

SONY

Video Camera Recorder 8

CCD-SP9

Operating Instructions

Before operating the unit, please read this manual thoroughly and retain it for future reference.

This unit cannot be used under water.

Mode d'emploi

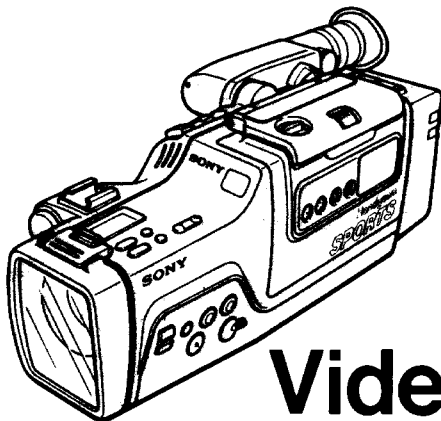
Avant la mise en service de l'appareil, lire entièrement ce mode d'emploi et le conserver pour toute référence ultérieure.

Cet appareil ne peut pas être utilisé sous l'eau.

Manual de instrucciones

Antes de utilizar la unidad, lea cuidadosamente este manual, y consérvelo para futuras referencias.

Esta unidad no puede emplearse bajo el agua.



PROPERTY OF THE
NATIONAL TECHNICAL DEPT.

FILE COPY

Do not remove

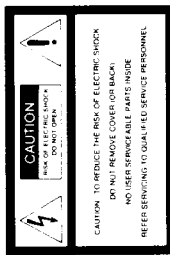
Video8 Handycam

Owner's Record

The model and serial numbers are located on the bottom. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. CCD-SP9 Serial No. _____

WARNING



This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

THIS PRODUCT IS NOT MEANT TO BE IMMERSSED IN WATER OR COME IN CONTINUOUS CONTACT WITH WATER.

Notice for the customers in Canada: This product complies with the Class B limits for radio noise emissions set out in Radio Interference Regulations.

INFORMATION
This equipment generates and uses radio frequency energy and if not installed and used properly, it may, in fact, cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off, the user is encouraged to try to correct the interference by one or more of the following measures:
Relocate the receiving antenna.
Relocate the equipment with respect to the receiver.
Move the equipment away from the receiver.
Plug the equipment into a different outlet so that the equipment and receiver are on different branch circuits.
If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions.
These suggestions do not void the warranty required by the Federal Communications Commission help/01.
"How to Identify and Resolve Radio-TV Interference Problems"
This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 044-000-000-045-4.

English

Please refer to the illustration corresponding to the letter code like [A-1] indicated in the instructions.

Notes

- The splash-proof CCD-SP9 has some resistance to water and moisture and makes it possible to use the unit outdoors. Exposure to water and moisture is not recommended to have a trail run to check that everything is working perfectly.
- Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright law.
- PCM recording/playback is not possible with this unit. The PCM sound recorded or after-recorded with another recorder cannot be played back with this unit.
- For using the recorder abroad, see page 118.
- The following units are packed with the CCD-SP9:
 - Battery pack NP-56H (1)
 - AC power adaptor ACV35 (1)
 - RFU adaptor RFU-90UC (1)
 - AV connecting cord (1)
 - Shoulder strap (1)
 - Lithium battery CR2025 (1)
- For details of the units, please read their instruction manuals.

This unit uses 8 mm video format cassettes. If records in the SP mode (approximately 143 cr/second) and can play back in the SP mode and the LP mode (approximately 0.72 cr/second).
The quality of the playback picture in the LP mode will not be as good as that in the SP mode.

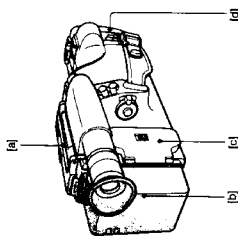
Table of Contents

Notes on use on the sea or at the beach	8
Location and function of parts and controls	12
To open each splash-proof cover	22
Adjusting the grip strap	24
Power Sources and Cassette Care	
Power sources	26
Selection of power sources	26
Using the battery pack	26
Using the AC power adaptor	30
Using the car battery	32
Using the optional battery pack	32
Lithium battery	38
Cassette care	40
Cassette Operation	
Adjustment of the position of the viewfinder lens	42
Easy camera recording with automatic adjustment	44
How to record	44
Indicators inside the viewfinder and the LCD panel	46
Instant playback on the spot	50
During recording, to record again on the previous recorded portion	52
Insert recording [1]	54
Manual focusing	56
Back light adjustment	56
Shutter speed adjustment	66
Zoom	70
Close-ups	72
Recording date or time	74
Recording a title	78
VTR Operation	
Preparation for playback	82
Playback	86
TV program recording	90
Insert recording [2]	96
Head tape counter	100
Tape ejection	104
Others	
Notes for better shooting	106
Notes on moisture condensation	112
Video head cleaning	114
Precautions	116
Using your recorder abroad	118
Specifications	120
Troubleshooting	124

Notes on Use on the Sea or at the Beach

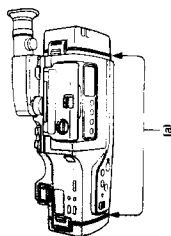
On Operation

- Do not use the unit under water.
- Avoid opening the top cover [a], the battery cover [b], the jack cover [c] or the lens cover [d] on the sea or at the beach. [A-1]
- Be especially careful not to damage the cassette tape when it is done in a place with low humidity and no sea breeze.
- The splash-proof integrity of the unit is maintained by the battery cover, the lens cover, the top cover, the jack cover and the rubber gaskets. Be especially careful not to damage or remove them. If they are damaged, the splash-proof effect will be lost.
- If you cannot avoid leaving the unit in the sun, be sure to cover it with a towel or similar.
- Do not throw the unit into the water.
- Do not change a battery with a wet hand.
- Before opening the buckle or the cover, be sure to dry the unit with a cloth.
- Before recording, clean the lens cover.



[A-1]

- The rubber gasket [A-2] assure the splash-proof function of this unit. To maintain splash-proof integrity, handle them properly by the following points.
- Check that there are no scratches or cracks on the rubber gaskets. Scratches or cracks may cause water leakage.
- Remove foreign materials such as dust and sand completely from the rubber gaskets and the grooves and the surface of the lens cover.
- Be especially careful not to damage the rubber gasket.
- Be careful of the rubber gasket's condition upon maintenance and the frequency of use, but we recommend changing them once a year at your Sony service facility.



[A-2]

Notes on Use on the Sea or at the Beach

On Cleaning

After recording at a location subject to sea breezes, clean the unit with a soft cloth lightly moistened with mild detergent solution. If water drops remain on the unit, the metal parts may be corroded. Do not use alcohol, benzene, or use any type of solvent, such as alcohol or benzene for cleaning, as this might damage the finish.

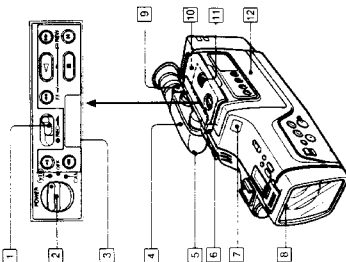
Sony does not accept liability for damage to the video camera recorder, battery, etc. or for loss of recorded pictures if corrosion occurs as a result of incorrect operation.

Location and Function of parts and Controls

For details on the use of each control, refer to the pages indicated in the circle.

[B-1]

- REC (recording) switch** ●
Slide in the direction of the arrow.
- POWER switch** ●
CAMERA: For camera recording
VTR: For playing back or editing tapes
OFF: Power off
- Type transport buttons** ●
FF (fast forward)
REW (rewind)
STOP (stop)
PAUSE (pause)
ALL (frame-by-frame)
SLOW (slow)
- Viewfinder** ●
The picture being recorded or played back can be monitored in monochrome here. Also, data such as caution indicators and function mode are displayed on the viewfinder screen.
- Camera recording/battery lamp** ●
Lights during camera recording. It blinks when the battery is weak or exhausted.
- Power zoom button** ● ●
- White balance sensor** ●
This is the sensor for auto white balance adjustment. During recording, do not cover the sensor.
- Lens cover** ●
- Viewfinder lens adjustment knob** ●
Adjust to your eyesight for good focus. Be sure to adjust this knob when shooting for the first time.
- EJECT (cassette eject) button** ●
Located inside the top panel cover.
- Top cover OPEN button** ●
- Cassette holder** ●



B-2

13 ZERO MEM (zero memory) button
Used to memorize the counter zero point.

14 DATE and TIME SET buttons
Press to display or turn off the date or time.

15 EDIT/SEARCH button

16 RESET button
Press to reset the counter to zero.

17 Viewfinder lock lever
While pressing this lever, turn up the viewfinder.

18 Eyecup

19 Tripod mount
Note when attaching a tripod not manufactured by Sony.
When attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 5.5mm. Otherwise the screw may damage the inner parts of the camera.

20 MACRO set button

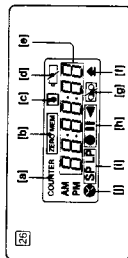
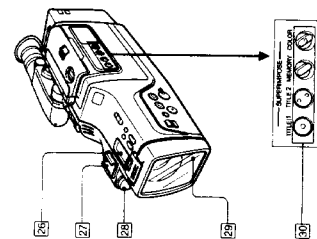
21 Focus adjustment button

22 FOCUS button
Used for manual focusing.

23 SHUTTER SPEED button
Used to select the shutter speed.

24 AUTO LOCK switch
Normally set to the AUTO LOCK position. When the camera is attached to a tripod, set this switch to the upper position. To adjust these items manually, set this switch to the upper position.

25 BACK LIGHT button



B-3

26 Display window
(a) COUNTER (memory) indicator
(b) ZERO MEM (memory) indicator
(c) Moisture condensation inside the unit.
(d) Blinks when the battery is weak.
(e) Indicates the time or the tape counter.
(f) Lights when the tape is being ejected.
(g) Lights when the unit cannot function normally.

(h) Lights steadily when no cassette is inserted.
(i) Blinks when the tape approaches its end or the safety tab of the inserted cassette is out (out feed).

(j) Tape speed indicator

(k) Tap speed indicator
(l) Blinks when the still in the head is clogged.

27 Accessory shoe
Attach an optional external microphone, video light, etc.

28 Built-in microphone (monaural)

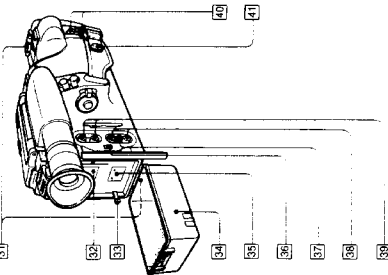
29 Infrared beam emitter and detector
Transmits an infrared beam toward the object to be shot and receives the beam reflected from the object during auto focusing. Do not look into it for a long time when focusing with auto focusing. Do not cover here.

30 SUPERIMPOSE buttons
Used to record the title.
TITLE 1 button
TITLE 2 button
MEMORY button
COLOR button



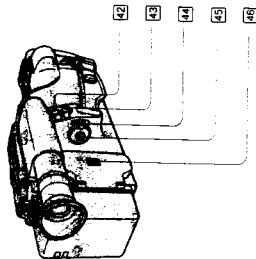
B-4

- 31** Hooks for shoulder strap
Attach a shoulder strap.
Be careful that the shoulder strap does not cover the white balance sensor, built-in microphone or lens.
- 32** Lithium battery compartment ●
- 33** BATT (battery select) knob ●
- 34** Battery cover ●
- 35** Battery mounting surface ●
- 36** EDIT switch ●
Normally set it to the upper position. When exiting tapes, set to EDIT.
- 37** RFU DC OUT (RFU adaptor DC output) jack (special minijack)
Supplies power to the RFU adaptor.
- 38** VIDEO/AUDIO OUT (output) jacks (phono jacks)
- 39** VIDEO/AUDIO IN (input) jacks (phono jacks)
- 40** MIC jack and DC OUT (microphone power output) jack
Connect an external microphone.
The MIC jack accepts Sony "plug-in-power" microphones and supplies power to them.
- 41** Grip strap

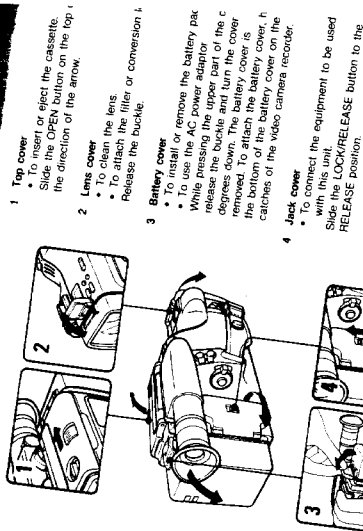


B-5

- 42** (E) (Earphone) jack (minijack)
- 43** REMOTE connector (stereo mini-minijack)
- 44** STANDBY switch
Set to STANDBY to set the unit to recording pause mode.
- 45** START/STOP button
Press to start and stop camera recording.
- 46** LOCK/RELEASE button
Slide to the RELEASE position to open the jack cover.
- Note on jack caps**
The DC OUT and (E) (earphone) jacks and REMOTE connector are provided with jack caps. Be sure to put the caps on when they are not in use.
- About C**
C stands for Local Application Control Bus System. The C connector is used for controlling the transport of video equipment and peripheral devices. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.



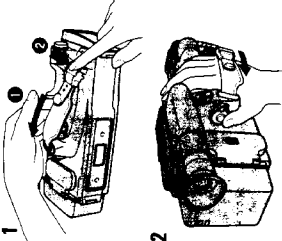
To Open Each Splash-Cover (c)



- 1 **Top cover**
 - To insert or eject the cassette, slide the OPEN button on the top in the direction of the arrow.
- 2 **Lens cover**
 - To attach the filler or correction lens, release the buckle.
- 3 **Battery cover**
 - To install or remove the battery pack, while using the AC power adaptor release the upper part of the c degrees down the battery cover removed. To attach the battery cover, push the bottom of the battery cover, h catches of the video camera recorder.
- 4 **Jack cover**
 - To connect the equipment to be used with this unit, slide the LOCK/RELEASE button to the RELEASE position.

Adjusting the Grip Strap (a)

- 1 Loosen the grip strap.
- 2 Pulling the strap, adjust the length of the strap so that your thumb can easily manipulate the START/STOP button.



Power Sources and Cassette Care

Power Sources

Selection of Power Sources

This manual shows the operations on one of the following power sources.

Power source	Accessories to be used
House current	AC power adaptor AC-V5 (supplied) or AC-V55 (page 30)
Battery pack	Battery pack NP-66H (supplied), NP-55, NP-77 or NP-77H (page 28)
12 or 24 V car battery	DC jack DC-J55 (page 30) (DCC-16B car battery cord supplied)

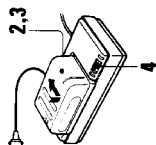
Notes on power source

- Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted cassette tape. If this is done by accident, turn the power again immediately and turn on the power switch.
- Be careful not to let any metal object touched on the metal part on the battery pack or AC power adaptor. When the battery pack is charged, keep it in its case.
- The video camera recorder has a splash-proof feature when it is used with an AC power adaptor or car battery cord.

Optional Accessories for Charging

- **AC-V55 AC power adaptor**
The battery packs can be charged simultaneously.
- **DC-V30 car battery charger**
Connect to the cigarette lighter socket of a car to charge an NP-66H, NP-55, NP-77 or NP-77H battery pack, or to supply power to Sony 8 mm video equipment that operates on 8 mm video battery packs above mentioned.
- **BC-V55 DC car battery charger**
A battery pack can be charged.

[E-1]



Using the Battery Pack

Step 1 Charge the battery pack. [E-1]

- 1 Connect the AC power adaptor to a wall outlet.
- 2 Align the grooves on the battery pack with those on the AC power adaptor.
- 3 Slide in the battery pack to the right, as illustrated.
- 4 Set the VTR CHARGE selector to CHARGE.

	NP-6BH	NP-55	NP-77	NP-7H
Required charging time	100	50	120	140

(approx. minutes)

See the instruction manual of the AC power adaptor for details.

Step 2 Mount the battery pack on the recorder. [E-2]

- 1 While pressing the upper part of the battery cover, release the buckle, and open the battery cover.
- 2 Align the right side of the battery pack with the white line on the recorder and slide in the battery pack to the right.
- 3 Attach the battery cover.

Note

Make sure the battery fits completely on the mounting surface of the recorder. Imperfect fit may damage the projections on the recorder.

To remove the battery pack [E-3]

- 1 Open the battery cover.
- 2 While pressing the BATT knob in the arrow direction, slide and pull out the battery pack.
- 3 Attach the battery cover.

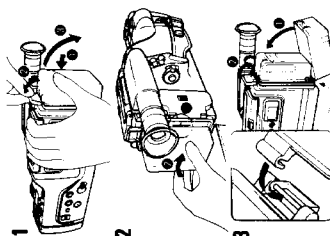
Battery life

A fully charged battery pack lasts for:

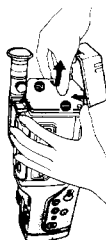
	NP-6BH	NP-55	NP-77	NP-7H
	70	40	80	95

(approx. minutes)

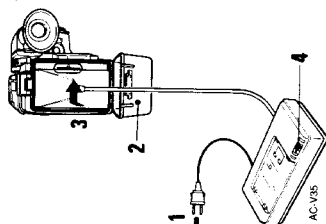
[E-2]



[E-3]



[E-5]



Using the AC Power Adaptor [E-5]

- 1 Connect the AC power adaptor to a wall outlet.
- 2 Open and remove the battery cover.
- 3 Align the right side of the connecting plate with the line on the recorder, and while pressing the connecting plate, slide it to the right.
- 4 Set the VTR CHARGE selector of the AC power adaptor to VTR.

To remove the connecting plate for the AC power adaptor from the video camera recorder

While pressing the BATT knob upward on the recorder, slide and pull out the connecting plate.

Other options

The AC-V55 AC power adaptor can also be used to operate this recorder on house current.

Using the Car Battery [E-6]

The DCP-55 DC pack (optional) is required.

- 1 Insert the DCP-16B car battery cord supplied with the DCP-55 DC pack into the DC IN jack on the DC pack.
- 2 Open and remove the battery cover.
- 3 Align the right side of the DC pack with the line on the recorder, and while pressing the DC pack, slide it to the right.
- 4 Connect the DCP-16B car battery cord to the cigarette lighter socket of a car (12 V or 24 V).

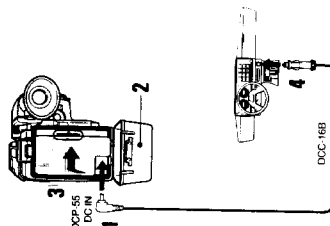
To remove the DC pack from the video camera recorder

While pressing the BATT knob on the recorder, slide and pull out the DC pack.

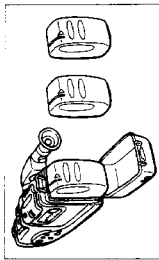
Other options

The AC-V55 AC power adaptor and the DCP-16B car battery cord or the DC-V30 car battery charger can also be used to operate this recorder on a 12 V or 24 V car battery.

[E-6]



E-7

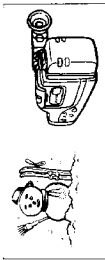


How to Prepare the Rechargeable Battery Pack

Have sufficient battery pack power to do 2 or 3 times as much recording than you have.

• Battery life as indicated in the instruction manual or catalogue of the recorder is measured by the continuous recording time of the recorder, placed at a room temperature using a full-charged battery.

E-8

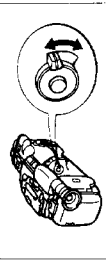


Battery life is shorter in a cold climate. [E-8]
 Batteries are affected by cold and the battery will be used up more quickly.

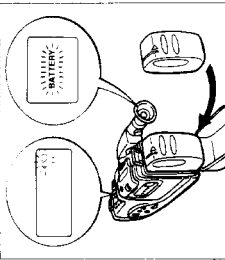
Turn the STANDBY switch of the recorder off when not recording to save battery power. [E-9]
 A smooth recording can be made even if recording is stopped and started again. While recording, the lens cover of the recorder moves automatically and the battery is used.

The battery is also used when a tape is inserted or removed.

E-9



E-10



When the battery becomes weak, the BATTERY indication and the red lamp in the viewfinder blink rapidly. [E-10]
 Turn off the power switch of the recorder and insert a fully charged battery into the recorder in order to obtain a smooth recording after the battery pack is replaced.

Notes on Charging

Before using the battery pack, charge it sufficiently. A brand new battery pack is not charged.

Recharge the battery pack only when it is exhausted. [E-12]

- If recording is completed before the CC mark appears in the display window, it is recommended that you remove the tape, set the POWER switch to CAMERA, slide up the STANDBY switch, and leave the recorder until the CC mark blinks rapidly.
- Repeated charging and discharging capacity remains causes a lowering of battery capacity. However, the original battery capacity can be recovered if you fully charge and discharge the battery again.

Recharge the battery pack before using.

If the battery pack is used for a long time, it is discharged.

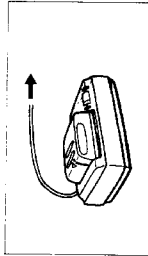
Charge it again, but in this case the battery life will be shorter than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

Keep the Terminals Clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened.

When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact between the terminals and the + and - terminals with a soft cloth or paper.

E-12



Power Sources

Notes on the Rechargeable Battery Pack

Why the battery pack heats up

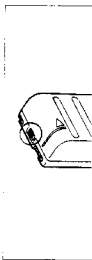
During charging or recording, the battery pack heats up. This is due to the heat generated and chemical change has occurred inside the battery pack and this is not dangerous.

How to care for the battery pack

- Remove the battery pack from the recorder after use. Do not leave it connected. When the battery pack is in the recorder, a small amount of current flows to the recorder even if the POWER switch is turned off. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not being used. When recharging, thus, it is recommended that you charge the battery before using.

How to use the switch on the battery pack

This switch is provided so that you can remove the battery pack from the recorder. Set the switch to the "no mark" position when recharging is completed. Set the switch to the "red mark" position when the battery is used up.



E-13

How many times can the battery pack be recharged

It can be fully charged and discharged about 500 times under normal temperatures. If the CCQ mark blinks rapidly just after turning on the recorder with a fully charged battery pack, the battery pack should be replaced with a new fully charged one.

Temperatures during charging

Lower temperatures require a longer charging time. Charging under temperatures ranging from 10°C to 30°C (50°F to 85°F) is recommended.

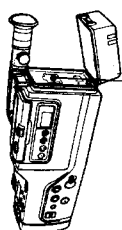
Power Sources

Lithium Battery [E1]

To Insert the Lithium Battery

This unit uses a lithium battery to activate the clock and to keep a title in memory. Before operating the unit for the first time, open the battery cover and install the supplied lithium battery.

F-1



1



2



F-2



- 1 Open the cover of the lithium battery compartment on the battery mounting surface.
- 2 Install the supplied CR2025 lithium battery with the (+) side facing out.
- 3 Close the cover.
- 4 Close the battery cover.

To remove the lithium battery [E2]

Press the side of the battery in the direction as indicated for installation.

Lithium battery life

Approximately 1 year in normal operation. When the lithium battery becomes weak, the time indication will blink. The LCD display screen for about 7 seconds in this mode. To replace the battery with a Sony CR2025 or Duracell DL-2025 lithium battery. Use of another battery may present a risk of fire or explosion.

Notes on lithium battery

- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.
- Do not break up the battery nor throw it into a fire, which might cause it to explode. Carefully dispose of the used batteries.

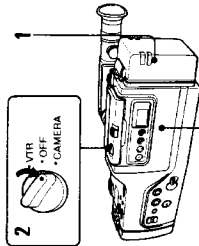
WARNING

Battery may explode if mistreated. Do not recharge, disassemble or dispose of it in fire.

Cassette Care

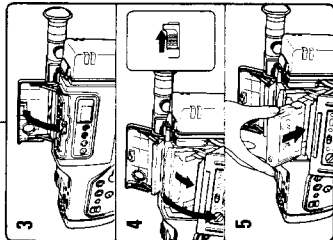
Cassette Insertion [G-1]

- 1 Open the battery cover and connect a power source.
- 2 Set the POWER switch to CAMERA.
- 3 Open the cassette holder cover, and slide the cassette eject button to open the cassette holder.
- 4 Insert a cassette with the window facing outside.
- 5 Push the cassette holder slightly to close.
- 6 Close the cassette holder cover and the top cover.



Cassette Ejection

- 1 Make sure that a power source is connected.
- 2 Set the POWER switch to CAMERA.
- 3 Open the top cover fully.
- 4 Open the cassette holder cover, and slide the cassette eject button to open the cassette holder.
- 5 Take out the cassette and close the cassette holder, cassette holder cover and the top cover.



To Prevent Accidental Erasure [G-2]

Slide out the tab on the cassette so that it covers the opening (A red mark will appear). To record on the cassette, slide the tab in to uncover the opening.

Notes

- Do not press the upper lid of the cassette compartment forcibly when it is moving.
- When the cassette holder is pressed to close, the upper lid of the cassette compartment will move forward.
- Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the kind of tape, thickness of tape, or if the tab is out or in, etc.
- To record from the beginning of the tape, turn the video camera recorder for about 15 seconds before recording. If the cassette is started before recording, it will avoid missing the starting point during playback on a video cassette recorder.



Camera Operation

Adjustment of the Position of the Viewfinder Lens

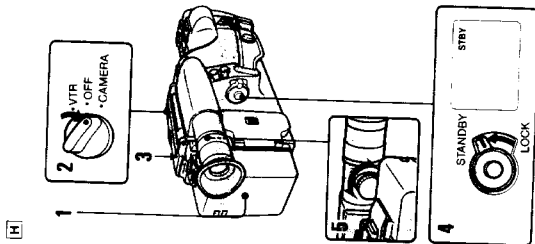
The position of the viewfinder lens for optimum vision varies depending on the person. [H]

- 1 Open the battery cover and connect a power source.
- 2 Set the POWER switch to CAMERA.
- 3 Insert a cassette.
- 4 Set the STANDBY switch to STANDBY.
- 5 Turn the viewfinder lens adjustment ring so that the indicator displayed on the viewfinder screen comes into sharp focus.

Adjustment of the position of the viewfinder lens is necessary after your initial use, or for use after someone else.

Note

If you leave the unit in the recording pause mode for 5 minutes or more, the unit will be automatically turned off. To resume recording, pause mode, slide the STANDBY switch down once and slide it up again.



Easy Camera Recording with Automatic Adjustment

How to Record

Hold the camera recorder as in the illustration. When your nose touches the recorder, adjust the angle of the viewfinder. [1.1]



[1.1]

- 1 Set the POWER switch to CAMERA.
- 2 Insert the cassette.
- 3 Set the AUTO LOCK switch to AUTO.
- 4 Set the STANDBY switch to STANDBY mode.
- 5 Press the START/STOP button. Recording will start.

[1.2]

Check on the viewfinder screen
STBY is displayed during recording pause mode. REC is displayed during recording.

To stop recording

Press the START/STOP button again. The unit will enter the recording pause mode. Avoid rough handling or mechanical shock to the unit. A smooth transition between scenes may not be made.

To check the last portion of the previous recording

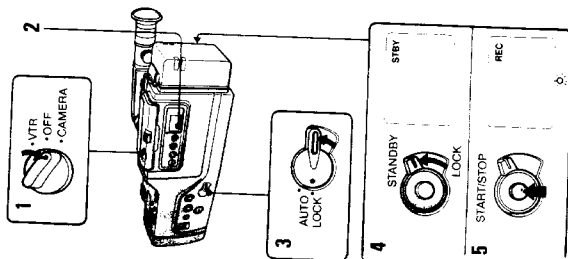
- 1 Set the recorder in recording pause mode by pressing the START/STOP button.
 - 2 Press the " " side of the EDIT/SEARCH button momentarily.
- The last few seconds of the recorded portion are rewound and then the recorded picture is monitored on the viewfinder screen. The unit then enters the recording pause mode.

If the picture has not been recorded

The video head may be contaminated. Clean the heads using the Sony VHS-5CLH video head cleaning cassette.

After using

- Set the STANDBY switch to LOCK.
- Set the POWER switch to OFF.



44

Easy Camera Recording with Automatic Adjustment

Notes on automatic adjustment

- During recording, do not cover the white balance sensor.
- During recording with auto focusing, do not turn or stop the focus ring forcibly.
- Keep the lens and the white balance sensor clean.
- The shutter speed is fixed at normal and the back light adjustment is released.

Under certain conditions, auto focusing will not operate properly (see page 60).

Easy Camera Recording with Automatic Adjustment

[1.4]

For low angle recording

While pressing the viewfinder lock lever, turn up the viewfinder. The viewfinder can be turned 90 degrees up.

When attaching the filter or conversion lens, hold the focus ring.

During recording, if the unit is splashed with water
Before opening the battery cover or the top cover, clean the unit with a dry soft cloth.

Note on power source

If the POWER switch is moved during recording, the tape will stop.

Notes on light sources

- Should you shoot a subject in bright conditions such as sunlight just after sunrise or sunset, the subject may appear on the viewfinder screen. In this case, move the camera away from the subject to resume the normal condition.
- A vertical band may appear when a subject such as a candle flame or a light is shot against a dark background.

Notes on playback on another VCR

- To view the picture which has been recorded on this unit, set the monitor switch of the recorder for playback to the STD (standard) position.
- When recording on this unit using a tape on which PCM stereo sound has previously been recorded, the monitor switch of the video cassette recorder for playback to the STD (standard) position. Otherwise, the sound may not be heard or may be distorted.

46

Easy Camera Recording with Automatic Adjustment

Indication inside the Viewfinder and in the Display Window [E3] [E5]

- [E] Title color (see page 80)
- [E] BACK LIGHT
The BACK LIGHT button has been pressed (see page 84)
- [E] Shutter speed (see page 98)
- [E] TERN Weak battery
- [E] CAUTION: The lens is clogged.
- [E] DEW: Moisture condensation inside the unit (see page 112)
- [E] CASSETTE: No cassette has been inserted or the safety tab of the inserted cassette is slid out.
- [E] TAPE END: The tape is at its end.
- [E] Manual operation
The FOCUS switch has been set to the manual condition.
- [E] STBY
Recording is momentarily stopped (recording pause mode).
- [E] REC
Recording is going on.
- [E] ZERO MEM
The ZERO MEM button has been pressed.
- [E] Date or time (see page 74)
- [E] Camera recording/battery lamp
Lights during camera recording. It blinks when the battery is weak or exhausted.

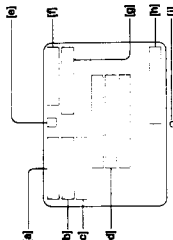
Indicators for caution

Display window [E3]	Inside the viewfinder [E5]
BATTERY	
TAPE END	
CASSETTE	
DEW	
CAUTION	

Indicators for the setting of the switch

Display window [E6]	Inside the viewfinder [E5]
BACK LIGHT	
ZERO MEM	
ZERO MEM	
Manual focus	

[E5]



[E6]



50

Easy Camera Recording with Automatic Adjustment

Instant Playback on the Spot [E7]

You can monitor the picture just recorded on the viewfinder screen.

- 1 Set the POWER switch to CAMERA.
- 2 Set the STANDBY switch to STANDBY.
- 3 Keep pressing the "-" side of the EDITSEARCH button to view the playback picture in reverse.
- 4 Keep pressing the "+" side of the EDITSEARCH button to view the playback picture.

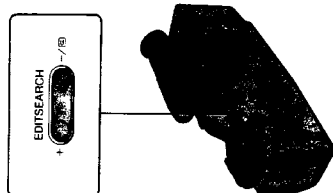
During Recording, to Record Again on the Previous Recorded Portion

- 1 Set the STANDBY switch to STANDBY.
- 2 Locate the portion to be recorded again by monitoring the picture on the viewfinder screen.
 - Keep pressing the "+" side of the EDITSEARCH button to advance the picture at a normal playback speed, or the "-" side to reverse the picture.
 - After the desired point, release the EDITSEARCH button.

The unit will be set to recording pause mode.
- 3 Press the START/STOP button to start recording.

Smooth recording can be made even if the recording is interrupted and started again, or even if the power is turned off and on again, provided that the cassette is not removed. But if the cassette has been removed, proceed as above.

[E7]



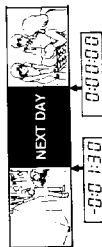
52

Insert Recording II — Using EDIT/SEARCH button

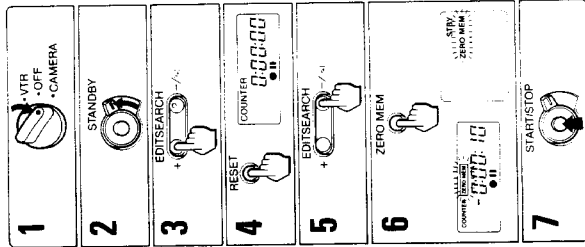
You can insert (record) video and audio simultaneously from the camera onto any recorded tape. [J-1]

Operation [J-2]

Monitor the picture being inserted on the viewfinder screen.



J-1



J-2

Manual Focusing

Use manual focusing when shooting subjects difficult to focus automatically (refer to page 68).

[K-1]

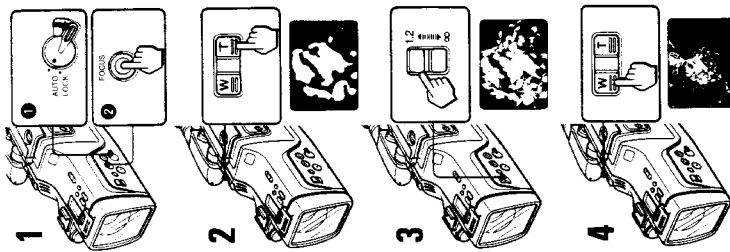
- 1 Set the AUTO LOCK switch to the upper position and press the FOCUS button.
- 2 Press the side of the power zoom lever to make the subject as large as possible in the viewfinder.
- 3 Press the upper or lower side of the focus adjustment button to achieve sharp focus.
- 4 Lower side: to move the lens forward
Upper side: to move the lens backward

Set the desired shot length using the power zoom button.

To reset to auto focus mode

- Press the FOCUS button again.
- Some helpful hints**
- When shooting in low light situations such as indoors, the built-in field in poor focus may appear. Press the FOCUS button at wide angles, after focusing in telephoto.
 - Recommended illumination of this unit is more than 100 lux (8.3 footcandles). If shooting is done indoors or under other circumstances where light is insufficient, video lights must be used for best results.
 - Under poor light conditions, the built-in field in poor focus may appear. Press the FOCUS button at wide angles, after focusing in telephoto. The picture will be recorded.
 - When the lens cover is attached, focus should be adjusted to the distance between the lens cover and the subject.

[K-1]



Insert Recording I

Notes on ZERO MEM mode

ZERO MEM mode is cancelled automatically in the following cases.

- When an insert recording is completed.
- When the position of the POWER switch is changed.
- When the power is turned off.

To restore it, press the ZERO MEM button again.

Notes

- When recording pause mode lasts for approximately 5 minutes, pause mode will be automatically released and the unit will be set to stop mode.
- When the inserted tape is played back, the picture may be distorted at the end of the inserted program.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

To insert the date or time
Follow steps 1 through 6 above, press the DATE or TIME button to display the date or time indication on the viewfinder screen and then press the START/STOP button.

The insert recording will stop automatically near the counter zero point.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

To insert the date or time
Follow steps 1 through 6 above, press the DATE or TIME button to display the date or time indication on the viewfinder screen and then press the START/STOP button.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

To insert the date or time
Follow steps 1 through 6 above, press the DATE or TIME button to display the date or time indication on the viewfinder screen and then press the START/STOP button.

To cancel ZERO MEM mode
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

Manual Focusing

Poor Conditions for Auto Focusing [K2]

To shoot subjects listed below you must use manual focusing.

- (a) **Black objects which absorb the infrared beam**
Ex. dark curtains or shade
- (b) **Objects in which the infrared reflection disperses**
Ex. a smooth slanting surface (Auto focusing functions when the camera is aimed squarely at the subject)
- (c) **Objects in which the infrared reflection is not sufficient**
Ex. bushes, grass or plants in the telephoto position
- (d) **Objects in which the infrared beam is reflected too much**
Ex. traffic signs, a white wall, a mirror, or a subject through plate glass
- (e) **Objects not solid**
Ex. fireworks, candle flame or smoke
- (f) **Extremely tiny objects which do not cover more than 1/10 of the viewfinder's area**
Ex. insects
- (g) **When there are other objects between the shooting object**
Ex. an animal inside a cage or baby inside a cot
- (h) **Moving objects**
Ex. a crowd or sports with lots of movement
- (i) **Objects which emit infrared beams themselves,**
such as automatic doors or fluorescent lights.
- (j) **Objects 10 - 50 meters (33 - 200 feet) away from the recorder**



(a)



(b)



(c)



(d)



(e)



(f)



(g)



(h)

Back Light Adjustment in

This unit adjusts the iris automatically. However, when shooting a subject that is backlit, set the AUTO LOCK switch to the upper position and press the BACK LIGHT button. The BACK LIGHT indication appears when the BACK LIGHT button has been pressed.

After shooting that particular scene, be sure to press the BACK LIGHT button again to release it. Otherwise the recorded picture will be too bright. The BACK LIGHT indication goes out.

Note
The function will be released once the POWER switch is set to OFF.

Automatic White Balance Function

The automatic white balance function allows the unit to record an image with natural color tones in most kinds of light. This insures that white will always be recorded as white regardless of the light source.

Notes

- The auto white balance may not function under the following conditions.
 - When lighting conditions change rapidly
 - When the camera is in a different light condition from the recorded subject. ex. when the subject is under a spotlight when the subject is outdoors and the camera is indoors.
 - Special light sources such as a sodium lamp
- Do not cover the white balance sensor.

Manual Focusing

Other Uses of Manual Focusing

- When using special effects lenses or filters
- When shooting still subjects on a tripod
- For focusing in close-up shooting, see page 72

Auto focusing system of this camera recorder
This recorder adjusts focus automatically by emitting an infrared beam. The beam is reflected back to the camera recorder when detecting the reflected beam. When the subject is approximately 3 meters (10 feet) away from the camera recorder, the focus is sharpest in the center of the screen. The camera recorder has the tendency, however, to focus a bit lower to the right when the subject is within 3 meters, and the focus shifts to the right when the subject is more than 3 meters away.

Notes

As the auto focusing of this camera recorder utilizes an infrared beam, it might malfunction when you use the camera recorder near infrared light sources such as an infrared beam, such as a TV or VCR remote commander, or another camera recorder that uses an infrared beam for auto focusing. It might also cause malfunctioning of such equipment.

Shutter Speed Adjustment

When a fast-moving subject is recorded at a normal shutter speed, its still picture may not be seen when played back (M.1). This can be improved by increasing the shutter speed (M.2). However, when the shutter speed is increased, not enough light will come into the lens, so the picture will be dark. Therefore, when recording at a high shutter speed, record in a brighter place than usual.

Choose an appropriate shutter speed according to the shooting situation.

See the chart below for examples.

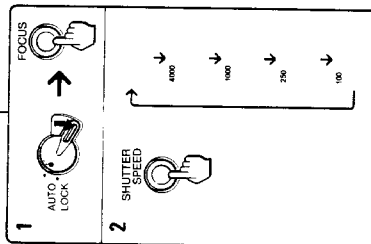
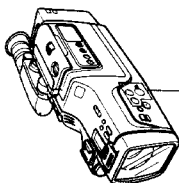
M.1



M.2



M.3



M.3

- 1 Set the AUTO LOCK switch to the upper position and press the FOCUS button.
- 2 Press the SHUTTER SPEED button repeatedly until the desired shutter speed indication appears on the viewfinder screen.

No indication → 4000 → 1000 → 250 → 100
(1/60) (1/4000) (1/1000) (1/250) (1/100)

Auto focus will not function in this case. When shooting, use manual focusing.

Zooming

The size of the subject in the scene can be changed.

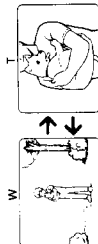
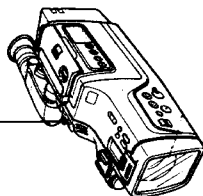
Power Zoom (N)

Press the T side of the power zoom button for telephoto and the W side for wide-angle. The zoom ring will move automatically.

For more zooming effect

- Use an optional conversion lens (VCL 1546A Auto-Convert). This lens, however, will not function in that case.
- The focal length of this unit is 9 mm to 54 mm. Converted into the focal length of a 35 mm camera, this means approximately 148 mm to 288 mm.

N



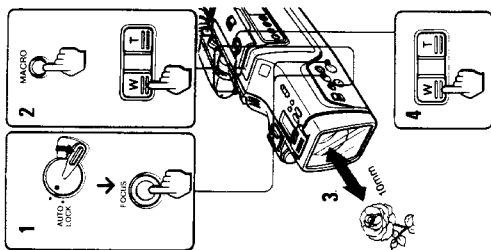
Close-ups (Macro) 12

Even tiny objects can literally fill the screen for dramatic close-up effects.

- 1 Set the AUTO LOCK switch to the upper position.
- 2 While pressing the MACRO button, press the "W" side of the power zoom button to set the unit to the macro position.
- 3 Bring the recorder as close as necessary to obtain the desired subject size.
The subject can be as close as approximately 10 mm (1/2 inch) from the lens surface. The lens cover is attached to the front of the unit.
- 4 Press the power zoom button within the MACRO range to focus sharply.

Notes

- Auto focusing does not function properly in the MACRO range.
- If the subject is closer than 10 mm, it cannot be brought into focus.
- When shooting in macro, the depth of field is very shallow, so pay attention to focus. To keep the subject in focus, use a tripod or monopod.
- Zooming is not possible during macro recording. To change the size of the subject, move the camera recorder closer or further away.



Recording Date or Time 13

Once the date and the current time are adjusted, the date or time can be recorded together with the picture.

Before setting the date and time, make sure that the battery pack and lithium battery are installed.

To Set Date and Time 13-1

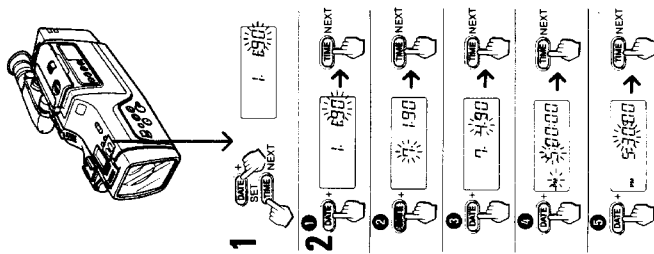
- 1 Press the DATE and TIME SET buttons simultaneously for more than 3 seconds until the date indication appears in the display. The time indication appears next. The DATE button now functions as the "←" button and the TIME button functions as the NEXT button.
- 2 Adjust the ● year, ● month, ● day, ● hour and ● minute in sequence, following the illustration.
First, adjust the blinking digits with the "←" button. Then, press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

The clock starts operating. There is no need to readjust the date and time as long as the lithium battery remains.

To clear the time indication from the display
Press the TIME SET (NEXT) button again.

The "←" button can be pressed in two ways

- When you keep the button pressed, the digits will advance continuously.
- When you press the button and immediately release the button, the digits will advance by one.



Recording Date or Time

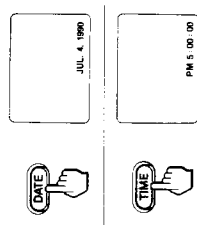
To check the preset date and time
Press the DATE or TIME SET button in the recording pause mode. When the same button is pressed again, the indication goes off.

To readjust an incorrect date or time
Set the unit to date/time setting mode and display the date or time on the screen. Press the incorrect digit blank. Continue with the + button and press the NEXT button. After adjusting the minute digits, press the NEXT button at the same time with an announced time signal.

To Record the Date or Time [P2]

During camera recording or in recording pause mode, press the DATE or TIME SET button to screen display the date or time on the viewfinder. The date or time being displayed will be recorded together with the picture.

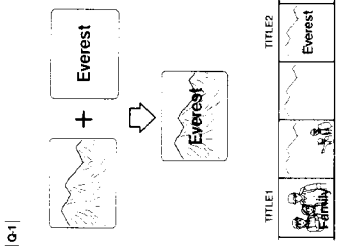
To stop recording the date or time
Press the DATE or TIME SET button again. The picture recording will continue.



Recording a Title

Before recording, memorize a title or figure. When recording, the title or figure is composed onto the picture being recorded. [O-1]

- Two kinds of titles or figures can be memorized.
- The color of the title or figure can be selected from 8 colors.



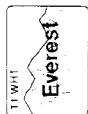
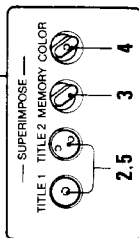
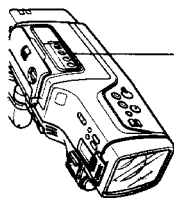
Preparations

To make a desired title card
Use a white card and draw the title with a desired color. Black is recommended for the best result in thick letters. If contrast is clear, a signboard can be memorized like the title card.

Before memorizing the title
1 Make sure that the lithium battery is fully charged. Set the camera to PAUSE mode.
2 Set the POWER switch to CAMERA.
3 Set the STANDBY switch to STANDBY. The unit is set to the recording pause mode.

Notes

- When deciding the title size, check the screen picture on your video monitor.
- To record the title, fix the title card and the video camera recorder.
- To memorize a title, use of an appropriate light is recommended for a better result.
- If the title card is small, use the macro shooting function.



Recording & Title

To Memorize the Title O-2

- 1 Point the camera to the title card and adjust the focus.
- 2 Press the TITLE 1 or 2 button.
- 3 Press the MEMORY button to memorize the title.
- 4 Select the title color while changing the color indication in the viewfinder. Each push on the COLOR button cyclically changes the color, as follows:

WHT → BLUE → GRN → CYAN
(white) (green) ↑
BLK → YEL → VIO → RED
(black) (yellow) (violet)

- 5 Press the TITLE 1 or 2 button (pressed in step 2) to turn off the title.

Notes

- The color indication in the viewfinder is not recorded on the tapes.
- You can change the title color even after starting the recording.

To check the title

- 1 Press the STOP button.
- 2 To check the memorized title, press the TITLE 1 or 2 button. To turn off the title, press the button again.

To Record the Title

To record the title at the beginning

- 1 Press the TITLE 1 or 2 button in recording pause mode, and start recording.

To record during camera recording

- 1 Press the TITLE 1 or 2 button at the point from which the title is to be inserted. The memorized title will be recorded together with the picture.

To stop recording the title

- 1 Press the TITLE 1 or 2 button again. The picture recording will continue.

To record the title several times

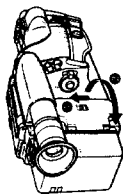
- 1 By pressing the TITLE 1 or 2 button, you can record the title as many times as desired.

VTR Operation

Preparation for Playback

When the VCR is connected to the TV, refer to the pages 82 and 84.

Before connection, open the jack cover. [R-1]



R-1

Connecting a TV without audio/video input connectors [R-2]

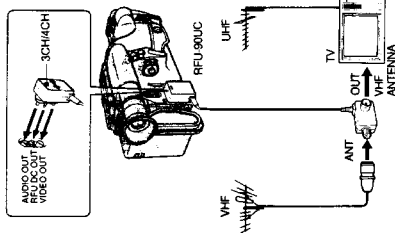
- 1 Connect the RFU adaptor to this unit.
- 2 Connect the VHF antenna and TV to the antenna selector. Use a F-300mm coaxial cable for antenna connection.

On the TV channel for the video camera recorder

Whenever you view the playback picture, set the channel selector of the RFU adaptor to either VHF channel 3 CH or 4 CH and select the same channel on the TV.

Note on the RFU adaptor

Usually keep the RFU adaptor and the TV connected. When you set the POWER switch of this unit to OFF, the input mode of the TV is automatically switched to TV antenna input.



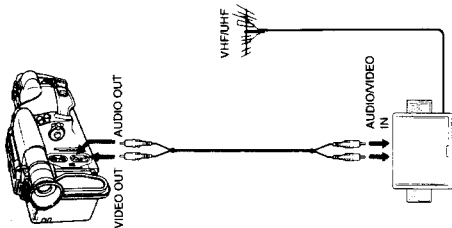
Preparation for Playback

Connecting a TV (or color monitor) equipped with audio/video input jacks [R-3]

- 1 Connect this unit to the TV using the supplied connecting cord.
- 2 Set the TV/VIDEO selector button on the TV to VIDEO.

When the TV or color monitor is a stereo type
Use a commercially available audio/video cable (Sony VMC-910MS/920MS or equivalent).

[R-3]



Playback

Turn on the TV (or color monitor), and select the channel for viewing a videotape picture (or set the TV/VIDEO selector to VIDEO).

[S-1]

- 1 Set the POWER switch to VTR, and insert a cassette.
- 2 Press the <▶> button. Playback will start.

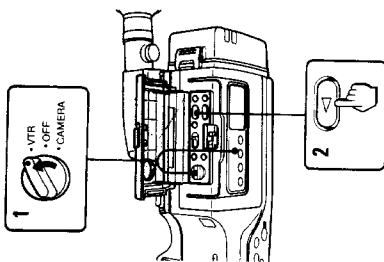
To stop the tape, press the ■ button.

After using, be sure to set the POWER switch to OFF.

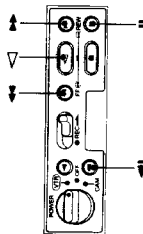
To view a still picture

press the ■ button during playback. To resume playback, press the ■ button again.

[S-1]



[S-2]



Monitoring a High-Speed Picture [S-2]

During playback—Picture Search

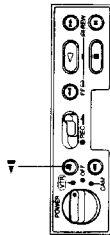
- 1 In the playback mode, press the ◀▶ or ▶▶ button.
The picture will be monitored at high speed as long as it is kept pressed.
- 2 Release the ◀▶ or ▶▶ button at the desired point.
Normal playback will resume.

During fastforward or rewind—Slide scan

- 1 Press the ◀▶ button in fast-forward mode or press the ▶▶ button in rewind mode. The picture is displayed while the button is kept pressed.
- 2 Press the ◀▶ button to resume normal playback.

To View the Frame-by-Frame Playback Picture [S-2]

Press the ■ button in still picture mode. To resume normal playback, press the ◀▶ button.



To View the Slow Motion Picture [53]

Press the **◀** button during playback or in still picture mode.
To resume normal playback, press the **▶** button.

Notes on various playback modes

- If you move the position of the **POWER** switch during playback, the tape will stop. When you move the **POWER** switch to **CAMERA**, the unit will enter recording pause mode, however, the unit will enter recording pause mode again when you press the **▶** button.
- When the pause mode lasts for 5 minutes or more, the unit will automatically enter the stop mode.
- Streaks will appear and the sound will be muted in the high-speed picture.

If the picture is distorted in still, frame-by-frame or slow motion playback mode

Set the unit to slow playback mode, press the **◀**, **▶**, or **EDIT/SEARCH** side of the **EDIT/SEARCH** button until a clear picture is obtained. Repeat adjusting until a still picture displayed clearest.

If the still picture appears to shake

Press the **◀** or **▶** side of the **EDIT/SEARCH** button until the picture stabilizes.

Note

The adjustment is retained in memory as long as the unit is not reset. Readjustment is only required when the recorded tape or playback is changed or when tapes recorded on other equipment are played back on this unit. The noise may not be eliminated completely when a tape recorded on other equipment is played back in still or slow picture mode.

TV Program Recording

The following connections make both TV program viewing/recording and tape playback possible.

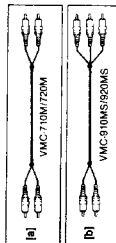
Combination of the Equipment to be Used

- Case 1 (page 52)**
To connect the VCR without input selector.
- Case 2 (page 54)**
To connect the VCR with an input selector.
- Case 3 (page 55)**
To connect the TV tuner and color monitor or TV with audio/video input and output jacks.

Connecting Cables [a]

- For antenna cable connections, use 75-ohm coaxial cables.
 - For video/audio connection, use the supplied or commercially available audio/video cable and connect the jacks on the equipment to be connected.
- [a] for monaural equipment**
phono x 2 ↔ phono x 2
Sony VMC-710M/720M or equivalent
- [b] for stereo equipment**
phono x 2 ↔ phono x 3
Sony VMC-910MS/920MS or equivalent

T-1



TV Program Recording

Case 1: To connect the VCR without input selector

Connections
Connect the equipment as shown in the illustration.

TV program recording [T.2]

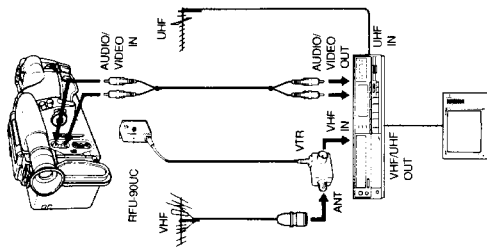
- 1 Disconnect the RFU adaptor from this unit, if it is connected.
Keep the RFU adaptor and the VCR.
 - 2 Turn on the VCR and TV.
 - 3 Set the POWER switch on this unit to VTR.
 - 4 Select the channel for the VCR on the TV.
 - 5 Select the TV channel to be recorded on the VCR.
 - 6 Insert a cassette into this unit and slide the REC switch.
- Recording will start.

To view another TV program while recording
Set the TV/VTR select button on the VCR to TV and select the desired program on the TV.

Playback

The RFU900C RFU adaptor is required.

- Connect the RFU adaptor to this unit.
- 1 Turn on the TV.
 - 2 Set the POWER switch on this unit to VTR.
 - 3 Select the channel for the VCR on the TV.
 - 4 Insert a cassette into this unit and press the <> button. Playback will start.



T.2

TV Program Recording

Case 2: To connect the VCR with an input selector

Connections
Connect the equipment as shown in the illustration.

TV program recording [T.3]

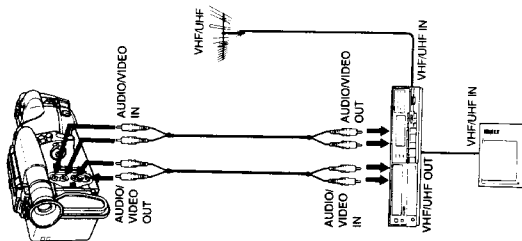
- 1 Turn on the VCR and TV.
 - 2 Set the POWER switch on this unit to VTR.
 - 3 Select the channel for the VCR on the TV.
 - 4 Set the input selector to TUNER, the TV/VTR select button to VTR and select the TV channel to be recorded on the VCR.
 - 5 Insert a cassette into this unit and slide the REC switch.
- Recording will start.

To view another TV program while recording
Set the TV/VTR select button on the VCR to TV and select the desired program on the TV.

Playback

- 1 Turn on the VCR and TV.
- 2 Set the POWER switch on this unit to VTR.
- 3 Set the input selector on the VCR to LINE TV.
- 4 Select the channel for the VCR on the TV.
- 5 Insert a cassette into this unit and press the <> button. Playback will start.

When the VCR to be connected is a stereo type
Use a commercially available audio/video cable (Sony VMC-910MS/920MS or equivalent).

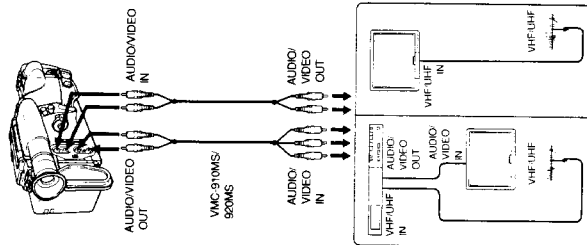


T.3

TV Program Recording

Case 3: To connect the TV tuner and color monitor, or TV with audio/video input and output jacks.

T-4



Connections
Connect the equipment as shown in the illustration.

- TV program recording [T-4]**
- 1 Turn on the TV tuner and color monitor, or TV.
 - 2 Set the POWER switch on this unit to VTR.
 - 3 Set the input selector on the TV tuner or TV to VTR and select the TV channel to be recorded.
 - 4 Insert a cassette into this unit and slide the REC switch to the ON position. Recording will start.

Playback

- 1 Turn on the TV tuner and color monitor, or TV.
- 2 Set the POWER switch on this unit to VTR.
- 3 Set the input selector on the TV tuner or TV to VTR and select the TV channel to be recorded.
- 4 Insert a cassette into this unit and press the <PLAY> button. Playback will start.

Insert Recording 2

To insert a TV Program or a Picture from Another VCR UI

Monitor the picture being inserted on the viewfinder screen.

- 1 Set the POWER switch to VTR.
- 2 Locate the point on the tape where the insert should end by pressing the <FF> button during playback.
- 3 Display the counter in the display window and press the RESET button.
- 4 Press the <FF> button. Playback to the counter is reset to zero.
- 5 Press the <FF> button. Playback to the point where the insert should begin.
- 6 Release the <FF> button to resume playback and press the <FF> button at the insert starting point.
- 7 Slide the <REC> switch in the arrow position to set the unit to recording pause mode.
- 8 Press the ZERO MEM button.

The insert ending point is stored in memory.

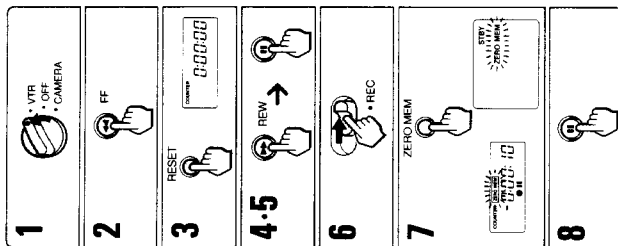
- 9 To start recording, press the <FF> button.

The insert recording will stop automatically near the counter zero point.

To cancel ZERO MEM mode

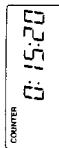
Press the ZERO MEM button so that the ZERO MEM indicator disappears.

U

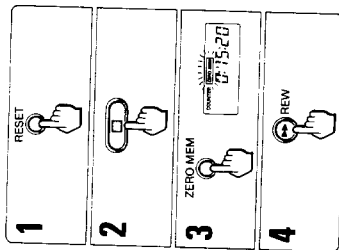


Use of the Tape Counter

During recording or when a tape recorded in the SP mode is played back, the digits on the counter indicate the actual recording or playback time. When a tape recorded in LP mode is played back, the digits on the counter indicate approximately half the actual playback time.
 E.g. When the counter indicates "0:15:20" during playback of an LP recorded tape, the tape was played back for approximately 30 minutes 40 seconds from the counter zero position. [V-1]



[V2]



Use of the Tape Counter

To Return to a Pre-registered Point [V2]

- 1 During recording or playback, press the RESET button at the point you later want to locate.
- 2 Press the button when the recording or playback has finished.
- 3 Press the ZERO MEM button. The "ZERO MEM" indicator will blink in the display.
- 4 Press the or button. The tape will be rewound or sent forward and stop automatically when the counter reaches approximately zero.

Notes

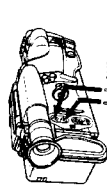
- The ZERO MEM button does not function during recording or playback mode.
- Be sure to press the ZERO MEM button when the tape is stopped.
- The ZERO MEM mode is cancelled automatically once the tape is rewound or sent forward to zero.

To Index the Whole Tape

Press the RESET button at the beginning of the tape. Then, after the tape has been indexed, by noting the counter reading at a particular point, you can easily find that point later by referring to the tape counter.

Notes

- The counter reading and the point of the tape may not correspond exactly.
- The counter does not indicate a blank, unrecorded portion of a tape.
- There will be a time lag of several seconds on the counter reading after repeated fast forward and rewind operations or after playing back in slow mode for a long time.

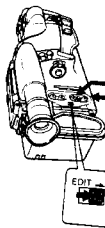


AUDIO/VIDEO
IN

AUDIO/VIDEO
OUT

AUDIO/VIDEO
IN

AUDIO/VIDEO
OUT



AUDIO/VIDEO
OUT

AUDIO/VIDEO
IN



To edit a home movie tape, you will need an edit VCR or another video camera recorder. Before connection, open the jack cover.

To Edit from Another VCR to this Unit [V-1]

- 1 Set the POWER switch on this unit to VTR.
- 2 Start playback on this unit to VTR.
- 3 To start recording, slide the ● REC switch on this unit.

To Edit from this Unit to Another VCR [V-2]

- 1 Set the POWER switch on this unit to VTR and turn on the other VCR.
- 2 Slide the EDIT button on this unit to EDIT.
- 3 Set the input selector on the VCR to LINE.
- 4 Press the ■ button on this unit during playback at the point where you want to start recording.
- 5 Press the record button on the other VCR, pressing the ■ button.
- 6 Release the ■ button on both units. Recording will start.

When the VCR to be used is a stereo type, use a commercially available audio/video cable (Sony VMC-310MS/500MS or equivalent).

After editing, turn off both units and be sure to slide the EDIT switch to the upper position.

To cut off an unnecessary portion
Press the ■ button on this unit at the beginning of the unnecessary portion.

Release it where you want to resume recording.

Function of the EDIT switch

Slide this switch down whenever you edit tapes. Signal loss that results from tape-to-tape transfer will be reduced, achieving more accurate signal transfer. When recording or playing back normally, keep this switch in the upper position.

Others

Hints for Better Shooting

Getting Stable Pictures

Take a good posture for shooting [X-1]
For hand-held shots, it is important to hold the recorder properly.

- Hold the recorder firmly and secure it with the grip belt so that you can move the camera and manipulate the recorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the recorder to support it. When adjusting the focus manually, make sure the recorder does not move.
- Stand opposite to the subject and let your feet take a comfortable stance.
- Place your eye firmly against the viewfinder eyepiece.
- Breathe gently.

Use a tripod

If you have a tripod for a still camera, it can also be used with the recorder. If a tripod is not available, try placing the recorder on a tabletop or any other flat surface of suitable height.

Keep the horizontal place level [X-2]

The horizontal place can be easily determined by using the viewfinder frame as a reference.

Planning Ahead

If you are going to edit the tape after recording
Shoot the scene a little longer to make the editing easier.

If you are not going to edit the tape after recording
First record a title and then use the START/STOP button to make a smooth recording.

Hints for better Shooting

Lighting

Shoot with the sun behind you

When the light source is behind the subject, or in the following situations, the subject will be lit too dark and the background too light.

- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background. In this case, the face will be recorded too dark.

Use video lights in the dark

To get the best colors, a sufficient light level must be maintained. Photography lamps or halogen lamps are recommended. For best results, use of Sony video lights is recommended since their weight and size allow them to allow safe, direct connection to the recorder. Do not point the light at the recorder. The high heat from the light can warp the casing of the recorder. For detailed instructions on proper use of the light, read its instruction manual.

Hints for better Shooting

Brightness levels

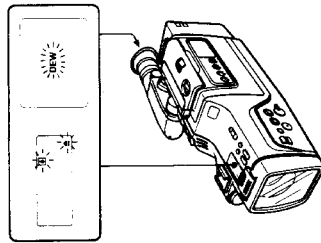
Using the following chart as a reference, take a few minutes to familiarize yourself with brightness levels to improve your recording technique.

Scene/conditions	Unit Lux	Aperture	ISO	Shutter speed
Strong sunlight				
Sunny beach, clear day in summer	100,000	f/8	100	1/500
Clear day, midday (100,000)				
Clear day, mid-afternoon (30,000)	30,000	f/8	100	1/500
Overcast day, midday (10,000)	10,000	f/8	100	1/500
Overcast day, one hour after sunrise	1,000	f/8	100	1/500
Office lit by fluorescent lamps, near window (1,000)	1,000	f/8	100	1/500
Department store counter (500)	500	f/8	100	1/500
Office lit by fluorescent lamps	500	f/8	100	1/500
Room lit by two 30 W fluorescent lamps (500)	500	f/8	100	1/500
Subway station platform (500)	500	f/8	100	1/500
Average night (100)	100	f/8	100	1/500
Thunder (15 - 30)				
Candlelight (10 - 15)				

Note

When an ND filter is attached, the lens cover cannot be attached. Therefore, when using the unit with the lens cover attached in bright places such as a ski mountain, set the shutter speed around 1/250.

[Y-1]



[Y-2]



Notes on Moisture Condensation

If the unit is brought directly from a cold to a warm location, moisture may condense on the lens and on the tape drum and on the tape. In this condition, the tape may adhere to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the unit is furnished with moisture sensors.

If moisture condenses inside the unit [Y-1]

Moisture is present inside the recorder when the DEW indicator blinks in the viewfinder and when the [Y-1] and [Y-2] indicators do not appear. In such cases, no function except for tape ejection will work.

Eject the tape, turn off the recorder, and leave it with the cassette holder open for at least 1 hour.

The recorder can be used again if the none of the DEW, [Y-1] and [Y-2] indicators does not appear when the power is turned on again.

If moisture condenses on the surface of the tape [Y-2]

If moisture is present on the surface of the tape when the tape is inserted and a tape transport button (←, →, etc.) is pressed, the [Y-2] indicator blinks in the display window. In such a case, no function except for tape ejection will work.

Eject the tape and let the recorder and the tape sit for at least 1 hour.

The tape can be used again if the [Y-2] indicator does not appear when the tape is inserted and a tape transport button is pressed.

If moisture condenses on the lens

No caution indicators will appear, but the picture becomes dim. Turn off the power and leave the recorder unused for at least 1 hour.

Video Head Cleaning

To ensure clear picture, clean the video heads periodically [Z].

When playback pictures are noisy or hardly visible, the video heads may be contaminated. [Z] shows slight contamination.

1 Clean the video heads with the Sony VHS-25CLH cleaning cassette (not supplied) referring to its instructions.

2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.

3 If the picture is still noisy, repeat cleaning (Do not repeat cleaning more than 5 times).

If the VHS-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Caution

Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

[Z]



Precautions

- Operate the unit on 6.0V (battery pack) or 7.5V (AC power adaptor).
- For recommended accessories, use the accessories recommended.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.

Do not hold the unit by the viewfinder. Avoid rough handling or mechanical shock to the viewfinder. Be careful of the lens. Do not apply excessive force to the microphone.

Avoid shooting the same object for a long period of time (for example, using as a lookout camera or pointing the camera directly at the sun or other bright light source). Prolonged exposure to bright light inside the camera may cause a poor picture quality.

Remove and store video cassettes after recording or playback.

Do not wrap up the unit and operate it because heat may build up internally. Avoid using and storing the recorder in the following locations:

- Locations susceptible to vibration.
- Locations exposed to strong magnetic fields.
- Locations near TV or radio transmitters where strong radio waves are generated.

Do not put the unit on the sand.

• Care

Store cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding. When the unit will not be used for a long period of time, periodically turn on the power, operate the camera section and record, erase and play back a tape for about three minutes.

Using Your Recorder Abroad

Each country has special TV color broadcast and electricity systems. Before using your recorder abroad, check the following points.

Power Sources

You can use your recorder in any country with the supplied AC power adaptor within 110 V - 240 V AC, 50/60 Hz.

Differences in Color System

You can view the playback picture in the viewfinder. However, if you want to view the playback picture on a TV, it must be an NTSC system. If you use a TV and should have video/audio inputs.

NTSC system countries

Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, the Philippines, U.S.A., etc.

PAL system countries

Australia, Austria, Belgium, China, Denmark, Finland, Great Britain, Holland, Hong Kong, Italy, Kuwait, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, West Germany, etc.

SECAM system countries

Bulgaria, France, Hungary, Iran, Iraq, Romania, Soviet Union, the Soviet Union, etc.

Specifications

System

Video recording system

Rotary two heads.

Optical scanning FM system

Audio recording system

Rotary head, FM system

Video signal

NTSC color, EIA standards

Video input

Form video format cassette

Video output

SP mode 2 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

LP mode 4 hours (R6:120)

Input and output connectors

Video output

Photo jack, 1 Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

Special minijack, 5 V DC

Photo jack, 1Vpp, 75 ohms

unbalanced, sync negative

Photo jack, 7.5dBa, at load

impedance less than 2.2

kilohms

General

Power requirements

On battery (rechargeable surface)

6.0 V (battery pack)

7.5 V (AC power adaptor)

Power consumption

6.5 W (camera recording)

including the viewfinder

Standby

Operating temperature

0°C to 40°C (32°F to 104°F)

Storage temperature

-20°C to +60°C (-4°F to

+140°F)

Dimensions

Approx. 136 x 137 x 347 mm

(width)

Weight

Approx. 1.7 kg (3 lb 12 oz)

excluding the battery and

cassette

Microphone

Electret condenser

Microphone directional

mounting type

Supplied accessories

See page 3.

Design and specifications are subject to change

without notice.