Dear Customer,
Thank you for purchasing this digital video camera. Before use, please read the safety information and precautions contained in the following pages to ensure safe use of this product.

Using This Instruction Manual
• All major sections and subsections are listed in the Table Of Contents on the cover page.
• Notes appear after most subsections. Be sure to read these as well.
• Basic and advanced features/operation are separated for easier reference.

It is recommended that you . . .
..... refer to the Index (☞ pgs. 81 – 88) and familiarize yourself with button locations, etc. before use.
..... read thoroughly the Safety Precautions and Safety Instructions that follow. They contain extremely important information regarding the safe use of this product.

You are recommended to carefully read the cautions on pages 89 through 91 before use.

SAFETY PRECAUTIONS

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

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

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

The AA-V40U AC Power Adapter/Charger should be used with:
AC 120 V∿, 60 Hz in the USA and Canada,
AC 110 V – 240 V∿, 50 Hz/60 Hz in other countries.

CAUTION (applies to the AA-V40U)
TO PREVENT ELECTRIC SHOCK MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION (s'applique à l'AA-V40U)
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.

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

Caution: (applies to Jack Box)
To reduce the risk of fire, do not remove cover. No user-serviceable parts inside. Refer servicing to qualified service person.

NOTES:
● *The rating plate (serial number plate) and safety caution are on the bottom and/or the back of the main unit.*
● *The rating plate (serial number plate) of the AC Power Adapter/Charger is on its bottom.*

This camcorder is designed to be used with NTSC-type color television signals. It cannot be used for playback with a television of a different standard. However, live recording and LCD monitor/viewfinder playback are possible anywhere. Use the JVC BN-V408U/V416U/V428U battery packs and, to recharge them, the provided multi-voltage AC Power Adapter/Charger. (An appropriate conversion adapter may be necessary to accommodate different designs of AC outlets in different countries.)

When the equipment is installed in a cabinet or on a shelf, make sure that it has sufficient space on all sides to allow for ventilation (10 cm (3-15/16") or more on both sides, on top and at the rear).

Do not block the ventilation holes.
(If the ventilation holes are blocked by a newspaper, or cloth etc. the heat may not be able to get out.)

No naked flame sources, such as lighted candles, should be placed on the apparatus.

When discarding batteries, environmental problems must be considered and the local rules or laws governing the disposal of these batteries must be followed strictly.

The apparatus shall not be exposed to dripping or splashing.

Do not use this equipment in a bathroom or places with water.
Also do not place any containers filled with water or liquids (such as cosmetics or medicines, flower vases, potted plants, cups etc.) on top of this unit.
(If water or liquid is allowed to enter this equipment, fire or electric shock may be caused.)

IMPORTANT PRODUCT SAFETY INSTRUCTIONS

Electrical energy can perform many useful functions. But improper use can result in potential electrical shock or fire hazards. This product has been engineered and manufactured to assure your personal safety. In order not to defeat the built-in safeguards, observe the following basic rules for its installation, use and servicing.

ATTENTION:

Follow and obey all warnings and instructions marked on your product and its operating instructions. For your safety, please read all the safety and operating instructions before you operate this product and keep this manual for future reference.

INSTALLATION

1. Grounding or Polarization

(A) Your product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

(B) Your product may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

2. Power Sources
Operate your product only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. If your product is intended to operate from battery power, or other sources, refer to the operating instructions.

3. Overloading
Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

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

5. Ventilation
Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered.
• Do not block the openings by placing the product on a bed, sofa, rug or other similar surface.
• Do not place the product in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

6. Wall or Ceiling Mounting
The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

ANTENNA INSTALLATION INSTRUCTIONS

1. Outdoor Antenna Grounding
If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

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

3. Power Lines
An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE, ANSI/NFPA 70

NEC – NATIONAL ELECTRICAL CODE
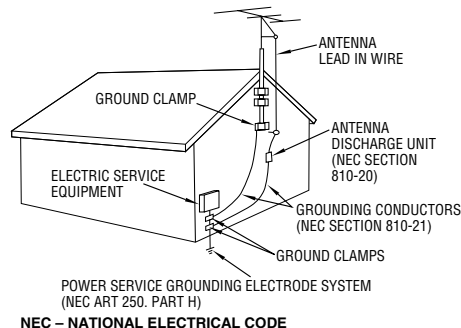
USE

1. Accessories

To avoid personal injury:

• Do not place this product on an unstable cart, stand, tripod, bracket or table. It may fall, causing serious injury to a child or adult, and serious damage to the product.

• Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the product.

• Use a mounting accessory recommended by the manufacturer and follow the manufacturer 's instructions for any mounting of the product.

• Do not try to roll a cart with small casters across thresholds or deep-pile carpets.

2. Product and Cart Combination

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

PORTABLE CART WARNING
(Symbol provided by RETAC)

3. Water and Moisture

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

4. Object and Liquid Entry

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

5. Attachments

Do not use attachments not recommended by the manufacturer of this product as they may cause hazards.

6. Cleaning

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

7. Heat

The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

SERVICING

1. Servicing

If your product is not operating correctly or exhibits a marked change in performance and you are unable to restore normal operation by following the detailed procedure in its operating instructions, do not attempt to service it yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

2. Damage Requiring Service

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a. When the power supply cord or plug is damaged.

b. If liquid has been spilled, or objects have fallen into the product.

c. If the product has been exposed to rain or water .

d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.

e. If the product has been dropped or damaged in any way.

f. When the product exhibits a distinct change in performance—this indicates a need for service.

3. Replacement Parts

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

4. Safety Check

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in safe operating condition.

SAFETY PRECAUTIONS

Do not point the lens or the viewfinder directly into the sun. This can cause eye injuries, as well as lead to the malfunctioning of internal circuitry. There is also a risk of fire or electric shock.

CAUTION!

The following notes concern possible physical damage to the camcorder and to the user

When carrying, be sure to always securely attach and use the provided shoulder strap. Carrying or holding the camcorder by the viewfinder and/or the LCD monitor can result in dropping the unit, or in a malfunction.

Do not carry or hold the camcorder by the lens hood. This can cause the unit to drop, resulting in injury or serious damage to the camcorder

Take care not to get your finger caught in the cassette holder cover. Do not let children operate the camcorder, as they are particularly susceptible to this type of injury

Do not use a tripod on unsteady or unlevel surfaces. It could tip over, causing serious damage to the camcorder.

CAUTION!

Attaching the Jack Box to the camcorder with cables (S-Video, Editing, DC, etc.) connected, then leaving it on top of the TV is not recommended, as tripping on the cables will cause the camcorder to fall, resulting in damage.

Attach only the optional JVC VL-V3U Video Light, VL-F3U Video Flash or MZ-V3U Stereo Zoom Microphone to the camcorder's Info-Shoe.

Mini **DV** NTSC **SD** **MultiMediaCard**

■ This camcorder is designed exclusively for the digital video cassette, SD Memory Card and MultiMediaCard. Only cassettes marked "Mini **DV**" and memory cards marked "**SD**" or "*MultiMediaCard*" can be used with this unit.

Before recording an important scene . . .
.... make sure you only use cassettes with the Mini DV mark Mini **DV**.
.... make sure you only use memory cards with the mark **SD** or *MultiMediaCard*.
.... remember that this camcorder is not compatible with other digital video formats.
.... remember that this camcorder is intended for private consumer use only. Any commercial use without proper permission is prohibited. (Even if you record an event such as a show, perform-ance or exhibition for personal enjoyment, it is strongly recommended that you obtain permis-sion beforehand.)
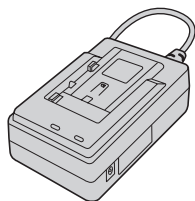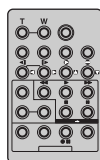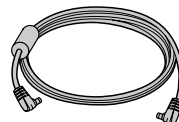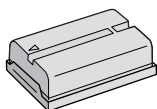
• **AC Power Adapter/Charger AA-V40U**

• **Remote Control Unit RM-V716U**
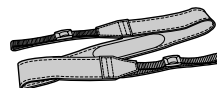
• **DC Cord**

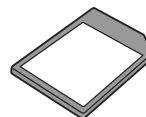• **Battery Pack BN-V408U**
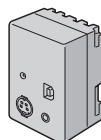
• **Jack Box CU-V504U**

• **Shoulder Strap**

• **Lens Hood** (☞ pg. 7 for attachment)
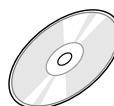
• **AAA (R03) Battery x 2 (for remote control unit)**

• **MultiMediaCard (16 MB) (Already inserted in the camcorder)**
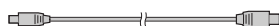
• **S-Video Cable**

• **Audio/Video Cable (ø3.5 mini-plug to RCA plug)**

• **CD-ROM**
  The CD ROM contains the following 5 software programs:
  • USB Driver Soft (for Windows®)
  • USB Driver Soft (for Macintosh®)

  Presto!
  • Mr. Photo
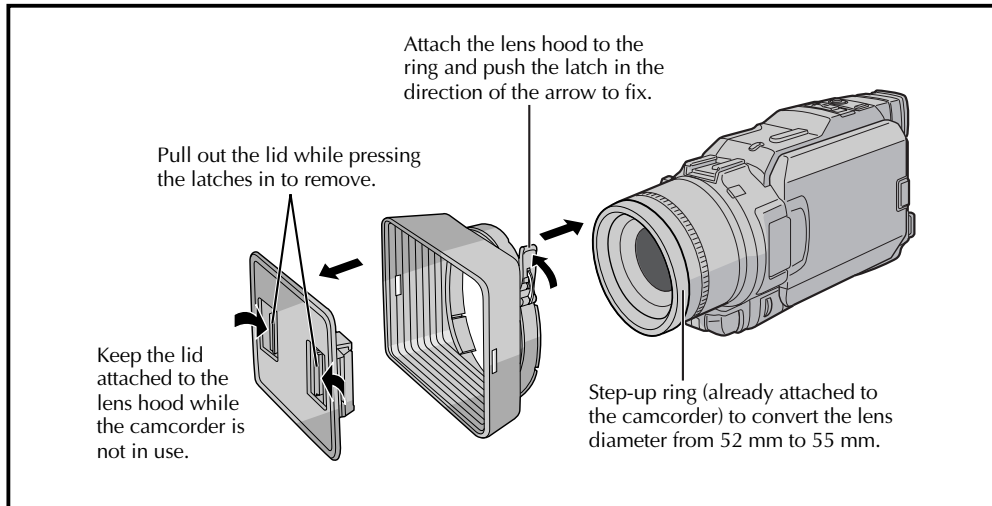 • PhotoAlbum
  • ImageFolio
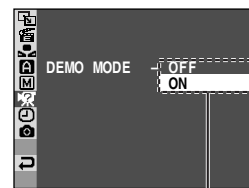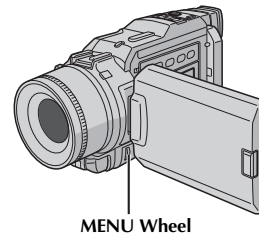
• **Editing Cable**

• **USB Cable**

How To Attach The Lens Hood

The provided lens hood helps block out glare when shooting under bright sunlight.

Attach the lens hood to the ring and push the latch in the direction of the arrow to fix.

Pull out the lid while pressing the latches in to remove.

Keep the lid attached to the lens hood while the camcorder is not in use.

Step-up ring (already attached to the camcorder) to convert the lens diameter from 52 mm to 55 mm.

AUTOMATIC DEMONSTRATION

Automatic Demonstration takes place when "DEMO MODE" is set to "ON" (factory-preset).

■ Available when the Power Switch is set to "🅐" or "🅜" and no cassette is in the camcorder.

■ Performing any operation during the demonstration stops the demonstration temporarily. If no operation is performed for more than 1 minute after that, the demonstration will resume.

■ "DEMO MODE" remains "ON" even if the camcorder power is turned off.

■ To cancel Automatic Demonstration:
  1. Set the Power Switch to "🅜" while pressing down the Lock Button located on the switch and press the **MENU** wheel. The Menu Screen appears.
  2. Rotate the **MENU** wheel to select "🎦 SYSTEM" and press it. The SYSTEM Menu appears.
  3. Rotate the **MENU** wheel to select "DEMO MODE" and press it. The Sub Menu appears.
  4. Rotate the **MENU** wheel to select "OFF" and press it.
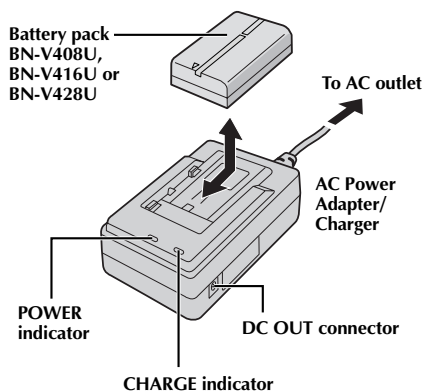 5. Rotate the **MENU** wheel to select "◀RETURN", and press it twice. The normal screen appears.

MENU Wheel

DEMO MODE — OFF
             ON

Sub Menu

**Battery pack
BN-V408U,
BN-V416U or
BN-V428U**

To AC outlet

**AC Power
Adapter/
Charger**

**POWER
indicator**

DC OUT connector

CHARGE indicator

| Battery pack	Fully charging time
BN-V408U	approx. 1 hr. 30 min.
BN-V416U (optional)	approx. 2 hrs.
BN-V428U (optional)	approx. 3 hrs. 20 min.

Power

This camcorder's 2-way power supply system lets you choose the most appropriate source of power. Do not use provided power supply units with other equipment.

CHARGING THE BATTERY PACK

1 Make sure you unplug the camcorder's DC cord from the AC Power Adapter/Charger. Plug the AC Adapter/Charger's power cord into an AC outlet. The POWER indicator lights.

2 Attach the battery pack with the ⊕ ⊖ mark aligned with the corresponding marks on the AC Power Adapter/Charger. The CHARGE indicator begins blinking to indicate charging has started.

3 When the CHARGE indicator stops blinking but stays lit, charging is finished. Slide the battery and lift off. Remember to unplug the AC Adapter/Charger's power cord from the AC outlet.

NOTES:
● *If the protective cap is attached to the battery pack, remove it first.*
● *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 noted above 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 Adapter/Charger near a radio.*
● *If you connect the camcorder's DC cord to the adapter during battery charging, power is supplied to the camcorder and charging stops.*
● *Since the AC Power Adapter/Charger processes electricity internally, it becomes warm during use. Be sure to use it only in well-ventilated areas.*
● *When charging the battery pack for the first time or after a long storage period, the CHARGE indicator may not light. In this case, remove the battery pack from the AC Power Adapter/Charger, then try charging again.*
● *If the battery operation time remains extremely short even after having been fully charged, the battery is worn out and needs to be replaced. Please purchase a new one.*
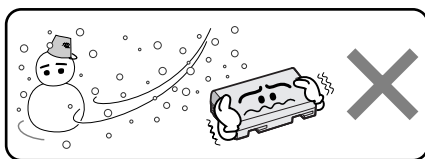
Lithium-ion is vulnerable in colder temperatures.

About Batteries

DANGER! Do not attempt to take the batteries apart, or expose them to flame or excessive heat, as it may cause a fire or explosion.
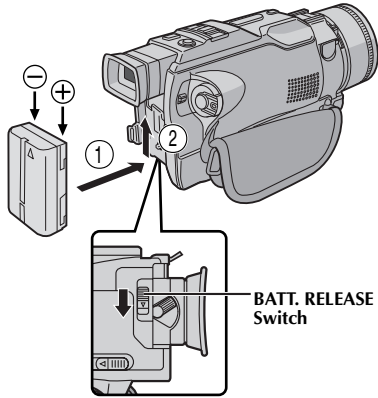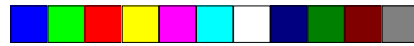
WARNING! Do not allow the battery or its terminals to come in contact with metals, as this can result in a short circuit and possibly start a fire.

The Benefits Of Lithium-Ion Batteries

Lithium-ion battery packs are small but have a large power capacity. However, when one is exposed to cold temperatures (below 10°C/50°F), its usage time becomes shorter and it may cease to function. If this happens, place the battery pack in your pocket or other warm, protected place for a short time, then re-attach it to the camcorder. As long as the battery pack itself is not cold, it should not affect performance.

(If you're using a heating pad, make sure the battery pack does not come in direct contact with it.)

USING THE BATTERY PACK

1 With the arrow on the battery pack pointing upward, push the battery pack slightly against the battery pack mount ①.

2 Slide up the battery pack until it locks in place ②.
● If the battery pack is attached with its ⊕ ⊖ mark set in the wrong direction, a malfunction may occur.

To Detach The Battery Pack . . .
.... slide the battery pack down slightly while sliding down **BATT. RELEASE** to detach it.

BATT. RELEASE Switch

ATTENTION:
Before detaching the power source, make sure that the camcorder's power is turned off. Failure to do so can result in a camcorder malfunction.

INFORMATION:
The extended-use battery pack kit is a set composed of a battery pack and AC Power Adapter/Charger:
VU-V840 KIT : BN-V840U battery pack & AA-V15U AC Power Adapter/Charger
VU-V856 KIT : BN-V856U battery pack & AA-V80U AC Power Adapter/Charger
Read the kit's instruction manual before using. Neither BN-V840U nor BN-V856U can be charged by using the AC Power Adapter/Charger provided with this camcorder. Use only the AA-V15U AC Power Adapter/Charger for BN-V840U battery pack and only AA-V80U AC Power Adapter/Charger for BN-V856U battery pack.

Approximate recording time

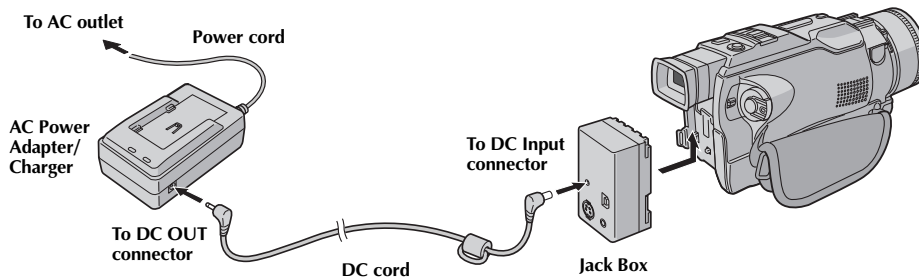| Battery pack	LCD monitor on/ Viewfinder off	LCD monitor off/ Viewfinder on
BN-V408U	1 hr. 5 min.	1 hr. 15 min.
BN-V416U (optional)	2 hrs. 10 min.	2 hrs. 30 min.
BN-V428U (optional)	3 hrs. 50 min.	4 hrs. 20 min.
BN-V840U (optional)	5 hrs. 20 min.	6 hrs. 10 min.
BN-V856U (optional)	7 hrs. 30 min.	8 hrs. 40 min.

NOTES:
● *Recording time is reduced significantly under the following conditions:*
  ● *Zoom or Record-Standby mode is engaged repeatedly.*
  ● *The LCD monitor is used repeatedly.*
  ● *The playback mode is engaged repeatedly.*
● *Before extended use, it is recommended that you prepare enough battery packs to cover 3 times the planned shooting time.*

USING AC POWER

Use the AC Power Adapter/Charger (connect as shown in the illustration).
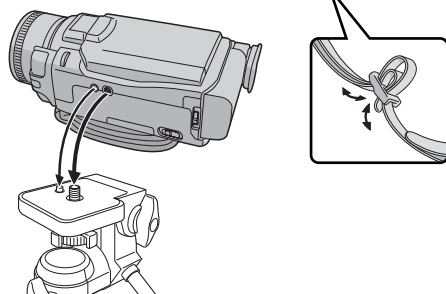
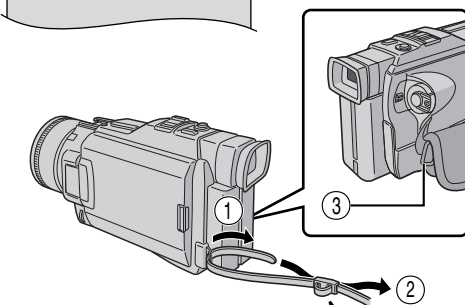**NOTES:**
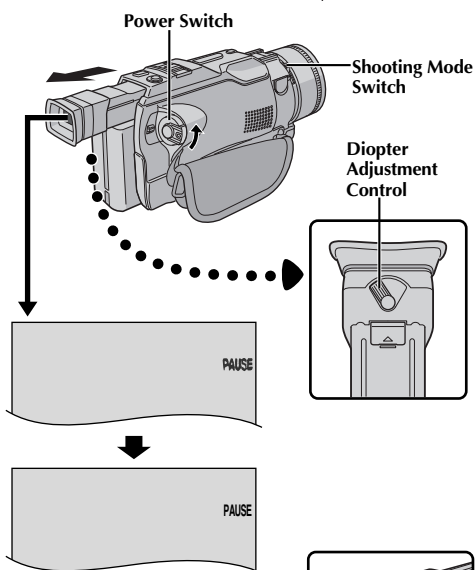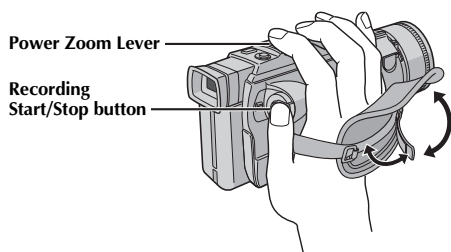● *The provided AC Power Adapter/Charger features automatic voltage selection in the AC range from 110 V to 240 V.*
● *For other notes, ☞ pg. 8.*

To AC outlet
Power cord
AC Power Adapter/ Charger
To DC OUT connector
DC cord
To DC Input connector
Jack Box

Power Zoom Lever

Recording Start/Stop button

Power Switch

Shooting Mode Switch

Diopter Adjustment Control

PAUSE

PAUSE

Grip Adjustment

1 Separate the Velcro strip.

2 Pass your right hand through the loop and grasp the grip.

3 Adjust so that your thumb and fingers can easily operate the Recording Start/Stop Button and Power Zoom Lever. Refasten the Velcro strip.

Viewfinder Adjustment

1 Set the Power Switch to " **A** " or " **M** " while pressing down the Lock Button located on the switch. Set the Shooting Mode Switch to any position.

2 Pull out the viewfinder fully and adjust it manually for best viewability.

3 Turn the Diopter Adjustment Control until the indications in the viewfinder are clearly focused.

Shoulder Strap Attachment

1 Following the illustration, thread the strap through the eyelet ①, then fold it back and thread it through the buckle ②. Repeat the procedure to attach the other end of the strap to the other eyelet ③, making sure the strap is not twisted.
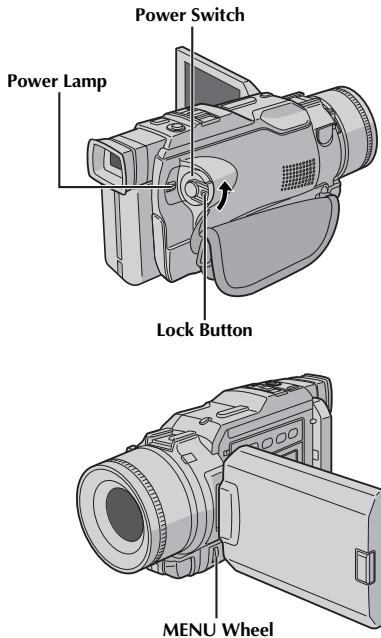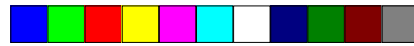
Tripod Mounting

1 Align the screw and camera direction stud on the tripod with the camera's mounting socket and stud hole. Then tighten the screw.
• Some tripods are not equipped with studs.

CAUTION:
When using a tripod, be sure to open and extend its legs fully to stabilize the camcorder. To prevent damage to the unit caused by falling over, do not use a small-sized tripod.

Power Switch

Power Lamp

Lock Button

MENU Wheel

Display

```
FADER/WIPE    F.WHITE
PROGRAM AE
W.BALANCE
CAMERA        ▶
MANUAL        ▶
SYSTEM        ▶
DISPLAY       ▶
DSC           ▶

END
```

DISPLAY Menu

```
ON SCREEN  – LCD/TV
DATE/TIME  – AUTO
TIME CODE  – ON
CLOCK        DEC 25 '00
    ADJ.      5:30 PM


◀RETURN
```

```
CLOCK        DEC 25 '00
    ADJ.      5:30 PM


```

Date/Time Settings

The date/time is recorded onto the tape at all times, but its display can be turned on or off during playback (☞ pg. 41).
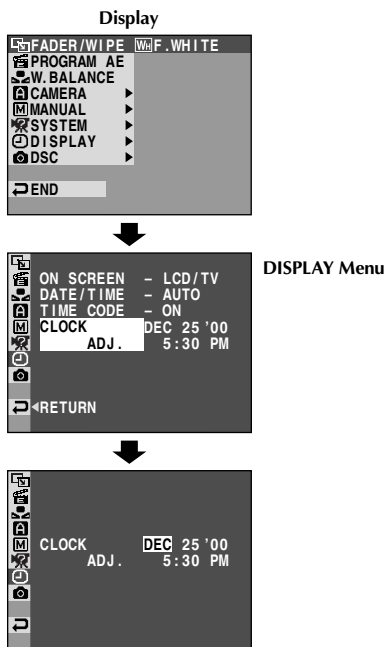
1 Set the Power Switch to " Ⓜ " while pressing down the Lock Button located on the switch, and open the LCD monitor fully or pull out the viewfinder fully. The power lamp lights and the camcorder is turned on.

2 Press the **MENU** wheel. The Menu Screen appears.

3 Rotate the **MENU** wheel to select " 🕑 DISPLAY". Press it and the DISPLAY Menu appears.

4 Rotate the **MENU** wheel to select "CLOCK ADJ.". Press it and "month" is highlighted.
Rotate the **MENU** wheel to input the month. Press it. Repeat to input the day, year, hour and minute.
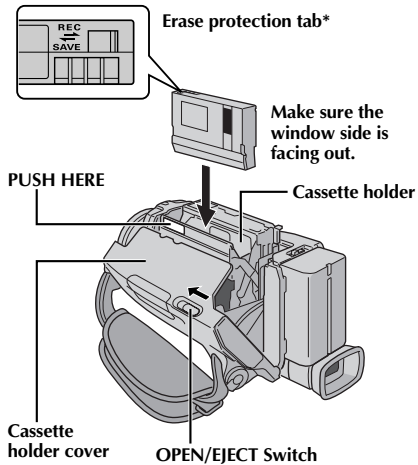Rotate the **MENU** wheel to select "◀RETURN", and press it twice. The Menu Screen closes.

Built-in Clock's Rechargeable Lithium Battery

To store the date/time in memory, the clock's rechargeable lithium battery is integrated in the camcorder. While the camcorder is connected to an AC outlet using the AC Power Adapter/Charger, or while the battery pack attached to the camcorder continues to supply power, the clock's rechargeable lithium battery is always charged. However, if the camcorder is not used for approx. 3 months, the clock's lithium battery will become discharged and the date/time stored in memory will be lost. When this occurs, first connect the camcorder to an AC outlet using the AC Power Adapter/Charger for over 24 hours to charge the clock's rechargeable lithium battery. Then perform the date/time setting before using the camcorder.
Note that the camcorder can be used without setting the date/time.

NOTE:
*Even if you select "CLOCK ADJ.", if the parameter is not highlighted the camcorder's internal clock continues to operate. Once you move the highlight bar to the first date/time parameter (month), the clock stops. When you finish setting the minute and press the **MENU** wheel, the date and time begin operation from the date and time you just set.*

Erase protection tab*

Make sure the window side is facing out.

PUSH HERE

Cassette holder

Cassette holder cover

OPEN/EJECT Switch

*** To Protect Valuable Recordings . . .**

.... slide the erase protection tab on the back of the tape in the direction of "SAVE". This prevents the tape from being recorded over. To record on this tape, slide the tab back to "REC" before loading it.

Be sure to press only the section labeled "PUSH HERE" to close the cassette holder; touching other parts may cause your finger to get caught in the cassette holder, resulting in injury or product damage.

Loading/Unloading A Cassette

The camcorder needs to be powered up to load or eject a cassette.

1 Slide and hold **OPEN/EJECT** in the direction of the arrow then pull the cassette holder cover open until it locks. The cassette holder opens automatically.
• Do not touch internal components.

2 Insert or remove a tape and press "PUSH HERE" to close the cassette holder.
• Once the cassette holder is closed, it recedes automatically. Wait until it recedes completely before closing the cassette holder cover.
• When the battery's charge is low, you may not be able to close the cassette holder cover. Do not apply force. Replace the battery with a fully charged one before continuing.

3 Close the cassette holder cover firmly until it locks into place.

Approximate recording time

Tape	Recording mode	
	SP	LP
30 min.	30 min.	45 min.
60 min.	60 min.	90 min.
80 min.	80 min.	120 min.

NOTES:
● It takes a few seconds for the cassette holder to open. Do not apply force.
● If you wait a few seconds and the cassette holder does not open, close the cassette holder cover and try again. If the cassette holder still does not open, turn the camcorder off then on again.
● If the tape does not load properly, open the cassette holder cover fully and remove the cassette. A few minutes later, insert it again.
● When the camcorder is suddenly moved from a cold place to a warm environment, wait a short time before opening the cassette holder cover.
● Closing the cassette holder cover before the cassette holder comes out may cause damage to the camcorder.
● Even when the camcorder is switched off, a cassette can be loaded or unloaded. After the cassette holder is closed with the camcorder switched off, however, it may not recede. It is recommended to turn the power on before loading or unloading.
● When resuming recording, once you open the cassette holder cover a blank portion will be recorded on the tape or a previously recorded scene will be erased (recorded over) regardless of whether the cassette holder came out or not. See page 23 for information about recording from the middle of a tape.
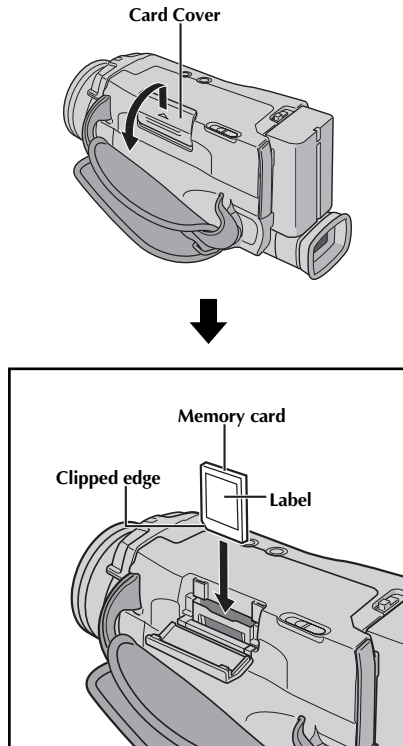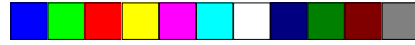
Card Cover

Loading A Memory Card

The provided MultiMediaCard is already inserted in the camcorder when you receive the camcorder.

1 Make sure the camcorder's power is off.

2 Open the card cover (**MEMORY CARD**).

3 Insert the memory card clipped edge first.
• Do not touch the terminal on the reverse side of the label.

4 To close the card cover, push it until you hear a click.

Memory card

Clipped edge

Label

To Unload A Memory Card . . .
.... in step **3** push the memory card, which then comes out of the camcorder automatically. Pull it out and close the card cover.

NOTES:
● *Be sure to use only SD Memory Cards marked " ⚡ " or MultiMediaCards marked " MultiMediaCard ".*
● *Some brands of memory cards are not compatible with this camcorder. Before purchasing a memory card, consult its manufacturer or dealer.*
● *Before using a new memory card, it is necessary to FORMAT the card. ☞ pg. 49.*

ATTENTION:

Do not insert/remove the memory card while the camcorder is turned on, as this may cause the memory card to be corrupted or cause the camcorder to become unable to recognize whether or not the card is installed.
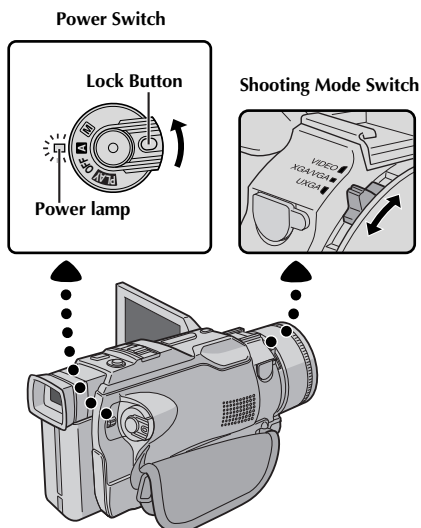

To turn on the camcorder, first set the Power Switch to any operation mode except "OFF" while pressing down the Lock Button located on the switch, then pull out the viewfinder fully or open the LCD monitor fully.

Power Switch

Lock Button

Power lamp

Shooting Mode Switch

When the Power Switch is set to " 🅰 ", " 🅰 " appears. When set to " 🎛 " or " PLAY ", there is no indication.

🅰

The following indications appear in the upper left corner, depending on the Shooting Mode Switch position.

UXGA

— **No display** : When set to "VIDEO"

— **XGA or VGA** : When set to "XGA/VGA"

— **UXGA** : When set to "UXGA"

Operation Mode

Choose the appropriate operation mode according to your preference using the Power Switch and Shooting Mode Switch.

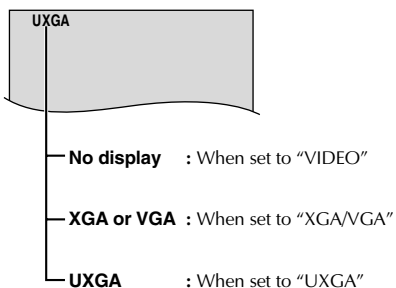| Power Switch Position |
|---|
| **🎛 (Manual):** Allows you to set various recording functions using the Menus. If you want more creative capabilities than Full Auto recording, try this mode. |
| **🅰 (Full Auto):** Allows you to record using NO special effects or manual adjustments. Suitable for standard recording. |
| **OFF:** Allows you to switch off the camcorder. |
| **PLAY :** Allows you to play back a recording on the tape, to display an image stored in the memory card or to transfer a still image recorded on the tape or in the memory card to a computer. |

Shooting Mode Switch Position
VIDEO: • Allows you to record on a tape. Approx. 6 seconds of a still image can be inserted between video recordings (☞ pg. 20). • Zoom magnification over 10X is available (☞ pg. 22, 29). • Allows you to record video on a tape and store still images in a memory card simultaneously (☞ pg. 26). • Allows you to record moving images (successive jitter-free still images) with superior quality on a tape (☞ pg. 24). The still images can also be processed on a PC or printed out.
XGA/VGA: • Allows you to record still images in a memory card (☞ pg. 16, 21). • File size: 1024 x 768 pixels (XGA) or 640 x 480 pixels (VGA)
UXGA: • Allows you to record still images in a memory card at high resolution (☞ pg. 16, 21). Suitable for recording still images with superior quality. • File size: 1600 x 1200 pixels

Power Switch

Power Lamp

Lock Button

MENU Wheel

Display

Menu Screen

REC MODE — SP
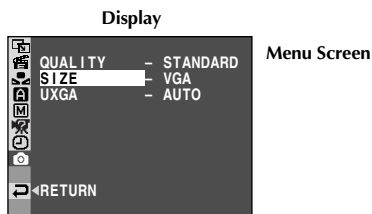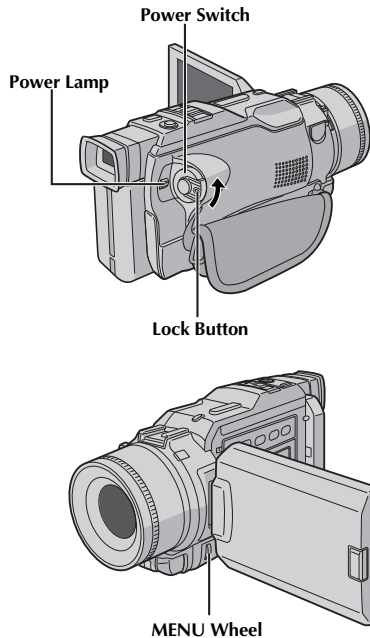LP

Sub Menu
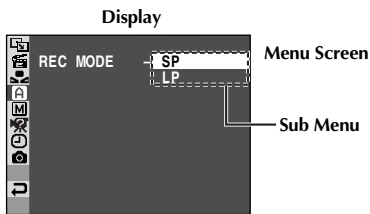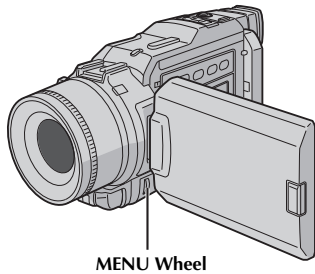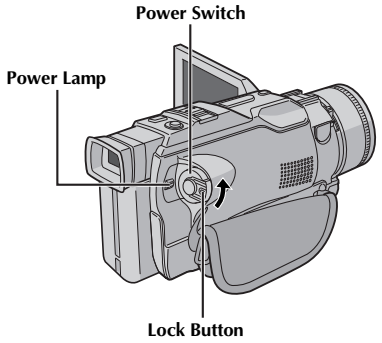
Recording Mode Setting

Set the tape recording mode depending on your preference.

1 Set the Power Switch to " Ⓜ " while pressing down the Lock Button located on the switch, and open the LCD monitor fully or pull out the viewfinder fully . The power lamp lights and the camcorder is turned on.

2 Press the **MENU** wheel. The Menu Screen appears.

3 Rotate the **MENU** wheel to select " Ⓐ CAMERA" and press it. The CAMERA Menu appears.

4 Rotate the **MENU** wheel to select "REC MODE" and press it. The Sub Menu appears. Select "SP" or "LP" by rotating the **MENU** wheel and press it. Rotate the **MENU** wheel to select "◀RETURN", and press it twice. The Menu Screen closes.
• Audio Dubbing (☞ pg. 71) and Insert Editing (☞ pg. 72) are impossible on a tape recorded in the LP mode.
• "LP" (Long Play) is more economical, providing 1.5 times the recording time.

NOTES:
● *If the recording mode is switched during recording, the playback picture will be blurred at the switching point.*
● *It is recommended that tapes recorded in the LP mode on this camcorder be played back on this camcorder .*
● *During playback of a tape recorded on another camcorder, blocks of noise may appear or there may be momentary pauses in the sound.*

Power Switch

Power Lamp

Lock Button

MENU Wheel

Display

Menu Screen

```
QUALITY   – STANDARD
SIZE      – VGA
UXGA      – AUTO

↵ ◄RETURN
```

Picture Mode Setting

The Picture mode can be selected to best match your needs.

1 Set the Power Switch to " M " while pressing down the Lock Button located on the switch, and open the LCD monitor fully or pull out the viewfinder fully . The power lamp lights and the camcorder turns on.

2 Press the **MENU** wheel. The Menu Screen appears.

3 Rotate the **MENU** wheel to select " ◙ DSC" and press it. The DSC Menu appears.

4 Rotate the **MENU** wheel to select "QUALITY" and press it. The Sub Menu appears. Rotate the **MENU** wheel to select the desired mode and press it.

If you are recording with the Shooting Mode Switch (☞ pg. 14) set to "XGA/VGA" . . . go to step 5.

If you are recording with the Shooting Mode Switch set to "UXGA" . . . go to step 6.

5 Rotate the **MENU** wheel to select "SIZE" and press it. The Sub Menu appears. Rotate the **MENU** wheel to select "XGA" or "VGA".

Go to step 7.

6 Rotate the **MENU** wheel to select "UXGA" and press it. The Sub Menu appears. Rotate the **MENU** wheel to select the desired mode.

AUTO : 🔳 or ⬜ appears (☞ pg. 21). Automatically processes the image according to the DOUBLE or ENLARGE methods described below, depending on the shooting situation or subject.

DOUBLE : 🔳 appears (☞ pg. 21). Engages pixel-shift technology to double-expose the image and generate a UXGA-sized picture.

ENLARGE : ⬜ appears (☞ pg. 21). Digitally enlarges the image to UXGA size.

7 Rotate the **MENU** wheel to select " ◄RETURN", and press it twice. The Menu Screen closes.

STORAGE CAPACITY

The number of storable images depends on the selected picture quality and size as well as the composition of the subjects in the images.

Approximate number of storable images
(Provided 16 MB MultiMediaCard)

SIZE	QUALITY	
	FINE	STANDARD
UXGA (1600 x 1200)	20	60
XGA (1024 x 768)	48	144
VGA (640 x 480)	100	300

Approximate number of storable images
(Optional 8 MB MultiMediaCard)

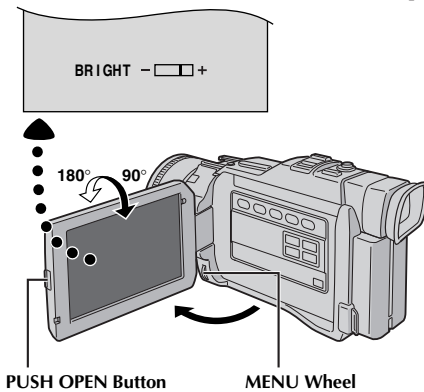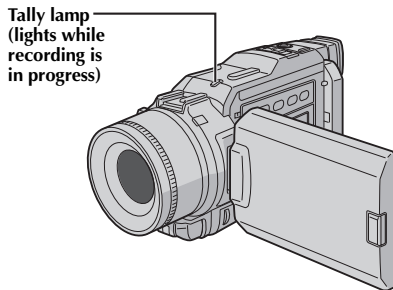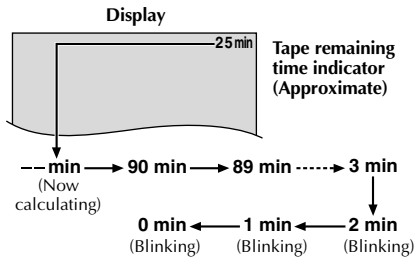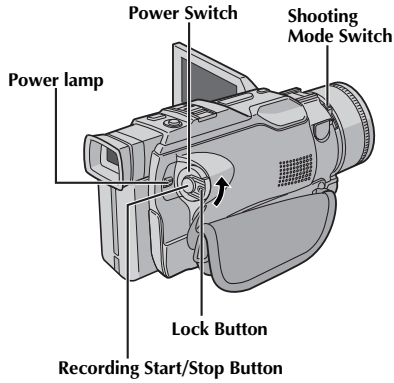| SIZE	QUALITY	
	FINE	STANDARD
UXGA (1600 x 1200)	10	30
XGA (1024 x 768)	24	72
VGA (640 x 480)	50	150

NOTES:
● *If the Shooting Mode Switch is set to "UXGA" during video recording, the camcorder stops video recording.*
● *The camcorder automatically zooms out to less than 2X when the Shooting Mode Switch is set to "UXGA".*
● *With images shot in the UXGA mode . . .*
  — the shutter speed is applicable only up to 1/500 in the "SPORTS" mode (☞ pg. 37).
  — Sepia and Monotone cannot be activated.
● *If "DOUBLE" is selected in the UXGA mode, images may not be processed properly in the following situations:*
  — when the subject has no contrast (difference in brightness and darkness).
  — when shooting in a dark place.
  — when the subject contains identical patterns that are regularly repeated.
  — when shooting under a flickering light such as a fluorescent light or candlelight.
  — when the subject is moving rapidly.
  — when there is excessive camera-shake.
● *If "AUTO" is selected in the UXGA mode, and any of the shooting situations listed above are encountered, the camcorder will automatically process the image using the ENLARGE method.*

Power Switch

Shooting Mode Switch

Power lamp

Lock Button

Recording Start/Stop Button

Display

25 min

Tape remaining time indicator (Approximate)

—– min ⟶ 90 min ⟶ 89 min ----⟶ 3 min
(Now calculating)

0 min ◀— 1 min ◀— 2 min
(Blinking) (Blinking) (Blinking)

Tally lamp (lights while recording is in progress)

BRIGHT − ▭▭ +

180°   90°

PUSH OPEN Button   **MENU Wheel**

NOTE:
You should already have performed the procedures listed below. If not, do so before continuing.
● *Power (☞ pg. 8)*
● *Grip Adjustment (☞ pg. 10)*
● *Viewfinder Adjustment (☞ pg. 10)*
● *Load A Cassette (☞ pg. 12)*
● *Recording Mode Setting (☞ pg. 15)*

1 Set the Shooting Mode Switch to "VIDEO", then set the Power Switch to " **A** " or " **M** " while pressing down the Lock Button located on the switch. Make sure "CAMERA MODE" is set to "VIDEO" in the Menu Screen (☞ pg. 28, 29).

Shooting while using the viewfinder: Make sure the LCD monitor is closed and locked. Pull out the viewfinder fully.
● Be sure to pull out the viewfinder until you hear a click, otherwise it may be pushed back in during use.

Shooting while using the LCD monitor: Make sure the viewfinder is pushed back in. Press **PUSH OPEN** and open the LCD monitor fully. Tilt it upward/ downward for best viewability.

● The power lamp lights and the camcorder enters the Record-Standby mode. "PAUSE" is displayed.

2 Press the Recording Start/Stop Button. " ✪REC " appears while recording is in progress.

To Stop Recording . . .
.... press the Recording Start/Stop Button. The camcorder re-enters the Record-Standby mode.

To Adjust The Brightness Of The Display
.... rotate the **MENU** wheel until the bright level indicator on the display moves and the appropriate brightness is reached.
● It is also possible to adjust the brightness of the view-finder.

NOTES:
● When you use the LCD monitor outdoors in direct sunlight, the LCD monitor may be difficult to see. If this happens, use the viewfinder instead.
● The image will not appear simultaneously in the LCD monitor and the viewfinder except during Interface Shooting.
● The cassette holder cannot be opened unless a power supply is attached.
● There may be a delay after you open the cassette holder cover until the cassette holder opens. Do not use force.
● Once the cassette holder is closed, it recedes automatically. Wait until it recedes completely before closing the cassette holder cover.
● The time required to calculate and display the remaining tape length, and the accuracy of the calculation, may vary according to the type of tape used.
● "TAPE END" appears when the tape reaches its end, and the power goes off automatically if left in this condition for 5 minutes. "TAPE END" also appears when a cassette at its end is loaded.
● If the Record-Standby mode continues for 5 minutes, the camcorder's power shuts off automatically. To turn the camcorder on again, push back and pull out the viewfinder again or close and re-open the LCD monitor.
● When a blank portion is left between recorded scenes on the tape, the time code is interrupted and errors may occur when editing the tape. To avoid this, refer to "Recording from the middle of a tape" (☞ pg. 23).
● During recording, sound is not heard from the speaker. To hear the sound, connect optional headphones to the PHONE connector. The sound volume is at the level it was adjusted to during playback (☞ pg. 40).
● **To turn the tally lamp or beep sounds off, ☞ pg. 28, 30.**

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).

INTERFACE SHOOTING

The person you shoot can view himself/herself in the LCD monitor, and you can even shoot yourself while viewing your own image in the LCD monitor.
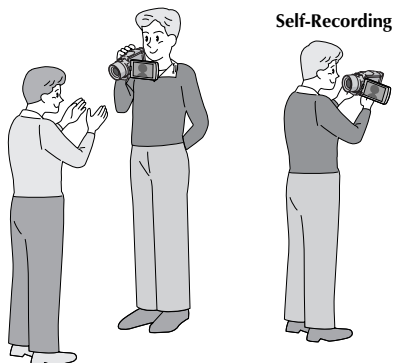Open the LCD monitor and tilt it upward to 180° so that it faces forward. When the LCD monitor is tilted upward to an angle of over approx. 105°, the monitor image is inverted vertically. If the viewfinder is pulled out at that time, it also switches on.
Point the lens toward the subject (yourself when self-recording) and start recording.
During Interface Shooting, the monitor image and indications do not appear inverted as they would when viewing a mirror.

Self-Recording

NOTES:
● During Interface Shooting, the "Tape Running" indicator and warning indications (☞ pg. 87, 88) are the only ones that are shown; they appear reversed in the display as they would when viewing a mirror, but are not reversed in the recording.
● The tape remaining indicator does not appear during interface shooting. However, when the remaining time reaches 2 minutes, the indicator appears showing the remaining time.

Power Switch

Shooting Mode Switch
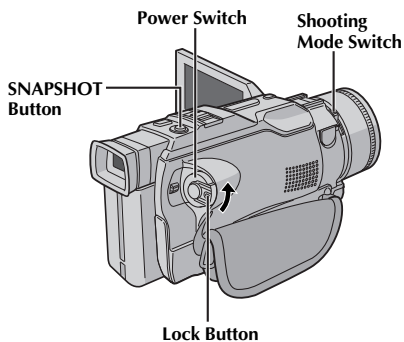
SNAPSHOT Button

Lock Button

Display

SNAP MODE — **PIN-UP**
FRAME
FULL
MULTI-4
MULTI-9
NEGA POSI

Menu Screen
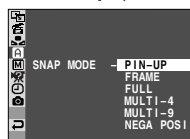
FULL
Snapshot mode
with no frame* √
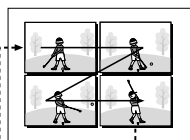
MULTI-4
Multi-Analyzer 4
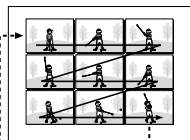
MULTI-9
Multi-Analyzer 9

NEGA POSI
Nega/Posi mode* √

PIN-UP
Pin-Up mode √

FRAME
Snapshot mode
with frame* √

* There is the sound effect of a shutter closing.

√ When "FULL", "FRAME", "PIN-UP" or "NEGA POSI" is selected, snapshot recording will always be performed with higher quality (☞ pg. 24) even if "CAMERA MODE" is set to "VIDEO".

Snapshot (For Video Recording)

This feature lets you record still images that look like photographs onto a tape.

SNAPSHOT MODE SELECTION

1 Set the Shooting Mode Switch to "VIDEO", then set the Power Switch to " Ⓜ " while pressing down the Lock Button located on the switch. Pull out the viewfinder fully or open the LCD monitor fully.

2 Press the **MENU** wheel. The Menu Screen appears.

3 Rotate the **MENU** wheel to select " Ⓐ CAMERA". Press it and the CAMERA Menu appears.

4 Rotate the **MENU** wheel to select "SNAP MODE", then press it.

5 Rotate the **MENU** wheel to select the desired Snapshot mode, then press it.
Rotate the **MENU** wheel to select " ◄RETURN" and press it twice. The Menu Screen closes.

SNAPSHOT RECORDING

1 Set "CAMERA MODE" to "VIDEO" or "PS-VIDEO" in the Menu Screen (☞ pg. 28, 29).

2 Press **SNAPSHOT**.
If you press during Record-Standby . . .
..... "PHOTO" appears and a still image will be recorded for approx. 6 seconds, then the camcorder re-enters the Record-Standby mode.

If you press during Recording . . .
..... "PHOTO" appears and a still image will be recorded for approx. 6 seconds, then the normal recording resumes.

Motor Drive Mode
Keeping **SNAPSHOT** pressed provides an effect similar to serial photography. (Interval between still images: approx. 1 second)

NOTES:
● *To remove the shutter sound, ☞ "BEEP" on pg. 30.*
● *If Digital Zoom is used while in the "MULTI-4" or "MULTI-9" mode, Snapshot recording will be performed with 10X magnification.*
● *If Snapshot recording is not possible, "PHOTO" blinks when **SNAPSHOT** is pressed.*
● *If Program AE with special effects (☞ pg. 36) is engaged, certain modes of Program AE with special effects are disabled during Snapshot recording. In such a case, the icon blinks.*
● *If **SNAPSHOT** is pressed when "DIS" is set to "ON" (☞ pg. 29), the Stabilizer will be disabled.*
● *To dub images recorded on a tape to a memory card, ☞ pg. 60.*
● *When shooting in the Multi-Analyzer 4 or Multi-Analyzer 9 modes, the optional flash (☞ pg. 83) will not light.*
● *During playback as well, all snapshot modes except Nega/ Posi mode are available when " 🎥 ➡ Ⓜ COPY" is set to "OFF" in the Menu Screen (☞ pg. 41).*
● *When a headphone set is connected to the PHONE connector, the shutter sound is not heard from the speaker, however it is recorded onto the tape.*

Power Switch

Shooting Mode Switch

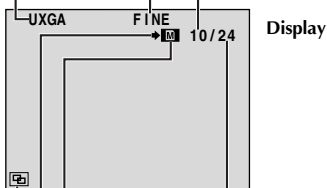**SNAPSHOT Button**

Lock Button
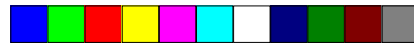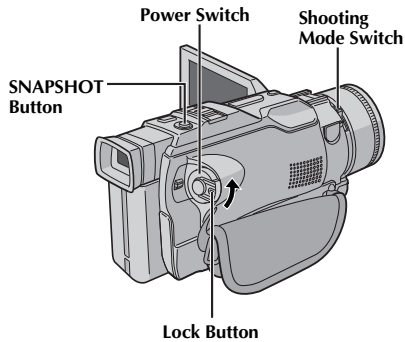
Picture Size
Displays the file size of the stored image: UXGA, XGA or VGA (☞ pg. 16).

Picture Quality
Displays the quality of the stored image: FINE or STD (standard) (in order of quality) (☞ pg. 16).

Number of shots taken
Displays the number of images that have already been shot.

UXGA   FINE
⏎ M 10 / 24   **Display**

Total number of shots
Displays the approximate total number of shots that can be stored, including those already taken. The number increases or decreases depending on the shots stored, the Picture mode, Shooting mode, etc.

Card icon
Appears during shooting and blinks when a memory card is not loaded.

Shooting icon
Appears and blinks during shooting.

UXGA Mode icon
Displays the process utilized to create the UXGA size image: 🔲 (DOUBLE) or ▭ (ENLARGE) (☞ pg. 16).

Snapshot mode with no frame

There is the sound of a shutter closing.

Basic Shooting (Snapshot)

You can use your camcorder as a Digital Still Camera for taking snapshots.

NOTE:
You should already have performed the procedures listed below. If not, do so before continuing.
● *Power (☞ pg. 8)*
● *Grip Adjustment (☞ pg. 10)*
● *Viewfinder Adjustment (☞ pg. 10)*
● *Loading A Memory Card (☞ pg. 13)*
● *Picture Mode Setting (☞ pg. 16)*

1 Set the Shooting Mode Switch to "XGA/VGA" or "UXGA", then set the Power Switch to " 🅰 " or " Ⓜ " while pressing down the Lock Button located on the switch. Open the LCD monitor fully or pull out the viewfinder fully.

2 Press **SNAPSHOT** halfway. The screen becomes a still image, which is captured into the camcorder 's memory. However, it is not recorded until **SNAPSHOT** is pressed fully.
• At this moment, if you release **SNAPSHOT**, snapshot recording will be canceled.

3 Press **SNAPSHOT** fully.
The image is recorded in the memory card.
• Still images are recorded in the snapshot mode with no frame.

To Delete Unwanted Still Images . . .
..... when unwanted still images are stored in the memory card or its memory is full, refer to "Deleting Images" (☞ pg. 47) and delete unwanted still images.

To Remove The Shutter Sound . . .
..... when you do not want to hear the shutter sound, set "BEEP" to "OFF" in the Menu Screen (☞ pg. 28, 30). The sound is no longer heard from the speaker.
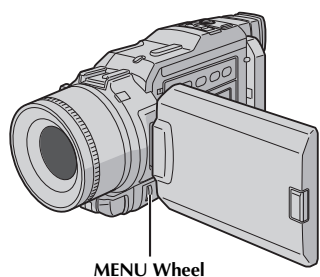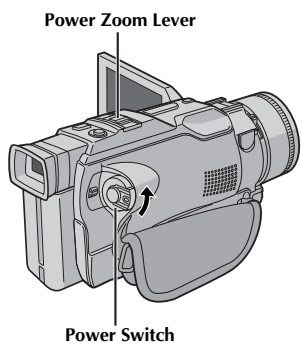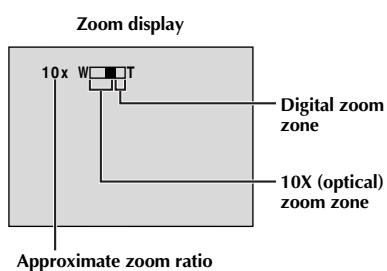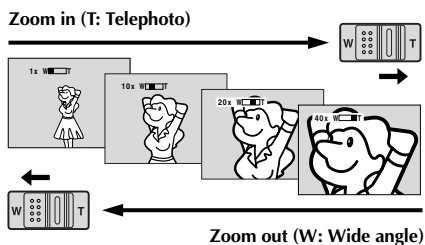
NOTES:
● *Even if "DIS" is set to "ON" (☞ pg. 29), the Stabilizer will be disabled.*
● *If Snapshot recording is not possible, "PHOTO" blinks when* ***SNAPSHOT*** *is pressed.*
● *If Program AE with special effects (☞ pg. 36) is engaged, certain modes of Program AE with special effects are disabled during Snapshot recording. In such a case, the icon blinks.*
● *If shooting is not performed for approx. 5 minutes when the Power Switch is set to " 🅰 " or " Ⓜ " and power is supplied from the battery pack, the camcorder shuts off automatically to save power. To perform shooting again, close the LCD monitor and re-open it. When using the viewfinder, push back it in and pull it out again.*
● *The Motor Drive mode (☞ pg. 20) is disabled when the Shooting Mode Switch is set to "XGA/VGA" or "UXGA".*
● *When a headphone set is connected to the PHONE connector, the shutter sound is not heard from the speaker.*
● *Still images taken are compliant to DCF (Design rules for Camera File systems). They do not have any compatibility with devices which are not compliant to DCF.*
● *In the XGA mode, images shot using a 680,000-pixel Progressive Scan CCD (effective area: 630,000 pixels, 962 x 654 pixels) are converted and stored in the XGA mode file size (1024 x 768 pixels).*

Zoom in (T: Telephoto)

1x W ▮▮ T

10x W ▮▮ T

20x W ▮▮ T

40x W ▮▮ T

W ⦙⦙ T

Zoom out (W: Wide angle)

Zoom display

10x W ▮▮ T

Digital zoom zone

10X (optical) zoom zone

Approximate zoom ratio

Power Zoom Lever

Power Switch

MENU Wheel

FEATURE: Zooming

PURPOSE:
To produce the zoom in/out effect, or an instantaneous change in image magnification.

OPERATION:
Zoom In
Slide the Power Zoom Lever towards "T".
Zoom Out
Slide the Power Zoom Lever towards "W".
■ The further you slide the Power Zoom Lever, the quicker the zoom action.

NOTES:
● *Focusing may become unstable during Zooming. In this case, set the zoom while in Record-Standby, lock the focus by using the manual focus (☞ pg. 27), then zoom in or out in Record mode.*
● *Zooming is possible to a maximum of 300X, or it can be switched to 10X magnification using the optical zoom (☞ pg. 29).*
● *Zoom magnification of over 10X is done through Digital image processing, and is therefore called Digital Zoom.*
● *During Digital zoom, the quality of image may suffer.*
● *Digital zoom cannot be used in the following cases:*
  • *When digital image processing, such as Picture Wipe/Dissolve (☞ pg. 34, 35) or Video Echo (☞ pg. 36, 37), is activated.*
  • *When the Shooting Mode Switch is set to "UXGA" or "XGA/VGA" (☞ pg. 14).*
  • *When "CAMERA MODE" is set to "DUAL" in the Menu Screen (☞ pg. 28, 29).*
  • *When "CAMERA MODE" is set to "PS-VIDEO" and "WIDE MODE" is set to "PS-WIDE" in the Menu Screen (☞ pg. 28, 29).*
● *Macro shooting (as close as approx. 5 cm (2 ") to the subject) is possible when the Power Zoom Lever is set all the way to "W". Also see "TELE MACRO" in the Menu Screen on page 30.*
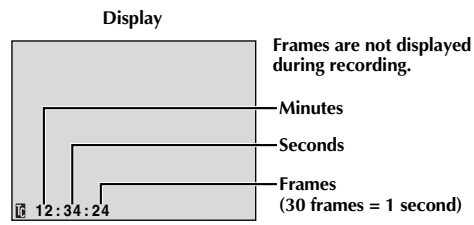

NOTE: Recording From The Middle Of A Tape

Time Code

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

If recording starts from a blank portion, the time code begins counting from "00:00:00" (minute:second:frame). If recording starts from the end of a previously recorded scene, the time code continues from the last time code number.

To perform Random Assemble Editing (☞ pg. 65 – 70), time code is necessary. If during recording a blank portion is left partway through the tape, the time code is interrupted. When recording is resumed, the time code starts counting up again from "00:00:00". This means the camcorder may record the same time codes as those existing in a previously recorded scene. To prevent this, perform "Recording From The Middle of A Tape" below in the following cases;

• When shooting again after playing back a recorded tape.
• When power shuts off during shooting.
• When a tape is removed and re-inserted during shooting.
• When shooting using a partially recorded tape.
• When shooting on a blank portion located partway through the tape.
• When shooting again after shooting a scene then opening/closing the cassette holder cover.
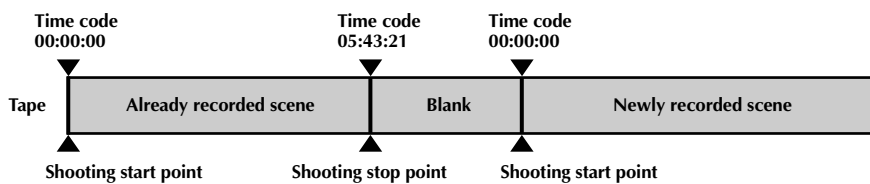
Display

Frames are not displayed during recording.

Minutes

Seconds

Frames (30 frames = 1 second)

12:34:24

Recording From The Middle Of A Tape

1. Play back a tape or use Blank Search (☞ pg. 43) to find the spot at which you want to start recording, then engage the Still Playback mode (☞ pg. 40).
2. Set the Power Switch to " Ⓐ " or " Ⓜ " while pressing down the Lock Button located on the switch, then start recording.
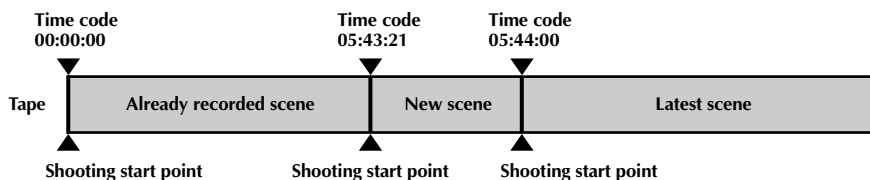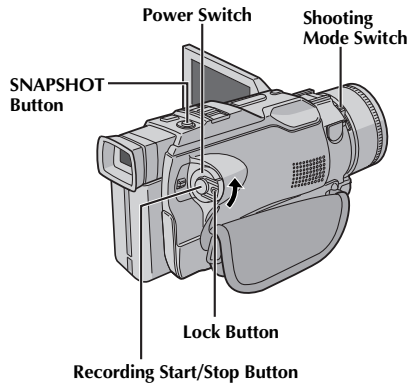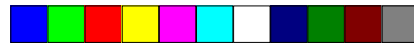
NOTES:
● *The time code cannot be reset.*
● *During fast-forwarding and rewinding, the time code indication does not move smoothly.*
● *The time code is displayed only when "TIME CODE" is set to "ON" (☞ pg. 31, 41).*

When a blank portion is recorded on a tape

Time code 00:00:00		Time code 05:43:21	Time code 00:00:00	
▼		▼	▼	
Tape	Already recorded scene	Blank	Newly recorded scene	
	▲ Shooting start point	▲ Shooting stop point	▲ Shooting start point	

Proper recording

Time code 00:00:00		Time code 05:43:21	Time code 05:44:00	
▼		▼	▼	
Tape	Already recorded scene	New scene	Latest scene	
	▲ Shooting start point	▲ Shooting start point	▲ Shooting start point	

Power Switch

Shooting Mode Switch

SNAPSHOT Button

Lock Button

Recording Start/Stop Button

Progressive Mode Recording

This mode lets you record moving images (successive jitter-free still images) onto a tape. Images can then played back jitter-free, with superior quality. High-resolution still images can also be processed on a personal computer or can be printed out (☞ pg. 57).

1 Set the Shooting Mode Switch to "VIDEO", then set the Power Switch to " Ⓜ " while pressing down the Lock Button located on the switch. Pull out the viewfinder fully or open the LCD monitor fully.

2 Set "CAMERA MODE" to "PS-VIDEO" in the Menu Screen (☞ pg. 28, 29).

**3** To start Progressive Mode Recording, press the Recording Start/Stop Button.

To End Progressive Mode Recording . . .
.... press the Recording Start/Stop Button. The camcorder enters the Record-Standby mode.

NOTES:
● *When an image recorded using the Progressive Mode is played back, the image may not look natural.*
● *When "CAMERA MODE" is set to "PS-VIDEO", Picture Wipe/Dissolve (☞ pg. 34) and some Program AE with special effects (☞ pg. 36) cannot be used.*
● *If **SNAPSHOT** is pressed in the PS-VIDEO mode, a snapshot will be recorded with higher quality than in VIDEO mode. However, "MULTI-4" and "MULTI-9" cannot be used (☞ pg. 20).*
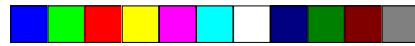
Description of Progressive Scan CCD

Progressive Scan is a special image sensing method which, unlike conventional interlace scanning, is able to pick up all the lines of picture information in one Scan. Since the Progressive Scan CCD is capable of outputting 60 full Frames* per second — twice the amount of conventional systems — it is able to deliver a high quality picture even when its output signal is converted to a format that can be viewed on a TV screen.

*A NTSC TV screen image is composed of 30 Frames per second. 1 Frame is made up of 2 Fields.
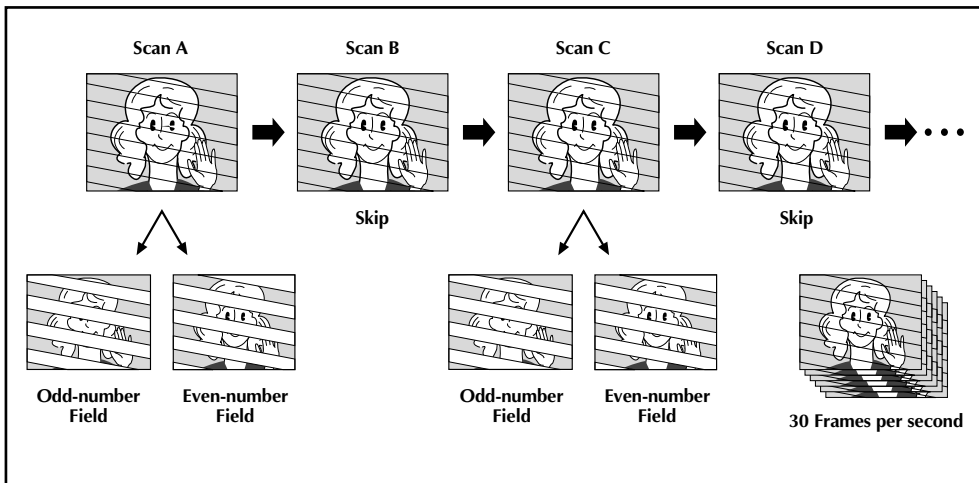
1 Frame

Scan A   **Scan B**
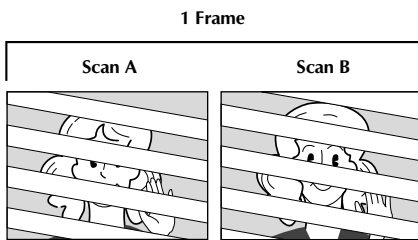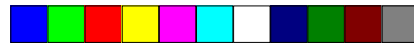
1. Regular shooting of moving images

Records 30 odd and 30 even image Fields, for a total of 60 per second. Since there is a time lag between an odd and even Field, when they are combined to make 1 Frame the part of the image that is moving appears as image jitter. **However, during normal playback, the moving picture looks smooth and natural.**

2. Progressive mode shooting of moving images (Progressive Mode Recording☞ pg. 24)
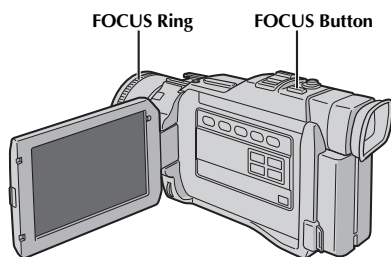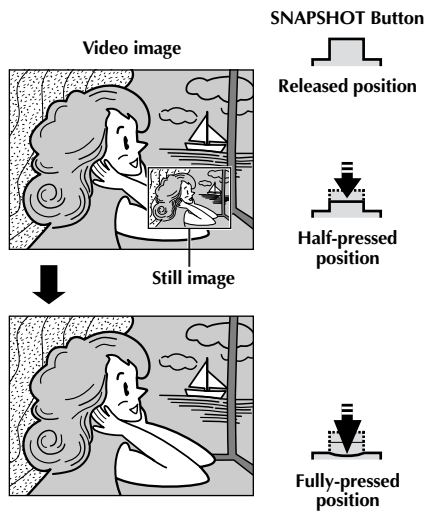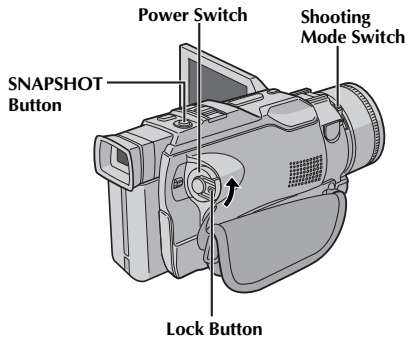
Scan A is recorded, divided into an odd- and even-number Field, and then Scan B is skipped. Scans C and D are handled in the same way as Scans A and B, as illustrated below, thereby recording 30 Frames per second.

Since each recorded odd- and even-number Field originates from the same Scan there is no time lag between them, and so when they are combined into a Frame and **a still image is displayed on a TV or PC monitor the picture does not look jittery. However, when moving images are played back, the picture can look unnatural.**

Scan A   **Scan B**   **Scan C**   **Scan D**

                    Skip   **Skip**

Odd-number Field **Even-number Field**   **Odd-number Field** **Even-number Field**   **30 Frames per second**

Power Switch

Shooting Mode Switch

SNAPSHOT Button

Lock Button

Video image

Still image

SNAPSHOT Button

Released position

Half-pressed position

Fully-pressed position

FOCUS Ring   **FOCUS Button**

Dual Shooting

Lets you record images on a tape and store still images in a memory card simultaneously. In other words, it is possible to store still images in the memory card without interrupting image recording on the tape.

1 Set the Shooting Mode Switch to "VIDEO", then set the Power Switch to "Ⓜ" while pressing down the Lock Button located on the switch. Pull out the viewfinder fully or open the LCD monitor fully.

2 Set "CAMERA MODE" to "DUAL" in the Menu Screen (☞ pg. 28, 29).

3 While recording to a tape, press **SNAPSHOT** halfway. A still image is displayed in the lower right corner of the screen where the video image being recorded is displayed.
• At this moment, if you release **SNAPSHOT**, snapshot recording will be canceled.

4 Press **SNAPSHOT** fully. The displayed still image is stored in the memory card.
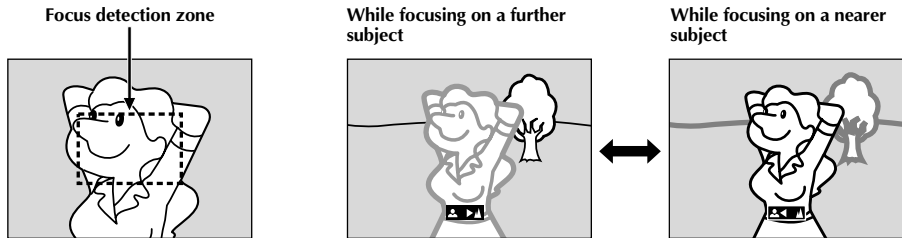
NOTES:
● *If **SNAPSHOT** is pressed in the Record-Standby mode, only a still image is stored in the memory card. Video recording does not take place.*
● *If **SNAPSHOT** is pressed when "DIS" is set to "ON" (☞ pg. 29), the Stabilizer will be disabled.*
● *The Stabilizer is less effective in the DUAL mode than in other modes.*
● *Still images are stored in the memory card in VGA mode file size (☞ pg. 14).*
● *When "CAMERA MODE" is set to "DUAL", all Fade/ Wipe Effects and some Program AE with special effects cannot be used (☞ pg. 34 – 37).*
● *The optional flash (☞ pg. 5, 83) will not light during video recording.*

Focus detection zone

While focusing on a further subject

While focusing on a nearer subject

FEATURE: **Auto Focus**

PURPOSE:

The camcorder's Full Range AF system offers continuous shooting ability from close-up (as close as approx. 5 cm (2") to the subject) to infinity.

However, correct focus may not be obtainable in the situations listed below (in these cases 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 in the viewfinder.*
• When the scene contains minute patterns or identical patterns that are regularly repeated.
• When the scene is affected by sunbeams or light reflecting off the surface of a body of water.
• When shooting a scene with a high-contrast background.

* The following low-contrast warnings appear blinking: ▲, ◀, ▶ and ▲

NOTES:

● *If the lens is smeared or blurred, accurate focusing is not possible. Keep the lens clean, wiping with a piece of soft cloth if it gets dirty. When condensation occurs, wipe with a soft cloth or wait for it to dry naturally.*
● *When shooting a subject close to the lens, zoom out first (☞ pg. 22). If zoomed-in in the auto focus mode, the camcorder may automatically zoom out depending on the distance between the camcorder and the subject. This will not occur when "TELE MACRO" (☞ pg. 30) is activated.*

FEATURE: **Manual Focus**

PURPOSE:

To obtain correct focus.

OPERATION:

1) If you are using the viewfinder, you should already have made the necessary viewfinder adjustments (☞ pg. 10).
2) Set the Power Switch to "Ⓜ" while pressing down the Lock Button located on the switch and set the Shooting Mode Switch to "VIDEO", then press **FOCUS**. The manual focus indicator appears.
3) To focus on a farther subject, rotate the Focus Ring clockwise. " ▶ " appears and blinks.
To focus on a nearer subject, rotate the Focus Ring counter clockwise. " ◀ " appears and blinks.

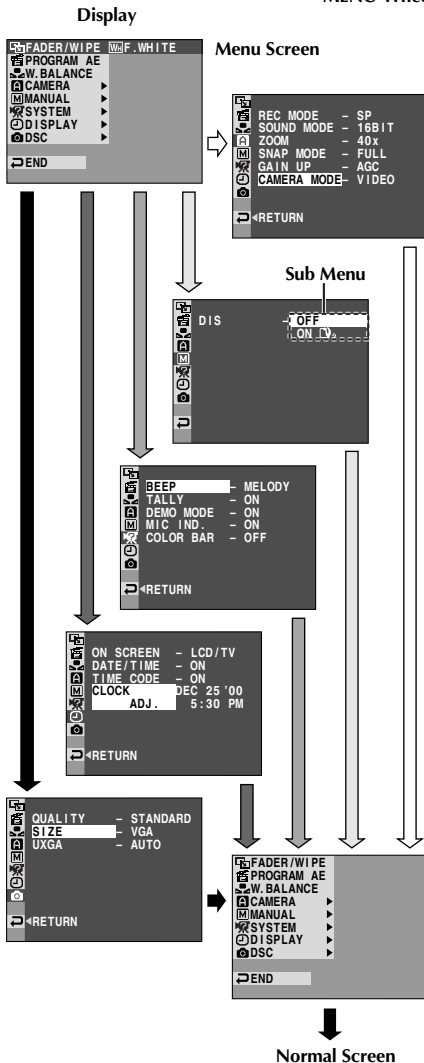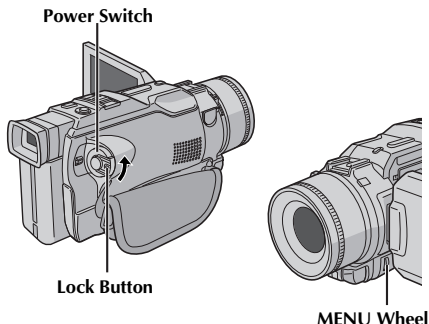To reset to Auto Focus, press **FOCUS** or set the Power Switch to " Ⓐ ".

NOTES:

● *Be sure to focus the lens in the maximum telephoto position when you use the Manual Focus mode. If you focus in on a subject in the wide-angle position, sharply focused images cannot be obtained when zoomed up because the depth-of-field is reduced at longer focal lengths.*
● *When the focus level cannot be adjusted any further or closer, "▲" or "▲" will blink.*

Power Switch

Lock Button

MENU Wheel

Display

FADER/WIPE W F.WHITE
PROGRAM AE
W.BALANCE
CAMERA   ►
MANUAL   ►
SYSTEM   ►
DISPLAY   ►
DSC   ►
END

Menu Screen

REC MODE   – SP
SOUND MODE – 16BIT
ZOOM   – 40x
SNAP MODE   – FULL
GAIN UP   – AGC
CAMERA MODE – VIDEO
◄RETURN

Sub Menu

DIS   – OFF
         ON
⤶

BEEP   – MELODY
TALLY   – ON
DEMO MODE   – ON
MIC IND.   – ON
COLOR BAR   – OFF
◄RETURN

ON SCREEN   – LCD/TV
DATE/TIME   – ON
TIME CODE   – ON
CLOCK   DEC 25 '00
    ADJ.   5:30 PM
◄RETURN

QUALITY   – STANDARD
SIZE   – VGA
UXGA   – AUTO
◄RETURN

FADER/WIPE
PROGRAM AE
W.BALANCE
CAMERA   ►
MANUAL   ►
SYSTEM   ►
DISPLAY   ►
DSC   ►
END

Normal Screen

Using Menus For Detailed Adjustment

This camcorder is equipped with an easy-to-use, on-screen menu system that simplifies many of the more detailed camcorder settings (☞ pg. 29 – 31) .

1 Set the Power Switch to " Ⓜ " while pressing down the Lock Button located on the switch, then pull out the viewfinder fully or open the LCD monitor fully .

2 Press the **MENU** wheel. The Menu Screen appears.

3 Rotate the **MENU** wheel to select the desired function menu, and press it. The selected function menu appears.

4 Function menu setting depends on the function.
If you have selected " FADER/WIPE", " PROGRAM AE" or " W. BALANCE" . . .
 .... see pg. 29.
If you have selected " CAMERA", " MANUAL", " SYSTEM", " DISPLAY" or " DSC" . . .
 .... go to step **5**.

5 Rotate the **MENU** wheel to select the desired function and press it. The Sub Menu appears.
Then, rotate the **MENU** wheel to select the parameter, and press it. Selection is complete.

6 Rotate the **MENU** wheel to select " ◄RETURN" and press it twice. The Menu Screen closes.
• The icon represents "END".

Menu Screen Explanations

▦ FADER/WIPE			Refer to "Fade/Wipe Effects" (☞ pg. 34, 35).
▦ PROGRAM AE			Refer to "Program AE With Special Effects" (☞ pg. 36, 37).
▦ W.BALANCE			Refer to "White Balance Adjustment" and "Manual White Balance Operation" (☞ pg. 39).
Ⓐ CAMERA	REC MODE		Allows you to set the video recording mode (SP or LP) depending on your preference (☞ pg. 15).
	SOUND MODE	12 BIT	Enables video recording of stereo sound on four separate channels, and is recommended for use when performing audio dubbing. (Equivalent to the 32 kHz mode of previous models)
		16 BIT	Enables video recording of stereo sound on two separate channels. (Equivalent to the 48 kHz mode of previous models)
	ZOOM	10X	When set to "10X" while using digital zoom, the zoom magnification will reset to 10X since digital zoom will be disengaged.
		40X	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.
		300X	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 300X digital magnification.
	SNAP MODE		Refer to "Snapshot (For Video Recording)" (☞ pg. 20).
	GAIN UP	OFF	Allows you to shoot dark scenes with no picture brightness adjustment.
		AGC	The overall appearance may be grainy, but the image is bright.
		AUTO ☀A	The shutter speed is automatically adjusted (1/30 — 1/200 sec.). Shooting a subject in low or poor lighting at 1/30 sec. shutter speed provides a brighter image than in the AGC mode, but the subject's movements are not smooth or natural. The overall appearance may be grainy. While the shutter speed is being automatically adjusted, " ☀A " is displayed.
	CAMERA MODE	VIDEO	Enables regular video shooting.
		DUAL	Enables "Dual Shooting" (☞ pg. 26).
		PS-VIDEO	Enables "Progressive Mode Recording" (☞ pg. 24).
Ⓜ MANUAL	DIS	OFF	To compensate for unstable images caused by camera-shake, particularly at high magnification. **NOTES:** ● Accurate stabilization may not be possible if hand shake is excessive, or under the following conditions: • When shooting subjects with vertical or horizontal stripes. • When shooting dark or dim subjects. • When shooting subjects with excessive backlighting. • When shooting scenes with movement in various directions. • When shooting scenes with low-contrast backgrounds. ● Switch off this mode when recording with the camcorder on a tripod. ● The "⬚" indicator blinks or goes out if the Stabilizer cannot be used.
		ON ⬚	
	SELF-TIMER		Refer to "Self-Timer" (☞ pg. 32).

▨ : Factory-preset

NOTES:
● *The "Ⓐ CAMERA" settings are effective when the Power Switch is set to both " Ⓐ " and "Ⓜ ".*
● *The "Ⓜ MANUAL" settings are effective only when the Power Switch is set to " Ⓜ ".*

Menu Screen Explanations (cont.)

M MANUAL	**5S**	**OFF**	Refer to "5-Second Recording" (☞ pg. 33).
		5S	
		ANIM.	Allows you to record a few frames only. By using an inanimate object and changing its position between shots, you can record the subject as though it is moving (☞ pg. 33).
	TELE MACRO	**OFF**	Usually the distance to a subject where the lens is in focus depends on the zoom magnification. Unless there is a distance more than 1m (3.3 ft.) to the subject, the lens is out of focus at the maximum telephoto setting. When set to "ON", you can shoot a subject as large as possible at a distance of approx. 60 cm (2 ft.). • Depending on the zoom position, the lens may go out of focus.
		ON	
	WIDE MODE	**OFF**	Records with no change in the screen ratio. For playback on a TV with a normal screen ratio.
		16:9LB ▭	Inserts black bands at the top and bottom of the screen. During playback on wide-screen TVs, the black bands at the top and bottom of the screen are cut and the screen ratio becomes 16:9. ▭ appears. When using this mode, refer to your wide-screen TV's instruction manual. During playback/recording on 4:3 TVs/LCD monitor/viewfinder, black bands are inserted at the top and bottom of the screen and the image appears like a letterboxed 16:9 movie. • "16:9LB" mode is effective only when the Shooting Mode Switch is set to "VIDEO" (☞ pg. 14) and "CAMERA MODE" is set to "VIDEO" or "PS-VIDEO" in the Menu Screen (☞ pg. 29).
		16:9SQ. W	For playback on TVs with an aspect ratio of 16:9. Naturally expands the image to fit the screen without distortion. W appears. When using this mode, refer to your wide-screen TV's instruction manual. During playback/recording on 4:3 TVs/LCD monitor/viewfinder, the image is elongated vertically. • "16:9SQ." mode is effective only when the Shooting Mode Switch is set to "VIDEO" (☞ pg. 14) and "CAMERA MODE" is set to "VIDEO" or "PS-VIDEO" in the Menu Screen (☞ pg. 29).
		PS-WIDE SW	"SW" appears. The zoom range is extended beyond the maximum optical zoom wide angle range. This mode's wide angle setting is equivalent to using a 0.7X wide conversion lens. Zooming is possible from 0.7X to 10X. This mode is suitable for shooting in a small room. • "PS-WIDE" mode is effective only when the Shooting Mode Switch is set to "VIDEO" (☞ pg. 14) and "CAMERA MODE" is set to "PS-VIDEO" in the Menu Screen (☞ pg. 29).
	WIND CUT	**OFF**	Disengages the function which cuts down on noise created by wind.
		ON 🗨	Helps cut down on noise created by wind. " 🗨 " appears. The quality of the sound will change. This is normal.
SYSTEM	**BEEP**	**OFF**	Even though not heard while shooting, shutter sound is recorded on the tape.
		BEEP	The beep sounds when the power is turned on or off, and at the beginning and end of recording. Also to activate the shutter sound effect (☞ pg. 20, 21).
		MELODY	Instead of a beep, a melody sounds when any operation is performed. It also activates the shutter sound effect (☞ pg. 20, 21).
	TALLY	**OFF**	The tally lamp remains off at all times.
		ON	The tally lamp comes on to signal the start of recording.

▭ **: Factory-preset**

NOTES:
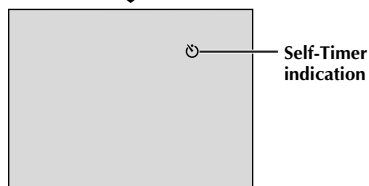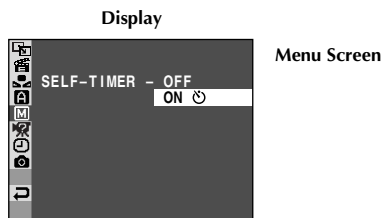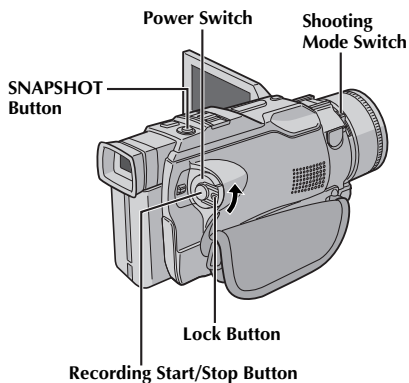● *The "M MANUAL" settings are effective only when the Power Switch is set to " M ".*
● *"SYSTEM" functions which are set when the Power Switch is set to " M " are also applied when the Power Switch is set to " PLAY " (☞ pg. 41).*

SYSTEM	**DEMO MODE**	**OFF**	Automatic demonstration will not take place.
		ON	Demonstrates certain functions such as Program AE with special effects, etc., and can be used to confirm how these functions operate. When "DEMO MODE" is set to "ON" and the Menu Screen is closed, demonstration starts. Performing any operation during the demonstration stops the demonstration temporarily. If no operation is performed for more than 1 minute after that, the demonstration will resume. **NOTES:** ● If a tape is in the camcorder, the demonstration cannot be turned on. ● "DEMO MODE" remains "ON" even if the camcorder power is turned off. ● If "DEMO MODE" remains "ON", some functions will not be available. After viewing demo, set to "OFF".
	MIC IND.	**OFF**	Microphone Level Indicator does not appear.
		ON	Microphone Level Indicator appears when recording starts, providing the operator with immediate visual confirmation that recording has started. Regardless of this setting, Microphone Level Indicator does not appear when the Power Switch is set to " 🅰 ", " PLAY "* or "OFF". * Except Audio Dubbing mode.
	COLOR BAR	**OFF**	Color Bars do not appear.
		ON	Color bars appear on screen which allows color settings to be adjusted quickly and easily for natural-looking picture reproduction. Regardless of this setting, color bars do not appear in the following cases: • When the Power Switch is set to " 🅰 ", " PLAY " or "OFF". • When the Shooting Mode Switch is set to "UXGA" or "XGA/VGA". • When "WIDE MODE" is set to "PS-WIDE" in the Menu Screen.
DISPLAY	**ON SCREEN**	**LCD**	Keeps the camcorder's display (except the date, time and time code) from appearing on the connected TV screen.
		LCD/TV	Makes the camcorder's display appear on screen when the camcorder is connected to a TV.
	DATE/ TIME	**OFF**	The date/time does not appear.
		AUTO	Displays the date/time for approx. 5 seconds in the following cases: • When the Power Switch is set from "OFF" to " 🅰 " or " Ⓜ ". • When video playback starts. The camcorder displays the date/time when scenes are recorded. • When the date is changed during video playback.
		ON	The date/time is always displayed.
	TIME CODE	**OFF**	Time code is not displayed.
		ON	Time code is displayed on the camcorder and on the connected TV. Frame numbers are not displayed during recording.
	CLOCK ADJ.		Allows you to set the current date and time (☞ pg. 11).
DSC	**QUALITY**		Refer to "Picture Mode Setting" (☞ pg. 16).
	SIZE		
	UXGA		

☐ : **Factory-preset**

NOTES:
● "🖾 SYSTEM" and "🔲 DISPLAY" functions which are set when the Power Switch is set to " Ⓜ " are also applied when the Power Switch is set to " PLAY " (☞ pg. 41). "CLOCK ADJ." only appears when the Power Switch is set to " Ⓜ ".
● The "🔲 DISPLAY" settings are effective even when the Power Switch is set to " 🅰 ".
● The "ON SCREEN" setting can also be changed by pressing the **DISPLAY** Button on the remote control (provided) (☞ pg. 55, 58, 66).
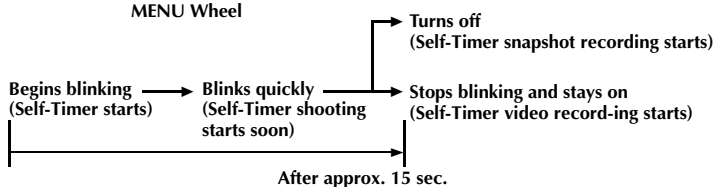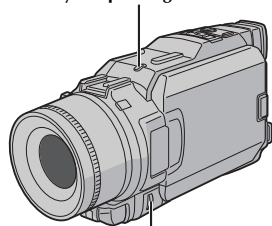
Power Switch

Shooting Mode Switch

SNAPSHOT Button

Lock Button

Recording Start/Stop Button

Display

```
SELF-TIMER - OFF
                ON ⏱
```

Menu Screen

⏱ — **Self-Timer indication**

When the Recording Start/Stop Button or SNAPSHOT is pressed, the tally lamp changes as shown:

MENU Wheel

Self-Timer

Once the camcorder is set, the camcorder operator can become part of the scene in a more natural way, adding the final touch to a memorable picture.

1 Set the Power Switch to " Ⓜ " while pressing down the Lock Button located on the switch. Pull out the viewfinder fully or open the LCD monitor fully.
• You can tilt the LCD monitor upward to 180° so that it faces forward and view yourself while self-recording with the viewfinder pushed back.

2 Press the **MENU** wheel. The Menu Screen appears.

3 Rotate the **MENU** wheel to select " Ⓜ MANUAL", and press it.

4 Rotate the **MENU** wheel to select "SELF-TIMER", and press it. The Sub Menu appears. Rotate the **MENU** wheel to select "ON ⏱", and press it. Selection is complete. Rotate the **MENU** wheel to select "◀RETURN", and press it twice to close the Menu Screen.

5 To engage the Self-Timer for video recording, press the Recording Start/Stop Button. After 15 seconds, the beep sounds and video recording starts. To stop Self-Timer recording, press the Recording Start/Stop Button again. The camcorder re-enters Record-Standby mode.
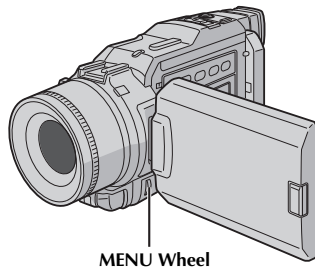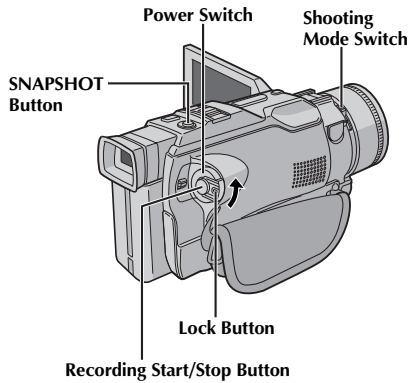
OR

Press **SNAPSHOT**. After 15 seconds, the beep sounds and snapshot recording starts. After that, the camcorder re-enters Record-Standby mode.

6 To end Self-Timer recording, select "OFF" in step **4**.

NOTE:
If "BEEP" and "TALLY" are set to "OFF" (☞ pg. 30), the beep does not sound and the tally lamp does not light.

Turns off (Self-Timer snapshot recording starts)

Begins blinking (Self-Timer starts) → **Blinks quickly (Self-Timer shooting starts soon)** → **Stops blinking and stays on (Self-Timer video record-ing starts)**

After approx. 15 sec.

Power Switch

Shooting Mode Switch

SNAPSHOT Button

Lock Button

Recording Start/Stop Button

MENU Wheel

Display

Menu Screen

```
5S     – OFF
         5S
         ANIM.
```
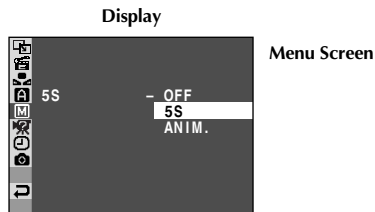
5-Second Recording

Record a vacation or an important event in 5-second clips to keep the action moving. This function is available only for video recording.

1 Set the Shooting Mode Switch to "VIDEO", then set the Power Switch to " Ⓜ " while pressing down the Lock Button located on the switch. Pull out the viewfinder fully or open the LCD monitor fully.

2 Press the **MENU** wheel. The Menu Screen appears.

3 Rotate the **MENU** wheel to select " Ⓜ MANUAL", and press it. The MANUAL Menu appears.

4 Rotate the **MENU** wheel to select "5S", and press it. The Sub Menu appears.

5 Rotate the **MENU** wheel to select "5S", and press it. Selection is complete. Rotate the **MENU** wheel to select "◄RETURN", and press it twice to close the Menu Screen.
• "5S" appears.

6 Press the Recording Start/Stop Button. The tally lamp lights and beep sounds to indicate the start of recording, and after 5 seconds the camcorder enters Record-Standby mode.
• Even if you press the Recording Start/Stop Button again within 5 seconds after recording starts, Record-Standby mode is not engaged.

7 To exit the 5S mode, select "OFF" in step **5**.

To Take A Snapshot In The 5-Second Recording Mode . . .
.... instead of pressing the Recording Start/Stop Button in step **6**, select the desired Snapshot mode in the Menu Screen, then press **SNAPSHOT**. The camcorder records a 5-second still (☞ pg. 20). When "5S" is set to "ANIM." (☞ pg. 30) this function is not available.

NOTE:
When "5S" is set to "ANIM." in the Menu Screen the 5-second recording mode is not available. Animation recording of a few frames only is taken instead (☞ pg. 30).
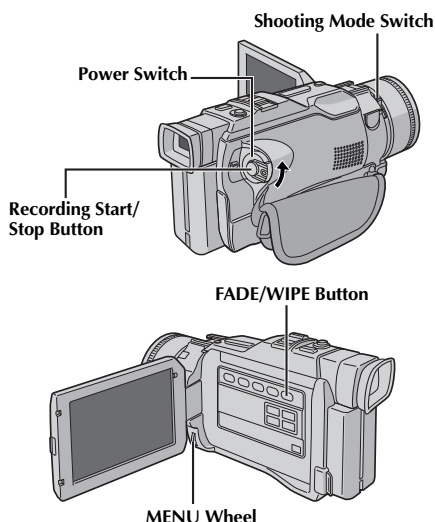
Fade/Wipe Effects

These effects let you make pro-style scene transitions. Use them to spice up the transition from one scene to the next. You can also vary transitions from scene to scene.

IMPORTANT:

Some Fade/Wipe Effects cannot be used with certain modes of Program AE with special effects (☞ pg. 36, 37). If an unusable Fade/Wipe Effect is selected, its indicator blinks or goes out.

Shooting Mode Switch

Power Switch

Recording Start/Stop Button

FADE/WIPE Button

MENU Wheel

To Deactivate The Selected Effect . . .
.... press **FADE/WIPE** again in step **6** so that the effect indicator disappears.

NOTES:
- *You can extend the length of a Fade or Wipe by pressing and holding the Recording Start/Stop Button.*
- *If the power is turned off after a scene is finished recording, the stored point is erased, disabling the Picture Wipe/Dissolve combination. When this happens, the Picture Wipe/Dissolve indicator blinks. Also note that power shuts off automatically if 5 minutes elapse in the Record-Standby mode.*
- *Picture Wipe/Dissolve cannot be used when "CAMERA MODE" is set to "PS-VIDEO".*
- *All Fade/Wipe Effects cannot be used when "CAMERA MODE" is set to "DUAL".*
- *The sound at the end of the last recorded scene is not stored.*

FADE/WIPE SELECTION
(WH , BK , BW , ▢ , ▢ , ◖ , ◖▶ , ▱ and ▱)

Fade or Wipe works when video recording is started or when you stop recording.

1 Set the Shooting Mode Switch to "VIDEO" and set the Power Switch to " M " while pressing down the Lock Button located on the switch. Pull out the viewfinder fully or open the LCD monitor fully.

2 Press the **MENU** wheel. The Menu Screen appears.

3 Set "CAMERA MODE" to "VIDEO" or "PS-VIDEO" in the Menu Screen (☞ pg. 28, 29).

4 Rotate the **MENU** wheel to select " ▦ FADER/WIPE", then press it. Rotate the **MENU** wheel to select the desired function, then press it. Selection is complete.

5 Press the **MENU** wheel again. The Menu Screen closes.

6 *To activate the Fade-in or Wipe-in . . .*
.... Press **FADE/WIPE** during Record-Standby mode so that the selected effect indicator appears.

To activate the Fade-out or Wipe-out . . .
.... Press **FADE/WIPE** during recording so that the selected effect indicator appears.

7 Press the Recording Start/Stop Button to activate the Fade-in/out or Wipe-in/out.

PICTURE WIPE OR DISSOLVE SELECTION
(▦P , ▢P , ▢P , ◖P , ◖▶P , ▱P and ▱P)

The Picture Wipe or Dissolve works when video recording is started.

1 Follow steps **1** through **5** above.

2 Engage the Record-Standby mode.
If you press FADE/WIPE during recording . . .
.... press the Recording Start/Stop Button when one scene is finished. The point at which the scene ended is stored in memory.

If you press FADE/WIPE during Record-Standby mode . . .
.... press the Recording Start/Stop Button to start recording and press it again when one scene is finished. The point at which the scene ended is stored in memory.

3 If you start recording a new scene within 5 minutes of the end of the previous recording (without having turned the camcorder's power off), the previous scene wipes out, revealing the new scene.

Fader And Wipe Menu

Menu	Effect
WH FADER — WHITE	Fade in or out with a white screen.
BK FADER — BLACK	Fade in or out with a black screen.
B.W FADER — B.W	Fade in to a color screen from a black and white screen, or fade out from color to black and white.
WIPE — CORNER	Wipe in on a black screen from the upper right to the lower left corner, or wipe out from lower left to upper right, leaving a black screen.
WIPE — WINDOW	The scene starts in the center of a black screen and wipes in toward the corners, or comes in from the corners, gradually wiping out to the center.
WIPE — SLIDE	Wipe in from right to left, or wipe out from left to right.
WIPE — DOOR	Wipe in as the two halves of a black screen open to the left and right, revealing the scene, or wipe out and the black screen reappears from left and right to cover the scene.
WIPE — SCROLL	The scene wipes in from the bottom to the top of a black screen, or wipes out from top to bottom, leaving a black screen.
WIPE — SHUTTER	Wipe in from the center of a black screen toward the top and bottom, or wipe out from the top and bottom toward the center leaving a black screen.
P DISSOLVE	The new scene gradually appears as the old one gradually disappears.
P WIPE — CORNER	The new scene wipes in over the previous one from the upper right corner to the lower left corner.
P WIPE — WINDOW	The next scene gradually wipes in from the center of the screen toward the corners, covering the previous scene.
P WIPE — SLIDE	The next scene gradually wipes in over the previous one from right to left.
P WIPE — DOOR	The previous scene wipes out from the center to the right and left, like a door being pushed open to reveal the next scene.
P WIPE — SCROLL	The new scene wipes in over the last one from the bottom of the screen to the top.
P WIPE — SHUTTER	The new scene wipes in over the previous one from the center toward the top and bottom of the screen.