

Panasonic

VHS Compact Movie
NV-MC20B
Operating Instructions



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

VQT3415

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HQ (High Quality) Picture System

Video recorders carrying the HQ symbol mark feature the new VHS High Quality Picture System. This system assures complete compatibility with VTRs that use the conventional VHS system.

IMPORTANT

Your attention is drawn to the fact that recording of pre-recorded tapes or discs or other published or broadcast material may infringe copyright laws.

WARNING

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

VHS-C Movie NV-MC20

- The rating plate is on the bottom side of the VHS-C Movie.

AC Adaptor VW-AMC2

- The rating plate is on the bottom panel of the unit.

- This apparatus was produced to BS 800:1983.

FOR YOUR SAFETY

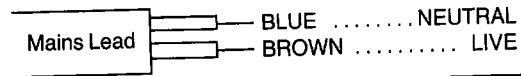
■ DO NOT REMOVE THE OUTER COVER.

To prevent electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

■ AC MAINS LEAD CONNECTION. (VW-AMC2B U.K. model only.)

The wires in the mains lead of this apparatus are coloured in accordance with the following code.

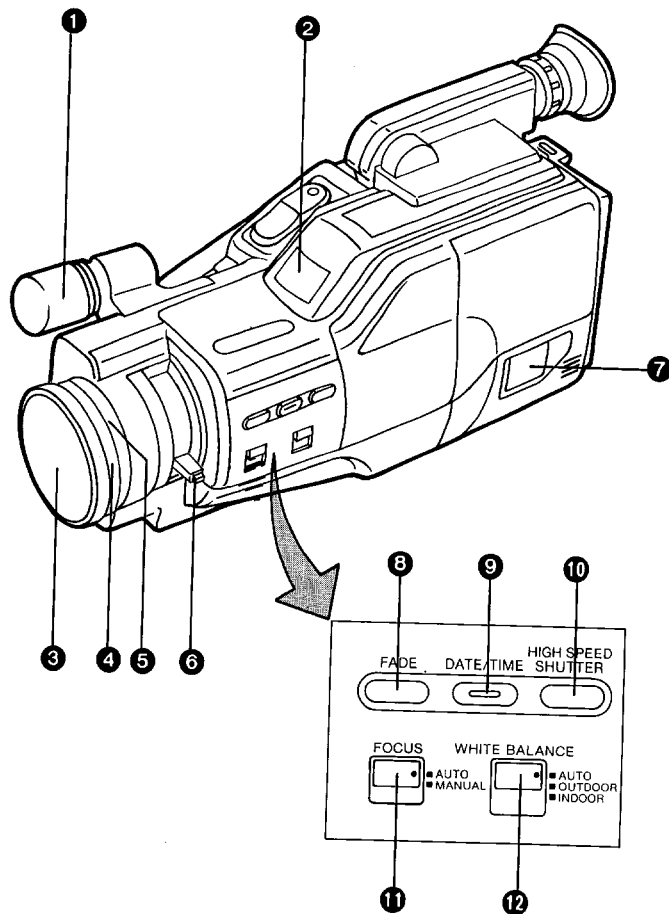
Important



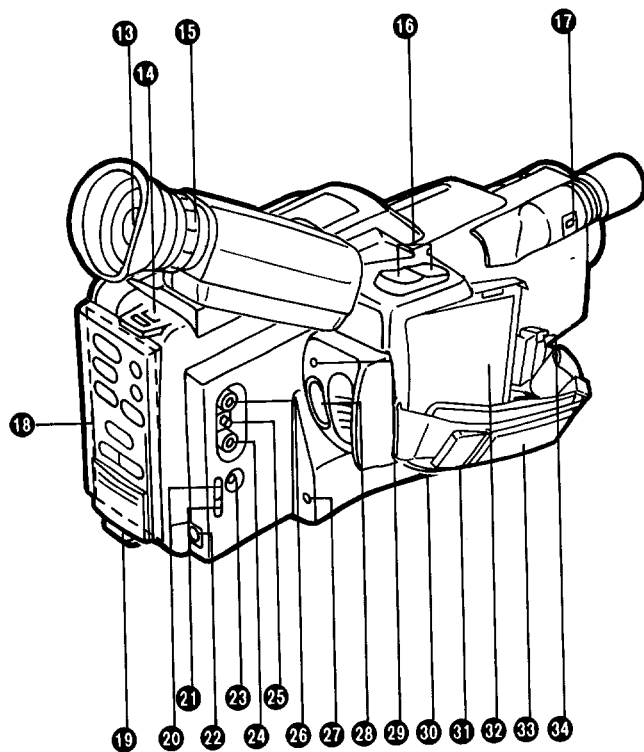
As the colours of the wires in the mains lead may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows: The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK. The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

is the safety information.

CONTROLS AND COMPONENTS

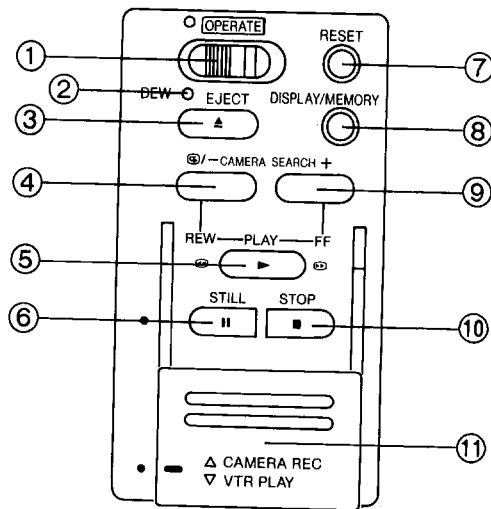


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18 General Operation Controls

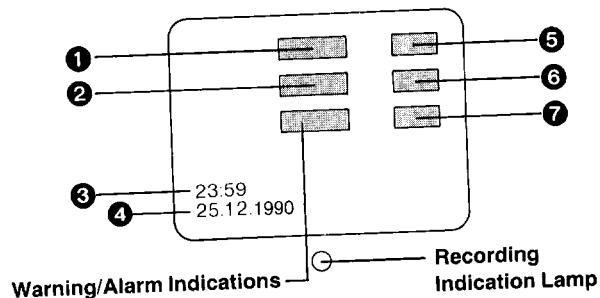


No.	Name	Page
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⑩	Stop Button	19
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⑪ Function of the Camera/VTR Selector Cover		
Closed		For camera recording.
Open (as illustrated)		For other operations than camera recording.

Electronic Viewfinder

The following indications are displayed in the Electronic Viewfinder (EVF) to inform you of the operating conditions of the VHS-C Movie.



There is little battery power left. The VHS-C Movie will be turned off in a few minutes. Replace the battery pack by a fully recharged one.



It is impossible to record because the erasure prevention tab of the cassette is not intact.



During recording, the tape has almost reached its end. Replace the tape with a new one. The indication will remain lit when the tape has reached its end.



When condensation has formed inside the VHS-C Movie, the "DEW" indication will flash and a few seconds later, the unit will turn itself off.



Video Head Clogging (see page 37).

1 Remaining Battery Power Indications

E---F The "—" indications begin to disappear from right to left as the power of the battery pack weakens.

2 Counter Indications

M0123 Tape Counter

1:23 Lap Time Counter

3 Clock Indications

4 Date Indications

5 Tape Running Indications

REC Recording mode

PAUSE Recording Pause mode, Rec Review

▷ Play mode, Camera Search (In forward direction)

|| Still mode

▷▷ Fast Forward/Cue mode

◁◁ Rewind/Review mode,

Camera Search (In reverse direction)

6 Manual White Balance Indications

OUT OUTDOOR

IN INDOOR

7 High Speed Shutter Mode Indications

1/500 1/500 sec.

1/1000 1/1000 sec.

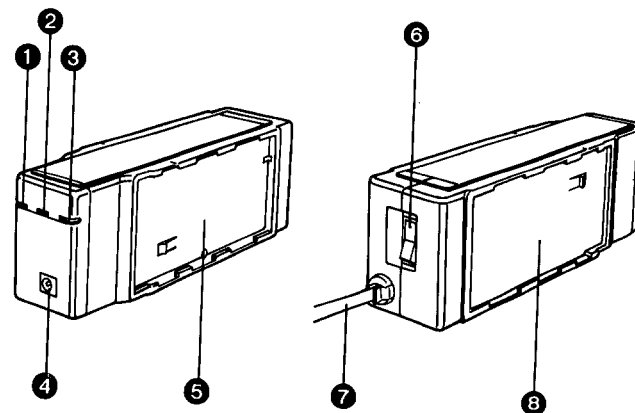
•Some of the above indications may light up alternately at the same place in the EVF to indicate the corresponding operating condition or warning.

AC Adaptor (VW-AMC2)

Precautions

- Avoid violent shocks and rough handling of the unit.
- Do not allow liquid to spill into the unit.
- Do not place heavy objects on the unit.
- When unplugging the mains cord or other connection cords, be sure to grasp the plug, not the cord.
- When listening to a radio while the AC Adaptor is in operation, the radio reception may be distorted. In this case, move the radio away from the AC Adaptor.

Controls and Components



No.	Name	Page
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8	Battery Holder (1)	10

VHS-C MOVIE SYSTEM ACCESSORIES

Standard Accessories

AC Adaptor
Battery Pack
RF Adaptor
Shoulder Strap
System Carrying Case
BNC/PHONO Adaptor Plug
Cassette Adaptor
AV Output Cable
Coaxial Cable
Battery for Clock Operation
DC Input Cable
Battery for Cassette Adaptor Operation

Optional Accessories

Pause Remote Control Unit (VW-RM1)
Car Battery Cord (VW-ACC5)
Carrying Bag (VW-CB10E)
Handgrip (VW-GPC1E)

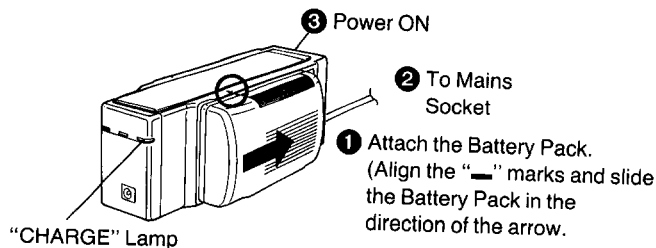
 is the safety information.

CAUTION: TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

THE POWER SUPPLY UNITS

Battery Pack

Charging the Battery Pack



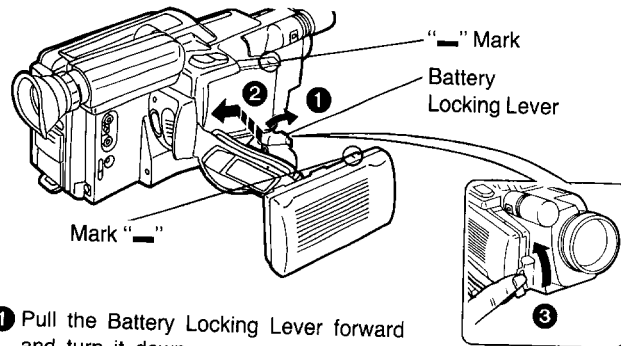
- When charging an exhausted battery pack, the Charging Indicator Lamp will go out about 90 minutes after charging starts. However, the Battery Pack should be charged at least 3 hours for extended use.
- The VHS-C Movie can be used continuously for approx. 60 minutes with a fully charged Battery Pack.

To charge two Battery Packs simultaneously, attach one each to the Battery Holder on either side of the AC Adaptor.

•Charging Indicator Lamp

- Lit The Battery Pack is being charged.
- Not lit Charging has been completed.
- Flashing The Battery Pack is in the waiting condition for charging. (When two Battery Packs are attached, one of the lamps will be flashing.) After the charging of the first Battery Pack is completed, the lamp that was flashing will now be lit, and the charging of the second Battery Pack will start.

Attaching



- ① Pull the Battery Locking Lever forward and turn it down.
- ② Align the “-” marks and slide the Battery Pack backward (←).
- ③ Hold the part of the Battery Locking Lever where the belt is attached and turn it up until it locks with a click.

Removal

Wait about 10 seconds after turning the VHS-C Movie off with the Operation On/Off Switch, before removing the Battery Pack. To remove the Battery Pack, turn the Battery Locking Lever down and slide the Battery Pack forward until it is released.

- If the Battery Pack is removed during recording or playback, the tape remains wound around the video head cylinder and could become damaged. Before removing the Battery Pack, put the VHS-C Movie in the stop mode and then turn it off with the Operation On/Off Switch.

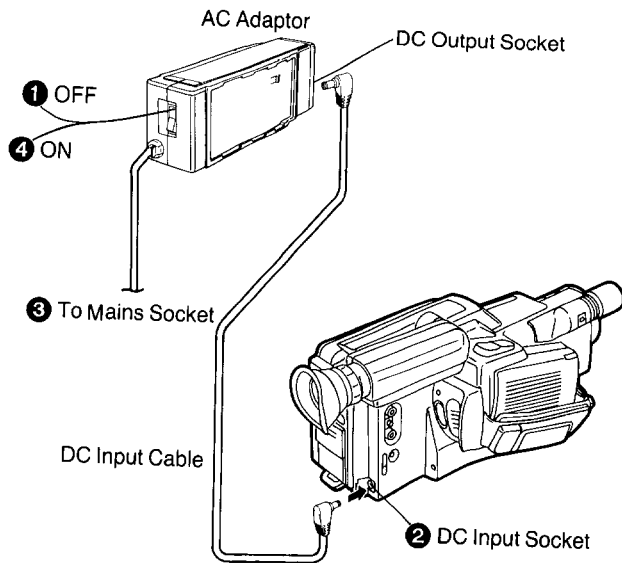
Cautions for Using Battery Packs

Be sure to charge the Battery Packs before using them.

- Pay attention to the following points to avoid danger.
 1. Do not throw the Battery Pack into fire.
 2. Do not short-circuit the poles of the connector.
 3. Do not disassemble or reconstruct the Battery Pack.
 4. Use only the supplied AC Adaptor to charge Battery Packs.
- Follow the instructions below to avoid damage to the Battery Packs or reduction of their service life.
 1. Never subject the Battery Packs to strong shocks or drop them.
 2. Do not recharge a Battery Pack that is already fully charged.
- During operation of the VHS-C Movie or during recharging, the Battery Pack may become warm however this does not pose any problem.
- The service life of a Battery Pack has its limits. If the operation time of a Battery Pack in spite of normal recharging becomes so short that its normal use for shooting is no longer possible, it should be replaced with a new one.

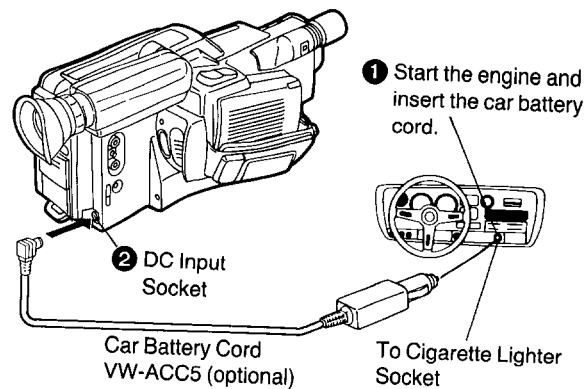
- The function of the Battery Pack is based on a chemical reaction. Use it according to its characteristics.
 1. Charge the Battery Pack within a temperature range of 10°C~35°C. If charged at lower temperatures, the chemical reaction cannot take place optimally, causing the performance of the Battery Pack to deteriorate. At higher temperatures, the Battery Pack cannot be charged completely.
 2. Store the Battery Pack in cool and dry place. If exposed to high temperatures for a long time, the battery life will be shortened and the self-discharging process will be increased.
 3. Charge the Battery Pack before using it because self-discharging may occur if it has not been used for a long period of time.
 4. When not using the Battery Pack, remove it from the VHS-C Movie or the AC Adaptor.
- When the VHS-C Movie is not actually being used, remove the Battery Pack to avoid reduction of its service life.

AC Adaptor (supplied)



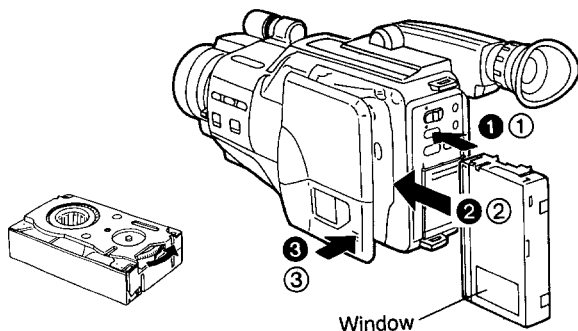
- When a Battery Pack is attached to the AC Adaptor, the VHS-C Movie cannot be supplied with power. Therefore, be sure to remove the Battery Pack.
- Never use any other AC Adaptor than the specified one.

Car Battery Cord (optional)



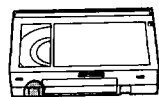
- The car battery cord can only be used with 12 V DC negative-grounded vehicles. 24 V DC or positive-grounded vehicles can not be used.
- If the supplied voltage from the vehicle drops too low, the VHS-C Movie will turn off automatically to prevent any malfunctioning. When this happens, wait about 10 seconds before switching the VHS-C Movie on again.
- It is not possible to recharge the Battery Pack by using the vehicle's battery and/or the car battery cord.

THE VIDEO CASSETTE



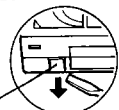
Before Inserting the cassette

Make sure that the tape is not loose. If it is loose, pull it in by turning the cog wheel on the side of the cassette in the direction of the arrow.



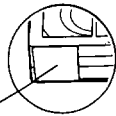
Erasure Prevention Tab

To prevent accidental erasure



Break off the tab with a screwdriver.

To record again



Cover the hole with adhesive tape.

Inserting the Video Cassette

- 1 Press the Eject Button.
 - 2 Insert the video cassette into the cassette compartment with its window facing outside.
 - 3 Push the cassette compartment cover inward, until it locks with a click.
- Use **VHS-C** video cassettes only.
 - When a power supply unit (Battery Pack, AC Adaptor or car battery) is connected to the VHS-C Movie, the Eject Button remains operative, even if the VHS-C Movie has been switched off with the Operation On/Off Switch.

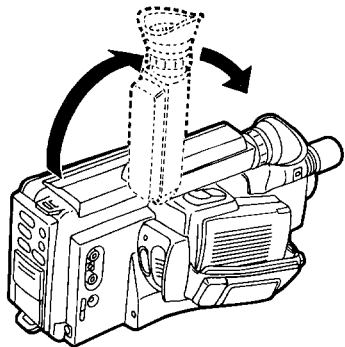
Removing a Video Cassette

- 1 Press the Eject Button.
- 2 Pull out the video cassette.
- 3 Push the cassette compartment cover inward, until it locks with a click, to close the cassette compartment.

ELECTRONIC VIEWFINDER

For low-angle shots

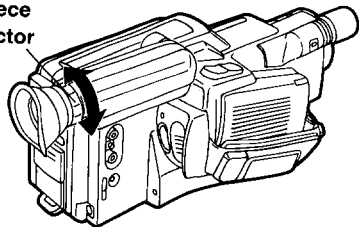
The Electronic Viewfinder can be turned upward by a maximum of 180°. This is convenient for taking low-angle shots. The EVF can also be moved back and forth.



Eyepiece Corrector

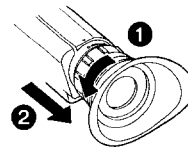
This control makes it possible for people who wear glasses to adjust the eyepiece to their eyesight.

**Eyepiece
Corrector**

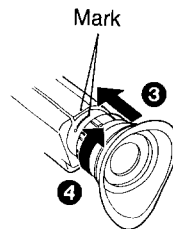


For Viewing the EVF with the Left Eye

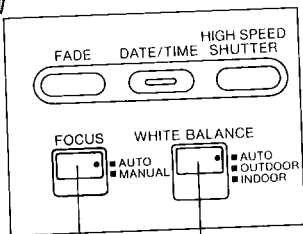
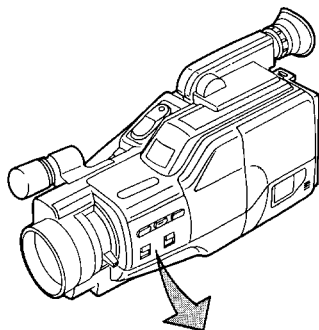
- Turn the Eyecap counterclockwise to remove it.



- Turn the Eyecap so that its right side faces left. Align the marks, and insert and turn the Eyecap clockwise until it locks with a click.



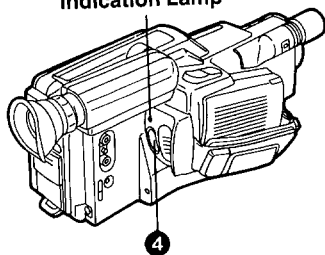
CAMERA RECORDING



2

1

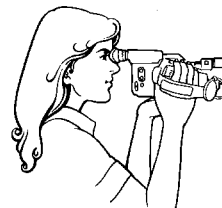
**External Recording
Indication Lamp**



Preparation

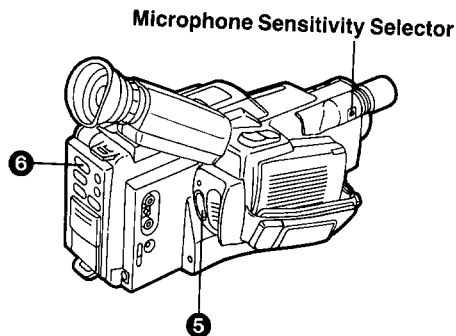
1. Slide the Camera/VTR Selector Cover close so that it covers the Tape Running Buttons.
2. Slide the Operation On/Off Switch to the right to turn the VHS-C Movie on.
3. Insert a video cassette with the erasure prevention tab intact.
 - A few seconds later, the VHS-C Movie will change over to the recording pause mode.

- 1 Set the White Balance Mode Selector to "AUTO".
For more details, see page 27.
- 2 Set the Focus Mode Selector to "AUTO".
For more details, see page 28.
- 3 Place the VHS-C Movie in the shooting position.



- Grasp the Handgrip and adjust the length of the Grip Belt with the Velcro tape closure to the size of your hand.
- Attach the Lens Cap to the Grip Belt.

- 4 Press the Start/Stop Button.
 - The Recording Indication "REC" is displayed on the EVF screen and the Recording Indication Lamp below the EVF screen is lit.
 - The External Recording Indication Lamp on the back of the Grip is also lit.



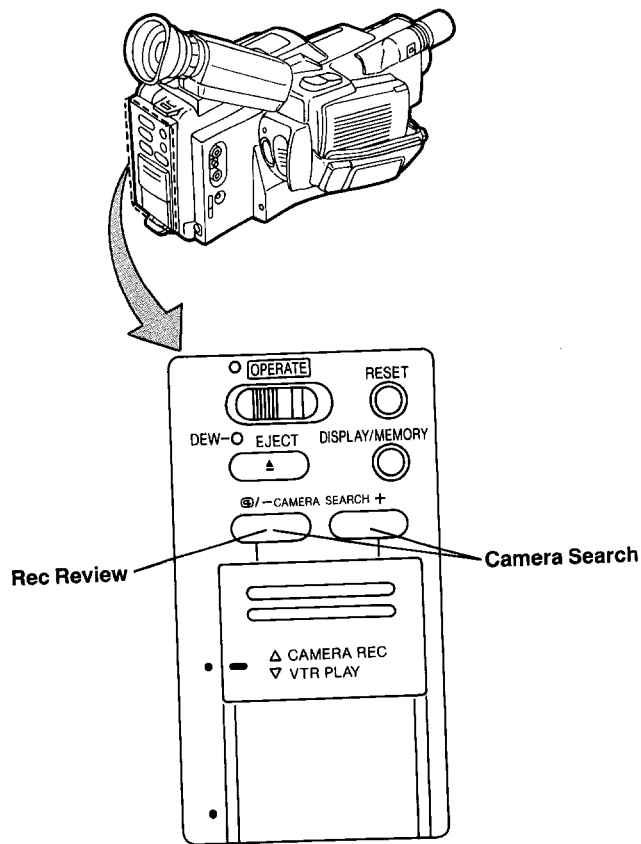
- 5 To temporarily stop the recording (recording pause), press the Start/Stop Button again.
 - 6 To finish the recording, put the VHS-C Movie in the recording pause mode and then slide the Operation On/Off Switch to the right again to turn the VHS-C Movie off.
- If the VHS-C Movie is left in the Record pause mode for more than 6 minutes:
The VHS-C Movie will automatically switch over to the power off mode to protect the tape and save battery power.
 - When the tape reaches its end during recording, the VHS-C Movie will automatically switch over to the stop mode.

Microphone Sensitivity Selector

The sensitivity of the Microphone can be increased by setting the Microphone Sensitivity Selector to "HIGH". Usually, this selector is left in the "NORMAL" position.

- If this selector is switched from "HIGH" to "NORMAL" during recording, the recording of the audio signal will be interrupted for a few seconds. However, this is not due to any malfunction.

Confirming Recorded Scenes



Camera Search for checking
longer recorded scenes.

Rec Review for a quick check
of the end of a recorded scene.

Camera Search Function (Sound is not reproduced)

In the recording pause mode, a recorded scene can be played back at high speed in reverse direction by keeping the /REW Button pressed. Review Speed; and it can then be played back at normal speed in forward direction by keeping the /FF Button pressed.

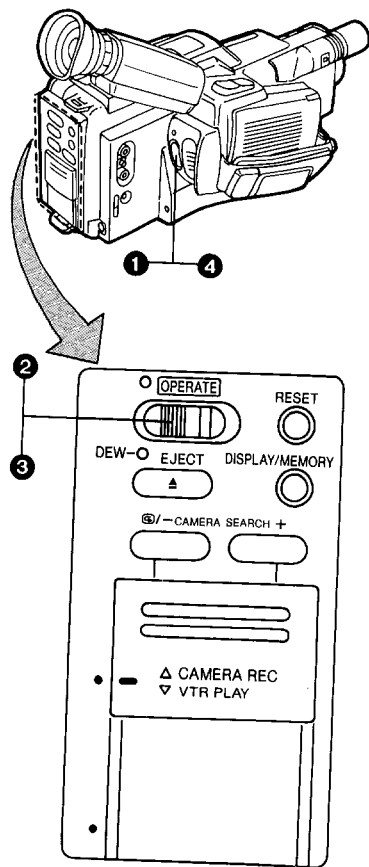
When the button is released, the VHS-C Movie will return to recording pause mode.

Rec Review Function

Press the Rewind/Review Button whilst the VHS-C Movie is in the recording pause mode.

- The last 3 seconds of the recorded scene will be played back and the VHS-C Movie will again stop in the recording pause mode, ready for further recording.

To Save Power and Extend the Life of the Battery Pack



During Recording

- 1** Press the Start/Stop Button to stop the recording.

Recording Pause

- 2** Slide the Operation On/Off Switch to the right to turn the VHS-C Movie off.
 - The Operation Lamp will go off.
 - No picture can be seen in the EVF.
 - As the tape is left wound around the head cylinder, the VHS-C Movie will automatically switch itself off after 2 days (about 48 hours) if it is left in this condition.

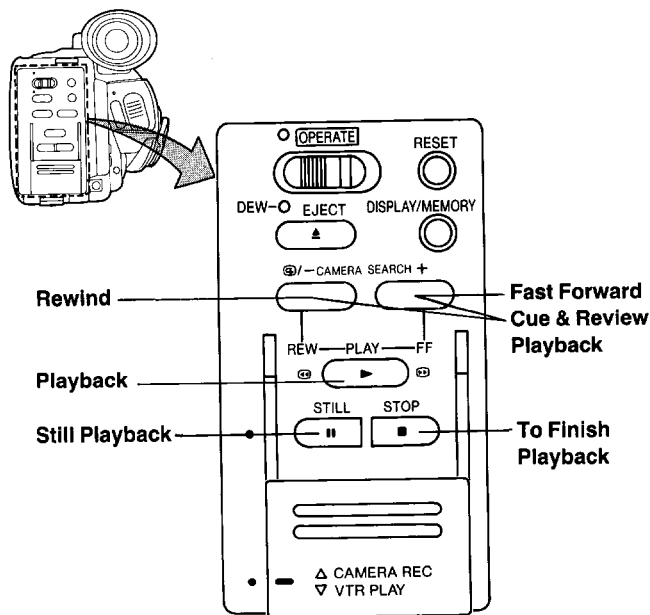
Recording Stop

- 3** Slide the Operation On/Off Switch to the right again to make the VHS-C Movie ready for recording the next scene.
 - It takes about five seconds for the picture in the EVF to become stable.

Recording Pause

- 4** Press the Start/Stop Button to start recording again.
 - When the VHS-C Movie is in the recording pause mode, the use of battery power can be temporarily suspended by operating the Operation On/Off Switch. Operating this switch a second time will put the VHS-C Movie back into the recording pause mode, so it will be ready again to start recording.

PLAYBACK



Preparation

1. Slide the Operation On/Off Switch to the right to turn the VHS-C Movie on.
2. Insert a recorded tape.
3. Slide the Camera/VTR Selector Cover open so that the Tape Running Controls become accessible.
4. For Playback via a TV set, see "CABLE CONNECTIONS" on pages 23, 24.

Fast Forward

Press the Fast Forward/Cue Button to rapidly wind the tape forward.

- The tape will stop automatically when it reaches its end.

Rewind

Press the Rewind/Review Button to rewind the tape.

- The tape will stop automatically at the beginning of the tape.

Playback

Press the Play Button.

- The tape will be rewound automatically when it reaches the end.

Cue & Review Playback

When the Fast Forward/Cue Button or the Rewind/Review Button is kept pressed while the VHS-C Movie is in the playback mode, the tape will be played back at high speed in forward or reverse direction.

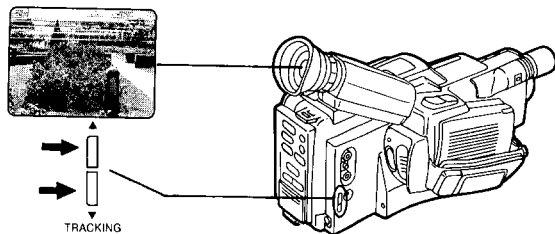
Still Playback

When the VHS-C Movie is in the playback mode, press the Still Button to view a still picture. To continue the normal playback, press this button again.

To Finish Playback

Press the Stop Button.

●Tracking Control

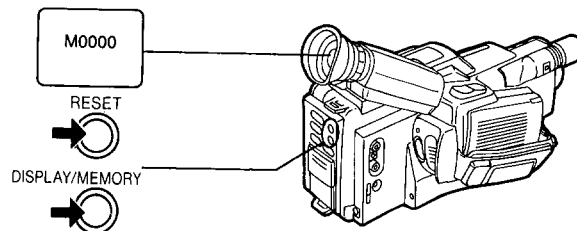


- When the playback picture contains noise bar distortion as shown in the picture above, it can be eliminated by pressing the Tracking Up or Down Button.
To return the tracking control to the former setting, press the two buttons simultaneously.
- When playing back a tape which has been recorded on another video recorder, it may not be possible to completely eliminate this distortion.
- Noise which takes the form of horizontal bars appears in the Cue, Review and Still playback modes. This is not an indication of a malfunction.
- If the VHS-C Movie is left in the Still Playback mode, for more than about 6 minutes, the VHS-C Movie will switch over to the stop mode to protect the tape and the video heads.

Tape Counter and Memory Function

Press the Reset Button at a desired point and then press the Display/Memory Button.

- The Tape Counter is reset to "0000" and the Memory Indicator "M" appears.

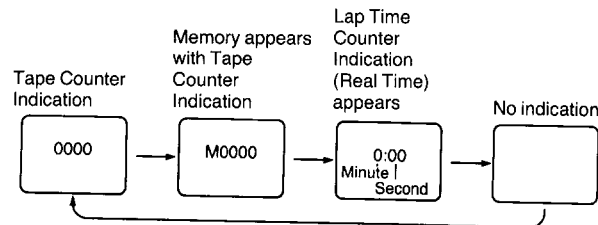


After pressing the Stop Button to end the playback, press the Rewind/Review Button.

- The tape will automatically stop at about the point where the Tape Counter reads "0000".

Counter Indication

By repeatedly pressing the Display/Memory Button, the Counter Indication can be changed in the following sequence.

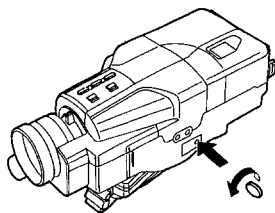


- The indication of the Lap Time Counter counts up only during recording.

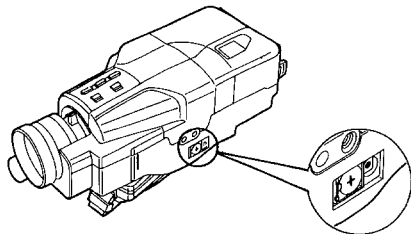
Setting of the Date and Clock & Recording the Date/Clock Indications

How to Insert the Battery for the Clock Operation

- 1 Remove the lid on the bottom of the VHS-C Movie with a coin.



- 2 Insert the "LR1130" size battery with the polarities ($\oplus$ and $\ominus$) aligned correctly and then replace the lid.
 - The clock starts working as soon as the battery is inserted.



The "LR1130" size battery (supplied) is necessary for the operation of the built-in digital clock, and to memorize the Date/Clock Indications when the VHS-C Movie is turned off.

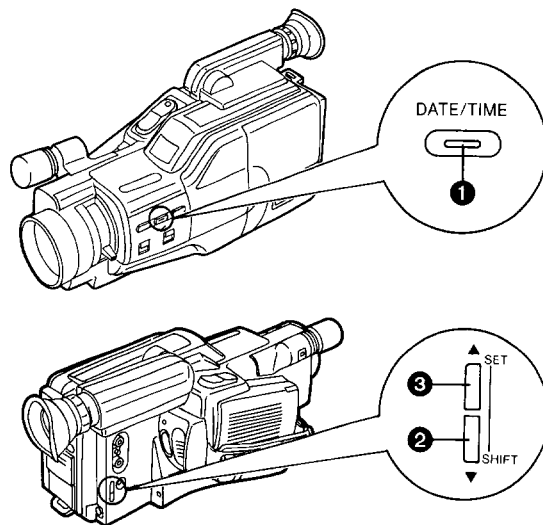
Cautions

- When this battery is almost exhausted, the whole time and date indication will flash.
- When this battery is completely exhausted, the indication "PLEASE SET BATTERY" will appear.
- To make this indication disappear, press the Date/Time Selector twice.
- If this indication is still displayed after the battery has been replaced, turn the VHS-C Movie off and then on again.

CAUTION FOR BATTERY REPLACEMENT

- The life of the battery is about one year, however, it depends on the frequency of use. Inspect and if necessary, replace the battery once a year.
- Load the new battery with their polarities ($\oplus$ and $\ominus$) aligned correctly.
- Do not apply heat to battery, or internal short-circuit may occur.
- Remove spent battery immediately and dispose of it.

Setting of the Date and Clock



- ① When the Date/Time Selector is pushed, the indication shown on the right will appear in the EVF.

0 : 12
1 . 1. 1989

- If no battery is inserted, the indication "PLEASE SET BATTERY" will light up. In this case, insert the battery as described on page 21.

- ② When the Shift Button is kept pressed for more than about 2 seconds, the "Year" portion will start to flash. Then, at every press of the Shift Button, the items to be set will flash in the following sequence.

Year → Month → Date → Hour → Minute

- ③ When the Set Button is pushed, the flashing portion displayed will be changed in the following sequence.

YEAR: 1989 → 1990 → → 2088
MONTH: 1 → 2 → → 12
DATE: 1 → 2 → → 28 → (29) → (30) → (31)
HOUR: 0 → 1 → → 23
MINUTE: 00 → 01 → → 59

- Repeat procedures ② and ③ until all five items have been set.
- Once the time and date are set, press the Shift Button in response to a precise time signal so that the clock may begin to function.

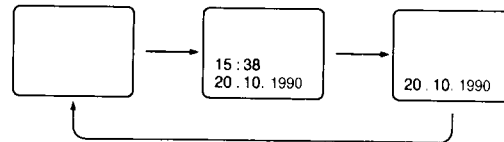
Recording the Date/Clock Indications

When the Date/Time Selector is pushed repeatedly, the indication will change in the following sequence.

To record neither
the Date nor the
Clock Indication:

To record the
Date and Clock
Indications:

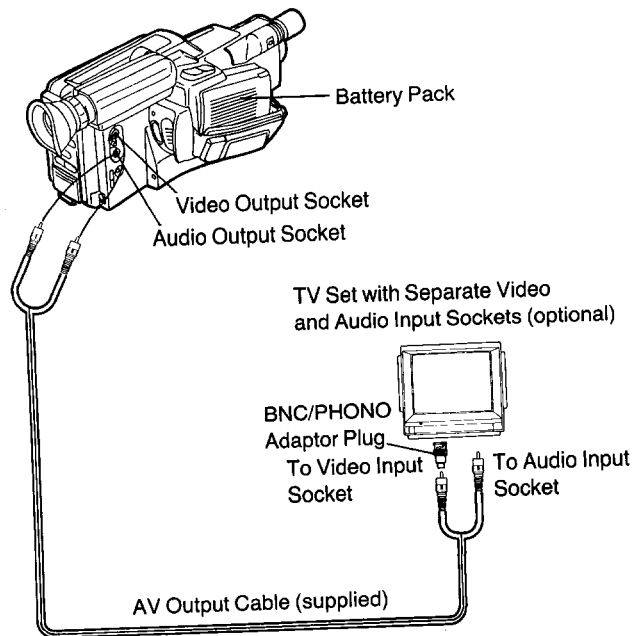
To record only the
Date Indication:



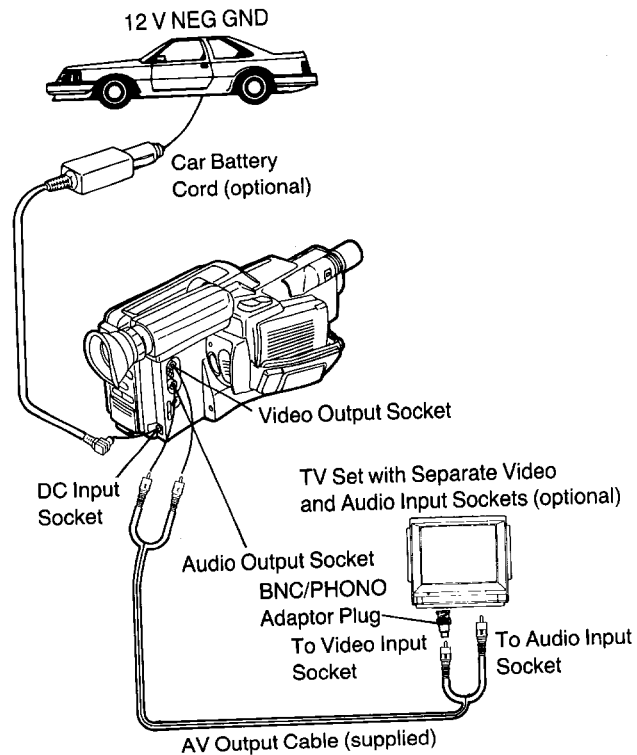
CABLE CONNECTIONS

Connection to a TV Set with Video and Audio Input Sockets

When using the Battery Pack as power source



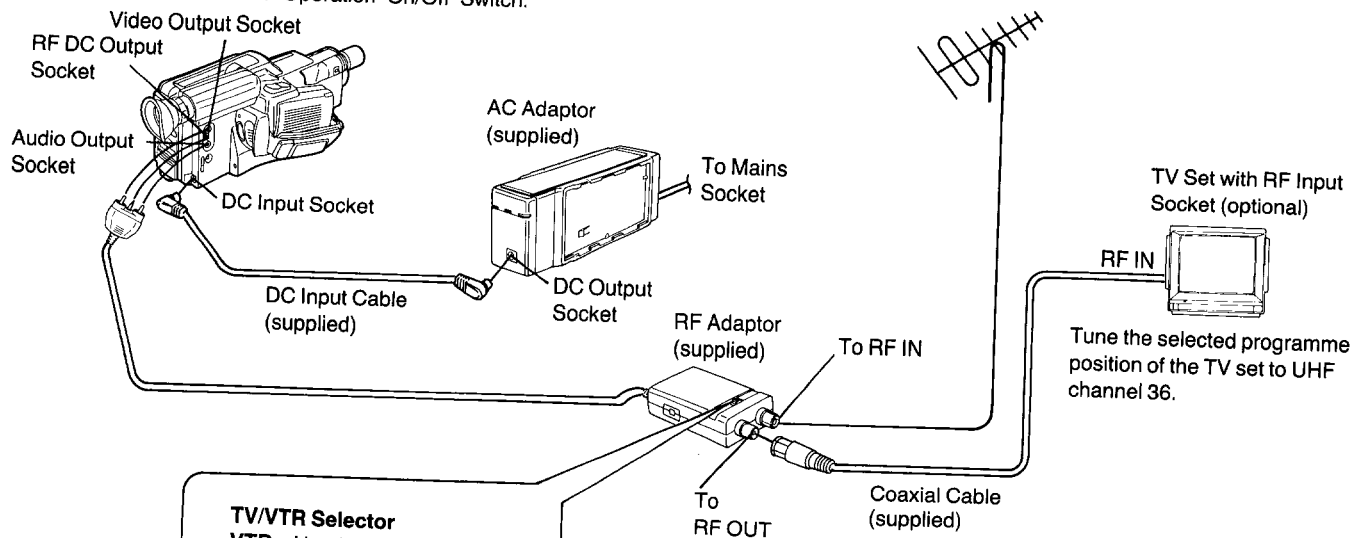
When using a car battery cord as power source



Connection to a TV Set without Video and Audio Input Sockets

The AC Adaptor and RF Adaptor are required

Before connecting the RF Adaptor to the VHS-C Movie, turn the VHS-C Movie off with the Operation On/Off Switch.



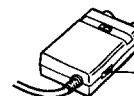
TV/VTR Selector

VTR: Used for playing back a video cassette on the VHS-C Movie.

TV: Used for watching TV.

Note: Only use the specified adaptors for the connections. The VHS-C Movie cannot be used to record programmes on TV.

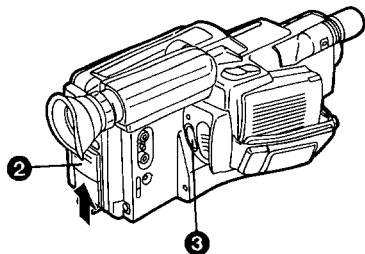
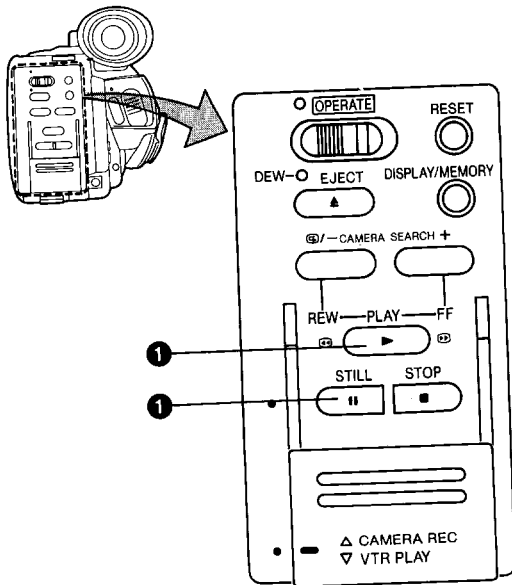
PAL System Selector



I: for U.K.

G: for Continental Europe

ASSEMBLE EDITING



Preparation

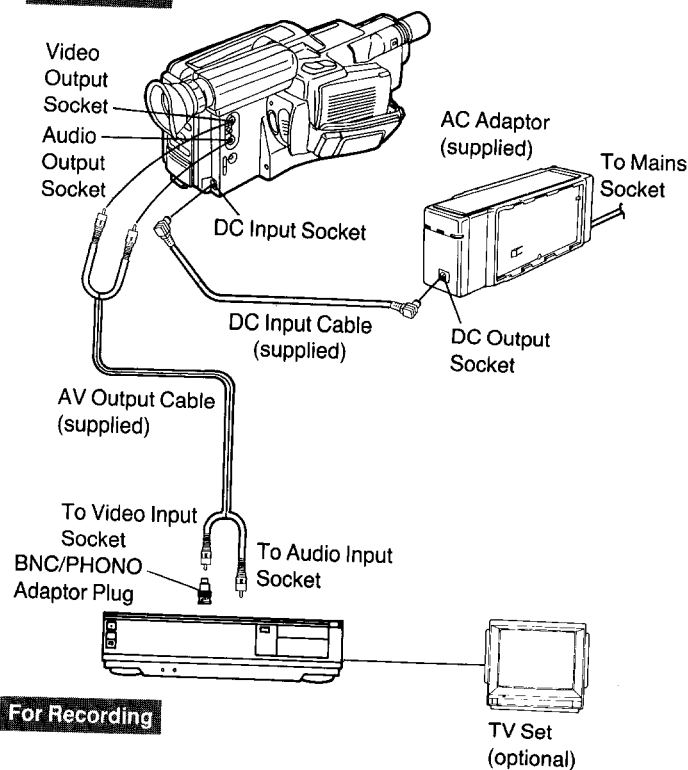
1. Insert a video cassette with the erasure prevention tab intact.
2. Slide the Camera/VTR Select Cover open.

- 1 Press the Play Button to locate the point where the new recording is to be joined (Assemble Editing), and press the Still Button at the desired point.
- 2 Slide the Camera/VTR Selector Cover close so that it covers the Tape Running Buttons.
- 3 Press the Start/Stop Button.

DUBBING (COPYING)

Connection of the VHS-C Movie with a Video Recorder

For Playback



For Recording

- 1 Place the VTR into the recording pause mode, at the point on the tape where you wish to record the picture from the recorded cassette in the VHS-C Movie recording.
 - 2 Locate the exact point on the tape in the VHS-C Movie from where you want to start copying and put the VHS-C Movie into the still playback mode.
 - 3 Press the Still Button on the VHS-C Movie and the Pause/Still Button on the VTR to start the copying.
- The picture quality of a copied tape is inferior to that of the original tape.
 - If the VTR used for copying features 2 tape speeds, select the normal speed (SP mode) for the best result.
 - When a tape, that was originally recorded on the VHS-C Movie and that later has some scene added on a VTR by using the Insert Editing function, is again played back on the VHS-C Movie, the playback of the inserted part may be affected by uneven colour and coloured stripes.

Connection of the VHS-C Movie to a VHS VTR Equipped with Synchro Edit Function

Connect the Remote Control Socket of the VHS-C Movie and the synchro edit socket of the recording VTR with the optional synchro connection cable (VW-K1).

- When editing, it is possible to operate the playback start and stop of the VHS-C Movie with the recording start and stop of the recording VTR.
- For the operation, refer to the operating instructions of the recording VTR.

TECHNIQUES FOR SHOOTING

White Balance

The VHS-C Movie, like any other video camera, responds differently to the colours depending on the weather and the time, even under seemingly same sunlight. The adjustment necessary to assure natural colour rendition is called "white balance adjustment".

"AUTO" position The white balance is automatically adjusted as the illumination changes.



In certain cases, the use of the preset positions is recommended:

"INDOOR" When shooting under the light from incandescent light bulbs or halogen lamps.

"OUTDOOR" When shooting outdoors under the sunlight.

Cautions for Use of the Auto White Balance Adjustment Mode

In the Auto mode, the sensors built into the front of the VHS-C Movie detect the colour temperature of the illumination of the scene and automatically adjust the white balance. In the following shooting conditions, the Auto mode may not provide exact white balance adjustment.

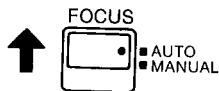
1. When the illumination of the subject is different from the light that falls on the VHS-C Movie.
2. When either the VHS-C Movie or the subject is in the shade.
3. When extremely bright light sources are used, such as mercury-vapour lamps, sodium lamps or some types of fluorescent lamps.
4. When the illumination is not bright enough (approx. 15 lux).
5. When the scene has strong red-coloured illumination, e.g. during sunrise and sunset.
6. When intensive light hits only the red or the blue light sensor in the window.
7. When there is some other light source that is outside the sensing range of the white balance adjustment sensors, e.g. snowy landscape, cloudy weather, incandescent light and candlelight.
8. When there is some object placed in front of the sensor window that prevents light from reaching it.
9. When shooting in the macro range, the Auto mode does not operate. Therefore, use the "INDOOR" or "OUTDOOR" position.

Focus

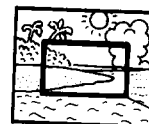
Auto Focus

Set the Focus Mode Selector to "AUTO".

- While watching the picture in the EVF, aim the VHS-C Movie at the subject on which you want to focus.



The focus will automatically be adjusted to the object within the focusing zone.



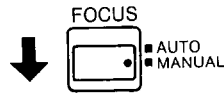
Focusing Zone Frame.

Note

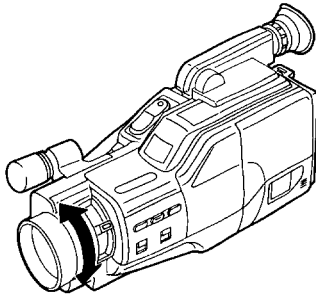
This Auto Focus system does not measure the actual distance but adjusts the lens to the optimum focusing condition based on the video signal. Therefore, the distance setting on the lens may be different from the actual distance in some cases. However, this is not an indication of a malfunction.

Manual Focus

- 1 Set the Focus Mode Selector to "MANUAL".



- 2 Turn the Focus Ring to adjust the focus.

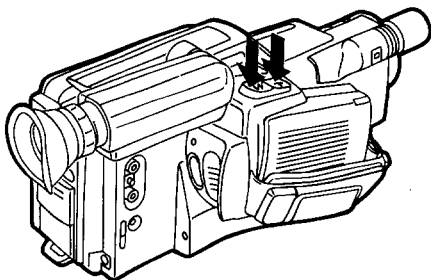


In the following shooting conditions, the Auto Focus system will not be able to provide stable and exact focus adjustment. Set the Focus Mode Selector to "MANUAL" in such cases and adjust the focus by turning the Focus Ring.

1. When shooting a subject through dirty glass.
2. When shooting subjects with shiny surfaces.
(The focusing zone frame may disappear.)
3. When shooting a subject with a part of it near and another part far from the VHS-C Movie.
4. When shooting an oblique subject.
5. When shooting a subject with distinct horizontal stripes.
6. When shooting a flat subject such as a white wall.
7. When no part of the subject is within the focusing zone frame.
8. When shooting with the macro close-up function or with special lenses or filters.
9. When shooting a fast-moving subject.
10. When shooting a dark subject.
(The focusing zone frame may go on and off.)

Zooming

Power Zooming

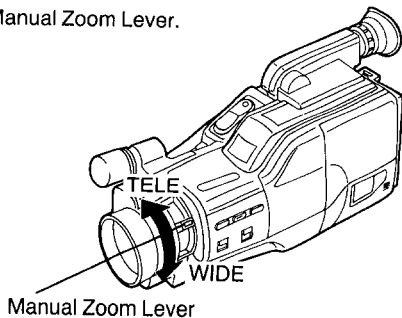


To zoom to wide-angle, press the "W" Button.

To zoom to telephoto, press the "T" Button.

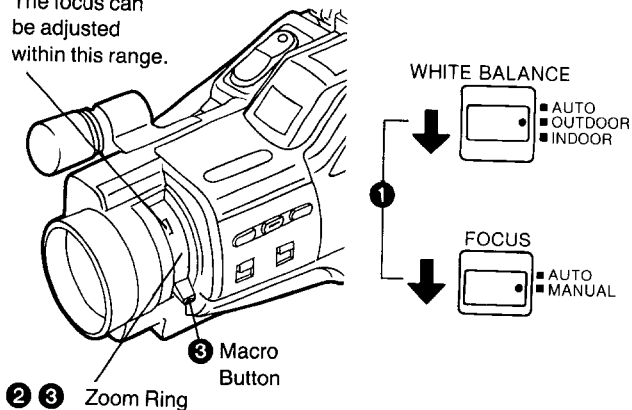
Manual Zooming

Use the Manual Zoom Lever.



Macro Close-Up

The focus can be adjusted within this range.



Shooting Small Objects

The macro function allows shooting small plants and tiny insects. It is also possible to shoot photos from a photo album. (The focus can be adjusted within a distance of 1.2 m.)

- 1 Set the White Balance Mode Selector to the "INDOOR" or "OUTDOOR" position and set the Focus Mode Selector to "MANUAL".
- 2 Turn the Zoom Ring all the way down to the click stop.
- 3 Press the Macro Button and again turn the Zoom Ring down. Turn the Zoom Ring slowly and focus on the desired object.

Lighting

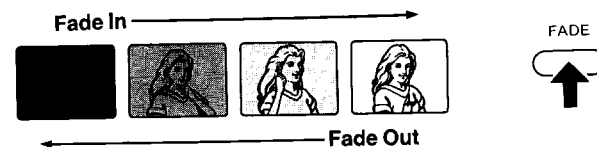
Standard Values of Brightness

(lux)	(Place or Daylight)
10–15	●Candlelight
400–500	●Office with fluorescent lamps
500–700	●Department store counter
1000	●Sunlight one hour before sunset, clear day
2000	●Sunlight one hour after sunrise, cloudy day.
25000	●Sunlight at 10 AM, cloudy day
32000	●Sunlight at noon, cloudy day
35000	●Sunlight at 3 PM, clear day
65000	●Sunlight at 10 AM, clear day
100000	●Sunlight at noon, clear day

Fade-in and Fade-out

Fading out a scene to black is possible by keeping the Fade Button pressed, and fading in from black is operated by releasing this button.

The sound is also faded out and faded in together with the picture.



High Speed Shutter

The VHS-C Movie has 3 different shutter speeds:

HIGH SPEED
SHUTTER



1/50 s normal shutter speed

1/500 s electronic high speed shutter

1/1000 s electronic high speed shutter

By repeatedly pushing the High Speed Shutter Selector, the shutter speed can be changed as follows:

1/500 sec. → 1/1000 sec. → Normal

For videographing of fast movements, the shutter speed can be set to 1/500 or 1/1000 with the switch HIGH SPEED SHUTTER.

With a video recorder equipped with the playback functions super still playback, super still advance and super fine slow motion, sharp-contoured pictures can be played back in these functions

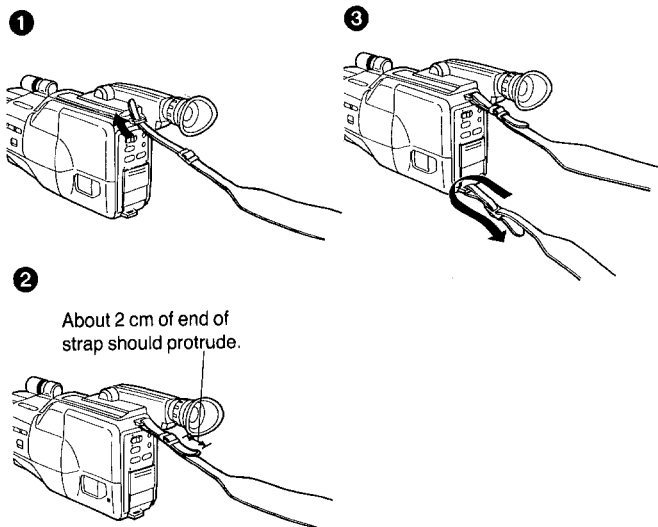
- The following conditions are required for shooting with the High Speed Shutter function:

The subject must be brightly lit, with little shade, under sunlight or some other illumination of more than 300 lux.

- If shooting under the illumination produced by fluorescent lamps, the picture will be adversely influenced by flickering.
- If the picture is played back in the normal playback mode, the movements may appear to be not very smooth.
- The playback picture will be slightly darker than the picture recorded without using the High Speed Shutter function.

Accessories

How to Attach the Shoulder Strap

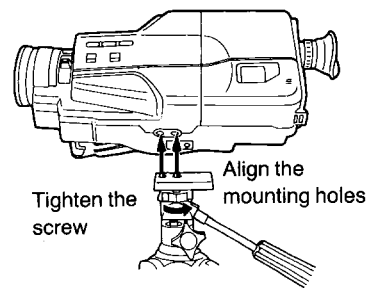


About 2 cm of end of strap should protrude.

- 1 Pass the end of the Shoulder Strap through the slit of the Shoulder Strap Holder on the upper part of the rear of the VHS-C Movie.
- 2 Securely attach the end of the strap.
- 3 Attach the other end of the Shoulder Strap at the lower part of the rear of the VHS-C Movie in the same way as mentioned above.

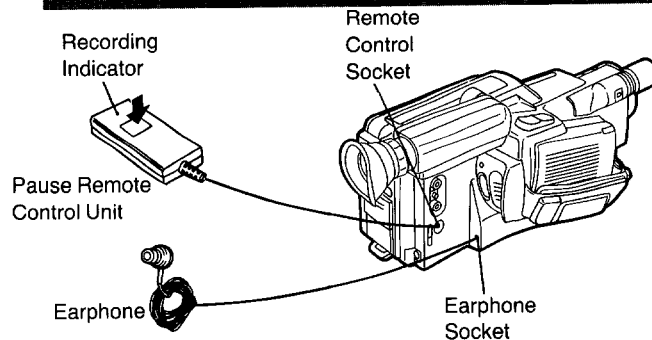
How to Mount the VHS-C Movie on a Tripod (optional)

Bottom side of the VHS-C Movie

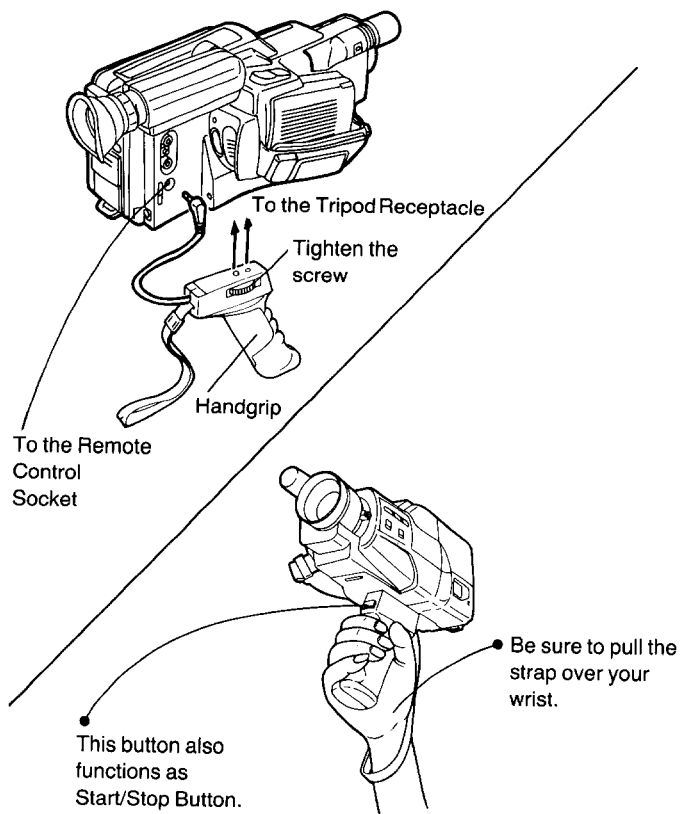


- Place the tripod on a stable surface, with its legs fully spread.

How to Use the Pause Remote Control Unit and Earphone

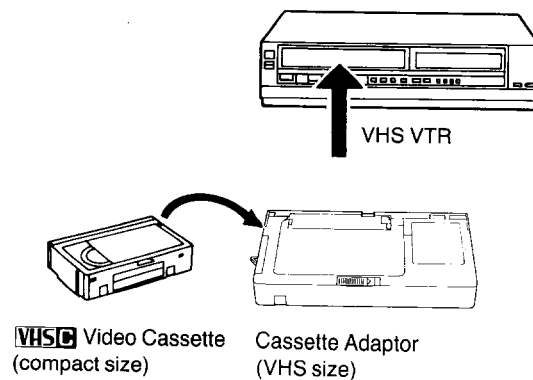


How to Use the Handgrip (Optional)



Playback on a VHS VTR

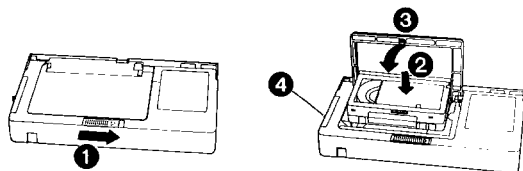
- Use the Cassette Adaptor (supplied).
For details about operating the Cassette Adaptor, see pages 35 and 36 of these Operating Instructions.



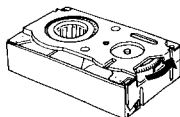
Cassette Adaptor

Make sure that a battery is in the Cassette Adaptor.

Loading a VHS-C Cassette

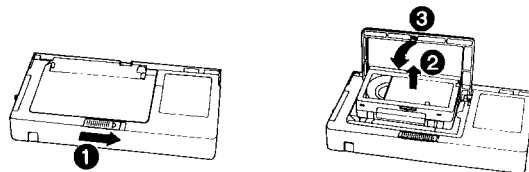


Before loading a VHS-C cassette into the Cassette Adaptor, turn the cog wheel in the direction of the arrow to pull in the slack of the tape.



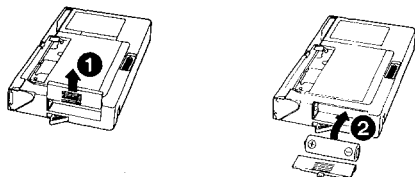
- ❶ Slide the Open Button in the direction of the arrow, and the Compartment Cover will pop open.
- ❷ Insert the **VHS-C** Cassette vertically.
- ❸ Close the Compartment Cover firmly.
(Tape loading starts automatically. During loading, do not touch the rotating part on the underside of the Cassette Adaptor.)
- ❹ The Stopper is retracted.
(When the Stopper is completely retracted, the tape loading in the Cassette Adaptor is completed. It can now be inserted into a VHS video recorder.)

Take Out the VHS-C Cassette



- ❶ Slide the Open Button in the direction of the arrow. The tape will be retracted into the **VHS-C** cassette and the Compartment Cover will pop open. Do not touch the rotating part on the underside of the Cassette Adaptor at this time.
- ❷ Take out the **VHS-C** cassette.
• Pushing the cassette from the underside of the adaptor will make it easier to take it out.
- ❸ Close the Compartment Cover.
• During the loading of the tape, some mechanical noise can be heard. However this is not an indication of a malfunction of the Cassette Adaptor.

How to Load the Battery



- ❶ Slide the Battery Cover upward and remove it.
- ❷ Load one "R6" size battery with the polarities correctly aligned as shown in the illustration and replace the cover by pushing it down until it locks with a click.

CAUTION FOR BATTERY REPLACEMENT

- If the tape loading time is getting longer, the battery is becoming exhausted. Replace it with a new one.
- Load the new battery with their polarities (+ and -) aligned correctly.
- Do not apply heat to battery, or internal short-circuit may occur.
- Remove spent battery immediately and dispose of it.

Cautions for Use

- This Cassette Adaptor is made to exacting precision standards. Dropping this Cassette Adaptor, exposing it to strong vibration and shocks, disassembling or remodelling it will cause malfunction. Never try to disassemble it.
- Do not insert and eject this Cassette Adaptor on a VHS VTR many times without running the tape, because this could cause the tape to get loose, creased or scratched.
- It is not possible to reverse this Cassette Adaptor for use.
- When loading the VHS-C cassette into the Cassette Adaptor, be careful not to touch the tape directly. After use, take out the VHS-C cassette from the Cassette Adaptor.
- Do not put the adaptor in the following places.
 - Places with high humidity or much dust.
 - Places exposed to direct sunlight or near heating equipment.
 - Places with strong magnetic fields such as generated by motors, transformers, magnets etc.
 - Places with oily smoke or steam, e.g. in a kitchen.
- Never insert the Cassette Adaptor into a **VHS** VTR without a **VHS-C** compact video cassette in it.
- In the special playback modes (Slow Motion, Still Playback etc.), the picture may be distorted by jitter and noise bars.

CAUTIONS

Please read these cautions before operating the VHS-C Movie.

Video Head Clogging

The video heads are the means by which the VHS-C Movie places picture signals on the tape during recording, and reads picture signals from the tape during playback. If these heads become dirty and clogged from long use, the signals can no longer be recorded correctly, and the playback picture will be distorted accordingly. This is the case, for example, during the playback of a tape, the sound of which is reproduced normally, but no picture is seen, or the picture is greatly distorted. When such symptoms occur, have the VHS-C Movie checked by qualified service personnel.

The VHS-C Movie is equipped with head clogging detection function. When the heads are clogged, the  Indication in the EVF will appear. As the accumulation of dirt on the heads may be dislodged by the movement of the tape, it is possible that this indication sometimes appears, but may not reappear on the next recording starts.

The head clogging detection function will be activated when the shooting is started from the recording pause mode. However, it will not be activated when shooting immediately after replacing the cassette and after performing Camera Search or Playback.

If Condensation Forms Inside the VHS-C Movie

Condensation (dew) forms when warm air comes in contact with a cold object, for example on a window in a heated room in winter. Condensation may form in the VHS-C Movie and damage the tape and the video heads, if:

- The VHS-C Movie is in a room where the heater has just been turned on.
- The VHS-C Movie is in a room with steam or high humidity.
- The VHS-C Movie is brought from cold surroundings into a well-heated room.

- The VHS-C Movie is suddenly brought from cool surroundings, such as an air-conditioned room or car, to a place which is hot and humid.

- When condensation has formed inside the VHS-C Movie, the "DEW" indication in the EVF and the Dew Indication Lamp located on the panel with the General Operation Controls will both flash. A few seconds later, the unit will turn itself off to protect the tape and the video heads.

After a while, turn the unit on again and make sure that the Dew Mark is not displayed any more. Then, wait about 1 hour before operating the VHS-C Movie again. Depending on the surrounding conditions, it may take several hours before the VHS-C Movie can be used again.

- As condensation forms gradually, it may take about 10–15 minutes before the VHS-C Movie turns itself off after a change of working environment.
- In an extremely cold place, condensation may freeze and turn into frost. In this case, it may take quite some time for the frost to melt, turn into dew and evaporate.
- When you bring the VHS-C Movie from a very cold place, e.g. the ski slopes, into a heated room, keep it in a tightly closed plastic bag or similar to prevent condensation from forming inside the VHS-C Movie.

Keep the VHS-C Movie away from Oily Smoke and Steam

Protect the VHS-C Movie from Humidity and Dust

Surrounding Conditions

Use the VHS-C Movie under conditions where the temperatures are between 0°C and 40°C, and where the humidity is between 20% and 80%. To avoid deformation of the outer case or other damage, do not leave it exposed to direct sunlight for any length of time, also never leave it in a closed automobile.

Keep the VHS-C Movie Away from Heaters

Keep the VHS-C Movie Away from TV Sets

Do not place the VHS-C Movie near a TV set because it might impair the picture and sound quality of the recorded tape, and/or adversely affect the performance of the VHS-C Movie.

Keep Magnets Away

Never bring a magnet or magnetized object such as fluorescent lamps, motors, electric clocks and battery operated toys etc. close to the VHS-C Movie because this could adversely affect its performance.

Keep the VHS-C Movie Away from Areas with Strong Electric Fields

The picture may become distorted, when the VHS-C Movie is used in places with strong electric fields, such as near TV or radio antennas.

Never Put any Objects Inside

Never insert any object other than a video cassette into the VHS-C Movie. If any object is dropped into it or if any liquid is spilled into it, consult qualified service personnel. Operating it with some foreign matter inside may cause fire or electric shock.

No Fingers Inside

Touching internal parts of the VHS-C Movie is very dangerous and may cause serious damage to the VHS-C Movie. Do not attempt to disassemble it. For internal inspection, adjustment or repairs, consult qualified service personnel.

Handle with Care

Never drop the VHS-C Movie or expose it to strong physical shocks. Shocks during use may result in abnormal operation and performance.

Appearance of Smear Distortion

Smear distortion is a peculiar characteristic of the CCD device. It appears as a bright vertical stripe on the screen when the VHS-C Movie is aimed at spot lights or other bright lights and light reflecting objects. To avoid this problem, make sure not to aim the VHS-C Movie at such strong light sources during shooting.

Cover the Lens with the Cap after Shooting

Keep the VHS-C Movie Away from Strong Light

Do not expose the VHS-C Movie to strong light, because the heat from it may cause deformation or other damage.

When the VHS-C Movie Is Not Being Used

Remove the video cassette and turn the VHS-C Movie off with the Operation On/Off Switch.

Keep Insecticide Spray Away

Never spray things like insecticide on the lens and body of the VHS-C Movie. Also, never leave rubber or vinyl objects in contact with any part of it for a long time, because the colour might change and the body surface might be damaged.

Never Place the VHS-C Movie with the Cassette Compartment Side Facing Down

Never use the VHS-C Movie with the cassette compartment facing down as this might cause uneven winding and slacking of the tape.

Cleaning the VHS-C Movie

- The body of the VHS-C Movie is made of plastic materials. Never use benzine, thinner or other chemicals for cleaning, because the colour might be changed and the case surface might be damaged.
- Wipe the case and operation panel with a soft, clean cloth. For persistent stains, use a cloth moistened with mild detergent and water, and then wipe with a dry cloth.
- Clean the lens only with a blower brush (used for photo cameras) or a special lens cleaning tissue (used for glasses and cameras).

BEFORE REQUESTING SERVICE

Power Source

- The power does not turn on.
 - Is the power supply unit correctly connected to the VHS-C Movie?
- The power turns on, but it turns off again immediately.
 - If the Battery Pack is exhausted, replace it with a fully charged one.
 - If condensation has formed, wait until it has dissolved.

Camera Recording

- The power is on, but no picture appears in the EVF.
 - Is the lens covered with the lens cap?
- Camera recording cannot be performed.
 - If the tab of the cassette is broken out, cover the tab hole with adhesive tape.
- The picture is not clear.
 - Is the eyepiece correctly adjusted to your eyesight?
 - Is the lens surface dusty?
- The Auto Focus system does not provide optimum focus adjustment.
 - Is the Focus Mode Selector set to "AUTO"?
 - For shooting conditions where the "AUTO" setting of the Focus Mode Selector cannot provide optimum focus adjustment, set the selector to "MANUAL" and adjust the focus.

Playback

- No playback picture is reproduced.
 - Is the connection to the TV set correct?
 - Is the TV set tuned to the video playback channel?
- The colours are not correct.
 - Is the colour adjustment of the TV set correct?
- The playback picture is not in colour.
 - The playback picture has large amounts of "snow".
 - Adjust the tracking.
 - If the tape is old, use a new tape.

SPECIFICATIONS

NV-MC20B

is the safety information.

Power Source:

DC 9.6 V

Power Consumption:

Recording mode; 7.2 W (Battery Operation)

Camera Search Mode; 8.7 W (Battery Operation)

Video Recording System:

Rotary four heads, helical scanning system

Tape Speed:

23.39 mm/s

Tape Format:

VHS tape

Recording/Playback

Time:

30 min. with NV-EC30HG

VIDEO

Television System:

CCIR; 625 lines, 50 fields PAL colour signal

Modulation System:

Luminance; FM azimuth recording

Colour signal; Converted subcarrier phase shift recording

Output Level:

Video out (PHONO)

1.0 Vp-p,

75 ohm unbalanced

AUDIO

Output Level:

Audio out (PHONO)

−8 dB,

600 ohm unbalanced

Audio Track:

1 track (Normal-Mono)

Image Sensor:

1/2-inch CCD Image Sensor

Lens:

6:1 Power Zoom Lens with MACRO Function

Auto Iris

Auto Focus System F1.2 (9–54 mm)

Lens Front Diameter 49 mm

Viewfinder:	2/3-inch Electronic Viewfinder
Standard Illumination:	1,400 Lux
Minimum Required Illumination:	10 Lux
Video Horizontal Resolution:	Colour; More than 230 lines
Signal-to-Noise Ratio:	Video; More than 40 dB Audio; More than 41 dB
Audio Frequency Response:	100–8,000 Hz
Operating Temperature:	0°C–40°C
Operating Humidity:	20%–80%
Weight:	Approx. 1.3 kg (without Battery Pack)
Dimensions:	124 (W)×140 (H)×328 (D) mm

VW-AMC2B

 is the safety information.

Power Source:	AC 100–240 V, 50–60 Hz (Automatic voltage adjustment)
Power Consumption:	25 W
DC Output:	DC 9.6 V 1.2 A (VHS-C Movie) DC 9.6 V 0.86 A (Battery pack charging)

Weight:	Approx. 0.56 kg
Dimensions:	53 (W)×68.5 (H)×191 (D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.





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Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan