

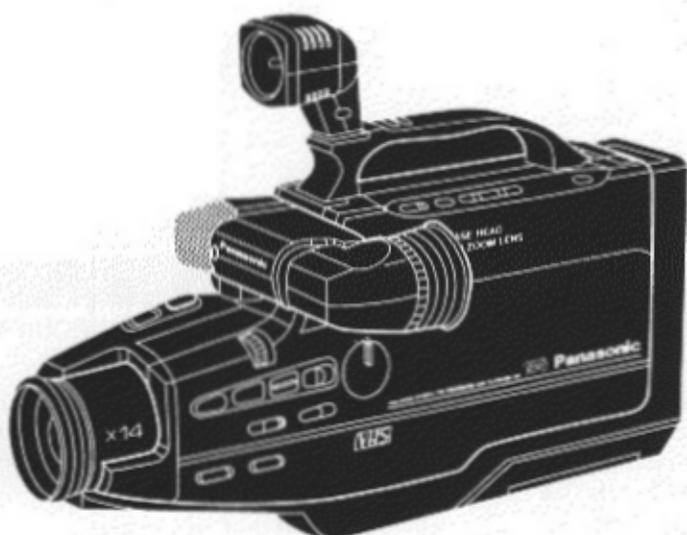
Operating

Instructions

Panasonic **VHS**
Professional/Industrial Video

**PRO
LINE**

AG-**188U**



Before attempting to connect, operate or adjust this product, please read these instructions thoroughly.

Things You Should Know

Thank you for choosing Panasonic!

You have purchased one of the most sophisticated and reliable products on the market today. Please take time to fill in the information at right. The serial number is on the tag located on the underside of your Camcorder. Be sure to **retain this manual** as your convenient Camcorder information source.

Date of Purchase _____

Dealer Purchased From _____

Dealer Address _____

Dealer Phone No. _____

Model No. _____

Serial No. _____

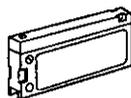
Unpack your Camcorder

These accessories are provided in order to set up or use your Camcorder.

1 pc. AC Adaptor
(AG-B21P)



1 pc. Battery Pack
(AG-BP20-P)



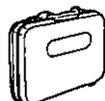
1 pc. Audio/Video
Cable (VJAW0020)



1 pc. Shoulder Strap
(VYCW0071)



1 pc. System Carrying
Case (AG-HT8)



1 pc. Color Enhancement
Light (VUAW0415)



Safety Precautions

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

Your Camcorder is designed to record and play back in Standard Play (SP) mode only. Your Camcorder will not perform normal playback for programs pre-recorded in Long Play (LP) or Super Long Play (SLP) mode.

This Camcorder is equipped with the HQ System to provide excellent video pictures, and is compatible with standard VHS equipment.

Only use those tapes with the **VHS** mark. It is recommended that only cassette tapes that have been tested and inspected for use in 2, 4, 6 and 8 hour VCR machines be used.



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

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

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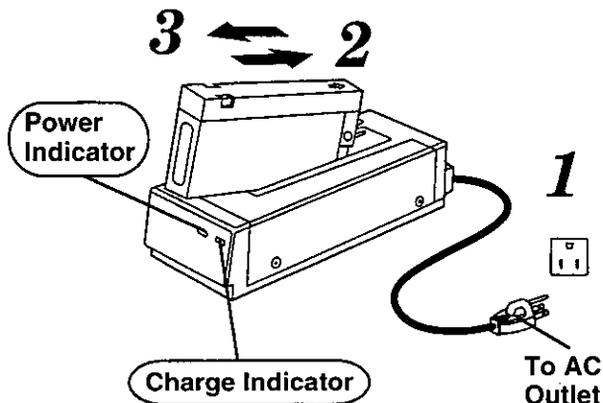
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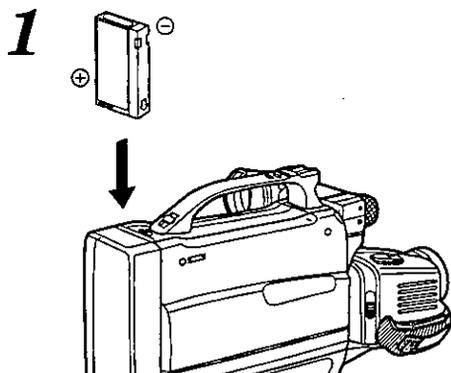
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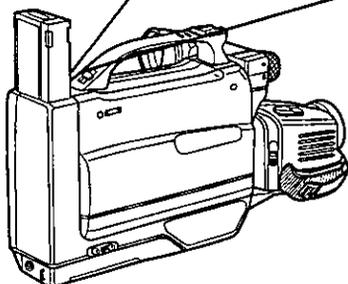
Supplying Power



Battery will not charge when installed in Camcorder.



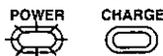
BATT(ery) Eject Button



Charge the Battery Pack

1

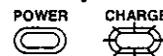
Plug in the AC Adaptor.



2

Power Indicator lights up.

Insert the Battery



Charge Indicator lights up.

- The Battery Pack should charge in about 1 hour and 40 minutes.

3

Remove the Battery



Charge Indicator goes out when charging is complete (about 1 hour and 40 minutes.)

Use the Battery Pack

1

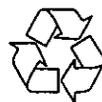
Insert the Battery into the Battery Compartment until it locks with a click.

2

To Remove the Battery.

Slide the BATT(ery) Eject button.

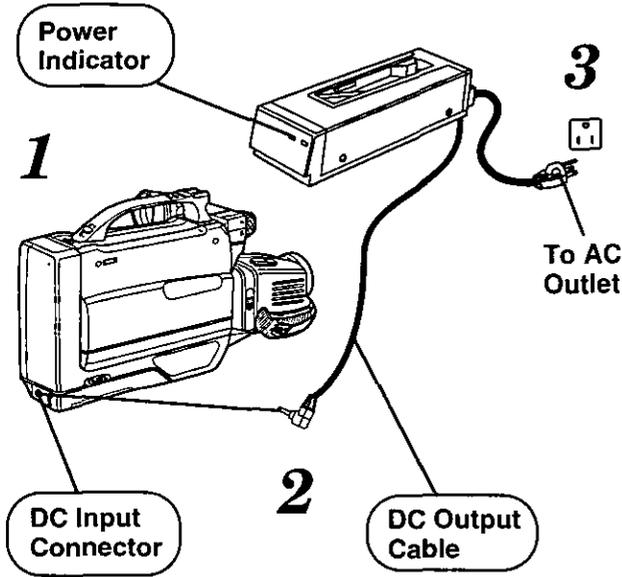
- Be sure that the Power is "OFF" before ejecting the Battery Pack.



ATTENTION: Pb

The product that you have purchased is powered by a rechargeable battery. The battery is recyclable. At the end of its useful life, under various state and local laws, it may be illegal to dispose of this battery into the municipal waste stream. Check with your local solid waste officials for details in your area for recycling options or proper disposal.

Supplying Power



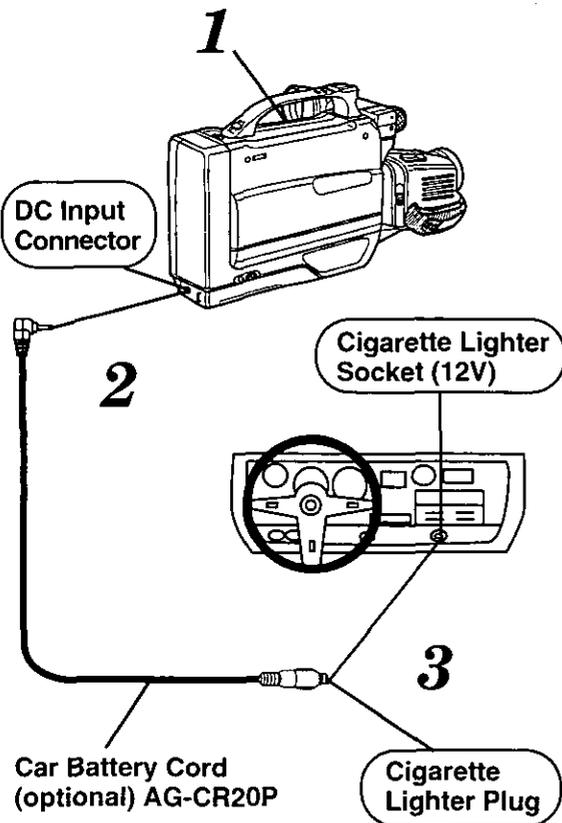
AC Adaptor (Supplied)

1  Turn the Camcorder Power OFF before connecting.

2 Connect the DC Output Cable into the DC Input Connector on your Camcorder.

3 Plug in the AC Adaptor.
• The Power indicator will light up.

Note:
AC Adaptor does not function while charging the Battery.



Car Battery Cord (Optional)

1  Turn the Camcorder Power OFF before connecting.

2 Connect a AG-CR20P Car Battery Cord into the DC Input Connector on your Camcorder.

3 Start your car engine and then insert the Car Battery Cord plug into your cigarette lighter socket.

• There is a fuse located in the lighter plug end of the cord.
Should fuse replacement be necessary use the exact current rating (in amps).

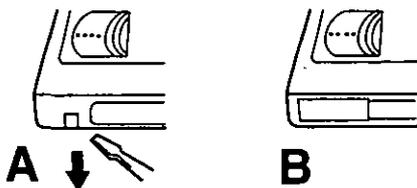
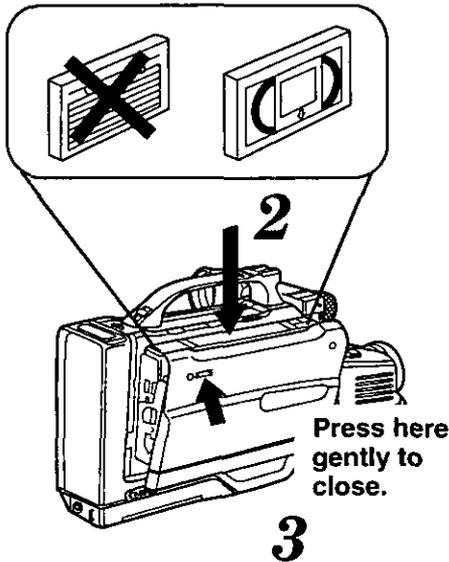
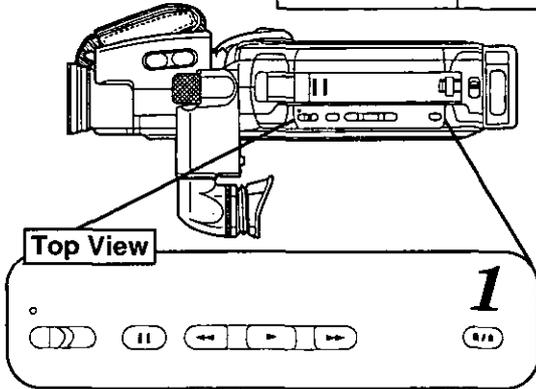
Note:
This cord can only be used in vehicles equipped with DC 12V (negative ground) batteries.
Use only the specified car battery cord.

Cassette Information

Types of Video Cassettes

Use only tapes with the **VHS** mark on the cassette.

Tape Speed	Maximum Record/Playback Time		
SP (Standard Play)	T160	T120	T60
	2 Hours 40 Minutes	2 Hours	1 Hour



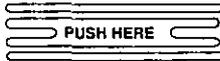
Loading a Cassette

Connect the Camcorder to a power source.

1  Press **STOP/EJECT** to open the door.

2 Insert the cassette with the window facing out.

Do not attempt to insert a cassette which is upside down or backwards.

3  Press **PUSH HERE** to close the door.

To Remove a Cassette

 Press **STOP/EJECT**.

Erase Protection Tab

Cassettes have a record tab to ensure that recordings are not accidentally erased.

A To prevent accidental erasure
Break off the tab with a screwdriver.

B To record again
Cover the hole with cellophane tape.

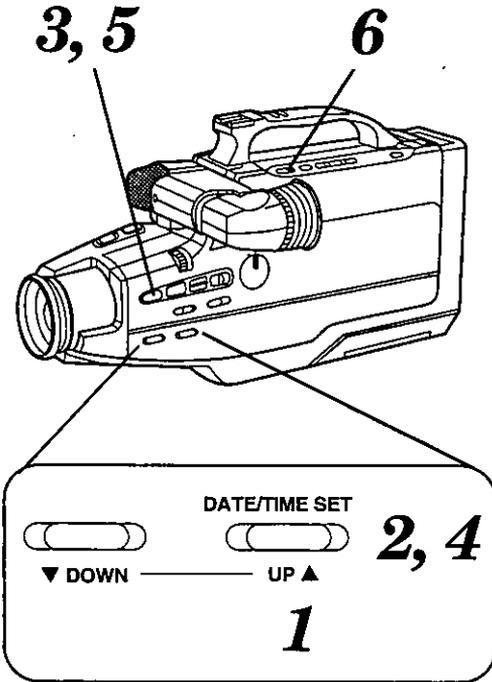
Setting the Clock

Before you begin...

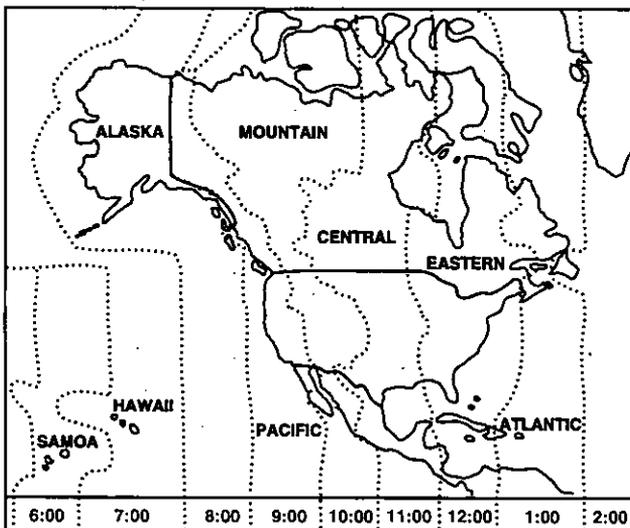
- Connect the Camcorder to a power source. (see page 4)
- Turn the Camcorder Power ON.

Note:

The Camcorder will exit the CLOCK SET menu if, after activation, none of the DATE/TIME SET ▲, ▼ or DISPLAY buttons are pressed within 30 seconds.



Time Zone chart



Set the Time Zone

When travelling, you can reset the Camcorder's clock to the local time by simply entering the new time zone.

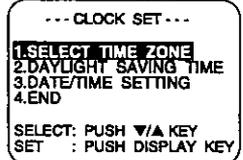
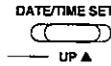
Note:

When you set the clock for first time, please set the Time Zone, Daylight Saving Time, and then Date and Time.

When you travel outside the eight time zones below, please set the clock manually (see page 9).

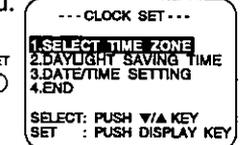
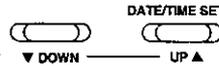
1

Press DATE/TIME SET UP ▲ to display the CLOCK SET menu.



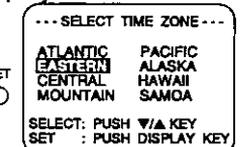
2

Press ▲ or ▼ repeatedly to select 1.SELECT TIME ZONE from the CLOCK SET menu.



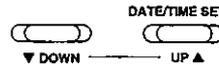
3

Press DISPLAY to display the SELECT TIME ZONE menu.



4

Press ▲ or ▼ repeatedly to select one of the eight time zones of the location where you are using the Camcorder.



5

Press DISPLAY to fix the Time Zone. The CLOCK SET menu appears.



To exit from the CLOCK SET menu, Select 4. END and press DISPLAY.

6

Turn the Camcorder Power OFF after setting the Time Zone.



Note:

If you do not turn the Camcorder Power OFF, the Time Zone might not be set properly.

To Change the Time Zone

Follow the steps 1–6 above.

Setting the Clock

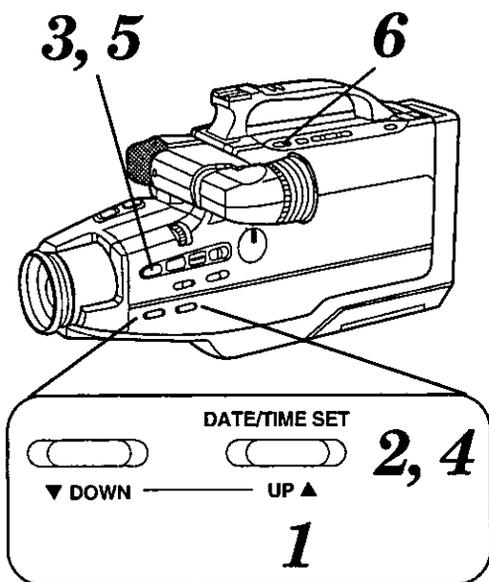
Before you begin...

- Connect the Camcorder to a power source. (see page 4)
- Turn the Camcorder Power ON.

Note:

The Camcorder will exit the CLOCK SET menu if, after activation, none of the DATE/TIME SET ▲, ▼ or DISPLAY buttons are pressed within 30 seconds.

If Hawaii or Samoa Time Zone is selected, the clock will not automatically adjust to daylight saving time.



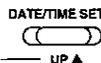
Set the Daylight Saving Time

The clock will automatically adjust to daylight saving time so you do not have to do it manually.

Note:

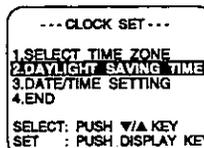
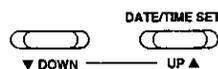
When you set the clock for first time, please set the Time Zone, Daylight Saving Time, and then Date and Time.

1



Press DATE/TIME SET UP ▲ to display the CLOCK SET menu.

2



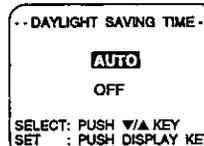
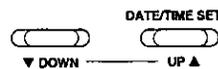
Press ▲ or ▼ repeatedly to select 2.DAYLIGHT SAVING TIME from the CLOCK SET menu.

3



Press DISPLAY to display the DAYLIGHT SAVING TIME menu.

4



Press ▲ or ▼ to select AUTO or OFF.

5



Press DISPLAY to fix the DAYLIGHT SAVING TIME setting. The CLOCK SET menu appears.

To exit from the CLOCK SET menu, Select 4. END and press DISPLAY.

6



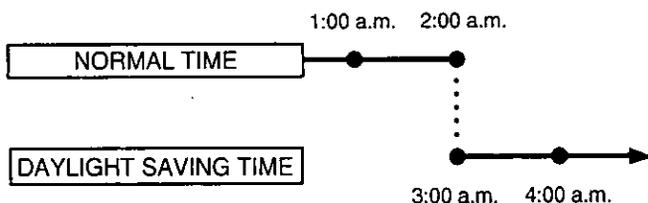
Turn the Camcorder Power OFF after setting the DAYLIGHT SAVING TIME.

Note:

If you do not turn the Camcorder Power OFF, the Daylight Saving Time might not be set properly.

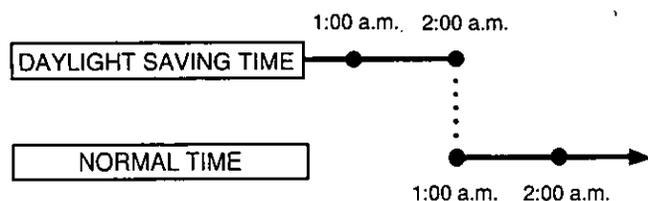
Spring:

First Sunday in April (DAYLIGHT SAVING TIME: AUTO) Automatically adds one hour and adjusts the clock.



Autumn:

Last Sunday in October (DAYLIGHT SAVING TIME: AUTO) Automatically turns back one hour and adjusts the clock.



Setting the Clock

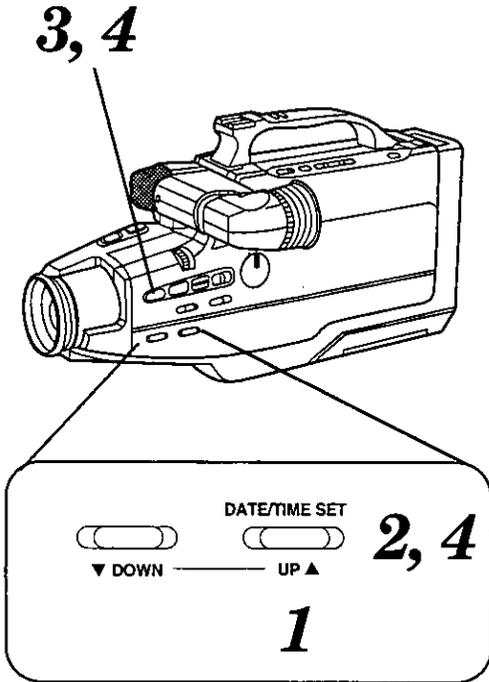
Before you begin...

- Connect the Camcorder to a power source. (see page 4)
- Turn the Camcorder Power ON.

Note:

The Camcorder will exit the CLOCK SET menu if, after activation, none of the DATE/TIME SET ▲, ▼ or DISPLAY buttons are pressed within 30 seconds.

Whenever "12:00:00AM JAN 1 1994" appears, it indicates that the clock needs adjustment.



Set the Date and Time

The date and time is calculated, including leap year, up to DEC 31 2093.

Note:

When you set the clock for first time, please set the Time Zone, Daylight Saving Time, and then Date and Time.

1

DATE/TIME SET
UP ▲

--- CLOCK SET ---

1.SELECT TIME ZONE
2.DAYLIGHT SAVING TIME
3.DATE/TIME SETTING
4.END

SELECT: PUSH ▼/▲ KEY
SET : PUSH DISPLAY KEY

Press DATE/TIME SET UP ▲ to display the CLOCK SET menu.

2

DATE/TIME SET
▼ DOWN — UP ▲

--- CLOCK SET ---

1.SELECT TIME ZONE
2.DAYLIGHT SAVING TIME
3.DATE/TIME SETTING
4.END

SELECT: PUSH ▼/▲ KEY
SET : PUSH DISPLAY KEY

Press ▲ or ▼ repeatedly to select 3.DATE/TIME SETTING from the CLOCK SET menu.

3

DISPLAY

Press DISPLAY to display the DATE/TIME SETTING menu.

4

--- DATE/TIME SETTING ---

12:00:00AM
JAN 1 1994

SELECT: PUSH ▼/▲ KEY
SET : PUSH DISPLAY KEY

Adjust the flashing digits for the hour, minute, second, month, day and year.

Press ▲ or ▼ repeatedly (or hold down) to enter the desired numbers, then, press DISPLAY to fix that portion and move to the next.

DATE/TIME SET ▼ DOWN — UP ▲ 5:00:00PM JAN 1 1994 → DISPLAY 5:00:00PM JAN 1 1994

DATE/TIME SET ▼ DOWN — UP ▲ 5:20:00PM JAN 1 1994 → DISPLAY 5:20:00PM JAN 1 1994

DATE/TIME SET ▼ DOWN — UP ▲ 5:20:00PM FEB 1 1994 → DISPLAY 5:20:00PM FEB 1 1994

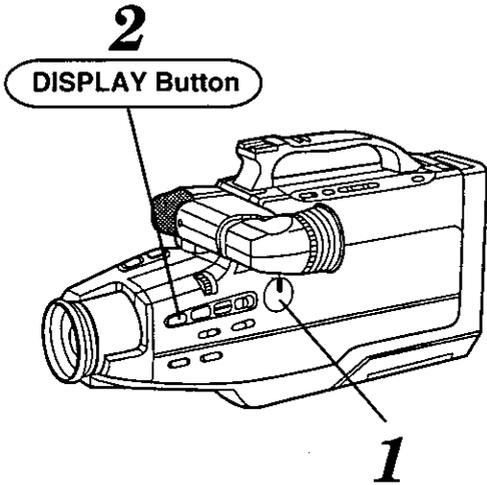
DATE/TIME SET ▼ DOWN — UP ▲ 5:20:00PM FEB 12 1994 → DISPLAY 5:20:00PM FEB 12 1994

DATE/TIME SET ▼ DOWN — UP ▲ 5:20:00PM FEB 12 1995 →

When you finish setting the year, the clock starts operating, and the CLOCK SET menu appears.

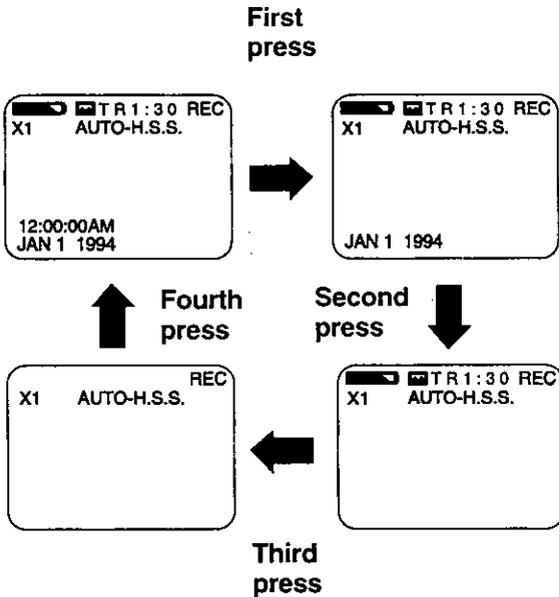
To exit from the CLOCK SET menu, Select 4. END and press DISPLAY.

Electronic Viewfinder Indications



Note:
The tape remaining indication will not function with T-160 tapes.

EVF Indications



Note:
In the VCR mode, the display can only be changed while the tape is stopped.
Only Date and Time are recorded on the Tape.

Tape/Battery Remaining

The remaining recording time on the tape and the battery charge level can be displayed.



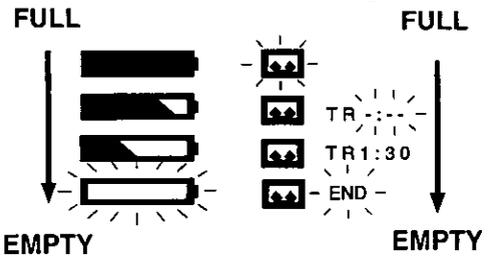
Set the VCR/CAMERA switch to "CAMERA".



Press DISPLAY repeatedly to select the desired display.

Battery Remaining:
Shows battery charge remaining.

Tape Remaining:
Shows the time remaining on the tape in 1 minute segments, during recording.

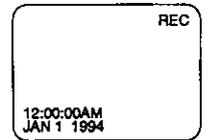


- It will take several seconds for the tape remaining indicator to operate (TR --- flashes) after the tape starts moving.

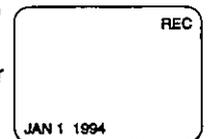
Record the Date and Time



Set the VCR/CAMERA switch to "CAMERA". When placed in Record mode, the time and date will be recorded on the tape.

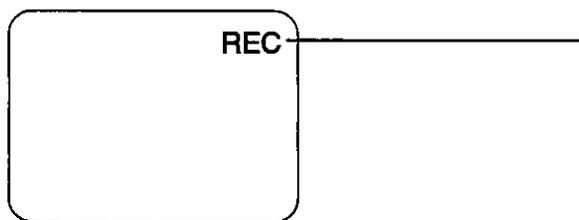


Press DISPLAY once to change the display to date only. Press once or twice more to remove the date/time display.



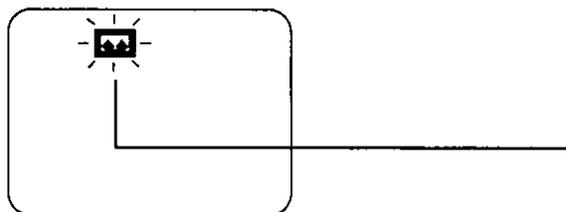
Electronic Viewfinder Indications

Here are some of the basic indications which appear in the Camcorder EVF. They will not be recorded on the tape.



Operating Mode Indications

REC (record)
PAUSE (record pause)
FF (fast forward)
PLAY
REW (rewind)



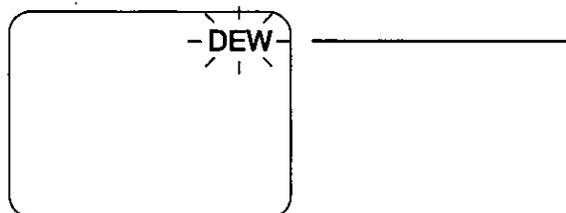
Warning Indications



This indicator flashes when the tape is about to end in REC mode.

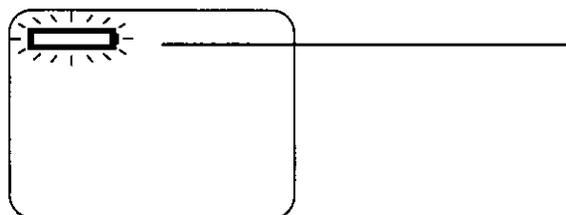


If the record tab is missing or no tape is inserted, this indicator will flash for one minute and recording will not start.



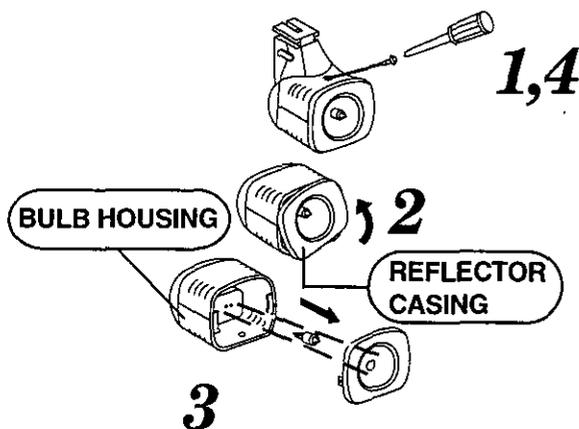
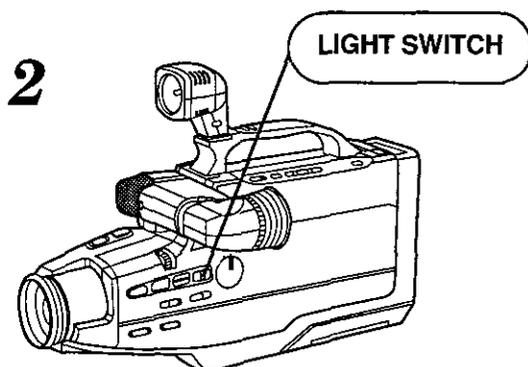
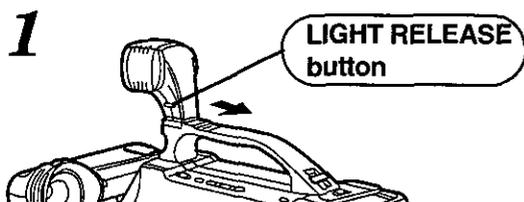
DEW

If excessive moisture condenses in the unit, it will not operate. This indicator will flash for several seconds and the Camcorder will automatically turn OFF. In this case, wait until the indicator no longer flashes when your Camcorder is turned on again.



 will flash for a few minutes prior to automatic power shut off. When this happens, a battery recharge is necessary.

Color Enhancement Light



Danger:

- When replacing the bulb, use only lamp bulbs (PART NO. VLLW0002) supplied by Panasonic to reduce the risk of fire. Use a cloth or tissue when handling the bulb as finger oils will decrease the bulb life. To prevent possible burn hazard, disconnect the Color Enhancement Light Unit and allow the lamp to cool before replacing.
- Do not connect any light other than the standard light included. Use of a different light, modification to the light connector or light jack may cause severe battery drain and fire hazard.

Using the 10W Light

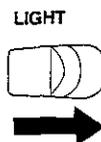
To brighten the natural colors in a scene.

1

Slide Light into built-in Light Mount. Be sure it locks into place.

2

Slide LIGHT Switch ON.



To remove the Light:

Press Light RELEASE button and slide the Light out of the mount.

Caution:

This light becomes hot during operation.

Replacing the Bulb

1 Turn screw counterclockwise on the underside of the reflector casing and remove.

2 Turn reflector casing counterclockwise only as far as shown in the diagram and pull it off the bulb housing.

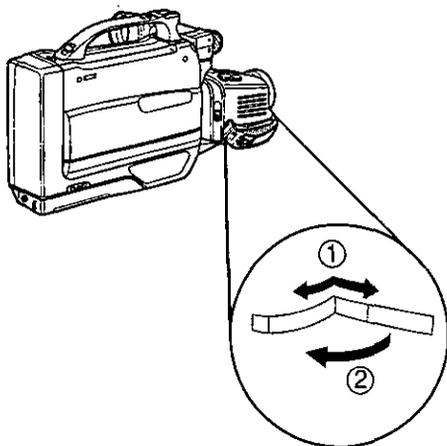
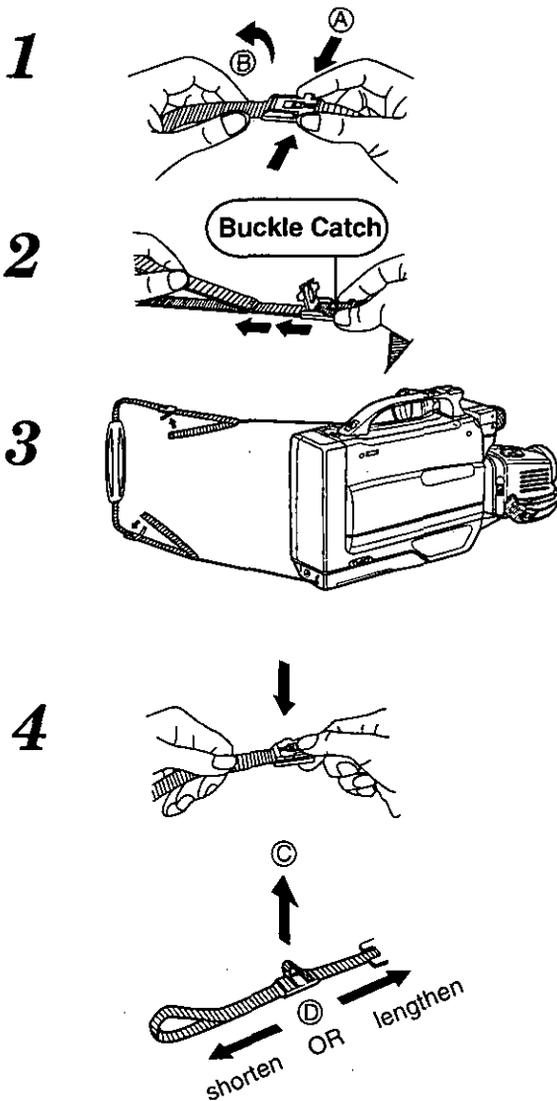
3 Using a clean cloth or tissue, replace the bulb.

4 Replace the reflector casing turning it clockwise. Replace the screw.

Note:

- If using the Enhancement Light for an extended period of time, take note of the surrounding temperature. As a safety feature, if the surrounding temperature exceeds 104° F (40°C), the light will temporarily go out. It will resume normal operation when the temperature drops. Be sure to provide ventilation when using the light in a hot environment.
- Using the Enhancement Light when the Camcorder is powered by a car battery may shorten bulb life.
- Do not attempt to lift or carry the Camcorder by holding the Enhancement Light.

Attaching the Shoulder Strap



1

Pinch the tabs together on either side of the clasps (B) and open the buckles.

2

Unhook the strap from the Buckle Catch.

3

Thread the strap ends through the Strap Attachment Rings. Then re-hook them onto the Buckle Catch.

4

Snap both clasps shut to lock the straps in place.

Pull a loop of the strap loose from the buckle, (C) then pull the strap through the buckle to lengthen or shorten it.

Hand Strap

1

Hold the Camcorder by putting your hand through the Hand Strap.

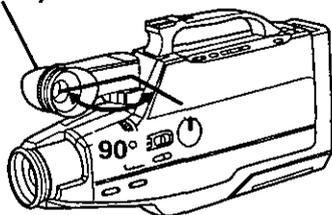
2

Adjust the length to the size of your hand using the illustration at left as a guide.

Adjust for Right or Left Eye

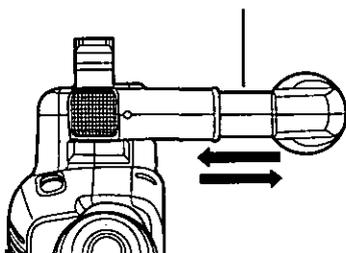
1

Electronic
Viewfinder
(EVF)

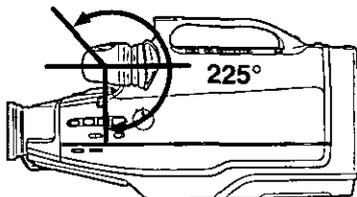


2

Extension Tube



3



1

Swing the EVF to the left to lock into a right-angled viewing position.

2

Extend the EVF as needed for comfort.

3

Rotate the eyepiece up or down to adjust for height.

• Be sure the EVF is locked into position to obtain the proper picture in the EVF.

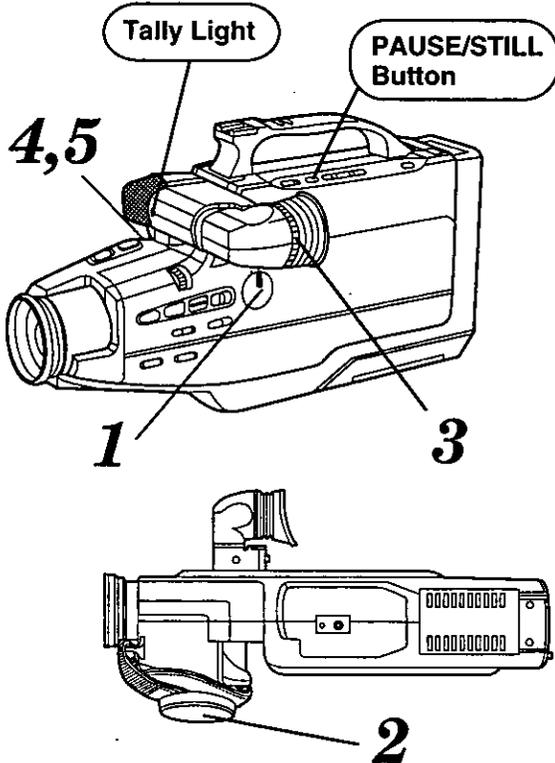
To Store

Return the EVF to its compact storage position. (See item 1.)

Camera Recording

Before you begin...

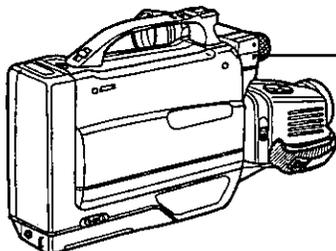
- Connect the Camcorder to a power source (see page 4)(Battery Pack, AC Adaptor or Car Battery Cord.)
- Turn the Camcorder Power ON.
- Insert a cassette with record tab (see page 6).



Edit Search:

Besides recording, you can view or search scenes.

Set the VCR/CAMERA switch to the CAMERA position and hold down the PLAY, FF/SEARCH or REWIND/SEARCH button in Rec/Pause mode.



Wind Buffer Switch

Simple Recording

1 Set the VCR/CAMERA switch to CAMERA.



EVF

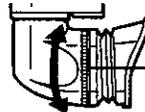
PAUSE

2

The lens cap can be attached to the hand strap with the built-in clip.

Record/Pause mode.

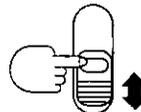
3



Vision Adjustment Control

With your eye against the Eye Cup, adjust the Vision Adjustment Control to your eyesight.

4



REC

Slide the Record Button Cover up or down to protect or access the Record button.

Press RECORD/PAUSE to start recording. The Tally Light is lit during recording.

5

Press RECORD/PAUSE again to pause recording.

- You can start and stop recording by pressing PAUSE/STILL.

Helpful Notes:

- **To remove the cassette**
In Record/Pause mode, press STOP/EJECT.

To conserve power

After 5 minutes Record/Pause mode will automatically change to Standby mode. To resume recording, Turn the Camcorder Power ON.

Wind Buffer Switch

This feature allows you to reduce wind noise.

Usually set to "NORMAL".

Set to "WIND BUFFER" to reduce wind noise.

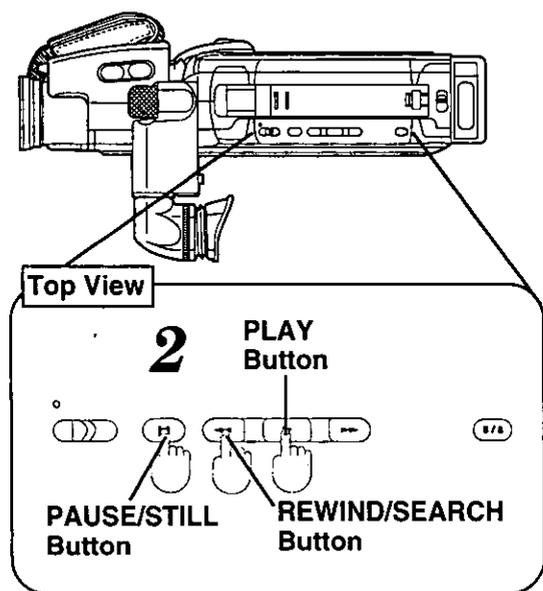
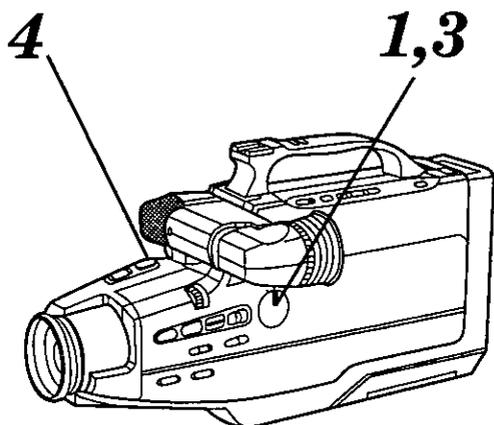
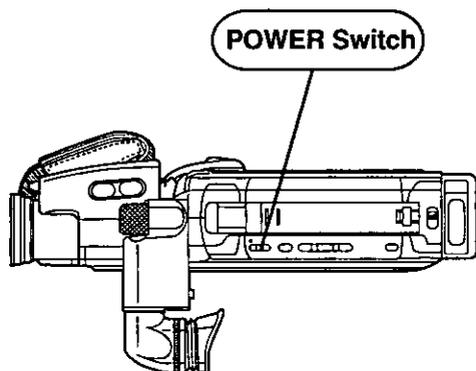


WIND BUFFER



NORMAL

Camera Recording



Easy Edit Standby

If you stop recording but plan to resume within 24 hours, use the Edit Standby feature to make a smooth transition between scenes.

Turn off the Camcorder while in Record/Pause mode and leave the cassette in the Camcorder.

Then turn on the Camcorder and Press RECORD/PAUSE (within 24 hours) to continue recording.

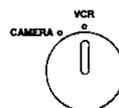
Note:

- If it is longer than 24 hours before you resume recording, use the manual Easy Edit feature described below.

Manual Easy Editing

For proper continuity when taping from the Stop mode, or after charging the Battery Pack.

1



Set the VCR/CAMERA switch to VCR.

2

REW/⏮



Press **REWIND** to go back a few seconds on the tape.

PLAY



Then, press **PLAY** to review the picture on the Viewfinder.

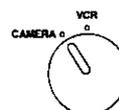
PAUSE



Now, press **PAUSE/STILL** at the location you wish to continue your recording.

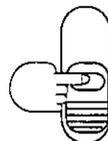
STILL

3



To prepare for Recording, set the VCR/CAMERA switch to "CAMERA." Your Camcorder will go into the Record/Pause mode.

4

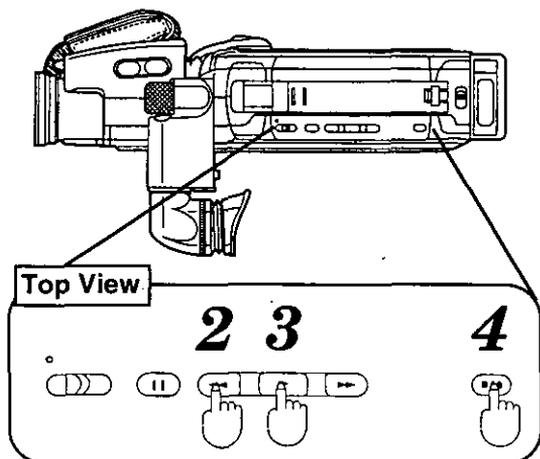


Press **RECORD/PAUSE** to continue recording.

Playback your Recordings

Before you begin...

- Connect the Camcorder to a power source. (see page 4)
- Turn the Camcorder Power ON.
- Insert a recorded cassette.

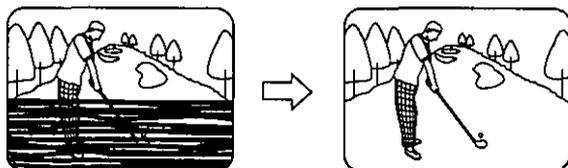
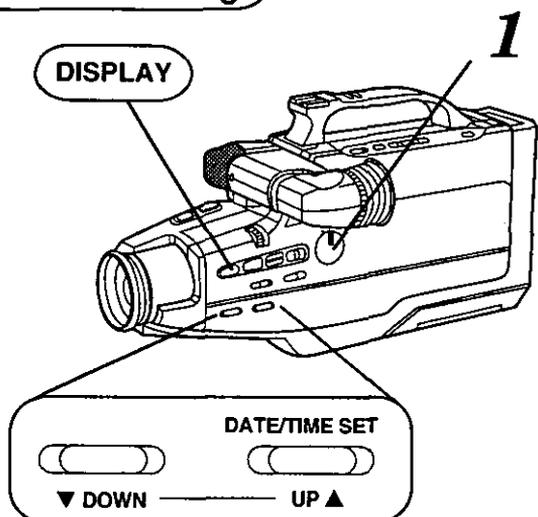


Helpful Notes

Search Speed

Standard Play (SP) Search is about 3 times the normal speed.

Manual Tracking



Playback using the EVF

1

Set the VCR/CAMERA switch to VCR.



2

Press REW/SEARCH to rewind the tape.



3

Press PLAY to start playback.



4

Press STOP/EJECT to stop playback.



- During tape playback, Electronic Viewfinder Indications will disappear.

Special Playback Effects

(Sound is Muted)

Rapidly Locate a Scene

Press FF or REW for a rapid visual search. Press again, or press PLAY to resume normal speed.

View a Still Picture

Press PAUSE/STILL to freeze the playback picture. Press again to resume normal playback.

Auto Playback

When the Camcorder is in the VCR mode and a tape without a record safety tab is inserted, the Camcorder will begin to play automatically.

Tracking Control

Auto Tracking

Continuously analyzes the signal of each recording for optimum picture quality.

Manual Tracking

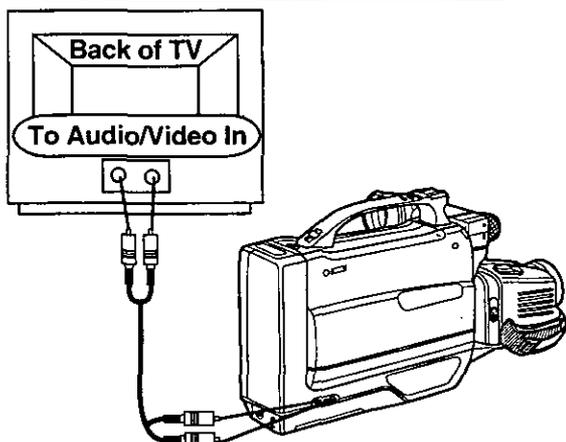
To minimize the noise in some recordings, manual tracking may be necessary.

Press DATE/TIME SET UP ▲/DOWN ▼ until picture is clear. Press DISPLAY to return to Auto Tracking.

Playback your Recordings

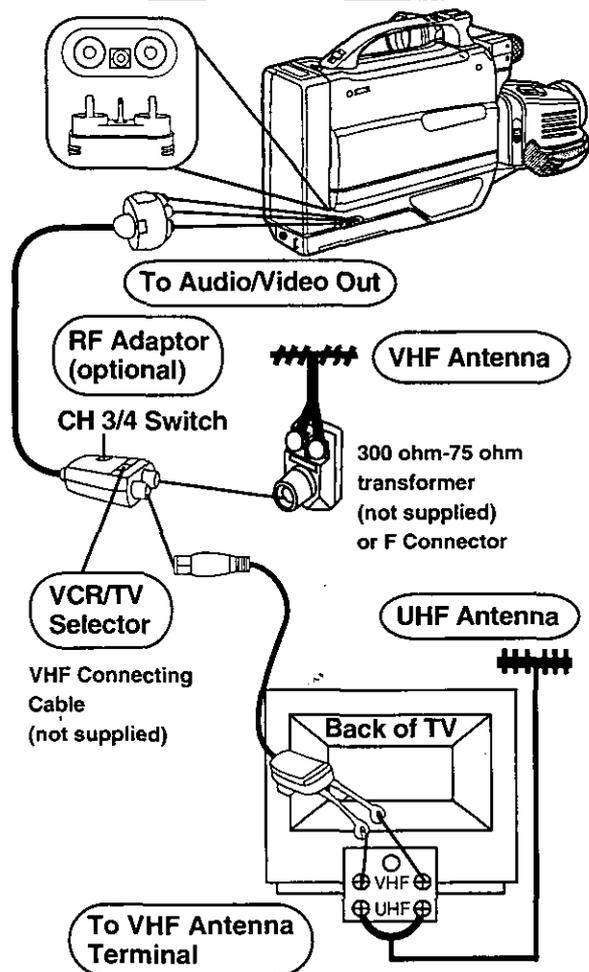
Your Camcorder may be connected to a TV to play back tapes or to view what you are recording.

TV with AUDIO/VIDEO IN Jacks.



To Audio/Video Out

TV without AUDIO/VIDEO IN Jacks.

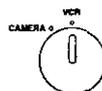


Playback or Viewing using a TV

1 Connect your Camcorder to a power source (Battery Pack, AC Adaptor or Car Battery cord).

2 Turn on the Camcorder.

3



Set the VCR/CAMERA switch to VCR to playback a tape.

Or, set to CAMERA to monitor what your Camcorder is recording.

4

Turn the TV ON and set it to LINE INPUT.

Check your TV operating instructions for further information.

Note: Optional RF Adaptor

If your TV has no VIDEO or AUDIO IN Jacks, select CH 3 or 4 on your TV to match the optional RF Adaptor CH 3/4 switch and set the VCR/TV selector on the RF Adaptor to VCR.

5

Start playback or begin a recording.

Note:

Indications on Electronic Viewfinder will also appear on TV.

To remove them, use the Display off mode described below.

Display-off Mode

This feature allows you to remove all Electronic Viewfinder Indications.

Before inserting a tape, press DISPLAY and PAUSE/STILL together for more than one second to remove the indications except time and date*.

To display the Electronic Viewfinder Indications again, **turn the Camcorder Power off and then again on.**

* To remove the time and date, refer to page 10.

Note:

Pressing the DISPLAY and PAUSE/STILL together to remove the Indications in Record/Pause mode will start the recording.

To watch TV only

If you have connected the Camcorder to your TV using an RF Adaptor. 

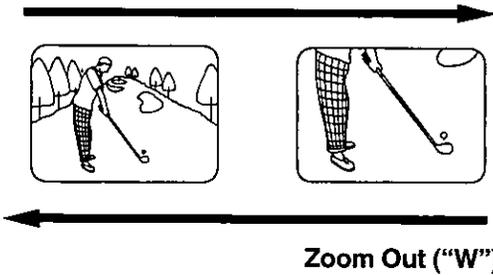
Turn the Camcorder off. 

Then, set the VCR/TV Selector on the RF Adaptor to "TV." 

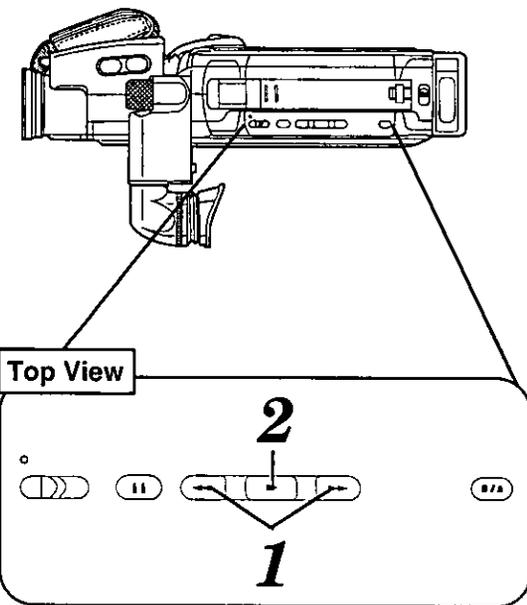
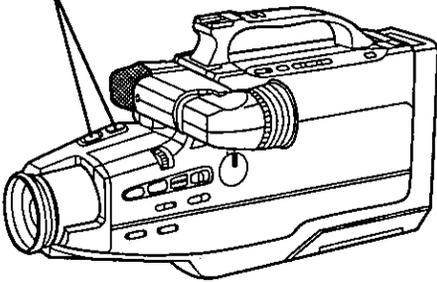
Now, turn the TV ON and select a channel.

Special Features

Zoom In ("T")



POWER ZOOM

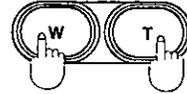


2-Speed Power Zoom

You can gradually zoom in for close ups or zoom out for wide angle shots.

Zoom slowly by lightly pressing the "T" (Telephoto) or the "W" (Wide Angle) side of the POWER ZOOM switch.

Zoom quickly by using normal pressure.



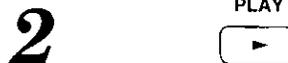
Rec End Search

You can go directly to the blank portion of tape just where your recording ends.



Press the REW and FF buttons at the same time in the "CAMERA" mode.

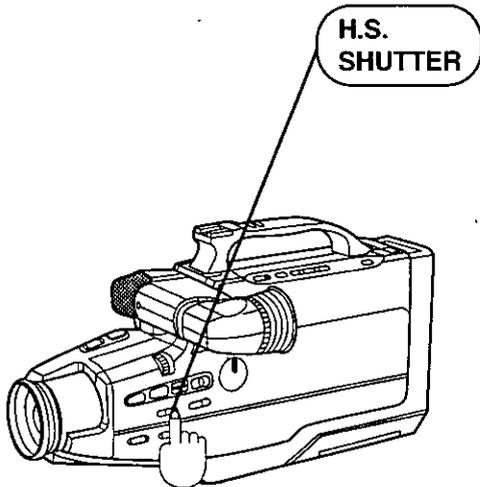
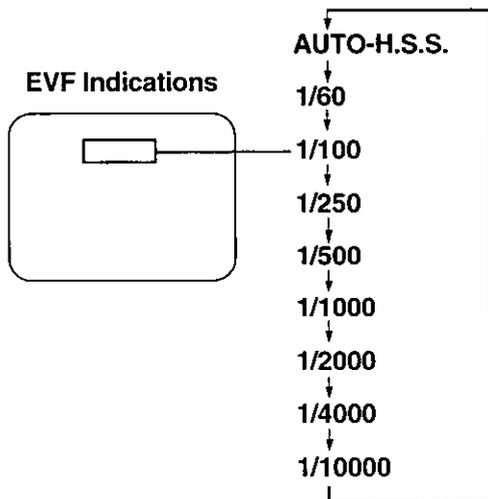
- The Camcorder will advance or rewind and then stop at the beginning of a blank section of tape.
- A tape, once recorded, is not considered "blank" even if it has been erased.



Press PLAY to cancel this function.

- If the Rec End Search feature is used directly after an Edit Search (see page 15) was performed, the Camcorder will stop approximately where the Edit Search was begun, regardless of whether it begins with a blank portion of tape or not.

Special Features



High Speed Shutter

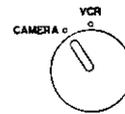
To record high speed motion (e.g. a tennis stroke) for improved replay in STILL or SLOW mode.

Auto Shutter

In the AUTO mode ("AUTO-H.S.S." is displayed in the EVF), the Camcorder will automatically adjust the shutter speed from 1/60 to 1/250 according to the brightness of the subject. The speed does not appear in the EVF.

- AUTO mode is automatically selected when the VCR/CAMERA switch is set to CAMERA.

Manual Selection



1

Set the VCR/CAMERA switch to CAMERA.

H.S.SHUTTER



2

Slide HIGH SPEED SHUTTER while recording.

H.S.SHUTTER

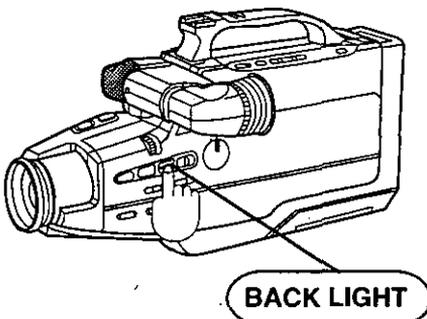
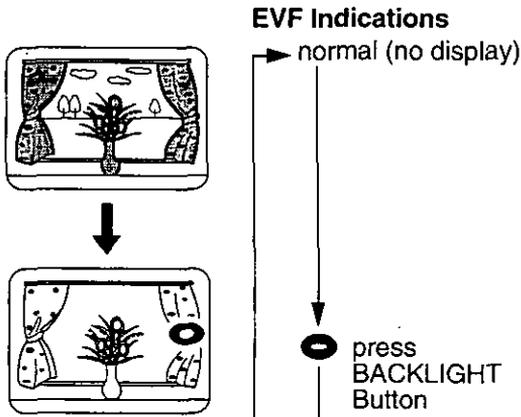
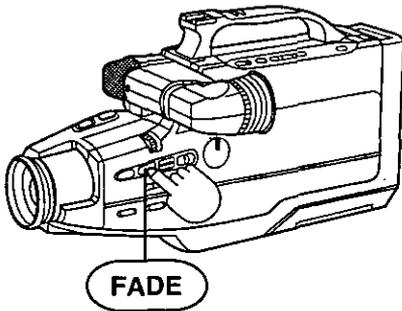
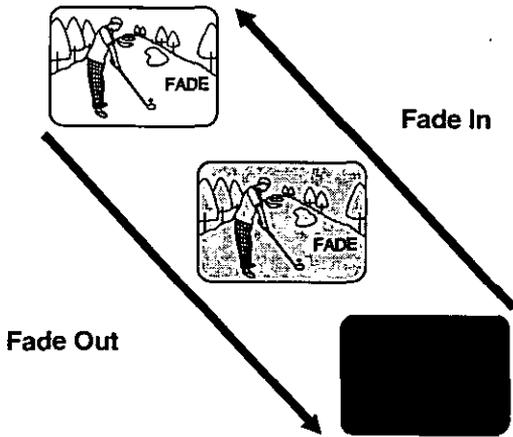


3

Slide repeatedly to obtain one of the eight higher shutter speeds shown at left.

The High Speed Shutter indicator flashes when the light level is inadequate. More light should be provided to achieve better picture quality and color. (See page 25.)

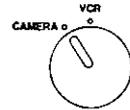
Special Features



Audio/Video Fade In/Out

This feature allows you to make smoother scene transitions for a professional look.

Set the VCR/CAMERA switch to CAMERA.



Fade In:

Hold down the FADE button until the picture and sound fade out.

Then, press RECORD/PAUSE to start recording.

Now, release the FADE button and the picture and sound will gradually fade in.

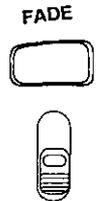


Fade Out:

(Recording is in progress.)

Hold down the FADE button until the picture and sound fade out.

Then, press RECORD/PAUSE to pause the recording.



Backlight Button

Use when recording a subject that is darker than the surrounding scene, in a shadowed area or when the light source is in back of your subject.

1 BACK LIGHT



Press BACKLIGHT while recording.



Indication appears in the EVF.

2 BACK LIGHT



When lighting conditions return to normal, press BACKLIGHT again to disengage.



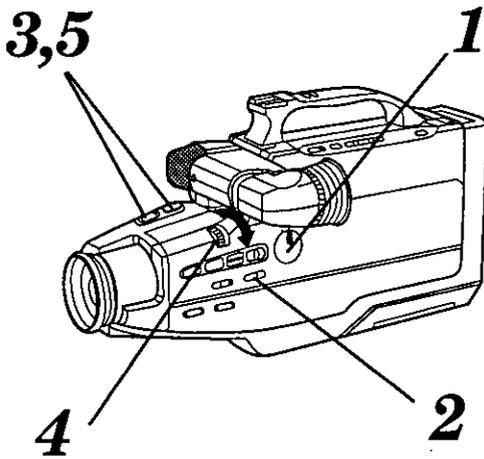
Indication disappears

Special Features

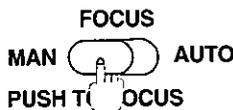
Helpful Notes

Use Manual Focus when recording ...

- a subject through glass.
 - a subject with a nearby foreground and background far from the Camcorder.
 - a subject with distinct horizontal stripes.
 - a subject not centered in the Viewfinder.
 - subjects with shiny surfaces.
 - an obliquely angled subject.
 - a bright, flat subject, such as a white wall.
 - in low light situations.
 - a scene with fast motions, like a golf swing.
- Re-focusing may be required** when your Camcorder is aimed at a new scene.



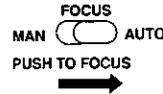
- When you want to adjust the focus quickly in the "MANUAL" position, you can activate the Auto Focus. Leave the Focus switch in "MANUAL", and then press and hold the Focus switch. The picture automatically adjusts for focus as long as you continue pressing.



Auto Focus

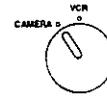
The Camcorder will automatically bring the subject into focus even during zooming.

Set FOCUS to "AUTO" if necessary so that the letters "MF" do not appear in the EVF.



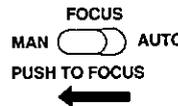
Manual Focus

1



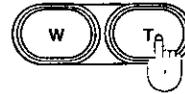
Set the VCR/CAMERA switch to "CAMERA".

2



Set FOCUS to "MANUAL" so that "MF" (Manual Focus) appears in the EVF.

3



Press and hold the "T" side of the POWER ZOOM switch until the lens is zoomed in all the way (subject at maximum size).

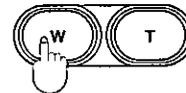
4



Rotate the Lens Focus Dial until the picture is in focus.

- It may be necessary to back away from the subject to focus the image properly.

5



Press the "W" side of the POWER ZOOM switch to frame the picture as desired.

Macro Focus (for close-ups)

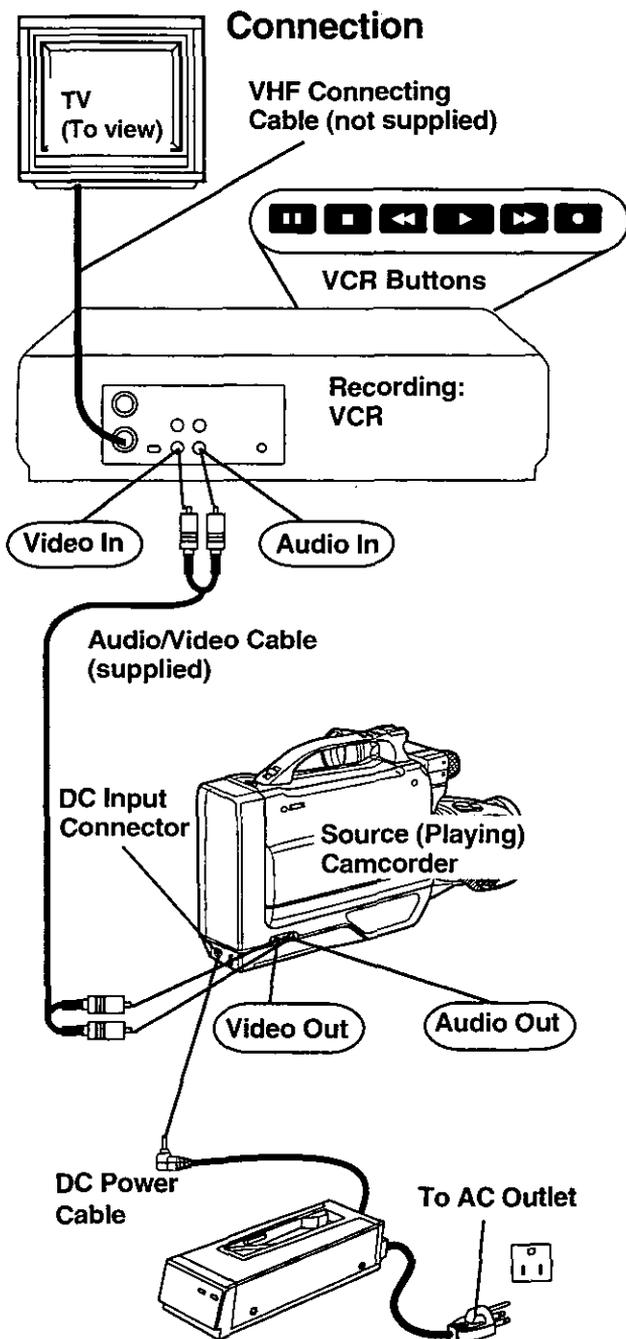
Auto Focus will function down to 1/2 inch (12.7mm) in front of the lens.

Press the "W" side of the POWER ZOOM switch to the wide angle position. Bring the Camcorder as close to the subject as necessary.

Copying your Tapes (dubbing)

Before you begin...

- Turn ON both units.
- Set the recording VCR's Input Signal Selector to LINE.
- Set the VCR/CAMERA switch on the Camcorder to VCR.



Main Operation

1

Insert the tape to be copied into the source (playing) Camcorder and a blank tape with record tab into the editing (recording) unit.

2

PLAY



Press PLAY on the (playing) Camcorder.

3

PAUSE



STILL

Press PAUSE/STILL when the tape reaches the point you want to start dubbing.

4



Press PLAY and REC together then immediately press PAUSE/STILL on the recording VCR.

5

PAUSE



STILL



Press PAUSE/STILL on the playing Camcorder and PAUSE/STILL on the recording unit to begin copying your tape.

6

STOP



EJECT



Press STOP/EJECT on both units when dubbing is complete.

Monitor with your TV

- Turn the TV ON and select its VCR channel (either CH3 or CH4).
- Set the VCR/TV Selector on the recording VCR to VCR.

CAUTION:

Unauthorized exchanging and/or copying of copyrighted recordings may be copyright infringement.

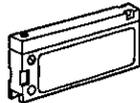
Camcorder Accessory System

Power Supplies

Standard Accessories



AC Adaptor
(AG-B21P)



Battery Pack
(AG-BP20-P)

Connection

Standard Accessory



Audio/Video Cable
(VJAW0020)

Optional Accessory



RF Adaptor
(AG-RF20P)

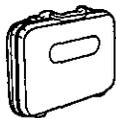
Optional Accessory



Car Battery Cord
(AG-CR20P)

To Transport

Standard Accessories



System Carrying Case
(AG-HT8)



Shoulder Strap
(VYCW0071)

To Enhance your Recording

Standard Accessory



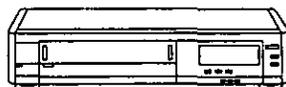
Color Enhancement Light
(VUAW0415)

To Copy your Tapes (with Video/Audio)

Standard Accessory



Audio/Video Cable
(VJAW0020)



VCR

Battery Pack (P. 4)

- Store the Battery Pack in a cool, dry, dark place.
- Do not drop it or subject it to strong jolts.
- Always charge the Battery Pack soon after full use. Discharging for a long time may make its life shorter and recharging impossible.
- Be careful not to put the Battery Pack near fire because this may cause damage.
- Batteries should never be disposed of in fire.
- Do not use any other chargers than specified.
- Do not use the Battery Pack for appliances other than specified.
- Do not use it below 32°F (0°C) or above 104°F (40°C).
- Do not use an insufficiently charged or worn out Battery Pack.

Charge the Battery Pack (P. 4)

- The useful operation time of the Battery will gradually decrease after repeated use and recharging. The Battery is no longer serviceable if the operation time is very short, even after a sufficient charge.
- To preserve the life of your Battery, please be sure to remove the Battery Pack from the Camcorder for storage after every use, storing it fully recharged. When recharging, should the charging indicator on the AC Adaptor go out in a short time and the Battery cannot be fully charged, please leave the Battery on the AC Adaptor for approx. 24 hours even after the charging indicator goes off. Use this battery in the Camcorder, then repeat this procedure one more time. This procedure should restore the Battery to normal operation.

Car Battery Cord (P. 5)

- Be sure to start your car engine before inserting the cigarette lighter plug of the Car Battery Cord into the lighter socket; otherwise, the cigarette lighter plug fuse may blow.
- Because the car is running while your Camcorder is in operation, make sure you're in a ventilated area.
- Disconnect the cigarette lighter plug when your Camcorder is not being used.

Note:

The Car Battery Cord can only be used in vehicles equipped with DC 12V (negative ground) batteries.

Tape Remaining (P. 10)

- The remaining tape indicator "END" will continue flashing during the last 5 minutes as a final warning that the tape is about to end.
- The remaining tape time is being calculated when the indicator "-:--" flashes (up to 20 seconds) in the EVF.

Special Playback Effects (P. 17)

- During search playback, horizontal noise bars will appear and there will be no audio.
- To protect the tape and video heads, your Camcorder's operating modes will revert as follows:

STILL → STOP after 5 minutes.

STOP → POWER OFF after 5 minutes when using a Battery Pack.

- When the tape reaches its end during playback, or fast forward, it will rewind automatically.

High Speed Shutter (P. 20)

- For proper color reproduction it is recommended that you use this feature outdoors. For indoor High Speed Shutter recording, the supplied COLOR ENHANCEMENT LIGHT, or additional halogen or tungsten light should be provided. Fluorescent light will degrade the picture quality.
- For effective operation, this feature requires ample light. More light is required for the fastest shutter speed.
- The Auto Focus system may not operate properly under insufficient light when you are using the High Speed Shutter.

Copying your Tapes (P. 23)

- Tapes recorded on other VCRs for use with the Camcorder must be recorded in SP mode.
- For technical reasons, dubbing a tape may reduce its quality.

CCD Warning

When your Camcorder is aimed at excessively bright objects, such as the sun or other bright lights, a vertical bar may appear in the picture. This is a normal characteristic of the CCD pick-up device. Try to avoid aiming the camera at extremely bright objects.

CATV System Installer

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

Encountering Blank Tape

If a blank section of tape is encountered in the play mode, the screen will be jumbled until a recorded signal is again detected. This is normal.



Lens Filters

- Light filters extend your control of any lighting situation. You can fit the Camcorder Lens Hood with any standard or "special effect" photographic lens filter that is 55 mm in diameter.

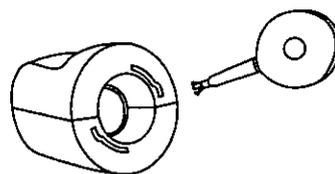
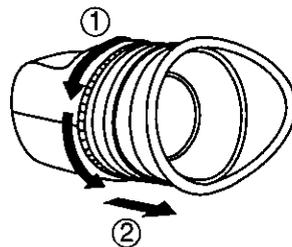
To Remove The Lens Hood:

Facing the Lens, turn the Lens Hood counterclockwise to its limit. Cover the Lens Hood with the palm of your hand, and lightly press and squeeze the Lens Hood Ring, supplying equal pressure around the ring. Turn the Ring counterclockwise a little more, to loosen and remove it.

Notes on Operations

Cleaning the EVF

Grip the Vision Adjustment Control, turn gently, but firmly counter-clockwise. Then pull the eyepiece free. Then, remove any lint or dust particles with a blower, available at photography stores. Do not touch lenses with fingers. To replace the lens, line up the grooves on the eyepiece with the small knobs inside the EVF chamber. Gently insert the lens back into the chamber and turn clockwise making sure the lens is locked in place.



FCC Warning: Any unauthorized changes or modifications to this equipment would void the user's authority to operate.

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

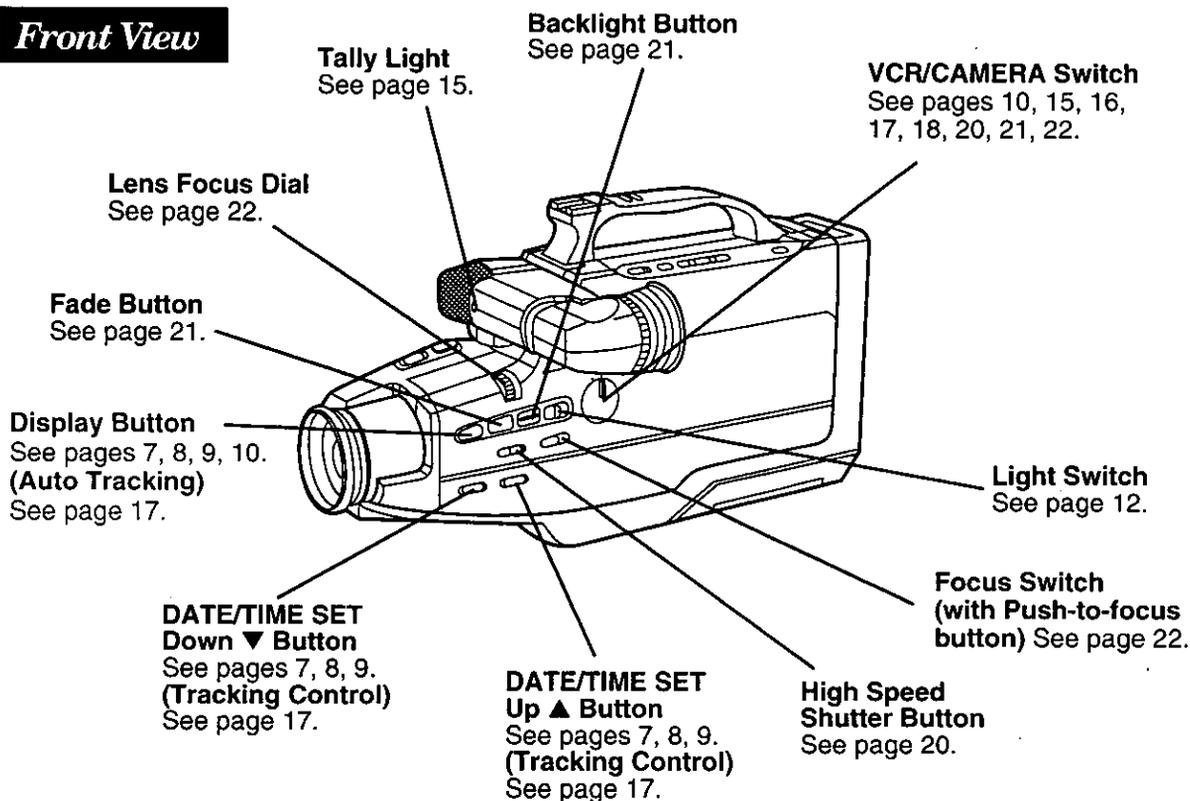
Note: This equipment has been tested and found to comply with Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when operated in a residential environment.

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, use the equipment in another location and/or utilize an electrical outlet different from that used by the receiver.

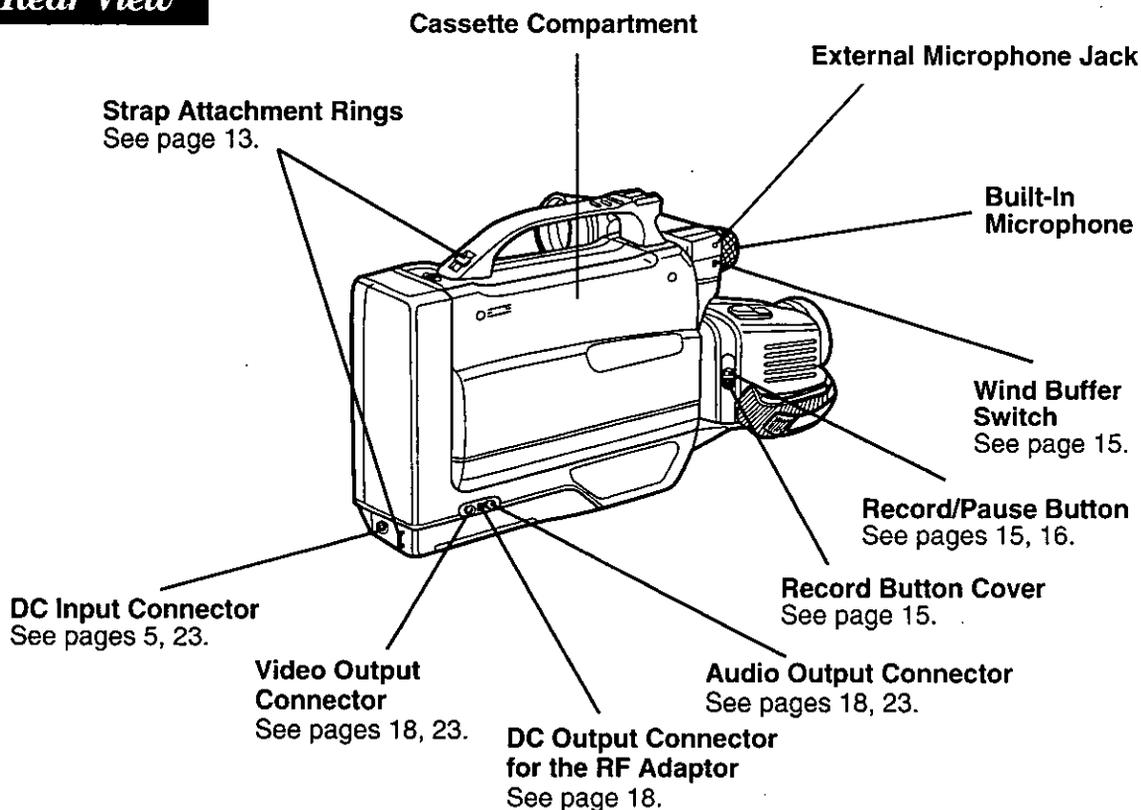
If necessary, consult the dealer or an experienced radio/TV technician for help. The user may find the booklet, 'Something About Interference' available from FCC local regional offices helpful.

Index of Controls

Front View

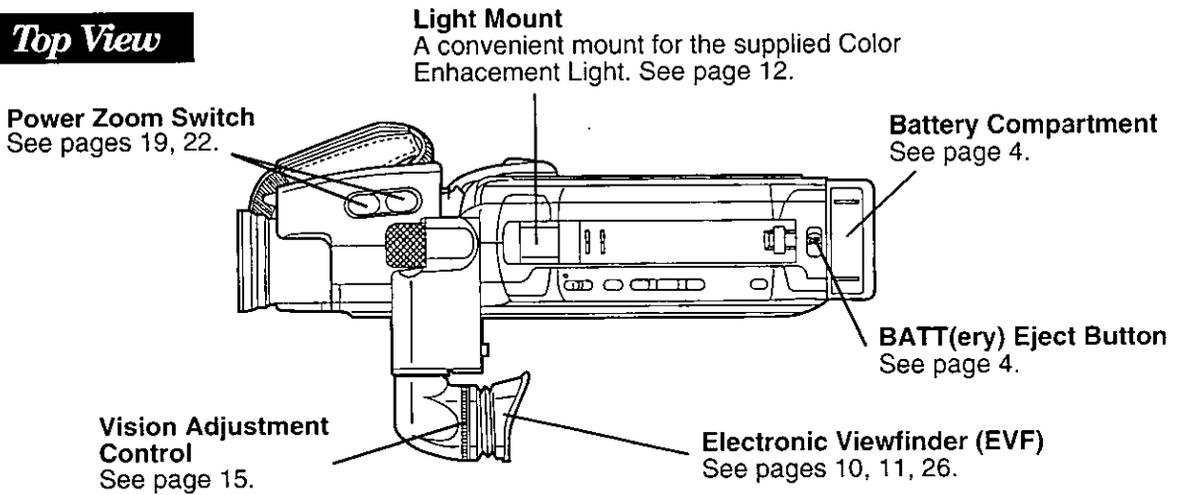


Rear View



Index of Controls

Top View

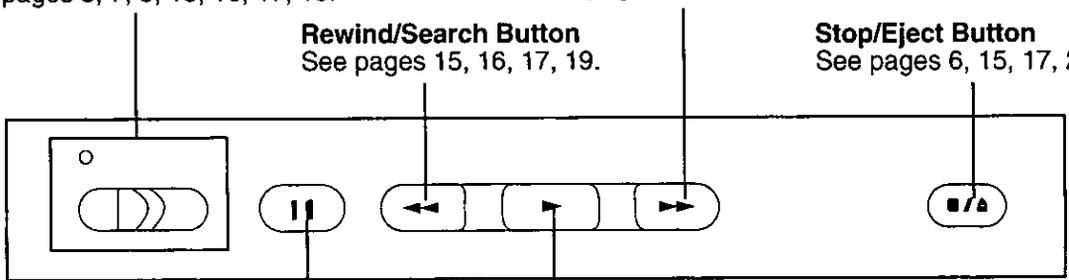


Power Switch and Indicator
See pages 5, 7, 8, 15, 16, 17, 18.

Fast Forward/Search Button
See pages 15, 17, 19.

Rewind/Search Button
See pages 15, 16, 17, 19.

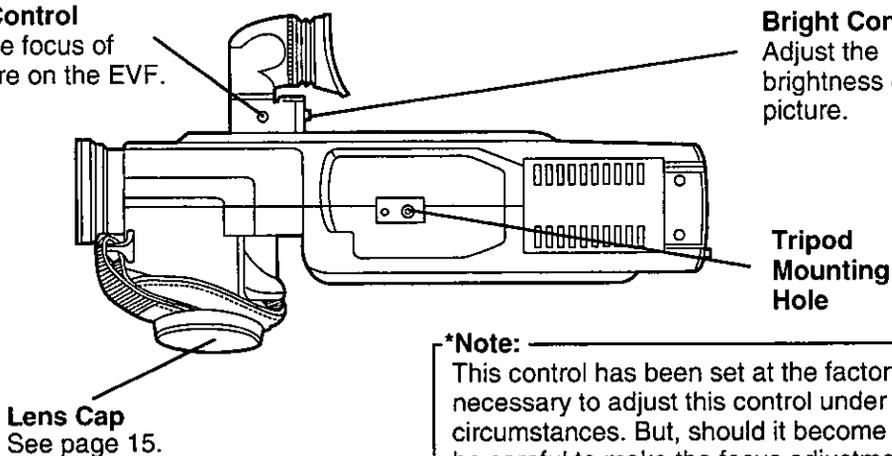
Stop/Eject Button
See pages 6, 15, 17, 23.



Underside View

***Focus Control**
Adjust the focus of the picture on the EVF.

Bright Control
Adjust the brightness of the picture.



***Note:**

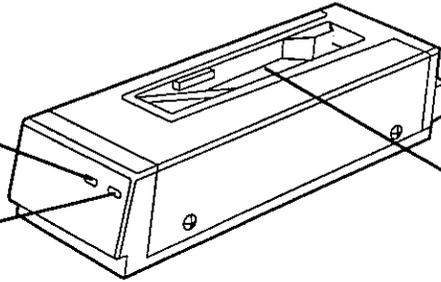
This control has been set at the factory. It is not necessary to adjust this control under normal circumstances. But, should it become necessary; be careful to make the focus adjustment with a small, slender screwdriver so as not to damage the miniature control.

Index of Controls

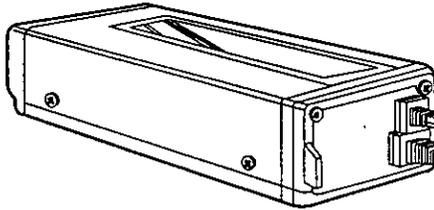
AC Adaptor

Power Indicator Lamp
See pages 4, 5.

Charging Indicator Lamp
See page 4.



Battery Charging Compartment
See page 4.



DC Output Cable
See page 5.

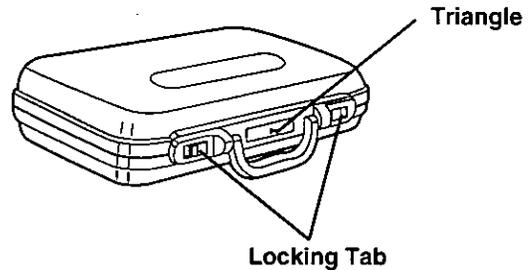
AC Power Cord
See pages 4, 5.

System Carrying Case

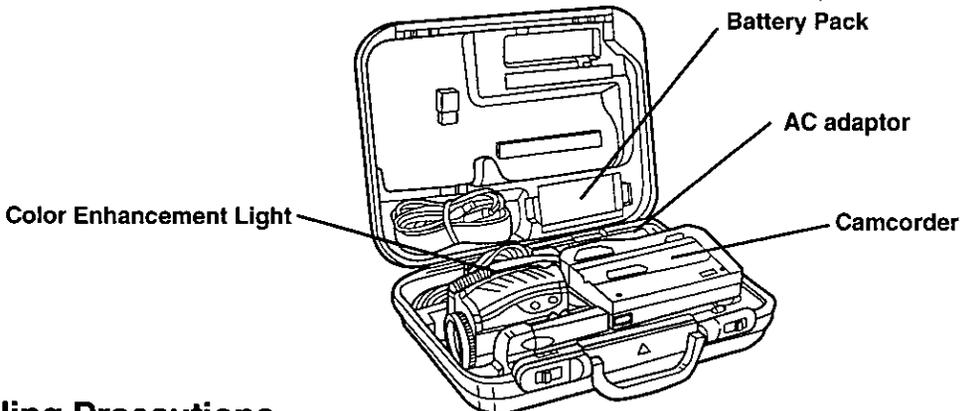
The System Carrying Case (AG-HT8) is packed with your Camcorder for organizing, carrying and storing the Camcorder system and optional accessories.

To Open the Case

Be sure that the triangle in the center of the case is facing up; press raised tabs to open. Raise lid.



Accessory Storage Suggestion



Handling Precautions

- This case will not withstand strong impact, nor protect your Camcorder from strong vibrations or shocks.
- This case has been designed for comfortable carrying and easy access; sitting, stepping or placing heavy objects on the case may cause permanent damage to its structure or contents.

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Specifications

Power Source:

VHS Camcorder: DC 12V

Power Consumption:

AC Adaptor: 120V AC, 50/60 Hz

VHS Camcorder: 12V DC 11W (Max. 21W)

Video Signal:

AC Adaptor: 40 W

Video Recording System:

EIA Standard (525 lines, 60 fields) NTSC color signal

Audio Track:

4 rotary heads. helical scanning system

Pick-Up System:

1 track

Pick-Up Device:

Sequential color difference field reverse system

Lens:

One integral color filter Charge Coupled Device (CCD)

14:1 zoom lens, F1:1.6 with auto iris control

Focal length: 5.3mm - 74.2mm

Power zoom function

Lens filter diameter: 55mm

Viewfinder:

2/3 inch (16.9mm) Electronic Viewfinder

Minimum Illumination Required:

1 lx (F1:1.6) 0.1 footcandles

External Microphone Input Level:

-70dB, 4.7K ohms unbalanced, M3 connector

Operating Temperature:

32°F-104°F (0°C-40°C)

Operating Humidity:

10%-75%

Weight:

VHS Camcorder: 4.1lbs.

1.9kg

AC Adaptor: 1.34 lbs.

0.61kg

Dimensions:

VHS Camcorder: 3-3/4 (W) × 8 (H) × 15-1/8 (D) inch

95 (W) × 203 (H) × 385 (D) mm

AC Adaptor: 3 (W) × 1-3/4 (H) × 8-1/4 (D) inch

76 (W) × 43 (H) × 210 (D) mm

Weight and dimensions shown are approximate.

Designs and specifications are subject to change without notice.

Before Requesting Service

If you have a problem with your Camcorder, it may be a minor one that you can correct yourself. Use the chart below in case your problem is listed, and then follow the recommendations.

Symptom	Correction
No picture in the EVF ...	<ul style="list-style-type: none"> • Make sure the Power Source is connected. (pp. 4, 5) • Make sure the POWER is turned ON. (p.15) • Check the Dew Indicator. (p.11) • Make sure the battery is fully charged. (p.4) • Make sure all necessary cables are connected correctly and firmly. (p.18) • Make sure the Lens Cap is removed. (pp. 15, 28)
Video cassette can't be inserted ...	<ul style="list-style-type: none"> • Make sure the Power Source is connected. (pp. 4, 5) • Insert the cassette with the window side facing out and the record tab facing up. (p.6)
Video cassette can't be removed ...	<ul style="list-style-type: none"> • Make sure the Power Source is connected. (pp. 4, 5)
No operation starts when operation buttons are pressed ...	<ul style="list-style-type: none"> • Check the Dew Indicator. (p.11)
Recording does not operate ...	<ul style="list-style-type: none"> • Make sure the record tab is intact. (p.6) • Check the Battery Indicator. (p.10) • Check the Dew Indicator. (p.11)
Auto Focus does not operate ...	<ul style="list-style-type: none"> • Make sure the Focus Switch is set to "AUTO". (p. 22) • Make sure the unit is ON, with the VCR/CAMERA switch set to "CAMERA". (p. 15).
The sound from microphone can't be monitored ...	<ul style="list-style-type: none"> • Make sure the unit is set to REC or Record/Pause mode.
No playback picture, or the playback picture is noisy or contains streaks ...	<ul style="list-style-type: none"> • Press the DATE/TIME Set Up ▲/Down ▼ button (Tracking Control). (p.17).
During still, the picture has motion or blurred action ...	<ul style="list-style-type: none"> • Portions of the still picture where the normal speed motion was particularly rapid may produce this effect. This is normal.
If the top of your playback picture waves back and forth excessively ...	<ul style="list-style-type: none"> • Because the playback signal is not as stable as an off-the-air TV signal, the top of your TV screen may be bent or unstable when the tape is played back. This symptom is more noticeable when a pre-recorded tape, recorded on another VCR, is played back. To solve this problem, locate the horizontal hold control on your TV. Turn it slowly to correct the wavy picture. If your TV does not have a horizontal hold control or adjusting the control does not help, some modifications may have to be made to the TV set. Technically this is called "Horizontal AFC time constant change." If such a problem is noticed, please contact your local TV service center. (Some nominal service charges may be required.)
Snowy or distorted picture. Audio playback OK ...	<ul style="list-style-type: none"> • The Video heads are the means by which the recorder places picture signals on the tape during recording, and reads picture signals from the tape during playback. If these heads become dirty or clogged, the signals can no longer be recorded correctly, and the playback picture will be distorted. If this is the case, for example, during the playback of a tape, the sound is reproduced normally, but no picture is seen, or the picture is greatly distorted. If this symptom occurs have the recorder checked by qualified service personnel.

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