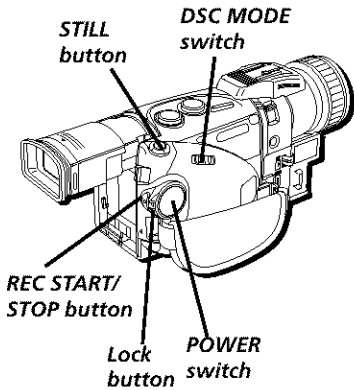
Viewfinder



Eyepiece focus control on bottom of viewfinder

Using the Viewfinder

1. Remove the lens cap.
 2. Close the monitor.
- Note:** If the monitor is open, the viewfinder turns off.
3. Pull the viewfinder completely out, and lift it up.
 4. Adjust the viewfinder to a comfortable viewing position.
 5. Slide the eyepiece focus control to adjust the focus of the viewfinder for your vision.



Start Recording

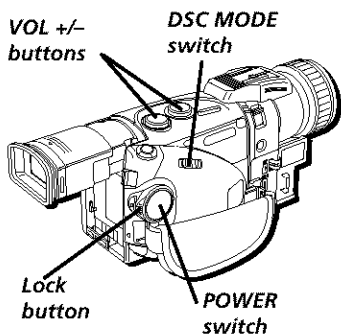
1. Remove the lens cap, and open the LCD monitor.
2. Make sure you have inserted a cassette for video recording and/or a memory card for recording still pictures.
3. Place the EASY/MANUAL/AUTO switch to the AUTO position.
4. Place the FOCUS switch to the AUTO position.
5. Place the DSC MODE switch to the DUAL position.
6. Press in the Lock button and set the POWER switch to the CAMERA position.
7. Record video on tape or a still picture on the memory card.

Record Video on the Tape

- Press and release the REC START/STOP button to start and stop recording on the tape.
- *REC* appears in the viewfinder or LCD monitor while the camcorder is recording (but won't be recorded on the tape).
- When you are not recording, the camcorder enters the record-pause mode and *PAUSE* appears in the viewfinder or on the LCD monitor.

Record a Still Picture on the Memory Card

- Place the camcorder in record-pause mode (*PAUSE* appears in the viewfinder or on the LCD monitor).
- Use the power Zoom W/T buttons to frame your subject.
- Press the STILL button to record a still picture on the memory card. *RECORDING TO MEMORY CARD* appears in the viewfinder or on the LCD monitor.

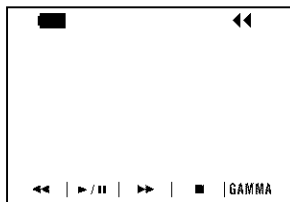


Play Your Taped Recording

1. Set the DSC MODE switch to TAPE.
2. Press in the Lock button and set the POWER switch to the PLAY position.
3. Press ◀◀ or ▶▶ on the LCD monitor to rewind or fast forward the tape to the desired point.
4. Press ▶/|| to begin playback.
5. Press ■ when finished playing the tape.

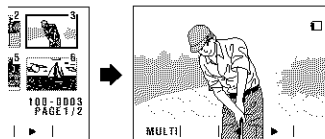
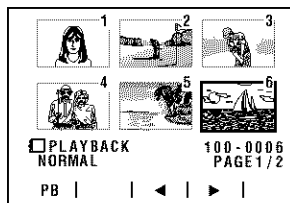
Note: Sound will play back if the LCD monitor is open or closed. To adjust the volume, use the Zoom WIT buttons (also labeled VOL +/-).

- More information about using the LCD monitor and viewfinder can be found on pages 32-34.



View Your Still Pictures

1. Set the DSC MODE switch to CARD.
2. Press in the Lock button and set the POWER switch to the PLAY position.
3. If the image you want to see does not appear on the monitor, press ◀ or ▶ to search through the thumbnail images.
4. When you see the image you want to display highlighted, press PB to display it full screen.



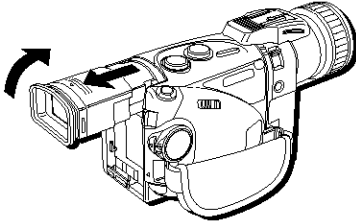
Turn off the Camcorder



1. Set the POWER switch to OFF.
2. Close the LCD monitor and replace the lens cap.

Powering the Camcorder

You can power your camcorder with a battery or the AC adapter/charger. The battery must be charged *as described on the next page* before it can be used to power the camcorder.

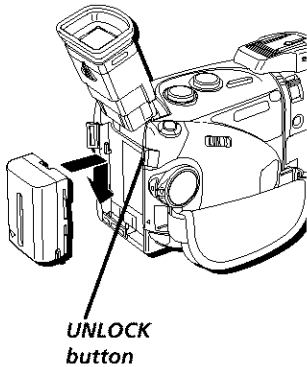
Attaching the Battery to the Camcorder



1. Make sure the POWER switch is set to OFF.
2. Pull the viewfinder all the way out and lift it up.
3. Align the  mark on the side of the battery to the  on the camcorder.
4. Press the battery in and slide it down until it locks into place.

Cautions:

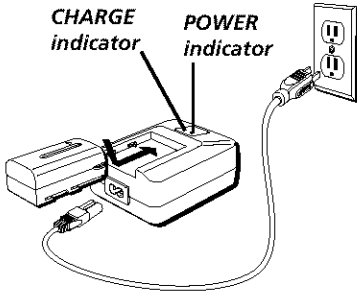
- *Always stop recording or playback and place POWER switch in OFF before attaching or removing the battery. Removing the battery while the camcorder is recording or playing back may cause damage to the tape or card.*
- *Remove the battery if the camcorder will not be used for a long period of time.*
- *Use only the recommended batteries for this camcorder. Use of other batteries may present a risk of fire or explosion.*



Removing the Battery from the Camcorder

1. Make sure the POWER switch is set to OFF.
2. Pull the viewfinder all the way out and lift it up.
3. Press and hold the UNLOCK button in the direction of the arrow, slide the battery up, and remove it.

Charging the Battery



1. Remove the power connector's cable from the AC adapter/charger, if attached.
2. Connect the supplied power cord to the AC power socket on the AC adapter/charger, and insert the AC plug into a working AC outlet. The POWER indicator lights.
3. Align the reference mark on the battery with the mark on the adapter/charger. Slide the battery into the groove until it locks into place. The CHARGE indicator lights.
4. The CHARGE indicator will turn off when the battery is fully charged. Unplug the power supply from the AC outlet.
5. Slide the battery pack out of the adapter charger and remove it.

Notes:

- If a protective cap is on the battery, remove it before use or charging.
- Charge the battery in temperatures between 50° and 90° Fahrenheit (10-35° Celsius).
- Charging times are based on a fully discharged battery and vary depending on temperature and battery conditions.
- If you store a partially charged battery for a long period of time, its performance is reduced.
- Charging and discharging isn't possible if the wrong type of battery is used.
- If the battery operation time remains extremely short even after having been fully charged, the battery may be worn out and needs to be replaced.

Tip

Before extended use, it is recommended that you prepare enough battery packs to cover 3 times the planned shooting time.

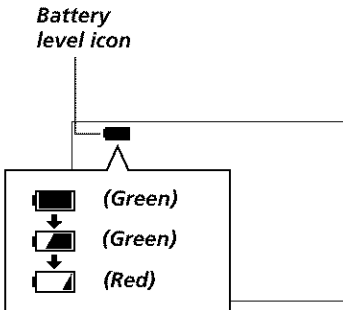
Approximate Charging Time

Battery	Charging Time
252762	approx. 100 min.
252763	approx. 160 min

Approximate Recording Time (in Minutes)

Battery	Viewfinder On	LCD Monitor On
252762	110	90
252763	220	180

Note: Recording time is reduced significantly when you use the zoom or record-standby modes or LCD monitor repeatedly.



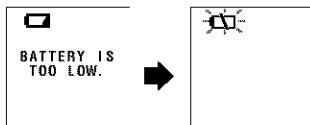
Battery Level Icon

The battery level icon appears in the viewfinder or LCD monitor and shows the amount of power left in the rechargeable battery. While using the LCD monitor, press the MENU/DISPLAY button to display the icon.

When the battery power becomes very low, a warning indicator will appear. Replace the battery pack.

Notes:

- The battery level icon is not recorded on the tape.
- The remaining battery indicator is only an approximation of actual time left.
- Use of the Zoom WIT buttons during low power conditions may cause the camcorder to suddenly shut off.

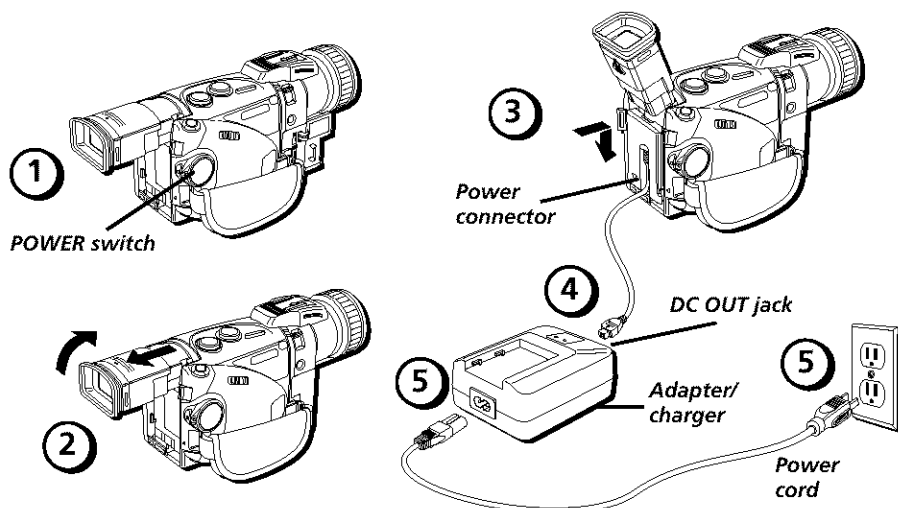


Battery Care and Storage

- After repeated charging and use, battery life gradually decreases. When operation time is too short to be useful, the battery should be replaced.
- If the battery pack becomes too hot, remove it from the camcorder and let it cool down.
- Do not short the battery's terminals.
- Do not attempt to disassemble or modify the battery. There are no user-serviceable parts inside.
- Use the battery only with specified adapter/chargers and camcorders.
- Throwing the battery into a fire or exposing it to excessive heat – over 149°F (65°C) could be hazardous.

Using the Power Supply

The power supply attaches to the camcorder and lets you power it directly from standard household power. The power supply operates on 110-240 volts, 50/60 Hz.



1. Place the POWER switch to the OFF position.
2. Pull out the viewfinder completely and lift up.
3. Align the reference mark on the power connector with the mark on the camcorder. Hold the top of the power connector flush against the camcorder, and press the bottom of the power connector in and slide it down until it locks into place.
4. Connect the power connector's small plug with the arrow facing up into the DC OUT jack on the adapter/charger.
5. Connect the power cord to the adapter/charger, and insert the power cord's plug into a working AC outlet.

Caution: Only use the power supply provided with this unit. Using other power supplies may damage the unit.

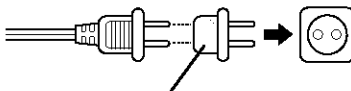
Removing the Power Supply

1. Make sure the POWER switch is set to OFF.
2. Pull the viewfinder all the way out and lift it up.
3. Press and hold the UNLOCK button in the direction of the arrow and remove the power connector.

Caution: Always stop recording or playback and place POWER switch in OFF before attaching or removing the battery. Removing the battery while the camcorder is recording or playing back may cause damage to the tape or card.

Using an Optional Plug Adapter in Foreign Countries

An optional plug adapter might be required in some countries.

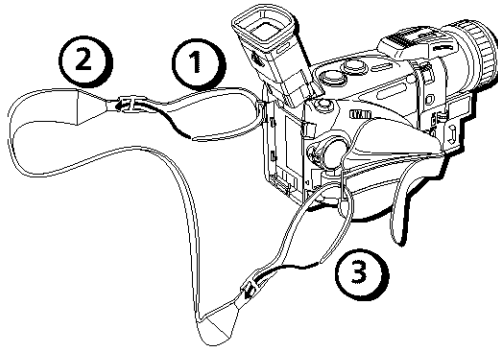


AC Plug Adapter

1. Plug the power supply's plug into the AC plug adapter.
2. Plug the AC plug adapter into the AC outlet.

Using the Shoulder Strap

The camcorder's shoulder strap is designed to let you carry the camcorder from your shoulder and – when ready– bring the camcorder to shooting position in one quick movement.

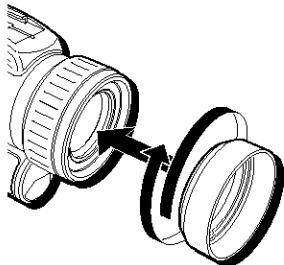


1. Following the illustration, thread the strap through the eyelet.
2. Fold the strap back and thread it through the buckle.
3. Repeat the procedure to attach the other end of the strap to the other eyelet located under the hand strap. Make sure the strap is not twisted.

Caution: When carrying the camcorder with the shoulder strap, you should close the LCD monitor and rotate the viewfinder down and slide it in. This helps prevent possible damage to the monitor or viewfinder from bumping against your body as you move. Make sure the shoulder strap is firmly attached before using it to carry the camcorder.

Attaching the Lens Hood

When recording outdoors on a sunny day or in a location with bright lighting, attach the supplied lens hood to the camcorder.



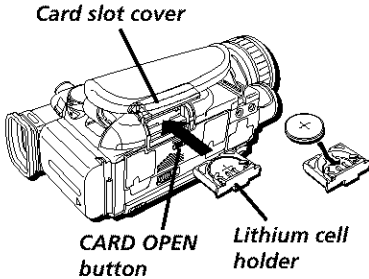
- Turn the lens hood in the direction of the arrow to attach it.
- To remove the lens hood, turn it in the opposite direction.

Notes:

- *The lens cap can still be attached on top of the lens hood.*
- *Filters and other accessories cannot be attached on top of the lens hood.*

Install the Clock Lithium Cell

The supplied lithium cell must be installed for the camcorder to remember the date and time settings.



1. Slide the CARD OPEN button in the direction of the arrow to open the card slot cover.
2. Pull out the cell holder using the tip of a ballpoint pen or other pointed object.
3. Insert the lithium cell into the cell holder with the + side of the cell facing the + side of the holder.
4. Insert the cell holder back into the compartment.
5. Close the card slot cover.

To Remove the Clock Lithium Cell

Perform steps 1 and 2 above, and lift out the lithium cell from the cell holder.

Notes:

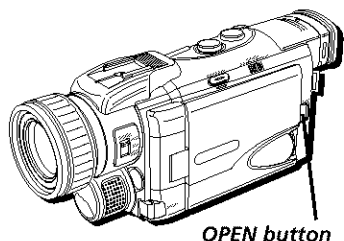
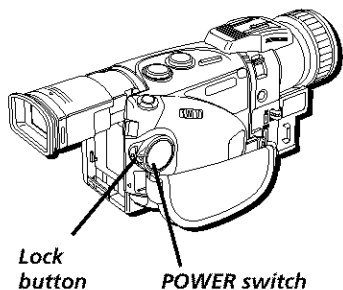
- Set the date and time after inserting a lithium cell. Not setting the date and time causes extra wear on the lithium cell.
- Replace the cell with a new CR2025 lithium cell when the time display starts to fall behind the correct time.

Important: Lithium cell battery. Replace only with 3-volt lithium cell-such as CR2025. Use of other cell presents a risk of fire or explosion. Must be disposed of properly. Never handle punctured or leaking cell. May cause burns or personal injury.

Keep out of the hands of children. Can cause death or injury if swallowed. If swallowed, consult a physician immediately for emergency treatment.

The Lithium cell used in this device may explode resulting in a fire or chemical burn if mistreated. Do not recharge, disassemble, heat above 212°F (100°C), or incinerate.


Never use metallic tweezers to hold the cell, and never short circuit the + and - sides of the cell.



Set the Area, Date and Time

The date and time must be set before it can be displayed. Set the clock for your standard time and use the daylight saving feature *described on page 28* to set daylight savings time.

Date and time information is always recorded. The display can be turned on or off during playback or recording.

1. Press in the Lock button and set the POWER switch to CAMERA.
2. Press the LCD monitor OPEN button and open the LCD monitor.
3. Press the MENU/DISPLAY button repeatedly to display the menu screen.
4. Press ▼ or ▲ to select  and then press SET to display the CLOCK SET menu.

Note: If the date and time have been set, the MANUAL SET menu appears.

5. Press ▼ or ▲ to select AREA and then press SET.
6. Press ▼ or ▲ until your area appears (for example, 20 NEW YORK if you live in New York), and then press SET

Note:

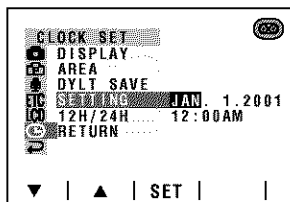
- See Time Zone Chart and Area Table on pages 106-107 for the area number and name of the representative city for your time zone.

7. Press ▼ or ▲ to select SETTING and then press SET.
8. Press ▼ or ▲ until the desired month appears, and then press SET.

Repeat to set the day, year, hour, and minute.

Repeat the above steps to change a number.

9. Press MENU/DISPLAY repeatedly to turn off the menu screens.



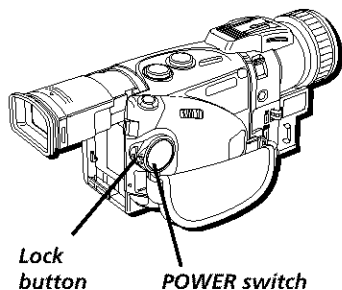
Changing to the 24-hour Time Mode



1. After step 8 *on the previous page*, press ▼ or ▲ to select *12H/24H*, and then press *SET*.
2. Press ▼ or ▲ to select *24H*, and then press *SET*.
3. Press the MENU/DISPLAY button repeatedly to turn off the menu screen.


Notes:

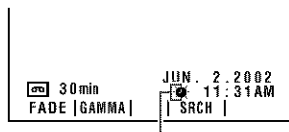
- *The date and time are recorded on the tape or card. Press the MENU/DISPLAY button to turn the time display on or off.*
- *The menu screen automatically turns off if no settings are made within five minutes.*



Set Daylight Saving Time

If your area observes daylight saving time, turn on this feature so the camcorder can automatically set its clock for daylight saving time.

1. Press in the Lock button and set the POWER switch to CAMERA.
2. Press the LCD monitor OPEN button and open the LCD monitor.
3. Press the MENU/DISPLAY button repeatedly to display the menu screen.
4. Press ▼ or ▲ to select  and then press *SET* to display the *CLOCK SET* menu.
5. Press ▼ or ▲ to select *DYLT SAVE*, and then press *SET*.
6. Press ▼ or ▲ to select *ON* and then press *SET*.
 - The time automatically changes to daylight savings time.
 - The daylight savings indicator appears with the time display.
7. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.



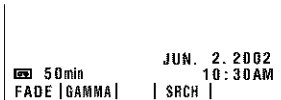
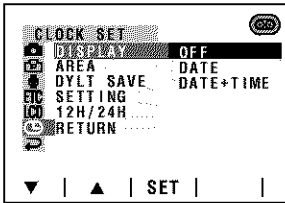
Daylight Savings indicator

To Reset to Standard Time

Perform steps 1 through 6 above, and select *DYLT SAVE OFF*.

Displaying the Date and Time of Recording

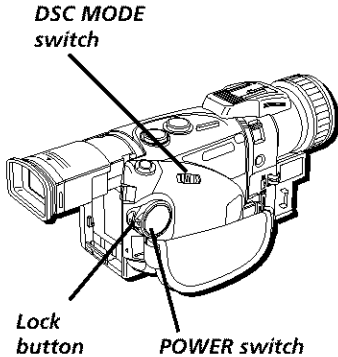
Follow the procedure below to display the date or date and time. You can display the date and time during both recording and playback. The clock cell must be installed and the time and date set before you can display and record them (see pages 25-28).



1. Follow steps 1 through 4 under *Set Daylight Saving Time*.
2. Press ▼ or ▲ to select *DISPLAY* and press *SET*.
3. Press ▼ or ▲ to select *DATE*, *DATE+TIME*, or *OFF* and press *SET*.
 - Select *DATE* to display and record the date.
 - Select *DATE+TIME* to display and record the date and time.
 - Select *OFF* to turn off the date and time display. It will not be recorded.
4. Press the MENU/DISPLAY button repeatedly until the menu screen turns off. The date or date and time are displayed.


Notes:

- Before recording, make sure that the date and time have been correctly set (see pages 26-28). If they have not been set, the display will be left blank when playing back the recording. The display will also be left blank for unrecorded or damaged portions of the tape.
- In TAPE-PLAY mode, the current date and time are displayed when the tape is not being played back.



Set the Tape Recording Speed

You can select the LP tape recording speed and record for approximately 50 percent more recording time with the same picture quality as the SP recording speed.

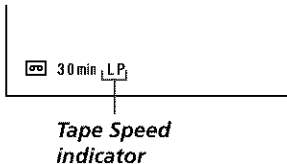
1. Place the DSC MODE switch to the DUAL or TAPE position.
2. Press in the Lock button and set the POWER switch to CAMERA.
3. Press the LCD monitor OPEN button and open the LCD monitor.
4. Press the MENU/DISPLAY button repeatedly to display the menu screen.
5. Press ▼ or ▲ to select , and then press SET.
6. Press ▼ or ▲ to select TAPE SPEED, and then press SET.
7. Press ▼ or ▲ to select LP and then press SET.



Notes:

- To record in LP mode, be sure to use a Mini DV cassette labeled for use with LP recording speed.
- Audio dubbing is not possible with LP recorded tapes.

TAPE SPEED LP



Using the Monitors

Chapter Overview:

- Seeing What You Are Recording
- Selecting a User Mode
- Using the Menu Screens
- On-Screen Icons

Changing Entertainment. Again.

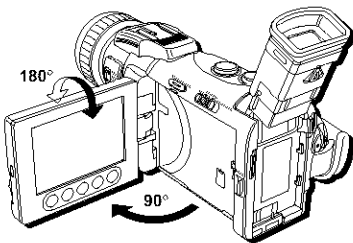


Seeing What You Are Recording

To see what is recording, use either the LCD monitor or the viewfinder monitor. When the LCD monitor is open, the viewfinder turns off. When you close the LCD monitor, the viewfinder turns on.

Using the LCD Monitor

The camcorder's LCD monitor is a miniature color screen that you can use for recording or playback.



1. Open the LCD monitor. The viewfinder turns off.
2. For convenient viewing, the LCD monitor can be tilted once it is open 90° from the camcorder. Tilt the monitor forward up 180° or down up to 90°.

- From a high angle (such as over a crowd)—tilt the monitor down to record.
- From a low angle (such as when kneeling)—tilt the monitor up to record.

Cautions

Never force the LCD monitor to rotate completely around. This could damage both the monitor and/or the camcorder.

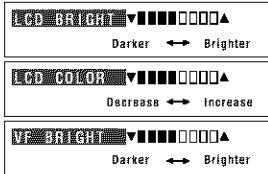
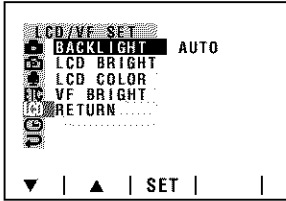
When carrying the unit with the shoulder strap, close the monitor to prevent possible damage to it.

When the *LCD COLOR* menu item is adjusted, the picture on the LCD monitor may differ from the picture actually recorded. Do not change the color setting unless it is necessary. This adjustment only affects the screen picture, not the recorded image.

Adjusting the Screen Picture

If the picture on the screen is difficult to see due to ambient lighting or other factors, adjust the screen picture settings.

1. Open the monitor and press the MENU/DISPLAY button repeatedly to display the menu screen.
2. Press ▼ or ▲ to select **LCD** and then press *SET* to display the *LCD/VF SET* menu.
3. Press ▼ or ▲ to select *LCD BRIGHT*, *LCD COLOR*, or *VF BRIGHT*, and then press *SET*.



LCD BRIGHT: Adjusts the brightness of the picture on the LCD monitor.

LCD COLOR: Adjusts the color density of the picture on the LCD monitor.

VF BRIGHT: Adjusts the brightness of the picture in the viewfinder.

Note: Use the CONTROL dial to adjust VF BRIGHT while looking through the viewfinder.

4. Press ▼ or ▲ to adjust the item to the desired setting and press SET.
5. Repeatedly press the MENU/DISPLAY button until the menu screens turn off.

Note: Recording outdoors on bright, sunny days can make the LCD monitor hard to see. Use the viewfinder instead.

Adjusting the Screen Backlight

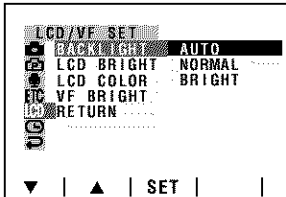
1. Open the monitor and repeatedly press the MENU/DISPLAY button to display the menu screen.
2. Press ▼ or ▲ to select LCD and press SET to display the LCD/VF SET menu.
3. Press ▼ or ▲ to select BACKLIGHT and press SET.
4. Press ▼ or ▲ to select AUTO, NORMAL, or BRIGHT, and press SET.

AUTO: The camcorder automatically switches between NORMAL and BRIGHT depending upon light conditions. This mode is only available in the CAMERA modes.

NORMAL: For use indoors or under moderate lighting conditions.

BRIGHT: For use outdoors under strong lighting conditions, such as bright daylight.

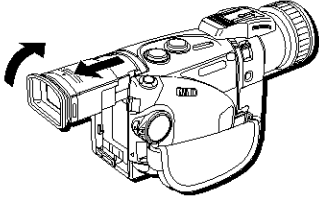
5. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.



Using the Monitors

Using the Viewfinder

The camcorder's viewfinder is a miniature color monitor that displays what the camcorder is recording or playing back. For convenient viewing, rotate the viewfinder up or down.



Opening the viewfinder

1. Pull out the viewfinder completely and lift up.
2. Adjust the viewfinder to a comfortable position.

Cautions:

- Do not try to raise the viewfinder until it is completely pulled out.
- Do not lift the camcorder by the viewfinder.

Notes:

- When the LCD monitor is open, the viewfinder turns off.
- Use the CONTROL dial to adjust the brightness of the viewfinder with the LCD/IVF SET menu.

Closing the viewfinder

1. Lower the viewfinder and push it in completely.

Eyepiece Focus Control

The eyepiece focus control lets you set the focus of the viewfinder for your vision. If you wear eyeglasses, you probably can operate the camcorder without them.

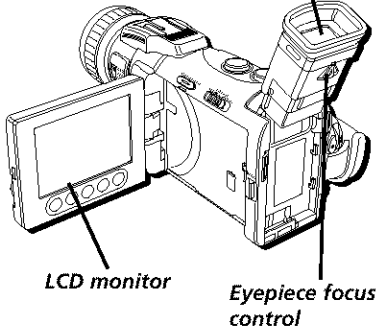
It is easiest to set the correct focus by focusing on one of the viewfinder's on-screen displays. Look through the viewfinder and adjust the eyepiece focus control for your vision.

1. Slide the eyepiece focus control until the indicators in the viewfinder are clearly visible.

Note: The eyepiece focus control does not affect the focus of the image captured by the camcorder.

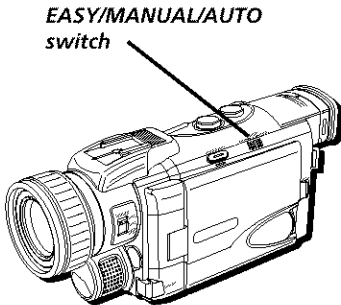
Cautions:

- Never force the viewfinder to rotate completely around. This will damage the viewfinder and/or the camcorder.
- When carrying the unit with the shoulder strap, put the viewfinder down and in to help prevent possible damage to it.



User Modes

During recording, you can select three different User Modes that determine which menus appear when you press the MENU/DISPLAY button. The menus have different functions available on the menu screens that appear.



Select a User Mode

1. Open the LCD monitor and adjust the angle for convenient viewing.
2. Set the DSC MODE and POWER switches to the desired recording settings.
3. Set the EASY/MANUAL/AUTO switch to the mode you want to use.
 - Set the switch to AUTO for normal recording. These menus let you adjust all of the camcorder functions except the manual settings.
 - Set the switch to EASY to display a menu with only basic recording functions.
 - Set the switch to MANUAL to adjust all settings including the manual settings for focus, shutter speeds, and exposure.
4. The indicator for the mode you select is displayed.

Notes:

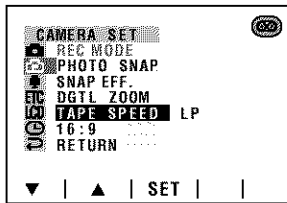
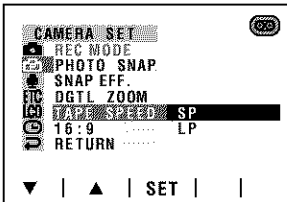
- *The EASY/MANUAL/AUTO switch has no function during playback.*
- *All manual settings are cancelled when you set the EASY/MANUAL/AUTO switch to AUTO.*
- *The example screens used in this manual assume the EASY/MANUAL/AUTO switch is set to AUTO unless indicated otherwise.*
- *The example screens in this manual are for explanation purposes, and may differ slightly from the actual screen displays.*

Using the Menu Screens

During recording, the type of menu screens that appear depend on the setting of the DSC MODE and EASY/MANUAL/AUTO switch (see *previous page*). The menu screens can be used to adjust the various settings of the camcorder.

Turn on Menu Screens (User Mode Set to AUTO)

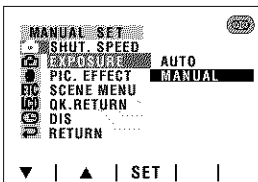
1. With the EASY/MANUAL/AUTO switch set to AUTO and the DSC MODE DUAL/TAPE/CARD switch set to TAPE, press the MENU/DISPLAY button repeatedly to display the menu screen.
2. Press ▼ or ▲ to select the desired menu, and then press *SET* to display the features of the selected menu.
3. Press ▼ or ▲ to select the desired menu item, and press *SET*. The available settings for the selected menu item are displayed.
4. Press ▼ or ▲ to select the desired menu setting, and press *SET*.
 - The selected menu setting is set.
5. To adjust another menu item, press ▼ or ▲ to select *RETURN* and press *SET* until the camcorder returns to the status in step 3 or 4, and repeat the procedure from that point.



Turn on Menu Screens (User Mode Set to MANUAL)

All of the menus are displayed plus the *MANUAL SET* menu that lets you manually adjust focus, shutter speed, and exposure.

1. With the EASY/MANUAL/AUTO switch set to MANUAL and the DSC MODE DUAL/TAPE/CARD switch set to TAPE, press the MENU/DISPLAY button repeatedly to display the menu screen.
2. Follow steps 2-5 above to select and set a menu item.

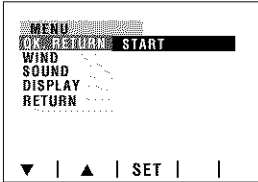


Turn on Menu Screens (User Mode Set to EASY)

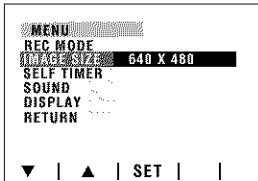
These menus offer the convenience of displaying only the basic functions.

1. With the EASY/MANUAL/AUTO switch set to EASY and the DSC MODE DUAL/TAPE/CARD switch set to TAPE, press the MENU/DISPLAY button repeatedly to display the menu screen.

Note: There is also an EASY menu screen when recording with the DSC MODE DUAL/TAPE/CARD switch set to CARD.



Easy MENU Screen for Tape Recording



Easy MENU Screen for Card Recording

Turn Off the Menu Screens

Press the MENU/DISPLAY button repeatedly until the menu screen turns off.

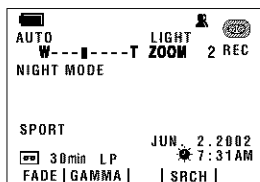
Notes:

- Certain menu items are common among the camcorder modes. If the DISPLAY menu item, for example, is set to "DATE+TIME" in TAPE-PLAY mode, it will be automatically set to "DATE+TIME" in other modes.
- The menu items are displayed in yellow when the corresponding functions are selected. The menu items are displayed in gray when the corresponding functions cannot be selected.
- The CONTROL dial can also be used to operate the menu screens. Rotate the dial to select an item and press it in to set the item. This is convenient when you are using the viewfinder.
- The menu screen automatically turns off if no settings are made within five minutes.
- The EASY/MANUAL/AUTO switch has no function during playback.
- All manual settings (except manual focus) are cancelled when you set the EASY/MANUAL/AUTO switch to AUTO.
- The example screens used in this manual assume the EASY/MANUAL/AUTO switch is set to AUTO unless indicated otherwise.
- The example screens in this user's guide are for explanation purposes, and may differ slightly from the actual screen displays.

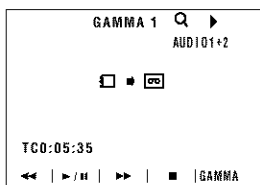
Using the Monitors

On-Screen Icons

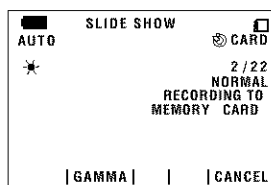
Several displays appear on the LCD monitor or in the viewfinder to aid in the operation of the camcorder. Although it may look crowded, all of the icons shown below do not appear on-screen at the same time. Also, not all screen icons are shown in the illustration. Refer to the icon descriptions that follow.



Recording Menu Icons



Playback Menu Icons



Card Only Menu Icons

Warning Icons

**Displayed for
Three Seconds**

**Displayed
After Three
Seconds**

Description of Warning

**BATTERY IS
TOO LOW.**



Indicates that the battery is almost depleted. Replace it with a fully charged battery pack.

**INSERT
A CASSETTE.**



No video cassette in camcorder. Insert a cassette.

**EJECT THE
CASSETTE.**

**EJECT THE
CASSETTE.**

Appears if the video cassette is defective and should be removed.

**CASSETTE
NOT
RECORDABLE.**



Flashes when you try to record to a tape with the protect tab in the protect position.

**THE TAPE
ENDS SOON.**











Appears when a tape has almost reached its end during recording.

**CHANGE THE
CASSETTE.**

TAPE END

Appears when a tape has reached its end during recording.

Using the Monitors

Displayed for Three Seconds	Displayed After Three Seconds	Description of Warning
DEW		Appears if moisture occurs inside the camcorder. When this icon appears, remove the tape and wait a few hours before using the camcorder again. The camcorder will turn off 10 seconds after this warning.
		Flashes if the video heads are clogged and should be cleaned.
LAMP	LAMP	Appears if the fluorescent lamp behind the LCD monitor is close to the end of its service life. Call your local authorized RCA dealer for service.
		All warnings will be indicated by  displayed in the center of the screen if the vertical rotation of the LCD monitor is between 135° and 180° when in one of the CAMERA modes, or if one of the manual screens is displayed. To check the type of warning, rotate the monitor back to within 135°, or press the MENU/DISPLAY button to turn off the manual screen.
		Flashes when the MultiMediaCard is not inserted correctly. Check card insertion.
Displayed for Five Seconds	Description of Warning	
MEMORY CARD FULL	Appears when the MultiMediaCard's capacity has been reached and it cannot store anymore images. Delete some of the images or insert a new card.	
NO DATA ON MEMORY CARD	Appears when MultiMediaCard has no data, or when the data is corrupt.	
MEMORY CARD ERROR	Appears when there is data corruption or card is recorded in a format that is not compatible. Format the card to use with this camcorder.	
FORMAT MEMORY CARD	Appears when card has not been formatted.	
MEMORY CARD PROTECTED	Appears when the card is copy protected.	
DATA PROTECTED	Appears when you are trying to delete protected images or files.	

Using the Monitors

Displayed for Five Seconds

Description of Warning

**MEMORY CARD
READ ERROR**

Appears when the selected image cannot be read by the camcorder.

**CANNOT
STORE DATA**

Appears when the camcorder cannot read any data. Replace the card.

Card Playback Status Displays

CARD

Indicates a card is inserted.

6/7

Current image number/total number of images.

NORMAL

Picture quality indicator.

1280

Image size indicator (resolution width).

100-0006

Image file name.



Appears when camcorder is copying still picture from card to tape.



Appears when camcorder is copying a still picture from the tape to the card.

Recording and Playback Icons

Date, Time, or Date and Time Icons

JUN. 2. 2002
10:30AM

Indicates the current date and time and is recorded when it is displayed.

Program AE with Special Effects Icons

SPORT

Appears when you select *SPORT* to record fast-moving action, such as sporting events.

SUNLIGHT

Appears when you select *SUNLIGHT* to record fast moving subjects with little blur.

DUSK

Appears when you select *DUSK* to record scenes at twilight, fireworks, etc.

PARTY

Appears when you select *PARTY* to record scenes in direct lighting, such as spotlights.

DIS (Digital Image Stabilizer) Icon



Appears when you are using Digital Image Stabilizer.

Tape Speed Icon

LP

Tape speed *LP* has been selected.









Time Code Icon

TC0:06:20

Indicates the recorded time code.

Using the Monitors

Status Icons

REC	Appears when the camcorder is recording.
PAUSE	Appears during record-standby or record-pause.
	Appears when the camcorder plays a tape.
	Appears during play-pause.
	Appears during fast forward.
	Appears during rewind.
	Appears when timer is set.
	Appears during self timer.
	Indicates a MultiMediaCard is inserted or camcorder is in Card Mode.
	Appears when Automatic Daylight Savings feature is on.

Time-Remaining Icon

120min	Indicates the approximate time remaining on the tape.
---------------	---

Focus Icon

MF	<i>MF</i> is displayed when focus is set to manual.
-----------	---

AUTO Icon

AUTO	<i>AUTO</i> appears while the camera is in full auto mode.
-------------	--

Volume Indicator

 VOLUME	Appears during volume adjustment.
--	-----------------------------------

Zoom Icons

W---■-----T D-ZOOM 40
W---■-----T ZOOM 2

Appears during zoom with digital zoom feature.
Appears during zoom with optical zoom feature.

Audio Indicators

AUDIO1+2, AUDIO 1,
or AUDIO 2

Displays the audio playback mode.

NIGHT MODE Indicators

NIGHT MODE, IR LIGHT 1,
IR LIGHT 2, or IR LIGHT 3

Appears when the Night Mode feature is activated.

Gamma Indicators

GAMMA1,
or GAMMA2

Appears when Gamma has been manually adjusted during playback.

GAMMA

Appears during recording when the Gamma Feature is used to make only the subject brighter.



Appears during recording when the Gamma feature is used to brighten the whole picture. The brighter portions may appear washed out.

LIGHT

Appears when the Gamma feature needs to be adjusted manually.

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Recording

Chapter Overview:

- Recording Details
- Recording Features
- Recording Tips

Changing Entertainment. Again.

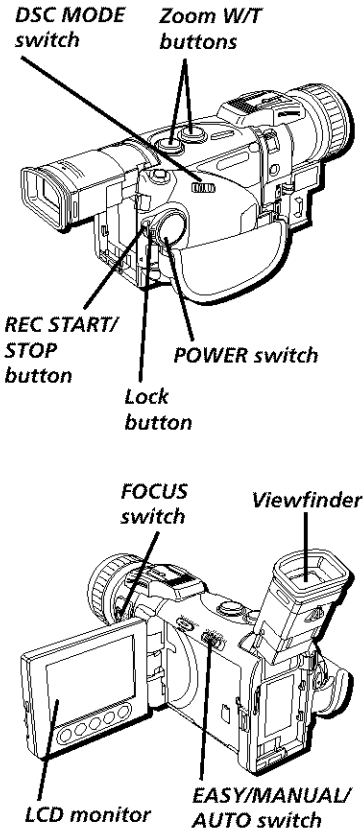


Recording Details

There are three recording modes you can select. TAPE-CAMERA records moving video or still pictures on the tape. DUAL-CAMERA records both moving video or still pictures on the tape and still images on the memory card. CARD-CAMERA tells the camcorder to act like a digital camera and record still images on the memory card.

TAPE-CAMERA Mode—Recording on Tape

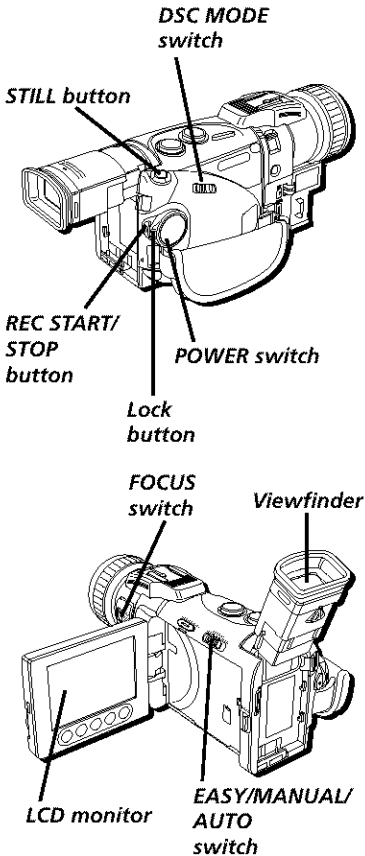
1. Set the EASY/MANUAL/AUTO switch to the AUTO position.
2. Set the FOCUS switch to the AUTO position.
3. Set the DSC MODE switch to the TAPE position.
4. Press in the Lock button and set the POWER switch to the CAMERA position
5. Open the LCD monitor or adjust the viewfinder.
6. Press the Zoom W or T button to zoom in or out on your subject.
7. Press and release the REC START/STOP button to start recording. *REC* appears in the viewfinder or LCD monitor (but won't be recorded).
8. When finished recording, press and release the REC START/STOP button again to stop recording. The camcorder is now in the record-pause mode. *PAUSE* appears in the viewfinder or on the LCD monitor.



Notes:

- If the Record-Standby mode continues for 5 minutes, the camcorder's power shuts off automatically. Set the POWER switch to OFF, and then back to CAMERA to turn the camcorder on.
- To remove the icons from the camcorder's display during recording, press the MENU/DISPLAY button.

DUAL-CAMERA Mode—Tape and Card Recording



1. Make sure a MultiMediaCard and DV cassette are inserted properly.
2. Set the EASY/MANUAL/AUTO switch to the AUTO position.
3. Set the FOCUS switch to the AUTO position.
4. Set the DSC MODE switch to the DUAL position.
5. Press in the Lock button and set the POWER switch to the CAMERA position.
6. Open the LCD monitor or adjust the viewfinder.
7. Press the Zoom W or T button to zoom in or out on your subject.
8. Record video on tape or a still picture on the memory card.

Record Video on the Tape

- Press and release the REC START/STOP button to start and stop recording on the tape.

REC appears in the viewfinder or LCD monitor while the camcorder is recording (but won't be recorded on the tape).

When you are not recording, the camcorder enters the record-pause mode and *PAUSE* appears in the viewfinder or on the LCD monitor.

Record a Still Picture on the Memory Card

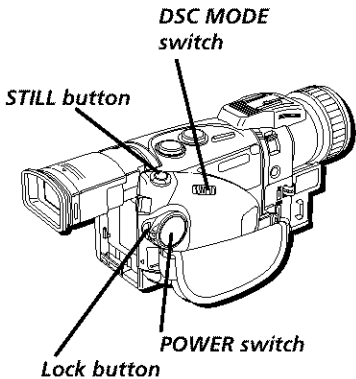
- Set the camcorder to record-pause mode. *PAUSE* appears in the viewfinder or on the LCD monitor.

Press the STILL button to record a still picture on the memory card. *RECORDING TO MEMORY CARD* appears in the viewfinder or on the LCD monitor.

- When finished recording, set the POWER switch to OFF.

Notes:

- If the Record-Standby mode continues for 5 minutes, the camcorder's power shuts off automatically. Set the POWER switch to OFF, and then back to CAMERA to turn the camcorder on.
- To remove the icons from the camcorder's display during recording, press the MENU/DISPLAY button.

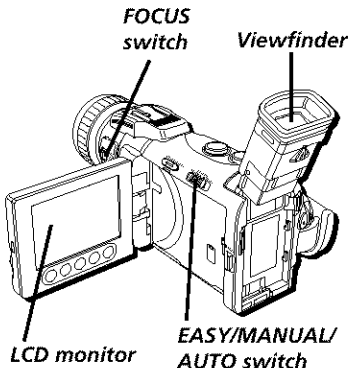


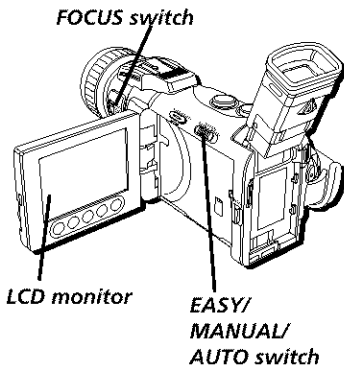
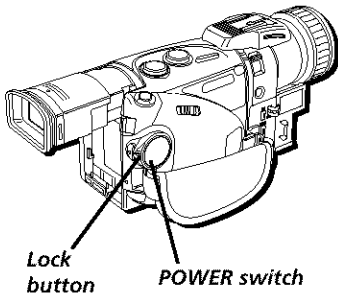
CARD-CAMERA Mode—Recording on a Memory Card

- Insert the supplied MultiMediaCard.
- Set the EASY/MANUAL/AUTO switch to AUTO.
- Set the FOCUS switch to AUTO.
- Set the DSC MODE switch to CARD.
- Press in the Lock button and set the POWER switch to CAMERA.
- Open the LCD monitor or adjust the viewfinder.
- Press the STILL button to record a still image of the subject.
- When finished recording, set the POWER switch to OFF.

Note:

- To remove the icons from the camcorder's display during recording, press the MENU/DISPLAY button.





Full-Auto Mode

Use the Full-Auto mode to easily record good-quality images.

1. Press in the Lock button and set the POWER switch to the CAMERA position. The camcorder enters the Record-Standby mode.
2. Set the EASY/MANUAL/AUTO switch to AUTO to have the camcorder automatically select the best settings for your recording. *AUTO* appears in the viewfinder or LCD monitor.

Note: *Placing the camcorder in the full-auto mode will cancel all of the settings you may have adjusted in the MANUAL screen.*

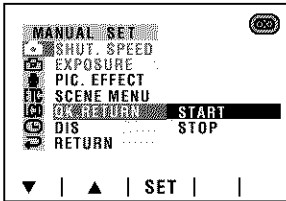
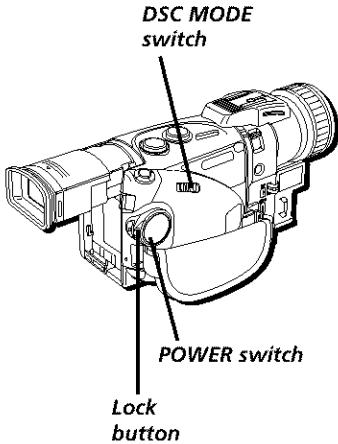
3. Set the FOCUS switch to AUTO to have the camcorder automatically focus for you.

Journalistic Shooting

In some situations, different shooting angles may provide more dramatic results. Hold the camcorder in the desired position and tilt the LCD monitor in the most convenient direction. It can rotate 270° (90° downward, 180° upward).

Self-Recording


You can even record yourself while viewing your own image in the LCD monitor. Open the LCD monitor and tilt it upward 180° so that it faces forward, then point the lens toward yourself and start recording.



Quick Return Screen

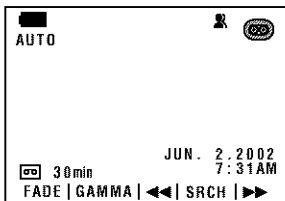
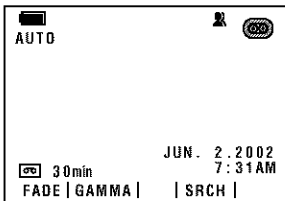
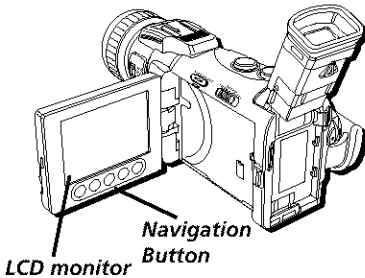
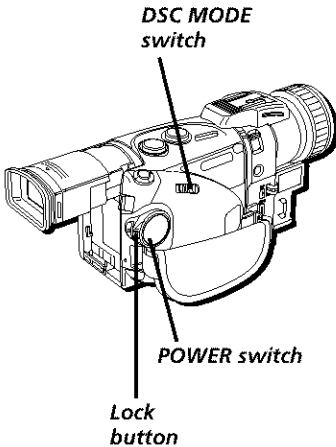
Quick Return

After playing back the tape you recorded, you can quickly return to the end of the last recording by using the Quick Return feature on the Mode screen.

1. Set the DSC MODE switch to TAPE or DUAL, and press in the Lock button to set the POWER switch to CAMERA.
2. In the Record-Standby mode, press the MENU/DISPLAY button repeatedly to display the menu screen.
3. If the *MANUAL SET* menu is not highlighted press ▼ or ▲ to select  and then press *SET* to display the *MANUAL SET* menu.
4. Press ▼ or ▲ to select *QK. RETURN*, and then press *SET*.
5. Press ▼ or ▲ to select *START* and then press *SET*.
 - *SEARCH* flashes and the tape begins fast forwarding or rewinding to the end of the last recorded scene.
 - When the tape reaches the end of the last recorded scene, *FINISHED* is displayed and the camcorder enters the Record-Standby mode.
6. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.

Notes:

- To cancel Quick Return, repeat the above steps and select *STOP* and then press *SET*.
- Quick Return cannot be used if the cassette has been removed since the last recording or if no recording has been made since the cassette was loaded.



SEARCH Screens

Edit Search

The edit search feature allows you to search for the point on the tape where you wish to start recording without switching the POWER switch to PLAY.

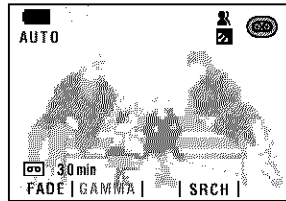
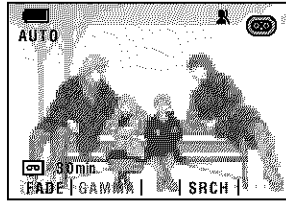
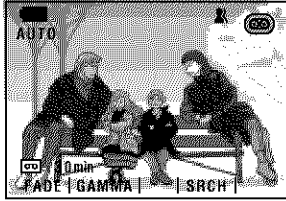
1. Set the DSC MODE switch to TAPE or DUAL, and press in the Lock button to set the POWER switch to CAMERA.
2. In the Record-Standby mode, if the displays are not visible, press the MENU/DISPLAY button until the on-screen displays appear.
3. Press *SRCH*.
4. Press and hold **▶▶** (forward edit search) or **◀◀** (reverse edit search).
 - In forward edit search, the tape is played back at normal speed. In reverse edit search, the tape is played back at approximately 5.5 times normal speed.
5. When you locate the point where you want to begin recording, release the **▶▶** or **◀◀** button.
 - Playback stops, and the camcorder enters Record-Pause mode. The tape will record from this point when you start recording.
6. Press *SRCH* to cancel the edit search function and return to normal displays.


Notes:

- *The sound is off during search.*
- *Some picture noise appears during reverse edit search.*


Gamma Brightness

The Gamma Brightness feature improves the picture by increasing the brightness of the image. Use this when a subject is backlit or when recording in a dark or poorly illuminated area. The image will appear dark if it is recorded normally. *LIGHT* will appear on the monitor when the light is insufficient.




1. Press in the Lock button and set the POWER switch to CAMERA.
2. In the Record-Standby mode, press the MENU/DISPLAY button to turn on displays.
3. Press *GAMMA* to brighten the image.
 - *GAMMA* turns yellow on the LCD monitor.
 - Press *GAMMA* again to brighten the picture even more. The  indicator appears.

Notes:

- When only *GAMMA* is displayed, the subject becomes brighter while leaving the brighter portions of the image unaffected. When  is displayed, the brighter portions of the image get whited out.
- Some picture noise appears when using Gamma Brightness while *LIGHT* is displayed.
- Fine brightness adjustment is possible using *Exposure*.

To Cancel Gamma Brightness Compensation


Press *GAMMA* until  disappears.

Select the Audio Mode

This camcorder allows you to select 12-bit or 16-bit audio recording mode. The camcorder normally records audio in the 12-bit mode. For higher-quality audio recording, select the 16-bit mode.



Set the Audio Mode to 16Bit

1. Press the Lock button in and set the POWER switch to CAMERA.
2. Press the MENU/DISPLAY button repeatedly to display the menu screen.
3. Press ▼ or ▲ to select , and press SET.
4. Press ▼ or ▲ to select AUDIO MODE and press SET.
5. Press ▼ or ▲ to select 16bit and then press SET. 16bit is displayed on the monitor.
6. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.

To Return to 12Bit Mode

Select 12bit and press SET in step 5 above.

Note: When using audio dubbing with 16-bit audio recordings, both the dubbed and original sounds will be recorded in mono (see page 74).

Zooming

Using the Zoom Buttons (W and T)

To zoom in close (telephoto) or out (wide angle), press one of the zoom buttons.

Optical zooming is the natural, non-enhanced magnification that the camcorder's lens will support. Optical zooming is possible up to ten times when recording on tape and up to seven times when recording on the memory card.

Digital zooming makes it possible to capture images up to a maximum of 400 times normal magnification. The camcorder uses technology to artificially enhance the image.

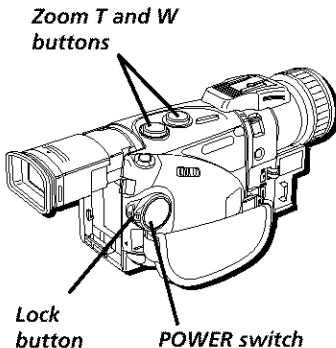
When using the zoom buttons, an icon appears on screen to display the approximate zoom ratio.

Notes:

- *While zooming, focusing may become unstable. If so, set the zoom while in Record-Standby mode and adjust the image using manual focus (see page 98). Once the focus is set, zoom the camcorder in or out while recording.*
- *The zoom level icon moves during zoom. Once it reaches the end of the zoom icon bar, all magnification from that point is through digital processing.*
- *During digital zoom, the quality of the image may suffer.*

Optical Zooming

You can zoom in and out for close-up or wide-angle shots by pressing Zoom T or W. The camcorder automatically focuses at most distances when zooming.



1. Press T or W to zoom in or out on a subject.

- Press T to zoom in on the subject.

The camcorder is unable to focus closer than five feet (1.5m). It will automatically zoom out and focus.

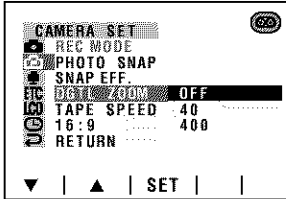
- Press W to zoom out.

The on-screen display shows the current zoom setting.

2. Press the zoom button harder to increase the zoom speed or softer to decrease the speed.

Digital Zoom

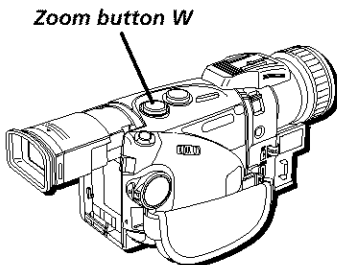
You can use digital zoom to magnify images to a maximum of 400 times normal magnification. Digital zoom is possible up to 400 times when recording on a tape.



1. Press the Lock button in and set the POWER switch to CAMERA.
2. Press the MENU/DISPLAY button repeatedly to display the menu screen.
3. Press ▼ or ▲ to select and press SET.
4. Press ▼ or ▲ to select DIGITAL ZOOM and press SET.
5. Press ▼ or ▲ to select OFF, 40, or 400 and press SET.
 - Select OFF to turn digital zoom off.
 - Select 40 to have 10-40 times digital zoom.
 - Select 400 to have 10-400 times digital zoom.
6. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.
7. Press the Zoom W or T button to zoom. The zoom indicator appears in the display.

Macro Zooming

Macro zooming allows you to take close-up shots of small objects. To record a magnified image that is within approximately five feet of the camcorder, use Macro Zoom.



1. Press Zoom button W to zoom all the way out.
2. Move the camcorder close to the subject until you obtain the desired angle of view.

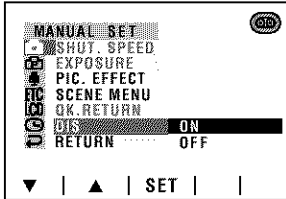
The camcorder will automatically focus on the subject.

Notes:



- Make sure there is sufficient light for macro recordings.
- For best results, use a tripod during macro recording.

Digital Image Stabilization (DIS)

Digital Image Stabilization is used to compensate for unstable images caused by camera shake, especially at high magnifications. This feature is turned on by default from the factory.



Turning the DIS Feature ON and OFF

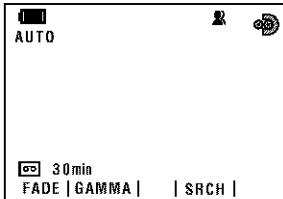
1. Press the Lock button in and set the POWER switch to CAMERA.
2. Press the MENU/DISPLAY button repeatedly to display the menu screen.
3. Press ▼ or ▲ to select  and press *SET*.
4. Press ▼ or ▲ to select *DIS* and press *SET*.
5. Press ▼ or ▲ to select *OFF* or *ON* and press *SET*.
 - Select *OFF* to turn Digital Image Stabilization off.
 - Select *ON* to turn digital image stabilization on. The DIS indicator () appears on the screen.
6. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.

Notes:

- *Accurate stabilization may not be possible if hand shake is excessive.*
- *Switch off stabilization when the camcorder is mounted to a tripod.*

Fading Scenes

The fade feature allows you to gradually bring the image and sound in or out at the beginning or end of a scene for creating scene transitions. This is especially effective for indicating a dramatic change in scenery.



Fading In and Out

1. Press the Lock button in and set the POWER switch to CAMERA.
2. Set the DSC MODE switch to TAPE.
3. Press *FADE*.
4. Press the REC START/STOP button to begin recording. The picture will turn white and begin to fade in.
5. Press the REC START/STOP button to stop recording. The image and sound will fade out gradually as the image turns white. The camcorder will then return to the Record-Pause mode.

Cancel Fade

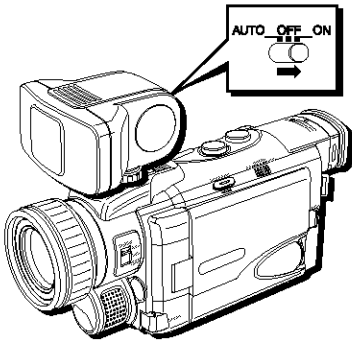
Press *FADE* again. The Fade mode is automatically cancelled after you have faded out.

Fading Out Only

1. During recording, press *FADE*.
2. Press the REC START/STOP button at the point where you wish to stop recording and fade out.

Video Light (Optional)

To brighten the scene when natural lighting is too dim, the camcorder can use an optional video light (see page 151). You can turn on the video light at all times, set it to turn on automatically when additional light is needed, or turn it off.



Use the Optional Video Light

Set the Light AUTO/OFF/ON switch.

- Set to AUTO to have the light turn on when recording in dark locations. *LIGHT* must appear for the light to turn on automatically.
- Set to OFF to turn off the light.
- Set to ON to turn the light on whenever the camcorder is turned on.

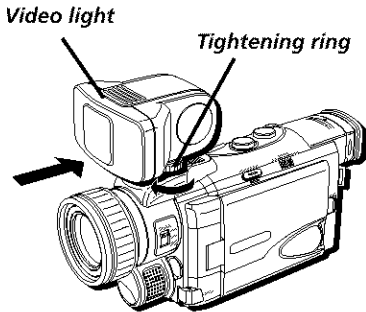
Notes:

- *The video light can only be used when the camcorder is on and will not operate if the NIGHT MODE switch is set to ON.*
- *When not using the video light, turn it off to save battery power.*
- *Even if the battery level indicator does not indicate a low battery, the camcorder may turn off automatically if the video light is turned on when you start a recording or when you turn on the video light.*
- *When the Light switch is set to AUTO, the light may keep turning on and off depending on the lighting conditions. If this happens, set the Light switch to ON or OFF.*

Cautions



- *Never operate the video light closer than one foot to people or other objects.*
- *The video light becomes very hot. Do not touch it during use or right after use. Serious injury may result.*
- *Do not place the camcorder in a carrying case right after using the light.*
- *Never operate the video light close to flammable or explosive material.*
- *The video light and bulb need to cool for approximately 30 minutes after use before the bulb assembly is replaced. Replace the bulb only with Replacement Part 253403 (6V, 3W bulb).*



Attach the Optional Video Light

1. Hold the light *as shown*, and attach it to the accessory shoe by sliding it in the direction of the arrow until it locks into place.
2. Turn the tightening ring in the direction of the arrow to secure the video light.

Remove the Optional Video Light

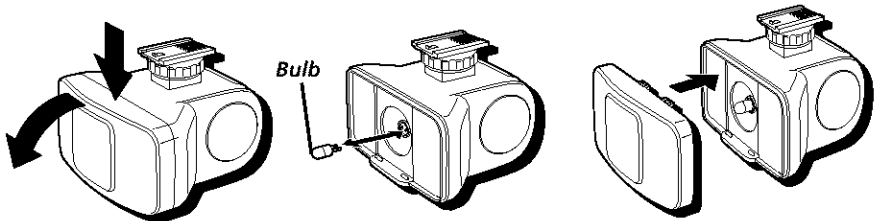
Turn the screw in the opposite direction from the arrow and pull off the light.

Cautions

- *Make sure to attach the video light securely.*
- *Do not use the video light to carry the camcorder.*

Replacing the Bulb

The video light's bulb will eventually have to be replaced. If the bulb burns out, replace it only with replacement part 253403. For more information about bulb replacement, contact the nearest RCA service center or authorized dealer.



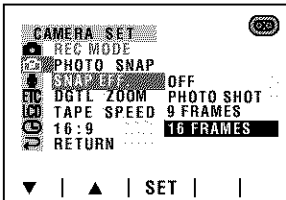
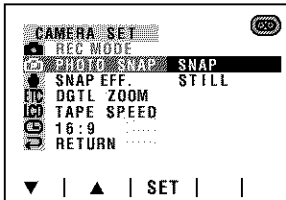
1. Wait at least 30 minutes after using the video light for it to cool, and remove the front cover *as shown*.
2. Grasp the tip of the bulb and pull it straight out of the reflecting plate.
3. Insert the new bulb into the hole of the reflecting plate and reattach the front cover *as shown*.

Cautions


- *The video light and bulb need to cool for approximately 30 minutes after use before the bulb assembly is replaced.*
- *Replace the bulb only with Replacement Part 253403 (6V, 3W bulb).*

Multiple-Strobe Recording

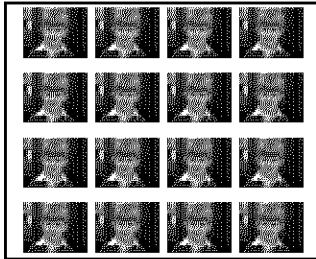
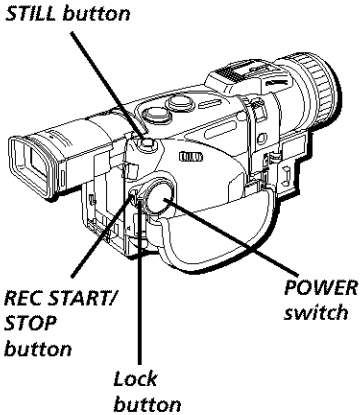
The multiple strobe recording feature allows you to record a fast-moving subject at intervals of 1/10 of a second using a 9 or 16-frame picture on tape. This is useful when you want to check your form in sports, such as tennis or golf.



Set Multiple-Strobe Recording Mode

1. Press the Lock button in and set the POWER switch to CAMERA.
2. Set the DSC MODE switch to TAPE.
3. Repeatedly press the MENU/DISPLAY button to display the menu screen.
4. Press ▼ or ▲ to select  and press *SET*.
5. Press ▼ or ▲ to select *PHOTO SNAP* and press *SET*.
6. Press ▼ or ▲ to select *SNAP* or *STILL* and press *SET*.
 - Select *SNAP* to record a multi-frame picture for six seconds.
 - Select *STILL* to record a multi-frame picture until you press the REC START/STOP button to stop recording.
7. Press ▼ or ▲ to select *SNAP EFF.* and press *SET*.
8. Press ▼ or ▲ to select *9 FRAMES* (9-frame picture) or *16 FRAMES* (16-frame picture) and press *SET*.
9. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.

Note: The picture quality will be slightly less than normal when using Multiple-Strobe modes.



**Multi Strobe 16-Frame
Recording**

Record Using Multiple Strobe

1. Press the Lock button in and set the POWER switch to CAMERA.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. During Record-Pause mode, press the STILL button. A multi-frame picture of the subject is displayed (9 or 16-frames--whichever you selected).
4. Press the REC START/STOP button. The multi-frame picture is recorded.
 - You can also press the STILL button during recording to record a Multi-Strobe picture on your tape.
5. If *STILL* is selected, press the REC START/STOP button to stop recording the picture.

To Cancel the Multi-Frame Picture

- In *PHOTO SHOT* mode, press the STILL button while the camcorder is in the Record-Pause mode.
- In *STILL* mode, press the STILL button.


Notes:

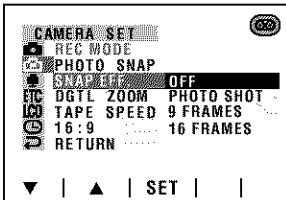
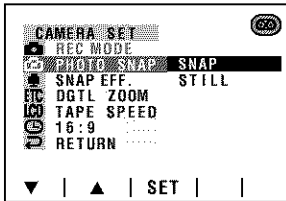
- *Multiple strobe recording can also be used during recording by pressing the STILL button.*
- *The picture quality in Multiple-Strobe recording mode will be slightly lower than normal pictures.*
- *Multiple Strobe recording cannot be used with digital picture effects or the wide-screen function.*

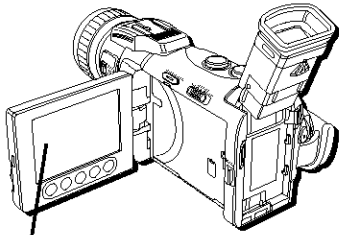
Still Recording on Tape

You can record still images of subjects with normal sound on a tape. You can select *PHOTO SHOT* and record a still picture for six seconds or *STILL* and continuously record a still image.

Select Still-Recording Mode

1. Press the Lock button in and set the POWER switch to CAMERA.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select  and press SET.
4. Press ▼ or ▲ to select *PHOTO SNAP* and press SET.
5. Press ▼ or ▲ to select *SNAP* or *STILL* and press SET.
 - Select *SNAP* to record a still picture for six seconds.
 - Select *STILL* to record a still picture until you press the REC START/STOP button to stop recording.
6. Press ▼ or ▲ to select *SNAP EFF.* and press SET.
7. Press ▼ or ▲ to select *PHOTO SHOT* and press SET.
8. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.





LCD monitor

Record Still Images

1. Press the Lock button in and set the POWER switch to CAMERA.
2. During Record-Pause mode, press the STILL button. A still picture of the subject is displayed.
3. Press the REC START/STOP button. The still picture is recorded.

- If *PHOTO SHOT* mode is selected, the camcorder returns to Record-Pause mode after recording the still picture for six seconds.
- You can also press the STILL button during recording to record a still picture on your tape.

If *PHOTO SHOT* is selected, the sound and visual effect of the camera shutter is turned off. The camcorder returns to record-pause mode after recording the still picture for six seconds.

4. If *STILL* mode is selected, press the REC START/STOP button to stop recording the picture.

Note: To turn off the shutter sound, (see page 108).

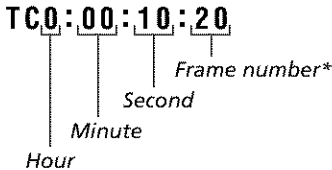
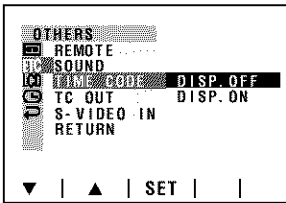
To Cancel the Still Picture

- In *PHOTO SHOT* mode, press the STILL button while the camcorder is in the Record-Pause mode.
- In *STILL* mode, press the STILL button.

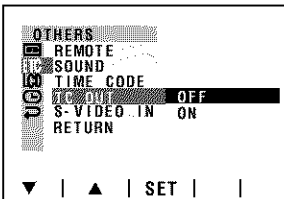
Time Code Display

During recording, a time code is captured on the tape. This code confirms the location of the recorded scene on the tape during playback.

If recording starts from a blank portion of the tape, the time code begins counting from *TC0:00:00* (hours: minutes: seconds). A frame number is displayed during still playback. If recording starts from the end of a previously recorded scene, the time code continues from the last time code number.



*Displayed during still playback.



Turn Time Code Display On and Off

1. Press the Lock button in and set the POWER switch to CAMERA.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select **ETC** and press **SET**.
4. Press ▼ or ▲ to select **TIME CODE** and press **SET**.
5. Press ▼ or ▲ to select **DISP. ON** or **DISP. OFF** and press **SET**.
 - The Time Code indicator appears on the display when you select **DISP. ON**.
6. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.

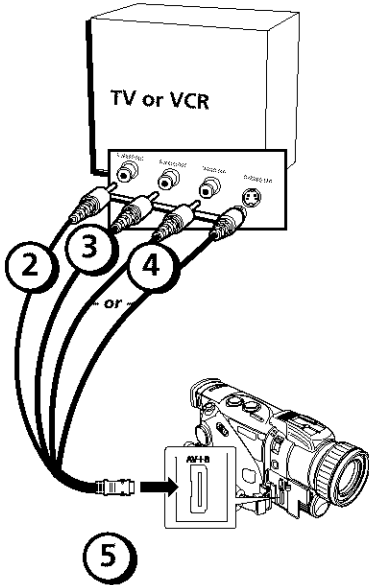
Note: The time code is automatically set to *TC:---:--* when a tape is ejected.

Display Time Code on TV During Playback

1. While playing back a tape, press the MENU/DISPLAY button repeatedly to display the menu screen.
2. Press ▼ or ▲ to select **ETC**, and press **SET**.
3. Press ▼ or ▲ to select **TC OUT**, and press **SET**.
4. Press ▼ or ▲ to select **ON** or **OFF** and press **SET**.
5. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.

Recording From an External Source

You can use this camcorder to record or edit videos from another source, such as a VCR or TV. To connect your camcorder to a TV (or VCR) with audio/video outputs, use the supplied audio/video/S-Video cable.



Connections

1. Make sure all units are turned off before making any connections.
2. Connect the white plug of the cable to the left AUDIO OUT jack on the TV (or VCR).

Note: Some VCRs or TVs do not offer left and right audio jacks. For units with one audio jack, use the cable's white plug.

3. Connect the red plug of the cable to the right AUDIO OUT jack on the TV (or VCR).
4. Connect the yellow plug to the VIDEO OUT jack on the TV (or VCR).

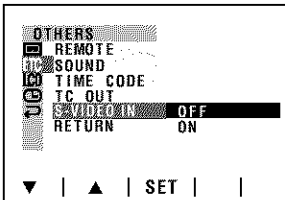
OR: Use the S-Video out for video out for an S-Video connection.

5. Open the jack cover on the camcorder and connect the other end of the cable to the AV+S jack on the camcorder.

Note: Hold in the catches on the side of the plug and pull it out to remove it from the camcorder. Do not pull on the cable without holding in the catches.

Turn On the S-Video Input

If you have connected your camcorder using the S-video cable, set the *S-VIDEO IN* feature to *ON* in the menu.



1. Put in a tape and set the DSC MODE switch to TAPE and the POWER switch to PLAY.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select **ETC** and press **SET**.
4. Press ▼ or ▲ to select *S-VIDEO IN* and press **SET**.
5. Press ▼ or ▲ to select *ON* and press **SET**.
6. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.

To Record From an External Source

1. Place a tape in the camcorder, set the DSC MODE switch to TAPE, and set the POWER switch to PLAY.
2. Start playback from the TV or VCR making sure you can see the picture on the camcorder.

Note: *If NO SIGNAL is displayed on the camcorder screen, make sure the audio/video/S-Video cable is properly connected.*

3. Press the REC START/STOP button on the camcorder. The camcorder will enter the Record-Pause mode.
4. Press ►/■ to begin recording.
 - Press ►/■ to start and stop recording.
 - Press ■ to stop recording.

Recording Tips

- To improve picture quality and color reproduction, try to make sure indoor scenes are well-lit.
- Don't move the camcorder rapidly from side-to-side while recording. A steady, gradual "pan" avoids blurring and "jitter".
- Use the viewfinder or LCD monitor to make sure the camcorder is level while recording so that your scene isn't "tilted."
- Do not bump or tap the camcorder's microphone while recording as this sound will be recorded.
- Include close-ups of individuals when taping family outings or group functions.
- Fading in and out of scenes makes your videos appear more professional.
- Learn to use the special effects to add variety to your recordings.
- Be aware of video and audio backgrounds. Background details barely noticed while recording may show up as visual "clutter" on your recording. Background noises (especially TV sets, radios, household appliances, traffic sounds, etc.) might detract from the sound you want to record.
- Avoid long "still" shots of landmarks and scenic attractions. Recordings are more interesting if they include people and details. "Local color" gives travel videos lasting appeal. To add interest, consider recording a familiar or landmark scene from an unfamiliar vantage point.

Playback

Chapter Overview:

- Playback Options
- Playback Features
- Dubbing
- Connection to a TV (or VCR)

Changing Entertainment. Again.



Playback Options

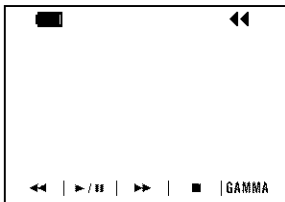
The camcorder's playback features include still, picture search, gamma, multiple strobe and digital effects. In this section, you'll also learn how to connect your camcorder to a TV or VCR.

The LCD monitor screen functions as a handy playback monitor. Nothing needs to be connected, allowing instant on-screen playback with the sound through the built-in speaker.

This section mainly describes playback features for your recorded tapes. See Chapter 6 for detailed information on playback of MultiMediaCards.

Tape Playback Using the LCD Monitor

1. Insert a tape.
2. Open the LCD monitor.
3. Set the DSC MODE switch to the TAPE position.
4. Press in the Lock button and set the POWER switch to the PLAY position.
5. Use the monitor navigation buttons.
 - Press the ◀◀ or ▶▶ button to rewind or fast forward the tape.
 - Press ▶/|| to begin playback.
6. Press ■ when finished playing the tape.

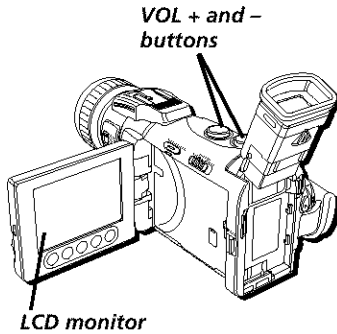


Tips

The playback picture can be viewed in the viewfinder (with the LCD monitor shut), on the LCD monitor, or on a connected TV (see page 78). You can also view the playback picture on the LCD monitor with it flipped over and retracted.

Adjust the LCD Monitor Brightness

You can adjust the brightness of the monitor using the menu system. The brightness of the monitor does not affect the recording (see pages 32-33).



Controlling Speaker Volume

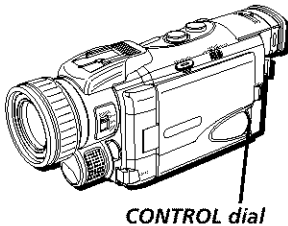
You can adjust the volume of the speaker during playback.

- Press the VOL + button to turn up the volume.
- Press the VOL – button to turn down the volume.

Playback Using the Viewfinder

You can also watch the playback in the viewfinder by closing the LCD monitor with the screen facing in. No sound is available during viewfinder playback.

- To operate the playback functions, rotate the CONTROL dial to select the desired on-screen button or operation and press the CONTROL dial in.

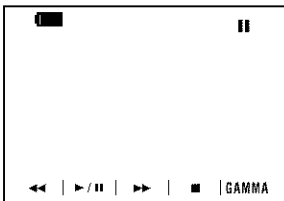


Playback Features

Still Playback

Still playback pauses the tape, freezing a single frame.

1. Press ►/|| during playback to freeze the image.
 2. To resume normal playback, press ►/|| again.
- If pause continues for more than five minutes, the camcorder automatically returns to normal.



Shuttle Search

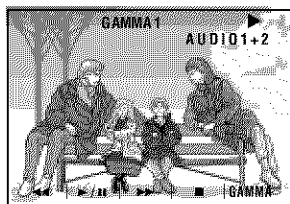
Shuttle search allows high-speed searching in either forward or reverse directions.



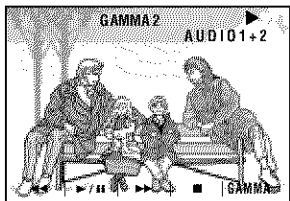
1. Press ►► or ◀◀ during playback.
 - A slight mosaic effect appears on screen during shuttle search. This is normal.
 - The sound is turned off during search.
2. To resume normal playback, press ►/||.

Gamma Playback

Gamma improves the tape playback picture by increasing the brightness of the subject while not affecting the brighter portions.



1. During playback press the MENU/DISPLAY button to turn on the displays.
2. Press *GAMMA* once. The picture brightens and *GAMMA1* appears in the display.
3. Press *GAMMA* again for an even brighter picture. *GAMMA2* appears in the display.



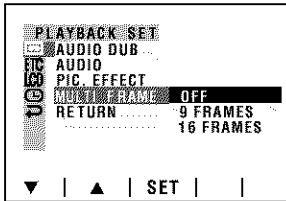
Cancel Gamma Playback

Press *GAMMA* until *GAMMA1* and *GAMMA2* disappear from the display.

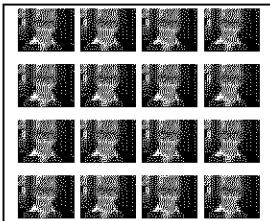
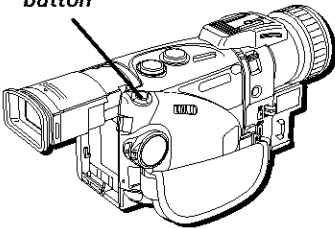
Note: *Gamma playback has no effect during still playback.*

Multiple-Strobe Playback


The multiple-strobe playback feature allows you to playback a fast-moving subject at intervals of 1/10 of a second using a 9 or 16-frame picture. This is useful when you want to check your form in sports, such as tennis or golf.



STILL
button



Use Multi-Strobe Playback

1. Press the Lock button in and set the POWER switch to PLAY.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select  and press SET.
4. Press ▼ or ▲ to select MULTI FRAME and press SET.
5. Press ▼ or ▲ to select 9 FRAMES (9-frame picture) or 16 FRAMES (16-frame picture) and press SET.
6. Press the MENU/DISPLAY button repeatedly until the menu screen turns off.
7. Playback the tape from a point before the part you want to playback in Multi Strobe.
8. Press the STILL button at the point you want to start Multi-Strobe playback. A multi-frame picture of the image is displayed.

Notes:

- If a memory card is inserted in the camcorder, the still image dubbing screen appears. Press the MENU/DISPLAY button to remove the dubbing screen.
- You can dub the multi-strobe images to a memory card (see page 73).

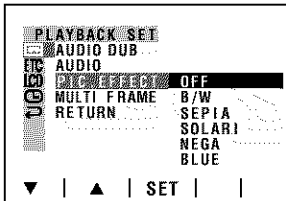
Cancel Multi-Strobe Playback

Press the STILL button to cancel Multi-Strobe playback.

Note: Multi-Strobe playback does not operate during still, search or with Picture Effect.

Digital Effect Playback

Use one of the digital picture playback effects to add a more dramatic look to your recording.



Select a Digital Effect for Playback

1. Press the Lock button in and set the POWER switch to PLAY.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select if you are playing a tape (if you are playing back a card) and press *SET*.
4. Press ▼ or ▲ to select *PIC. EFFECT* and press *SET*.
5. Press ▼ or ▲ to select the picture effect you want, and then press *SET*.
 - Select *OFF* for normal playback.
 - Select *B/W* to have the picture displayed in black and white.
 - Select *SEPIA* to display the picture with a brownish tint like old photos.
 - Select *SOLARI* to display the picture with enhanced contrast creating a unique artistic image.
 - Select *NEGA* to display the picture with the blacks and whites of the image reversed and the colors of the image inverted.
 - Select *BLUE* to display the picture with the effect of recording through a blue filter.
6. Press the MENU/DISPLAY button until the menu screen turns off.

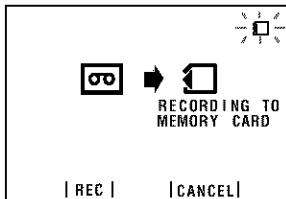
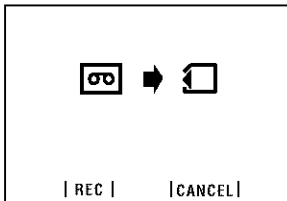
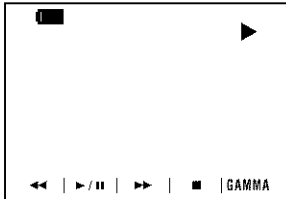
To Cancel the Digital Picture Effect

Select *OFF* and then press *SET* in step 5 above.


Note: Digital picture effects cannot be selected when a still image is displayed.

Dubbing Images from a Tape to a Card

It is possible to make a still image from your favorite frame of a motion video recorded on the tape and dub that image on the memory card.



To Dub an Image

1. Insert a recorded DV cassette and a card in the camcorder.
2. Set the DSC MODE switch to the TAPE position.
3. Press in the Lock button and set the POWER switch to the PLAY position.
4. Press ►/|| to start playback, and then press the STILL button at the point where the desired image appears. The Dubbing screen automatically appears.
 - To cancel dubbing, press *CANCEL*.
5. Press *REC* to dub the still image to the card. The  indicator flashes red while the still image is being recorded.
6. Press *CANCEL* to cancel the still image.

Audio Dubbing Feature

You can add narration to a tape recorded with this camcorder by using the built-in stereo microphone, while preserving the original audio and video recording. Select your recording mode.

Note: Audio dubbing cannot be performed via the DV jack.

Audio Recorded in the Audio Dubbing Mode

Audio can be recorded and dubbed in 12 or 16-bit. To change the recording mode see *page 53*. The chart below shows how audio is recorded in the normal and dubbing modes.

In Normal Recording Mode

12-Bit Audio Recording

The audio is recorded in stereo on Audio 1.

- **Audio 1:** Stereo (left and right) sound
- **Audio 2:** No audio

16-Bit Audio Recording

The audio is recorded in stereo with the left and right sound on two separate channels.

- **Audio 1:** Left sound
- **Audio 2:** Right sound

In Audio Dubbing Mode

12-Bit Audio Recording

The dubbed audio is recorded on Audio 2.

- **Audio 1:** Original stereo (left and right) sound
- **Audio 2:** Dubbed stereo (left and right) sound

16-Bit Audio Recording

The dubbed audio is recorded on Audio 2 over the original right sound. Both the dubbed and original sounds are in mono.

- **Audio 1:** Original left sound
- **Audio 2:** Dubbed sound

To Audio Dub

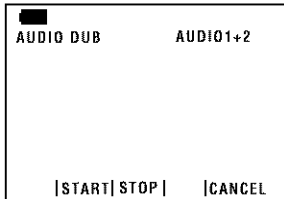
1. Play back the recorded DV cassette and locate the tape position where you wish to start audio dubbing.

Note: Use a Mini DV cassette recorded in SP mode. Audio Dubbing is not possible with LP mode recordings.



2. Press ►/|| to pause playback.
3. Press the MENU/DISPLAY button repeatedly to display the menu screen.
4. Press ▼ or ▲ to select **AUDIO DUB**, and then press *SET*.
5. Press ▼ or ▲ to select **AUDIO DUB**, and then press *SET*. The **AUDIO DUB** screen will appear.
6. Press *START* to begin audio dubbing.

- To pause audio dubbing, press *STOP*.
- To quit audio dubbing, press *CANCEL*. The **AUDIO DUB** screen turns off and playback stops.



To Change Dubbed Audio or Dub Additional Scenes

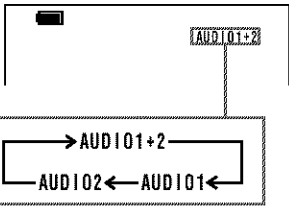
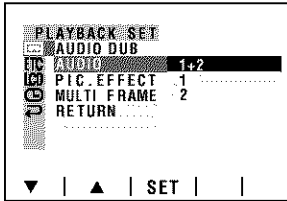
1. Press *CANCEL* to turn off the **AUDIO DUB** screen.
2. Repeat steps 1 to 5 above.

Notes:

- It is recommended that you use Audio Dubbing only with recordings made with this camcorder. Use of recordings made with other digital video equipment may result in poor audio quality.
- Audio dubbing will automatically pause if the original audio changes from 12-bit mode to 16-bit mode or vice versa. Press *START* to resume operation.
- Audio dubbing will automatically stop if a portion of the tape recorded in LP mode or an unrecorded portion of the tape is encountered.
- You can play back the dubbed audio and the original audio together or separately (see Audio Playback Mode on the next page).

Audio Playback Mode

You can select three different audio playback modes to listen to the dubbed audio recorded on the tape.



AUDIO 1+2

- 12-bit audio recording in stereo (Audio 1 and Audio 2 channels)
- 16-bit audio recording in stereo (left and right channels)

AUDIO 1

- 12-bit audio recording in stereo (Audio 1 channel only)
- 16-bit audio recording in mono (left channel only)

AUDIO 2

- 12-bit audio recording in stereo (Audio 2 channel only)
- 16-bit audio recording in mono (right channel only)

Select an Audio Playback Mode

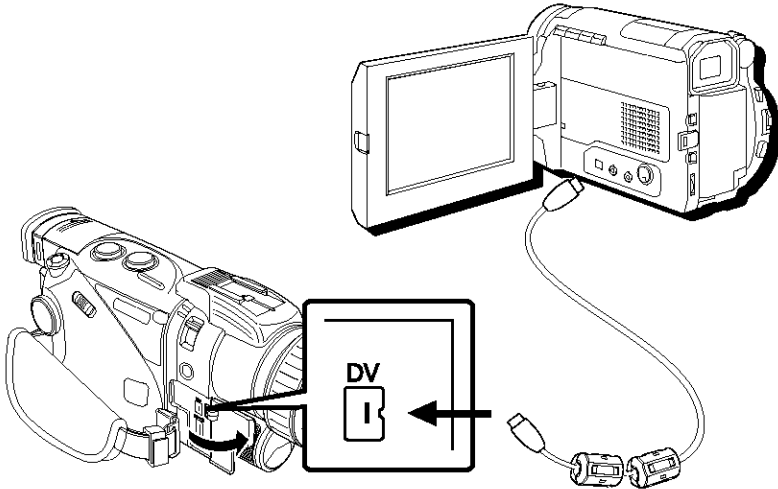
1. Play back a Mini DV cassette with dubbed audio.
 2. Press the MENU/DISPLAY button repeatedly to display the menu screen.
 3. Press ▼ or ▲ to select **00**, and then press *SET*.
 4. Press ▼ or ▲ to select *AUDIO*, and then press *SET*.
 5. Press ▼ or ▲ to select the desired audio playback mode, and then press *SET*.
- Select *1+2* (*AUDIO 1+2*), *1* (*AUDIO 1*) or *2* (*AUDIO 2*). The Chart on the left shows which audio is played back for that mode.
 - The audio playback mode indicator is displayed.

Notes:

- *The audio playback mode indicator, AUDIO, is displayed in different colors depending on the audio recording mode (12- or 16-bit) used for the recording being played back.*
- *A white display indicates 12-bit audio recording mode, and a green display, 16-bit audio recording mode.*

Dubbing to Another Digital Video Camcorder

You can also copy a recording to another camcorder with a DV jack using an optional DV cable. Be sure to attach the two small included ferrite cores on the end of the cable next to the camcorder.



To Use this Camcorder as the Playback Camcorder:

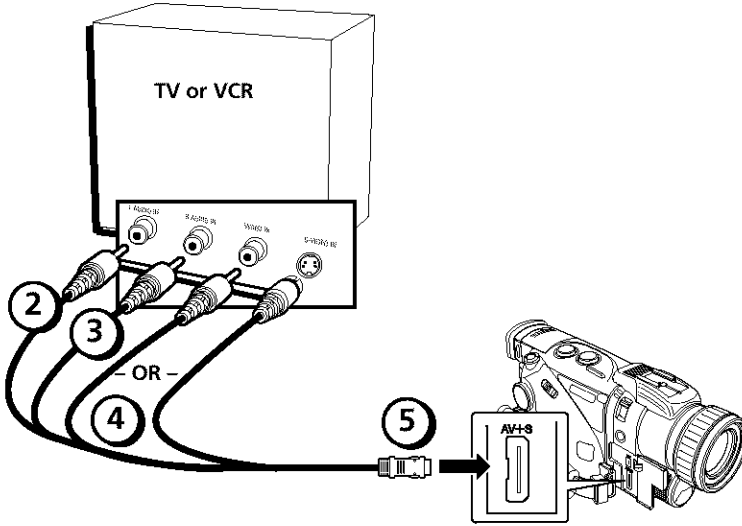
1. Make sure all units are turned off before making any connections.
2. Connect one end of the optional DV cable to each digital camcorder.
3. Press the camcorder's **▶/||** button to start playback.
4. While watching the playback on the monitor, start the receiving camcorder's record mode from the spot on the source tape you want to begin recording.

Notes:

- *It is recommended to use the power supply instead of the battery for uniform playback.*
- *For digital dubbing, this camcorder can be connected to only one device at a time. This camcorder can also be used as the recording camcorder.*
- *Even though the DV cable is connected correctly, sometimes the image may not appear during playback. If this occurs, turn off the power and make connections again.*

Connecting to a TV (or VCR) with Audio/Video (and/or S-VIDEO) Input Jacks

To connect your camcorder to a TV (or VCR) with audio/video (or S-Video) inputs, use the supplied Audio/Video/S-Video cable. If your TV is already connected to a VCR, attach the camcorder to the VCR and watch what the camcorder is recording or playing on the TV.



1. Make sure all units are turned off before making any connections.
2. Connect the white plug of the cable to the left AUDIO IN jack on the TV (or VCR).
Note: Some VCRs or TVs do not offer left and right audio jacks. For units with one audio jack, use the cable's white plug.
3. Connect the red plug of the cable to the right AUDIO IN jack on the TV (or VCR).
4. Connect the yellow plug to the VIDEO IN jack on the TV (or VCR).
OR: Connect the S-Video plug for video for an S-Video connection.
5. Open the jack cover on the camcorder and connect the other end of the cable to the AV+S jack on the camcorder.

Note: Hold in the catches on the side of the plug and pull it out to remove it from the camcorder. Do not pull on the cable without holding in the catches.

Playback on a TV (or VCR) with Audio/Video/S-Video Input Jacks

1. Turn on the TV and tune it to the video input channel or turn on the VCR and set it to the “line” or “camera mode”. (If your VCR does not have a “line” or “camera mode”, consult the VCR user’s guide.) Operate the TV as you normally do to see the signal coming from the VCR.
2. Open the LCD monitor.
3. Press in the Lock button and set the POWER switch to the PLAY position.
4. Press ►/|| button to begin playback.
 - During playback, use the playback features.
5. Press ■ when you are finished.

Notes:

- *It is recommended to use the power supply instead of the battery for power to achieve uniform playback.*
- *Adjust the TV sound volume to its minimum level to avoid a sudden burst of sound when the camcorder is turned on.*
- *If you have a TV or speakers that are not specially shielded, do not place the speakers next to the TV as interference will occur in the camcorder playback picture.*

Dubbing to a VCR

1. Following the illustration, connect the camcorder and the VCR.
2. Press in the Lock button and set the POWER switch to the PLAY position. Turn on the VCR’s power, and insert the appropriate tapes in the camcorder and VCR.
3. Make sure the VCR is in the appropriate AUX (LINE or VIDEO IN) mode and in the Record-Pause mode.
4. Use the camcorder’s ►►, ◀◀, and ►/|| buttons to find a spot just before the edit-in point. Once it is reached, press ►/|| on the camcorder.
5. When you’re ready to start recording, press ►/|| on the camcorder and press the appropriate record button on the VCR.
6. When you want to stop recording, press the VCR’s pause button and press ►/|| on the camcorder.
7. Repeat steps 4 through 6 for additional editing. Then stop the VCR and camcorder when finished.

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Advanced Features

Chapter Overview:

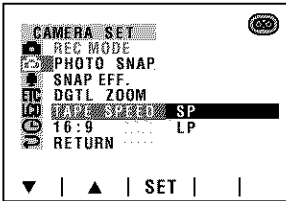
- Using the Menus for Advanced Adjustment
- Menu Definitions
- Using the Advanced Features

Changing Entertainment. Again.



Using Mode and Menu Screens For Advanced Adjustments

During recording, the type of Mode and Menu screens that appear depend on the setting of the DSC MODE and EASY/MANUAL/AUTO switch (see pages 35-37). The Mode screens appear automatically. The menu screens can be used to adjust many of the advanced settings of the camcorder.



Turn on Menu Screens

1. Open the LCD monitor and adjust.
2. Press in the Lock button and set the POWER switch to CAMERA or PLAY.
3. Press the MENU/DISPLAY button repeatedly to display the menu screen.

Note: When playing a tape, the Menu screen appears after the POWER switch is set to PLAY (go to step 4).

4. Press ▼ or ▲ to select the desired menu, and then press SET to display the features of the selected menu.
5. Press ▼ or ▲ to select the desired menu item, and press SET. The available settings for the selected menu item are displayed.
6. Press ▼ or ▲ to select the desired menu setting, and press SET.
 - The selected menu setting is set.
7. To adjust another menu item, press ▼ or ▲ to select RETURN and press SET until the camcorder returns to the status in step 5 or 6, and then repeat the procedure from that point.

Notes:

- Certain menu items are common among the camcorder modes. If the DISPLAY menu item, for example, is set to DATE+TIME in the TAPE-PLAY mode, it will be automatically set to DATE+TIME in other modes.
- The menu items are displayed in yellow when the corresponding functions are selected. The menu items are displayed in gray when the corresponding functions cannot be selected.
- The CONTROL dial can also be used to operate the Mode and Menu screens. Rotate the dial to select an item and press it in to set the item.
- The menu screen automatically turns off if no settings are made within five minutes.

Mode and Menu Screen Definitions

The following charts contain brief definitions of the features of the Mode and Menu screens. These screens offer different features for each recording and playback mode. For a more detailed explanation on how to use each feature, refer to the corresponding section.

DSC MODE Switch Set to DUAL or TAPE— POWER Switch in CAMERA.

Mode Screens


FADE Fades in and out of scenes (*see page 57*).

GAMMA Adds brightness to dark image (*see page 52*).

SRCH Lets you visually search the tape in CAMERA mode (*see page 51*).

MENU Screens


MANUAL SET Menus

The following menus are available when  is selected.

SHUT. SPEED	AUTO	Allows you select <i>AUTO</i> or <i>MANUAL</i> shutter speed. <i>MANUAL</i> allows you to adjust the shutter speed between 30 and 10000 (<i>see page 96</i>).
	MANUAL	
EXPOSURE	AUTO	Allows you select <i>AUTO</i> or <i>MANUAL</i> exposure settings. <i>MANUAL</i> allows you to adjust the exposure settings between -5 and 5 (<i>see page 95</i>).
	MANUAL	
PIC. EFFECT		Digital picture effects allow you to playback with a more dramatic effect (<i>see page 100</i>).
SCENE MENU		Allows you to set the camcorder to the best shooting mode for a specific situation by selecting one of the scene settings.
QK. RETURN	START	Returns you to beginning of recorded segment (<i>see page 50</i>).
	STOP	
DIS	ON	Factory Preset: Refer to Digital Image Stabilizer (<i>see page 56</i>).
	OFF	


Advanced Features

CAMERA SET Menus

The following menus are available when  is selected.

REC MODE	NORMAL	Allows you to record images with different quality settings. Only available in CARD mode (see page 113).
	ECONOMY	
	FINE	
PHOTO SNAP	SNAP	Allows you to record still images of subjects with normal sound on a tape. Only available in TAPE mode (see pages 62-63).
	STILL	
SNAP EFF.	OFF	Used with the PHOTO SNAP feature to make multiple strobe recordings of fast-moving subjects at intervals of 1/10 of a second using a 9 or 16 frame-picture. Only available in TAPE mode (see pages 60-61).
	PHOTO SHOT	
	9 FRAMES	
	16 FRAMES	
DGTL ZOOM	OFF	The optical zoom limit is 10X. When <i>OFF</i> is set, digital zoom is not used.
	40	Factory Preset: Allows you to use the Digital Zoom. By digitally processing and magnifying images, zooming is possible from 10X (the optical zoom limit) to a maximum of 40X digital magnification.
	400	Allows you to use the Digital Zoom. By digitally processing and magnifying images, zooming is possible from 10X (the optical zoom limit) to a maximum of 400X digital magnification.
TAPE SPEED	SP	Select the recording tape speed (see page 30).
	LP	
16:9	OFF	Does not display black bars. Use for normal recording.
	ON	Allows you to record black bars at the top and bottom of the screen to produce a wide-screen effect.

AUDIO SET Menus

The following menus are available when  is selected.

AUDIO MODE	12 bit	Factory Preset: Enables recording of stereo sound on four separate channels.
	16 bit	Enables recording of stereo sound on two separate channels.
ZOOM MIC	AUTO	Allows you to use the zoom microphone to record audio according to the magnification of the zoom lens. You can also use the zoom microphone to record sounds in the distance (<i>see page 102</i>).
	TELE	
	OFF	
WIND	ON	Wind noise is largely eliminated.
	OFF	Lets you record sounds without changes in wind intensity changing tonal qualities.
DIALOG REC	ON	Set to ON to record from a distance at a lecture, workshop or other occasion when the speaker's voice may blend with ambient sounds. Use this to record the speaker's voice more distinctly.
	OFF	

LCD/VF SET Menus

The following menus are available when **LCD** is selected.

BACKLIGHT	AUTO	Camcorder switches between <i>NORMAL</i> and <i>BRIGHT</i> depending on the ambient lighting.
	NORMAL	Use for indoors and moderate lighting.
	BRIGHT	Use outdoors under strong lighting or bright sun.
LCD BRIGHT		Adjusts the brightness of the picture on the LCD monitor.
LCD COLOR		Adjusts the color density of the picture on the LCD monitor.
VF BRIGHT		Adjusts the brightness of the picture in the viewfinder monitor.

Advanced Features

CLOCK SET Menus

The following menus are available when **C** is selected.

DISPLAY	OFF	The date/time does not appear.
	DATE	The date appears.
	DATE+TIME	The date and time appear.
AREA		World Clock: automatically adjusts the time to local time. Enter area number to adjust (<i>see page 106</i>).
DYLT SAVE	OFF	Does not set clock to Daylight Savings Time.
	ON	Advances the clock one hour to Daylight Savings Time.
SETTING		Use this to set the time and date (<i>see page 26</i>).
12H/24H	12H	Selects a 12-hour clock format.
	24H	Selects a 24-hour clock format.

OTHERS Menus

The following menus are available when **ETC** is selected.

SOUND	CHIME	A chiming sound is made when any operation is performed.
	BEEP	Beeps sound when any operation is performed.
	OFF	All confirmation sounds are turned off and shutter sounds during PHOTOSHOTS are also turned off.
MEDIA DISP	ON	<i>RECORDING TO TAPE</i> or <i>RECORDING TO MEMORY CARD</i> appears when recording a still image.
	OFF	Media Display will not appear.
TIME CODE	DISP.OFF	Factory Preset: Time Code is not displayed on camcorder.
	DISP.ON	Time Code is displayed on the camcorder.
TC OUT	OFF	Time Code is not displayed on TV.
	ON	Time Code is displayed on the TV. Frame numbers are not displayed during recording.
DEMO MODE	OFF	Auto demonstration will not operate.
	ON	Auto demonstration will operate (<i>see page 109</i>).


DSC MODE Switch Set to CARD – POWER Switch in CAMERA

Mode Screens

GAMMA Adds brightness to dark image (*see page 52*).


MENU Screens

MANUAL SET Menus

The following menus are available when  is selected.

SHUT. SPEED	AUTO	Allows you select <i>AUTO</i> or <i>MANUAL</i> shutter speed. <i>MANUAL</i> allows you to adjust the shutter speed between 30 and 500 (<i>see page 96</i>).
	MANUAL	
EXPOSURE	AUTO	Allows you select <i>AUTO</i> or <i>MANUAL</i> exposure settings. <i>MANUAL</i> allows you to adjust the exposure settings between -5 and 5 (<i>see page 95</i>).
	MANUAL	
SCENE MENU		Allows you to set the camcorder to the best shooting mode for a specific situation by selecting one of the scene settings.
SELF TIMER	EXECUTE	Refer to self-timer operation (<i>see page 116</i>).

CAMERA SET Menus

The following menus are available when  is selected.

REC MODE	NORMAL	Records images with standard image quality.
	ECONOMY	Allows you take more shots than in <i>NORMAL</i> mode but with a lower quality.
	FINE	Records in higher quality than <i>NORMAL</i> but with a lower number of shots.
IMAGE SIZE	1280x960	Images are recorded in 1280x960 pixels.
	640x480	Images are recorded in 640x480 pixels.
GUIDE FRM	OFF	No Guide Frames are displayed.
	CLOSE-UP	Displays a Guide Frame for recording a close-up face shot.
	PORTRAIT	Displays a Guide Frame for recording an upper-body view of a person.
	FULL-BODY	Displays a Guide Frame for recording a full-body view of a person.

Advanced Features

LCD/VF SET Menus

The following menus are available when **LCD** is selected (*same as page 85*).

CLOCK SET Menus

The following menus are available when **C** is selected. (*same as page 86*).

OTHERS Menus

The following menus are available when **ETC** is selected.

FORMAT	EXECUTE	Used to format a card. This will erase all of its contents (<i>see page 117</i>).
SOUND	CHIME	A chiming sound is made when any operation is performed.
	BEEP	Beeps sound when any operation is performed.
	OFF	All confirmation sounds are turned off and shutter sounds during PHOTOSHOTS are also turned off.
MEDIA DISP	ON	<i>RECORDING TO TAPE</i> or <i>RECORDING TO MEMORY CARD</i> appears when recording a still image.
	OFF	The Media Display will not appear.

DSC MODE Switch set to TAPE – POWER Switch in PLAY

Mode Screens

Press **◀◀** to rewind tape.

Press **▶/||** to start a tape playing. Press again to display a still picture.

Press **▶▶** to fast forward a tape.

Press **■** to stop the current camcorder operation.

GAMMA Press to increase the brightness of a subject (*see page 52*).

PLAYBACK SET Menus

The following menus are available when **☐** is selected.

AUDIO DUB		Refer to Audio Dubbing (<i>see page 74</i>).
AUDIO	1+2	Selects audio playback mode (<i>see page 76</i>).
	1	
	2	
PIC. EFFECT		Digital picture effects allow you to playback with a more dramatic effect (<i>see page 100</i>).
MULTI FRAME	OFF	Multiple Strobe Playback lets you capture the action of a fast-moving object at intervals of 1/10 of a second using a 9 or 16 frame picture (<i>see page 71</i>).
	9 FRAMES	
	16 FRAMES	

LCD/VF SET Menus

The following menus are available when **LCD** is selected (*same as page 85*).


OTHERS Menus

The following menus are available when **ETC** is selected.

REMOTE	ON	There is a built-in remote sensor for an optional remote control. Set this feature to ON to use an optional remote.
	OFF	Remote sensor is turned off.
SOUND	CHIME	A chiming sound is made when any operation is performed.
	BEEP	Beeps sound when any operation is performed.
	OFF	All confirmation sounds are turned off and shutter sounds during PHOTOSHOTS are also turned off.
TIME CODE	DISP. OFF	Factory Preset: Time Code is not displayed on camcorder.
	DISP. ON	Time Code is displayed on the camcorder.
TC OUT	OFF	Time Code is not displayed on TV.
	ON	Time Code is displayed on the TV. Frame numbers are not displayed during recording.
S-VIDEO IN	OFF	This is factory preset to <i>OFF</i> . <i>S-VIDEO IN</i> is turned off.
	ON	Set to <i>ON</i> to use the camcorder's <i>S-VIDEO IN</i> jack.

Advanced Features

CLOCK SET Menus

The following menus are available when  is selected.

DISPLAY	OFF	The date/time does not appear.
	DATE	The date appears.
	DATE+TIME	The date and time appear.


DSC MODE Switch Set to CARD – POWER Switch in PLAY

Mode Screens

MULTI Press to display a thumbnail of the images (*see page 118*).

PB Press to display the selected image full screen.

PLAYBACK SET Screens

The following menus are available when  is selected.

SLIDE SHOW	EXECUTE	Play back consecutive still images recorded on a card (<i>see page 122</i>).
SLIDE EFF.	OFF	Slide show effects are off.
	OVERLAP	A still image fades out as the next still image fades in. The two images momentarily overlap.
	WIPE	A still image is replaced with the next still image first appearing in the middle of the screen and gradually expanding to fill the screen.
PIC. EFFECT		Digital picture effects allow you to playback with a more dramatic effect (<i>see page 100</i>).
PROTECT	EXECUTE	Select to protect an image from being deleted (<i>see page 119</i>).
DELETE	EXECUTE	Select to delete an image (<i>see page 120</i>).
DELETE ALL	EXECUTE	Select to delete all images (<i>see page 121</i>).

OTHERS Menu

The following menus are available when **ETC** is selected.

REMOTE	ON	There is a built-in remote sensor for an optional remote control. Set this feature to ON to use an optional remote.
	OFF	Remote sensor is turned off.
SOUND	CHIME	A chiming sound is made when any operation is performed.
	BEEP	Beeps sound when any operation is performed.
	OFF	All confirmation sounds are turned off and shutter sounds during PHOTOSHOTS are also turned off.

LCD/VF SET Menu

The following menus are available when **LCD** is selected (*same as page 85*).

CLOCK SET Menu

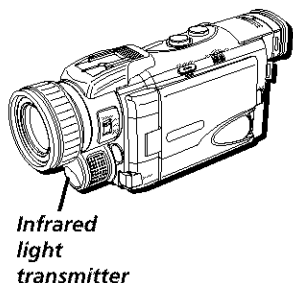
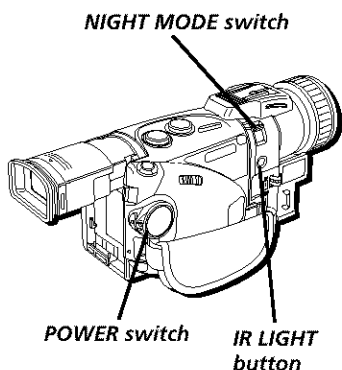
The following menus are available when **ⓐ** is selected (*same as page 90*).

Advanced Features

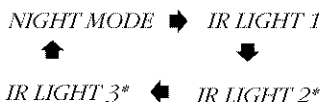
The camcorder has many advanced features to make your recording look more professional.

Night Mode

This feature can make dark subjects or areas even brighter than they would be under good, natural lighting. Although the recorded image is not grainy, it may have a strobing effect due to the slow shutter speed.



1. Press in the Lock button while setting the POWER switch to CAMERA.
2. Set the NIGHT MODE switch to ON. *NIGHT MODE* appears and the picture becomes brighter.
3. Press IR LIGHT button to make the picture brighter.
 - *NIGHT MODE* changes to *IR LIGHT 1* and the camcorder emits infrared light from the transmitter.
 - The picture becomes monochrome.
 - Each press of the IR LIGHT button increases the IR light mode. Set the IR light number higher for darker locations.



*Not available for recording on the card.

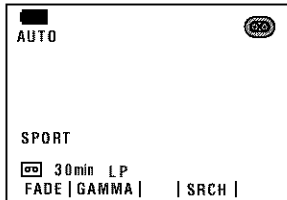
4. When finished using Night Mode, set the NIGHT MODE switch to OFF.

Notes:


- Use Night Mode when *LIGHT* appears on the display.
- During Night Mode many of the camcorder's manual functions cannot be used.
- The infrared light emitted from the camcorder illuminates up to a distance of about 10 feet away with *IR LIGHT 3*.
- During Night Mode, it may be difficult to bring the camcorder into focus. Try using a tripod or manual focus.

Program AE

You can set the camcorder to the best shooting mode for a specific situation by selecting one of the scene settings.



Select Scene Setting

1. Press in the Lock button while setting the POWER switch to CAMERA.
2. In Record-Standby, press MENU/DISPLAY repeatedly to display the menu screen.
3. Press ▼ or ▲ to select , and then press SET.
4. Press ▼ or ▲ to select SCENE MENU, and then press SET.
5. Press ▼ or ▲ to select the desired scene setting, and then press SET.

- The selected scene setting is displayed in yellow.
- The selected scene indicator is displayed on the LCD monitor.

6. To cancel a scene setting or turn all scene settings off, repeat step 5 and select OFF.
7. Press the MENU/DISPLAY button repeatedly to remove the menu screen.

Notes:

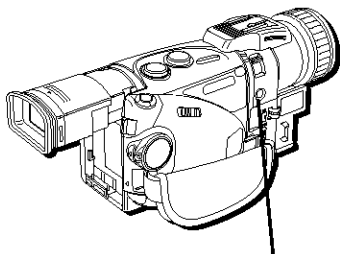
- Only one mode can be engaged at a time.
- Scene setting cannot be used with Night Mode.

Scene Setting	Effect
SPORT	You can record a fast-moving subject with little motion blur. (The shutter speed is set to 1/500 sec.) This is effective for recording tennis swings, track and field events.
SUNLIGHT	You can record without darkening the subject even if the background is particularly bright. This is effective for recording at ski areas or when swimming in the ocean.
DUSK	You can accurately record the red of the setting sun and the surrounding twilight.
PARTY	You can record a picture with the brightness adjusted for a subject with a large contrast to minimize white flaring. This is effective for recording subjects illuminated by a spotlight.

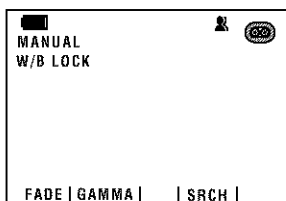
White Balance Adjustment

White balance refers to the correctness of color reproduction under various lighting. If the white balance is correct, all other colors will be accurately reproduced.

The white balance is usually adjusted automatically. However, you can reset this function manually to achieve a more professional color/tint reproduction.



W/B button



Reset the White Balance

1. Press in the Lock button while setting the POWER switch to CAMERA.
2. In Record-Standby mode, set the EASY/MANUAL/AUTO switch to MANUAL.
3. Hold a sheet of plain white paper in front of the camcorder lens. Adjust the distance so that the white paper fills the screen.

Note: It may be difficult to focus on the white paper. In such a case, adjust focus manually (see page 98).

4. Press the W/B button to set the white balance. *WHITE BAL* flashes while the camcorder is locking the white balance.
 - *W/B LOCK* will appear when white balance locking is complete.
5. Press the W/B button to exit white balance lock.

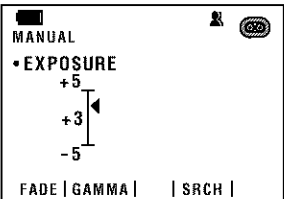
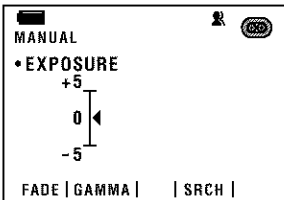
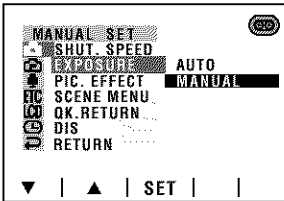
Notes:


- If *WHITE BAL* does not stop flashing, press the W/B button to cancel white balance.
- The camcorder will return to *AUTO White Balance* mode if a scene setting is selected and then canceled.
- *Manual White Balance* cannot be used with *Night Mode*.

Exposure Control

This feature automatically adjusts the exposure for the best available picture quality for most recording. Manual exposure adjustment is recommended in the following situations:

- When shooting using reverse lighting or when the background is too bright
- When shooting on a reflective natural background such as at the beach or when skiing
- When the background is overly dark or the subject light



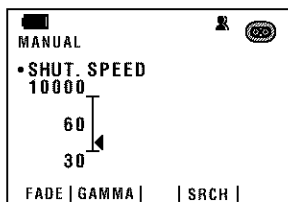
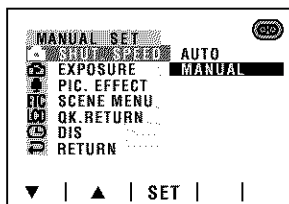
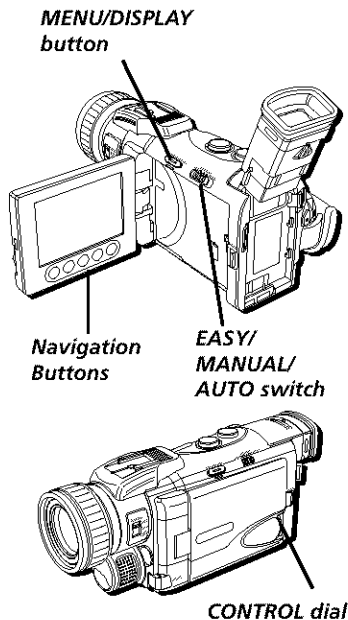
1. Press in the Lock button while setting the POWER switch to CAMERA.
2. In Record-Standby, set the EASY/MANUAL/AUTO switch to MANUAL. Press the MENU/DISPLAY button repeatedly to display the menu screen.
3. Press ▼ or ▲ to select , and then press *SET*.
4. Press ▼ or ▲ to select *EXPOSURE*, and then press *SET*.
5. Press ▼ or ▲ to select *MANUAL*, and then press *SET*.
 - The exposure setting screen is displayed.
6. Use the CONTROL dial to select an exposure setting, and then press the CONTROL dial in to select the exposure setting (+5—most light to -5—least light).
7. To return exposure to *AUTO*, repeat steps 2-5 and select *AUTO*.
8. Press the MENU/DISPLAY button repeatedly to remove the menu screen.
 - The camcorder returns to Record-Standby.


Notes:

- *The camcorder will return to AUTO Exposure mode if a scene setting is selected and then canceled afterward.*
- *Exposure control cannot be used with Night Mode.*

Shutter Speed Control

Auto Shutter Speed adjusts the shutter speed for the best available picture according to the lighting conditions. You may want to adjust the shutter speed manually to create a better quality picture. Recommended shutters speeds are *shown on the next page*.



1. Press in the Lock button while setting the POWER switch to CAMERA.
2. In Record-Standby, set the EASY/MANUAL/AUTO switch to MANUAL. Press the MENU/DISPLAY button repeatedly to display the menu screen.
3. Press ▼ or ▲ to select , and then press SET.
4. Press ▼ or ▲ to select SHUT. SPEED, and then press SET.
5. Press ▼ or ▲ to select MANUAL, and then press SET.
 - The shutter speed setting screen is displayed.
 - When recording on a tape, there are 17 shutter speeds from 30 (1/30 sec.) to 10000 (1/10,000 sec.).
 - When recording on a card, there are 9 shutter speeds from 30 (1/30 sec.) to 500 (1/500 sec.).
6. Use the CONTROL dial to select a shutter speed, and then press the CONTROL dial in to select the shutter speed.
7. To return shutter speed to AUTO, repeat steps 2-5 and select AUTO.
8. Press the MENU/DISPLAY button repeatedly to remove the menu screen.
 - The camcorder returns to Record-Standby.

Notes:

- *Fast shutter speeds can be used with the still recording functions to record higher quality still images of fast-moving objects.*
- *If the on-screen picture flickers when recording under fluorescent lighting, you may be able to compensate by setting the shutter speed to 1/100 second.*
- *Recording with shutter speeds faster than 1/60 sec. may darken the picture. Make sure to record in brightly lit areas if using higher shutter speeds.*
- *Using higher shutter speeds under fluorescent lighting will cause flickering in the picture and possibly color shifts.*
- *Set the EASY/MANUAL/AUTO switch to MANUAL to check the manual settings.*
- *The camcorder will return to AUTO Shutter Speed mode if a scene setting is selected and then canceled afterward.*
- *Manual Shutter Speed cannot be used with Night Mode.*

Recommended Shutter Speeds

1/30 Second

- Use to record in a poorly-illuminated location.
- Use when you want to create artistic trailing images of fast-moving subjects.

1/100 Second

- Use when you want to reduce the light by half.
- Use as a substitute for an ND2 filter.

1/250–1/1,000 Second

- Use to record outdoor sports on a partially cloudy day.
- Use to record an outside scene through a car window (when you want to minimize blur caused by the camera shaking).

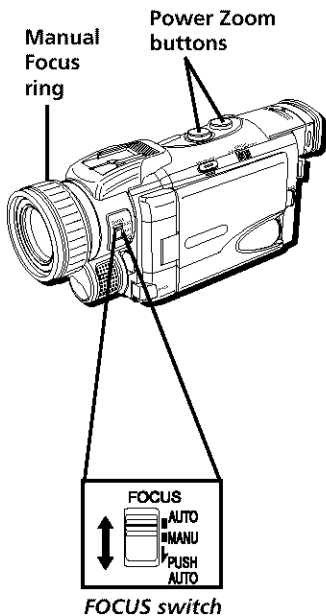
1/1,000–1/10,000 Second

- Use to record sports action in bright daylight.
- Use to record in bright daylight at some locations, such as a ski resort.

Auto and Manual Focus

The camcorder's automatic focus system offers continuous shooting ability from close-up to infinity. During auto focus, the camcorder will focus on the object located in the center of the scene. Auto focus may not operate correctly in the situations listed below. You may want to use manual focusing.

- When two subjects overlap in the same scene
- When illumination is low
- When the subject has no contrast (difference in brightness and darkness), such as a flat, one-color wall, or a clear, blue sky
- When a dark object is barely visible
- When the scene contains small patterns or identical patterns that are repeated
- When the scene is affected by light beams reflecting off water
- When shooting a scene with a high-contrast background



Auto Focus

1. Press in the Lock button while setting the POWER switch to CAMERA.
2. In Record-Standby mode, set the FOCUS switch to AUTO.

Manual Focus

1. Press in the Lock button while setting the POWER switch to CAMERA.
 2. In Record-Standby mode, set the FOCUS switch to MANU. *MF* is displayed.
 3. Use the Zoom T and W buttons to zoom in or out on the object you want to focus on.
 4. Rotate the manual focus ring to focus on the subject.
- ▲ appears when the focus cannot be adjusted any farther.
 - ■ appears when the focus cannot be adjusted any closer.

Use Auto Focus Temporarily

While the camcorder is in manual focus, you can use the auto-focus feature temporarily. This helps create a smooth image when you move from one subject to another using manual focus.

1. Push and hold the FOCUS switch in PUSH AUTO.
2. Release the switch to return to manual focus. FOCUS switch in MANU.

Cancel Manual Focus

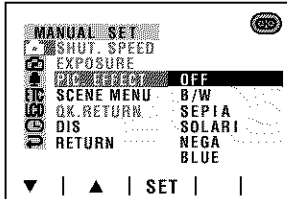
1. Set the FOCUS switch to AUTO.


Notes:

- *If the lens is smeared or blurred, accurate focusing isn't possible. Keep the lens clean, wiping it with a piece of soft cloth if it gets dirty. If condensation occurs, wipe the lens with a soft cloth or wait for it to dry naturally.*
- *When shooting a subject closer than 5 ft. to the lens, zoom out first. When zooming in the auto-focus mode, the camcorder may automatically zoom out depending on the distance between the camcorder and the subject.*

Digital Picture Effects

Use one of the digital picture effects to add a more dramatic look to your taped recordings.



1. Press in the Lock button while setting the POWER switch to CAMERA.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select  and then press SET.
4. Press ▼ or ▲ to select PIC.EFFECT and press SET.
5. Press ▼ or ▲ to select the PIC.EFFECT you want and press SET.
 - Select OFF for normal recording.
 - Select B/W to have the picture recorded in black and white.
 - Select SEPIA to record the picture with a brownish tint like old photos.
 - Select SOLARI to record the picture with enhanced contrast creating a unique artistic image.
 - Select NEGA to record the picture with the blacks and whites of the image reversed and the colors of the image inverted.
 - Select BLUE to record the picture with the effect of recording through a blue filter.
6. Press the MENU/DISPLAY button until the menu screen turns off.

To Cancel the Digital Picture Effect

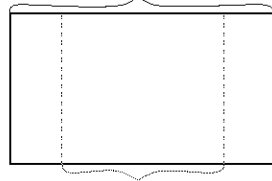
Select OFF and then press SET in step 5 above.

Note: Digital picture effects cannot be used when a still image is displayed.

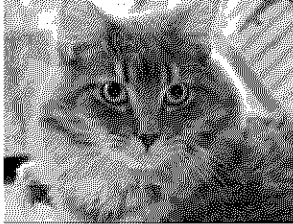
Wide Mode (16:9)

The camcorder lets you make recordings compatible with the 16x9 (wide screen) format. When Wide Mode is activated, the camcorder records black bars at the top and bottom of the picture to produce the wide-screen effect. This is also known as “letterbox” recording.

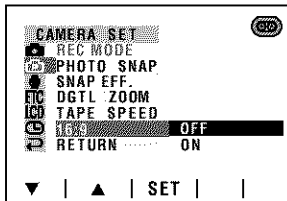
New 16x9 TV Screen



Standard Shape TV Screen




16:9 OFF



16:9 ON

Record in Wide Mode

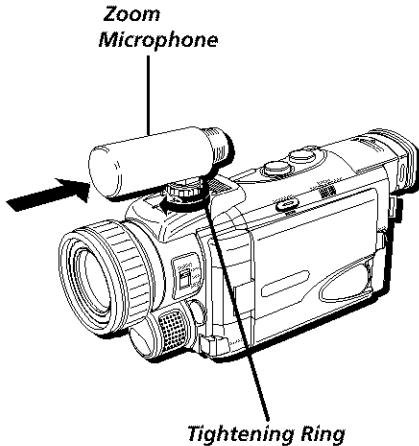
1. Press in the Lock button while setting the POWER switch to CAMERA.
2. Set the DSC MODE switch to TAPE.
3. Repeatedly press the MENU/DISPLAY button to display the menu screen.
4. Press ▼ or ▲ to select  and press SET to display the CAMERA SET screen.
5. Press ▼ or ▲ to select 16:9, and then press SET.
6. Press ▼ or ▲ to select ON, and then press SET.
 - The picture is displayed with black bars at the top and bottom.
7. Press the MENU/DISPLAY button until the menu screen turns off.

Return to Normal Screen

Select OFF and then press SET in step 5 .

Using the Zoom Microphone

Using the supplied zoom microphone allows you to produce optimum sound by recording audio according to the magnification of the zoom lens. You can set the zoom microphone to record only the sounds at a distance. Remove the optional accessory video light if it is attached (*see page 59*).



Attach Zoom Microphone

1. Slide the zoom microphone onto the accessory shoe in the direction of the arrow *as shown* until it locks into place.
2. Turn the tightening ring clockwise in the direction of the arrow to secure the zoom microphone.

Remove Zoom Microphone

Turn the tightening ring counter clockwise and slide off the microphone.


Cautions:

- *Make sure the microphone is securely attached to the accessory shoe.*
- *Leave the windscreen (foam cover) on while recording outdoors. Taking the windscreen off will significantly increase the wind noise.*
- *Do not pick up the camcorder by the zoom microphone. This may damage the camcorder or microphone.*

Select Zoom Microphone Mode

The zoom microphone lets you record sounds from a distance. It can automatically select the optimum sound when the zoom lens is zoomed out.



1. Press in the Lock button while setting the POWER switch to CAMERA.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select  and then press *SET* to display the *AUDIO SET*.
4. Press ▼ or ▲ to select *ZOOM MIC*, and then press *SET*.
5. Press ▼ or ▲ to select the *ZOOM MIC* mode you want and press *SET*.
 - Select *OFF* to turn the zoom microphone off. The built-in microphone is turned on. This allows you to record a wider range of sound than with the zoom microphone for normal recording.
 - Select *AUTO* to have the camcorder automatically select the optimum sound according to the magnification of the zoom lens. When the zoom lens is zoomed out, the built-in microphone is used to record sounds. As you zoom in, the sounds from the zoom microphone are mixed according to the zoom setting.
 - Select *TELE* to have the zoom microphone only record sounds at a distance. The built-in microphone is turned off.
6. Press the MENU/DISPLAY button until the menu screen turns off.


Note: Zoom Mic setting is fixed to *AUTO* in the *EASY* mode.

Dialog Recording

Dialog recording lets you record from a distance at a lecture, workshop or other occasion when the speaker's voice may blend with ambient sounds. Use this to record the speaker's voice more distinctly.



To Use Dialog Recording

1. Press in the Lock button while setting the POWER switch to CAMERA.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select  and press SET to display the AUDIO SET Menu screen.
4. Press ▼ or ▲ to select DIALOG REC and press SET.
5. Press ▼ or ▲ to select ON and press SET.
6. Press the MENU/DISPLAY button until the menu screen turns off.

To Cancel Dialog Records


Select OFF and press SET in step 5 .

Wind Cut

To help cut down on the noise created by wind when shooting outside, use the Wind Cut feature.



To Use Wind Cut

1. Press in the Lock button while setting the POWER switch to CAMERA.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select  and press SET to display the AUDIO SET menu screen.
4. Press ▼ or ▲ to select WIND, and then press SET.
5. Press ▼ or ▲ to select the wind cut mode you want, and then press SET.
 - Select ON when the wind noise is irritating. The wind noise is almost eliminated.
 - Select OFF to record sounds without changes in wind intensity changing tonal qualities.
6. Press the MENU/DISPLAY button until the menu screen turns off.

To Cancel Wind Cut

Select OFF and then press SET in step 5.

Note: When using wind cut, the sound quality changes. This is normal.


Advanced Features

World Clock

The World Clock feature adjusts the camcorder's clock to local time while traveling anywhere in the world. Use the time zone map and area table to help locate the area you want to select.



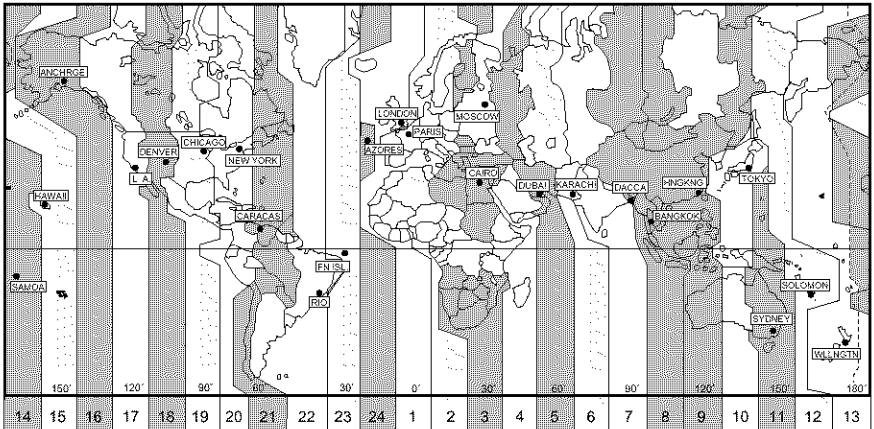
Set World Clock

1. Make sure the area, date and time for your home time zone have already been set (see page 26).
2. Press in the Lock button while setting the POWER switch to CAMERA.
3. Repeatedly press the MENU/DISPLAY button to display the menu screen.
4. Press ▼ or ▲ to select  and press SET to display the CLOCK SET screen.
5. Press ▼ or ▲ to select AREA, and press SET.
6. Press ▼ or ▲ to select the area and time zone you are in, and press SET.
7. Press the MENU/DISPLAY button until the menu screen turns off.

To Return Clock to Your Area

Select your area in Step 6 above.

Time Zone Chart



Area Number

Area Table

Area Number	Area Name	Countries or Areas*
1	LONDON	England, Morocco, GMT (Greenwich mean time)
2	PARIS	Austria, France, Germany, Italy, Netherlands, Spain, Sweden, Switzerland, Portugal, CST (Continental Standard Time), Tunisia
3	CAIRO	Egypt, Finland, Greece, Turkey
4	MOSCOW	Ethiopia, Iraq, Kenya, Mauritius, Saudi Arabia, Seychelles, Russia (Moscow)
5	DUBAI	United Arab Emirates
6	KARACHI	Maldives, Pakistan
7	DACCA	Bangladesh, India, Myanmar
8	BANGKOK	Cambodia, Indonesia (Jakarta), Thailand, Vietnam
9	HNGKNG	Australia (Perth), China, Hong Kong, Indonesia (Borneo, Bali), Malaysia, Philippines, Singapore, Taiwan
10	TOKYO	Japan, Korea
11	SYDNEY	Australia (Sydney)
12	SOLOMON	New Caledonia
13	WLLNGTN	Fiji, New Zealand
14	SAMOA	Western Samoa
15	HAWAII	Hawaii Is., Tahiti, HST (Hawaii Standard Time)
16	ANCHRGE	U.S.A. (Alaska), AST (Alaska Standard Time)
17	L.A.	U.S.A. (Los Angeles, San Francisco), PST (Pacific Standard Time)
18	DENVER	U.S.A. (Denver), MST (Mountain Standard Time)
19	CHICAGO	Mexico (Mexico City), U.S.A. (Chicago), CST (Central Standard Time)
20	NEW YORK	Canada (Montreal), Jamaica, Peru, U.S.A. (New York, Washington D.C.), EST (Eastern Standard Time)
21	CARACAS	Chile, Dominican Republic, Venezuela
22	RIO	Argentina, Brazil, Uruguay
23	FN ISL.	Fernando de Noronha
24	AZORES	Azores Islands

*These are commonly used names. The formal names may be different.

Setting the Confirmation Sound

A confirmation sound is made when you turn on or off the POWER switch, select a function or setting, or perform other designated operations. Use the procedure below to change the type of sound or to turn off the confirmation sounds.

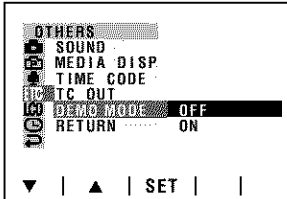


1. Repeatedly press the MENU/DISPLAY button to display the menu screen.
2. Press ▼ or ▲ to select **ETC.**, and press **SET**. Press ▼ or ▲ to select **SOUND** and press **SET**.
3. Press ▼ or ▲ to select **CHIME**, **BEEP**, or **OFF** and press **SET**.
 - Select **CHIME** to hear a chiming sound.
 - Select **BEEP** to hear an electronic beeping sound.
 - Select **OFF** and no confirmation sound, including a warning sound, is made.
4. Press the MENU/DISPLAY button until the menu screen turns off.

Note: If **OFF** is selected, the sound effect of a camera shutter closing in **PHOTO SHOT** will also be turned off.

Demonstration Mode

You can watch a brief demonstration of the special camcorder features in Demo mode.



Watching the Demonstration

1. Remove the Mini DV cassette from the camcorder, and set the NIGHT MODE switch to OFF.
2. Set the DSC MODE switch to TAPE or DUAL.
3. Hold in the Lock button and set the POWER switch to CAMERA.
4. Repeatedly press the MENU/DISPLAY button to display the menu screen.
5. Press ▼ or ▲ to select **ETC** and press *SET*. Press ▼ or ▲ to select *DEMO MODE* and press *SET*.
6. Press ▼ or ▲ to select *ON* and press *SET*.

- The demonstration begins.

Note: If you operate any controls, the demonstration pauses. If you leave it for 60 seconds or turn the power off temporarily, it will resume when you set the POWER switch to CAMERA.



Canceling Demo Mode

1. During the demonstration, press the MENU/DISPLAY button to display the menu screen.
2. Press ▼ or ▲ to select **ETC** and press *SET*. Press ▼ or ▲ to select *DEMO MODE* and press *SET*.
3. Press ▼ or ▲ to select *OFF* and press *SET* to stop the demonstration.
4. Press the MENU/DISPLAY button until the menu screen turns off.

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Digital Still Camera

Chapter Overview:

- Recording
- Playback
- Transferring Card Data to a Computer

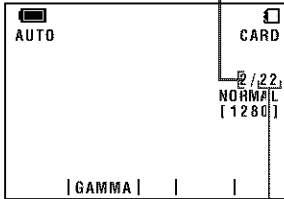
Changing Entertainment. Again.



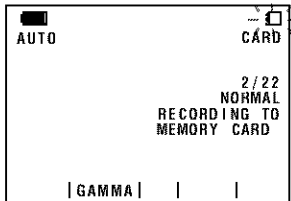
Card Recording


You can use the camcorder just like a digital camera and take a still picture and record it to the card.

Number of shots taken




Number of shots remaining



1. Make sure a MultiMediaCard is inserted (see page 13).
2. Set the FOCUS switch to AUTO and DSC MODE switch to CARD.
3. Press in the Lock button and set the POWER switch to CAMERA.
4. Open the LCD monitor or adjust the viewfinder.
5. Use the Zoom buttons to frame the subject (from 1 to 7 times zoom).
6. Press the STILL button to record a still image of the subject. The  indicator flashes red while data is being recorded on the card and returns to white when recording is finished.
7. When finished recording, set the POWER switch to OFF.

Caution:

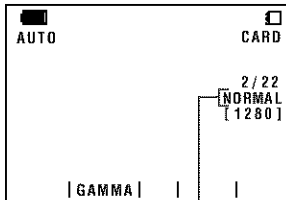
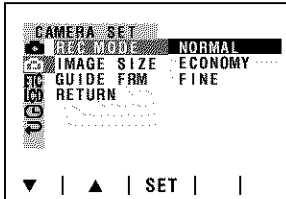
- Do not turn the power off or remove the card while the  indicator is flashing in step 6. This may delete or damage images on the card or damage the card.

Notes:

- To remove the icons from the camcorder's display during recording, press the MENU/DISPLAY button.
- In CARD-CAMERA mode, the angle of field is slightly wider than in TAPE-CAMERA or DUAL-CAMERA mode.
- Recording under insufficient light may result in blurred images. Try using a tripod.
- RECORDING TO MEMORY CARD or RECORDING TO TAPE is displayed during the recording of still images. If you do not want this displayed, set the MEDIA DISP. menu item in the OTHERS menu to OFF in one of the CAMERA modes.


Select Picture Quality and Image Size

The picture quality of still images recorded on a card and the number of recordable images depend on the combination of the picture quality and image size settings. Select the appropriate settings for your recording. The camcorder compresses each image with the picture quality setting to save memory on a card.



Picture Quality indicator

To Select a Picture Quality

1. Set the DSC MODE switch to DUAL or CARD and the POWER switch to CAMERA.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select  and press SET to display the CAMERA SET screen.
4. Press ▼ or ▲ to select REC MODE and press SET.
5. Press ▼ or ▲ to select NORMAL, ECONOMY, or FINE, and then press SET. The selected picture quality is displayed.
 - Select NORMAL to record approximately 48 images in 1280 x 960 or 200 images in 640 x 480.
 - Select ECONOMY to record approximately 92 images in 1280 x 960 or 360 images in 640 x 480.
 - Select FINE to record approximately 22 images in 1280 x 960 or 120 images in 640 x 480.
6. Press the MENU/DISPLAY button until the menu screen turns off.

Notes:

- The number of recordable images differs depending on the combination of picture quality and image size settings being used and the images being shot.
- The picture quality indicator displayed in the CARD-PLAY mode may differ from the quality selected for recording depending on factors, such as image details.

Select Image Size

Still images recorded on a card are made up of pixels. You can select the number of pixels you want to record. Larger number of pixels provide greater image detail, but use more card memory.

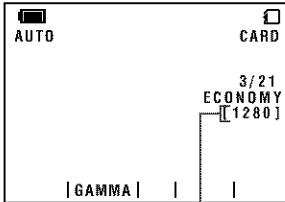
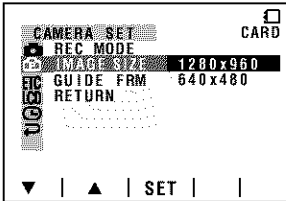



Image Size indicator

To Select an Image Size

1. Set the DSC MODE switch to CARD and the POWER switch to CAMERA.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select  and press SET to display the CAMERA SET screen.
4. Press ▼ or ▲ to select IMAGE SIZE and press SET.
5. Press ▼ or ▲ to select 1280x960 or 640x480 and press SET.
 - Select 1280x960 to record images in 1280 x 960 pixels. These images have better quality, but require more memory on the card.
 - Select 640x480 to record images in 640 x 480 pixels.
 - The selected image size indicator is displayed.
6. Press the MENU/DISPLAY button until the menu screen turns off.

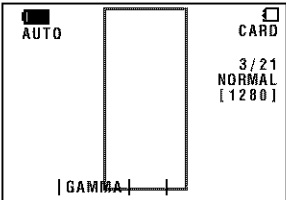
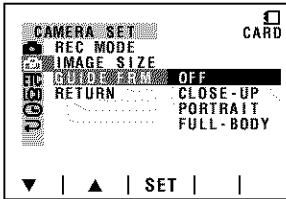
Note: When the DSC MODE switch is set to DUAL, image size is fixed at 640x480 pixels.

Approximate Number of Recordable Images		
Picture Quality	Image Size	
	1280 x 960	640 x 480
NORMAL	48	200
ECONOMY	92	360
FINE	22	120

This chart is approximate and applies to a 16MB memory card.

Recording with a Guide Frame

Displaying guide frames on the screen helps you gauge the size of the subject's image.



Full Body Guide Frame

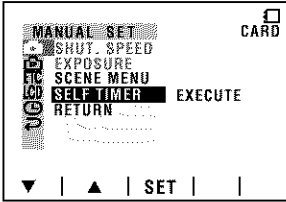
1. Set the DSC MODE switch to **CARD** and the **POWER** switch to **CAMERA**.
2. Repeatedly press the **MENU/DISPLAY** button to display the menu screen.
3. Press **▼** or **▲** to select **☐** and press **SET** to display the **CAMERA SET** screen.
4. Press **▼** or **▲** to select **GUIDE FRM**, and then press **SET**.
5. Press **▼** or **▲** to select a **GUIDE FRM** and press **SET**. The selected guide frame is displayed.
 - Select **OFF** to have no guide frames displayed.
 - Select **CLOSE-UP** to have a guide frame for recording a close-up of a person's face.
 - Select **PORTRAIT** to have a guide frame for recording an upper-body view of a person.
 - Select **FULL-BODY** to have a guide frame for recording a full-body view of a person.
6. Press the **MENU/DISPLAY** button until the menu screen turns off.

To Turn off Guide Frame


- Select **OFF** and press **SET** in step 5.

Recording with the Self Timer

The Self-Timer feature allows you to record images after a time-lag of ten seconds. This is convenient when you want to get in the picture.

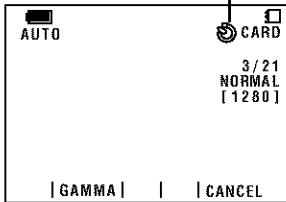


To Set the Self Timer

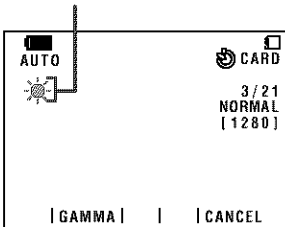
1. Set the DSC MODE switch to CARD and the POWER switch to CAMERA.
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select  and press SET to display the MANUAL SET screen.
4. Press ▼ or ▲ to select SELF TIMER and press SET. The Self-Timer indicator appears.
5. Center the subject and press the STILL button to set the timer. The Self-Timer indicator flashes while the timer counts down.

- A still image will be recorded ten seconds after you press the STILL button.

Self-Timer indicator



Self-Timer indicator flashes while the timer counts down.



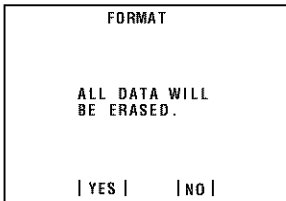
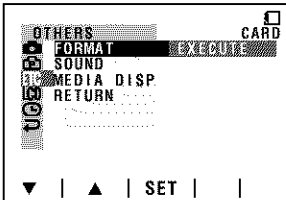
Notes:

- It is best to use a tripod to stabilize the camcorder during Self-Timer recording.
- To cancel Self-Timer, press CANCEL.
- The Self-Timer records one shot. Repeat steps 1-5 to record another shot.

Formatting a Card

In order to use a commercially available card with this camcorder, you must format it for this camcorder. You may also need to format a card if one of the following warnings appear.

- *FORMAT MEMORY CARD*
- *MEMORY CARD READ ERROR*
- *MEMORY CARD ERROR*
- *CANNOT STORE DATA*



To Format a Card

1. Insert the card you want to format (see page 13).
2. Set the DSC MODE switch to CARD and the POWER switch to CAMERA.
3. Repeatedly press the MENU/DISPLAY button to display the menu screen.
4. Press ▼ or ▲ to select **ETC** and press *SET* to display the *OTHERS* screen.
5. Press ▼ or ▲ to select *FORMAT* and press *SET*.
6. Press *SET* again to display the *FORMAT* screen.
 - Press *YES* to format the card.
 - Press *NO* to cancel formatting.
 - The menu screen appears when formatting ends.
7. Press the MENU/DISPLAY button until the menu screen turns off.

Notes:

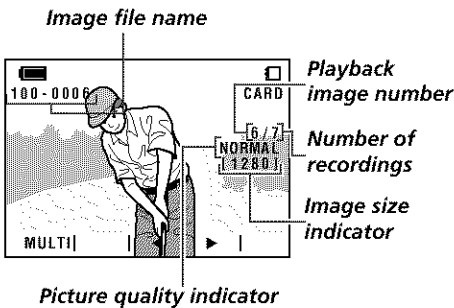
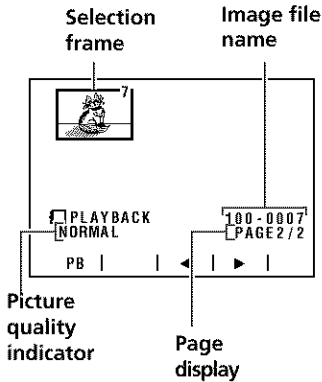
- The supplied MultiMediaCard is formatted for immediate use.
- Use this camcorder to format a card. The camcorder may not recognize the images on a card formatted by a computer or other equipment.

Cautions:

- Formatting a card deletes all images on the card including the delete-protected images. Be sure to copy important data on your computer or other media source before formatting the card (see page 128 to transfer data on a card to a computer).
- Do not remove the power source during formatting, as this may cause damage to the camcorder or card. It is recommended that you use the AC outlet for the power supply.

Card Playback

You can play back and view still images recorded on a card on the LCD monitor.



1. Make sure the card is inserted (*see page 13*).
2. Open the LCD monitor and adjust.
3. Set the DSC MODE switch to CARD.
4. Hold down the Lock button and set the POWER switch to PLAY.

- The images recorded on the card are displayed in a thumbnail format.

Note: Because the amount of recorded details for the recorded image varies, the picture quality indicator displayed during playback may not match the quality setting used during recording.

- If the image you want to view does not appear, press ◀ or ▶ to scroll through the thumbnail images.
5. Use ◀ or ▶ to scroll through the thumbnail images and highlight them.

- To set the image enclosed by the selection frame, press *PB*.
- The selected image is displayed in full screen.

Operations During Full-Screen Display

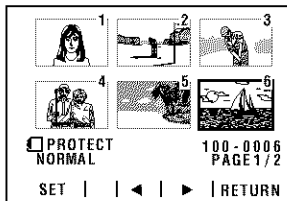
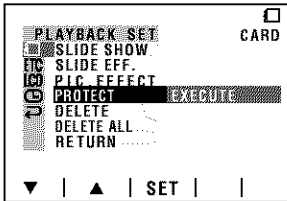
- Press ◀ or ▶ to display the full-screen picture of the previous or next image.
- To return to a thumbnail of the images, press *MULTI*.

Caution:

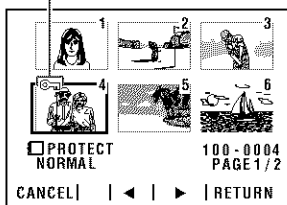
When image data created on a computer or recorded on a different camcorder is played back on that equipment and the data is corrupted (the image has video noise or is erratic), do not play back that image data on this camcorder. Doing so can sometimes cause abnormal screen display (vertical lines and so on). If this happens, turn off the camcorder's power and remove the card.

Delete Protection

It is possible to prevent your images recorded on the card from being accidentally erased by using the delete-protection feature.



Delete-protection indicator



1. Make sure the card is inserted (*see page 13*).
2. Open the LCD monitor and adjust.
3. Set the DSC MODE switch to CARD.
4. Hold down the Lock button and set the POWER switch to PLAY. The images recorded on the card are displayed in a thumbnail format.
5. Repeatedly press the MENU/DISPLAY button to display the menu screen.
6. Press \blacktriangledown or \blacktriangle to select \square and press *SET* to display the *PLAYBACK SET* screen.
7. Press \blacktriangledown or \blacktriangle to select *PROTECT* and press *SET*.
8. If the image you want to protect does not appear, press \blacktriangleleft or \blacktriangleright to scroll through the thumbnail images.
9. Press \blacktriangleleft or \blacktriangleright to select and highlight it and press *SET* to protect it. The \square indicator appears on the image when it is protected.
 - If you want to protect another image, repeat steps 8 and 9.
10. Press *RETURN*, and then press the MENU/DISPLAY button to turn off the *PROTECT* screen.

To Cancel the Protection Setting

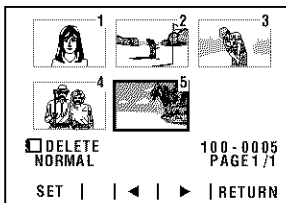
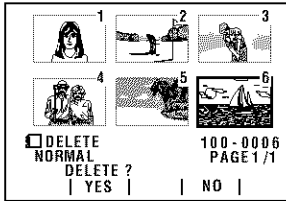
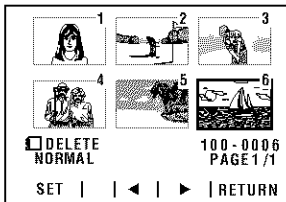
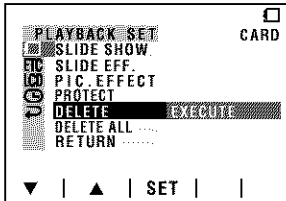
1. Perform steps 1-8 above.
2. Press \blacktriangleleft or \blacktriangleright to select and highlight it, and press *CANCEL* to cancel protection. The \square indicator disappears.
 - To cancel the protection for the image enclosed by the selection frame, press *CANCEL*.

Note: Formatting a card deletes all images on it, including the ones with the delete-protection setting.

Deleting Stored Images

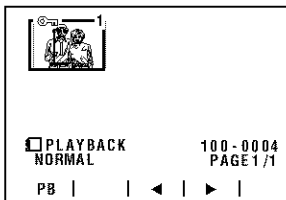
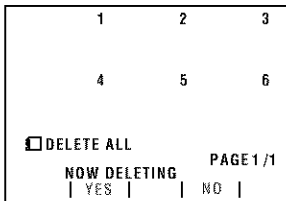
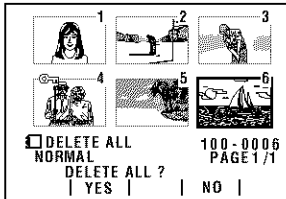
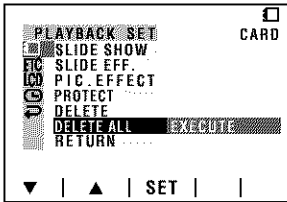
You can delete unwanted images to free up memory on a card for new images.

Note: Deleted images cannot be restored. Make sure you do not want the images before deleting them.



Deleting a Particular Image

1. Make sure the card is inserted (*see page 13*).
2. Open the LCD monitor and adjust.
3. Set the DSC MODE switch to CARD.
4. Hold down the Lock button and set the POWER switch to PLAY. The images recorded on the card are displayed in a thumbnail format.
5. Repeatedly press the MENU/DISPLAY button to display the menu screen.
6. Press ▼ or ▲ to select and press SET to display the *PLAYBACK SET* screen.
7. Press ▼ or ▲ to select *DELETE* and press SET.
8. If the image you want to delete does not appear, press ◀ or ▶ to scroll through the thumbnail images.
9. Press ◀ or ▶ to select and highlight it and press SET to delete. A delete confirmation screen will appear.
 - Press *YES* to delete the image.
 - To cancel deletion, press *NO*.
 - If you want to delete another image, repeat steps 8 and 9.
10. Press RETURN, and then press the MENU/DISPLAY button to turn off the menu screen.



Deleting All Stored Images

If you want to keep some images on the card, first delete-protect them (*see page 119*), and then perform the procedure below.

1. Make sure the card is inserted (*see page 13*).
2. Open the LCD monitor and adjust.
3. Set the DSC MODE switch to CARD.
4. Hold down the Lock button and set the POWER switch to PLAY. The images recorded on the card are displayed in a thumbnail format.
5. Repeatedly press the MENU/DISPLAY button to display the menu screen.
6. Press \blacktriangledown or \blacktriangle to select and press *SET* to display the *PLAYBACK SET* screen.
7. Press \blacktriangledown or \blacktriangle to select *DELETE ALL* and press *SET*.

- Press *YES* to delete all the images.
- To cancel deletion, press *NO*.

Notes:

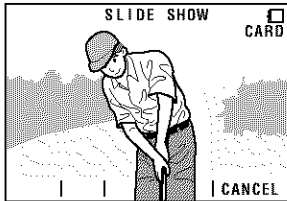
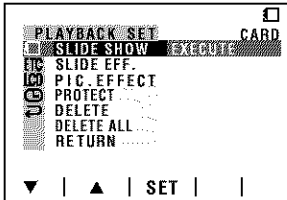
- *The protected images cannot be deleted. Cancel the protection setting to delete the image (see page 119).*
- *It will take some time to complete deleting all the stored images.*


Caution:

- *Do not turn the power off while deleting images.*

Slide Show Playback

It is possible to automatically play back consecutive still images recorded on a card. This is useful when confirming the data recorded on a card.



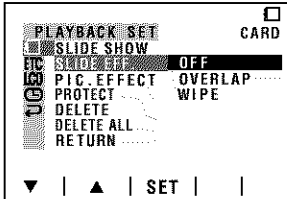
1. Display the full screen picture of the image from which you want to begin Slide Show Playback (see page 118).
2. Repeatedly press the MENU/DISPLAY button to display the menu screen.
3. Press ▼ or ▲ to select  and then press SET to display the PLAYBACK SET menu screen.
4. Press ▼ or ▲ to select SLIDE SHOW and press SET; slide show playback begins.
 - Beginning from the image selected in step 1, the recorded images will be displayed in full-screen one after another in order of recording.
 - After playing back all the images on the card once, Slide Show Playback automatically stops.
 - To stop the slide show, press CANCEL.
5. Press the MENU/DISPLAY button until the menu screen turns off.

Notes:

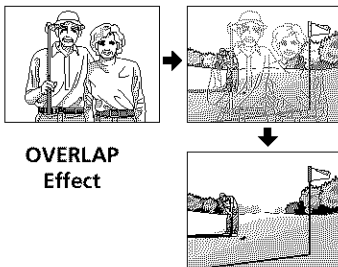
- The display interval may vary depending upon the image size.
- Slide Show Playback automatically stops if you press the MENU/DISPLAY button.
- Slide Show Playback cannot be used with Picture Effect Playback.

Using Slide Show Effects

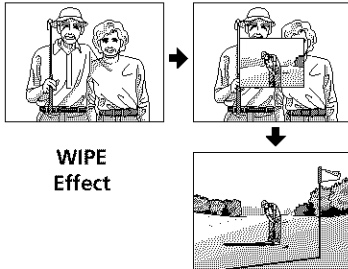
Slide show effects can be used to create interesting scene transitions between still images during Slide Show Playback.



1. Perform steps 1 and 3 on the previous page.
2. Press ▼ or ▲ to select *SLIDE EFF.* and press *SET*.
3. Press ▼ or ▲ to select *OFF*, *OVERLAP*, or *WIPE* and press *SET*.

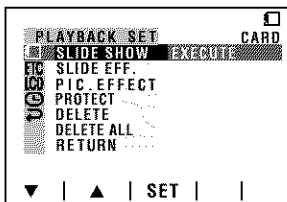


- Select *OVERLAP* to have the image fade out as the next image fades in replacing it. The two still images momentarily overlap.
- Select *WIPE* to have the displayed image replaced with the next image appearing in the middle of the screen and gradually expanding to fill the screen.
- Select *OFF* to have no effect.



4. Press ▼ or ▲ to select *SLIDE SHOW* and press *SET*.

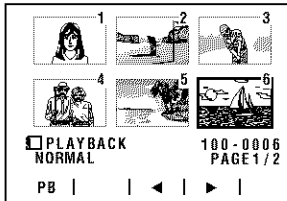
- The still image is replaced with the next still image with the selected slide show effect.
- After playing back all the images on the card once, Slide Show Playback automatically stops.
- To stop the slide show, perform step 3 and select *OFF*.



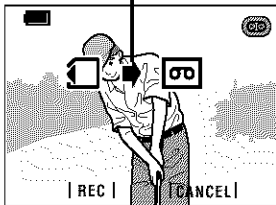
5. Press the MENU/DISPLAY button until the menu screen turns off.

Dubbing Images from a Card to a Tape

Follow the steps below to record still images from a card in the camcorder to a tape in the camcorder.



Card-to-Tape indicator



Card to tape dubbing

1. Insert the recorded card and a MiniDV cassette in the camcorder.
2. Set the DSC MODE switch to TAPE.
3. Hold down the Lock button and set the POWER switch to PLAY. Play back the tape and locate the place on the tape where you want the image to be recorded.
4. Set the DSC MODE switch to CARD. If the image you want to copy does not appear, press ◀ or ▶ to scroll through the thumbnail images.
5. Press *PB* to select the highlighted image.
 - The selected image is displayed full screen.
6. Press the REC START/STOP button. The camcorder enters Record-Standby. The card-to-tape dubbing indicator appears.
7. Press *REC* to begin dubbing the image to the tape.
8. Press *REC* again to stop dubbing.
 - If you want to dub another image, press ◀ or ▶ to display the image, and then repeat steps 5 through 8.
9. Press *CANCEL* when you are finished.

Viewing and Downloading

Chapter Overview:

- System Requirements for PhotoStudio 2000®
- Loading PhotoStudio 2000®
- Connecting to a Computer Using an Optional DV Cable

Changing Entertainment. Again.



System Requirements for PhotoStudio 2000®

Windows® PC Requirements

- Windows 95® PC with available serial port
- Windows 98® PC with available USB or serial port (USB port recommended)
- Windows 2000® PC with available USB or serial port (USB port recommended)
- Windows Me® PC with available USB or serial port (USB port recommended)
- Pentium-based or faster microprocessor
- 32 MB RAM
- 50 MB available hard disk space
- CD-ROM drive
- Color VGA display

Macintosh® Requirements

- Mac® OS 8.5 or later
- Power Mac® or iMac® (USB compatible)
- 32 MB RAM
- 50 MB available hard disk space
- Available USB port
- CD-ROM drive
- Color VGA display

PhotoStudio 2000 is a registered trademark of ArcSoft, Inc.

Windows is a trademark of Microsoft Corporation, registered in the U.S.A. and other countries.

Macintosh, Mac OS, PowerMac, and iMac are registered trademarks of Apple Computer, Inc.

Loading PhotoStudio 2000

To transfer your still images to your PC or Macintosh, you will need the supplied USB card reader, a suitably equipped computer with a USB connection, and the image transfer/editing software, PhotoStudio 2000.

1. Turn on your computer and insert the PhotoStudio 2000 CD-ROM into your drive.
2. Double click the installer icon and follow the on-screen instructions to install the software. DO NOT install the USB DRIVER CD-ROM at this time.
3. Follow the instructions in the next section to install the USB drivers for your computer.

How to Handle a CD-ROM

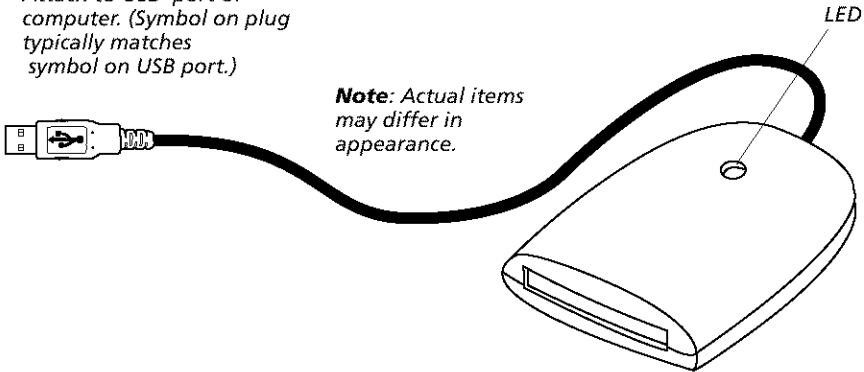
- Take care not to soil or scratch the surface.
- Do not write on or place stickers on the front or back.
- If the CD-ROM gets dirty, gently wipe it with a soft cloth outward from the center hole using a circular motion.
- Do not use conventional disc cleaners or cleaning spray.
- Do not bend the CD-ROM or touch its mirror surface.
- Do not store your CD-ROM in a dusty, hot, or humid environment. Keep it away from direct sunlight.

Attaching the External Card Reader to Your Computer

The included external card reader connects to the USB port on your computer and allows you to transfer still images recorded on the card directly to the computer. Follow the directions for the operating system you are using.

Attach to USB port of computer. (Symbol on plug typically matches symbol on USB port.)

Note: Actual items may differ in appearance.



Windows 2000 and Windows ME

1. Connect the card reader to an available USB port of your computer. The computer will automatically detect the new hardware and install the needed drivers. The card reader will appear as a *Removable Disk* icon when you click on *My Computer*.
2. The card reader is now ready for use.

Windows 98

There are two ways to install the card reader when you use Windows 98 as your operation system. You can use the included software to install the drivers automatically or install the drivers manually on a laptop.

Install Drivers Automatically

1. To install the necessary drivers automatically, insert the included software CD into the CD drive and double click on the *Setup.exe* icon.
2. Follow the directions on the screen and click *Finish* to restart the computer.
3. After the machine is restarted, connect the card reader to an available USB port of your computer. The computer will automatically detect the new hardware and the card reader will appear as a *Removable Disk* icon when you click on *My Computer*.

Install Drivers Manually

1. To install the necessary drivers manually, insert the included software CD into the CD drive.
2. Connect the card reader to an available USB port of your computer. The computer will automatically detect the new hardware and ask you for a driver.
3. Select *Search for the best driver for your device*, and click *Next*.
4. When the next screen appears asking where to search for the driver, select *CD-ROM drive* and *Specify a location*. Type in *D:\driver* (*D* being the location of your CD-ROM drive). Click on *Next*.
5. Windows will search for the driver and display the screen showing *D:\DRIVER\SDMMC071.INF* after it locates the driver. Click *Next* to have Windows install the driver.
6. The computer will now automatically detect the new hardware and the card reader will appear as a *Removable Disk* icon when you click on *My Computer*.

Macintosh

1. Connect the card reader to an available USB port of your computer.
2. The computer will automatically detect the new hardware and the card reader will appear as an icon on your computer.

Notes:

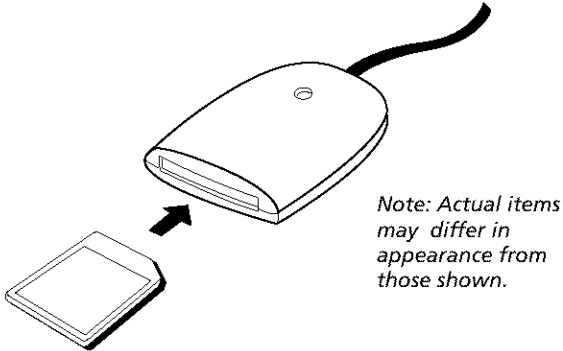
If your card reader does not appear when you turn on or reboot your computer, try replugging in the USB cable.

Consult your computer or device's owner's manual for USB port specifications and troubleshooting.

Viewing and Downloading

Downloading Still Images to Your Computer

Insert the recorded MultimediaCard notched edge first with front facing up into the card reader. Then follow the instructions in the next section to download your images.



Caution:

Removing the card before the data is completely written may cause loss of the entire contents of the card and damage the card.

Windows PC

There are 2 ways you can access your images using USB in Windows: 1) manually through the Programs menu, or 2) by accessing the newly assigned drive directly.

Programs Menu

1. Click the *Start* button in the lower left-hand corner of your screen.
2. Select *Programs*, followed by *PhotoStudio 2000*. Double click *PhotoStudio 2000*. (The software launches.)
3. In PhotoStudio 2000, select the *File* menu, followed by *Open*.
4. Finally, choose the appropriate drive to access and open your images.
5. When finished, close the software, then unplug the card reader and remove the card.

Note: You can double click a still image to automatically open it in PhotoStudio 2000. If it doesn't open, you must change the software application default your computer uses to open JPEG files (see *Changing the JPEG Default* on page 132.)

Direct Drive Access

1. Double click *My Computer*. (The *My Computer* window opens, showing you all the available drives.)
2. Double click the appropriate drive to access and open your images.
3. When finished, close the software, then unplug the card reader and remove the card.

Note: You can double click a still image to automatically open it in PhotoStudio 2000. If it doesn't open, you must change the software application default your computer uses to open JPEG files (see *Changing the JPEG Default* on page 132.)

Macintosh

1. Double click on the *untitled* drive icon on your desktop, followed by the *DCIM* folder, and the *101_RCA* folder.
2. Drag all the still images you want to move to your desktop. (The files are copied.)
3. When finished, drag the *untitled* drive icon to the trash, unplug the card reader, and remove the card.

Changing the JPEG Default

Depending on your system configuration, your still images might not automatically open in PhotoStudio 2000. This is because you probably already have another software program set as the default to open your images, which are saved in JPEG format. If you want to set PhotoStudio 2000 as the default application for your images, use the following instructions to change your computer's JPEG default.

Windows PC

1. Click the *Start* button in the lower left-hand corner of your screen.
2. Select *Programs*, followed by *Settings*.
3. Next select *Folder Options* and click the *File Types* tab. Then select *JPEG*.
4. Click *Edit*, then click *PhotoStudio 2000*.

Note: There are several variations of JPEG files (*JPG, JPEG, etc.*), so you might have to set PhotoStudio for each of them.

Macintosh

1. In the Apple menu, highlight *Control Panels*, followed by *File Exchange*.
2. Click the *PC Exchange* tab (if it isn't already selected) and select *JPEG*.
3. Click *Change*, then select *PhotoStudio 2000*.

Note: There are several variations of JPEG files (*JPG, JPEG, etc.*), so you might have to set PhotoStudio for each of them.

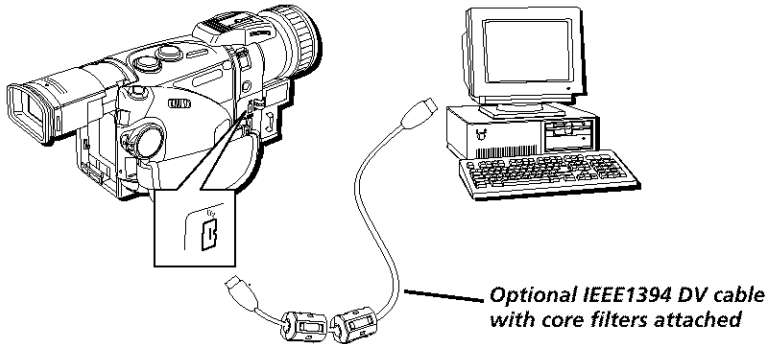
Connecting to a Computer Using an Optional DV Cable

To transfer your videos and still images that are on the tape to your PC or Macintosh, you will need an optional DV cable, a suitably equipped computer with IEEE1394 connection (also known as Firewire), a DV card, and editing software equipped with your computer or commercially available software. Some newer computers are already equipped with this connection.

Minimum Requirements

- IEEE1394 Firewire-compatible PC interface, DV card, and editing software
- IEEE1394 Firewire cable

Note: You can order an IEEE1394 Firewire cable from the accessories section (see page 160).



1. Make sure all units are turned off before making any connections.
2. Connect one end of the optional DV cable to your camcorder and the other end to the computer.
3. Press in the Lock button on the camcorder while setting the Power switch to PLAY (playback mode). (The POWER indicator comes on.)
4. Turn on the computer, open the application you want to use, and refer to the software user's guide of the application to transfer the still images or video.
5. When finished, close the software, then turn off the computer and camcorder.

Notes:

- Use the power supply instead of the battery pack to power the camcorder.
- The datetime information can't be transferred to the computer.
- For more information on how to download still images or video to your computer, refer to your DV card software user's guide.

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Other Information

Chapter Overview:

- Troubleshooting
- Final Notes
- Care and Cleaning
- Traveling Tips
- Specifications
- Limited Warranty
- FCC and Industry Canada Information
- Optional Accessories
- Index

Changing Entertainment. Again.



Troubleshooting

If you're having problems with your camcorder, try the solutions in this section. If the problem still exists, please consult your nearest authorized RCA service center.

External noise and interference (from a TV, a radio, etc.) might prevent your camcorder from functioning properly. In such cases, first disconnect the power supply unit (battery or AC power supply); and then reconnect it and proceed as usual from the beginning.

Power Problems

No power is supplied.

- The battery pack has not been attached correctly (*see page 19*).
- The battery pack is not charged (*see page 20*).
- The power supply has not been correctly connected (*see page 22*).
- There is dew in camcorder. Wait until camcorder dries out.

The power suddenly goes off and does not come back on by itself.

- Camcorder left in Record-Standby mode for five minutes. Turn the POWER switch OFF and then on again.
- The battery pack has completely discharged.
- Remove the tape and disconnect the power source. Then after a few minutes, try reconnecting and turning the power back on. If it still does not come on, consult your nearest authorized RCA service center.

Feature and Function Problems

Some menus or features are not available.

- The EASY/MANUAL/AUTO switch is set to AUTO. Set to MANUAL to access manual functions, and try again.
- The EASY/MANUAL/AUTO switch is set to EASY. Set to AUTO or MANUAL to access the other functions, and try again.

Vertical white lines appear when shooting a very bright object.

This sometimes occurs when there is a lot of contrast between the background and the object. It is not a defect of the camcorder. Try shooting from a different angle or adjusting the lighting conditions.

Bright, crystal-shaped spots appear in the LCD monitor and the viewfinder.

Sunlight is directly entering the lens. This is not a defect of the camcorder.

The back of the LCD monitor is hot.

The light used to illuminate the LCD monitor causes it to be hot. Close the LCD monitor to turn it off or set the POWER switch to OFF, and let the unit cool down.

Colored bright spots appear all over the LCD monitor or the viewfinder.

The LCD monitor and the viewfinder are made with high-precision technology. However, black spots or bright spots of light (red, green or blue) may appear constantly on the LCD monitor or in the viewfinder. These spots are not recorded on the tape. This is not due to any defect of the unit.

The icons and the picture color on the LCD monitor are not clear.

This may occur when the surface or the edge of the LCD monitor is pressed.

The LCD monitor, the viewfinder, and the lens are dirty.

Wipe them gently with a cleaning cloth. Wipe the LCD monitor gently in a semicircle because wiping strongly spreads the stain and it won't come out easily.

The image is out of focus.

- If using viewfinder, the eyepiece focus control may need to be adjusted (*see page 34*).
- The scene being shot is adversely affecting the operation of Auto Focus (*see page 98*).

Other Information

Manual settings are canceled.

EASY/MANUAL/AUTO switch or FOCUS switch has been set to AUTO. Manual settings are canceled.

Recording Problems

Recording on tape cannot be performed.

Make sure the Erase Protection tab is in the position that allows recording. If not, slide the tab. Some tapes have removable tabs. If the tab has been removed, cover the hole with adhesive tape.

Recording does not start.

The camcorder POWER switch has not been set to CAMERA or the DSC MODE switch is not set to the correct position (*see page 46*).

Cannot Record from S-Video Connector

Make sure the S-VIDEO IN feature on the *OTHERS* Menu is set to *ON* (*see page 65*).

Playback Problems

The tape is running, but there is no playback picture on the TV.

The TV has not been set to its VIDEO input channel.

Playback picture is blurred or interrupted.

The video heads are dirty or worn out. Consult your nearest authorized RCA service center for head cleaning or replacement (*see page 148*).

Rewinding or fast-forwarding can't be performed.

The tape is already fully wound on one reel or the other.

The date and time displays disappear.

- Press the MENU/DISPLAY button to turn them back on.
- If you remove the power source from the camcorder while the power is on, all settings and selections are erased. Make sure to turn the camcorder's power off before disconnecting the power source.

The wrong date and time are displayed/recorded.

If you have not performed Date/Time Setting (*see page 26*), the date and time are not displayed/recorded correctly. Check setting of Daylight Savings time (*see page 28*).

The tape won't eject.

The battery pack is running low.

No playback audio or audio is distorted.

- Check audio settings (*see page 53 and 76*).
- If using zoom mic, check the settings (*see page 102*).

Digital Still Camera Problems

Cannot record or playback a still picture.

- Check to make sure a compatible memory card with space available is inserted in the camcorder (*see page 13*).
- Make sure write-protect tab is in correct position (*see page 139*).
- Make sure DSC MODE switch is set to CARD or DUAL.

Cannot record images in 1280 x 960.

Make sure DSC MODE switch is set to CARD.

Cannot delete an image from the card.

Image is protected (*see page 119*). Cancel protection (*see page 119*).

Cannot format the card.

Make sure it is compatible with this camcorder (*see page 13*). Contact your dealer for advice.

Cannot record very many images on the card.

Check the picture quality and image size selected (*see pages 113-114*). Higher settings require more space on the memory card.

CARD WARNINGS appear on the screen.

Warnings appear to warn you of card problems such as a full card, etc. (*see pages 39-40*).

Final Notes

Power

- Perform charging where the temperature is between 10°C and 35°C (50°F and 95°F). 20°C to 25°C (68°F to 77°F) is the ideal temperature range for charging. If the environment is too cold, charging may be incomplete.
- Charging times are for a fully discharged battery pack.
- Charging time varies according to the ambient temperature and the status of the battery pack.
- To avoid interference with reception, do not use the AC power supply near a radio.
- Since the AC power supply processes electricity internally, it becomes warm during use. Be sure to use it only in well-ventilated areas.
- The following stops charging or discharging:
 - Unplugging the AC power supply's cord from the AC outlet.
 - Detaching the battery from the AC adapter/charger.

Date/Time Settings

- The date/time cannot be stored in memory if the clock cell has not been installed or needs replacing. Replace clock cell.

Video Recording

- When the POWER switch is set to CAMERA or PLAY and the LCD monitor is opened, the LCD monitor switches on and the viewfinder switches off automatically to save power.
- The cassette tape holder can't be opened unless a power supply is attached.
- There may be a delay after you slide TAPE OPEN until the cassette tape holder opens. Do not use force.
- The time required to calculate the remaining tape length, and the accuracy of the calculation, may vary according to the type of tape used.
- While recording, sound is not heard from the speaker.

Tapes

- A power supply must be attached to load or eject a tape.
- When loading a tape, it takes a few seconds for the cassette tape holder to open. Never apply force to the holder or door cover as this might result in damage to the camcorder and void the warranty.
- If the cassette tape holder does not open after a few seconds, close the holder door and try again. If it still does not open, turn the camcorder off, then on again.
- If the tape does not load properly, open the cassette tape holder door and fully remove the cassette. Wait a few minutes and reinsert it.
- Closing the cassette tape holder door before the holder comes out may damage the camcorder.
- Even when the camcorder is turned off, a tape can still be loaded or unloaded. After the cassette tape holder is closed with the camcorder switched off, though, it may not recede. **Turn the power on before loading or unloading tapes.**
- When recording, once the cassette tape holder door is open, a blank portion will be recorded on the tape or a previously recorded scene will be taped over regardless of whether the tape holder came out or not.

Dew Formation

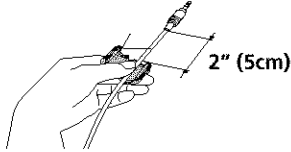
If your camcorder is brought directly from a cold place to a warm place, dew may condense inside your camcorder, on the surface of the head drum, and on the surface of the video tape. If this happens, the video tape may stick to the video head and be damaged or your camcorder may not operate correctly. Remove the tape, and wait a few hours before using the camcorder.

Dew may form in any of the following situations:

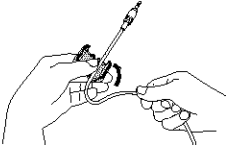
- When bringing the camcorder from a cold location to a warm location.
- When placing the camcorder in a cold room which is then heated rapidly.
- When bringing the camcorder outdoors from an air-conditioned room or car.
- When placing the camcorder in the direct path of air blowing from an air conditioner.
- When placing the camcorder in a humid room.

Attach Ferrite Core When Using Optional Earphones

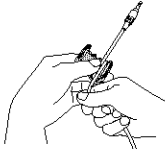
FCC regulations require that a ferrite core be used with optional earphones. When using an earphone with the camcorder, attach the larger ferrite core *as described below*.



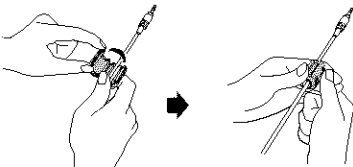
1. Place the larger ferrite core approximately 2" (5cm) from the plug of the earphones.



2. Hold the ferrite core and earphone cable in your left hand.



3. Wind the cable around the ferrite core once starting at the bottom.

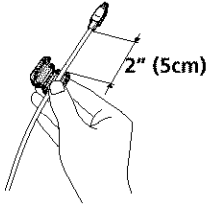


4. Close the ferrite core *as shown*.

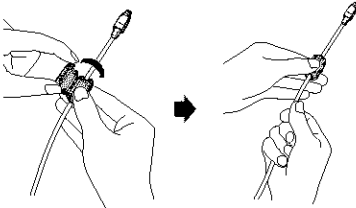
5. Connect the earphone cable to the PHONES jack.

Attach Ferrite Core When Using Optional DV Cable

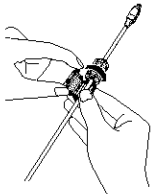
FCC regulations requires that two ferrite cores be used with an optional DV cable. When using a DV cable with this camcorder, attach the two smaller ferrite cores *as described below*.



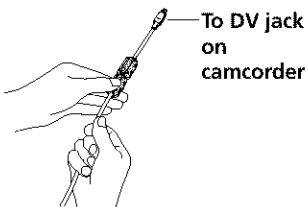
1. Place one small ferrite core approximately 2" (5cm) from either end of the cable.



2. Hold the ferrite core and cable in your right hand and close the core *as shown*.



3. Hold the other small ferrite core next to the ferrite core you have attached and close the second core *as shown*.

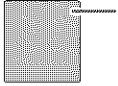


4. Connect the DV cable's plug to the DV jack of the camcorder.

Note: Make sure to connect the end of the DV cable with the ferrite cores to the DV jack on the camcorder.

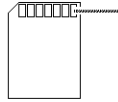
MultiMediaCards

Improper handling of the MultiMediaCard may cause damage to the card or images on the card. Follow the instructions below to correctly use the MultiMediaCard.



Label

Do not peel off the label or paste any paper, tape, or other material over it.



Contacts

This is the part that makes contact with the equipment. Be careful not to touch it with your fingers or metal objects, to smear anything on it, or to damage it.

Precautions on Handling MultiMediaCards

- Be sure to insert the card in the correct direction. Do not try to force the card in.
- The card is a precision component. Do not disassemble or modify it in any way. Take care not to bend it, subject it to severe shock, drop it, or allow it to get wet.
- Do not put the card in your pocket or other unprotected location as it may break due to pressure applied when you sit.
- Do not allow the card to get close to fire or throw the card in a fire.

Do not Use or Store MultiMediaCards in the Following Environments:

- Locations subject to electrical noise or powerful magnetic fields. Data on the card may be destroyed (erased).
- Locations exposed to direct sunlight.
- Locations subject to high temperature or high humidity.
- Locations where dust gathers in large amounts or blows through the air.
- Corrosive environments.
- Sunlit or enclosed spaces and other such locations subject to high temperature.

Watch Out for Static Electricity.

- Do not let dirt or other foreign matter accumulate on the card contacts, or touch them with your fingers, or rub or scrape them. Static electricity may damage (erase) data on the card. Clean the card by wiping it gently with a soft, dry cloth.
- When carrying or storing the card, place it in the plastic (polyethylene) bag it was originally packed in to keep dirt and dust off the contacts and protect it from static electricity. (This polyethylene bag has been given anti-static treatment.)

Watch Out For Condensation.

- Moisture (condensation) may form inside and outside the card if it is carried into an area subject to sudden, large changes of temperature. Watch out for condensation, because it can cause malfunctions.
- When moisture condenses on the card, leave the card at the prevailing temperature until the drops of moisture evaporate on their own.

Protect Your Image Data.

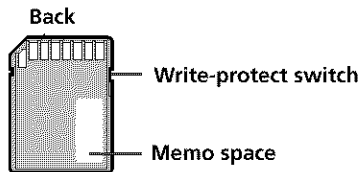
- It is best to copy your valuable image data from the card onto some other medium (personal computer, floppy disk, MO disk, etc.) and to backup the contents.
- Malfunction, repair, and so on can cause the recorded images to disappear from the card.
- Make absolutely sure not to remove the card or turn the camcorder power off while the card is recording data, erasing data, or formatting (initializing). This can cause loss of data and damage to the card.
- Initializing the card will erase the data on it. Make sure no important image data is recorded on the card before you initialize it.
- Please be aware that Thomson multimedia Inc. will not be liable for any damages resulting from loss of data caused by incorrect handling of the card by you or a third party, or caused by exposure to static electricity or electrical noise or by malfunction.

SD Memory Cards (Commercially Available)

Precautions on Handling SD Memory Cards

- After removing the card from the camcorder, be sure to immediately store it in the card case.
- Do not disassemble or modify the card.
- Do not strike, bend, drop, or allow the card to become wet.
- Do not touch the metal terminals with your hands or metallic objects.
- Do not peel off the label from the card.
- Do not attach other labels or stickers to the card.
- Do not use or store the card in locations directly exposed to sunlight, heat vents, heating appliances, or other locations with extremely high temperatures, such as inside a closed vehicle in the summer.
- Do not use or store the card in humid or dusty locations.
- Do not use or store the card in locations exposed to corrosive gases.

Protecting Your Data



- Set the write-protect switch to the locked side. Set the switch to the unlocked side when you want to record or edit the card again.
- Use an oil-based felt-tipped pen to write in the memo space. Do not use a pencil or ballpoint pen as these may damage the card or destroy the data on the card.
- Do not remove the card or turn off the power of the camcorder and peripheral equipment while data is being read or written. Also do not remove the power source from the camcorder. These actions can cause data to be destroyed. (Please be aware that Thomson multimedia Inc. cannot be held liable for any data loss or other loss directly or indirectly caused by data loss.)
- Make backup copies of your data wherever possible.

Care and Cleaning

After Using the Camcorder

1. Set the POWER switch to OFF.
2. Close and lock the LCD monitor.
3. Slide and hold the TAPE OPEN switch in the direction of the arrow and open the cassette holder cover. Remove the tape. Be careful not to touch the inside of the cassette holder as you may hurt yourself.
4. Push on the area marked PUSH. The cassette holder locks into place.
 - Once the cassette holder is closed, it recedes automatically. Wait until it recedes completely before closing the cassette holder cover.
5. Close the cover until it firmly locks into place.
6. Slide the UNLOCK switch, and remove the battery pack.
7. Reattach the lens cap.

Cleaning the Camcorder


1. Clean the exterior, wiping gently with a soft cloth. For heavy dirt, use diluted, mild soap and wring the cloth well. Then wipe again with a dry cloth.
2. Open the LCD monitor and wipe it gently with a soft, dry cloth. Close it when finished.
3. To clean the lens, blow it with air using a blower brush. Wipe gently with lens cleaning paper.

Notes:

- *Avoid using strong cleaning agents such as alcohol.*
- *Cleaning should be done only after the power supply has been disconnected.*
- *Mold may form if the lens is left dirty.*
- *When using a cleaner or chemically treated cloth, refer to the cautions of each product.*

Dirty Video Heads

Using the camcorder when the video tape is dirty may cause the heads to clog, producing noise on the recorded image or prevent the image from being recorded at all. Other things that may cause clogging include recording in high-temperature and high humidity environments, a lot of dust in the air, damaged tape, worn tape, long-time use or dew formation. Video heads becoming clogged soon after cleaning may be caused by a damaged tape. In this case, stop using the tape immediately.

If the video heads are clogged, the  indicator appears on the screen during recording. Signs of clogged heads during playback include: mosaic-like noise on the pictures, pictures that do not move, or the entire screen turning blue.

If using a cleaning tape does not clear the video heads, contact an authorized RCA service center or your dealer for further advice.

Using a Cleaning Tape (Commercially Available)

Video head cleaning can be done by using a commercially available cleaning tape.

Notes:

- Excessive use of a cleaning tape may cause damage to the video heads. Please read the instructions accompanying the cleaning tape carefully before using it.
- The fast forward and rewind functions cannot be used when the cleaning tape is in the camcorder.



To Use a Cleaning Tape

1. Insert a cleaning tape into the camcorder.
2. Open the LCD monitor and adjust the angle.
3. Set the DSC MODE switch to TAPE, and hold in the Lock button and set the POWER switch to PLAY.
 - The video head cleaning screen appears.
4. Press *START* to begin video head cleaning. *NOW CLEANING* flashes during cleaning.
 - After about 20 seconds, video head cleaning automatically finishes, and *EJECT THE CASSETTE* is displayed.
 - To cancel cleaning, Press *STOP*.
5. Remove the cleaning tape.

Proper Care and Storage

- Keep dirt from entering the camcorder's cassette tape door. Dust and grit are abrasive and cause excessive wear to both the recording/playback heads and tapes.
- Always cap the lens when the camcorder is not in use.
- Before handling the camcorder, make sure your hands and face are free from any chemical products such as suntan lotion, as it might damage the finish.
- The camcorder might be damaged by improper storage or handling. Do not subject the camcorder to swinging, shaking, or dropping.
- Do not store the camcorder in temperatures below -22°F (-30°C) or above 149°F (65°C).
- When the camcorder is not in use, always remove the tape and power supply.
- Retain the original carton for future storage or shipping purposes.

Tape Care and Storage

- When finished with a tape, rewind it, remove it from the camcorder, and label it. Protect the tape using the erase protection tab if necessary.
- Store tapes vertically in their protective cases at normal room temperatures. Never leave the camcorder or tapes in a car or outdoors for an extended period of time. Excessive heat or cold might damage tapes.
- Keep tapes away from strong magnetic fields such as electric motors, speakers, and other devices.
- Keep dust from entering the cassette tape compartment. All dust is abrasive and causes excessive wear on the tape and the camcorder's recording and playback heads.
- Never use tapes with damaged or spliced tape.
- Do not use a tape if it has been damaged or exposed to moisture. The tape might jam and/or damage the camcorder.

Things to Avoid

- Do not attempt to disassemble the camcorder. There are no user-serviceable parts inside.
- Avoid operating the camcorder immediately after moving it from a cold location to a warm location. Give the camcorder 1-1/2 to 2 hours to reach a stable temperature before inserting a tape.
- In cold to warm conditions, condensation might occur causing the tape to stick to the recording heads and damage the camcorder or tapes.
- Never aim the camcorder at the sun or other bright objects.
- Do not leave the camcorder in direct sunlight for extended periods of time. The resulting heat buildup might permanently damage the camcorder's internal parts or reduce the life of the clock battery.
- Do not operate the camcorder in extremely humid environments.
- Do not operate the camcorder near the ocean as salt water or spray might damage the internal parts of the camcorder.
- Do not operate the camcorder for extended periods in temperatures below 40°F (4°C) or above 95°F (35°C).
- Do not expose the camcorder or power supply/charger to rain or moisture. If any component becomes wet, turn off the power and take the unit to an authorized RCA camcorder service provider.
- Do not use any power supply or batteries other than the ones specified for the camcorder. Using the wrong accessories might cause damage to the camcorder.

Traveling Tips

- Write down your camcorder's serial number and keep it separate from the camcorder when traveling. If your camcorder is lost or stolen, you will be able to identify it.
- Use extra care to avoid damage to your camcorder and accessories when operating them at a beach or pool. Spray, sand, and dust should be avoided. If your lens has been exposed to the elements, clean it only with proper lens cleaning supplies.
- Make sure you have any plug adapters that you might need before taking your camcorder to other countries. Consult your dealer for advice.
- Carry your camcorder in a carrying case when traveling. See the accessories section (*page 151*) for a case designed especially for this camcorder. An ordinary suitcase or carry bag does not offer the protection your camcorder needs. Treat your camcorder as carry-on luggage to protect it from rough handling.

Specifications

Camcorder

Format

DV NTSC standard

Power source

DC 7.3 V \equiv (Using AC power supply)

DC 7.4 V \equiv (Using battery pack)

Power consumption

Viewfinder on:

4.5 W (8.5W with optional video light on)

LCD monitor on:

5.2 W (9.2W with optional video light on)

Signal system

NTSC-type

Recording/Playback Format

Video: digital component recording

Audio: PCM digital recording, 32 kHz 4-channel (12-bit), 48 kHz 2-channel (16-bit)

Cassette tape

Mini DV cassette tape

Tape speed

SP: 18.8 mm/sec.

LP: 12.5 mm/sec.

Recording time (max.)

SP: 80 minutes

LP: 120 minutes (with 80 min cassette)

Operating temperature

0°C to 40°C (32°F to 104°F)

Operating humidity

35% to 80%

Storage temperature

-20°C to 50°C (-4°F to 122°F)

Weight

Approx. 695 g (1.53 lbs)

Dimensions (W x H x D)

72 mm x 90 mm x 200 mm (3-11/16" x 4-21/32" x 7-11/32") (with the LCD monitor closed and with the viewfinder fully tilted downward)

Pickup

1/3.6" format CCD

Lens

10X optical/400X digital power zoom lens (f1.6, f=4.2-42mm in TAPE-CAMERA mode, f=5.7-42mm in CARD-CAMERA mode), full range auto focus

Viewfinder

Electronic LCD color viewfinder

White balance adjustment

Auto/Manual adjustment

LCD monitor system

3" diagonally measured, LCD panel/TFT active matrix

Speaker

Monaural

Audio/Video Jacks

S-Video

Y: 1 V(p-p), 75 Ω , analog

C: 0.29 V(p-p), 75 Ω , analog

Video

1 V (p-p), 75 Ω analog output (via Video output connector)

Audio

300 mV (rms), 1 k Ω analog stereo output (via Audio output connector)

DV

4-pin, IEEE 1394 compliant

Earphone Jack

3.5mm Diameter plug

AC Power Supply

Power requirement

U.S.A. and Canada: AC 120 V, 60 Hz

Other countries: AC 110 V to 240 V, 50 Hz/60 Hz

Output

DC 7.3V

Dimensions (W x H x D)

80 mm x 45 mm x 98 mm

(3-5/32" x 1-25/32" x 3-27/32")

Weight

Approx. 181 g (0.40 lbs)

Limited Warranty

What your warranty covers:

- Defects in materials or workmanship.

For how long after your purchase:

- 90 days from date of purchase for labor charges.
- One year from date of purchase for parts.

The warranty period for rental units begins with the first rental or 45 days from date of shipment to the rental firm, whichever comes first.

What we will do:

During the initial 90 days

Exchange your camcorder with a new or refurbished unit, or repair your camcorder. The option will be ours. There will be no cost to you.

After the 90 days and within one year

Exchange your camcorder with a new or refurbished unit, or repair your camcorder. The option will be ours. Parts will be provided at no charge, but you will be responsible for the cost of labor required for the repair.

How you get service:

- Call 1-800-283-6503 and have your unit's date of purchase and model/serial number ready. The model/serial number information is on the bottom of your camcorder.
- A representative will troubleshoot your problem over the phone. If the representative determines that you should receive a replacement unit, you will be provided with a Service Request (SR) number and the location of a nearby exchange point if one exists. No returns will be accepted without the SR number.
- Proof of purchase in the form of a bill of sale or receipted invoice which is evidence that the product is within the warranty period must be presented to obtain warranty service. For rental firms, proof of first rental is also required.

Other Information

To receive a replacement Camcorder before you return yours:

Option I

1. Provide your Discover, MasterCard, or Visa account number and expiration date to our phone representative. This is for security purposes. If we receive your unit, excluding all accessories, within 14 days from the date you were provided the SR number, only items not covered by warranty will be charged to your account. **IF YOUR UNIT IS NOT RECEIVED WITHIN 14 DAYS, THE SUGGESTED RETAIL VALUE OF THE CAMCORDER WILL BE CHARGED TO YOUR CREDIT CARD.** This amount, less \$10.00 handling, will be credited if the unit is subsequently received.
2. We will send you a replacement unit.
3. Ship the unit back to us, excluding all accessories, using the replacement unit's carton. Shipping instructions will be included in the carton along with your SR number which will allow you to easily ship the unit back to us. **Make sure you insure your shipment in case of damage or loss.** Include with the shipment:
 - Evidence of purchase date, such as a bill of sale to verify your unit's warranty eligibility.
 - A brief note describing your camcorder's problem.
 - Your name, address and phone number.

Return transportation, storage, handling, and insurance costs are your sole responsibility. We accept no liability in case of damage or loss.

Option II

1. For a fee of \$10.00, we will send a replacement unit to the exchange point.
2. The exchange location will notify you of its arrival.
3. Take your unit, excluding all accessories, and your evidence of purchase date, such as a bill of sale, to the exchange location and you will be provided the new or refurbished unit.
4. If the repairs were covered by your warranty, you will not be billed.

To receive a replacement unit after we have received your unit:

1. **Write the SR number on the outside of the carton used to return the unit. Make sure you insure your shipment in case of damage or loss.**
2. Carefully pack the unit, excluding all accessories, using the original box and packing material if possible.
3. Include with the shipment:
 - Evidence of purchase date, such as a bill of sale to verify your unit's warranty eligibility.
 - A brief note describing your camcorder's problem.
 - Your name, address and phone number.

Return transportation, storage, handling, and insurance costs are your sole responsibility. We accept no liability in case of damage or loss.

4. The representative will advise the address to mail a cashier's check or money order for payment if there are any out of warranty labor or parts charges and you elect not to use your credit card.
5. Upon receipt of your product, a new or refurbished unit will be shipped to you.

What your warranty does not cover:

- Adjustment of customer controls.
- Damage from misuse or neglect.
- A unit that has been modified or incorporated into other products or is used for institutional or other commercial purposes.
- Batteries for remote control and clock.
- Cleaning of video/audio heads.
- Camcorders purchased or serviced outside the U.S.A.
- Return transportation, storage and handling costs of your unit, including insurance for loss or damage.
- Acts of nature, such as but not limited to lightning damage.

Other Information

Product Registration:

- Please complete and mail the Product Registration Card packed with your Camcorder. It will make it easier to contact you should it ever be necessary. The return of the card is not required for warranty coverage.

Limitation of Warranty:

- **THE WARRANTY STATED ABOVE IS THE ONLY WARRANTY APPLICABLE TO THIS PRODUCT. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED (INCLUDING ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE) ARE HEREBY DISCLAIMED. NO VERBAL OR WRITTEN INFORMATION GIVEN BY THOMSON MULTIMEDIA INC., ITS AGENTS OR EMPLOYEES SHALL CREATE A WARRANTY OR IN ANY WAY INCREASE THE SCOPE OF THIS WARRANTY.**
- **REPAIR OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE EXCLUSIVE REMEDY OF THE CONSUMER. THOMSON MULTIMEDIA INC. SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT OR ARISING OUT OF ANY BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT. THIS DISCLAIMER OF WARRANTIES AND LIMITED WARRANTY ARE GOVERNED BY THE LAWS OF THE STATE OF INDIANA. EXCEPT TO THE EXTENT PROHIBITED BY APPLICABLE LAW, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ON THIS PRODUCT IS LIMITED TO THE APPLICABLE WARRANTY PERIOD SET FORTH ABOVE.**

How State Law relates to warranty:

- Some states do not allow the exclusion nor limitation of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you.
- This warranty gives you specific legal rights, and you also may have other rights that vary from state to state.

If you purchased your camcorder outside the United States:

- This warranty does not apply. Contact your dealer for warranty information.

FCC Declaration of Conformity and Industry Canada Information

FCC Regulations state that unauthorized changes or modifications to this equipment may void the user's authority to operate it.

This device complies with part 15 of FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) This device must accept any interference received, including interference that may cause undesired operation.

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

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

This equipment has been type tested and found to comply with the limits for a Class B Digital Device in accordance with the specifications in Part 15 of the FCC rules. These rules are designed to provide reasonable protections against radio and television interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause interference to radio or television reception (which you can determine by turning the equipment off and on), try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna (that is, the antenna for the radio or television that is "receiving" the interference).

Change the position of the Camcorder with respect to the radio or television equipment that is receiving interference.

Move the Camcorder away from the equipment that is receiving interference.

Plug the Camcorder into a different wall outlet so that the Camcorder and the equipment receiving interference are on different branch circuits.

If these measures do not eliminate the interference, please consult your dealer or an experienced radio/television technician for additional suggestions. Also, the Federal Communications Commission has prepared a helpful booklet, "How To Identify and Resolve Radio/TV Interference Problems." This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402. Please specify stock number 004-000-00345-4 when ordering copies.

For more information of FCC conformity: Thomson multimedia Inc.,
10330 N. Meridian Street, Indianapolis, IN 46290; 1-800-587-5850

FCC Declaration of Conformity

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Trade Name: RCA Model: RCA01
Equipment Classification: Computing Device Peripheral
Responsible Party: Thomson multimedia, Inc.
10330 N. Meridian Street
Indianapolis, IN 46290
Telephone 1-800-386-7389

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

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

This Class B digital apparatus meets all the requirements of the Canadian Interference-Causing Equipment Regulations.

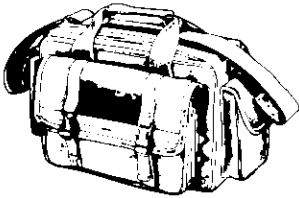
Optional Accessories

We invite you to take a look at some great ideas for sparking creativity and adding to the fun of using your camcorder. The following pages have a selection of accessories to help make your memorable moments look and sound even better.

These accessories are designed to make the process of recording and watching your videos more enjoyable.

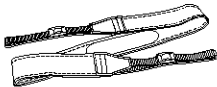
To order accessories, contact your local Dealer.

If a dealer is not nearby, all accessories are available through toll-free ordering or by using the order form found on page 153.



AC201A Soft Carrying Case

Custom compact soft case designed especially to provide protection and utility for your camcorder and most accessories. Rugged fabric lined with soft nonabrasive material and generous padding. Has three outside pockets with storage for lens filters, adapters, batteries, and tapes.



254338 Shoulder Strap

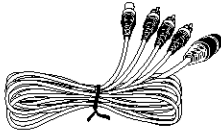
Designed to replace the shoulder strap that came with your camcorder.



253402 Video Light

Brightens the scene when natural lighting is too dim. You can turn on the video light at all times, set it to turn on automatically when additional light is needed, or turn it off.

All specifications and descriptions of accessories are subject to change without notice.



254336 Audio/Video/S-Video Cable

Replacement for the included A/V cable. Used to attach the camcorder to an external component like a TV or VCR.

H2011 DV Cable

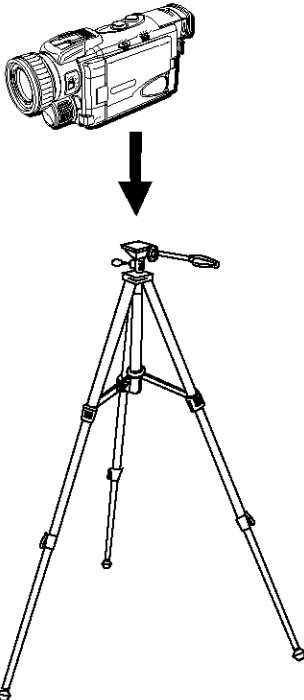


Used to connect the camcorder to a compatible PC with a IEEE1394 DV interface.

Using the Optional AC088 Tripod

Mounting the camcorder on a tripod, such as AC088, keeps the camcorder steady and produces excellent video results.

This tripod's fluid-effect head provides smooth camera pan and tilt. The quick-release mount makes it easy to attach or remove the camcorder. The grooved, tubular 3-section leg design folds down to 26" when not in use. Rubber feet allow for sure footing.



Cautions:

- *Before using a tripod, make sure it is stable enough to hold the camcorder without falling over. Do not transport the camcorder attached to the tripod.*
- *When attaching your camcorder to a tripod, be careful not to force the tripod screw into the camcorder's tripod mounting hole.*
- *The tripod screw should not protrude into the camcorder more than approximately three-eighths (3/8) of an inch. Forcing the screw could damage the mounting hole on the bottom of the camcorder.*

Accessories Order Form

Description	Part No.	Price	Qty.	Total
Super Lightweight Tripod	AC088	\$ 49.95		
Soft Camcorder Case	AC201A	\$ 34.95		
Shoulder Strap	254338	\$ 12.95		
Rechargeable Battery	252762	\$ 84.95		
AC Adapter/Charger	252767	\$ 92.95		
IEEE1394 DV Cable	H2011	\$ 34.95		
Video Light	253402	\$		
A/V/S-Video Cable	254336	\$ 27.25		

All prices subject to change without notice.

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Shipping and Handling \$ 5.00

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Money order or check must be in U.S. currency only. No COD or cash.

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_____ Apt: _____
City: _____
State: _____ Zip: _____

Please make sure that both sides of this form have been filled out completely.

- Allow 4 weeks for delivery.
- All accessories are subject to availability.

Detach Here



To order accessories, contact your local Dealer.

If a dealer is not nearby, you can also follow the directions below to order by telephone or direct-by-mail.

United States and Canada Orders

To place your order by phone, have your Visa, MasterCard, or Discover card ready and call the toll-free number listed below.

Use this number only to place an order for accessory items listed on this order form.

1-800-338-0376

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 (made payable to Thomson multimedia Inc.) to the following address:

Video Accessories

PO Box 8419

Ronks, PA 17573

Symbols

- 12-bit audio 80
- 16-bit audio 80
- 24-hour time mode 27

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Visit the RCA website at www.rca.com

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