For Customer in China

根据中华人民共和国信息产业部第39号令《电子信息产品污染控制管理办法》及标准中要求的“有毒有害物质或元素名称及含量”等信息，本产品相关信息请参考以下链接:
http://pro.sony.com.cn

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HDW-650
HDW-650F
HDW-650P
(SYM)
4-108-156-**04** (1)

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SONY

HD CAMCORDER

HDW-650
HDW-650F
HDW-650P

The supplied CD-ROM includes operation manuals for the HDW-650/650F/650P HD Camcorder (English and Japanese versions) in PDF format.
For more details, see “Using the CD-ROM manual” on page 9.

HDCAM Power HAD FX MEMORY STICK

OPERATION MANUAL English
1st Edition (Revised 3)

4108156040

WARNING

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

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

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

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

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

All interface cables used to connect peripherals must be shielded in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC Rules.

For the customers in Europe
This product with the CE marking complies with the EMC Directive issued by the Commission of the European Community. Compliance with this directive implies conformity to the following European standards:
- EN55103-1: Electromagnetic Interference (Emission)
- EN55103-2: Electromagnetic Susceptibility (Immunity)

This product is intended for use in the following Electromagnetic Environments: E1 (residential), E2 (commercial and light industrial), E3 (urban outdoors), E4 (controlled EMC environment, ex. TV studio).

The manufacturer of this product is Sony Corporation, 1-7-1 Konan, Minato-ku, Tokyo, Japan.
The Authorized Representative for EMC and product safety is Sony Deutschland GmbH, Hedelfinger Strasse 61, 70327 Stuttgart, Germany. For any service or guarantee matters please refer to the addresses given in separate service or guarantee documents.

For the State of California, USA only
Perchlorate Material - special handling may apply, See
www.dtsc.ca.gov/hazardouswaste/perchlorate
Perchlorate Material : Lithium battery contains perchlorate.

For the customers in Taiwan only

廢電池請回收

AVERTISSEMENT

Afin de réduire les risques d'incendie ou d'électrocution, ne pas exposer cet appareil à la pluie ou à l'humidité.

Afin d'écarter tout risque d'électrocution, garder le coffret fermé. Ne confier l'entretien de l'appareil qu'à un personnel qualifié.

Pour les clients en Europe
Ce produit portant la marque CE est conforme à la Directive sur la compatibilité électromagnétique (EMC) émise par la Commission de la Communauté européenne.
La conformité à cette directive implique la conformité aux normes européennes suivantes :
- EN55103-1 : Interférences électromagnétiques (émission)
- EN55103-2 : Sensibilité électromagnétique (immunité)

Ce produit est prévu pour être utilisé dans les environnements électromagnétiques suivants : E1 (résidentiel), E2 (commercial et industrie légère), E3 (urbain extérieur) et E4 (environnement EMC contrôlé, ex. studio de télévision).

Le fabricant de ce produit est Sony Corporation, 1-7-1 Konan, Minato-ku, Tokyo, Japon.
Le représentant autorisé pour EMC et la sécurité des produits est Sony Deutschland GmbH, Hedelfinger Strasse 61, 70327 Stuttgart, Allemagne. Pour toute question concernant le service ou la garantie, veuillez consulter les adresses indiquées dans les documents de service ou de garantie séparés.

WARNUNG

Um die Gefahr von Bränden oder elektrischen Schlägen zu verringern, darf dieses Gerät nicht Regen oder Feuchtigkeit ausgesetzt werden.

Um einen elektrischen Schlag zu vermeiden, darf das Gehäuse nicht geöffnet werden. Überlassen Sie Wartungsarbeiten stets nur qualifiziertem Fachpersonal.

Für Kunden in Europa
Dieses Produkt besitzt die CE-Kennzeichnung und erfüllt die EMV-Richtlinie der EG-Kommission.
Angewandte Normen:
- EN55103-1: Elektromagnetische Verträglichkeit (Störaussendung)
- EN55103-2: Elektromagnetische Verträglichkeit (Störfestigkeit)

Für die folgenden elektromagnetischen Umgebungen: E1 (Wohnbereich), E2 (kommerzieller und in beschränktem Maße industrieller Bereich), E3 (Stadtbereich im Freien) und E4 (kontrollierter EMV-Bereich, z.B. Fernsehstudio).

Der Hersteller dieses Produkts ist Sony Corporation, 1-7-1 Konan, Minato-ku, Tokyo, Japan.
Der autorisierte Repräsentant für EMV und Produktsicherheit ist Sony Deutschland GmbH, Hedelfinger Strasse 61, 70327 Stuttgart, Deutschland. Bei jeglichen Angelegenheiten in Bezug auf Kundendienst oder Garantie wenden Sie sich bitte an die in den separaten Kundendienst- oder Garantiedokumenten aufgeführten Anschriften.

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Chapter 4 Recording/Playback

Chapter 5 Menu Displays and Detailed Settings

Chapter 6 Saving and Loading User Setting Data

Chapter 7 Maintenance

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Foreword

Using the CD-ROM manual

The supplied CD-ROM includes versions of the Operation Manual for the HDW-650/650F/650P in English and Japanese in PDF format.

Preparations

The following program must be installed on your computer in order to read the Operation Manual contained on the CD-ROM.

• Adobe Reader Version 6.0 or higher

Memo

If Adobe Reader is not installed, you can download it from the following URL:
http://www.adobe.com/

Adobe and Adobe Reader are trademarks of Adobe Systems Incorporated the United States and/or other countries.

To read the CD-ROM manual

To read the Operation Manual contained on the CD-ROM, do the following.

1 **Insert the CD-ROM in your CD-ROM drive.**
A cover page appears automatically in your browser.
If it does not appear automatically in the browser, double-click on the index.htm file on the CD-ROM.

2 **Select and click on the Operation Manual that you want to read.**
This opens the PDF file of the Operation Manual.

Memo

The files may not be displayed properly, depending on the version of Adobe Reader. In such a case, install the latest version you can download from the URL mentioned in “Preparations” above.

Note

If you have lost or damaged the CD-ROM, you can purchase a new one to replace it. Contact a Sony service representative.

Chapter 1 Overview

Features

Camera features

New $^{2}/_{3}$-inch full-HD "PowerHAD FX" CCDs

- IT (Interline Transfer) $^{2}/_{3}$-inch progressive image sensors with 2.2 million pixels, for full HD resolution (1920 × 1080)
- Newly developed "PowerHAD FX" CCDs, featuring a signal processing ASIC with 14-bit A/D converters

These new image sensor technologies enable the capture of very high-quality images, with F11 (59.94i) and F12 (50i) sensitivity and 54 dB.

Multi-format support

The 59.94i/50i (HDW-650), 59.94i/50i/23.98P (HDW-650F), and 59.94i/50i/25P (HDW-650P) system frequencies are supported, for flexible worldwide HD recording.

High-quality shooting ensured by 14-bit camera signal processing

A 14-bit A/D converter ensures stable, reliable, high-quality image processing.

Rich selection of interfaces

- HDSDI signal output connector
- HDSDI and SDSDI signal output connector: Allows to select HDSDI or SDSDI signal. Timecode and other text data can be superimposed on signals.
- Composite signal output connector
- Gen-lock input connector: Enables synchronized operation of multiple units, with synchronization possible to either VBS or HD-Y signals.
- Audio input connectors: Supports AES/EBU signal input, in addition to microphone input, +48 V microphone input, and line input.
- Timecode input and output connectors

Features for improved performance under various shooting conditions

- Down conversion is provided as a standard function.
- The popular Picture Cache function is offered as a standard feature.
- The slow shutter function is provided as a standard function.
- New noise suppression circuits offer improved performance under difficult evening or nighttime shooting conditions.
- The digital extender function which is newly provided magnifies a part of the video by DSP processing, and prevents the decrease in sensitivity (F-drop) that occurs when the lens extender function is used.
- The ability to select from several gamma tables enables a high degree of freedom in picture composition.

VTR features

HDCAM format

- Use of the HDCAM format allows high performance HD digital recording and playback while preserving the same ease of use as conventional camcorder equipment.
- The same cassette size (S size) as Digital Betacam can be used to achieve the following long recording times.
  For 30 frames (59.94i): Approximately 40 minutes
  For 25 frames (50i and 25PsF): Approximately 48 minutes
  For 24 frames (23.98PsF): Approximately 50 minutes

Timecode operations

- LTC [1] and VITC [2] recording and LTC playback are available.

- The built-in timecode generator can be synchronized with an external generator.
- A lithium battery provides the back-up power supply for the built-in timecode generator enabling the camcorder to hold the timecode for approximately 5 years without supplying the power to the camcorder.
- The timecode can be displayed in the monochrome LCD even when the power is off. The automatic power shut-off function allows you to set the time to be displayed from among three patterns.

1) LTC: Longitudinal Time Code
2) VITC: Vertical Interval Time Code

Picture cache and interval recording functions

The unit can continuously capture up to 8 seconds of video and audio to its internal memory, so that you can record video and audio that was pre-stored before you pressed the REC START button. You can also record a specified number of frames at specified intervals.

Other VTR functions

- Recording continuity from the very next frame is ensured.
- You can automatically rewind and review the last 2 seconds of the recording on the tape for a quick check immediately after shooting.
- A four-times-normal speed color search function provides quick positioning of the tape.
- With the retake function, the camcorder searches for the most recently recorded cut and records the new cut over it.
- With the End-Search function, the camcorder searches for the point most recently recorded on the tape and automatically switches to recording pause mode (REC pause).
- The freeze function is provided to obtain a freeze-frame picture from the playback picture on the VTR by pressing the STOP button during playback.

Other features

Supports new digital wireless microphone system

The new digital wireless microphone system offers high-quality, superior resistance to noise, and simultaneous multi-channel operation. Installation of the DWR-S01D Digital Wireless Receiver [1)] enables simultaneous reception of two channels.

1) These products are not available in countries where they are prohibited by radio frequency regulations.

Note

When you use the DWR-S01D Digital Wireless Receiver in combination with this camcorder, you need to check both of their versions.

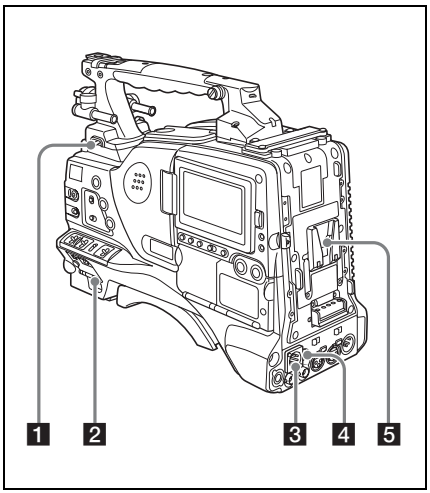
Consult a Sony representative for information about these versions.

3.5-inch color LCD monitor

The 3.5-inch color LCD monitor displays audio meters and menu.

Locations and Functions of Parts and Controls

Power supply



1 LIGHT switch

Determines how a video light connected to the LIGHT connector *(see page 13)* is turned on and off.

AUTO: When the POWER switch of the video light is in the on position, the video light is turned on automatically while the camcorder is recording.

MANUAL: You can turn the video light on or off manually, using its own switch.

Notes

- When this switch is set to AUTO, at the beginning of the recording, the picture is recorded even though the lighting may fluctuate until the video light comes on. If the beginning of the recording is important, you should set this switch to MANUAL.
- To ensure proper operation of the video light, Sony recommends the use of the BP-GL95/L80S Battery Pack with the camcorder.

2 POWER switch

Turns the main power supply on and off.

3 DC IN (DC power input) connector (XLR type, 4-pin, male)

To operate the camcorder from an AC power supply, connect an optional DC power cord to this terminal and then connect the cord to the DC output terminal of the BC-L70, BC-M150, or another battery charger.

4 DC OUT 12V (DC power output) connector (4-pin, female)

Supplies power for a WRR-860A/861/862 UHF Synthesized Diversity Tuner (not supplied) (maximum 0.5 A).
Do not connect any equipment other than the UHF Synthesized Diversity Tuner.

5 Battery attachment shoe

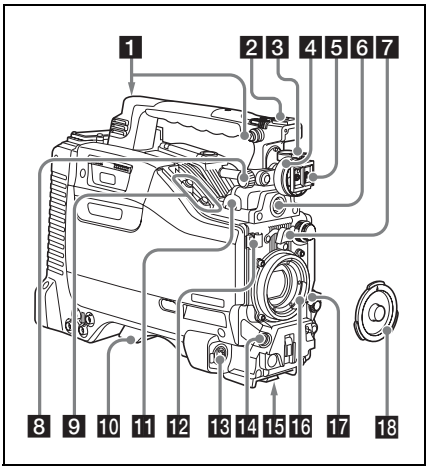
Attach a BP-GL95/GL65/L60S/L80S Battery Pack. Alternatively, you can attach an AC-DN2B/DN10 AC Adaptor to operate the camcorder on AC power supply.

For details about how to attach the battery or AC adaptor, see "Preparing a Power Supply" on page 31. For information about attaching a synthesized tuner, see "Attaching a UHF portable tuner (for a UHF wireless microphone system)" on page 41.

Note

For your safety, and to ensure proper operation of the camcorder, Sony recommends the use of the following battery packs: BP-GL95, BP-GL65, BP-L60S, and BP-L80S.

Accessory attachments



1 Shoulder strap fitting

Attach the supplied shoulder strap *(see page 45)*.

2 Light fitting shoe

Attach an optional accessory such as a video light *(see page 45)*.

3 Viewfinder front-to-back positioning lever

To adjust the viewfinder position in the front-to-back direction, loosen this lever and the LOCK knob. After adjustment, retighten this lever and the LOCK knob.

4 Viewfinder left-to-right positioning ring

Loosen this ring to adjust the left-to-right position of the viewfinder *(see page 33)*.

5 Viewfinder fitting shoe

Attach an optional viewfinder.

6 VF (viewfinder) connector (20-pin)

Connect an optional viewfinder.

Consult a Sony representative for information about available viewfinders.

7 Lens mount securing rubber

After locking the lens in position using the lens locking lever, fit this rubber over the lower of the two projections. This fixes the lens mount, preventing it from coming loose.

8 Viewfinder front-to-back positioning knob (LOCK knob)

Loosen this knob to adjust the front-to-back position of the viewfinder *(see page 33)*.

9 Fitting for optional microphone holder

Fit an optional CAC-12 Microphone Holder *(see page 39)*.

10 Shoulder pad

Raise the shoulder pad fixing lever to adjust the position in the front-to-rear direction. Adjust the position for maximum convenience when operating the unit on your shoulder.

For details of the adjustment, see "Adjusting the Shoulder Pad Position" on page 46.

11 LIGHT (video light) connector (2-pin, female)

A video light with a maximum power consumption of 50 W, such as the Anton Bauer Ultralight 2 or equivalent can be connected *(see page 45)*.

12 Lens cable clamp

Clamp a lens cable.

13 MIC IN (microphone input) (+48 V) connector (XLR type, 5-pin, female)

Connect a stereo microphone to this connector. The power (+48 V) is supplied via this connector.

14 LENS connector (12-pin)

Connect a lens cable to this connector.

Note

Power off this unit before connecting or disconnecting a lens cable to this connector.

Consult a Sony representative for information about available lenses.

15 Tripod mount

When using the unit on a tripod, attach the tripod adaptor (optional).

16 Lens mount (special bayonet mount)

Attach the lens.

Consult a Sony representative for information about available lenses.

17 Lens locking lever

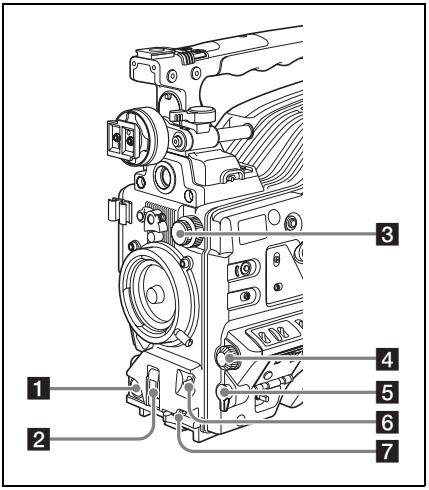
After inserting the lens in the lens mount, rotate the lens mount ring with this lever to lock the lens in position.
After locking the lens, be sure to use the lens mount securing rubber to prevent the lens from becoming detached.

18 Lens mount cap

Remove by pushing up the lens locking lever. When no lens is mounted, keep this cap fitted for protection from dust.

Operating and connectors section

Front



1 REC START (recording start) button

Press to start recording. Press it again to stop recording. The effect is the same as that of the REC button on the lens.

2 SHUTTER selector

Set to ON to use the electronic shutter. Flick to SELECT to switch the shutter speed or shutter mode setting within the range previously set with the menu. When this switch is operated, the new setting appears on the setting change/adjustment progress message display area for about three seconds.

For details about the shutter speed and shutter mode settings, see "Setting the Electronic Shutter" on page 52.

3 FILTER selector

Selects from the filters built into this unit.

FILTER selector (outer knob) setting and Electrical CC (color conversion) filter selection

FILTER selector (outer knob) setting	CC filter selection
A	Cross filter a)
B	3200K
C	4300K
D	6300K

a) A type of special effect filter that creates a cross of light in the highlight section.

FILTER selector (inner knob) setting and ND filter selection

FILTER selector (inner knob) setting	ND filter selection
1	Clear
2	1/4 ND
3	1/16 ND
4	1/64 ND

When this selector is used with the menu item for filter selection display set to ON *(see page 131)*, the new setting appears on the viewfinder screen for about three seconds.

For details, see "Adjusting the white balance" on page 50.

4 MENU knob

Changes the page selection or a setting within the menu.

For details about how to use the MENU knob, see "Menu Operations" on page 119.

5 EARPHONE jack (monaural, minijack)

You can monitor the E-E 1) sound during recording and playback sound during playback. When an alarm is indicated, you can hear the alarm sound through the earphone. You can use this with the EARPHONE jack on the rear of the unit at the same time. Plugging an earphone into the jack automatically cuts off the built-in speaker.

1) **E-E:** Abbreviation of "Electric-to-Electric". In E-E mode, video and audio signals input to the camcorder are output after passing through internal electric circuits only. This can be used to check input signals.

6 AUTO W/B BAL (automatic white/ black balance adjustment) switch

Activates the automatic white/black balance adjustment functions.

WHITE: Adjusts the white balance automatically. If the WHITE BAL switch *(see page 16)* is set to A or B, the white balance setting is stored in the corresponding memory. If the WHITE BAL switch is set to PRST, the automatic white balance adjustment function does not operate.

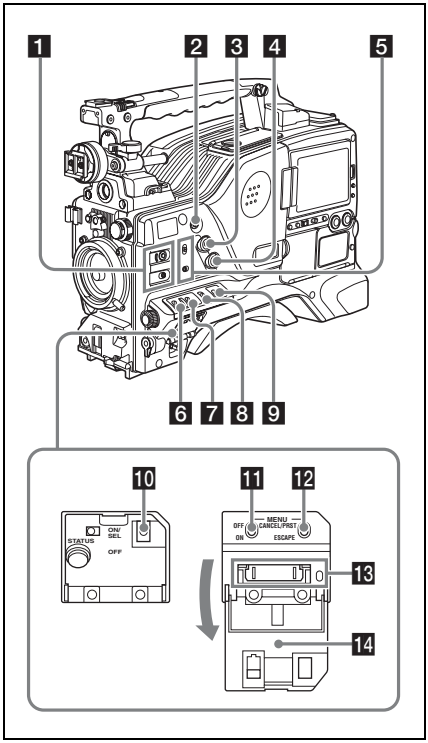
BLACK: Adjusts the black set and black balance automatically.

7 MIC (microphone) LEVEL control

Adjusts the input level of audio channels 1, 2, 3 and 4.

For details, see "Adjusting the Audio Level" on page 57.

Right side (near the front)



1 ASSIGN (assignable) 1/2 switches

You can assign the desired functions to these switches on the ASSIGNABLE SW page of the OPERATION menu.

Nothing is assigned to these switches when the camcorder is shipped from the factory (OFF is selected in the menu).

For details, see "Assigning functions to ASSIGN switches" on page 138.

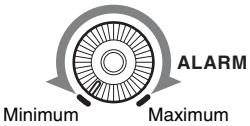
2 ASSIGN (assignable) 5 switch

You can assign the desired function to this switch on the ASSIGNABLE SW page of the OPERATION menu. The switch lights when being pressed. Nothing is assigned to the switch when the camcorder is shipped from the factory (OFF is selected in the menu).

For details, see "Assigning functions to ASSIGN switches" on page 138.

3 ALARM (alarm tone volume adjustment) knob

Controls the volume of the warning tone that is output via the built-in speaker or optional earphones. When the knob is turned to the minimum position, no sound can be heard.



4 MONITOR (monitor volume adjustment) knob

Controls the volume of the sound other than the warning tone that is output via the built-in speaker or optional earphones. When the knob is turned to the minimum position, no sound can be heard.

5 MONITOR (audio monitor selection) switches

By means of combinations of the two switches, you can select audio that you want to hear through the built-in speaker or optional earphones.

Position of down-side switch: CH-1/2

Position of up-side switch	Audio output
CH-1/CH-3	Channel 1 audio
MIX	Channels 1 and 2 mixed audio (stereo)
CH-2/CH-4	Channel 2 audio

Position of down-side switch: CH-3/4

Position of up-side switch	Audio output
CH-1/CH-3	Channel 3 audio
MIX	Channels 3 and 4 mixed audio (stereo)
CH-2/CH-4	Channel 4 audio

By connecting stereo headphones to the EARPHONE jack on the rear of the unit, you can hear the audio in stereo. (On the AUDIO 1 page of the MAINTENANCE menu, HEADPHONE OUT must be set to STREO.)

6 VTR SAVE/STBY (standby) switch

Controls the VTR power mode during pauses in recording.

SAVE: Power saving mode. When you press the REC START button, there is a short delay before recording starts, but power consumption in this mode is less than in standby mode. As a result, battery life is extended. When the switch is set to SAVE, the VTR SAVE indicator in the viewfinder lights.

STBY: Standby mode. Recording starts as soon as you press the REC START button.

Notes

- Avoid allowing the camcorder to remain in STBY (standby) mode for a long time.
- Even if the switch is set to the STBY position, the camcorder can automatically turn to power saving mode if the tape does not run for a certain period. In such a case, the VTR SAVE indicator in the viewfinder lights. This function is effective when a setting other than OFF is selected for the STBY OFF TIMER on the CAM CONFIG 1 page of the MAINTENANCE menu. The STBY OFF TIMER item also allows you to select the length of time until the camcorder turns to power saving mode.

For detailed information, see "Setting the Rec-Pause Stand-by Off Timer" on page 82.

7 GAIN selector

Switches the gain of the video amplifier to match the lighting conditions during shooting. The gains corresponding to the L, M, and H settings can be selected in the menu. (The factory settings are L=0 dB, M=6 dB, and H=12 dB.)

When this switch is adjusted, the new setting appears on the setting change/adjustment progress message display area of the viewfinder screen for about three seconds.

For details, see "Setting gain values for the GAIN selector positions" on page 137.

8 OUTPUT/DCC (output signal/dynamic contrast control) switch

Switches the video signal, which is output to the VTR, viewfinder, and video monitor from the camera section, between the following two.

BARS: Outputs the color bar signal.

CAM: Outputs the video signal from the camera. When this is selected, you can switch DCC [1] on and off.

1) **DCC (Dynamic Contrast Control):** Against a very bright background with the iris opening adjusted to the subject, objects in the background will be lost in the glare. The DCC function will suppress the high intensity and restore much of the lost detail and is particularly effective in the following cases.
   - Shooting people in the shade on a sunny day
   - Shooting a subject indoors, against a background through a window
   - Any high contrast scene

9 WHITE BAL (white balance memory) switch

Controls adjustment of the white balance.

PRST: Adjusts the color temperature to the preset value (the factory default setting: 3200K). Use this setting when you have no time to adjust the white balance.

A or B: Recall the white balance adjustment settings already stored in A or B. Flick the AUTO W/B BAL switch *(see page 15)* on the WHITE side, to automatically adjust the white balance, and save the adjustment settings in memory A or memory B. You can use the AUTO W/B BAL switch even when ATW [1] is in use.

B (ATW): When this switch is set to B and WHITE SWITCH <B> is set to ATW on the WHITE SETTING page of the OPERATION menu, ATW is activated.

When this switch is adjusted, the new setting appears on the setting change/adjustment progress message display area of the viewfinder screen for about three seconds.

1) **ATW (Auto Tracing White Balance):** The white balance of the picture being shot is adjusted automatically for varying lighting conditions.

10 STATUS ON/SEL/OFF (menu display on/page selection/display off) switch

This switch is enabled when the menu is not displayed.

ON/SEL: Each time this switch is pushed upward, a window to confirm the menu settings and status of the camcorder appears on the viewfinder screen. The window consists of four pages, which are switched each time the switch is pushed upward. Each page is displayed for about 10 seconds.

OFF: To clear the page after display, push this switch down to the OFF position.

You can select the pages to be displayed on the menu.

For details, see "Displaying the status confirmation screens" on page 136.

11 MENU ON/OFF switch

To use this switch, open the cover.

This switch is used to display the menu on the viewfinder screen or the test signal screen.

Closing the cover automatically sets this switch to OFF.

ON: Displays the menu on the viewfinder screen or the test signal screen.

OFF: Removes the menu from the viewfinder screen or the test signal screen.

For details, see "Menu Operations" (page 119).

12 CANCEL/PRST (preset)/ESCAPE switch

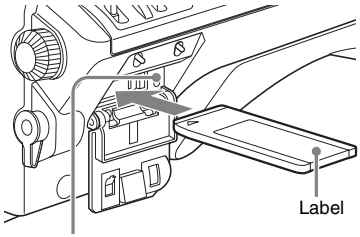
To enable this switch, set the MENU ON/OFF switch to ON.

Closing the cover automatically sets the MENU ON/OFF switch to OFF.

CANCEL/PRST: Flicking this switch up to this position displays the message to confirm whether the previous settings are cancelled or settings are reset to their initial values, depending on the menu operating condition. Flicking this switch up to this position again cancels the previous settings or resets the settings to their initial values.

ESCAPE: Use this switch when the menu page, which has a hierarchical structure, is opened. Each time the switch is flicked to this position, the page returns to one stage higher in the hierarchy.

13 "Memory Stick" compartment



Open the lid of the menu operating section, and insert a "Memory Stick", with the notch facing downward, in the direction shown by the arrow, so that it clicks into place.

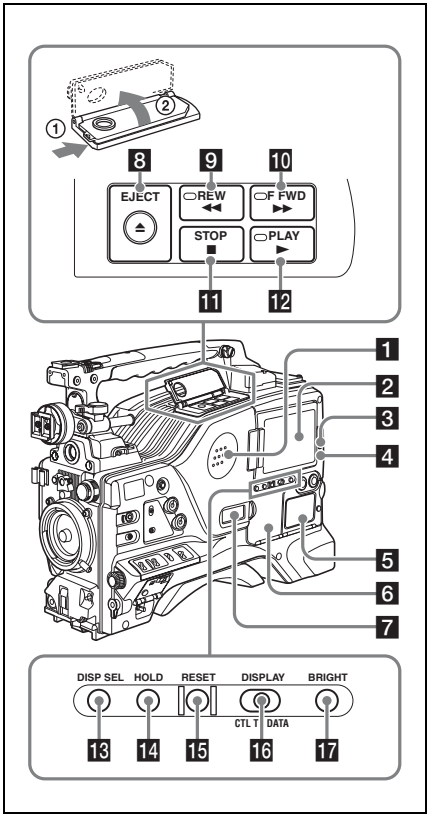
To remove a "Memory Stick", first press it in to release the lock, then withdraw.

The "Memory Stick" access indicator lights in green when a "Memory Stick" is loaded, and lights in red when the "Memory Stick" is being accessed for reading or writing.

For details about "Memory Stick", see "Handling the "Memory Stick"" on page 144.

14 Cover

Right side (near the rear)



1 Built-in speaker

The speaker can be used to monitor E-E sound during recording, and playback sound during playback. The speaker also sounds alarms to reinforce visual warnings.
If you connect earphones to the EARPHONE jack, the speaker output is suppressed automatically.

For details about alarms, see "Operation Warnings" on page 161.

2 LCD monitor

Displays camera video, VTR-related warnings, remaining battery capacity, remaining tape recording time, audio levels, time data, and so on.

For details, see "Status displays on the LCD monitor and monochrome LCD" on page 20.

3 WARNING indicator

Lights up or flashes when an abnormality occurs in the VTR section.

For details about the meaning of the states of the WARNING indicator, see ""Operation Warnings" on page 161.

4 TAPE indicator

This lights when a cassette is loaded.

5 Protection cover of the audio control/ timecode operations sections

Open to access the audio control section and the timecode operation section.

For details, see "Timecode/menu operations section and audio control section" on page 23.

6 Protection cover of the timecode/menu operations section

Open to access the buttons and switches used for setting timecode and user bit values and performing menu operations.

For details, see "Timecode/menu operations section and audio control section" on page 23.

7 Monochrome LCD

This shows the remaining battery capacity, remaining tape recording time, time data, and so on.

For details, see "Status displays on the LCD monitor and monochrome LCD" on page 20.

8 EJECT button

Press this button to eject or load a cassette.

9 REW (rewind) button and indicator

Press this button to rewind the tape. The indicator lights during rewinding.

10 F FWD (fast forward) button and indicator

Press this button to fast forward the tape. The indicator lights during fast forward.

11 STOP button

Press this button to stop the tape.

12 PLAY button and indicator

Press this button to view the recorded picture in the viewfinder or on the color video monitor. The indicator lights during playback. The four times normal speed search function is provided to make

it far quicker to find a desired location of the tape. Press the REW button or F FWD button during playback to view the four times normal speed search picture.

13 DISP SEL (display selection) button

With each press of this button, the display in the LCD monitor changes as follows.

Display indication	Meaning
Video with superimposed information (CHAR)	The LCD monitor displays the same text information as the viewfinder.
Video without superimposed information (MONI)	The video only appears.
Status display (STATUS)	Counter indications, warnings, audio levels, and similar information appear. No video image appears.

14 HOLD (display hold) button

Pressing this button instantly freezes the time data displayed in the counter display section. (The timecode generator continues running.) Pressing this button again releases the hold.
You can use this button, for example, to determine the exact time of a particular shot.

For details of the counter display, see page 20.

15 RESET button

Resets the value shown in the time counter display. According to the settings of the PRESET/REGEN/CLOCK switch *(see page 23)*, the F-RUN/SET/R-RUN switch *(see page 23)*, and the DATA DISPLAY switch *(see page 23),* this button resets the display as follows.

Settings of switches	To reset
DISPLAY switch: CTL	CTL to 0:00:00:00
DISPLAY switch: TC **PRESET/REGEN/ CLOCK switch:** PRESET **F-RUN/SET/R-RUN switch:** SET	Timecode to 00:00:00:00
DISPLAY switch: DATA **PRESET/REGEN/ CLOCK switch:** PRESET **F-RUN/SET/R-RUN switch:** SET **DATA DISPLAY switch:** U-BIT	User bits data [a] to 00 00 00 00

a) Of the timecode bits for every frame recorded on the tape, those bits which can be used to record useful information for the user such as scene number, shooting place, etc.

For details, see "Setting the Time Data" on page 60.

16 DISPLAY switch

CTL: Displays control signal.
TC: Displays timecode.
DATA: Displays the item selected with the DATA DISPLAY switch.

For details, see "Status displays on the LCD monitor and monochrome LCD" on page 20.

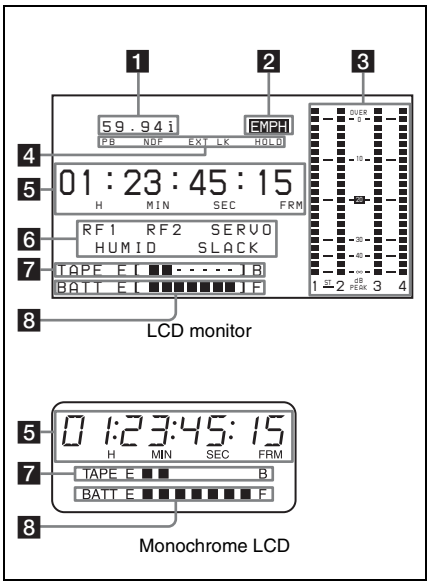
17 BRIGHT (brightness) button

Switches the brightness of the LCD monitor backlight, and turns the backlight of the monochrome LCD on and off.
Each press of the button selects the next setting in the order shown in the following table.

Setting	LCD monitor backlight	Monochrome LCD backlight
H	High (select this to view the LCD monitor outdoors in the daytime)	Lit
M	Brightness between H and L	Lit
L	Low (select this to view the LCD monitor indoors or outdoors at night)	Lit
OFF	Off (the display is also off)	Off

Status displays on the LCD monitor and monochrome LCD

The following displays appear on the LCD monitor and monochrome LCD when STATUS is selected with the DISP SEL button.



1 Frame frequency

Indicates the currently selected frame frequency.

59.94i: 59.94 fields per second, interlace scan mode

50i: 50 fields per second, interlace scan mode

25PsF: 25 frames per second, progressive scan mode (HDW-650P only)

23.98PsF: 23.98 frames per second, progressive scan mode (HDW-650F only)

2 Emphasis display

Lights during recording or playback when emphasis processing is performed on audio signals.

3 Audio level indicators

Indicates the audio recording or playback levels of channels 1 to 4.

4 Status display

PB: Appears when the tape is running.

NDF: Appears when non-drop-frame timecode is selected.

EXT-LK: Appears when the internal timecode generator is locked to an external signal input to the TC IN (timecode input) connector.

HOLD: Appears when the internal timecode generator is stopped.

5 Time counter display

Displays timecode, CTL signals, user bits or the real time. Except when the timecode is being set, the information displayed is determined by the settings of the DISPLAY and DATA DISPLAY switches.

For more information about timecode, see "Setting the timecode" (page 60).

Switch settings related to timecode and displayed information

DISPLAY switch position	DATA DISPLAY switch position	Displayed information
CTL	Any position	Control signal
TC	Any position	Timecode
DATA	U-BIT	User bits
	SHOT TIME	Data and time from shot data
	SHOT-NO	Time counter is not used (currently zero is displayed)

When the HOLD button is pressed to hold the timecode value, the timecode is displayed in the format shown below. When the HOLD button is pressed again to release the hold, the timecode is displayed in the normal format.

Lights when the HOLD button is pressed.

6 Warning indicator area

Displays warnings when trouble with recording or moisture condensation occurs.

For details, see "Operation Warnings" on page 161.

7 Remaining tape recording time indicator

Indication	Remaining recording time
TAPE E [■ ■ ■ ■ ■ ■ ■] B	More than 30 minutes
TAPE E [■ ■ ■ ■ ■ ■] B	25 to 30 minutes
TAPE E [■ ■ ■ ■ ■] B	20 to 25 minutes
TAPE E [■ ■ ■ ■] B	15 to 20 minutes
TAPE E [■ ■ ■] B	10 to 15 minutes
TAPE E [■ ■] B	5 to 10 minutes
TAPE E [■] B	2 to 5 minutes
TAPE E [■] B (flashing) [a]	0 to 2 minutes
TAPE E [ ] B (flashing)	0 minutes

a) During recording

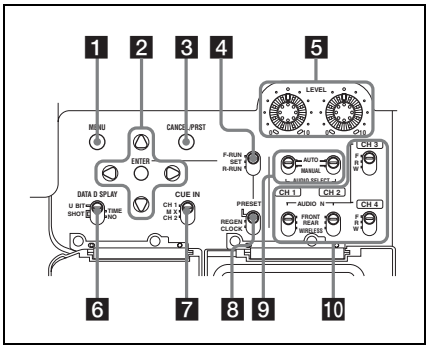
8 Remaining battery capacity indicator

Indication	Battery voltage	
	BP-L90A/L60S/L80S	Other batteries [a]
BATT E [■ ■ ■ ■ ■ ■ ■] F	15.5 V or more	17.0 V or more
BATT E [■ ■ ■ ■ ■ ■] F	15.1 to 15.5 V	16.0 to 17.0 V
BATT E [■ ■ ■ ■ ■] F	14.6 to 15.1 V	15.0 to 16.0 V
BATT E [■ ■ ■ ■] F	13.8 to 14.6 V	14.0 to 15.0 V
BATT E [■ ■ ■] F	12.9 to 13.8 V	13.0 to 14.0 V
BATT E [■ ■] F	12.0 to 12.9 V	12.0 to 13.0 V
BATT E [■] F	10.8 to 12.0 V	11.0 to 12.0 V
BATT E [ ] F	10.8 V or less	11.0 V or less

a) You can change the threshold voltages on the BATTERY 2 page of the MAINTENANCE menu *(see page 104)*.

Indication	Battery voltage
	BP-GL95/GL65/IL75/M100, Anton Bauer Battery System
BATT E [■ ■ ■ ■ ■ ■ ■] F	80 to 100%
BATT E [■ ■ ■ ■ ■ ■ ■]	70%
BATT E [■ ■ ■ ■ ■ ■]	60%
BATT E [■ ■ ■ ■ ■]	50%
BATT E [■ ■ ■ ■]	40%
BATT E [■ ■ ■]	30%
BATT E [■ ■]	20%
BATT E [■]	10%
BATT E [ ]	0%

Timecode/menu operations section and audio control section



1 MENU button

When pressed, enables menu operations with the arrow keys, the CANCEL/PRST button, and the ENTER button.

The menu appears temporarily, even when the MENU ON/OFF switch is in the OFF position.

For details, see "Menu Operations" (page 119).

2 ENTER button and arrow buttons

Use to set timecode and user bit values, and for menu screen operations.

Select items and change their values with the arrow buttons, and confirm with the ENTER button for menu screen operations.

When setting timecode and user bits, use the right and left arrow buttons to select the digit to modify (the selected digit flashes), and use the up and down arrow buttons to increment and decrement the flashing digit.

3 CANCEL/PRST (menu cancel/preset) button

This button is also enabled when the MENU button is pressed to enable arrow key operations. Cancels changes to a menu setting, or resets one or more settings to the default settings. A message appears so that you can confirm the cancellation or reset. Press again to confirm the cancellation or reset.

4 F-RUN/SET/R-RUN (free run/set/ recording run) switch

Selects the operating mode of the internal timecode generator. The operating mode is set as explained below, depending on the position of the switch.

F-RUN: Timecode keeps advancing, regardless of the operating state of the VTR. Use this setting when synchronizing the timecode with an external timecode.

SET: Sets the timecode or user bits.

R-RUN: Timecode advances only during recording. Use this setting to have a consecutive timecode on the tape.

For details, see "Setting the timecode" on page 60 and "Setting the user bits" on page 60.

5 AUDIO LEVEL CH-1/CH-2 (audio channel 1/2 recording level) knobs

Adjusts the audio levels to be recorded on channels 1 and 2 when the AUDIO SELECT CH-1/CH-2 switches *(see page 24)* are set to MANUAL.

6 DATA DISPLAY switch

U-BIT: Displays the user bit value.

SHOT TIME: Displays the date and time from the shot data.

SHOT-NO: Time counter is not used.

7 CUE IN(cue track input) switch

Selects the input signal to be recorded on the cue track.

CH-1: Signal selected by the AUDIO IN CH-1 switch

MIX: Mixed signals selected by the AUDIO IN CH-1 and CH-2 switches

CH-2: Signal selected by the AUDIO IN CH-2 switch

Note

When recording mixed signals by setting this switch to MIX, be sure to confirm that the emphasis settings of the two channels (on/off) are the same. If they are different, the camcorder cannot record or play back mixed signals correctly.

When the AES/EBU format audio signal is selected, the emphasis settings are determined by the channel status of the AES/EBU format audio signal (emphasis bit).

When an audio signal other than the AES/EBU format audio signal is selected, the emphasis setting depends on the setting of AU REC EMPHASIS *(see page 105)* on the AUDIO 2 page of the MAINTENANCE menu.

Use this in combination with other buttons.

8 PRESET/REGEN (regeneration)/ CLOCK switch

Selects whether to set a new timecode or to utilize the existing timecode.

PRESET: Records a new timecode.

REGEN: Records timecode continuous with the existing timecode recorded on the tape. Regardless of the setting of the F-RUN/SET/R-RUN switch, the camcorder operates in R-RUN mode.

CLOCK: Records timecode synchronized to the internal clock. Regardless of the setting of the F-RUN/SET/R-RUN switch, the camcorder operates in F-RUN mode.

9 AUDIO SELECT CH-1/CH-2 (audio channel 1/2 adjustment method selection) switches

Select the audio level adjustment method for each of audio channels 1 and 2.

AUTO: Automatic adjustment

MANUAL: Manual adjustment

10 AUDIO IN CH-1/CH-2/CH-3/CH-4 (audio channel 1/2/3/4 input selection) switches

AUDIO IN CH-1/CH-2 switches

Select the audio input signals to be recorded on audio channels 1 and 2.

FRONT: Audio input signals from the microphone connected to the MIC IN connector

REAR: Audio input signals from an audio device connected to the AUDIO IN CH-1/CH-2 connectors

WIRELESS: Audio input signals from the UHF portable tuner (supplied separately) if it is installed

AUDIO IN CH-3/CH-4 switches

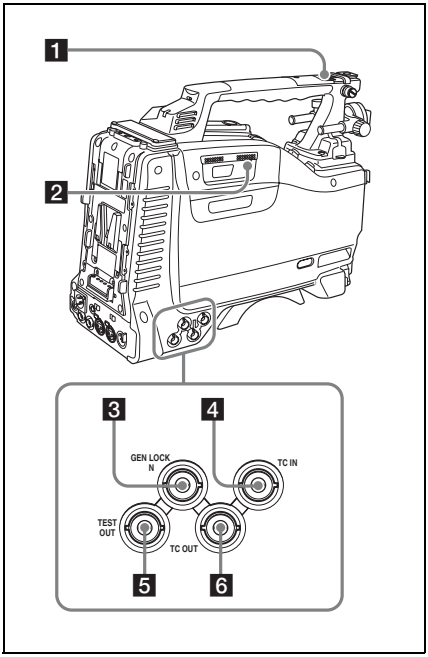
Select the audio input signals to be recorded on audio channels 3 and 4.

F (FRONT): Audio input signals from a microphone connected to the MIC IN connector

R (REAR): Audio input signals from an audio device connected to the AUDIO IN CH-1/CH-2 connectors

W (WIRELESS): Audio input signals from the UHF portable tuner (supplied separately) if it is installed

Left side and upper section



1 ASSIGNABLE 3/4 switches

You can assign the desired functions to these switches on the ASSIGNABLE SW page of the OPERATION menu.

Nothing is assigned to these switches when the camcorder is shipped from the factory (equivalent to a selection of OFF in the menu).

For details, see "Assigning functions to ASSIGN switches" on page 138.

2 Lid of the cassette compartment

This opens when the EJECT button on the top panel is pressed. Press the side of the lid to close.

3 GEN LOCK IN (genlock signal input) connector (BNC type)

- This connector inputs a reference signal when the camera is to be genlocked or when timecode is to be synchronized with external equipment. Use the GENLOCK page of the MAINTENANCE menu to adjust the genlock H-phase (phase of horizontal sync signal).
- This connector also inputs a return video signal. The HD-Y signal can be displayed in the viewfinder screen while holding the RET button

down with RETURN VIDEO set to ON on the ASSIGNABLE SW page of the OPERATION menu.

4 TC IN (timecode input) connector (BNC type)

To apply an external lock to the timecode of this unit, input the reference timecode.

For details of timecode, see "Setting the timecode" on page 60.

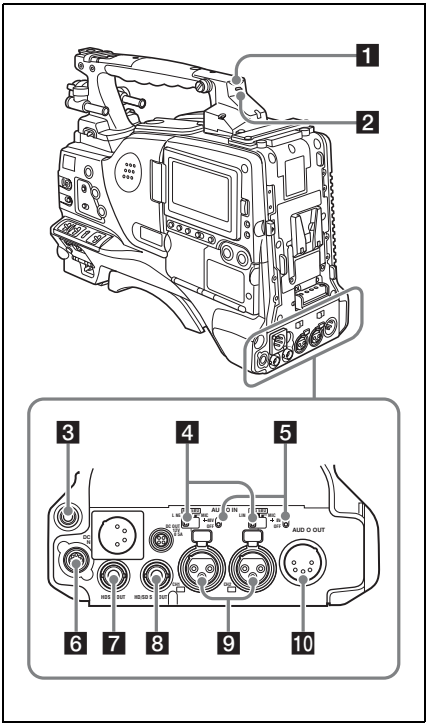
5 TEST OUT connector (BNC type)

This connector outputs the video signal for a video monitor. The output signal can be selected from composite video, HD-Y, R, G, and B. To switch output signals, use the TEST OUT SELECT item on the OUTPUT 1 page of the OPERATION menu.
If the output signal is set to one of R, G, or B, then this setting changes to HD-Y when the camcorder is powered off and on again.
Depending on menu settings, menus, timecode, and shot data can be superimposed on the image on the monitor. This connector can also be used to synchronize the timecode of an external VTR with the timecode of the camcorder.

6 TC OUT (timecode output) connector (BNC type)

To lock the timecode of an external VTR to the timecode of this unit, connect this connector to the external VTR's timecode input connector.

Rear



1 TALLY (back tally) indicator (red)

Lights up during recording. It will not light if the TALLY switch is set to OFF. This indicator also flashes to indicate warnings *(see page 18)* in the same manner as the REC/TALLY indicator in the viewfinder.

For details, see "Operation Warnings" on page 161.

2 TALLY switch

Set to ON to activate the TALLY indicator function.

3 EARPHONE jack (stereo, minijack)

You can monitor the E-E sound during recording and playback sound during playback. When an alarm is indicated, you can hear the alarm sound through the earphone. You can use this with the EARPHONE jack on the front of the unit at the same time. Plugging an earphone into the jack automatically cuts off the built-in speaker.
You can select monaural or stereo on the AUDIO 1 page of the MAINTENANCE menu.

4 LINE /AES/EBU / MIC selectors

These select the audio source of the audio input signals input to the AUDIO IN CH1/CH2 connectors.

LINE: Line input audio equipment
AES/EBU: AES/EBU format audio signal
MIC: Microphone input

Note

When either of these selectors is in the MIC position, and the corresponding +48V/OFF switch is in the +48V position, and you inadvertently connect any audio device other than a microphone to the corresponding connector (AUDIO IN CH1 or CH2), the connected device may be damaged.

5 +48V/OFF switches

Select either of the following positions for the microphones to be connected.

+48V: For a microphone that uses an external power supply
OFF: For a microphone that uses an internal power supply

6 REMOTE connector (8-pin)

Connect an RM-B150/B750 Remote Control Unit, which makes it possible to control the camcorder remotely.

Note

Before connecting/disconnecting the Remote Control Unit to/from the camcorder, be sure to turn off the camcorder POWER switch.

7 HDSDI OUT connector (BNC type)

Outputs an HDSDI signal (with embedded audio).

8 HD/SD SDI OUT connector (BNC type)

Outputs an HDSDI or SDSDI signal (with embedded audio). To switch between HDSDI and SDSDI output, use the HD/SD SDI OUT item on the OUTPUT 1 page of the OPERATION menu. Setting menus, timecode, or shot data can be superimposed on the camera output video depending on the menu settings, and you can view them on the monitor screen.

9 AUDIO IN CH1/CH2 (audio channel-1 and channel-2 input) connectors (XLR type, 3-pin, female)

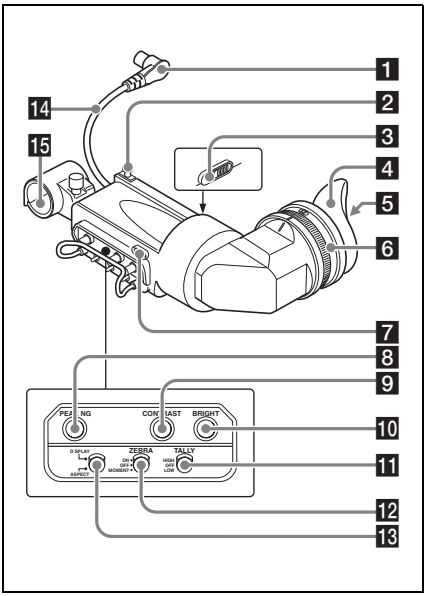
These are audio input connectors for channels 1 and 2 to which you can connect audio equipment or a microphone.

When the LINE / AES/EBU / MIC selectors are set to LINE or MIC, the CH1 connector is used for channel-1 and -3 inputs, and the CH2 connector for channel-2 and -4 inputs.
When the LINE / AES/EBU / MIC selectors are set to AES/EBU, the CH1 connector is used for channel-1 and -2 inputs, and the CH2 connector, for channel-3 and -4 inputs.

10 AUDIO OUT connector (XLR type, 5-pin, male)

Outputs the audio signals recorded on audio channels 1 and 2 or audio channels 3 and 4. The audio signals are selected by the MONITOR switches.

HDVF-20A viewfinder (optional)



1 Plug

Connect to the VF connector on the camcorder.

2 Stopper

Prevents the viewfinder from coming off the camcorder when it is slid from side to side.

3 Camera operator tally indicator

Lights up while camcorder is recording. This indicator can be covered when not in use.

This indicator also flashes to indicate warnings, in the same manner as the tally indicator and the REC indicator in the viewfinder.

4 Eyecup

5 Indicators and status display

For details, see "Status display on the viewfinder screen" on page 27.

6 Diopter adjustment ring

Allows for optimal focus adjustment.

7 Tally indicator

Lights up while camcorder is recording. Set the TALLY switch to OFF when not in use. The brightness can also be adjusted with the TALLY switch.

This indicator also flashes to indicate warnings, in the same manner as the camera operator tally indicator and the REC indicator in the viewfinder.

8 PEAKING control

Turning this control clockwise adjusts the picture sharpness, and makes focusing easier. This control has no effect on the output signals of the camcorder.

9 CONTRAST control

Adjusts the contrast of the screen. This control has no effect on the output signals of the camcorder.

10 BRIGHT control

Adjusts the brightness of the screen. This control has no effect on the output signals of the camcorder.

11 TALLY switch

Controls the tally indicator located on the front of the viewfinder.

HIGH: The tally indicator brightness is set to high.

OFF: The tally indicator is disabled.

LOW: The tally indicator brightness is set to low.

12 ZEBRA (zebra pattern) switch

Controls the zebra pattern display on the viewfinder screen as follows.

ON: A zebra pattern appears and stays.

OFF: The zebra pattern disappears.

MOMENT: A zebra pattern appears and stays for about five seconds.

13 DISPLAY/ASPECT switch

Turns the marker indication on and off, and switches between 4:3 and 16:9 aspect ratios for viewfinder screen display.

DISPLAY: When the marker indication is enabled with the camcorder, the marker indication on the viewfinder screen turns on and off every time you push the switch up to this position.

ASPECT: Each push of the switch down to this position toggles the mask display on and off. (Make mask display settings on the MARKER 1 page of the OPERATION menu *(see page 90)*.)

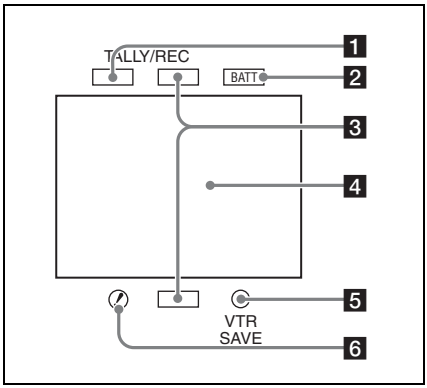
14 Viewfinder cable

15 Microphone holder

Status display on the viewfinder screen

Indicators

The following indicators are arranged above and below the viewfinder screen to show the current state and adjustments of the camcorder.



1 TALLY (green tally) indicator

Lights when the camcorder is in Picture Cache mode, and flashes when it is in Auto Interval Rec or Manual Interval Rec mode. Also, lights in green when the HDW-250/S280 connected to the HDSDI OUT connector starts recording, if HDSDI REMOTE I/F on the CAM CONFIG 2 page of the MAINTENANCE menu is set to G-TLY.

2 BATT (battery) indicator

This indicator starts flashing when the battery connected to the camcorder is nearly exhausted, and stays lit when the battery is completely exhausted.

To prevent interruption during operation, replace the battery as soon as this indicator starts flashing.

The battery power level at which the indicator starts flashing can be set on the BATTERY 1 page of the MAINTENANCE menu. For details, see page 103.

3 REC (recording, red tally) indicator

Lights up while camcorder is recording.

This indicator also flashes to indicate warnings, in the same manner as the tally indicator and the camera operator tally indicator.

4 Viewfinder screen

5 VTR SAVE indicator

This indicator lights when the VTR SAVE/STBY switch is set to SAVE, putting the VTR into power save mode.

6 ! (warning) indicator

This indicator lights when any of the following conditions occurs with the corresponding item set to ON on the '!' LED page of the OPERATION menu.

- The gain is set to other than 0 dB.
- The SHUTTER selector is set to ON.
- The WHITE BAL switch is set to PRST.
- The electric CC filter is ON.
- ATW is enabled.
- The lens extender is used.
- The reference value of auto iris adjustment is not the standard value.

The conditions that cause the indicator to light can be changed on the '!' LED STD page of the OPERATION menu.

For details, see "Selecting the conditions that light the '!' (warning) indicator" (page 131).

Layout of the status display on the viewfinder screen

The viewfinder screen displays not only the video picture but also characters and messages indicating the camcorder settings and operating status, a center marker, a safety zone marker, etc. When the menu screen is not displayed and the DISPLAY of the DISPLAY/ASPECT switch is set to ON, the items for which an ON setting was made on the VF DISP 1, VF DISP 2, or VF DISP 3 page of the OPERATION menu or with related switches are displayed at the top and bottom of the screen.

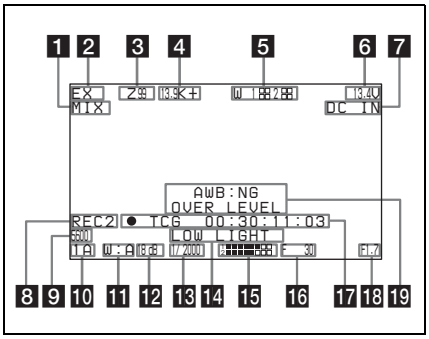
The messages that give details of the settings and adjustment progress and results can also be made to appear for about three seconds while settings are being changed, during adjustment, and after adjustment.

For details about the display item selection, see "Selecting the display items" on page 130.

For details about setting change and adjustment progress messages, see "Change confirmation/ adjustment progress messages" on page 131.

For details about marker display, see "Setting the marker display" on page 133.

All items that can be displayed on the viewfinder screen are shown below.



1 Playback mix

"MIX" appears when the playback mix function is set to ON.

2 Extender

Displays the extender settings of this unit and the lens.

EX: The lens extender is on.

08: The lens shrinker is on.

x2D: This unit's extender function is on.

Ex2D: The lens extender and the digital extender function of this unit are both on.

3 Zoom position

Indicates the zoom position of the zoom lens in the range from 0 to 99.

4 Color temperature

Displays a color temperature calculated from the gain of R and B, in the range 0.0 K to 99.9 K (in steps of 0.1 K). The +/– signs may be displayed depending on the OFFSET WHT setting *(see page 140)*.

No display: OFFSET WHT is OFF

+: The value of OFFSET WHT is greater than 3200K.

–: The value of OFFSET WHT is less than 3200K.

5 Wireless microphone reception level

When a UHF portable tuner is installed in the camcorder, "W" appears together with four-segment reception level indicators for each of the channels (1 or 2 channels) of the tuner. The indications are as follows.

Normal use: The number of white segments indicates the strength of the signal level.

Muted: The number of gray segments indicates the strength of the signal level.

Reception level over peak: "P" is displayed instead of the indicators. 1)

Tuner battery is low: The channel number and indicator of the corresponding channel flash. 1)

1) DWR-S01D only

6 Power source voltage/battery remaining capacity

When the unit is powered from a battery pack, indicates the remaining capacity of the power source voltage. When the unit is powered from a battery connected to the DC IN connector or AC adaptor attached to the battery attachment shoe, indicates the power source voltage.

7 External battery

Appears if the power is supplied from an AC adaptor connected to the DC IN connector.

8 External device control

Flashes when recording operation by the external device connected to the HDSDI OUT connector is being controlled.

However, this indicator only appears when HDSDI REMOTE I/F on the CAM CONFIG 2 page of the MAINTENANCE menu is set to CHARA and HD SDI OUT on the OUTPUT 1 page of the OPERATION menu is set to HDSDI.

9 Electric CC (color temperature) filter

Displays the color temperature when the electric CC filter is ON.

10 Filter

Indicates the currently selected filter type *(see page 14)*.

11 White balance memory

Indicates the currently selected white balance automatic adjustment memory.

A: Displayed when the WHITE BAL switch is set to A.

B: Displayed when the WHITE BAL switch is set to B.

P: Displayed when the WHITE BAL switch is set to PRST or when the preset button on an RM-B150 has been pressed.

T: Displayed when ATW is being used.

12 Gain value

Indicates the gain value (in dB) of the video amplifier, as set by the GAIN selector.

13 Shutter speed

Indicates the shutter speed or the shutter mode. However, if the SHUTTER selector *(see page 14)* is set to OFF, nothing is displayed.

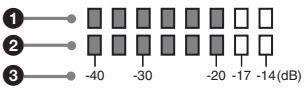
For details of the displayed shutter speed, see "Setting the Electronic Shutter" on page 52.

14 Operation/alarm message display area

For details, see "Operation/alarm messages" on page 164.

15 Audio level

Indicates the level of audio channel 1 and channel 2. The peak indication of the VTR level meter is related as follows to the audio level.



1 Audio channel 1 level indicator
2 Audio channel 2 level indicator
3 VTR level meter indicator

16 Remaining tape recording time

Indicates the remaining recording time (in minutes) of the tape.

Examples of remaining recording time indication

Indication	Remaining recording time
F-30	All to 30 minutes
30-25	30 minutes to 25 minutes
25-20	25 minutes to 20 minutes
20-15	20 minutes to 15 minutes
15-10	15 minutes to 10 minutes

17 Timecode

Indicates the elapsed recording/playback time, timecode, user bits or other information selected by the DISPLAY switch *(see page 19)* and the DATA DISPLAY switch *(see page 23)*.

18 Iris setting/auto iris override

Indicates the F value (iris setting) of the lens. Auto iris override is shown by an indicator made up of two segments each on the upper and lower sides.

For details, see "Changing the Reference Value for Automatic Iris Adjustment" on page 55.

19 Setting change and adjustment progress message display area

For details, see "Change confirmation/adjustment progress messages" on page 131.

Chapter 2 Preparations

Preparing a Power Supply

For safety, use only the Sony battery packs listed below.

- BP-GL95/GL65/L60S/L80S Lithium-ion Battery Pack
- AC power using the AC-DN2B/DN10 AC adaptor

Using a battery pack

When a BP-GL95/GL65/L60S/L80S Battery Pack is used, the camcorder will operate continuously for the time shown below.

Model name	Operating time
BP-GL95	Approx. 120 minutes
BP-GL65	Approx. 70 minutes
BP-L60S	Approx. 70 minutes
BP-L80S	Approx. 95 minutes

Note

The battery pack operating time depends on the frequency of use of the battery pack, and the ambient temperature when used.

Before use, charge the battery pack with a charger suitable for each battery.

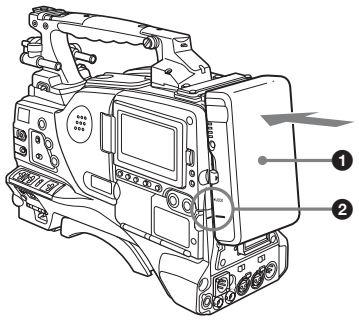
For details on the battery charging procedure, refer to the battery charger operation manual.

Note on using the battery pack

A warm battery pack may not be able to be fully recharged.

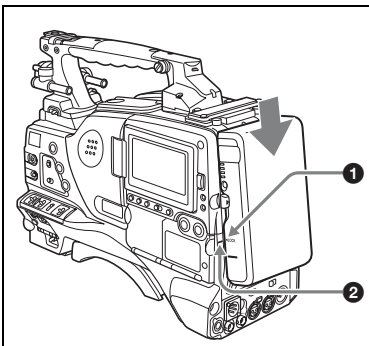
To attach the battery pack

1 Press the battery pack against the back of the camcorder, aligning the line on the side of the battery pack with the matching line on the camcorder.



❶BP-GL95/GL65/L60S/L80S
❷Align these lines.

2 Slide the battery pack down until its "LOCK" arrow points at the matching line on the camcorder.



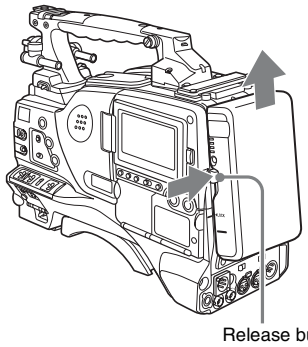
❶"LOCK" arrow
❷Matching line on the camcorder

Note

If the battery pack is not attached correctly, the terminal may be damaged.

To detach the battery pack

Holding the release button in, pull the battery pack up.



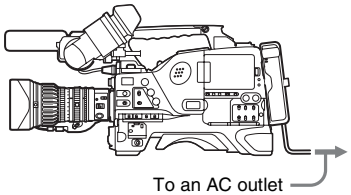
Notes

- During recording and playback, be careful never to remove the battery pack.
- Make sure to power the camcorder off before replacing the battery pack.

Using AC power

When using the AC-DN10 AC adaptor

Mount an AC-DN10 on the camcorder in the same way as a battery pack, then connect to the AC power supply.
The AC-DN10 can supply up to 100 W of power.



Attaching the Viewfinder

CAUTION

When the viewfinder is attached, do not leave the camcorder with the eyepiece facing the sun. Direct sunlight can enter through the eyepiece, be focused in the viewfinder and cause fire.

Note

The viewfinder is supplied separately.

Attaching the HDVF-20A/C35W

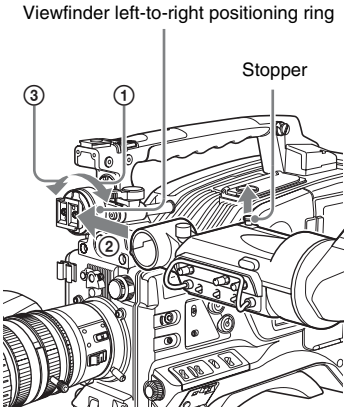
Note

When attaching the viewfinder, make notes of the following points.

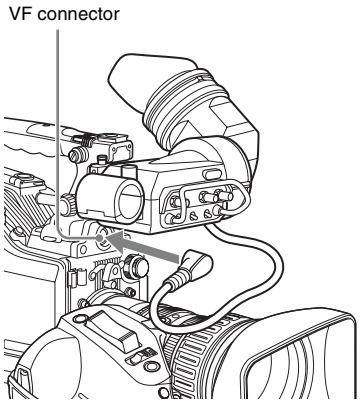
- Be sure to the power off the camcorder before coupling the viewfinder connector to the camcorder's VF connector. If you make this connection when the camcorder power is on, the viewfinder may not function properly.
- Couple the viewfinder connector firmly to the camcorder's VF connector. If the coupling is loose, noise may appear on the video or the tally indicator may not operate properly.

For more information about the connection of the viewfinder and camcorder, contact a Sony service representative.

1 ① Loosen the viewfinder left-to-right positioning ring, ② attach the viewfinder to the viewfinder fitting shoe, and ③ tighten the viewfinder left-to-right positioning ring.



2 Couple the viewfinder connector to the VF connector.

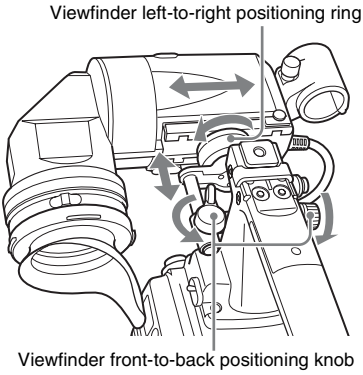


Detaching the viewfinder

You can carry out this by following the attaching procedure in reverse order, but there is an additional action to take: when detaching the viewfinder from the fitting shoe, pull up the stopper.

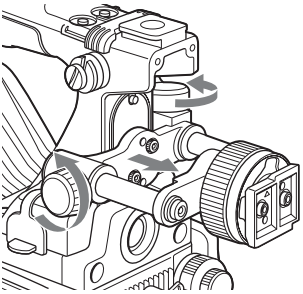
Adjusting the viewfinder position

To adjust the viewfinder left-right position, loosen the left-right positioning ring, and to adjust the front-back position, loosen the front-to-back positioning knob.

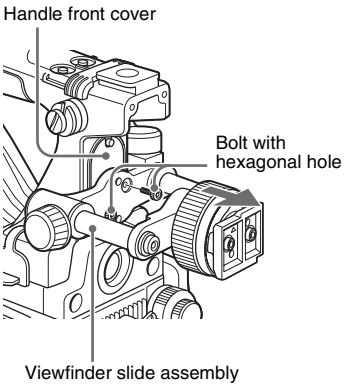


Moving the viewfinder shoe up

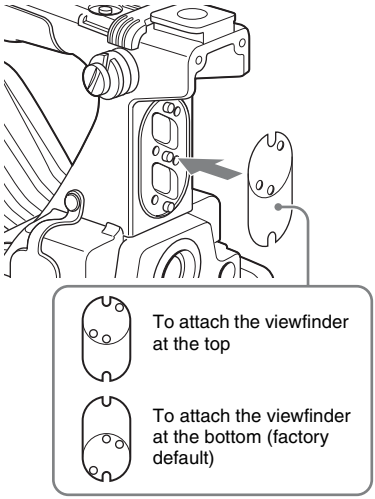
1 Loosen the viewfinder front-to-back positioning lever and the viewfinder front-to-back positioning knob, and then pull the viewfinder slide assembly forward.



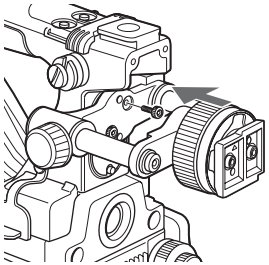
2 Using a 2.5 mm diameter hexagonal wrench, detach the viewfinder slide assembly and handle front cover.



3 Attach the handle front cover with the bottom edge up.

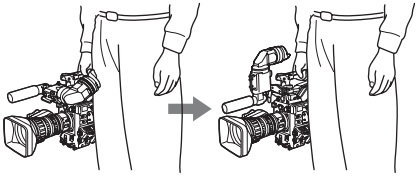


4 Attach the viewfinder slide assembly, reversing the steps of the removal procedure.



Using the BKW-401 Viewfinder Rotation Bracket

By fitting a BKW-401 Viewfinder Rotation Bracket (not supplied), you can rotate the viewfinder out of the way so that your right leg does not hit the viewfinder while you are carrying the camcorder.

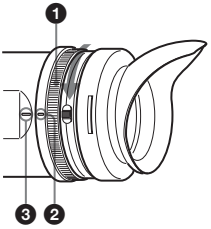


For details, refer to the operation manual for the BKW-401.

Detaching the eyepiece

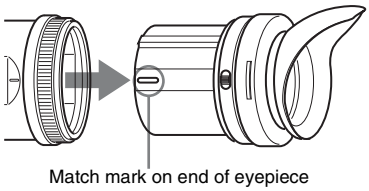
Removing the eyepiece gives a clearer view of the screen from further away. It is also easy to remove dust from the viewfinder screen and mirror when the eyepiece is detached.

1 Turn the eyepiece locking ring fully counterclockwise, to align the red marks on the locking ring and the viewfinder barrel.



❶Locking ring
❷Locking ring match mark
❸Match mark on the viewfinder barrel

2 Detach the eyepiece.



To reattaching the eyepiece

1 **Align the red marks on the eyepiece locking ring and the viewfinder barrel.**

2 **Align the red mark on the end of the eyepiece end with the red marks on the eyepiece locking ring and the viewfinder barrel. Then insert the eyepiece into the viewfinder barrel.**

3 **Turn the eyepiece locking ring clockwise until its "LOCK" arrow points at the red mark on the viewfinder barrel.**

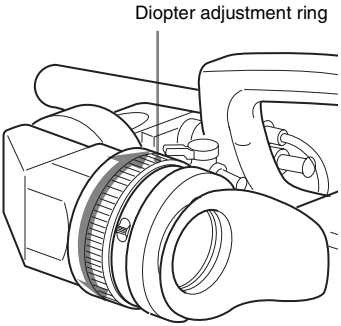
When the eyecup is worn out, replace it with a new one.

For details of a replacement eyecup, contact a Sony service representative.

Adjusting the viewfinder focus and screen

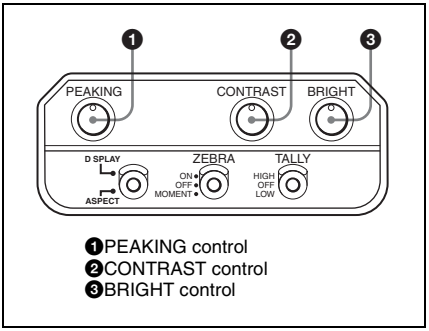
To adjust the viewfinder focus

Turn the diopter adjustment ring until the viewfinder image is sharpest.



To adjust the viewfinder screen

Adjust the brightness, contrast, and peaking of the viewfinder screen with the controls shown below.



❶PEAKING control
❷CONTRAST control
❸BRIGHT control

Setting the Date/Time of the Internal Clock

You can set or change the date and time of the internal clock. The date and time set are reflected in the timecode.
(How to select an item in the menu screen: Turn the MENU knob to move ➔ to the desired item.)

1 Display the TIME/DATE page of the DIAGNOSIS menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

```
 D02OTIME/DATE          TOP
➔ADJUST              ▷ EXEC

 HOUR                   12
 MIN                    55
 SEC                    58

 YEAR                   08
 MONTH                  03
 DAY                    31
```

2 Press the MENU knob.
The TIME ADJUST setting window appears.

```
      TIME ADJUST       ESC
 HOUR                   12
 MIN                    55
 SEC                    58

 YEAR                   08
 MONTH                  03
 DAY                    31

 OK
```

- HOUR: Sets the hour value.
- MIN: Sets the minutes value.
- SEC: Sets the seconds value.
- YEAR: Sets the year.
- MONTH: Sets the month.
- DAY: Sets the day.

3 Turn the MENU knob to move ➔ to the item you want to set, and press the MENU knob.
➔ on the left of the selected item changes to ● and ● on the left of the setting changes to **?**.

4 Turn the MENU knob to display the desired value, and press the MENU knob.
● changes to ➔ and **?** changes to ●.

5 To continue the remaining settings, repeat steps 3 and 4.

6 When you finish settings, turn the MENU knob to move ➔ to OK, then press the MENU knob.
The internal clock is set with the date and time set in steps **3** to **5**. The TIME/DATE page of the DIAGNOSIS menu appears again. The time set on the TIME ADJUST setting window is displayed.

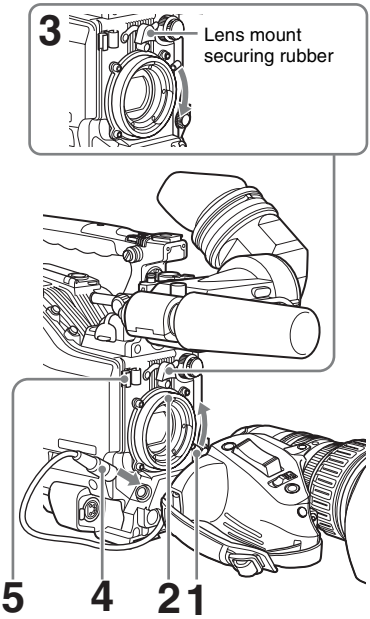
To cancel the setting

Before executing step **6**, move ➔ to ESC at the top right of the window and press the MENU knob.
Alternatively, flick the CANCEL/PRST / ESCAPE switch down to the ESCAPE side.
All settings or changes are discarded and the TIME/DATE page of the DIAGNOSIS menu appears.

Mounting the Lens

First power off the camcorder, and then mount the lens using the following procedure.

For information about using the lens, refer to the operation manual for the lens.



1 Push the lens locking lever up and remove the lens mount cap from the lens mount.

2 Align the center pin on the lens with the center slot in the lens mount, and insert the lens into the mount.

3 Holding the lens in place, push the lens locking lever down to lock the lens.

Caution

If the lens is not firmly locked, it may come off while the camcorder is being used. This could cause a serious accident. Make sure the lens is firmly locked. It is recommended that the lens mount securing rubber be put on the lens locking lever as illustrated above.

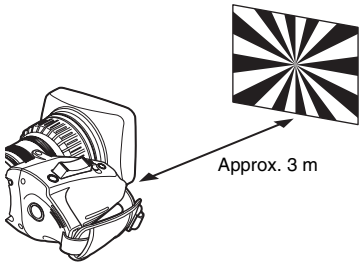
4 Connect the lens cable to the LENS connector.

5 Secure the lens cable with the cable clamps.

Adjusting the Flange Focal Length

If the lens does not stay in focus properly as you zoom from telephoto to wide angle, adjust the flange focal length (the distance from the plane of the lens mounting flange to the imaging plane). Make this adjustment after mounting or changing the lens.

The position of the controls for adjusting the flange focal length vary somewhat from lens to lens. Check the identification of the various controls in the lens manual.



1 **Set the iris to manual.**

2 **Open the iris. Place the flange focal length adjustment chart about 3 m (10 ft.) away from the camera, lit well enough to provide a satisfactory video output level.**

3 **Loosen the fixing screws on the F.f or F.B ring (flange focal length adjustment ring).**

4 **Use manual or power zoom to set the lens to telephoto.**

5 **Point the camera at the chart by turning the focus ring and focus on it.**

6 **Set the zoom ring to wide angle.**

7 **Turn the F.f or F.B ring until the chart is in focus, being careful not to disturb the focus ring.**

8 **Repeat steps 4 to 7 until the chart stays in focus all the way from wide angle to telephoto.**

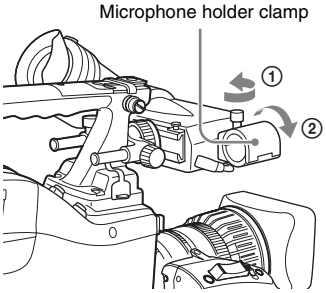
9 **Tighten the F.f or F.B ring fixing screws.**

Preparing the Audio Input System

Connecting a microphone to the MIC IN connector

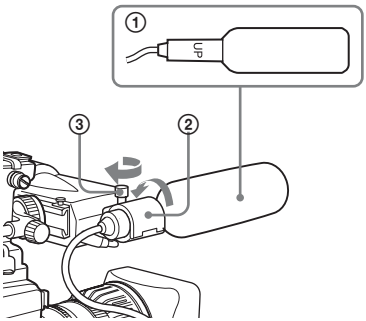
The MIC IN connector of this unit has an XLR 5-pin connector (female) for attaching a stereo microphone.

1 Loosen the screw and open the microphone holder clamp.



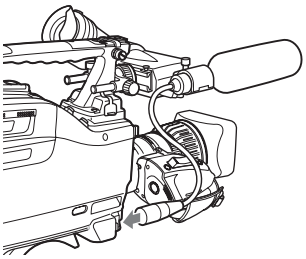
2 Place the microphone in the microphone holder.

① Place the microphone in the holder so that “UP” is at the top.
② Close the microphone holder.
③ Tighten the screw.



On how to perform this operation, refer to the operation manual for the microphone.

3 Plug the microphone cable into the MIC IN connector, then set the AUDIO IN switch for the channel on which you want to record the audio from this microphone to FRONT (for CH-1/CH-2) or F (for CH-3/CH-4).



Recording stereo sound

To record the L and R audio signals of stereo sound in channels 1 and 2, set both AUDIO IN CH-1 and CH-2 switches to FRONT.
To record the L and R audio signals of stereo sound in channels 3 and 4, set both AUDIO IN CH-3 and CH-4 switches to F.
Confirm that FRONT MIC SELECT on the SOURCE SEL page of the OPERATION menu is set to STREO (stereo).

Recording monaural sound

Set the appropriate AUDIO IN CH-1, CH-2, CH-3 and/or CH-4 switch(es) corresponding to the channel(s) to which you want to record to FRONT or F.
Set FRONT MIC SELECT to MONO.

4 Secure the microphone cable with the cable clamps.

Connecting microphones to the AUDIO IN connectors

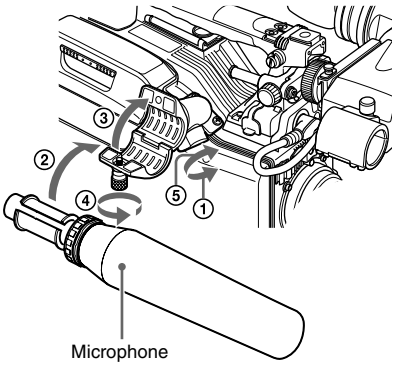
You can connect up to two monaural microphones to the AUDIO IN CH1/CH2 connectors, using a CAC-12 Microphone Holder (not supplied).
The following is the procedure for attaching an electret condenser microphone such as the ECM-674/678.

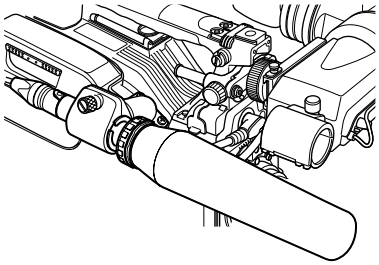
On how to attach the CAC-12, refer to the operation manual for the CAC-12.

1 Attach the electret condenser microphone.

① Loosen the ball joint lock lever.
② Place the microphone in the holder so that "UP" is at the top.
③ Close the microphone holder.
④ Tighten the screw.
⑤ Position so that the microphone does not interfere with the viewfinder and tighten the ball joint lock lever.

When attaching the ECM-674/678, use the microphone adaptor supplied with the CAC-12 Microphone Holder.



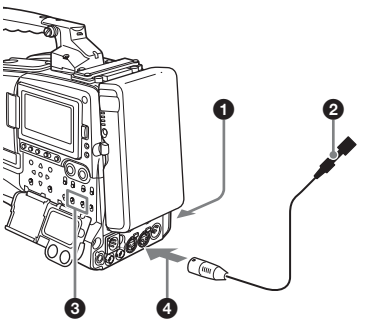


2 Connect the microphone cable to the AUDIO IN CH1 or CH2 connector.

3 Set the switches as follows.

Set the LINE / AES/EBU / MIC switch to MIC.

- Set the +48V/OFF switch as indicated below, depending on the power supply type of the microphone.
  Internal power supply: Set the +48V/OFF switch to OFF.
  External power supply: Set the +48V/OFF switch to +48V (ON).
- Set the AUDIO IN (CH-1/CH-2/CH-3/CH-4) switch for the channel to which the microphone is connected to REAR (for CH-1/CH-2) or R (for CH-3/CH-4).



4 Switch the input level to match the sensitivity of the microphone used.

Switch the input level by changing the REAR MIC REF setting on the AUDIO 1 page of the MAINTENANCE menu (factory default setting is –60 dB). *For details, see page 105.*

XLR connection automatic detection function

With the XLR connection automatic detection function being on, when a cable is connected to the AUDIO IN CH1 or CH2 connector, the input from that connector is automatically selected for audio recording, regardless of the setting of the AUDIO IN CH-1 or CH-2 switch.
The XLR connection automatic detection function can be switched on or off on the AUDIO 1 page of the MAINTENANCE menu, with the REAR XLR AUTO item.

Notes

- If the input level on this unit is not at an appropriate setting for the microphone sensitivity, loud sounds may be distorted, and the signal-to-noise ratio may be affected.
- In order for the AUDIO IN CH1 and CH2 connectors on the camcorder to be able to provide a phantom 48 V power supply, female XLR connectors (3-pin) are fitted. If the microphone cable has a female connector, use an adaptor.

- When you detach a CAC-12 Microphone Holder once you have attached to the camcorder, be careful not to lose the two screws fixing the CAC-12 (in step **1**). After detaching the CAC-12, be sure to put the two screws back into their original places.

Attaching a UHF portable tuner (for a UHF wireless microphone system)

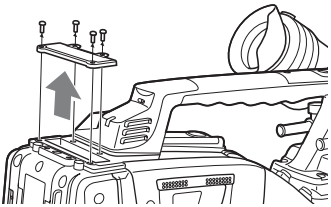
To use a Sony UHF wireless microphone system, fit one of the following UHF portable tuners.

- DWR-S01D Digital Wireless Receiver
- WRR-855S UHF Synthesized Tuner Unit
- WRR-860A/861/862 UHF Synthesized Diversity Tuner

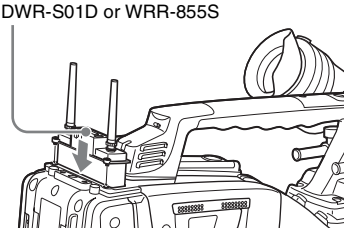
For details of these units, refer to the operation manuals for them.

To fit the DWR-S01D/WRR-855S

1 Remove the four fixing screws holding the cover of the portable tuner/receiver housing slot located in the rear of this unit, to remove the cover.



2 Insert the DWR-S01D or WRR-855S into the housing slot, and fasten the four fixing screws.



3 Set the AUDIO IN switch *(see page 24)* for the channel to which you want to input audio signal to W (WIRELESS).

Notes

- When the XLR connection automatic detection function is on, even if the AUDIO IN CH-1 or CH-2 switch is set to WIRELESS, the signal input to the AUDIO IN CH1 or CH2 connector is automatically selected when an audio cable is connected to the AUDIO IN CH1 or CH2 connector. In such a case, set REAR XLR AUTO to OFF on the AUDIO-1 page of the MAINTENANCE menu. (The factory default setting is OFF.)
- When the LINE / AES/EBU / MIC switch is set to LINE or MIC, the audio signals recorded on audio channels 3 and 4 are not affected by the XLR automatic detection function. They are determined by the settings of the AUDIO IN CH-3 and CH-4 switches.
- When you use the DWR-S01D Digital Wireless Receiver in combination with this camcorder, you need to check both of their versions.

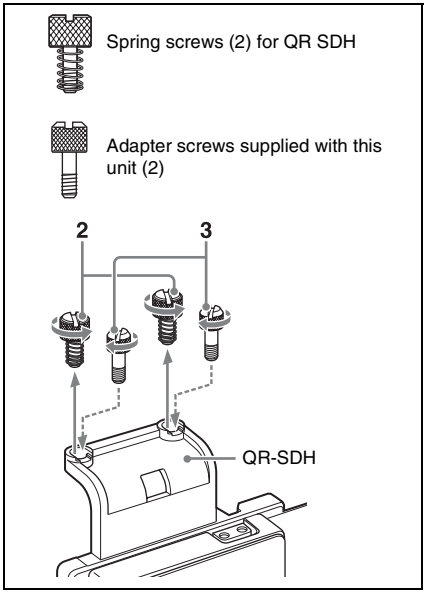
  Consult a Sony representative for information about these versions.

To users of the Anton Bauer QR-SDH

Note

If you attempt to mount a UHF portable tuner (such as the WRR-855S) with the Anton Bauer QR-SDH Gold Mount Battery Adapter (hereafter referred to as the QR-SDH) already mounted, the spring screws of the QR-SDH interfere with the tuner, preventing proper mounting. Instead of trying to mount the tuner forcibly, mount it after exchanging the spring screws for the adapter screws supplied with this unit.

To exchange the screws



1 If the QR-SDH is already mounted on this unit, remove it.

2 Remove the two spring screws by pulling up while rotating.
Save the removed spring screws for later use.

3 Screw the two adapter screws supplied with this unit into the QR-SDH.

4 Mount the QR-SDH on this unit.

To fit the WRR-862 (when using a BP-GL65/GL95/L60S/L80S Battery Pack)

1 Attach the WRR tuner fitting (not supplied; service part number: A-8278-057-B) to the back of the camcorder.

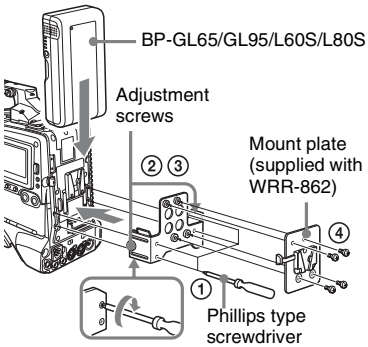
① Use a Phillips type screwdriver to tighten the four screws placed in the tuner fitting. For three of these screws, insert the screwdriver through the corresponding hole and tighten the screw.

Note

Make sure that all four screws are fully tightened.

② Loosen the adjustment screws on the tuner fitting.
③ Adjust the tuner fitting position for a BP-GL65/GL95/L60S/L80S Battery Pack to be attached, and tighten the adjustment screws to fix its position.
④ Attach the mount plate supplied with the WRR-862.

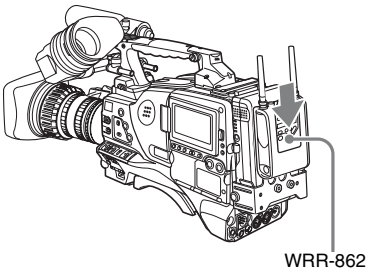
About the WRR tuner fitting (service part number: A-8278-057-B), contact a Sony service or sales representative.



2 Attach the battery pack.

On how to attach the battery pack, see "To attach the battery pack" on page 31.

3 Mount the tuner on the WRR tuner fitting.

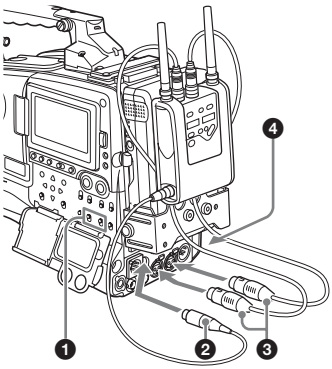


4 Connect the tuner power cord to the DC OUT connector of the camcorder, and the audio output cable to the AUDIO IN CH1 or CH2 connector.

5 **Set the switches as follows.**

- Set the LINE / AES/EBU / MIC switch for the channel to which the audio output cable is attached to MIC. Also, set the +48V/OFF switch to OFF.
- Set the AUDIO IN (CH-1/CH-2/CH-3/CH-4) switch for the channel to which the audio output cable is connected to REAR (for CH-1/CH-2) or R (for CH-3/CH-4).

However, this setting is not needed if the automatic XLR connection detection function is ON, because the audio to record will be detected automatically.



❶AUDIO IN CH-1/CH-2 switches
❷To DC OUT connector
❸To AUDIO IN CH1 or CH2 connector
❹LINE / AES/EBU / MIC switch

Connecting line input audio equipment

Connect the audio output connector of the audio equipment that supplies the line input signal to the AUDIO IN CH1 or CH2 connector.

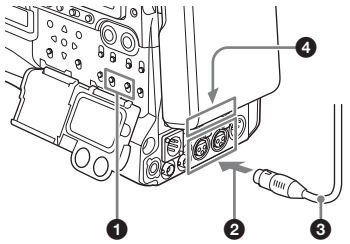
Switch settings

Set the LINE / AES/EBU / MIC switch for the channel to which the audio signal source is connected to LINE.

Selecting the audio inputs to be recorded

- If the XLR automatic detection function is set to OFF (factory default), set the AUDIO IN CH-1/CH-2/CH-3/CH-4 switches for the channels to which the audio equipment is connected. Set the switches to REAR (channels 1 and 2) or R (channels 3 and 4).
- When the XLR connection automatic detection function is set to on: When a cable is connected to the AUDIO IN CH1 or CH2 connector, the input from that connector is automatically selected for audio recording, regardless of the setting of the AUDIO IN CH-1 or CH-2 switch.

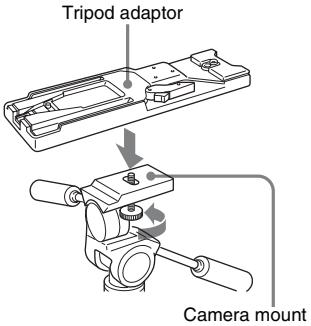
The XLR connection automatic detection function can be switched on or off on the AUDIO 1 page of the MAINTENANCE menu, with the REAR XLR AUTO item.



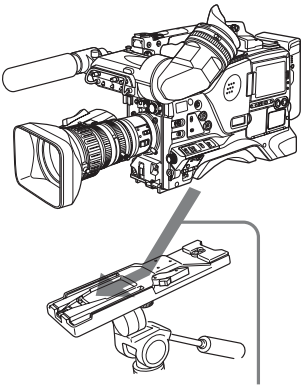
❶AUDIO IN CH-1/CH-2 switches
❷To AUDIO IN CH1 or CH2 connector
❸Audio equipment
❹LINE / AES/EBU / MIC switch

Tripod Mounting

1 Attach the VCT-14 tripod adaptor (not supplied) to the tripod.

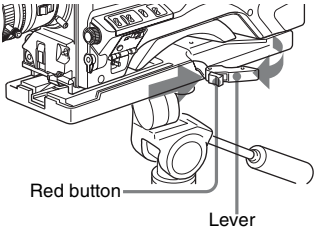


2 Mount the camcorder on the tripod adaptor.



To remove the camcorder from the tripod adaptor

Hold down the red button and pull the lever in the direction of the arrow.



Note

The tripod adaptor pin may remain in the engaged position even after the camcorder is removed. If this happens, press the red button against the lever a second time and move the lever as shown above until the pin returns to the stowed position. If the pin remains in the engaged position, you will not be able to mount the camcorder on the tripod adaptor.

Connecting a Video Light

With this camcorder, you can use the Anton Bauer Ultralight 2 or equivalent video light (powered by 12 V with maximum power consumption of 50 W).

- If you connect the video light to the LIGHT connector on the camcorder and set the LIGHT switch to AUTO, you can turn the light on and off automatically as you start and stop the VTR operation.
- The output of the LIGHT connector on the camcorder is controlled to 12 V even when the camcorder is supplied with over 12 V power (through the DC IN connector or battery pack). The brightness or color temperature of the light will not change according to voltage increase.

Notes

- Do not use a video light with power consumption of over 50 W.
- The brightness or color temperature of the light will change when the voltage (supplied through the DC IN connector or from the battery pack) is under 12 V.

To attach the video light

Fit the video light to the accessory fitting shoe on the camcorder grip, and connect the video light cable to the LIGHT connector.

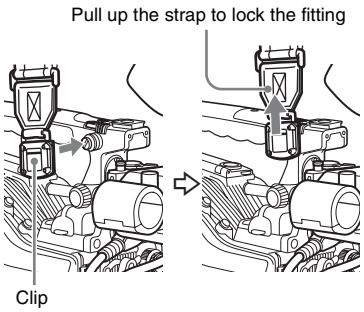
Note

The accessory fitting shoe on this unit is of the 1/4-inch tapped hole type. If you want to replace this with a slide-type shoe, contact a Sony service representative.

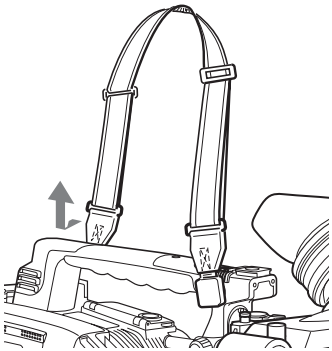
Using the Shoulder Strap

To attach the shoulder strap

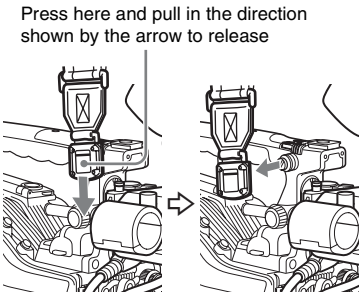
1 Fit one of the clips to a shoulder strap fitting.



2 Fit the other clip to the shoulder strap fitting on the other side of the grip in the same way as in step 1.

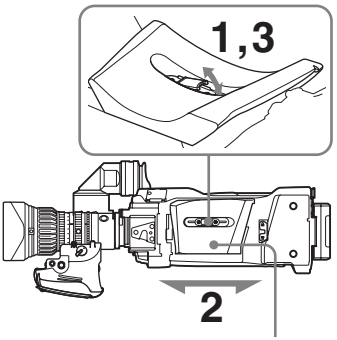


To remove the shoulder strap



Adjusting the Shoulder Pad Position

You can shift the shoulder pad from its center position (the factory default setting) backward by up to 10 mm (3/8 inch) or forward by up to 25 mm (1 inch). This adjustment helps you get the best balance for shooting with the camcorder on your shoulder.



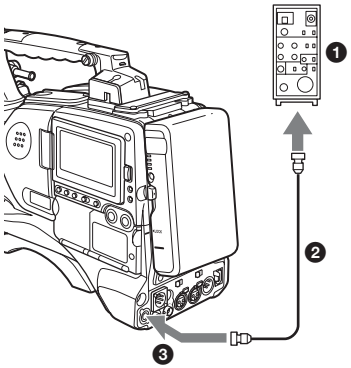
1 **Raise the lever in the center of the shoulder pad to unlock the shoulder pad.**

2 **Slide the shoulder pad backward or forward until it is in the most convenient position.**

3 **Bring down the lever to lock the shoulder pad in the selected position.**

Connecting the Remote Control Unit

Connecting the RM-B150/B750 Remote Control Unit enables remote control of the principal camera functions.
Connecting the remote control unit to the REMOTE connector (8-pin) automatically puts the camcorder into remote control mode. If you disconnect the remote control unit, the remote control mode is cancelled.



❶RM-B150/B750
❷Remote control cable
❸REMOTE connector

Camcorder switch functions when the remote control unit is connected

The following switches on the camcorder do not function.

- GAIN selector
- OUTPUT/DCC switch
- WHITE BAL switch
- AUTO W/B BAL switch
- SHUTTER selector
- ASSIGN 1/3/4/5 switches and RET button on the lens to which the TURBO SWITCH function is assigned
- REC START button (and the recording start/stop buttons on the lens, and the ASSIGN 1/3/4/5 switches and RET button on the lens to which the recording start/stop function is assigned) (when the RM REC START item on the CAM CONFIG 2 page of the MAINTENANCE menu is set to RM)
- ASSIGN 1/3/4/5 switches and RET button on the lens to which the electrical CC filter function is assigned.

Paint adjustment when the remote control unit is connected

The settings of the paint adjustment that were in effect the last time the remote control unit was used are recalled.

Function of the recording start/stop buttons when the remote control unit is connected

When the remote control unit is connected, you can make a setting to determine which of the recording start/stop buttons you will use. This setting is made using the RM REC START item on the CAM CONFIG 2 page of the MAINTENANCE menu.

Relationship between the setting of the RM REC START item and the function of recording start/stop buttons

Recording start/stop button	Settings of RM REC START		
	RM	CAM	PARA
Camcorder's REC START button	Disabled	Enabled	Enabled
Lens' VTR button	Disabled	Enabled	Enabled
Camcorder's ASSIGN 1/3/4/5 switches and lens' RET button assigned the recording start/stop function	Disabled	Enabled	Enabled
Remote control unit's VTR button	Enabled	Disabled	Enabled

When the monitor is connected to the MONITOR OUT connector of the remote control unit

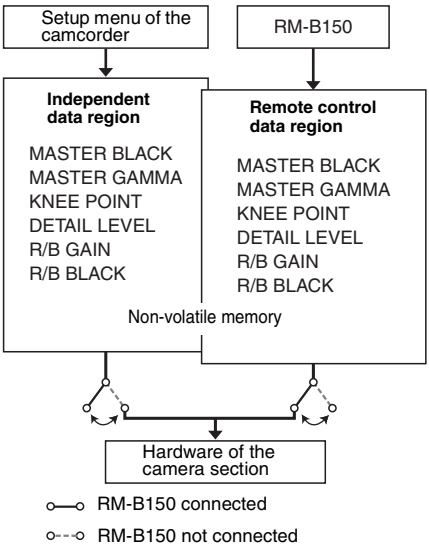
The MONITOR connector (BNC type) of the RM-B150/B750 outputs the same signal as that from the TEST OUT connector on the camcorder. Use the black cable supplied with the RM-B150/B750 to connect the monitor to the MONITOR connector on the RM-B150/B750.

When the remote control unit is disconnected from the camcorder

The camcorder settings return to the settings in effect before the remote control unit was connected.

Structure of the paint adjustment data

The non-volatile memory of the camcorder used for storing paint adjustment data consists of two regions as shown below: one is the “independent data region” that is used when a remote control unit is not connected, and the other is the “remote control data region” that is used when a remote control unit is connected. Paint adjustment data is automatically selected and output to the camera section depending on whether or not a remote control unit such as the RM-B150 is connected.



Thus, when a remote control unit is connected to the camcorder, the effective data region is switched to the “remote control data region” and the settings of the paint adjustment that were in effect the last time the remote control unit was used are recalled.

The settings of the absolute value rotational controls [1)] and absolute value switches [2)] are overwritten by those on the remote control unit after the remote control unit is connected.

When the remote control unit is disconnected from the camcorder, the “independent data region” becomes effective. Thus the camcorder will return to the settings that were in effect before the remote control unit was connected.

1) **Absolute value rotational controls:** The data corresponding to the angular position of controls is output. Rotational controls for which the data corresponding to the amount of their rotation is output are called relative value controls.
2) **Absolute value switches:** Like toggle switches or slide switches (except momentary switches), the switches (or knobs) whose positions must coincide with their functions are called absolute value switches.

When RM COMMON MEMORY is set to ON on the CAM CONFIG 2 page of the MAINTENANCE menu, you can use settings of the paint adjustment data stored in the independent data region even if you connect the remote control unit. In this case, the settings stored in the independent data region will be renewed when you change the settings on the remote control unit. Thus, the settings of the paint data made with the remote control unit can be retained even if the remote control unit is removed. However, if the switch position on the remote control unit differs from the one on the camcorder, the switch position on the camcorder takes precedence over that on the remote control unit.

Also, it is possible to keep the settings that are in effect before you connect the remote control unit. In this case, you should set the control knob to the relative value mode on the remote control unit.

For details, refer to the operation manual supplied with the remote control unit.

Chapter 3 Adjustments and Settings for Shooting

Adjusting the Black Balance and the White Balance

To ensure excellent image quality when using this camcorder, conditions may require that both the black balance and the white balance be adjusted.

Black balance adjustment

The black balance will require adjustment in the following cases.

- When the camcorder is used for the first time
- When the camcorder has not been used for a long time
- When the camcorder is used under conditions in which the surrounding temperature has changed greatly
- When the GAIN selector (L/M/H) values have been changed by using the USER menu

It is not usually necessary to adjust the black balance when using the camcorder after it has been off.

White balance adjustment

Always readjust the white balance when the lighting conditions change.

Viewfinder screen displays

If the black balance or white balance adjustment is started, messages that report on the progress and results are displayed on the viewfinder screen when the VF DISP MODE item is set to 2 or 3 on the VF DISP 1 page of the USER menu.

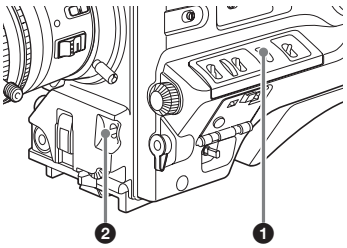
Note

Black balance and white balance adjustment values that are automatically set by the camcorder and the various settings are stored in the camcorder memory and retained even when the power is turned off.

Adjusting the black balance

In automatic black balance mode, adjustments are performed in the following order: black set and black balance. Manual black balance adjustment can be selected from the setup menu.

For details of manual black balance adjustment, refer to the Maintenance Manual.

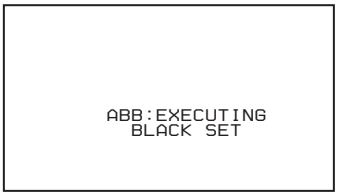


❶OUTPUT/DCC switch
❷AUTO W/B BAL switch

1 Set the OUTPUT/DCC switch to CAM.

2 Flick the AUTO W/B BAL switch to BLK and release the switch.

The switch returns to the center position, and the adjustment is executed.
During adjustment, the following message is displayed on the viewfinder screen.



The black balance adjustment ends in a few seconds with the message “ABB:OK” and the adjustment value is automatically stored in memory.

Notes

- During the black balance adjustment, the iris is automatically closed.
- During the black balance adjustment, the gain selection circuit is automatically activated so you may

see flickering on the viewfinder screen, but this is not a fault.

If automatic black balance adjustment cannot be made

If the black balance adjustment cannot be completed normally, an error message will appear for about 3 seconds on the viewfinder screen. Possible messages are listed below.

Error message	Meaning
ABB : NG IRIS NOT CLOSE	The lens iris did not close; adjustment was impossible.
ABB : NG TIME LIMIT	Adjustment could not be completed within the standard number of attempts.
ABB : NG OVERFLOW	The difference between the reference value and the current value is so great that it exceeds the range. Adjustment was impossible.

If any of the above error messages is displayed, retry the black balance adjustment.
Keep pushing the AUTO W/B BAL switch to BLK. If the error message occurs again, an internal check is necessary.

For information about this internal check, refer to the Maintenance Manual.

Note

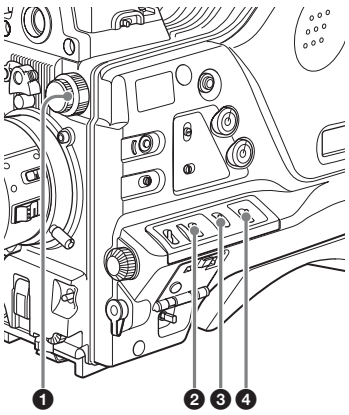
If the lens cable is not firmly connected to the LENS connector, it may not be possible to adjust the lens iris. If this happens, the black balance will be incorrect.

Black balance memory

Values stored in memory are held until the black balance is next adjusted.

Adjusting the white balance

1 Set the switches and selectors as shown in the figure below.



❶FILTER selector
❷GAIN selector: Set as low as possible.
❸OUTPUT/DCC switch: CAM
❹WHITE BAL switch: A or B a)

a) White balance setting values are stored in memory B only when the WHITE SWITCH <B> item is set to MEM on the WHITE SETTING page of the OPERATION menu.

If the setting of the GAIN selector or WHITE BAL switch is changed, a message reporting the new setting position appears for about 3 seconds in the setting change and adjustment progress message display area of the viewfinder screen.

2 Set the FILTER selector to suit the lighting conditions as follows.

The possible settings of the FILTER selector and their corresponding filters to be selected are listed below.

FILTER selector (outer knob) setting and CC filter selection

FILTER selector (outer knob) setting	CC filter selection
A	Cross filter
B	3200K
C	4300K
D	6300K

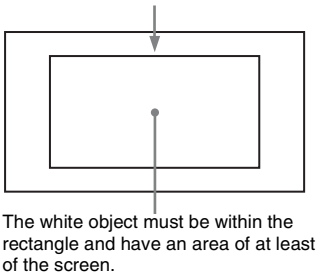
FILTER selector (inner knob) setting and ND filter selection

FILTER selector (inner knob) setting	ND filter
1	CLEAR
2	1/4 ND
3	1/16 ND
4	1/64 ND

If the setting of the FILTER selector is changed, a message reporting the setting appears for about 3 seconds in the setting change and adjustment progress message display area of the viewfinder screen.

3 Place a white test card under the same lighting conditions as for the subject to be shot and zoom up to it.

Alternatively, any white object such as a cloth or a wall can be used.
The absolute minimum white area is as follows.



Note

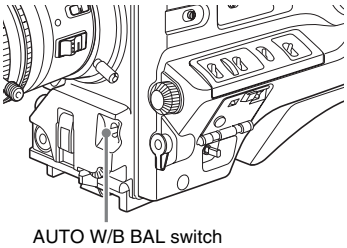
Make sure there are not bright spots in the rectangle.

4 Adjust the lens iris.

Manually adjusted lens: set the iris to an appropriate setting.

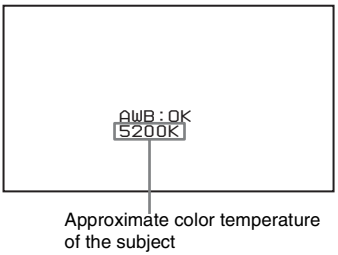
Lens with automatic iris: set the automatic/manual switch on the lens to automatic.

5 Flick the AUTO W/B BAL switch to WHITE and then release the switch.



The switch returns to the center position, and the adjustment is executed.

The white balance adjustment ends in about one second with the message shown in the following figure, and the adjustment setting is automatically stored in the memory (A or B) that was selected in step **1**.



Note

If the camera has a zoom lens with an automatic iris, the iris may hunt [1] during the adjustment. If this occurs, adjust the iris gain of the lens.

For details, refer to the lens operation manual.

1) **Hunting:** Repeated brightening and darkening of the image, resulting from repeated response to automatic iris control.

If the automatic white balance adjustment cannot be made

If the white balance adjustment cannot be completed normally, an error message will appear for about 3 seconds on the viewfinder screen. Possible messages are listed below.

Error message	Meaning
WHITE : NG LOW LEVEL	The white video level is too low. Either open the lens iris or increase the gain.
WHITE : NG COLOR TEMP HIGH	The color temperature is too high.
WHITE : NG COLOR TEMP LOW	The color temperature is too low.
WHITE : NG TIME LIMIT	Adjustment could not be completed within the standard number of attempts.
WHITE : NG POOR WHITE AREA	The white area could not be checked.
WHITE : NG OVER LEVEL	The white video level is too high. Either stop down the lens iris or change the ND filter.

If any of the above error messages is displayed, retry the white balance adjustment. If the error message occurs again, an internal check is necessary.

For information about this internal check, refer to the Maintenance Manual.

White balance memory

Values stored in memory are held until the white balance is next adjusted.

There are two sets of white balance memories, A and B, and adjustments for each of the CC filters can be automatically stored in the memory corresponding to the setting (A or B) of the WHITE BAL switch. The camcorder has four built-in CC filters, so a total of eight (4 × 2) adjustments can be stored. The number of memories allocated to each of A and B can be limited to one by setting the FILTER WHT MEM item to OFF on the WHITE SETTING page of the OPERATION menu. In this case, the memory contents are not linked to the CC filter settings.

If the WHITE BAL switch is set to B, and on the WHITE SETTING page of the OPERATION menu, the WHITE SWITCH <B> item is set to ATW, the ATW function is activated to automatically adjust the white balance of the picture being shot for varying lighting conditions.

Setting the Electronic Shutter

Shutter modes

The shutter modes that can be used with the electronic shutter and the shutter speeds that can be selected are listed below.

Standard mode:

For shooting fast-moving objects with little blurring.

Frame frequency	Shutter speed (sec.)
59.94i	$^1/_{100}$, $^1/_{125}$, $^1/_{250}$, $^1/_{500}$, $^1/_{1000}$, $^1/_{2000}$
50i	$^1/_{60}$, $^1/_{125}$, $^1/_{250}$, $^1/_{500}$, $^1/_{1000}$, $^1/_{2000}$
25PsF (HDW-650P only)	$^1/_{33}$, $^1/_{50}$, $^1/_{100}$, $^1/_{250}$, $^1/_{500}$, $^1/_{1000}$, $^1/_{2000}$
23.98PsF (HDW-650F only)	$^1/_{32}$, $^1/_{48}$, $^1/_{50}$, $^1/_{60}$, $^1/_{96}$, $^1/_{125}$, $^1/_{250}$, $^1/_{500}$, $^1/_{1000}$, $^1/_{2000}$

ECS (Extended Clear Scan) mode:

For obtaining images with no horizontal bands of noise when shooting subjects such as monitor screens.

Frame frequency	Shutter speed
59.94i	60.00 to 4300 Hz
50i	50.00 to 4700 Hz
25PsF (HDW-650P only)	25.00 to 2300 Hz
23.98PsF (HDW-650F only)	24.00 to 2200 Hz

SLS (Slow Speed Shutter) mode:

Select this mode for shooting subjects in low level lighting conditions.

SYSTEM LINE setting	Shutter speed (unit: frames)
1080	2, 3, 4, 5, 6, 7, 8, 16, 32

Notes

- Whatever the operating mode of the electronic shutter, the sensitivity of the CCD decreases with increasing shutter speed.
- When the automatic iris is used, the iris opens wider as the shutter speed increases, thus reducing the depth of field.
- Under artificial light, particularly fluorescent or mercury lamps, the light intensity may appear to be constant, but the red, green, and blue intensities are actually changing in synchronization with the frequency of the power supply causing flicker. Using an electronic shutter under such lighting could make the flicker even worse. Color flicker is particularly likely to happen when the power supply frequency is 60 Hz. However, if the power frequency is 50 Hz, setting the shutter speed to 1/100 can reduce this flicker.
- When a bright object is shot in ECS mode in such a manner that it fills the screen, the upper edge of the picture may have poor quality because of an inherent characteristic of CCDs. Before using ECS mode, check the shooting conditions.

Selecting the shutter mode and shutter speed

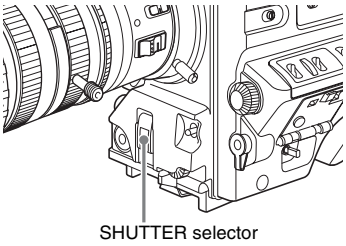
Use the SHUTTER selector to select a shutter mode or a standard-mode shutter speed. To set the shutter speed in ECS/SLS mode, with the SHUTTER selector set to ON and the ECS/SLS mode selected, use the MENU knob for adjustment.
You can use the SHT ENABLE page of the OPERATION menu to narrow the range of choice in advance.

Setting the shutter mode and standard-mode shutter speed

Once the shutter speed is selected, it is retained even when the camcorder power is turned off.

1 Follow the procedure described in "Selecting the display items" on page 130 to set the VF DISPLAY MODE item to 2 or 3 on the VF DISP 1 page of the USER menu.

2 Flick the SHUTTER selector from ON to SELECT.



The current shutter setting indication appears for about 3 seconds in the setting change and adjustment progress message display area of the viewfinder screen.
Examples: ": SHUTTER : 1/250", ": ECS : 60.00 Hz"

3 Before the shutter setting indication disappears, flick the SHUTTER selector down to SELECT again and repeat this until the desired mode or speed appears.

Pushing the SHUTTER selector down to SELECT repeatedly allows you to cycle through the settings of mode and speed preselected on the SHT ENABLE page of the OPERATION menu.
Note that all modes and all standard-mode speeds listed in the table on page 52 are preselected using the SHT ENABLE page of the OPERATION menu.
By factory default, all available shutter modes and shutter speeds are displayed in the sequence shown in the following figure. (You can use the SHT ENABLE page of the OPERATION menu to make a setting so that only the desired (or most frequently used) modes and speeds are displayed.)

Shutter speeds in standard mode can also be switched to angle display by using SHT DISP MODE in the CAM CONFIG 2 page of the MAINTENANCE menu.

Setting the shutter speed in ECS/SLS mode

1 Set the shutter speed mode to ECS/SLS (see the previous item).

2 Turn the MENU knob clockwise or counterclockwise until the desired frequency appears.

When the RM-B150 Remote Control Unit is connected

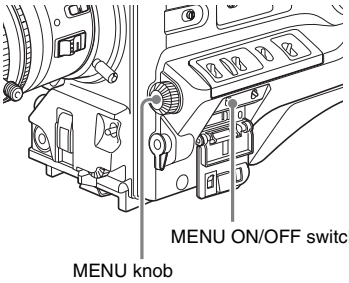
You can set the shutter speed of ECS/SLS with the rotary encoder of the RM-B150.

Changing the range of choice of shutter mode and speed settings

You can reduce the time required to select the shutter mode and speed by narrowing the choice of settings in advance. This can be done by using the SHT ENABLE page of the OPERATION menu.

Note

The settings selected on the SHT ENABLE page of the OPERATION menu become invalid when the RM-B150 Remote Control Unit is connected to the camcorder.



(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the SHT ENABLE page of the OPERATION menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

```
 022OSHT ENABLE

➧SHUTTER SLS        ●     ON
 SHUTTER ECS              ON
 SHUTTER 1/100            ON
 SHUTTER 1/125            ON
 SHUTTER 1/250            ON
 SHUTTER 1/500            ON
 SHUTTER 1/1000           ON
 SHUTTER 1/2000           ON
```

2 Turn the MENU knob to move ➧ to the shutter mode or shutter speed you want, then press the MENU knob.

➧ on the left of the selected item changes to ● and ● on the left of the setting changes to **?**.

3 Turn the MENU knob until ON appears, then press the MENU knob.

● on the left of the selected item changes to ➧ and **?** on the left of the setting changes to ●.

To set another mode or speed, return to step **2**.

Note that only the shutter speeds set to ON can be selected with the SHUTTER selector.

4 To end the menu operation, set the MENU ON/OFF switch to OFF or close the cover of the menu operating section.

The menu disappears from the screen and the display indicating the current status of the camcorder appears along the top and bottom of the viewfinder screen.

Changing the Reference Value for Automatic Iris Adjustment

The reference value for automatic iris adjustment can be changed to aid the shooting of clear pictures of back-lit subjects, or to prevent blown-out highlights. The reference value for the lens iris can be set within the following range with respect to the standard value.

- 0.25 to 1 (increasing by increments of 0.25): About 0.25 to 1 stop further open
- –0.25 to –1 (decreasing by increments of 0.25): About 0.25 to 1 stop further close

Also you can set the area where light detection occurs.

Changing the reference value

(How to select an item in the menu screen: Turn the MENU knob to move ➔ to the desired item.)

1 Display the AUTO IRIS page of the OPERATION menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

```
 017OAUTO IRIS

➔IRIS OVERRIDE   :●   OFF
 IRIS SPEED      :      0
 CLIP HIGH LIGHT :    OFF

 IRIS WINDOW     :      1
 IRIS WINDOW IND :    OFF
 IRIS VAR WIDTH  :    245
 IRIS VAR HEIGHT :     72
 IRIS VAR H POS  :      0
 IRIS VAR V POS  :      0
```

2 Check that the ➔ mark is at the IRIS OVERRIDE position, and then press the MENU knob.

➔ on the left of the selected item changes to ● and ● on the left of the setting changes to **?**.

3 Turn the MENU knob until ON appears, then press the MENU knob.

● on the left of the selected item changes to ➔ and **?** on the left of the setting changes to ●.

The IRIS OVERRIDE item is set to ON.

4 Set the MENU ON/OFF switch to OFF.

The AUTO IRIS page disappears from the screen.

5 Turn the MENU knob to change the reference value.

The changed reference value is retained until the power of the camcorder is turned off.

Even if the reference value is changed, it reverts to the standard value every time the power is turned on.

To make the iris more open

Turn the MENU knob counterclockwise as seen from the front of the camera.

The iris stop indicators as shown in the following table appear in the upper part to the left of the F number in the iris indication.

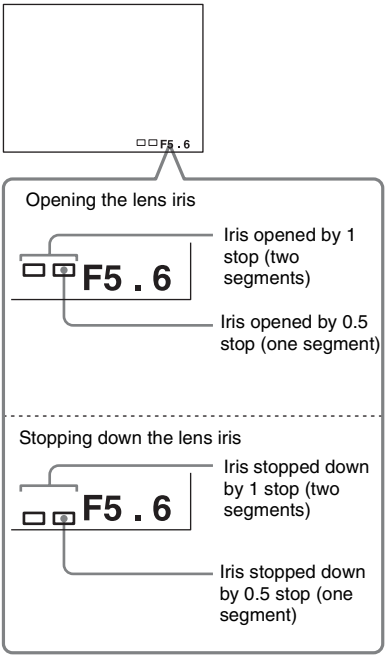
Iris stop	Indicator
+0.25	■
+0.5	□
+0.75	■□
+1	□□

To stop down the iris

Turn the MENU knob clockwise as seen from the front of the camera.

The iris stop indicators as shown in the following table appear in the lower part to the left of the F number in the iris indication.

Iris stop	Indicator
–0.25	■
–0.5	□
–0.75	■□
–1	□□



When the RM-B150 Remote Control Unit is connected

The IRIS control knob of the RM-B150 can be used for lens iris setting. In this case, the indicator is not displayed.

Selecting the automatic iris window

1 Follow the procedure of steps 1 and 2 described in the previous item to display the AUTO IRIS page.

2 Turn the MENU knob to move ➧ to IRIS WINDOW IND, then press the MENU knob.

➧ on the left of IRIS WINDOW IND. changes to ● and ● on the left of the setting changes to **?**.

3 Turn the MENU knob until ON appears, then press the MENU knob.

● changes to ➧ and **?** changes to ●

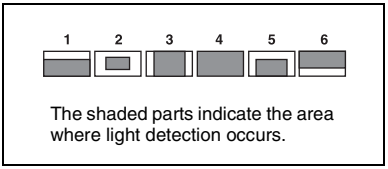
The currently selected auto iris window appears on the screen.

If it is not necessary to display the auto iris window on the screen, set to OFF.

4 Turn the MENU knob to move ➧ to IRIS WINDOW, then press the MENU knob.

➧ changes to ● and ● changes to **?**.

5 Turn the MENU knob until the desired auto iris window appears, then press the MENU knob.



● changes to ➧ and **?** changes to ●.

If you select VARIABLE, the following items become effective and you can set the window of the desired size. Set each item to the desired size.

Item	Setting
IRIS VAR WIDTH	The width of the window
IRIS VAR HEIGHT	The height of the window
IRIS VAR H POS.	The position of the window in the horizontal direction
IRIS VAR V POS.	The position of the window in the vertical direction.

6 Set the MENU ON/OFF switch to OFF.

The menu disappears from the screen and the display indicating the current status of the camcorder appears along the top and bottom of the screen.

To counter problems with very bright highlights

If the subject is too bright, the iris may close too much, leaving the overall image dark, or the highlights may be blown out. In such cases, setting the highlight clip function on reduces the luminance range, avoiding problems from the automatic iris correction.

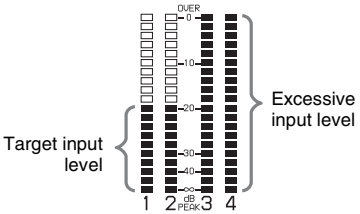
In the AUTO IRIS page of the OPERATION menu, set the CLIP HIGH LIGHT item to ON.

Adjusting the Audio Level

Setting the AUDIO SELECT CH-1/CH-2 switches to AUTO automatically adjusts the input levels of the audio signal to be recorded in audio channels 1 and 2. You can also adjust the audio level manually.
The input levels of signals to be recorded on audio channels 3 and 4 can be adjusted automatically or manually, as specified by a menu setting.

Target audio level for automatic audio level adjustment

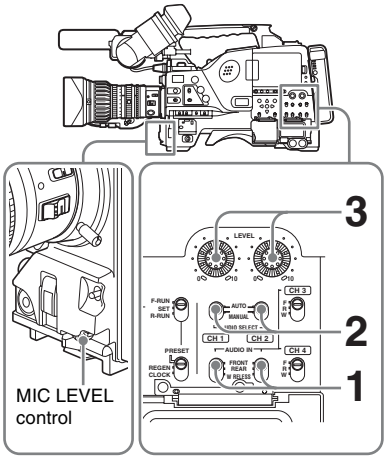
Make adjustment using –20 dB as the target level. If the audio level meter shows a maximum level of 0 dB, then it indicates that the input audio level is excessive.



Manually adjusting the audio levels of the audio inputs from the AUDIO IN CH1/CH2 connectors

Adjust the audio level as follows when recording the input to audio signals input to the AUDIO IN CH1 or CH2 connector to audio channels 1 and 2. When the XLR connection automatic detection function is set to ON, then the input from the connector is automatically selected for audio recording whenever a cable is connected to the AUDIO IN CH1 or CH2 connector. In this case, start the operation from step **2**.

You can turn on and off the XLR connection automatic detection function on the AUDIO 1 page of the MAINTENANCE menu.



1 To adjust the signal input to the AUDIO IN CH1 or AUDIO IN CH2 connector, set the AUDIO IN CH-1 or AUDIO IN CH-2 switch to REAR.
To adjust both input signals, set both switches to REAR.

2 Set the AUDIO SELECT switch(es) corresponding to the channel(s) selected in step 1 to MANUAL.

3 With the LEVEL control(s) for the channel(s) selected in step 1, adjust so that the audio level meter shows up to –20 dB for a normal input volume.

Correspondence between recording level adjustments and audio level controls

On the AUDIO 3 page of the MAINTENANCE menu, you can select which audio level control controls the audio recording level of the input to each of the AUDIO IN CH1/CH2 connectors. The correspondences between the settings of the menu items and the controls are as follows.

REAR1/WRR LEVEL: Audio recording level of channel 1

Setting	Control
SIDE1	LEVEL (CH-1) control (on the left)
FRONT	MIC LEVEL control
F+S1	LEVEL (CH-1) control linked with MIC LEVEL control.

REAR2/WRR LEVEL: Audio recording level of channel 2

Setting	Control
SIDE2	LEVEL (CH-2) control (on the right)
FRONT	MIC LEVEL control
F+S2	LEVEL (CH-2) control linked with MIC LEVEL control.

Note

When you have operation of the LEVEL (CH-1/CH-2) controls and MIC LEVEL control linked together, if the MIC LEVEL control is set to 0, the audio signals on channels 1 and 2 cannot be recorded. Check the position of the MIC LEVEL control before adjusting the LEVEL (CH-1/CH-2) controls.

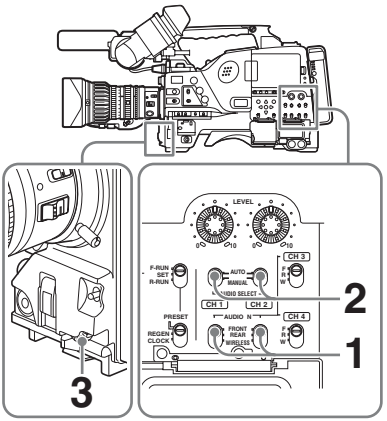
Manually adjusting the audio level of the MIC IN connector

Adjust the audio level as follows when recording the input from a microphone connected to the MIC IN connector to audio channel 1 and/or 2.

Note

If the XLR connection automatic detection mode is on, when the cables are connected to the AUDIO IN CH1/CH2 connectors, the camcorder detects the connection to the AUDIO IN CH1/CH2 connectors. Thus, the AUDIO IN switches are internally reset to REAR and the audio signals input to the AUDIO IN CH1/CH2 connectors are automatically selected.

Before adjusting the audio level of the front microphone, confirm that no cables are connected to the AUDIO IN CH1/CH2 connectors. Alternatively, set the REAR XLR AUTO item to OFF on the AUDIO 1 page of the MAINTENANCE menu.



1 Set either or both of the AUDIO IN switch(es) to FRONT.

To record stereo sound: Set both AUDIO IN CH-1 and CH-2 switches to FRONT.

To record monaural sound: Set the appropriate AUDIO IN CH-1 or CH-2 switch corresponding to the channel to which you want to record and adjust the monaural sound signal to FRONT.

See "Recording stereo sound" or "Recording monaural sound" (page 39) for more information.

2 Set the AUDIO SELECT switch(es) for the desired channel(s) selected in step 1 to MANUAL.

3 Turn the MIC LEVEL control, and adjust so that the audio level meter shows up to –20 dB for a normal input volume.

Correspondence between recording level adjustments and audio level controls

On the AUDIO 3 page of the MAINTENANCE menu, you can select which audio level control controls the audio recording level of the front microphone input. The correspondences between the settings of the menu items and the controls are as follows.

MIC CH1 LEVEL: Audio recording level of channel 1

Setting	Control
SIDE1	LEVEL (CH-1) control (on the left)
FRONT	MIC LEVEL control
F+S1	LEVEL (CH-1) control linked with MIC LEVEL control.

MIC CH2 LEVEL: Audio recording level of channel 2

Setting	Control
SIDE2	LEVEL (CH-2) control (on the right)
FRONT	MIC LEVEL control
F+S2	LEVEL (CH-2) control linked with MIC LEVEL control.

Note

When you have operation of the MIC LEVEL control and LEVEL (CH-1/CH-2) controls linked together, if the

LEVEL (CH-1/CH-2) controls are set to 0, the audio signals on channels 1 and 2 cannot be recorded. Check the position of the LEVEL (CH-1/CH-2) controls before adjusting the MIC LEVEL control.

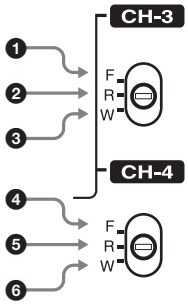
Recording audio on channels 3 and 4

Selecting the recorded audio

You can select the audio recorded on audio channels 3 and 4 with the AUDIO IN CH-3/CH-4 switches, or you can have the selection made automatically, as follows.

To automatically select the same audio as on channels 1 and 2

On the AUDIO 1 page of the MAINTENANCE menu, set the AUDIO CH3/4 MODE item to CH 1/2.



CH-3 switch

❶F: The audio signal from the front microphone is recorded.
❷R: The audio signal input to the AUDIO IN CH1 connector is recorded.
❸W: The audio signal of the wireless microphone is recorded.

CH-4 switch

❹F: Same as with the CH-3 switch.
❺R: The audio signal input to the AUDIO IN CH2 connector is recorded.
❻W: Same as with the CH-3 switch.

Note

When the LINE / AES/EBU / MIC switch is set to LINE or MIC, the audio signals recorded on audio channels 3 and 4 are not affected by the XLR automatic detection function. They are determined by the settings of the AUDIO IN CH-3 and CH-4 switches.

Adjusting the audio recording levels

To adjust automatically

On the AUDIO 3 page of the MAINTENANCE menu, set AUDIO SELECT CH3 (for audio channel 3) or AUDIO SELECT CH4 (for audio channel 4) to AUTO.

To adjust manually using the menus

1 **On the AUDIO 3 page of the MAINTENANCE menu, set the AUDIO SELECT CH3 (for audio channel 3) or AUDIO SELECT CH4 (for audio channel 4) to MANU.**

2 **On the AUDIO 3 page of the MAINTENANCE menu, change the setting of the LVL CONTROL CH3 (for audio channel 3) or LVL CONTROL CH4 (for audio channel 4), so that the audio level meters show up to –20 dB for normal input audio volume.**

To adjust manually with the MIC LEVEL control

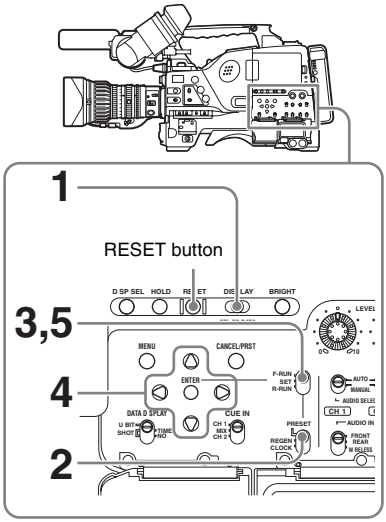
1 **On the AUDIO 3 page of the MAINTENANCE menu, set the AUDIO SELECT CH3 (for audio channel 3) or AUDIO SELECT CH4 (for audio channel 4) to FRONT.**

2 **Turn the MIC LEVEL control, adjusting it so that the audio level meters show up to –20 dB for normal input audio volume.**

Setting the Time Data

Setting the timecode

The timecode setting range is from 00 : 00 : 00 : 00 to 23 : 59 : 59 : 29 (hours : minutes : seconds : frames).



1 **Set the DISPLAY switch to TC.**

2 **Set the PRESET/REGEN/CLOCK switch to PRESET.**

3 **Set the F-RUN/SET/R-RUN switch to SET.**
The first (leftmost) digit of timecode flashes.

4 **Use the up and down arrow buttons to change values, and use the left and right arrow buttons to move the flashing digit. Repeat until all digits are set.**

To reset the timecode value to 00 : 00 : 00 : 00
Press the RESET button.

5 **Set the F-RUN/SET/R-RUN switch to F-RUN or R-RUN.**
F-RUN: Free run. The timecode generator keeps running.
R-RUN: Recording run. The timecode generator runs only while recording.

To set the drop frame mode/non-drop frame mode

You can select the drop frame (DF) mode or non-drop frame (NDF) mode on the TIMECODE page of the MAINTENANCE menu.

Note

This function is available when the frame frequency is set to 59.94i.

To make the timecode consecutive

When the F-RUN/SET/R-RUN switch is set to R-RUN, recording a number of scenes on the tape normally produces consecutive timecode. However, once you remove the tape and record on another tape, the timecode will no longer be consecutive when you use the original tape again for recording. In this case, to make the timecode consecutive, set the PRESET/REGEN/CLOCK switch to REGEN.

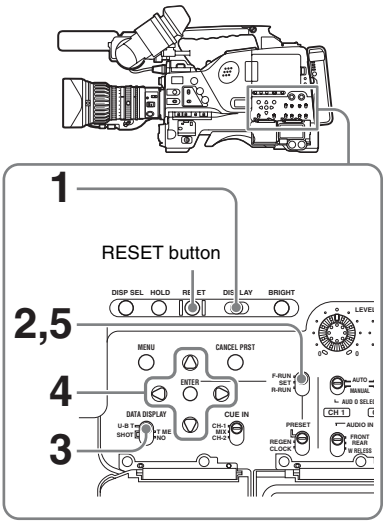
Saving the real Time in the Timecode

Setting the PRESET/REGEN/CLOCK switch to CLOCK saves the real time in the timecode. When it is necessary to set the actual time, use the TIME/DATE page of the DIAGNOSIS menu.

For details, see "Setting the Date/Time of the Internal Clock" on page 36.

Setting the user bits

By setting the user bits (up to 8 hexadecimal digits), you can record user information such as the date, time, or scene number on the timecode track.



1 **Set the DISPLAY switch to DATA.**

2 **Set the F-RUN/SET/R-RUN switch to SET.**
The first (leftmost) digit flashes.

3 **Set the DATA DISPLAY switch to U-BIT.**

4 **Use the up and down arrow buttons to change values, and use the left and right arrow buttons to move the flashing digit. Repeat until all digits are set.**

To reset the user bit data to 00 00 00 00
Press the RESET button.

5 **Set the F-RUN/SET/R-RUN switch to F-RUN or R-RUN, corresponding to the desired operating mode for the timecode generator.**
The set user bit data will be recorded for both LTC and VITC.

To store the user bit setting in memory

The user bit setting (apart from the real time) is automatically retained in memory even when the power is turned off.

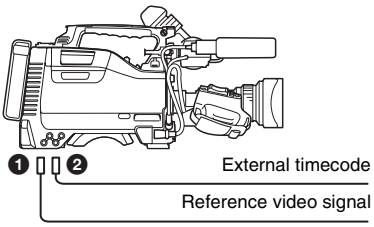
Synchronizing the timecode

You can synchronize the internal timecode generator of this camcorder with an external generator for the regeneration of an external timecode. You can also synchronize the timecode generators of other camcorders/VTRs with the internal generator of this camcorder.

Connections for timecode synchronization

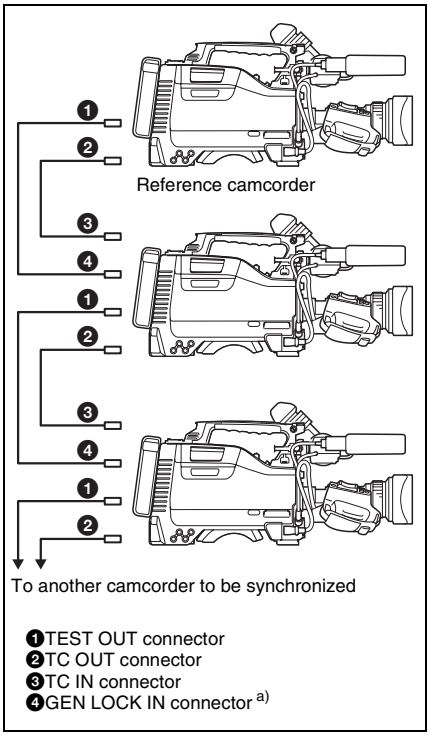
Connect both the reference video signal and the external timecode as illustrated below.

Example 1: Synchronizing with an external timecode



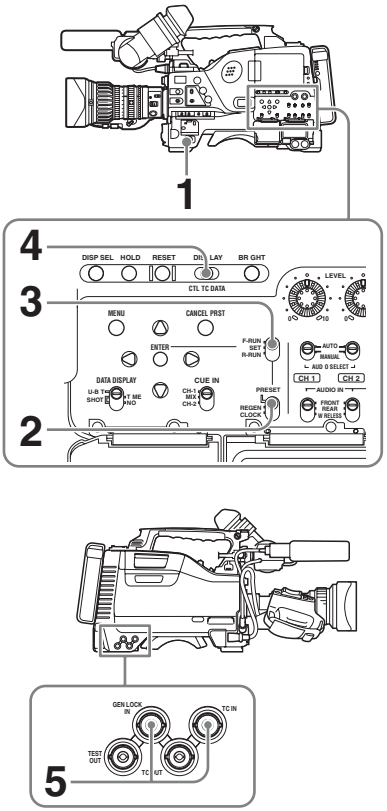
a) Set GENLOCK to ON on the GENLOCK page of the MAINTENANCE menu, if GENLOCK is set to OFF.

Example 2: Interconnecting a number of camcorders or timecode synchronization



a) Set GENLOCK to ON on the GENLOCK page of the MAINTENANCE menu, if GENLOCK is set to OFF.

To lock the timecode to an external source



1 **Turn on the POWER switch.**

2 **Set the PRESET/REGEN/CLOCK switch to PRESET.**

3 **Set the F-RUN/SET/R-RUN switch to F-RUN.**

4 **Set the DISPLAY switch to TC.**

5 **Supply a timecode signal and a reference video signal complying with the SMPTE standard and in proper phase relationship, to the TC IN connector and to the GEN LOCK IN connector, respectively.**

This operation synchronizes the internal timecode generator with the external timecode. After about 10 seconds, you can disconnect the external timecode without losing the synchronization. However, there will be noise on the recorded image if you connect or disconnect the timecode signal during recording.

Notes

- When you finish the above procedure, the internal timecode is immediately synchronized with the external timecode and the counter display will show the value of the external timecode. However, wait for a few seconds until the sync generator stabilizes before recording.
- If the frequency of the reference video signal is not the same as the frame frequency of the camcorder, the camera cannot be correctly genlocked. In such a case, the internal timecode is not correctly synchronized with the external timecode.
- When the GENLOCK item is set to OFF on the GENLOCK page of the MAINTENANCE menu, the timecode cannot be synchronized with the reference video signal. In this case, set the GENLOCK item to ON.

User bit settings during timecode synchronization

When the timecode is synchronized, only the time data is synchronized with the external timecode value. Therefore, each camcorder can have its own user bit settings.

You can lock the users bits of this camcorder to the user bits of external timecode by setting EXT-LK UBIT to EXT on the TIMECODE page of the MAINTENANCE menu.

To release the timecode synchronization

First disconnect the external timecode, then set the F-RUN/SET/R-RUN switch to R-RUN.

To change the power supply from the battery pack to an external power supply during timecode synchronization

To maintain a continuous power supply, connect the external power supply to the DC IN connector before removing the battery pack. You may lose timecode synchronization if you remove the battery pack first.

Camera synchronization during timecode synchronization

During timecode synchronization, the camera is genlocked to the reference video signal input from the GEN LOCK IN connector.

Chapter 4 Recording/Playback

About Cassettes

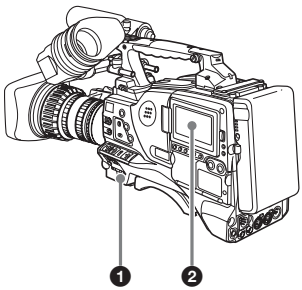
This section describes the procedure for loading and unloading a cassette.

For details about usable cassettes, see "VTR Section" on page 168.

Loading and unloading a cassette

Loading a cassette

1 Turn on the POWER switch.



❶POWER switch
❷HUMID indicator

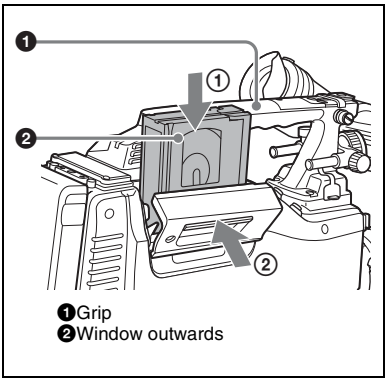
Note

If the interior of the VTR section is damp, the HUMID indicator will light. If this happens, wait until the indicator goes off before going on to step **2**.

2 Press the EJECT button.
The cassette compartment lid will open.

❶EJECT button
❷Cassette compartment lid

3 Check that there is no slack in the tape. Then slide in the cassette until it clicks into position and close the cassette compartment lid completely by pressing near the engraved PUSH.



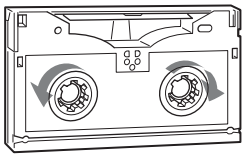
❶Grip
❷Window outwards

Notes

- To load the cassette correctly, insert the tape with the grip of the camcorder pointing upward as illustrated.
- When inserting the cassette, be careful that you do not hit the tape against the cassette holder.

Checking the tape for slack

Pressing in the reels lightly, turn them gently with your fingers in the directions shown below. If the reels will not move, there is no slack to adjust.



Unloading a cassette

With the power supply on, press the EJECT button to open the cassette compartment lid. Then take out the cassette. If you are not going to insert another cassette, close the cassette compartment lid.

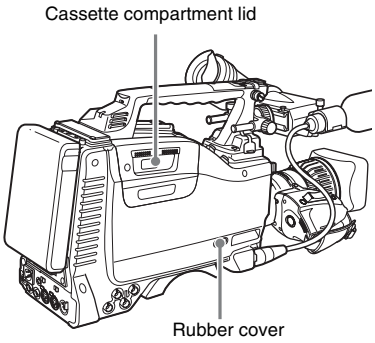
Even if the battery is exhausted and the VTR stops, it is possible to take out the cassette and close the cassette compartment lid if the remaining battery voltage is about 10.5 V or more. However, when the battery voltage is low, do not repeat the unloading operation. If you repeat the operation, the power may be turned off during the ejection operation and you may not be able to continue the operation.

Note

When you do not intend to use the camcorder for a long time, take out the cassette to protect the tape and turn off the power.

Unloading a cassette manually (manual eject)

When you cannot unload a cassette even if you press the EJECT button, take out the cassette manually as illustrated below.

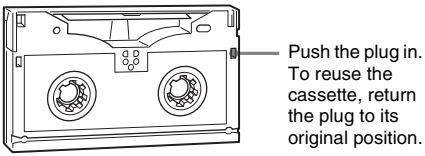


❶Turn the power off.
❷Open the rubber cover.
❸Pushing on the screw inside with a screwdriver, turn the screw clockwise until the cassette compartment lid opens.

You need not return the screw to its original position after taking out the cassette. Although the cassette compartment lid is not locked, turning on the power makes the cassette compartment lid operable again.

Preventing accidental erasure

The following procedure prevents cassettes from being recorded inadvertently.



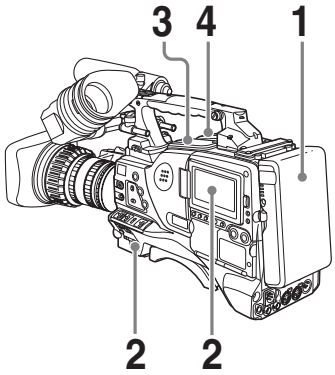
Recording

Basic procedures

This section describes the basic procedures for shooting and recording.
Before a shooting session, ensure that the camcorder is functioning properly.

For details, see "Testing the Camcorder Before Shooting" on page 153.

From power supply to tape loading



1 Attach a fully charged battery pack.

For details, see "Using a battery pack" on page 31.

2 Set the POWER switch to ON. Check that the HUMID indicator does not appear and that the battery power level is sufficient.
If HUMID indicator appears, wait until it disappears.

Note

After turning off the power, check whether the drum is dry (even if the HUMID indicator is off) with visual inspection when turning on the power again.

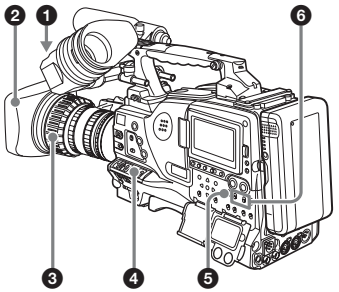
3 Check that there are no obstructions near the cassette compartment lid. then push the EJECT button to open the cassette compartment lid.

4 After checking the points below, load the cassette and close the cassette compartment lid.
- The cassette is not write-protected.
- There is no slack in the tape.

From adjusting the black balance and white balance to stopping recording

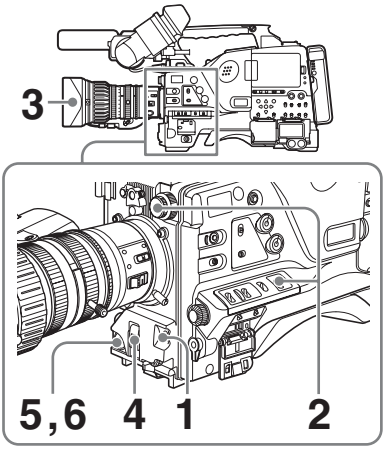
Switch settings

After turning on the power and loading a cassette, set the switches and selectors as shown below and begin operation.



❶DISPLAY: ON
❷Iris: AUTO
❸Zoom: AUTO
❹OUTPUT/DCC: CAM, DCC: ON
❺F-RUN/SET/R-RUN: F-RUN or R-RUN (set as needed)
❻AUDIO SELECT CH-1/CH-2: AUTO

Shooting



1 Push the AUTO W/B BAL switch to BLK to adjust the black balance.

For details of black balance adjustment, see "Adjusting the black balance" on page 49.

2 Select the CC filter and ND filter to match the lighting conditions, and adjust the white balance.

When the white balance settings are already in memory
Set the WHITE BAL switch to A or B.

When the white balance setting is not in memory and you do not have enough time to adjust the white balance
Set the WHITE BAL switch to PRST.
This automatically adjusts the white balance as follows, depending on the setting of the FILTER selector (outer knob).
A: Cross filter
B: 3200K
C: 4300K
D: 6300K

For details, see "Adjusting the white balance" on page 50.

3 Aim the camera at the subject and adjust the focus and zoom.

4 If necessary, set the electronic shutter for an appropriate mode and speed.

For details, see "Setting the Electronic Shutter" on page 52.

5 To start recording, press the REC START button or the VTR button on the lens.
If the recording start/stop function is assigned to the ASSIGN 1/3/4/5 switches or RET button, these switches function as REC START button.

For details, see "Assigning functions to ASSIGN switches" on page 138.

During recording, the REC indicator lights in the viewfinder. Perform zooming and focus control, if necessary.

6 To stop recording, press the REC START button or the VTR button on the lens again.
The REC indicator in the viewfinder goes off.

Cassette control buttons
During recording, the cassette control buttons (EJECT, REW, F FWD, PLAY, STOP) have no effect.

Note

When crash-recording without doing continuous recording on a recorded tape, or when recording with the retake function, the timecode recorded previously may be displayed for a few seconds when playing back the first part of the cut.

Continuous recording

If the camcorder is in the recording pause mode, simply pressing the REC START button on the camcorder or the VTR button on the lens continues recording exactly from the next frame. In other cases, you first need to position the tape at an appropriate point.

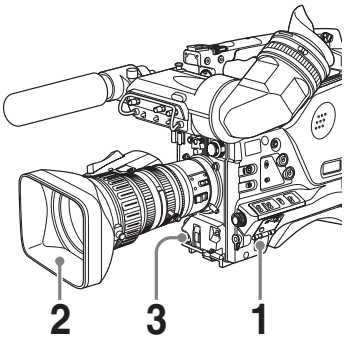
When the camcorder is in recording pause mode

Pressing the REC START button on the camcorder or the VTR button on the lens continues recording at exactly from the next frame. However, the time taken before recording starts depends on the setting of the VTR SAVE/STBY switch.

- If the VTR SAVE/STBY switch is in the SAVE position, it takes about 4 seconds before recording starts.

• If the VTR SAVE/STBY switch is in the STBY position, recording starts immediately. However, just after the switch position is changed from SAVE to STBY, it takes about 4 seconds before recording starts.

If you turn off the power during a recording pause mode



1 Turn on the power again.

2 Press the RET button on the lens.
If an analog composite signal is input to the GEN LOCK IN connector, make sure that RETURN VIDEO *(see page 89)* is set to OFF on the ASSIGNABLE SW page of the OPERATION menu.

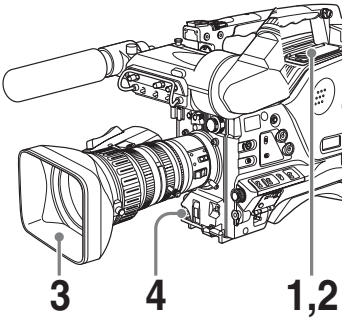
The camcorder positions the tape at the appropriate point. Note, however, that this function works only for continuously recorded material or consecutively joined segments totaling at least 3 seconds in length.

3 Press the REC START button on the camcorder or the VTR button on the lens to start recording.

Continuous recording in other cases

After rewinding or fast forwarding, after removing the cassette, or on a tape that has been partially recorded, you can obtain a continuous recording by following the procedure below. The End Search function also allows you to continue recording on a partially recorded tape.

For details, see "Searching for the end of the last recorded section and turning on recording pause mode (End Search function)" on page 78.



1 Looking in the viewfinder, press the PLAY button to start playback.

2 Press the STOP button at the desired point to begin recording. To continue from the end of a recording already on the tape, press the STOP button immediately after the end of the previously recorded segment (within 0.5 seconds).

3 Press the RET button.
The tape will rewind and will be positioned at the desired point to continue recording.

4 Press the REC START button on the camcorder or the VTR button on the lens to start recording.

Recording good shot marks

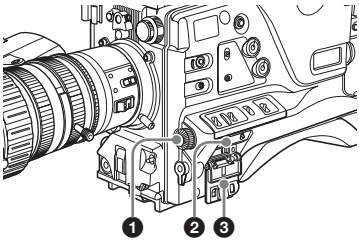
Good shot marks 1 and 2 are recorded on the LTC-UBIT area of the tape when the RET button on the lens is pressed during recording. Recording shot marks[1)] 1 and 2 for scenes containing important images and sounds enables quick access to the marked points. This increases editing efficiency.

For details about shot marker operations, refer to the manual supplied with your VTR.

A setting on the SHOT MARKER page of the MAINTENANCE menu determines whether or not good shot marks are recorded to the tape.

1) Shot mark: Timecode of the scene to be used as the editing point when editing.

Setting for recording good shot marks on the LTC-UBIT area on the tape



❶MENU knob
❷MENU ON/OFF switch
❸Switch cover

1 Display the SHOT MARKER page of the MAINTENANCE menu.

```
 M10OSHOT MARKER      TOP

 LTC UB-MARKER        SET
 REC START MARK       OFF
 SHOT MARKER 1        OFF
→SHOT MARKER 2    ●   OFF
```

For details on menu operations, see "Basic menu operations" on page 119.

2 Select LTC UB-MARKER, and press the MENU knob.

3 Turn the MENU knob to select which marker to record on LTC-UBIT.
The setting changes in the order of SET ⟷ ALL ⟷ OFF.

Item	Contents
SET	Determines whether or not marks are recorded for the items REC START MARK, SHOT MARKER 1, and SHOT MARKER 2 which appear when you select SET.
ALL	Records the recording start mark, shot mark 1, and shot mark 2 all.
OFF	Does not record any markers.

When you select SET, go to step **4**.

4 Set the mark(s) to be recorded to ON.

① Turn the MENU knob to move the ➡ mark to the mark to be set, then press the MENU knob.

```
 M10OSHOT MARKER      TOP

●LTC UB-MARKER    ?  SET
 REC START MARK       OFF
 SHOT MARKER 1        OFF
 SHOT MARKER 2         ON
```

② Turn the MENU knob clockwise or counterclockwise until the desired setting appears. To record the mark on the tape, select ON. To not record the mark, select OFF.
③ Press the MENU knob.
④ To set the remaining marks, repeat steps ①, ②, and ③.

Recording a shot mark 1

Press the RET button once. On the viewfinder screen, ● and the timecode of the marked point are displayed for about 3 seconds.

Recording a shot mark 2

Press the RET button twice. On the viewfinder screen, × and the timecode of the marked point are displayed for about 3 seconds.

Recording a recording start mark

You can record a recording start mark at the beginning of the recording.
Using recording start marks enables quick access to the marked points, for efficient editing.

For details about recording start marker operations, refer to the manual supplied with your VTR.

You can set whether or not recording start marks are recorded using the SHOT MARKER page of the MAINTENANCE menu.

For details about the setting, see "Setting for recording good shot marks on the LTC-UBIT area on the tape" on page 69.

Starting a shoot with a few seconds of pre-stored picture data (Picture Cache function)

This unit can continuously capture up to 8 seconds of the video and audio data currently being shot by the camera to its internal memory. This allows you to record a few seconds of pre-stored video and audio when you press the REC START button or the lens VTR button.

Setting the picture cache time/Picture Cache mode

To record in Picture Cache mode, you need to turn on Picture Cache mode and set the picture data storage time (Picture Cache time) using the OPERATION menu.

The Picture Cache time determines how many seconds of pre-stored data are recorded when you press the REC START button or the lens VTR button. Note that the number of seconds that are recorded may be shorter immediately after you change the setting of the VTR SAVE/STBY switch, and in the special cases described in the following notes.

Picture Cache time setting and recording start point

Picture Cache time	Recording start point	
	VTR STBY mode	VTR SAVE mode
8 (seconds) (For 50i/25PsF/23.98PsF format)	About 8 seconds before	About 5 seconds before
7 (seconds) (For 59.94i format)	About 7 seconds before	About 4 seconds before
6 (seconds)	About 6 seconds before	About 4 seconds before a)
5 (seconds)	About 5 seconds before	About 4 seconds before
4 (seconds)	About 4 seconds before	About 4 seconds before
3 (seconds)	About 3 seconds before	About 3 seconds before
2 (seconds)	About 2 seconds before	About 2 seconds before
1 (second)	About 1 seconds before	About 1 seconds before
0 (seconds)	About 0 seconds before	About 0 seconds before

a) For 50i/25PsF/23.98PsF format, you can record about 5 second of picture data stored in the memory.

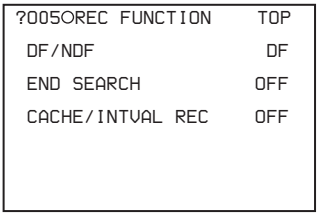
Notes

- The contents of the stored memory become unstable for a few moments immediately after you select Picture Cache mode or change the Picture Cache time, and immediately after you carry out playback or recording review. This means that pre-stored picture data will not be recorded if you press the REC START button or the lens VTR button immediately after one of the above operations.
- During playback or recording review, the picture data is not stored in the memory. Picture data corresponding to the duration of playback or recording review will not be in memory and will not be recorded on tape.

Setting procedure

(How to select an item in the menu screen: Turn the MENU knob to move ➡ to the desired item.)

1 Display the REC FUNCTION page of the OPERATION menu.



For details on menu operations, see "Basic menu operations" on page 119.

2 Select CACHE/INTVAL REC, and press the MENU knob to display "ON".

3 Turn the MENU knob to select CACHE, and press the MENU knob.

As you turn the MENU knob, the setting changes in the following sequence: OFF ⟷ CACHE ⟷ A. INT ⟷ M. INT.

When CACHE appears, the camcorder is in Picture Cache mode, where picture, sound, and timecode are constantly saved in

memory. The TALLY indicator (green) in the viewfinder is on while picture data is being stored in memory.
Also CACHE REC TIME appears.

Note

When HDSDI REMOTE I/F *(see page 110)* is set to G-TLY on the CAM CONFIG 2 page of the MAINTENANCE menu, this TALLY indicator does not light in green even in Picture Cache mode.

4 Select CACHE REC TIME, and turn the MENU knob to select the desired Picture Cache time.

The Picture Cache time changes in the following sequence: 0SEC ⟷ 1SEC ⟷ 2SEC ⟷ 3SEC ⟷ 4SEC ⟷ 5SEC ⟷ 6SEC ⟷ 7SEC [1)].

1)7 sec for 59.94i format, and 8 sec for 50i/25PsF/23.98PsF format.

5 Press the MENU knob.

The Picture Cache mode settings once made continue to be effective until changed.
You can assign the Picture Cache on/off function to one of the ASSIGN 1/2/3/4/5 switches and RET button on the lens.

For details, see "Assigning functions to ASSIGN switches" on page 138.

Note

When recording in Picture Cache mode, VITC is not recorded when the F-RUN/SET/R-RUN switch is set to R-RUN. When it is set to the F-RUN position, VITC is recorded.

Camcorder operations in Picture Cache mode

The recording procedure in Picture Cache mode is basically the same as that for normal recording. However, note the following differences.

- When you record in Picture Cache mode, the picture you shoot is recorded to tape after the Picture Cache time elapses. For this reason, the tape does not stop immediately when you press the REC START button to stop recording. While the tape is still running, all tape operation buttons (EJECT, REW, F FWD, PLAY, and STOP) are disabled, in the same way as during recording. Also, if you press the REC START button or the VTR button on the lens again during this time, recording starts again as if there had been no pause in recording.
- Normally, the time after which the tape stops when recording is stopped is equal to the Picture Cache time. However, it may be shorter than the Picture Cache time if one of the following operations has been performed, because the amount of stored data is less than the Picture Cache time.
  - You started recording immediately after selecting Picture Cache mode.
  - You started recording immediately after changing the Picture Cache time.
  - You started recording immediately after playback or recording review.
  - You started recording in Picture Cache mode immediately after the unit is powered on.
- The timecode stops advancing while time data is being set (when the F-RUN/SET/R-RUN switch is set to SET). For this reason, if you start recording immediately after switching to a position other than SET (to F-RUN or R-RUN), then timecode from the time when the timecode advance was stopped may be recorded.
- Positions of shot marks may be shifted depending on the Picture Cache time setting.
- Picture Cache time menu operations are disabled during recording. To change the Picture Cache time setting, stop the recording by pressing the REC START button or the VTR button on the lens.

If power is lost during recording

- If the power is turned off during recording, the camera will switch itself off after the tape has run for a few seconds.
- If you remove the battery, pull out the DC cable, or cut power to the AC adaptor during recording, actual recording of picture data ends the instant the tape is stopped. However, a certain amount of recorded picture data, equal to that recorded during the Picture Cache time, will be lost, because it has not yet been recorded on the tape before the tape stops. For this reason, make sure you do not change the battery while recording.

If the camcorder runs out of tape during recording

If the camcorder runs out of tape and stops during recording, a certain amount of recorded picture data, equal to that recorded during the Picture Cache time, will be lost, because it has not yet been recorded on the tape.

Shooting picture at intervals (Interval Rec function)

You can use the unit's internal memory to capture and record video at specified intervals.
There are two Interval Rec modes:

- **Auto Interval Rec**
  In Auto Interval Rec mode, pictures are automatically shot a frame at a time at the specified interval and stored in memory. To use this function you must set the total time for shooting (TAKE TOTAL TIME) and the length of time for recording on the tape (REC TIME).
- **Manual Interval Rec**
  There are two Manual Interval Rec modes:
  - Single Trigger mode
    In this mode, the camcorder records a preset number of frames (NUMBER OF FRAME) each time the REC START button or the VTR button on the lens is pressed.
  - Continuous Trigger mode
    In this mode, the camcorder records at preset intervals. Continuous interval recording is started by one press of the REC START button or the VTR button on the lens.

In Manual Interval Rec mode (Auto Interval Rec or Continuous Trigger mode) the light connected to the LIGHT connector turns on automatically before recording starts if the PRE-LIGHTING function is set to ON. This allows you to record pictures under stable light and color temperature conditions.

Auto Interval Rec mode settings

To record in Auto Interval Rec mode, you need to turn on Auto Interval Rec and set the total time from start to finish of shooting (TAKE TOTAL TIME) and the length of time for recording on the tape (REC TIME). Make these settings in the USER menu.

Notes

- When making for Auto Interval Rec mode settings, set TAKE TOTAL TIME first, and then set REC TIME.
- To turn on the light automatically before recording starts, set the LIGHT switch to AUTO.

To turn on Auto Interval Rec mode, proceed as follows.

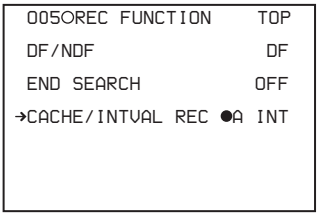
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the REC FUNCTION page of the OPERATION menu.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select CACHE/INTVAL REC, and press the MENU knob.

3 Turn the MENU knob to select A.INT, and press the MENU knob.



As you turn the MENU knob, the setting changes in the following sequence: OFF ⟷ CACHE ⟷ A. INT ⟷ M. INT.
When A. INT appears, the camcorder is in Auto Interval Rec mode. The TALLY indicator (green) in the viewfinder flashes (one flash/second) while the camcorder is in this mode. Also, TAKE TOTAL TIME, REC TIME and PRE-LIGHTING appear.

4 Turn the MENU knob to select TAKE TOTAL TIME, and press the MENU knob.

5 Turn the MENU knob to select the desired setting of TAKE TOTAL TIME, and press the MENU knob.
The setting time changes in the following sequence: 5MIN ⟷ 10MIN ⟷ 15MIN ⟷ 20MIN ⟷ 30MIN ⟷ 40MIN ⟷ 50MIN ⟷ 1H ⟷ 2H ⟷ 3H ⟷ 4H ⟷ 5H ⟷ 7H ⟷ 10H ⟷ 15H ⟷ 20H ⟷ 30H ⟷ 40H ⟷ 50H ⟷ 70H ⟷ 100H.
(MIN = minutes; H = hours)

6 Turn the MENU knob to select REC TIME, and press the MENU knob.

7 Turn the MENU knob to select the desired setting of REC TIME, and press the MENU knob.

The setting time changes in the following sequence: 5SEC ⟷ 10SEC ⟷ 15SEC ⟷ 20SEC ⟷ 30SEC ⟷ 40SEC ⟷ 50SEC ⟷ 1MIN ⟷ 2MIN ⟷ .....38MIN ⟷ 39MIN ⟷ 40MIN [1].

(SEC = seconds; MIN = minutes)

1) You can select a time up to 40MIN for 59.94i format, and 48MIN for 50i/25PsF/23.98PsF format.

Note

You cannot set a REC TIME that is more than one thirtieth of TAKE TOTAL TIME.

For example: When TAKE TOTAL TIME is set to 1H, the maximum value of REC TIME is 2 MIN. (60 minutes divided by 30 gives 2 minutes.)

The time setting displayed when you turn the MENU knob changes within the available setting times.

Be sure to set REC TIME only after setting TAKE TOTAL TIME.

8 Turn the MENU knob to select PRE-LIGHTING, and press the MENU knob.

9 Turn the MENU knob to select the desired time to turn on the light before starting to record, and press the MENU knob.

The PRE-LIGHTING time changes in the following sequence: OFF ⟷ 2SEC ⟷ 5SEC ⟷ 10SEC.

Notes

- Set the LIGHT switch on the camcorder to AUTO to turn on the light before recording.
- The light switch must also be set to ON. With these settings, the light turns on and off automatically. (However, the light remains on continuously if the off time is less than 5 seconds.)
- When the LIGHT switch is set to MANUAL and the light switch is set to ON, the light remains on continuously.

10 To end the menu operation, set the MENU ON/OFF switch to OFF.

The menu display disappears from the viewfinder screen and the message "AUTO INTERVAL **M**S" indicating Auto Interval Rec mode appears along the bottom of the viewfinder.

"**M**S" indicates the shooting interval. For example, when TAKE TOTAL TIME is set to 1H and REC TIME is set to 30 SEC, the message "AUTO INTERVAL 00M04S" appears. The shooting interval is 4 seconds. The display indicating the current status of the camcorder appears along the top and bottom of the viewfinder.

Note

The settings for Auto Interval Rec mode are maintained until changed. However, if you turn the camcorder off, Auto Interval Rec mode is cleared except for the TAKE TOTAL TIME, REC TIME and PRE-LIGHTING settings. To use the Auto Interval Rec function again after switching on the power, perform steps **1** to **3**.

Recording in Auto Interval Rec mode

Note

When you use blank cassettes, such as brand new cassettes, be sure to record color bars for more than 2 seconds at the beginning of a cassette.

1 After performing the basic procedures for shooting and recording, following the instructions in "Basic procedures" *(see page 66)*, secure the camcorder so that it will not move.

2 Press the REC START button on the camcorder or the VTR button on the lens.

The camcorder starts recording in Auto Interval Rec mode. When you use the PRE-LIGHTING function, recording starts after the light is switched on.

The actual recording to tape begins after the camcorder has saved about five seconds of video in memory, so the tape runs intermittently.

While the unit recording in Auto Interval Rec mode, the TALLY indicator (green) in the viewfinder flashes (4 flashes/second) and the message "AUTO INTERVAL **M**S" flashes on the viewfinder screen.

The REC indicator in the viewfinder lights while the camcorder is capturing data to memory.

After the length of time for recording on the tape (REC TIME) has elapsed, the camcorder stops recording automatically.

To continue auto interval recording

Press the REC START button on the camcorder or the VTR button on the lens again.

The camcorder starts recording in Auto Interval Rec mode again.

To interrupt auto interval recording

Press the REC START button or the VTR button on the lens. The camcorder stops recording. However, the tape may run to record picture data already stored in memory.

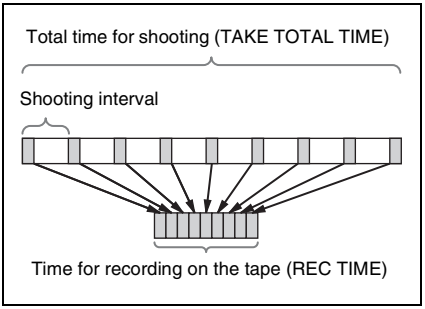
To stop auto interval recording

You can exit Auto Interval Rec mode using the following two methods:

- Set the POWER switch to OFF.
- Set CACHE/INTVAL REC to OFF on the REC FUNCTION page of the USER menu.

Time required for shooting and time required for recording on the tape

Auto Interval Rec mode is an effective way to shoot objects that move slowly. To use this function, you need to set the total shooting time (TAKE TOTAL TIME) and the length of time for recording on the tape (REC TIME).
The total shooting time is the time required to capture the slowly moving subject. The camcorder must be arranged so that the subject is always framed in the picture during this time.
The tape recording time is the length of time that material is recorded after one interval. The camcorder calculates the time-lapse interval from these two times.



Notes on Auto Interval Rec operation

- **Timecode**
  In Auto Interval Rec mode, the internal timecode generator runs in R-RUN mode regardless of how the F-RUN/SET/R-RUN switch is set. The information specified in the menu is saved in the user bits.
- **Audio**
  Audio signals are not recorded in Auto Interval Rec mode.
- **Cassette control buttons**
  While recording in Auto Interval Rec mode, you cannot use the cassette control buttons (EJECT, REW, F FWD, PLAY and STOP). To use these buttons, stop recording by pressing the REC START button or the VTR button on the lens.
- **Menu operation**
  While recording in Auto Interval Rec mode, you cannot change the settings of CACHE/INTVAL REC, TAKE TOTAL TIME and REC TIME. To change the settings, stop recording by pressing the REC START button or the VTR button on the lens.
- **When the camcorder power is turned off during recording**
  - When you set the POWER switch to OFF, the camcorder will turn itself off after the tape has run for a few seconds to record the picture data stored in memory.
  - If you remove the battery, unplug the DC cable, or cut power to the AC adaptor during auto interval recording, picture data stored before recording stops (a maximum of 5 seconds) may be lost. Be careful of when you exchange the battery.
- **If the unit runs out of tape during auto interval recording**
  Picture data (a maximum of 5 seconds) shot and stored before the tape stops is not recorded if the camcorder runs out of tape and stops.

Manual Interval Rec mode

Manual Interval Rec has the following two modes.

Single Trigger mode: Each time the REC START button or VTR button on the lens is pressed, the camcorder captures to memory a single shot consisting of the specified number of video frames.

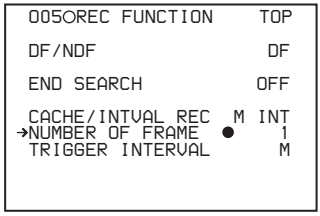
Continuous Trigger mode: Once the REC START button or VTR button on the lens is pressed, the camcorder captures consecutive shots to memory at the specified interval, with each shot consisting of the specified number of video frames.

Setting up Manual Interval Rec Single Trigger mode

1 Select CACHE/INTVAL REC on the REC FUNCTION page of the OPERATION menu.

2 Turn the MENU knob to select M.INT, and press the MENU knob.
As you turn the MENU knob, the setting changes in the following sequence: OFF ⟷ CACHE ⟷ A. INT ⟷ M. INT.
When M. INT appears, the camcorder is in Manual Interval Rec mode and the TALLY indicator (green) in the viewfinder flashes.
NUMBER OF FRAME, TRIGGER INTERVAL and RE-LIGHTING appear.

3 Turn the MENU knob to select NUMBER OF FRAME, and press the MENU knob.



4 Turn the MENU knob to select the desired number of frames to be recorded in each shot, and press the MENU knob.
The number changes in the following sequence: 1 ⟷ 2 ⟷ 4 ⟷ 8.

5 Turn the MENU knob to select TRIGGER INTERVAL, and press the MENU knob.

6 Turn the MENU knob to select M, and press the MENU knob.
The number changes in the following sequence: M ⟷ 1SEC ⟷ 2SEC.....12H ⟷ 24H.
When M appears, the TALLY indicator (green) flashes (2 flashes/second) and PRE-LIGHTING disappears.

7 To end the menu operation, set the MENU ON/OFF switch to OFF (or close the cover).
The menu display disappears from the viewfinder screen and the message "MANU INTERVAL *FRAME", indicating the Single Trigger mode of the Manual Interval Rec mode, appears along the bottom of the viewfinder.
"*FRAME" indicates the number of frames set in step **3**.
The display indicating the current status of the camcorder appears along the top and bottom of the viewfinder.

Note

The settings for Manual Interval Rec Single Trigger mode are maintained until changed. However, if you turn the camcorder off, all Manual Interval Rec mode settings are cleared except for the NUMBER OF FRAME setting. To use Manual Interval Rec Single Trigger mode again after turning on the camcorder, perform steps **1** and **2**.

Recording in Manual Interval Rec Single Trigger mode

Follow the procedure below to shoot in of Manual Interval Rec Single Trigger mode.

Note

When you use blank cassettes, such as brand new cassettes, be sure to record color bars for more than 2 seconds at the beginning of a cassette.

1 After performing the basic procedures for shooting and recording, following the instructions in "Basic procedures" *(see page 66)*, secure the camcorder so that it will not move.

2 Press the REC START button on the camcorder or the VTR button on the lens.
The camcorder starts recording in Manual Interval Rec Single Trigger mode . The TALLY indicator (green) in the viewfinder flashes (2 flashes/second) and the message "MANU INTERVAL *FRAME" flashes on the viewfinder screen.
Each time you press the REC START button or the VTR button, the camcorder captures and stores picture data for the preset number of frames. The REC indicator in the

viewfinder is on while the camcorder is capturing the picture to memory.
The camcorder stores about 5 seconds of picture data to memory, and then records the stored picture data on the tape. The tape runs intermittently.

To stop recording in Single Trigger mode

You can use the following two methods. However, the tape may continue to run to record the picture data stored in the memory at the instant the tape stopped.

- Press the EJECT button.
- Set the POWER switch to OFF.

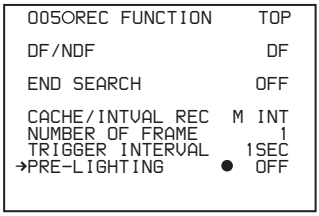
Setting up Manual Interval Rec Continuous Trigger mode

1 Follow steps 1 to 5 in "Setting up Manual Interval Rec Continuous Trigger mode" on page 76.

2 Turn the MENU knob to select the desired trigger interval, and press the MENU knob.

The number changes in the following sequence: M ⟷ 1SEC ⟷ 2SEC.....12H ⟷ 24H.
When a trigger interval time other than M is displayed, the camcorder is in Manual Interval Rec Continuous Trigger mode. The TALLY indicator (green) flashes (1 flash/second).

3 Turn the MENU knob to select PRE-LIGHTING, and press the MENU knob.



4 Turn the MENU knob to select the desired time to turn on the light before starting to record, and press the MENU knob.

The PRE-LIGHTING time changes in the following sequence: OFF ⟷ 2SEC ⟷ 5SEC ⟷ 10SEC.

Notes

- If you want to turn on the light automatically before recording starts, set the LIGHT switch to AUTO. Also, set the switch of the light connected to the LIGHT connector to ON. The light automatically turns on and off in Manual Interval Rec Continuous Trigger mode. However, if the light would be off less than 5 seconds, it remains on continuously.
- When the LIGHT switch is set to MANUAL and the switch of the light is set to ON, the light is always on.

5 To end the menu operation, set the MENU ON/OFF switch to OFF (or close the cover).

The menu display disappears from the viewfinder screen and the message "INTERVAL *SEC *FRAME", indicating Continuous Trigger mode of Manual Interval Rec, appears along the bottom of the viewfinder.
"*SEC" indicates the trigger interval preset and "*FRAME" indicates the number of frames preset.
The display indicating the current status of the camcorder appears along the top and bottom of the viewfinder.

Note

The settings for Manual Interval Rec Continuous Trigger mode are maintained until changed. However, if you power the camcorder off, all Manual Interval Rec mode settings are cleared except for the NUMBER OF FRAME, TRIGGER INTERVAL, and PRELIGHTING settings. To use Manual Interval Rec Continuous Trigger mode again after switching on the power, perform steps **1** and **2** in "Setting up Manual Interval Rec Continuous Trigger mode" on page 76.

Recording in Manual Interval Rec Continuous Trigger mode

Note

When you use blank cassettes, such as brand new cassettes, be sure to record color bars for more than 2 seconds at the beginning of a cassette.

1 After performing the basic procedures for shooting and recording, following the instructions in "Basic procedures"

(see page 66), **secure the camcorder so that it will not move.**

2 Press the REC START button on the camcorder or the VTR button on the lens.

The camcorder starts recording in Manual Interval Rec Continuous Trigger mode, the flashing cycle of the TALLY indicator (green) changes from 1 flash/second to 4 flashes/second, and the message "INTERVAL *SEC *FRAME" flashes on the viewfinder screen.

If you are using the PRE-LIGHTING function, the light turns on when you press the REC START button. After the preset PRE-LIGHTING time has elapsed, the camcorder captures the picture data to memory. The REC indicator in the viewfinder is on while the camcorder is capturing the picture in the memory. The camcorder stores about 5 seconds of picture data to memory, and then records the stored picture data on the tape. As a result, the tape runs intermittently.

To stop recording in Manual Interval Rec Continuous Trigger mode

You can stop recording in Manual Interval Rec Continuous Trigger mode using the following two methods. However, the tape may continue to run to record the picture data stored in memory at the instant the tape stopped.

- Press the REC START button or the VTR button on the lens.
- Set the POWER switch to OFF.

Notes on Manual Interval Rec operation

Take note of the following points. They are common to both Single Trigger mode and Continuous Trigger mode, except for the noted differences.

- **Timecode**
  In Manual Interval Rec mode, the internal timecode generator runs in R-RUN mode regardless of how the F-RUN/SET/R-RUN switch is set.
- **Audio**
  Audio signals are not recorded in Manual Interval Rec mode.
- **Cassette control buttons**
  While recording in Manual Interval Rec Single Trigger mode (the green TALLY indicator in the viewfinder flashes twice per second), you cannot use the cassette control buttons (REW, F FWD, PLAY and STOP).
  Note that the camcorder stops recording in Manual Interval Rec Single Trigger mode if you press the EJECT button.
  While recording in Manual Interval Rec Continuous Trigger mode (the green TALLY indicator flashes four times per second), you cannot use the cassette control buttons (EJECT, REW, F FWD, PLAY and STOP). To stop recording, press the REC START button or the VTR button on the lens. However, the tape may run to record the picture data stored in the memory before stopping the manual interval recording.
- **Menu operations**
  In Manual Interval Rec Single Trigger mode , you cannot change the settings of CACHE/ INTVAL REC and NUMBER OF FRAME on the REC FUNCTION page after the camcorder starts recording. To change the settings, stop recording by pressing the EJECT button or setting the POWER switch to OFF.
  While recording in Manual Interval Rec Continuous Trigger mode, you cannot change the settings of CACHE/INTVAL REC, NUMBER OF FRAME and TRIGGER INTERVAL on the REC FUNCTION page. To change these settings, stop recording by pressing the REC START button or the VTR button on the lens or by setting the POWER switch to OFF.
- **When the camcorder power is turned off during recording in Manual Interval Rec mode**
  - When you set the POWER switch to OFF, the camcorder will switch itself off after tape access has continued for a few seconds to record the picture data stored in memory.
  - If you remove the battery, unplug the DC cable, or cut the power to the AC adaptor during manual interval recording, picture data stored before recording stops (a maximum of 5 seconds) may be lost. Be careful of when you exchange the battery.

- **If the camcorder runs out of tape during recording in Manual Interval Rec mode**
  Picture data (a maximum of 5 seconds) at the instant the tape stopped is not recorded if the camcorder runs out of tape and stops.

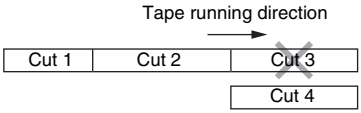
Recording continuously on the previous cut

By assigning the retake function to one of the ASSIGN 1/3/4/5 switches or RET button, you can use these switches/button to position the tape at the most recent cut, clear it and record a new cut.

For details, see "Assigning functions to ASSIGN switches" on page 138.

Continuously recording after the cut before the most recent cut

Example: After recording cut 3, clear cut 3 and record cut 4 after cut 2



1 **Press the RET button on the lens while holding the ASSIGN 1 switch down. In the above example, press with the camcorder in recording pause mode after recording cut 3.**
The camcorder automatically positions the tape at the end point of cut 2 and enters recording pause mode.

2 **Record cut 4.**
Cut 4 is recorded after cut 2.

Notes

- When pictures consisting of cuts recorded using the retake function are played back on a professional VTR, the CHANNEL CONDITION indicator, which indicates the condition of the played back signal of the VTR, may be lit in yellow, noise may be added to the cue audio for the first 2 or 3 seconds, or the previously recorded timecode may be displayed for a few seconds. To avoid this, it is recommended that you make the first part of the cut (in the above example, cut 4) about 3 seconds longer.
- In the following cases, the retake function does not operate. The message INVALID OPERATION! Is displayed on the viewfinder screen for three seconds.
  - When only one cut has been recorded
  - When the length of the recorded cut is less than 3 seconds
  - When Picture Cache is ON

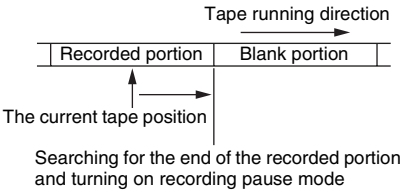
  The retake function also does not operate after recording stops until the recording pause operation is completed (about 1 second). The message INVALID OPERATION! is displayed. In this case, the retake function will operate when you perform the retake operation again after the message disappears.

Searching for the end of the last recorded section and turning on recording pause mode (End Search function)

The End Search function allows the camcorder to search for the end of a recorded section on the tape after the recorded section is rewound and played back.
To use this function, set END SEARCH on the REC FUNCTION page of the OPERATION menu to ON.

For details on menu operations, see "Basic menu operations" on page 119.

END SEARCH function



Searching for the end of a recorded section and turning on recording pause mode

1 **Rewind the tape being recorded, then push the PLAY button to start playback.**

2 **After checking the recorded picture, press the STOP button to select recording pause mode.**

3 **Press the RET button on the lens.**

The tape automatically runs and stops at the end of the recording. The camcorder is in recording pause mode.

Note

When the STOP KEY FREEZE function is set to active on the CAM CONFIG 1 page of the MAINTENANCE menu, the picture is frozen once you press the STOP button during playback. To activate the End Search function, press the STOP button again to stop the camcorder, then press the RET button on the lens.

Checking Recording and Playback

By pressing the PLAY button, you can review any length of recorded material in the viewfinder in black and white. There are two other ways to review the recording.

- Recording review: You can view the last 2 seconds of the recorded material in the viewfinder.
- Color playback: You can view the recorded material in color on a color video monitor without the need for an external adaptor.

You can also view the picture during rewind or fast forward searches by pressing the PLAY + REW buttons or PLAY + F FWD buttons.

See "Timecode/menu operations section and audio control section" on page 23 for information about the switches and controls used to select the audio output signal and to adjust the audio level.

Note

Noise may occur if you play back a tape recorded on this camcorder on the HDW-F900 HD camcorder.

Checking the last two seconds of the recording – recording review

If you press the RET button on the lens while recording is paused, the last 2 seconds of the recording are played back on the viewfinder screen and the color LCD. Use this function to check whether recording went smoothly. If you hold the RET button down longer, up to 10 seconds of the tape are rewound and played back. After playback, the camcorder is ready to start recording again.

If you assign the LENS RET function to one of the ASSIGN 1/3/4/5 switches or the RET button, you can use that switch or button in the same way as the RET button on the lens.

For details, see "Assigning functions to ASSIGN switches" on page 138.

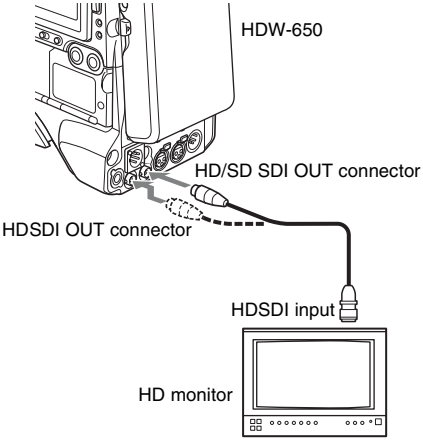
Note

The recording review functions only works if the recording you have made is at least 3 seconds long.

Checking the recording on the color video monitor – playback in color

Connect an HD color video monitor with an HDSDI input connector to the HDSDI OUT connector or the HD/SD SDI OUT connector of the camcorder. By pressing the PLAY button, you can view the recorded picture.

The signals output from these connectors depend on menu settings.



Note

If HD SDI OUT or HD/SD SDI OUT is set to OFF on the OUTPUT 1 page of the OPERATION menu, you cannot view the recorded picture. Set it to HDSDI.

For details, see "Selecting the output signals" on page 137.

Checking the camera picture on the viewfinder and/or color video monitor

Normally, during VTR playback, the signals output from the TEST OUT connector and the HDSDI OUT connector switch from the camera picture to the recorded picture. The viewfinder and the LCD monitor also switch to the recorded picture. However, by setting the PB VIDEO on the OUTPUT 2 page of the OPERATION menu, you can choose to output the camera picture even during VTR playback.

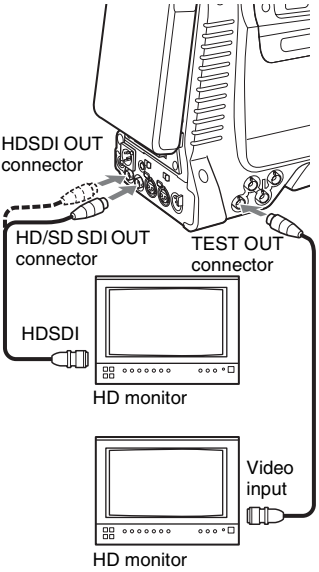
Note that HDSDI output always switches from the camera picture to the recorded picture during VTR playback, regardless of the setting of the PB VIDEO.

To output VTR playback signals to the viewfinder, TEST OUT connector, and the HDSDI OUT connector

Set PB VIDEO *(see page 87)* on the OUTPUT 2 page of the OPERATION menu to ALL.

To output VTR playback signals to the HDSDI OUT connector, and output the camera picture to the viewfinder and the TEST OUT connector

Set PB VIDEO *(see page 87)* on the OUTPUT 2 page of the OPERATION menu to HDSDI.



Freezing a picture during playback

Pressing the STOP button during playback stops playback and freezes the picture.
The CAM CONFIG 1 page of the MAINTENANCE menu allows you to set the freeze-frame mode where you can view the frozen picture during playback.

Settings for freezing a picture

1 Display the CAM CONFIG 1 page of the MAINTENANCE menu.

```
 M120CAM CONFIG 1     TOP

 REC TALLY BLINK       ON
 REC START BEEP       OFF
 SUB LCD MODE SEL   TIMER
 SUB LCD TIMER         1H
 SHOT TIME DISP     MD HM
 VIDEO OUT (F/R)       EE
 STBY OFF TIMER    60MIN
→STOP KEY FREEZE   ●  OFF
 EMERGENCY EJECT      OFF
 TAPE LED BRIGHT     HIGH
```

2 Turn the MENU knob to select STOP KEY FREEZE, and press the MENU knob.

3 Turn the MENU knob to select the desired freeze mode, and press the MENU knob.
The freeze mode changes in the following sequence: OFF ⟷ FRAME ⟷ FIELD

Setting	Contents
OFF	Deactivates the freeze function.
FRAME	Freezes pictures in frame mode. This mode is effective for freezing pictures of objects that are not moving.
FIELD	Freezes pictures in field mode. This mode is effective for freezing moving pictures.

Viewing frozen pictures

1 Press the PLAY button to start playback.

2 Press the STOP button at the instant when you want to freeze the picture.
The tape stops running and the picture is frozen.
The timecode is displayed in the counter display and the PLAY indicator flashes (one flash/second).

Changing to another mode

To cancel the freeze-frame mode for viewing the frozen picture and change to another mode, proceed as follows:

To restart playback: Press the PLAY button.
To search the color picture: Press the F FWD or REW button.
To view the pictures shot by the camcorder: Press the STOP button.
To rewind the tape: Press the REW button twice.
To fast forward the tape: Press the F FWD button twice.
To eject the tape: Press the EJECT button.

Notes

- In the freeze-frame mode, you cannot start recording pictures on the tape. To start recording the shot pictures again, press the STOP button to finish playback, then press the REC START button.
- When changing to the recording pause mode from the freeze-frame mode by using the End-Search function or positioning function for continuous recording, press the STOP button first, then press the RET button on the lens.

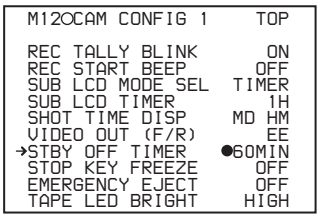
When remotely controlling the camcorder from an optional RM-B150/B750 Remote Control Unit

You can perform the same operation from an RM-B150/B750.

Setting the Rec-Pause Stand-by Off Timer

The VTR SAVE/STBY switch allows you to select the VTR power mode during pauses in recording or when the unit is stopped.
Standby mode (with the VTR SAVE/STBY switch set to STBY) allows you to protect the tape and recording heads. You can also set up the unit in such a way that it switches from standby mode to power saving mode when the tape does not run for a specified time. This setting is made on the CAM CONFIG 1 page of the MAINTENANCE menu.

1 Display the CAM CONFIG 1 page of the MAINTENANCE menu.



2 Turn the MENU knob to select STBY OFF TIMER, and press the MENU knob.

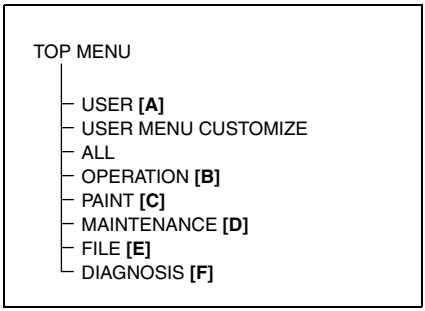
3 Turn the MENU knob to select OFF in order not to enter in the VTR SAVE mode, or select the desired time to enter the VTR SAVE mode, then press the MENU knob.

The time changes in the following sequence: 60MIN ↔ 30MIN ↔ 10MIN ↔ 5MIN ↔ OFF.

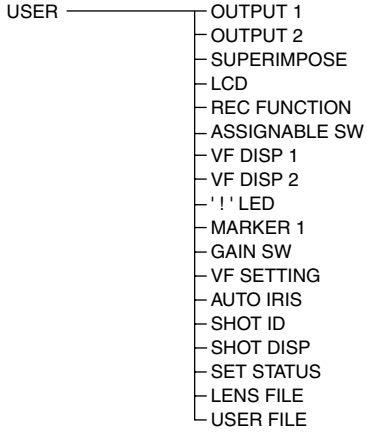
Chapter 5 Menu Displays and Detailed Settings

Menu Organization

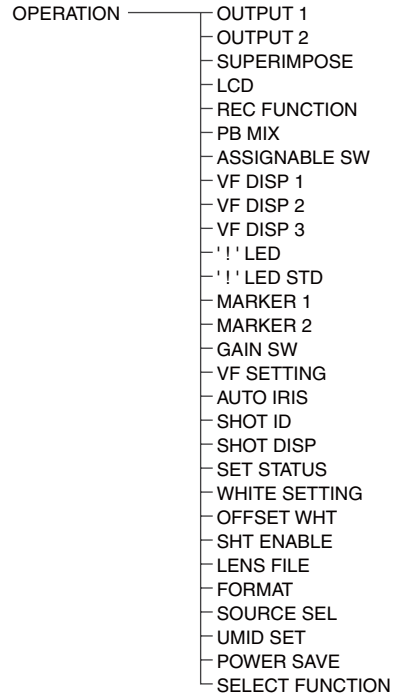
The following chart shows the organization of menus in this camcorder.



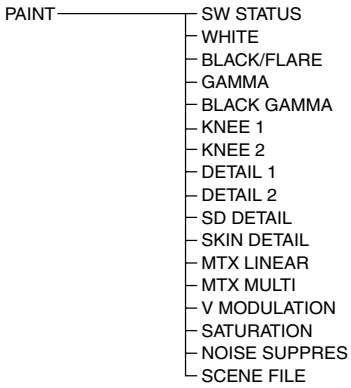
[A] USER menu



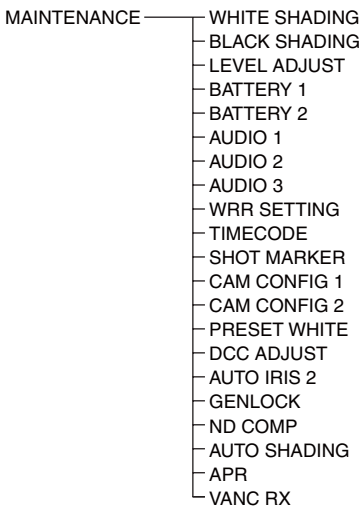
[B] OPERATION menu



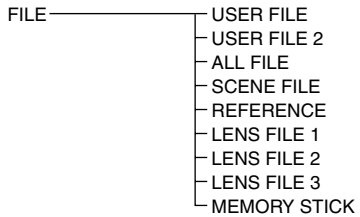
[C] PAINT menu



[D] MAINTENANCE menu



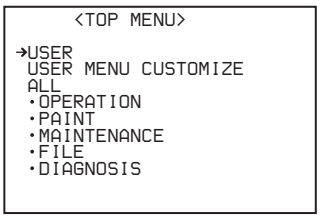
[E] FILE menu



[F] DIAGNOSIS menu

TOP menu and top-level menus

The TOP menu appears when, with no menu displayed, you hold down the MENU knob and set the MENU ON/OFF switch to ON. The TOP menu contains only top-level menus.



When you select a top-level menu, the most recently shown page of that menu appears. The CONTENTS page appears when the menu is selected for the first time.

For details about how to use menus, see page 119.

USER menu

This menu allows you to add any desired page from the OPERATION, PAINT, MAINTENANCE, FILE, and DIAGNOSIS menus to suit your needs. By gathering frequently used pages on the USER menu beforehand, you can call up them quickly whenever you need them.
This menu is normally displayed when the MENU ON/OFF switch is set to ON.

USER MENU CUSTOMIZE menu

This menu allows you to add pages to or delete pages from the USER menu to suit your needs.

ALL menu

This menu allows you to handle all items in the OPERATION, PAINT, MAINTENANCE, FILE, and DIAGNOSIS menus as if they were in one menu.

OPERATION menu

This menu contains items for changing settings according to conditions related to the subject when the camcorder is being operated.

PAINT menu

This menu contains items for making detailed image adjustments while using a waveform monitor to monitor the waveforms output by the camera. Support of a video engineer is usually required to use this menu. Although you can also use an external remote control unit to set the items on this menu, this menu is effective when using the camcorder by itself outdoors.

MAINTENANCE menu

This menu contains items for making settings for audio, timecode, and battery.

FILE menu

This menu is for saving the adjusted data in the camcorder memory or in a “Memory Stick”. The following files can be saved.

User files

User files save the setting items and setting data of customized USER menus. You can save up to 100 user files in a “Memory Stick”. Once you save a user file in a “Memory Stick”, you can easily set the USER menu to your preference by loading the file.

For details on user files, see “Saving and Recalling User Files” on page 145.

ALL files

ALL files save the setting data of all of the menus. You can save up to 100 ALL files in a “Memory Stick”.

Once a camcorder is set up according to your preferences and you save an ALL file in a “Memory Stick”, you can easily set other camcorders to those settings by loading the data from the “Memory Stick”.

Note

Device specific data (output levels and shading that requires adjustment for the specific device) is not saved.

Scene files

In the scene file, the setting values of PAINT menu items set to shoot a particular scene are saved. You can save up to five scene files in the camcorder memory and up to 100 scene files in a “Memory Stick”. For example, first adjust the settings to shoot a rehearsal of a particular scene and then save them as a scene file. Then load that file before the actual shooting so that you can quickly recreate setup conditions of the rehearsal.

Reference files

Reference files save the reference values that are set when STANDARD is executed in the SCENE FILE page of the PAINT menu. You can save one reference file in the internal memory of the unit and one in a “Memory Stick”.

Lens files

Lens files save the setting data used to compensate for the characteristics of lenses, such as flare, white shading, and auto iris gain. You can save up to 32 lens files in the internal memory of the unit and up to 100 lens files in a “Memory Stick”.

DIAGNOSIS menu

This menu shows the digital hours meter, the ROM version, and information about the internal device status of the camcorder.

Menu List

Tips

- The bold-faced numbers designate the pages that have been registered in the USER menu at the factory.
- The bold-faced settings are the factory default settings.
- The initial value of items with a setting range of –99 to 99 is 0.
- When the setup value in the Settings column is surrounded by parentheses ( ), the value is a relative value. The setting range shown on the menu screen may differ from what is shown in the manual.

OPERATION menu

No.	Page	Item	Settings	Description
01	OUTPUT 1	HD SDI OUT	OFF/**HDSDI**	Selects the output signal from the HDSDI OUT connector.
		HD/SD SDI OUT	OFF/**HDSDI**/SDSDI	Selects the output signal from the HD/SD SDI OUT connector.
		HD/SD SDI SUPER	**OFF**/ON	Sets the superimposed information output from the HD/SD SDI OUT connector.
		TEST OUT SELECT	VBS/**Y**/R/G/B	Selects the output signal from the TEST OUT connector. **Note** When R, G, or B is selected, turning the power of the unit off and on changes the setting to Y.
		TEST OUT SUPER	**OFF**/ON	Sets the superimposed information output from the TEST OUT connector.

No.	Page	Item	Settings	Description
02	OUTPUT 2	PB VIDEO	**ALL**/HDSDI	*For details, see "Checking the camera picture on the viewfinder and/or color video monitor" on page 80.*
		DOWN CON MODE	SQEZE/LETTER/**CROP**	Sets the conversion mode for down-converted output. **Note** LETTER cannot be selected when LETTER BOX on the SELECT FUNCTION page is set to DISABLE.
		WIDE ID	**OFF**/ON	Specifies whether to add wide picture information to the SD output signal. **OFF:** Output the video signals without adding wide picture information. **ON:** When the DOWN CON MODE item is set to SQEZE, add wide picture information to the output video signals.
03	SUPERIMPOSE	SUPER(VFDISP)	OFF/**ON**	When the HD/SD SDI SUPER item or the TEST OUT SUPER item on the OUTPUT 1 page is set to ON, turn the output of text (superimposed) information from the HD/SD SDI OUT or TEST OUT connector on or off for each item.
		SUPER(MENU)	OFF/**ON**	
		SUPER(TC)	**OFF**/ON	
		SUPER(MARKER)	**OFF**/ON	
		SUPER(ZEBRA)	**OFF**/ON	
04	LCD	LCD COLOR	(–137 to **0** to 62)	Adjusts the LCD color.
		LCD MARKER&ZEBRA	OFF/**ON**	Turns the marker and zebra display in the LCD monitor on or off.

No.	Page	Item	Settings	Description
05	REC FUNCTION	DF/NDF (when the frame frequency is set to 59.94i)	**DF**/NDF	Switches between DF and NDF. **DF:** drop frame mode **NDF:** non-drop frame mode
		END SEARCH	**OFF**/ON	*For details, see "Searching for the end of a recorded section and turning on recording pause mode" on page 78.*
		CACHE/INTVAL REC	**OFF**/CACHE/A.INT/ M.INT	*For details, see "Starting a shoot with a few seconds of pre-stored picture data (Picture Cache function)" on page 70.*
		(CACHE) CACHE REC TIME	**0**/1/2/3/4/5/6/7SEC [a]	
		(A.INT) TAKE TOTAL TIME	**5**/10/15/20/30/40/50 MIN, 1/2/3/4/5/7/10/15/ 20/30/40/50/70/100 H	*For details, see "Shooting picture at intervals (Interval Rec function)" on page 72.*
		(A.INT) REC TIME	**5**/10/15/20/30/40/50 SEC, 1 to 40 MIN [b]	
		(A.INT and M.INT except TRIGGER INTERVAL set to M) PRE-LIGHTING	**OFF**/2SEC/5SEC/10SEC	
		(M.INT) NUMBER OF FRAME	**1**/2/4/8	
		(M.INT) TRIGGER INTERVAL	**M**/1 to 10/15/20/30/40/50 SEC, 1 to 10/15/20/30/ 40/50 MIN, 1/2/3/4/6/12/ 24H	
06	PB MIX	PB MIX	**OFF**/ON	Turns the playback mix function on or off.
		MIX DIRECTION	**CAM**/PB	Selects the mixing direction. **CAM:** Mix the playback picture into the camera picture. **PB:** Mix the camera picture into the playback picture.
		MIX MODE	**Y-MIX**/WIRE W/ WIRE B	Selects the type of picture information to mix. **Y-MIX:** Mix Y signals. **WIRE W:** Mix outline components with white lines. **WIRE B:** Mix outline components with black lines.
		MIX LEVEL	0% to **80%**	Specifies the mix level.
		STOP KEY FREEZE	**OFF**/FRAME/FIELD	Selects the type of freeze picture to display when the STOP button is pressed during playback.

No.	Page	Item	Settings	Description
07	ASSIGNABLE SW	ASSIGN SW <1>		*For details, see "Assigning functions to ASSIGN switches" on page 138.*
		ASSIGN SW <2>		
		ASSIGN SW <3>		
		ASSIGN SW <4>		
		ASSIGN SW <5>		
		ASSIGN SW <RET>		
		ZOOM SPEED	0 to **20** to 99	Selects the zoom speed, when you have assigned ZOOM to ASSIGN SW <3> or ASSIGN SW <4>, when using a lens that supports zoom from the camera.
		RETURN VIDEO	**OFF**/ON	Turns the return video function on or off.
08	VF DISP 1	VF DISP	OFF/**ON**	*For details, see "Selecting the display items" on page 130.*
		VF DISP MODE	1/2/**3**	
		DISP EXTENDER	OFF/**ON**	
		DISP FILTER	OFF/**ON**	
		DISP CC 5600K	OFF/**ON**	
		DISP WHITE	OFF/**ON**	
		DISP GAIN	OFF/**ON**	
		DISP SHUTTER	OFF/**ON**	
		DISP AUDIO	OFF/**ON**	
		DISP TAPE	OFF/**ON**	
09	VF DISP 2	DISP IRIS	OFF/**ON**	
		DISP ZOOM	OFF/**ON**	
		DISP COLOR TEMP	**OFF**/ON	
		DISP BATT REMAIN	**INT**/VOLT/AUTO	
		DISP DC IN	**OFF**/ON	
		DISP WRR RF LVL	**OFF**/ON	
		DISP TIME CODE	**OFF**/ON	
		DISP PB MIX	OFF/**ON**	
10	VF DISP 3	LOW LIGHT	**OFF**/ON	
		LOW LIGHT LEVEL	(–99 to 99)	
		VF BATT WARNING	**10%**/20%	
		ABSOLUTE VALUE	**OFF**/ON	Display absolute values for items that are being displayed as relative values (the target values are highlighted).

No.	Page	Item	Settings	Description
11	'!' LED	GAIN <!>	OFF/**ON**	*For details, see "Indicators" on page 27.*
		SHUTTER <!>	OFF/**ON**	
		WHITE BAL <!>	OFF/**ON**	
		CC 5600K <!>	OFF/**ON**	
		ATW RUN <!>	OFF/**ON**	
		EXTENDER <!>	OFF/**ON**	
		FILTER ND <!>	**OFF**/ON	
		FILTER CC <!>	**OFF**/ON	
		OVERRIDE <!>	OFF/**ON**	
12	' ! ' LED STD	GAIN <!>	**0dB**/LOW/MID/HIGH	*For details, see "Selecting the conditions that light the '!' (warning) indicator" on page 131.*
		SHUTTER <!>	OFF/ECS/ 1/32 / 1/33 / 1/48 / 1/50 / 1/60 / 1/96 / 1/100 / 1/125 / 1/250 / 1/500 / 1/1000 / 1/2000/ SLS [c)]	
		WHITE BAL <!>	P/A/B/PA/PB/**AB**	
		CC 5600K <!>	**OFF**/ON	
		ATW RUN <!>	**OFF**/ON	
		EXTENDER <!>	**OFF**/ON	
		FILTER ND <!>	**1**/2/3/4	
		FILTER CC <!>	A/**B**/C/D	
		OVERRIDE <!>	**OFF**/ON	
13	MARKER 1	MARKER	OFF/**ON**	*For details, see "Setting the marker display" on page 133.*
		CENTER	**OFF**/ON	
		CENTER MARK	1/2/**3**/4	
		SAFETY ZONE	**OFF**/ON	
		SAFETY AREA	80%/**90%**/92.5%/95%	
		ASPECT	**OFF**/ON	
		ASPECT SELECT	15:9/14:9/13:9/**4:3**/1.85/ 2.35	
		ASPECT MASK	OFF/**ON**	
		ASPECT MASK LVL	0 to **12** to 15	
		100% MARKER	**OFF**/ON	
14	MARKER 2	USER BOX	**OFF**/ON	
		USER BOX WIDTH	3 to **240** to 479	
		USER BOX HEIGHT	3 to **135** to 269	
		USER BOX H POS	–477 to **0** to 476	
		USER BOX V POS	–267 to **0** to 266	
		CENTER H POS	–480 to **0** to 479	
		CENTER V POS	–270 to **0** to 269	
		ASPECT SAFE ZONE	**OFF**/ON	
		ASPECT SAFE AREA	80%/**90%**/92.5%/95%	

No.	Page	Item	Settings	Description
15	GAIN SW	GAIN LOW	–6dB/–3dB/**0dB**/3dB/ 6dB/9dB/12dB/18dB/ 24dB/30dB/36dB/42dB	*For details, see "Setting gain values for the GAIN selector positions" on page 137.*
		GAIN MID	–6dB/–3dB/0dB/3dB/ **6dB**/9dB/12dB/18dB/ 24dB/30dB/36dB/42dB	
		GAIN HIGH	–6dB/–3dB/0dB/3dB/ 6dB/9dB/**12dB**/18dB/ 24dB/30dB/36dB/42dB	
		GAIN TURBO	–6dB/–3dB/0dB/3dB/ 6dB/9dB/12dB/18dB/ 24dB/30dB/36dB/**42dB**	
		TURBO SW IND	**OFF**/ON	
		SHOCKLESS GAIN	**OFF**/ON	
16	VF SETTING	ZEBRA	**OFF**/ON	*For details, see "Setting the viewfinder" on page 133.*
		ZEBRA SELECT	**1**/2/BOTH	
		ZEBRA1 DET LVL	30% to **70%** to 107%	
		ZEBRA1 APT LVL	1% to **10%** to 20%	
		ZEBRA2 DET LVL	52% to **100%** to 109%	
		VF DETAIL LEVEL	(–99 to 99)	
17	AUTO IRIS	IRIS OVERRIDE	**OFF**/ON	*For details, see "Changing the Reference Value for Automatic Iris Adjustment" on page 55.*
		IRIS SPEED	(–99 to 99)	
		CLIP HIGH LIGHT	**OFF**/ON	
		IRIS WINDOW	**1**/2/3/4/5/6/VAR	
		IRIS WINDOW IND	**OFF**/ON	
		IRIS VAR WIDTH	20 to **240** to 479	
		IRIS VAR HEIGHT	20 to **135** to 269	
		IRIS VAR H POS	–460 to **0** to 459	
		IRIS VAR V POS	–253 to **0** to 252	
18	SHOT ID	ID-1	**Blank**/up to 12 characters	*For details, see "Setting the shot ID" on page 135.*
		ID-2	**Blank**/up to 12 characters	
		ID-3	**Blank**/up to 12 characters	
		ID-4	**Blank**/up to 12 characters	
19	SHOT DISP	SHOT DATE	**OFF**/ON	*For details, see "Recording shot data superimposed on the color bars" on page 134.*
		SHOT TIME	**OFF**/ON	
		SHOT MODEL NAME	**OFF**/ON	
		SHOT SERIAL NO	**OFF**/ON	
		SHOT ID SEL	**OFF**/ID-1/ID-2/ID-3/ID-4	
		SHOT 16:9 CHARA	**OFF**/ON	
		SHOT BLINK CHARA	**OFF**/ON	
20	SET STATUS	STATUS ABNORMAL	OFF/**ON**	*For details, see "Displaying the status confirmation screens" on page 136.*
		STATUS SYSTEM	OFF/**ON**	
		STATUS FUNCTION	OFF/**ON**	
		STATUS AUDIO	OFF/**ON**	

No.	Page	Item	Settings	Description
21	WHITE SETTING	WHITE SWITCH <B>	**MEM**/ATW	Specifies the operating mode when the WHITE BAL switch is set to the B side. **MEM:** Auto white balance **ATW:** Auto tracing white balance
		SHOCKLESS WHITE	OFF/**1**/2/3	Specifies the transition time when the WHITE BAL switch is changed to a new setting (1 is fastest)
		ATW SPEED	1/2/3/**4**/5	Switches the transition speed of auto tracing white balance (ATW) (1 is fastest)
		AWB FIXED AREA	**OFF**/ON	Executes AWB (auto white balance) at the center of the screen.
		FILTER WHT MEM	OFF/**ON**	Sets the content of the white balance memory area for each position number of the FILTER selector.
22	OFFSET WHT	OFFSET WHITE <A>	**OFF**/ON	*For details, see "Specifying an offset for the auto white balance setting" on page 140.*
		WARM-COOL <A>	Displays reference color temperature	
		WARM-COOL BAL <A>	(–99 to 99)	
		OFFSET WHITE <B>	**OFF**/ON	
		WARM-COOL <B>	Displays reference color temperature	
		WARM-COOL BAL <B>	(–99 to 99)	
23	SHT ENABLE SHT ENABLE 2	SHUTTER SLS	OFF/**ON**	The items which can be set differ depending on the settings of the FORMAT page. *For details, see "Setting the Electronic Shutter" on page 52.*
		SHUTTER ECS	OFF/**ON**	
		SHUTTER 1/32	OFF/**ON**	
		SHUTTER 1/33	OFF/**ON**	
		SHUTTER 1/48	OFF/**ON**	
		SHUTTER 1/50	OFF/**ON**	
		SHUTTER 1/60	OFF/**ON**	
		SHUTTER 1/96	OFF/**ON**	
		SHUTTER 1/100	OFF/**ON**	
		SHUTTER 1/125	OFF/**ON**	
		SHUTTER 1/250	OFF/**ON**	
		SHUTTER 1/500	OFF/**ON**	
		SHUTTER 1/1000	OFF/**ON**	
		SHUTTER 1/2000	OFF/**ON**	

No.	Page	Item	Settings	Description
24	LENS FILE	LENS FILE SELECT	**1** to 32	*For details, see "Selecting the lens file" on page 141.*
		F.ID	Display only	
		S. NO	Display only	
		L.ID	Display only	
		L.MF	Display only	
25	FORMAT	CURRENT	Display only	Displays the currently selected frame frequency.
		NEXT	**59.9i/**50i (HDW-650) 59.9i/50i/**25P** (HDW-650P) 59.9i/50i/**23.9P** (HDW-650F)	Selects the frame frequency. (The selected frame frequency becomes effective after the power is turned off and then on again.) **59.9i:** set to 59.94i **50i:** set to 50i **25P:** set to 25PsF **23.9P:** set to 23.98PsF
26	SOURCE SEL	FRONT MIC SELECT (when stereo microphone is connected)	MONO/**STREO**	Input mode selection for front microphone.
27	UMID SET	EX-OWNERSHIP REC	**OFF**/ON	*For details, see "Setting the UMID data" on page 141.*
		COUNTRY CODE	**Blank**/up to 4 characters	
		ORGANIZATION	**Blank**/up to 4 characters	
		USER CODE	**Blank**/up to 4 characters	
		INSTANCE NO	**RND**/GEN	
		TIME ZONE	**00** to 3F	
		MACHINE	Display only	
28	POWER SAVE	TEST OUT SAVE	OFF/**ON**	**ON:** No test signal is output when the cable is not connected. **OFF:** The test signal is always output.

No.	Page	Item	Settings	Description
29	SELECT FUNCTION	LETTER BOX	DISABLE/**ENABLE**	Enable the selection of "LETTR" (LETTER BOX) in the DOWN CON MODE item on the OUTPUT 2 page. **Note** Breakup may occur in output signals and in the video and audio of this unit for about 5 to 10 seconds immediately after this setting is changed.
		FOCUS MAG	**DISABLE**/ENABLE	Enable the assignment of the FOCUS MAG function to the ASSIGN switches. **Note** Breakup may occur in output signals and in the video and audio of this unit for about 5 to 10 seconds immediately after this setting is changed.

a) When 59.94i is selected, the maximum setting is 7SEC. When either 50i, 25PsF, or 23.98PsF is selected, the maximum setting is 8SEC.

b) The maximum setting differs as follows depending on the frame frequency.

- 59.94i: 40MIN
- 50i or 25PsF: 48MIN
- 23.98PsF: 50MIN

c) The shutter speed depends on the selected frame frequency.

PAINT menu

No.	Page	Item	Settings	Description
01	SW STATUS	GAMMA	OFF/**ON**	Turns the gamma correction on or off.
		BLACK GAMMA	**OFF**/ON	Turns the black gamma correction on or off.
		MATRIX	**OFF**/ON	Turns the linear matrix correction and user-set matrix correction functions on or off.
		KNEE	OFF/**ON**	Turns the knee correction on or off.
		WHITE CLIP	OFF/**ON**	Turns the white clipping correction on or off.
		DETAIL	OFF/**ON**	Turns the detail signal on or off.
		APERTURE	OFF/**ON**	Turns the aperture function on or off.
		FLARE	OFF/**ON**	Turns the flare function on or off.
		TEST SAW	**OFF**/ON	Selects the test signal.

No.	Page	Item	Settings	Description
02	WHITE	COLOR TEMP <A>	Displays reference color temperature.	Sets the color temperature of WHITE A.
		C TEMP BAL <A>	(–99 to 99)	Adjusts the value more precisely when the color temperature adjustment through COLOR TEMP is not satisfactory.
		R GAIN <A>	(–99 to 99)	Only the value of R GAIN is changed.
		B GAIN <A>	(–99 to 99)	Only the value of B GAIN is changed.
		COLOR TEMP <B>	Displays reference color temperature.	Sets the color temperature of WHITE B.
		C TEMP BAL <B>	(–99 to 99)	Adjusts the value more precisely when the color temperature adjustment through COLOR TEMP is not satisfactory.
		R GAIN <B>	(–99 to 99)	Only the value of R GAIN is changed.
		B GAIN <B>	(–99 to 99)	Only the value of B GAIN is changed.
03	BLACK/FLARE	MASTER BLACK	(–99 to 99)	Adjusts the master black level.
		R BLACK	(–99 to 99)	Adjusts the R black level.
		G BLACK	(–99 to 99)	Adjusts the G black level.
		B BLACK	(–99 to 99)	Adjusts the B black level.
		FLARE	OFF/**ON**	Turns the flare correction circuit on or off.
		MASTER FLARE	(–99 to 99)	Adjusts the flare level of the master.
		R FLARE	(–99 to 99)	Adjusts the R flare level.
		G FLARE	(–99 to 99)	Adjusts the G flare level.
		B FLARE	(–99 to 99)	Adjusts the B flare level.
		TEST OUT SELECT	VBS/**Y**/R/G/B	Selects the output signal of TEST OUT connector.

No.	Page	Item	Settings	Description
04	GAMMA	GAMMA	OFF/**ON**	Turns the gamma correction function on or off.
		STEP GAMMA	0.35 to **0.45** to 0.90	Sets the gamma correction curve by steps. [a)]
		MASTER GAMMA	(–99 to 99)	Sets the master gamma correction curve. [a)]
		R GAMMA	(–99 to 99)	Sets the R gamma correction curve. [a)]
		G GAMMA	(–99 to 99)	Sets the G gamma correction curve. [a)]
		B GAMMA	(–99 to 99)	Sets the B gamma correction curve. [a)]
		TEST OUT SELECT	VBS/**Y**/R/G/B	Selects the output signal of TEST OUT connector.
		GAMMA TABLE	**STD**/HG	Selects the gamma table.
		GAM TABLE (STD)	1 to **5** to 6	Selects the standard gamma table.
		(HG) GAM TABLE (HG)	1 to **4**	Selects the hyper gamma table.
05	BLACK GAMMA	BLACK GAMMA	**OFF**/ON	Turns the black gamma correction on or off.
		BLK GAMMA RANGE	LOW/L.MID/H.MID/ **HIGH**	Sets the range affected by black gamma.
		MASTER BLK GAMMA	(–99 to 99)	Adjusts the master black gamma.
		R BLACK GAMMA	(–99 to 99)	Sets the correction curve of the R black gamma.
		G BLACK GAMMA	(–99 to 99)	Sets the correction curve of the G black gamma.
		B BLACK GAMMA	(–99 to 99)	Sets the correction curve of the B black gamma.
		TEST OUT SELECT	VBS/**Y**/R/G/B	Selects the output signal of TEST OUT connector.
06	KNEE 1	KNEE	OFF/**ON**	Turns the knee correction circuit on or off. [a)]
		KNEE POINT (M)	50.0% to **95.0%** to 109.0%	Sets the knee point level. [a)]
		KNEE SLOPE (M)	(–99 to 99)	Set the knee slope level. [a)]
		KNEE SATURATION	OFF/**ON**	Turns the knee saturation function on or off.
		KNEE SAT LEVEL	(–99 to 99)	Sets the knee saturation level.
		WHITE CLIP	OFF/**ON**	Turns the white clipping function on or off.
		WHITE CLIP LEVEL	59.94i/23.98PsF: 95.0 to **108.0** to 109.0% 50i/25PsF: 95.0 to **105.0** to 109.0%	Adjusts the white clipping level.

No.	Page	Item	Settings	Description
07	KNEE 2	KNEE SATURATION	OFF/**ON**	Turns the knee saturation function on or off.
		KNEE POINT (R)	–45.0 to **0.0** to 14.0%	Sets the knee point level. [a) b)]
		KNEE SLOPE (R)	(–99 to 99)	Sets the knee slope level. [a) b)]
		KNEE POINT (G)	–45.0 to **0.0** to 14.0%	Sets the knee point level. [a)]
		KNEE SLOPE (G)	(–99 to 99)	Sets the knee slope level. [a)]
		KNEE POINT (B)	–45.0 to **0.0** to 14.0%	Sets the knee point level. [a) b)]
		KNEE SLOPE (B)	(–99 to 99)	Sets the knee slope level. [a) b)]
08	DETAIL 1	DETAIL	OFF/**ON**	Turns the detail signal on or off.
		APERTURE	OFF/**ON**	Turns the aperture correction function on or off.
		DETAIL LEVEL	(–99 to 99)	Sets the general level of the detail signal.
		APERTURE LEVEL	(–99 to 99)	Sets the aperture correction level.
		DTL H/V RATIO	(–99 to 99)	Sets the level of the V detail signal.
		CRISPENING	(–99 to 99)	Sets the crispening level.
		LEVEL DEPEND	OFF/**ON**	Turns the level depend function on or off.
		LEVEL DEPEND LVL	(–99 to 99)	Sets the level of the level depend.
		DETAIL FREQUENCY	(–99 to 99)	Sets the frequency of the H detail signal.
09	DETAIL 2	KNEE APERTURE	**OFF**/ON	Turns the knee aperture function on or off.
		KNEE APT LVL	(–99 to 99)	Sets the knee aperture level.
		DETAIL LIMIT	(–99 to 99)	Sets the both detail black and white limiters.
		DTL WHT LMT	(–99 to 99)	Sets the detail white limiter.
		DTL BLK LMT	(–99 to 99)	Sets the detail black limiter.
		DTL V-BLK LMT	(–99 to 99)	Sets the V detail black limiter.
		V DTL CREATION	NAM/G/**R+G**/Y	Selects the source signal of the V DTL signal.
		H/V CONTROL MODE	H/V / **V**	Selects the operation mode of DTL H/V RATIO on the DETAIL 1 page. **H/V:** H and V increase and decrease in inverse proportion **V:** V DTL only enabled

No.	Page	Item	Settings	Description
10	SD DETAIL	SD DETAIL	OFF/**ON**	Turns the SD detail correction on or off.
		SD DETAIL LEVEL	(–99 to 99)	Sets the general level of the SD detail signal.
		SD CRISPENING	(–99 to 99)	Sets the SD crispening level.
		SD DTL WHT LIMIT	(–99 to 99)	Sets the SD detail white limiter.
		SD DTL BLK LIMIT	(–99 to 99)	Sets the SD detail black limiter.
		SD LEVEL DEPEND	OFF/**ON**	Turns the SD level depend function on or off.
		SD LV DEPEND LVL	(–99 to 99)	Sets the level of the SD level depend.
		SD DTL FREQUENCY	(–99 to 99)	Sets the frequency of the SD H detail signal.
		SD DTL H/V RATIO	(–99 to 99)	Sets the level of the SD V detail signal.
		SD CROSS COLOR (when the frame frequency is set to 59.94i or 23.98PsF)	(–99 to 99)	Sets the SD cross color reduction level.
11	SKIN DETAIL	SKIN DETAIL ALL	**OFF**/ON	Turns on or off all of channels 1, 2 and 3 for the color detail function.
		SKIN DETECT	Moves to color detection page.	Executes the color detail function.
		SKIN AREA IND	**OFF**/ON	Turns on and off the function that displays a zebra pattern where color was detected.
		SKIN DTL SELECT	**1**/2/3	Selects the type of the color detail function.
		SKIN DETAIL	OFF/**ON**	Turns the color detail function on or off for the type selected in the above item.
		SKIN DETAIL LVL	(–99 to 99)	Sets the level of the color detail signal.
		SKIN DTL SAT	(–99 to 99)	Adjusts the saturation level of the hue possessed by the color detail function.
		SKIN DTL HUE	**0** to 359	Adjusts the center phase of the hue possessed by the color detail function.
		SKIN DTL WIDTH	0 to **39** to 359	Adjusts the width of the hue possessed by the color detail function.

No.	Page	Item	Settings	Description
12	MTX LINEAR	MATRIX	**OFF**/ON	Turns the linear matrix correction and user-set matrix correction functions on or off.
		MATRIX(USER)	**OFF**/ON	Turns the user-set matrix correction function on or off.
		MATRIX(PRESET)	OFF/**ON**	Turns the preset matrix correction function on or off.
		MATRIX(PRST) SEL	1/**2**/3/4/5/6	Selects the preset matrix correction function.
		MATRIX(USER) R-G	(–99 to 99)	Sets the arbitrary R-G user-set matrix coefficients.
		MATRIX(USER) R-B	(–99 to 99)	Sets the arbitrary R-B user-set matrix coefficients.
		MATRIX(USER) G-R	(–99 to 99)	Sets the arbitrary G-R user-set matrix coefficients.
		MATRIX(USER) G-B	(–99 to 99)	Sets the arbitrary G-B user-set matrix coefficients.
		MATRIX(USER) B-R	(–99 to 99)	Sets the arbitrary B-R user-set matrix coefficients.
		MATRIX(USER) B-G	(–99 to 99)	Sets the arbitrary B-G user-set matrix coefficients.
13	MTX MULTI	MATRIX	**OFF**/ON	Turns the linear matrix correction and multi matrix correction functions on or off.
		MATRIX (MULTI)	**OFF**/ON	Turns the multi matrix correction function on or off.
		MATRIX AREA IND	**OFF**/ON	Turns the zebra indication on or off in the area corresponding to the currently selected setting.
		MATRIX COLOR DET	Moves to color detection page.	Detects color.
		MTX(MULTI) PRESET	–	Clears settings for 16 axes of MTX (MULTI) HUE and MTX (MULTI) SAT respectively.
		MTX (MULTI) AXIS	**B**/B+/MG–/MG/MG+/R/R+/YL–/YL/YL+/G–/G/G+/CY/CY+/B–	Sets 16 hue axes as the targets of the multi matrix correction function.
		MTX (MULTI) HUE	(–99 to 99)	Sets hue correction values for each of the 16 axis modes.
		MTX (MULTI) SAT	(–99 to 99)	Sets saturation correction values for each of the 16 axis modes.

No.	Page	Item	Settings	Description
14	V MODULATION	V MOD	OFF/**ON**	Turns the V modulation function on or off.
		MASTER VMOD	(–99 to 99)	Adjusts the master V modulation level.
		R VMOD	(–99 to 99)	Adjusts the R V modulation level.
		G VMOD	(–99 to 99)	Adjusts the G V modulation level.
		B VMOD	(–99 to 99)	Adjusts the B V modulation level.
		TEST OUT SELECT	VBS/**Y**/R/G/B	Selects the output signal of the TEST OUT connector.
15	SATURATION	SATURATION	**OFF**/ON	Turns the saturation function on or off.
		SATURATION LEVEL	(–99 to 99)	Sets the saturation level.
		LOW KEY SAT	**OFF**/ON	Turns the low key saturation function on or off.
		L. KEY SAT LEVEL	(–99 to 99)	Sets the saturation level of the low luminance part.
		L. KEY SAT RANGE	LOW/L.MID/H MID/ **HIGH**	Sets the luminance level at which the low key saturation function becomes effective.
		Y BLACK GAMMA	**OFF**/ON	Turns the Y black gamma function on or off.
		Y BLK GAM LEVEL	(–99 to 99)	Sets the gamma curve in the low luminance part.
		Y BLK GAM RANGE	LOW/L.MID/H MID/ **HIGH**	Sets the luminance level at which the Y black gamma becomes effective. (linked with L.KEY SAT RANGE)
16	NOISE SUPPRESS	NOISE SUPPRESS	OFF/**ON**	Turns the noise suppressor function on or off.
		NOISE SUP LEVEL	**0%** to 100%	Adjusts the noise suppressor level for the current master gain value.
		MASTER GAIN(TMP)	–6dB/–3dB/**0dB**/3dB/ 6dB/9dB/12dB/18dB/ 24dB/30dB/36dB/42dB	Temporarily adjusts the master gain value.
		NOISE SUP SETTING	Display only	Displays the noise suppressor level for each master gain value.

No.	Page	Item	Settings	Description
17	SCENE FILE	1	STANDARD	Recalls the scene file saved in the memory of the camcorder.
		2	STANDARD	
		3	STANDARD	
		4	STANDARD	
		5	STANDARD	
		STANDARD	–	Clears all current detail-adjusted settings and switch settings and returns the settings to the standard settings saved in the reference file.
		SCENE RECALL	EXEC	Recalls the scene file from the memory of the camcorder or the "Memory Stick".
		SCENE STORE	EXEC	Stores the scene file in the memory of the camcorder or the "Memory Stick".
		F.ID	STANDARD/up to 16 characters	Sets the File ID.

a) This item cannot be set when HG is selected for GAMMA TABLE.

b) This item cannot be set when KNEE SATURATION is set to ON.

MAINTENANCE menu

No.	Page	Item	Settings	Description
01	WHITE SHADING	WHT SHAD CH SEL	**R**/G/B/TEST	Selects the channel adjusted by this menu. If TEST is selected, the setting is linked to the setting of TEST OUT SELECT.
		TEST OUT SELECT	VBS/**Y**/R/G/B	Selects the signal output of the TEST OUT connector.
		R/G/B WHT H SAW	(–99 to 99)	H Saw white shading compensation.
		R/G/B WHT H PARA	(–99 to 99)	H Parabola white shading compensation.
		R/G/B WHT V SAW	(–99 to 99)	V Saw white shading compensation.
		R/G/B WHT V PARA	(–99 to 99)	V Parabola white shading compensation.
		WHITE SAW/PARA	OFF/**ON**	Turns white shading Saw and Parabola compensation on and off.

No.	Page	Item	Settings	Description
02	BLACK SHADING	BLK SHAD CH SEL	**R**/G/B/TEST	Selects the channel adjusted by this menu. If TEST is selected, the setting is the same as the setting of TEST OUT SELECT.
		TEST OUT SELECT	VBS/**Y**/R/G/B	Selects the signal output of the TEST OUT connector.
		R/G/B BLK H SAW	(–99 to 99)	H Saw black shading compensation.
		R/G/B BLK H PARA	(–99 to 99)	H Parabola black shading compensation.
		R/G/B BLK V SAW	(–99 to 99)	V Saw black shading compensation.
		R/G/B BLK V PARA	(–99 to 99)	V Parabola black shading compensation.
		BLACK SAW/PARA	OFF/**ON**	Turns black shading Saw and Parabola compensation on and off.
		MASTER BLACK	(–99 to 99)	Master black level adjustment.
		MASTER GAIN(TMP)	–6dB/–3dB/**0dB**/ 3dB/6dB/9dB/ 12dB/18dB/ 24dB/30dB/ 36dB/42dB	Temporarily adjusts the master gain value.
03	LEVEL ADJUST	HD-Y LEVEL	(–99 to 99)	Adjusts the Y level of the HD component signal.
		VBS VIDEO LEVEL	(–99 to 99)	Adjusts the composite signal video level.
		VBS SETUP LEVEL (displayed only when the frame frequency is set to 59.94i or 23.98PsF)	**0%**/7.5%	Selects the setup level of the composite signal. **Note** The factory default setting for HDW-650F is 7.5%.
		TEST OUT SELECT	VBS/**Y**/R/G/B	Selects the signal output of the TEST OUT connector.

No.	Page	Item	Settings	Description
04	BATTERY 1	Info BEFORE END	**5%**/10%/ 15%...95%/100%	Used when a BP-GL65/GL95 Battery Pack is used. Sets the remaining power (% value) of the battery at which the BEFORE END warning should be issued. [a)]
		Info END	**0%**/1%/2%/3%/ 4%/5%	Used when a BP-GL65/GL95 Battery Pack is used. Sets the remaining power (% value) of the battery at which the END warning should be issued. [b)]
		Sony BEFORE END	**11.5V** to 17.0V (in 0.1 V steps)	Used when a BP-L60S/L80S Battery Pack is used. Sets the voltage level of the battery at which the BEFORE END warning should be issued. [a)]
		Sony END	**11.0V** to 11.5V (in 0.1 V steps)	Used when a BP-L60S/L80S Battery Pack is used. Sets the voltage level of the battery at which the END warning should be issued. [b)]
		Other BEFORE END	11.5V to **11.8V** to 17.0V (in 0.1 V steps)	Used when a battery pack other than a Sony battery pack is used. Sets the voltage level of the battery at which the BEFORE END warning should be issued.
		Other END [c)]	**11.0V** to 14.0V (in 0.1 V steps)	Used when a battery pack other than a Sony battery pack is used. Sets the voltage level of the battery at which the END warning should be issued.
		DC IN BEFORE END	11.5V to **11.8V** to 17.0V (in 0.1 V steps)	Used when an external power source is connected to the DC IN connector. Sets the voltage level of the connected external power source at which the BEFORE END warning should be issued.
		DC IN END	**11.0V** to 14.0V (in 0.1 V steps)	Used when an external power source is connected to the DC IN connector. Sets the voltage level of the connected external power source at which the END warning should be issued.
		DETECTED BATTERY	Info/Sony/Other/ DC IN	Displays the type of automatically detected battery.

No.	Page	Item	Settings	Description	
05	BATTERY 2	TYPE DETECTION	**AUTO**/OTHER	**AUTO:** Automatically detects the type of the battery. **OTHER:** Always judges the battery to be of the "OTHER"[c] type regardless of the actual battery type.	
		SEGMENT NO.7	11.0V to **17.0V** (in 0.1 V steps)	When the battery type judgment is "OTHER", sets the voltage level below which the battery status indicator segment No.7 should turn off.	Battery status indicator segments  ("E" [d] and "F" are always on.)
		SEGMENT NO.6	11.0V to **16.0V** to 17.0V (in 0.1 V steps)	When the battery type judgment is "OTHER", sets the voltage level below which the battery status indicator segment No. 6 should turn off.	
		SEGMENT NO.5	11.0V to **15.0V** to 17.0V (in 0.1 V steps)	When the battery type judgment is "OTHER", sets the voltage level below which the battery status indicator segment No. 5 should turn off.	
		SEGMENT NO.4	11.0V to **14.0V** to 17.0V (in 0.1 V steps)	When the battery type judgment is "OTHER", sets the voltage level below which the battery status indicator segment No. 4 should turn off.	
		SEGMENT NO.3	11.0V to **13.0V** to 17.0V (in 0.1 V steps)	When the battery type judgment is "OTHER", sets the voltage level below which the battery status indicator segment No. 3 should turn off.	
		SEGMENT NO.2	11.0V to **12.0V** to 17.0V (in 0.1 V steps)	When the battery type judgment is "OTHER", sets the voltage level below which the battery status indicator segment No. 2 should turn off.	
		SEGMENT NO.1	**11.0V** to 17.0 V (in 0.1 V steps)	When the battery type judgment is "OTHER", sets the voltage level below which the battery status indicator segment No. 1 should turn off.	

No.	Page	Item	Settings	Description
06	AUDIO 1	AUDIO OUT (F/R)	**CUE**/EE	Selects the audio output signal during FF/REW. **CUE:** Cue audio signal **EE:** Input signal
		REC AUDIO OUT	**EE**/SAVE	Selects the audio output during recording. **EE:** Outputs the E-E sound **SAVE:** Enters in the SAVE mode
		AUDIO CH3/4 MODE	CH1/2/**SW**	Selects the sources to be recorded to channels CH-3/4. **CH1/2**: Same sources as CH-1/2. **SW:** Signals selected by the AUDIO IN CH-3/CH-4 switches.
		REAR XLR AUTO	**OFF**/ON	Turns the XLR connection automatic detection on or off.
		FRONT MIC REF	–60dB/**–50dB**/–40dB	Sets the reference level of the front microphone.
		REAR MIC REF	**–60dB**/–50dB/–40dB	Sets the reference level when the AUDIO IN CH1 or CH2 connector is set to MIC.
		HEADPHONE OUT	**MONO**/STREO	Selects whether to make the rear earphone monaural or stereo.
		REC AUDIO DELAY	**OFF**/1 FLD	Specifies the audio recording phase. **OFF:** Record at the same phase as video. **1 FLD:** Delay by one frame with respect to the video.
07	AUDIO 2	AU REC EMPHASIS	**OFF**/ON	Turns the emphasis function on or off.
		CUE REC	OFF/**ON**	Turns cue audio recording on or off.
		AU REF LEVEL	**–20dB**/–18dB/–16dB	Sets the audio input reference level.
		AU REF OUT	**0dB**/+4dB/–3dB	Sets the output reference level.
		AU CH12 AGC MODE	**MONO**/STREO	Selects whether to perform automatic input level adjustment of analog audio signals to be recorded on channels 1 and 2 independently for each channel, or in stereo mode.
		AU CH34 AGC MODE	**MONO**/STREO	Selects whether to perform automatic input level adjustment of analog audio signals to be recorded on channels 3 and 4 independently for each channel, or in stereo mode.
		AU AGC SPEC	**–6dB**/–9dB/–12dB/–15dB/–17dB	AGC saturation level setting.
		AU LIMITER MODE	**OFF**/–6dB/–9dB/–12dB/–15dB/–17dB	For manual audio input level adjustment, selects the limiter saturation level for loud input signals.
		AU OUT LIMITER	OFF/**ON**	Turns the audio output limiter on or off.

No.	Page	Item	Settings	Description
08	AUDIO 3	AU SG (1KHz)	ON/**OFF**/AUTO	Sets whether to output a 1 kHz test tone during the Color Bar mode or not. **ON:** A 1 kHz test tone is output during the Color Bar mode. **OFF:** A 1 kHz test tone is not output during the Color Bar mode. **AUTO:** A 1 kHz test tone is output only when the CH 1 AUDIO SELECT switch on the inside panel is in the AUTO position.
		MIC CH1 LEVEL	SIDE1/**FRONT**/F+S1	When recording the front microphone sound on CH 1, selects which control is to be used for the level adjustment. **SIDE 1:** LEVEL control (left side) **FRONT:** MIC LEVEL control **F+S1:** LEVEL control (left side) or the MIC LEVEL control (The two controls are linked to each other.)
		MIC CH2 LEVEL	SIDE2/**FRONT**/F+S2	When recording the front microphone sound on CH 2, selects which control is to be used for the level adjustment. **SIDE 2:** LEVEL control (right side) **FRONT:** MIC LEVEL control **F+S2:** LEVEL control (right side) or the MIC LEVEL control (The two controls are linked to each other.)
		REAR1/WRR LEVEL	**SIDE1**/FRONT/F+S1	Selects any of these controls to adjust the audio level of the equipment that is connected to the wireless microphone and whatever is connected to the AUDIO IN CH1 connector on the rear panel. **SIDE 1:** LEVEL control (left side) **FRONT:** MIC LEVEL control **F+S1:** LEVEL control (left side) or the MIC LEVEL control (The two controls are linked to each other.)
		REAR2/WRR LEVEL	**SIDE2**/FRONT/F+S2	Selects any of these controls to adjust the audio level of the equipment that is connected to the wireless microphone and whatever is connected to the AUDIO IN CH2 connector on the rear panel. **SIDE 2:** LEVEL control (right side) **FRONT:** MIC LEVEL control **F+S2:** LEVEL control (right side) or the MIC LEVEL control (The two controls are linked to each other.)

No.	Page	Item	Settings	Description
08	AUDIO 3	AUDIO SELECT CH3	**AUTO**/MANU/ FRONT	Selects either automatic operation or manual operation to adjust the audio recording level of audio channel 3. **AUTO:** Automatically adjusts the recording level **MANU:** Manually adjusts the recording level **FRONT:** Level as adjusted by the MIC LEVEL control on the front panel of the camcorder
		AUDIO SELECT CH4	**AUTO**/MANU/ FRONT	Selects either automatic operation or manual operation to adjust the audio recording level of audio channel 4. **AUTO:** Automatically adjusts the recording level **MANU:** Manually adjusts the recording level **FRONT:** Level as adjusted by the MIC LEVEL control on the front panel of the camcorder
		LVL CONTROL CH3	0 to **70** to 100	Adjusts the audio recording level of audio channel 3 in manual operation mode.
		LVL CONTROL CH4	0 to **70** to 100	Adjusts the audio recording level of audio channel 4 in manual operation mode.
09	WRR SETTING	WRR VALID CH SEL [e)]	**ALL**/CH1	Selects whether to enable channels 1 and 2 of the wireless receiver, or channel 1 only. **ALL:** Enable both channel 1 and 2. **CH1:** Enable channel 1 only. Select this setting to use the wireless receiver as a monaural receiver.
		WRR CH SELECT [e)]	**TX1**/TX2	Specifies the target channel for other items in this menu. **TX1:** Channel 1 **TX2:** Channel 2
		WRR DELAY COMP [e)]	OFF/**ON**	Enables or disables the delay compensation function for wireless audio input. **OFF:** Disables the function. **ON:** Enables the function.
		TX*(*: channel number) [e)]	–	Displays the name of the transmitter whose signals are being received on the channel selected by WRR CH SELECT.
		TX* AUDIO PEAK(*: channel number) [e)]	**---**/PEAK	Displays whether the AF level of the transmitter whose signals are being received on the channel selected by WRR CH SELECT is over the peak.
		TX* INPUT LEVEL(*: channel number) [e)]	MIC/LINE	Displays whether the input level of the transmitter whose signals are being received on the channel selected by WRR CH SELECT is set to MIC or LINE.

No.	Page	Item	Settings	Description
09	WRR SETTING	TX* ATT LEVEL(*: channel number) [e]	–	Sets the ATT level of the transmitter whose signals are being received on the channel selected by WRR CH SELECT (the permissible setting range may vary depending on the transmitter device).
		TX* LCF FREQ(*: channel number) [e]	–	Sets the Low Cut Filter frequency of the transmitter whose signals are being received on the channel selected by WRR CH SELECT (the permissible setting range may vary depending on the transmitter device).
		TX* SYSTEM DELAY(*: channel number) [e]	**AUTO/** 0.0ms~8.0ms	When WRR DELAY COMP is set to ON, sets the amount of audio delay for the channel selected by WRR CH SELECT. **AUTO:** Automatically adjusts the amount of delay so that the delay in the audio received from the wireless receiver is zero. **0.0ms~8.0ms:** Sets the amount of anticipated wireless system delay, for cases in several wireless systems are being used over a device such as an audio mixer.
10	TIMECODE	TC OUT	**AUTO**/GENE	Selects the timecode signal output. **AUTO:** Outputs the timecode generator output during recording and outputs the timecode reader output during playback. **GENE:** Outputs the timecode generator output during recording and playback.
		DF/NDF (when the frame frequency is set to 59.94i)	**DF**/NDF	Sets DF or NDF mode. **DF:** Drop frame mode **NDF:** Non-drop frame mode
		EXT-LK UBIT	**INT**/EXT	Sets whether the LTC UBIT setup value locks to an INT or an EXT source when the timecode is locked to an external source. **INT:** Internal lock **EXT:** External lock
		LTC UBIT	**FIX**/TIME	Sets the data to be recorded in UBIT of LTC. **FIX:** Records the data that is set by the user. **TIME:** Records the present time.
		VITC UBIT	**FIX**/TIME	Sets the data to be recorded in UBIT of VITC. **FIX:** Records the data that is set by the user. **TIME:** Records the present time.
		WATCH AUTO ADJ	OFF/**ON**	Matches the time of the internal clock with the time data of the user bits of an external timecode. Turns the automatic time correction function of the internal clock on or off.
		UBIT GROUP ID	**000**/101	Selects the UBIT GROUP ID.

No.	Page	Item	Settings	Description
10	TIMECODE	TC DELAY(REC/EE) (HDW-650F/650P only)	**OFF**/ON	Turns on or off the function to delay timecode to be recorded or timecode to be output in E-E mode by 1 frame. [f)] **Note** When this function is turned on, a 1-frame delay is applied to timecode to be recorded, timecode to be output from the HDSDI OUT connector, and timecode to be output from the TC OUT connector.
11	SHOT MARKER	LTC UB-MARKER	**SET**/ALL/OFF	Sets whether to write the markers in UBIT of LTC or not. **SET:** Independently selects the on or off setting of the following items, REC START MARK, SHOT MARK 1, and SHOT MARK 2. **ALL:** Writes the recording start mark, shot mark 1, and shot mark 2 all. **OFF:** Does not write.
		REC START MARK	**OFF**/ON	**OFF:** Does not write recording start mark. **ON:** Writes recording start mark.
		SHOT MARKER 1	**OFF**/ON	**OFF:** Does not write shot mark 1. **ON:** Writes shot mark 1.
		SHOT MARKER 2	**OFF**/ON	**OFF:** Does not write shot mark 2. **ON:** Writes shot mark 2.
12	CAM CONFIG 1	REC TALLY BLINK	OFF/**ON**	Turns on and off the tally that flashes when the battery or remaining tape time is low.
		REC START BEEP	**OFF**/ON	Turns on or off the REC START/STOP alarm sound.
		SUB LCD MODE SEL	**TIMER**/OFF/ CONT	Sets the timecode (TC) display after poweroff as follows. **TIMER:** The TC display turns off after the elapse of the time set by the SUB LCD TIMER below. **OFF:** Not displayed. **CONT:** Displayed.
		SUB LCD TIMER	**1H**/3H/8H	Sets the duration of time after which the TC display is to be turned off after power-off, when the SUB LCD MODE SEL item, above, is set to TIMER (H: hours).
		SHOT TIME DISP	**MD:HM**/ DM:HM/D:HMS	Selects the format of the time to be displayed on the LCD. **MD:HM:** Month, day, hour, minute **DM:HM:** Day, month, hour, minute **D:HMS:** Day, hour, minute, second
		VIDEO OUT (F/R)	**EE**/PB	Selects the video output signal during FF/ REW. **EE:** Input signal **PB:** Playback signal
		STBY OFF TIMER	OFF/5MIN/ 10MIN/30MIN/ **60MIN**	Sets the length of time for the stand-by off timer when the VTR SAVE/STBY switch is set to STBY.

No.	Page	Item	Settings	Description
12	CAM CONFIG 1	STOP KEY FREEZE	**OFF**/FRAME/FIELD	Selects the type of frozen picture to be used when the recorded video signal is stopped by pressing the STOP button during playback.
		EMERGENCY EJECT	**OFF**/ON	Sets whether the emergency cassette ejection is permitted or not when an error is detected. **OFF:** Emergency cassette ejection is prohibited when the tape may be damaged by ejecting the cassette. **ON:** Emergency cassette ejection is permitted when any type of error occurs.
		TAPE LED BRIGHT	OFF/LOW/**HIGH**	Sets the brightness of the TAPE indicator, and whether it lights or is off.
13	CAM CONFIG 2	TEST SAW SELECT	**SAW**/REC	Selects the test signal.
		COLOR BAR SELECT	**ARIB**/100%/75%/SMPTE	Selects the HD color bar type.
		USER & ALL ONLY	**OFF**/ON	Show only USER menu in the top menu.
		RM COMMON MEMORY	**OFF**/ON	Selects whether or not to share settings for when a remote control unit is connected and when the unit is used alone.
		RM REC START	**RM**/CAM/PARA	When an RM remote control unit is connected, selects which recording start/stop buttons are enabled. **RM:** remote control unit **CAM:** camera **PARA:** both
		HDSDI REMOTE I/F	**OFF**/CHARA/G-TLY/R-TLY	Selects whether to use the function that enables recording control from this unit of an external device connected to the HDSDI OUT connector of this unit. g) Also selects the indication that shows whether the external device is recording. **OFF:** Do not use the remote recording control function. **CHARA:** Use the function, and indicate by the controlling external device indicator in the viewfinder *(see page 29)*. **G-TLY:** Use the function, and indicate by the TALLY indicator in the viewfinder. **R-TLY**: Use the function, and indicate by the REC (recording, red tally) indicator in the viewfinder. **Note** When R-TLY is selected, the REC indicator lights even when the unit is not recording.
		SHT DISP MODE	**SEC**/DEG	Selects shutter speed display (seconds or degrees).

No.	Page	Item	Settings	Description
13	CAM CONFIG 2	FAN CONTROL	**AUTO**/MANU/ OFF	Specifies the fan control method. **AUTO:** Normal fan control **OFF:** Forcibly stop the fan. **MANU:** Forcibly stop the fan while the unit is recording. **Note** Temperatures rise within the unit when the fan is forcibly stopped, so it should not be stopped for extended periods. Forcible stopping of the fan is cancelled if temperatures rise to abnormal levels within the unit. If the unit is powered off while this item is set to MANU or OFF, the setting is changed to AUTO when the unit is powered on again.
14	PRESET WHITE	COLOR TEMP <P>	Display reference color temperature.	Sets the white balance preset value.
		C TEMP BAL <P>	(–99 to 99)	Finer setting when the desired color could not be obtained with the COLOR TEMP <P> color temperature setting.
		R GAIN <P>	(–99 to 99)	Sets the R gain preset value.
		B GAIN <P>	(–99 to 99)	Sets the B gain preset value.
		AWB ENABLE <P>	**OFF**/ON	When the WHITE BAL switch is set to PRST, turns the function that enables execution of AWB (auto white balance) on and off.
15	DCC ADJUST	DCC FUNCTION SEL	**DCC**/FIX	Enables or disables automatic knee point adjustment when the OUTPUT/DCC switch is set to CAM, DCC: ON. **DCC:** Automatically adjust the knee point according to the luminance of the subject. **FIX:** Set the knee point to a fixed value.
		DCC D RANGE	400%/450%/ 500%/550%/ **600%**	Sets the dynamic range when the OUTPUT/ DCC switch is set to CAM, DCC: ON.
		DCC POINT	(–99 to 99)	Adjusts the DCC minimum knee point.
		DCC GAIN	(–99 to 99)	Adjusts the gain to DCC detected value.
		DCC DELAY TIME	(–99 to 99)	Adjusts the DCC reaction speed.
		DCC PEAK FILTER	0 to 15	Adjusts the response sensitivity to the peak of the DCC detected value.

No.	Page	Item	Settings	Description
16	AUTO IRIS 2	IRIS WINDOW	**1**/2/3/4/5/6/VAR	Selects the auto iris detection window. **VAR:** variable
		IRIS WINDOW IND	**OFF**/ON	Turns on and off the function which displays a frame marker for the auto iris detection window.
		IRIS LEVEL	(–99 to 99)	Adjusts the level of the auto iris target value.
		IRIS APL RATIO	(–99 to 99)	Adjusts the mix ratio of auto iris detection peak value and average value.
		IRIS VAR WIDTH	20 to **240** to 479	Adjusts the width of detection frame when the auto iris detection window is set to VAR.
		IRIS VAR HEIGHT	20 to **135** to 269	Adjusts the height of detection frame when the auto iris detection window is set to VAR.
		IRIS VAR H POS	–460 to **0** to +459	Adjusts the horizontal position of detection frame when the auto iris detection window is set to VAR.
		IRIS VAR V POS	–235 to **0** to +252	Adjusts the vertical position of detection frame when the auto iris detection window is set to VAR.
		IRIS SPEED	(–99 to 99)	Adjusts the auto iris speed.
		CLIP HIGH LIGHT	**OFF**/ON	Turns on and off the function which, during auto iris adjustment, ignores very bright areas by dulling the reaction to high luminescence.
17	GENLOCK	GENLOCK	OFF/**ON**	Turns genlock on and off.
		GL HD H PHASE	(–99 to 99)	Sets the H phase of HD signal output during genlock operation.
		GL SD H PHASE	(–99 to 99)	Sets the H phase of SD signal output during genlock operation.
		REFERENCE	INTERNAL/ GENLOCK	Displays the type of reference signal used by this unit.
18	ND COMP	ND OFFSET ADJUST	**OFF**/ON	Turns on and off the mode which sets ND (neutral density) filter color compensation values.
		CLEAR ND OFFSET	EXEC	Clears ND filter color compensation values.
19	AUTO SHADING	AUTO BLK SHADING	EXEC	Execute the auto black shading correction function.
		RESET BLK SHD	EXEC	Clears black shading compensation values.
		TEST OUT SELECT	VBS/**Y**/R/G/B	Selects the signal output of the TEST OUT connector.
		MASTER GAIN(TMP)	–6dB/–3dB/**0dB**/ 3dB/6dB/9dB/ 12dB/18dB/ 24dB/30dB/ 36dB/42dB	Temporarily sets the master gain value.

No.	Page	Item	Settings	Description
20	APR	APR	EXEC	Executes the automatic pixel noise reduction function.
		APR(SLS)	EXEC	Suppresses white flecks in SLS (Slow Speed Shutter) mode by executing the automatic pixel noise reduction function. **Note** The execution time for this function is about 30 minutes. More time may be required when temperatures inside the unit are low.
		APR PRESET	EXEC	Deletes data that was registered by execution of the automatic pixel noise reduction and black balance adjustment functions.
21	VANC RX	UMID LINE 1	**0** to 20	Selects the line on which the UMID is to be recorded (First field). When 0 is selected, the UMID is not recorded.
		UMID LINE 2	**0**, 564 to 593	Selects the line on which the UMID is to be recorded (Second field). When 0 is selected, the UMID is not recorded.

a) The setting of this item is overridden by the setting of Other BEFORE END when TYPE DETECTION in the BATTERY 2 page is set to OTHER.

b) The setting of this item is overridden by the setting of Other END when TYPE DETECTION in the BATTERY 2 page is set to OTHER.

c) When TYPE DETECTION in the BATTERY 2 page is set to AUTO, any batteries other than Sony BP-series batteries and Anton Bauer intelligent battery systems are classified as Others.

d) Flashes once per second when the battery status is BEFORE END, and flashes 4 times per second when the battery status is END.

e) A setting for this item is enabled when the DWR-S01D Digital Wireless Receiver is installed.

f) Delay is applied only when the timecode is locked to an external timecode and its format is PsF.

g) HD SDI OUT in the OUTPUT 1 page of the OPERATION menu must be set to HDSDI.

FILE menu

No.	Page	Item	Settings	Description
01	USER FILE	USER FILE LOAD	EXEC	*For details, see "Saving and Recalling User Files" on page 145.*
		USER FILE SAVE	EXEC	
		F.ID	**Blank**/up to 16 characters	
		USER PRESET	EXEC	*For details, see "Resetting USER menu settings to the standard settings" on page 129.*
02	USER FILE 2	STORE USR PRESET	EXEC	Save settings for items on pages registered in the USER menu as the standard settings.
		CLEAR USR PRESET	EXEC	Clears the standard setting of pages registered in the USER menu.
		CUSTOMIZE RESET	EXEC	Returns the pages registered in the USER menu to the factory default state.
		LOAD CUSTOM DATA	**OFF**/ON	Selects whether to load page and item customization data when USER FILE LOAD on the USER FILE page is executed.
		LOAD OUT OF USER	**OFF**/ON	Selects whether to load data for items on pages not registered in the USER menu when USER FILE LOAD on the USER FILE page is executed.
		BEFORE FILE PAGE	**OFF**/ON	Selects whether to load data for items on the pages beyond USER FILE in the USER menu when USER FILE LOAD on the USER FILE page is executed.
		USER LOAD WHITE	**OFF**/ON	Selects whether to load white balance data when USER FILE LOAD on the USER FILE page is executed.

No.	Page	Item	Settings	Description
03	ALL FILE	ALL FILE LOAD	EXEC	Load ALL file.
		ALL FILE SAVE	EXEC	Save ALL file.
		F.ID	**Blank**/up to 16 characters	Name ALL file.
		ALL PRESET	EXEC	Return all items to preset values.
		STORE ALL PRESET	EXEC	Save the current settings of all items as preset values.
		CLEAR ALL PRESET	EXEC	Clear the preset values of all items.
		3SEC CLR PRESET	**OFF**/ON	Turns the following function on and off: When the CANCEL/PRST/ESCAPE switch is held on the CANCEL/PRST side for three seconds, clear the preset values of each item.
04	SCENE FILE	1	STANDARD	*For details, see "Saving and Loading Scene Files" on page 148.*
		2	STANDARD	
		3	STANDARD	
		4	STANDARD	
		5	STANDARD	
		STANDARD	–	
		SCENE RECALL	EXEC	
		SCENE STORE	EXEC	
		F.ID	STANDARD	
05	REFERENCE	REFERENCE STORE	EXEC	Save reference file saved in the "Memory Stick" in internal memory.
		REFERENCE CLEAR	EXEC	Clear reference file.
		REFERENCE LOAD	EXEC	Load reference file.
		REFERENCE SAVE	EXEC	Save reference file to "Memory Stick".
		F. ID	**Blank**/up to 16 characters	Name reference file.
		SCENE WHITE DATA	**OFF**/ON	Selects whether to load white balance data when SCENE RECALL or STANDARD on the SCENE FILE page is executed.

No.	Page	Item	Settings	Description
06	LENS FILE 1	LENS FILE RECALL	EXEC	Load lens file.
		LENS FILE STORE	EXEC	Save lens file.
		F.ID	**No Offset/**up to 16 characters	Sets the name of the last selected lens file.
		SOURCE	MEMORY1	Displays the number of last loaded lens file.
		LENS NO OFFSET	EXEC	Clear lens file.
		LENS AUTO RECALL	OFF/**ON**/S.No	Specifies whether to automatically load the lens file of a lens that supports serial communications. **OFF:** Do not use the lens file function. **ON:** Load the lens file corresponding to the lens model name, and reflect the contents of the file. **S.No:** If the lens can communicate its serial number, load the lens file corresponding to the lens model name and serial number, and reflect the contents of the file. If the lens serial number cannot be communicated, load the lens file corresponding to the lens model name (same as the ON setting).
		S.NO	Display only	Displays the serial number of the connected lens that supports serial communications.
		L.ID	Display only	Displays the name of the connected lens that supports serial communications.
		L.MF	Display only	Displays the manufacturer of the connected lens that supports serial communications.

No.	Page	Item	Settings	Description
07	LENS FILE 2	LENS M VMOD [a]	(–99 to 99)	Adjusts the lens file V SAW shading compensation.
		LENS CENTER H [a]	(–99 to 99)	Compensates the horizontal position of lens file center marker.
		LENS CENTER V [a]	(–99 to 99)	Compensates the vertical position of lens file center marker.
		TEST OUT SELECT	VBS/**Y**/R/G/B	Selects the signal output of the TEST OUT connector.
		LENS R FLARE [a]	(–99 to 99)	Adjusts the lens file flare (R).
		LENS G FLARE [a]	(–99 to 99)	Adjusts the lens file flare (G).
		LENS B FLARE [a]	(–99 to 99)	Adjusts the lens file flare (B).
		LENS W-R OFST [a]	(–99 to 99)	Adjusts the white balance (R) compensation value of the lens file.
		LENS W-B OFST [a]	(–99 to 99)	Adjusts the white balance (B) compensation value of the lens file.
08	LENS FILE 3	SHADING CH SEL	**R**/G/B/TEST	Selects the channel adjusted by this menu. If TEST is selected, the setting is linked to the setting of TEST OUT SELECT.
		TEST OUT SELECT	VBS/**Y**/R/G/B	Selects the signal output of the TEST OUT connector.
		LENS R/G/B H SAW [a]	(–99 to 99)	Adjusts the H Saw white shading compensation.
		LENS R/G/B H PARA [a]	(–99 to 99)	Adjusts the H Parabola white shading compensation.
		LENS R/G/B V SAW [a]	(–99 to 99)	Adjusts the V Saw white shading compensation.
		LENS R/G/B V PARA [a]	(–99 to 99)	Adjusts the V Parabola white shading compensation.
		IMAGE INVERT	**OFF**/ON	Turns the image inversion function on or off.
09	MEMORY STICK	M.S. FORMAT	EXEC	Format “Memory Stick”.
		M.S. IN > JUMP TO	**OFF**/USER/ALL/ SCENE/LENS/REFER/ USER1	*For details, see “Jumping to a File-Related Menu Page When Inserting a “Memory Stick”” on page 151.*

a) “EX” is displayed when the extender is on, and “08” is displayed when the wide converter is on.

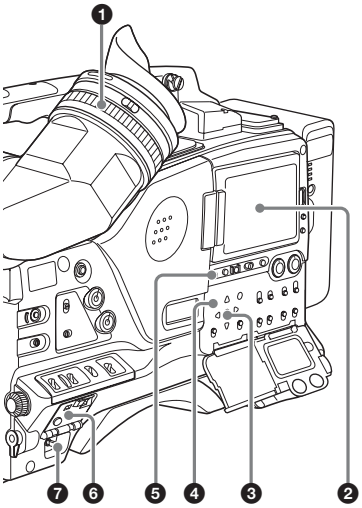
DIAGNOSIS menu

No.	Page	Item	Description
01	HOURS METER	RESET METER	Resets the resettable meters (-2).
		DRUM RUNNING	Displays the total time the drum has rotated.
		TAPE RUNNING	Displays the accumulated time the tape has run.
		OPERATION	Display the time that the unit has been powered on.
		THREADING	Displays the number of times of tape threading.
		DRUM RUNNING-2	Displays the total time the drum has rotated. a)
		TAPE RUNNING-2	Displays the accumulated time the tape has run. a)
		OPERATION-2	Displays the times that the unit has been powered on. a)
		THREADING-2	Displays the number of times of tape threading. a)
02	TIME/DATE	ADJUST	*For details, see "Setting the Date/Time of the Internal Clock" on page 36.*
		HOUR	
		MIN	
		SEC	
		YEAR	
		MONTH	
		DAY	
03	ROM VERSION	AT	Displays ROM version.
		SS	
		FP	
		AU DSP	
		EQ	
		DCP	
04	DEV STATUS	I/O: MS, FP, CN, DCP, VF	Displays the status of each internal device of this unit.
		D/A: DCP1, DCP2	
		EEPROM: CN, DCP, DR	
		FRAM: AT	
		FAN: CNB	
		LSI: DCP1, DCP2, DCP3, DCP4, TG	
		SCI: SS, RM, BATT	

a) Resettable

Menu Operations

Displaying menus



❶Viewfinder
❷LCD monitor
❸ENTER button
❹MENU button
❺DISP SEL button
❻MENU ON/OFF switch
❼POWER switch

To use the unit's menu system, set the MENU ON/OFF switch under the switch cover at the front of the unit to the ON position, or press the MENU button under the switch cover of the timecode/menu operations section.
When the camcorder is powered on, set the MENU ON/OFF switch to ON, ore press the MENU button to display the menu on the viewfinder screen and the LCD monitor.
If this is the first time the menu has been used after the camcorder has been powered on, the USER menu is displayed. If the menu has been used before, the last accessed page appears.

When the menu is not displayed on the LCD monitor

Press the DISP SEL button below the LCD monitor to select the CHAR display.

To clear the menu display from the screen

Do one of the following.
- Set the MENU ON/OFF switch to OFF. (When the cover of the menu operating section is closed, this switch is automatically set to OFF.)
- Press the MENU button. (When the MENU ON/OFF switch is set to the ON position, the menu display is not cleared even when the MENU button is pressed.)

When the DISPLAY of the DISPLAY/ASPECT switch on the viewfinder is set to ON, the display indicating the current status of the camcorder appears on the viewfinder screen.

For details, see "Selecting the display items" on page 130.

To display the TOP menu

Do one of the following.
- With no menu displayed on the screen, hold down the MENU knob and set the MENU ON/OFF switch to ON.
- With no menu displayed on the screen, hold down the ENTER button and press the MENU button.

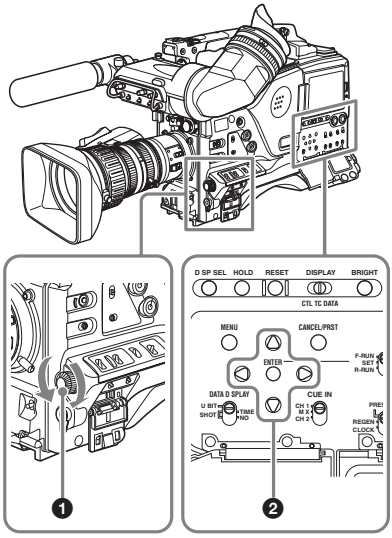
Depending on the internal switch settings, display of the TOP menu may be disabled. For details, refer to the Maintenance Manual.

Basic menu operations

You can set the various menu items by doing one of the following.
- Turn or hold down the MENU knob.
- Use the MENU button, the arrow buttons, and the ENTER button.

In the remainder of this section, the LCD monitor is generally shown as an example of the menu display, but a similar display also appears on the viewfinder screen.

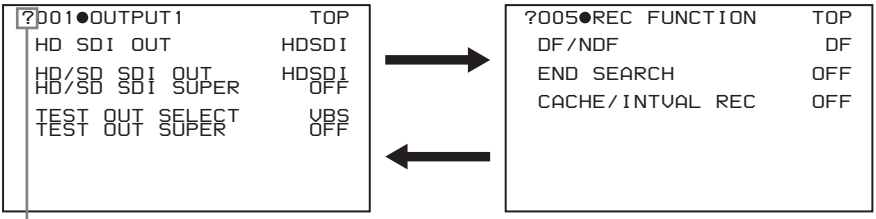
To select the setting items and values on the menu



❶MENU knob
❷Arrow buttons

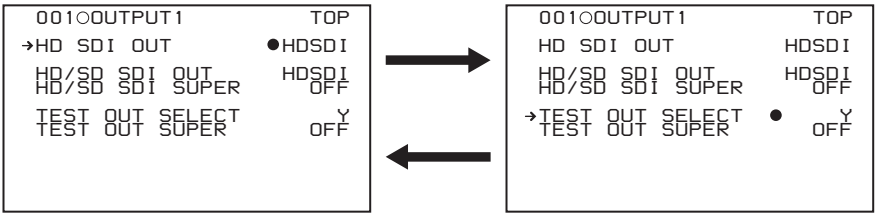
Turn the MENU knob or press the arrow buttons to select in the cases explained as follows.

To scroll pages



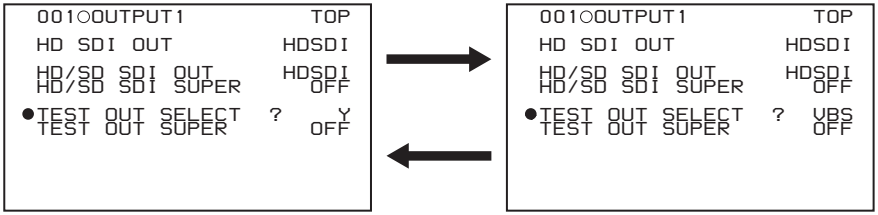
When ? blinks, turn the MENU knob or press the arrow buttons (▲▼) to switch pages.

To select a menu or setting item



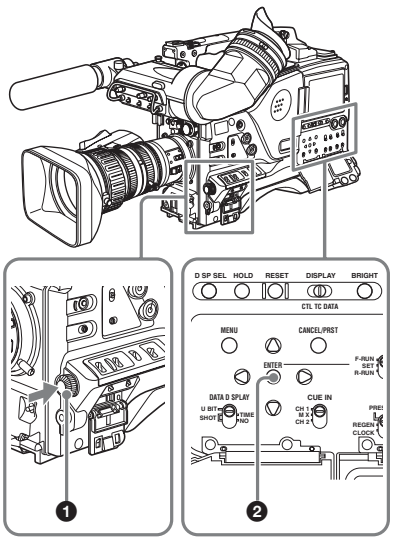
When ➔ appears, turn the MENU knob or press the arrow buttons (▲▼) to move ➔ up and down.

To change a setting value



When ? blinks, turn the MENU knob or press the arrow buttons (▲▼) to change the setting (ON/OFF, value, etc.).

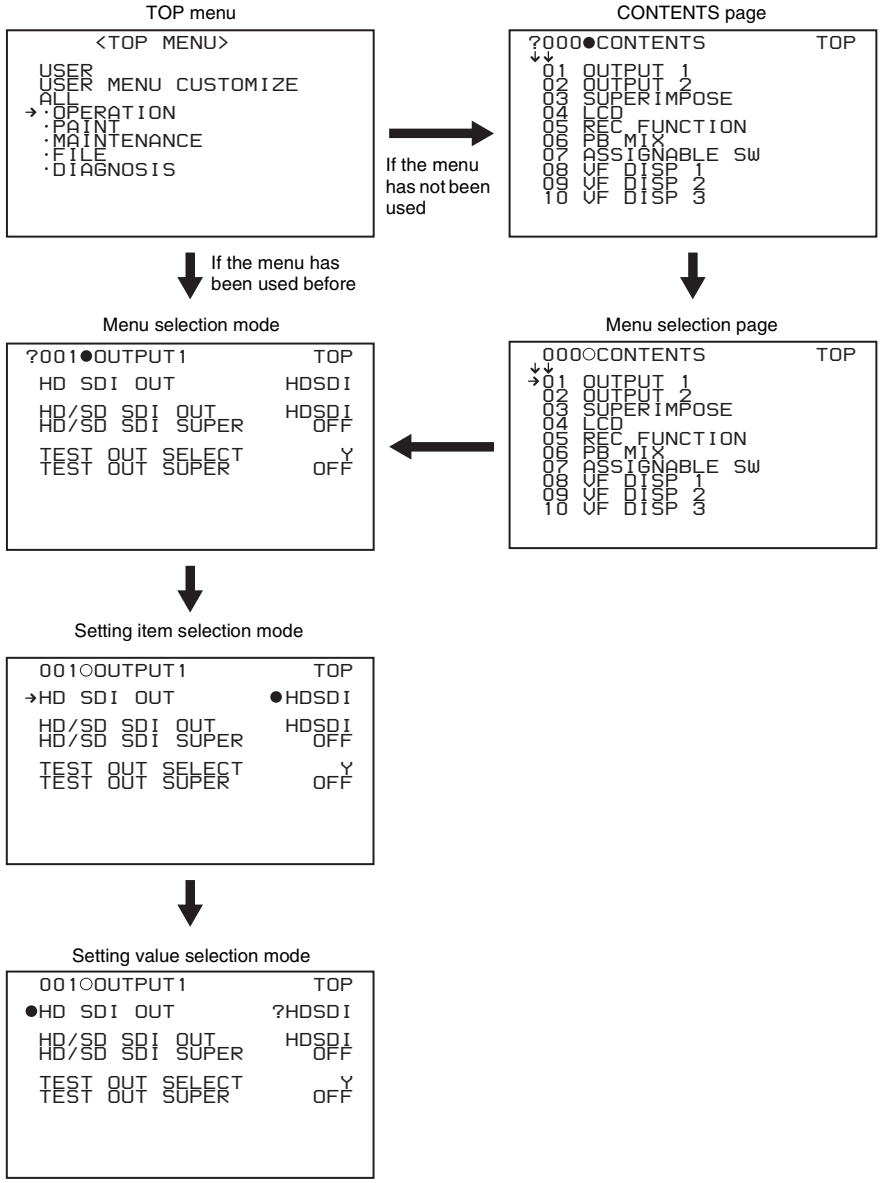
To confirm the selection of a menu, a setting item, or a setting value



❶MENU knob
❷ENTER button

Each time you press the ENTER button or the MENU knob, the menu display switches in the following sequences.

Example: When using the OPERATION menu



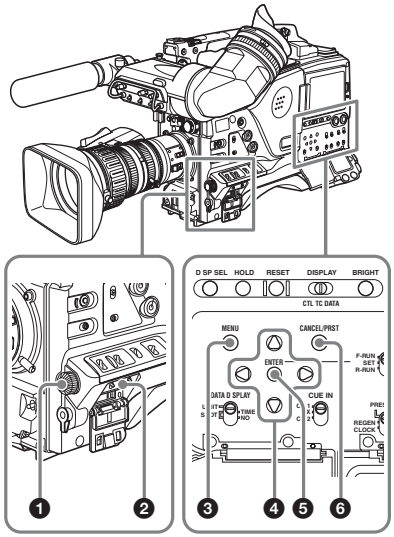
Note

If the TOP menu has not been displayed since the camcorder is powered on, “TOP” does not appear at the upper right on the above screen, and you cannot go to the TOP menu. In this case, follow the procedure in “To display the TOP menu” *(see page 119)*.

To display the TOP menu when another menu is displayed

Move ➧ to "TOP" displayed at the top right of each page of the menu, and press the ENTER button or the MENU knob. Alternatively, repeatedly press the CANCEL/PRST/ESCAPE to the ESCAPE side until the TOP menu appears, or repeatedly press the arrow (◀) button.

Using the USER menu (example menu operation)



❶MENU knob
❷CANCEL/PRST/ESCAPE switch
❸MENU button
❹Arrow buttons: When pressed, provide the same function as turning the MENU knob.
❺ENTER button: When pressed, provides the same function as pressing the MENU knob.
❻CANCEL/PRST button: When pressed, provides the same function as pressing the CANCEL/PRST/ESCAPE switch up.

This section explains menu operations using the USER menu as an example. The operations are the same for the ALL, OPERATION, PAINT, MAINTENANCE, FILE, and DIAGNOSIS menus.

For details about how to operate the USER MENU CUSTOMIZE menu, see "Editing the USER menu" (page 125).

1 Set the MENU ON/OFF switch to ON.

Normally, the USER menu appears.
If it does not, turn the MENU knob to move ➧ to USER in the TOP menu, and press the MENU knob.
If the USER menu has been used before, the last accessed page appears. In this case, go to step **2**.
If this is the first time the USER menu has been displayed, the CONTENTS page of the USER menu appears. In this case, follow the procedure below.

① Press the MENU knob. Then turn the MENU knob to move ➧ to the desired page number.

```
?U00●CONTENTS              TOP
↓↓
→01 OUTPUT 1
 02 OUTPUT 2
 03 SUPERIMPOSE
 04 LCD
 05 REC FUNCTION
 06 ASSIGNABLE SW
 07 VF DISP 1
 08 VF DISP 2
 09 I/F LED
 10 MARKER 1
```

This indicates that the menu screen can be scrolled.

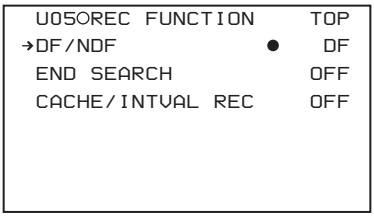
② Press the MENU knob again.
The page selected in ① is displayed.
Go to step **3**.

When you set items on the ALL, OPERATION, PAINT, MAINTENANCE, FILE, and DIAGNOSIS menus, move ➧ to the menu that contains the desired item in the TOP menu, and then press the MENU knob.

2 Turn the MENU knob until the desired page appears.

```
?U05●REC FUNCTION          TOP
 DF/NDF                     DF
 END SEARCH                 OFF
 CACHE/INTVAL REC           OFF
```

3 Press the MENU knob.
➧ and ● appear.



4 Turn the MENU knob to move ➧ to the desired item, and then press the MENU knob.
➧ changes to ●, and ● changes to ?.

5 Turn the MENU knob to change the setting.
Depending on the direction of turning the knob, the setting value increases, decreases, switches between ON and OFF, and so on.

To interrupt changing the settings
Set the MENU ON/OFF switch to OFF. By setting the MENU ON/OFF switch to ON again, the values that were displayed when you interrupted the setting operations will reappear so you can continue making settings.

6 Press the MENU knob.
● changes to ➧, and ? changes to ●. The selection is confirmed.

7 To continue setting other items on the same page, repeat steps from 4 to 6.

8 To end the menu operation, set the MENU ON/OFF switch to OFF.
The menu disappears from the screen, and the display indicating the current status of the camcorder appears along the top and bottom of the screen.

To cancel a change or return to the standard settings

Note

Depending on the setting item, in some cases only the function to return to the standard setting is valid.

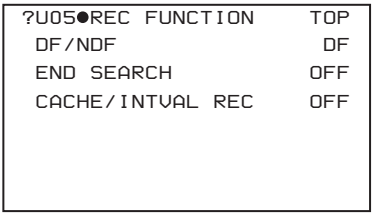
1 Before pressing the MENU knob in step 6 of the above procedure, flick the CANCEL/PRST/ESCAPE switch to the CANCEL/PRST position.
The message “CANCEL DATA OK?” appears.

2 Flick the CANCEL/PRST/ESCAPE switch to the CANCEL/PRST position again.
The message “CANCEL DATA” appears to indicate that the change has been cancelled.

3 To return to the standard settings after pressing the MENU knob in step 6 of the above procedure, flick the CANCEL/PRST/ESCAPE switch to the CANCEL/PRST position.
The message “PRESET DATA OK?” appears on the screen.

4 Flick the CANCEL/PRST/ESCAPE switch to the CANCEL/PRST position again.
This returns to the standard settings.

To move to another page



When ? appears in front of the page number
Turn the MENU knob to switch pages.

When nothing appears in front of the page number
Turn the MENU knob to move ➧ to the page number, and press the MENU knob. Then turn the MENU knob to switch pages.

Editing the USER menu

The USER MENU CUSTOMIZE menu allows you to configure a USER menu that consists only of pages and items that you need by adding, deleting or replacing the pages.

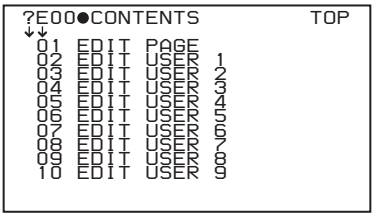
To add a new page

The USER MENU CUSTOMIZE menu allows you to add a new page to the USER menu. While the EDIT page contains factory-preset items, the EDIT USER 1 to EDIT USER 19 pages are all blank in their initial state. You can register up to 10 items, including blank lines, on each of these pages.

(How to select an item in the menu screen: Turn the MENU knob to move ➔ to the desired item.)

1 Display the TOP menu *(see page 119)*.

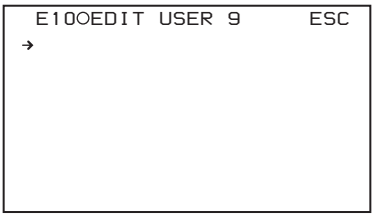
2 Select USER MENU CUSTOMIZE, and press the MENU knob.
If this is the first time the USER MENU CUSTOMIZE menu has been displayed, the CONTENTS page of the menu appears.



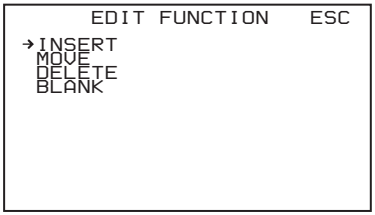
If the USER MENU CUSTOMIZE menu has been used before, the last accessed page appears.

3 If the CONTENTS page is displayed, press the MENU knob. Then select one of EDIT USER 1 to EDIT USER 19, and press the MENU knob.
If a different page other than the CONTENTS page is displayed, turn the MENU knob until the desired page appears, then press the MENU knob.

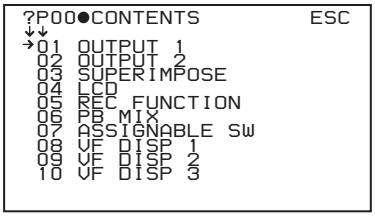
Example: when the EDIT USER 9 page is selected



4 Press the MENU knob. Then select the line where you want to add an item, and press the MENU knob.
The EDIT FUNCTION page appears.



5 Select INSERT, and press the MENU knob.
The following menu appears.



6 Add the items as follows.

① Press the MENU knob, scroll the page until the desired item appears, and then press the MENU knob again.
② Press the MENU knob again, select the desired item, and then press the MENU knob.

The EDIT USER 9 page appears again, displaying the newly added item.

7 Repeat steps 4 to 6 to add the remaining items.
You can add up to 10 items on one page.

To delete items from a page by using the CANCEL/PRST/ESCAPE switch

1 Follow steps 1 to 3 in "To add a new page" *(see page 126)*.

2 Press the MENU knob. Then select the item that you want to delete.

3 Flick the CANCEL/PRST/ESCAPE switch to the CANCEL/PRST position.
The message "DELETE ITEM OK?" appears.

4 Flick the CANCEL/PRST/ESCAPE switch to the CANCEL/PRST position again.

To delete items from a page by using the menu

1 Follow steps 1 to 3 in "To add a new page" *(see page 126)*.

2 Press the MENU knob. Then select the item that you want to delete, and press the MENU knob.
The EDIT FUNCTION page appears.

3 Select DELETE, and press the MENU knob.
The previously displayed page appears again, and the message "DELETE OK? YES ➔ NO" appears.

4 Select YES, and press the MENU knob.

To replace items on a page

1 Follow steps 1 to 3 in "To add a new page" *(see page 126)*.

2 Press the MENU knob. Then select the item that you want to replace, and press the MENU knob.
The EDIT FUNCTION page appears.

3 Select MOVE, and press the MENU knob.
The previously displayed page appears again.

4 Select the position to which you want to move the item, and press the MENU knob.
The item selected in step **2** moves to the position that you selected in step **4**.

To insert a blank line

1 Follow steps 1 to 3 in "To add a new page" *(see page 126)*.

2 Press the MENU knob. Then select the item that you want to replace, and press the MENU knob.
The EDIT FUNCTION page appears.

3 Select BLANK, and press the MENU knob.
The previously displayed page appears again, and a blank line is inserted above the specified item.

Note

You cannot insert a blank line on a page where 10 items have already been registered.

To add/delete/replace pages

You can add a new page to the USER menu, delete a page from the USER menu, or replace pages, using the EDIT PAGE of the USER MENU CUSTOMIZE menu.

To add a page

(How to select an item in the menu screen: Turn the MENU knob to move ➔ to the desired item.)

1 Display the TOP menu *(see page 119)*.

2 Select USER MENU CUSTOMIZE, and press the MENU knob.
If this is the first time the USER MENU CUSTOMIZE menu has been displayed, the CONTENTS page appears. If the menu has been used before, the last accessed page appears.

3 If the CONTENTS page is displayed, press the MENU knob. Then select EDIT PAGE, and press the MENU knob.
If a different page is displayed, turn the MENU knob until the EDIT PAGE screen appears.

The EDIT PAGE appears.

```
?E01●EDIT PAGE          TOP
↓↓
 01 OUTPUT 1
 02 OUTPUT 2
 03 SUPERIMPOSE
 04 LCD
 05 REC FUNCTION
 06 ASSIGNABLE SW
 07 VF DISP 1
 08 VF DISP 2
 09 'I' LED
 10 MARKER 1
```

4 Press the MENU knob. Then select the position where you want to add the page, and press the MENU knob.
The EDIT FUNCTION page appears.

5 **Select INSERT, and press the MENU knob.**
The CONTENTS page appears.

6 **Select the desired page, and press the MENU knob.**
The number and name of the page selected in step **6** is added above the item selected in step **4**.

To cancel adding a page
Before pressing the MENU knob in step **6**, select ESC at the top right of the screen, and press the MENU knob.
The EDIT PAGE screen appears again.

To delete a page by using the CANCEL/PRST/ESCAPE switch

1 **Follow steps 1 to 3 in "To add a page" *(see page 127)*.**

2 **Press the MENU knob. Then select the page that you want to delete.**

3 **Flick the CANCEL/PRST/ESCAPE switch to the CANCEL/PRST position.**
The message "DELETE PAGE OK?" appears.

4 **Flick the CANCEL/PRST/ESCAPE switch to the CANCEL/PRST position again.**

To delete a page by using the menu

1 **Follow steps 1 to 3 in "To add a page" *(see page 127)*.**

2 **Press the MENU knob. Then select the page that you want to delete, and press the MENU knob.**
The EDIT FUNCTION page appears.

3 **Select DELETE, and press the MENU knob.**
The previously displayed page appears again, and the message "DELETE OK? YES → NO" appears at the upper right.

4 **Select YES, and press the MENU knob.**

To replace pages

1 **Follow steps 1 to 3 in "To add a page" *(see page 127)*.**

2 **Press the MENU knob. Then select the page that you want to move, and press the MENU knob.**
The EDIT FUNCTION page appears.

3 **Select MOVE, and press the MENU knob.**
The previous screen appears again.

4 **Select the position to which you want to move the page, and press the MENU knob.**
The page selected in step **2** is moved to the position.

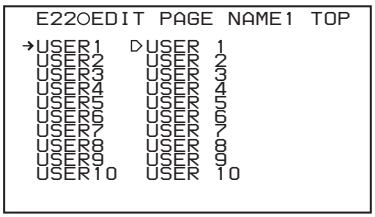
To rename pages

The names of pages (USER 1 to USER 19) created with EDIT USER 1 to EDIT USER 19 can be changed. (The maximum name length is 15 characters.)

Note

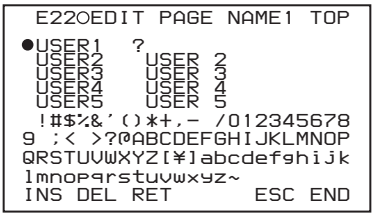
The ASSIGN ITEM SEL page cannot be renamed.

1 **Display the EDIT PAGE NAME1 or EDIT PAGE NAME2 of the USER MENU CUSTOMIZE menu.**
EDIT PAGE NAME1: To rename USER1 to USER10
EDIT PAGE NAME2: To rename USER11 to USER19



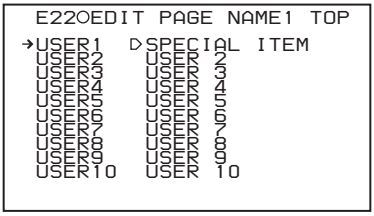
For details on menu operations, see "Basic menu operations" on page 119.

2 **Select the page that you want to rename (USER 1 to USER 19), and press the MENU knob.**
A character table appears.



3 **Follow steps 3 and 4 described in *"Setting the shot ID" on page 135* to enter characters.**

4 **When you have finished entering the name, turn the MENU knob to move ■ to END, and press the MENU knob.**
The entered name is now displayed.

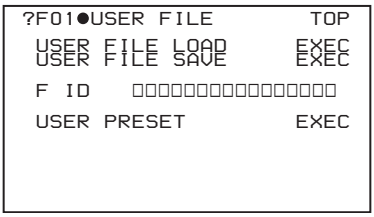


Resetting USER menu settings to the standard settings

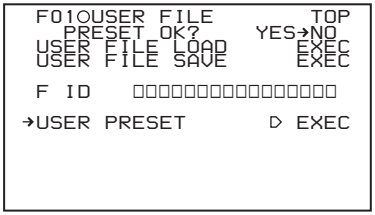
You can return all settings in the USER menu to standard settings.
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 **Display the USER FILE page of the FILE menu, and press the MENU knob.**

For details on menu operations, see "Basic menu operations" on page 119.



2 **Press the MENU knob, then select USER PRESET, and press the MENU knob.**
The message "PRESET OK? YES ➧ NO" appears.



3 **Select YES, and press the MENU knob.**
The message "COMPLETE" appears, and the settings for all items in the USER menu are reset to the standard settings.

Setting the Status Display on the Viewfinder Screen and the LCD Monitor

This section explains the menu settings for the display of the viewfinder screen. These settings are also used for the display of the LCD monitor in the same way.

Selecting the display items

To select the items to be displayed on the viewfinder screen (with the viewfinder DISPLAY of the DISPLAY/ASPECT switch set to ON) and the LCD monitor, use the VF DISP 1, VF DISP 2, and VF DISP 3 pages of the OPERATION menu.
(How to select an item in the menu screen: Turn the MENU knob to move ➡ to the desired item.)

1 Display the VF DISP 1, VF DISP 2, or VF DISP 3 page of the OPERATION menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select the desired setting item, and press the MENU knob.

On the VF DISP 1, VF DISP 2, and VF DISP 3 pages, you can select any of the following items to turn its display on or off.

VF DISP 1 page

Item	Description
VF DISP	Turns viewfinder display items on or off. a)
VF DISP MODE	Selects the display mode. b)
DISP EXTENDER	Extender indicator
DISP FILTER	Types of the ND filter
DISP WHITE	White balance memory indicator
DISP CC 5600K	Electric CC filter indicator
DISP GAIN	Gain indicator
DISP SHUTTER	Shutter speed and ECS mode indicator
DISP AUDIO	Audio level indicator
DISP TAPE	Remaining disc capacity indicator

a) Viewfinder display items can be also turned on or off by pushing the DISPLAY/ASPECT switch on the viewfinder up to the DISPLAY side.

b) For detailed information on the display mode, see "Change confirmation/adjustment progress messages" (page 131).

VF DISP 2 page

Item	Description
DISP IRIS	Iris opening indicator
DISP ZOOM	Zoom position indicator
DISP COLOR TEMP	Displays the color temperature.
DISP BATT REMAIN a)	Displays the battery voltage/remaining capacity of an internal battery pack or an external battery connected to the DC IN connector.
DISP DC IN	Displayed when the power is supplied from an external battery connected to the DC IN connector.
DISP WRR RF LVL	Displays the reception level of the wireless microphone.
DISP TIME CODE	Displays the timecode.
DISP PB MIX	Playback mix function indicator

a) When an Anton Bauer battery system or a BP-GL65/GL95 battery pack is installed, the remaining battery power is shown as a percentage value (%) according to the setting of this item.

INT: When one of the above batteries is installed, the remaining power is shown as a percentage value (%) when there is a change in the value or when the power is low.

AUTO: The remaining power is shown as a percentage value (%) when one of the above batteries is installed. Otherwise the voltage (VOLT) is displayed continuously.

VOLT: The voltage (VOLT) is displayed continuously.

VF DISP 3 page

Item	Description
LOW LIGHT	Turns on and off the on-screen warning that the average level of the video has dropped beneath a set level.
LOW LIGHT LEVEL	Sets the LOW LIGHT threshold value.
VF BATT WARNING	Specifies the remaining battery capacity level that starts the flashing warning in the viewfinder.

3 Turn the MENU knob to select the desired setting (ON, OFF, or value), and press the MENU knob.

4 Repeat steps 2 and 3 until you have set all of the desired items.

Change confirmation/adjustment progress messages

You can limit or suppress the messages that give details of setting changes and adjustment progress and results by setting a display mode. The conditions under which messages are displayed and their correspondence with the display mode are as follows:

Y: Message is displayed.
N: Message is not displayed.

Message display condition	Message	Display mode setting		
		1	2	3
When the filter selection has been changed	ND: n (where n = 1, 2, 3, 4) or CC: m (m=A, B, C, D)	N	N	Y
When the gain setting has been changed	GAIN: n (where n = –6dB, –3dB, 0dB, 3dB, 6dB, 9dB,12dB, 18dB, 24dB, 30dB, 36dB, 42dB)	N	N	Y
When the setting of the WHITE BAL switch has been changed	WHITE: n (where n = A CH, B CH, PRESET) or ATW: RUN	N	N	Y
When the OUTPUT/DCC switch has been set to DCC ON or OFF	DCC: ON (or OFF)	N	Y	Y
When the shutter speed and mode setting has been changed [a)]	:SHUTTER: 1/100 (or 1/125, 1/250, 1/500, 1/1000, 1/2000, ECS, SLS)	N	Y	Y
When the black or white balance has been adjusted	E.g. AWB : OK	N	Y	Y

a) This is also displayed for about 3 seconds when the SHUTTER selector is set to ON.

Changing the display mode

1 Display the VF DISP 1 page of the OPERATION menu on the screen, and press the MENU knob.

For details on menu operations, see “Basic menu operations” on page 119.

2 Select VF DISP MODE, and press the MENU knob.

3 Select the desired display mode, and press the MENU knob.

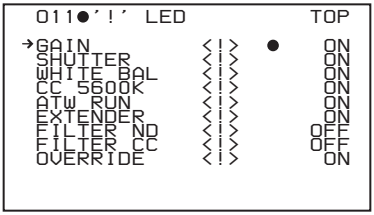
Selecting the conditions that light the ‘!’ (warning) indicator

Select the items that light the viewfinder indicator on the ‘!’ LED page of the OPERATION menu,

and select the conditions that cause the indicator to light on the '!' LED STD page of the OPERATION menu.

1 Press the MENU knob to display the '!' LED page of the OPERATION menu.

For details on menu operations, see "Basic menu operations" on page 119.
The current setting is displayed to the right of each item.



Operation when '!' LED STD items are set to factory default settings

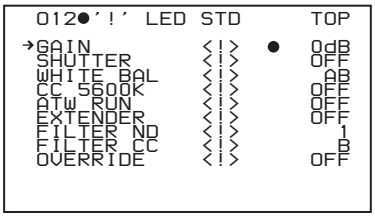
Item	Description
GAIN	Lights when the gain is set to anything but 0 dB.
SHUTTER	Lights when the SHUTTERselector is set to anything but OFF.
WHITE BAL	Lights when the WHITE BALswitch is set to PRST.
CC 5600K	Lights when the CC 5600K mode is set to ON.
ATW RUN	Lights when ATW is being used.
EXTENDER	Lights when the lens extender isused.
FILTER ND	Lights when the ND FILTER selector is set to anything but 1.
FILTER CC	Lights when the CC FILTER selectoris set to anything but B.
OVERRIDE	Lights when the reference value of the auto iris adjustment is other than the standard value.

2 Set the various items.

① Select the item to set and press the MENU knob.
② Select the desired setting and press the MENU knob.
③ Repeat steps ① and ② to set the remaining items.

The conditions under which the indicator lights can be changed on the '!' LED STD page.
To change the conditions, continue to step **3**.

3 Display the '!' LED STD page.



Item	Description
GAIN	GAIN switch position L, M, H, or 0 dB
SHUTTER	Shutter modes, OFF, ECS, or SLS
WHITE BAL	White balance automatic adjustment memory, P (PRST), A, B, PA, PB, or AB
CC 5600K	CC 5600K mode ON or OFF
ATW RUN	ATW ON or OFF
EXTENDER	Extender ON or OFF
FILTER ND	Types of the ND filter, 1, 2, 3, or 4
FILTER CC	Types of the CC filter, A, B, C, or D
OVERRIDE	ON or OFF when the reference value of the auto iris adjustment is other than the standard value

4 Set the various items.

① Select the item to set and press the MENU knob.
② Select the desired setting and press the MENU knob.
③ Repeat steps ① and ② to set the remaining items.

To make '!' LED page settings only

The '!' LED page is registered in the USER menu as well as the OPERATION menu. You can display the '!' LED page from the USER menu without needing to display the TOP menu.

Setting the marker display

Switch the display of the center and safety zone markers on or off, and select whether the area indicated by the safety zone marker is 80%, 90%, 92.5%, or 95% of the screen area.
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the MARKER 1 or MARKER 2 page of the OPERATION menu on the screen, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select the desired item, and press the MENU knob.
You can set the following items on the MARKER 1 and MARKER 2 pages.

MARKER 1 page

Item	Description
MARKER	To hide all markers, set to OFF.
CENTER	To display the center marker, set to ON.
CENTER MARK	Selects the position of the center marker.
SAFETY ZONE	To display the safety zone, set to ON.
SAFETY AREA	Selects the safety zone range (80%, 90%, 92.5% or 95%).
ASPECT	To display the aspect marker, set to ON.
ASPECT SELECT	Selects the aspect mode (15:9/14:9/13:9/4:3/1.85/2.35).
ASPECT MASK [a)]	To make the areas out of the selected aspect marker dimmer, set to ON.
ASPECT MASK LVL	To set the mask level, when the ASPECT MASK is set to ON.
100 % MARKER	To display the effective pixel area, set to ON.

a) The ASPECT MASK setting affects the viewfinder and LCD monitor display. In the following cases, it also affects the VBS signal or the HD/SD SDI signal.
- When HD/SD SDI OUT on the OUTPUT 1 page is set to HDSDI or SDSDI, and HD/SD SDI SUPER is to ON, and SUPER (MARKER) on the SUPERIMPOSE page is set to ON
- When TEST OUT SELECT on the OUTPUT 1 page is set to VBS, and TEST OUT SUPER is set to ON, and SUPER (MARKER) on the SUPERIMPOSE page is set to ON

MARKER 2 page

Item	Description
USER BOX	Turns the display of the box cursor on and off.
USER BOX WIDTH	Sets the width of the box cursor (distance from center to left or right edge).
USER BOX HEIGHT	Sets the height of the box cursor (distance from center to top or bottom edge).
USER BOX H POS	Sets the horizontal position of the center of the box cursor.
USER BOX V POS	Sets the vertical position of the center of the box cursor.
CENTER H POS	Sets the horizontal position of the center marker.
CENTER V POS	Sets the vertical position of the center marker.
ASPECT SAFE ZONE	Turns the display of the aspect safety zone on and off.
ASPECT SAFE AREA	Selects the range of the aspect safety zone (80%/90%/92.5%/95%).

3 Turn the MENU knob to change the setting, and press the MENU knob.

4 Repeat steps 2 and 3 until you have set all of the desired items.

Setting the viewfinder

You can make settings for viewfinder screen display functions.
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the VF SETTING page of the OPERATION menu on the screen, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select the desired item, and press the MENU knob.

You can set the following items on the VF SETTING page.

Item	Description
ZEBRA	Turns the zebra display on or off. a)
ZEBRA SELECT	Selects ZEBRA 1, ZEBRA 2 or BOTH.
ZEBRA 1 DET. LVL	Adjusts the level of the zebra 1 (30% to 70% to 107%) display.
ZEBRA 1 APT. LVL	Adjusts the aperture level of the zebra 1 display. (1% to 10% to 20%)
ZEBRA 2 DET. LVL	Adjusts the level of the zebra 2 (52% to 100% to 109%) display.
VF DETAIL LEVEL	Adjusts the sharpness of the viewfinder (–99 to 99).

a) When you use the viewfinder which is not equipped with the ZEBRA switch, turns the display on or off using this item. When you use the viewfinder with the ZEBRA switch, the most recent operation of the ZEBRA switch and this menu operation is effective.

3 Turn the MENU knob to change the setting, and press the MENU knob.

4 Repeat steps 2 and 3 until you have set all of the desired items.

Recording shot data superimposed on the color bars

In the SHOT DISP page of the USER menu, you can select which shot data is recorded superimposed on the color bars. You can also select which of the shot IDs (1 to 4) set in the SHOT DATA page is recorded superimposed on the picture.
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the SHOT DISP page of the OPERATION menu on the screen, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select the desired item, and press the MENU knob.

You can set the following items on the SHOT DISP page.

Item	Description
SHOT DATE	Selects whether or not the shot data is superimposed (ON or OFF).
SHOT TIME	Selects whether or not shot time is superimposed (ON or OFF).
SHOT MODEL NAME	Selects whether or not the model name is superimposed (ON or OFF).
SHOT SERIAL NO	Selects whether or not the serial number is superimposed (ON or OFF).
SHOT ID SEL	Selects whether or not the shot ID set on the SHOT ID page is superimposed. a)
SHOT 16:9 CHARA	Turns the following function on and off: When displaying aspect ratio 4:3 video, record superimposed "16:9" in the locations where 16:9 video is cut.
SHOT BLINK CHARA	Selects whether or not the blinking * is superimposed (ON or OFF).

a) To carry out superimposed recording, select the SHOT ID number (1 to 4). Not to carry out superimposed recording, select OFF.

3 Turn the MENU knob to select whether or not to record the selected item superimposed on the color bars or the SHOT ID number, and press the MENU knob.

4 Repeat steps 2 and 3 until you have set all of the desired items.

To carry out superimposed recording

To actually record the items selected for superimposed recording on the SHOT DISP page, set the OUTPUT/DCC switch to BARS, DCC OFF.
The items selected for superimposed recording appear on the screen and are recorded superimposed on the color bars.

Example display: when SHOT DATA is set to ON

Setting the shot ID

You can set a shot ID of up to 12 alphanumeric characters, spaces, and symbols.
When the OUTPUT/DCC switch is set to BARS, DCC OFF, this shot ID is output with the color bar signal. You can set four shot IDs (ID-1 to ID-4).

Note

When the menu is displayed, the shot ID is not displayed even if the color bar signal is output.

(How to select an item in the menu screen: Turn the MENU knob to move ➔ to the desired item.)

1 Display the SHOT ID page of the OPERATION menu on the screen, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

```
 018○SHOT ID              TOP
→ID-1  ●□□□□□□□□□□□□□◁
 ID-2   □□□□□□□□□□□□□
 ID-3   □□□□□□□□□□□□□
 ID-4   □□□□□□□□□□□□□
```

2 Select one of ID-1 to ID-4, and press the MENU knob.

A ■ mark appears over the first character position in the string, and characters can now be input.

```
 018○SHOT ID              TOP
●ID-1  ?■                ◁
 ID-2   □□□□□□□□□□□□□
 ID-3   □□□□□□□□□□□□□
 ID-4   □□□□□□□□□□□□□

 !#$%&'()*+,- /012345678
9 ;< >?@ABCDEFGHIJKLMNOP
QRSTUVWXYZ[¥]abcdefghijk
lmnopqrstuvwxyz~
INS DEL RET          ESC END
```

3 Enter or change the shot ID.

When you are entering the whole shot ID, go to ②.

① Turn the MENU knob to move the ■ mark to the character which you want to change, then press the MENU knob.

```
 018○SHOT ID              TOP
●ID-1  ? ■               ◁
 ID-2   □□□□□□□□□□□□□
 ID-3   □□□□□□□□□□□□□
 ID-4   □□□□□□□□□□□□□

 !#$%&'()*+,- /012345678
9 ;< >?@ABCDEFGHIJKLMNOP
QRSTUVWXYZ[¥]abcdefghijk
lmnopqrstuvwxyz~
INS DEL RET          ESC END
```

② Turn the MENU knob until the ■ mark moves to the character position that you want to select, then press the MENU knob.

```
 018○SHOT ID              TOP
●ID-1  ?+                ◁
 ID-2   □□□□□□□□□□□□□
 ID-3   □□□□□□□□□□□□□
 ID-4   □□□□□□□□□□□□□

 !#$%&'()*■,- /012345678
9 ;< >?@ABCDEFGHIJKLMNOP
QRSTUVWXYZ[¥]abcdefghijk
lmnopqrstuvwxyz~
INS DEL RET          ESC END
```

4 Repeat step 3 for each of the remaining characters.

5 When the input is complete, turn the MENU knob to move the ■ mark over END, then press the MENU knob.

This ends the input, and returns to the original SHOT ID page.

To insert a space

In step **3** above, move the ■ mark over INS, and press the MENU knob.
To cancel inserting a space, move the ■ mark over RET, then press the MENU knob.

To delete a character

In step **3** of "Setting the shot ID" *(see page 135)*, move the ■ mark over DEL, and press the MENU knob.
This deletes the character under the ■ mark in the shot ID row.
To cancel deleting the character, move the ■ mark over RET, and press the MENU knob.

To cancel changing shot ID

Before executing step **5** of "Setting the shot ID" *(see page 135)*, move the ➧ mark over ESC, then press the MENU knob or flick the CANCEL/PRST/ESCAPE switch to ESCAPE.

Displaying the status confirmation screens

You can confirm the settings or status of the camcorder on the LCDs by displaying the following four screen.

ABNORMAL <!> screen
This window allows you to confirm why the ! (warning) indicator lights in the viewfinder. You can use the "!" LED page of the OPERATION menu to set whether or not the ! (warning) indicator lights.

SYSTEM screen
This screen displays information such as the system format and the type of input or output signal.

FUNCTION screen
This screen displays the functions assigned to the assignable switches, ON or OFF of ZEBRA, the detection level, and other information.

AUDIO STATUS screen
This screen allows you to confirm the following items related to audio.
- Setting condition of audio
- Setting condition of DF/NDF
- Type of front microphone
- Type of input signal to audio channels 1 to 4
- Input level of audio channels 1 to 4

You can use the SET STATUS page of the OPERATION menu to set whether or not the status confirmation screens are displayed.

To display the status confirmation screens

You can use the CANCEL/PRST/ESCAPE switch as the STATUS ON/SEL/OFF switch when the MENU ON/OFF switch is set to OFF (when the cover of the menu operating section is closed, OFF is automatically selected).

To disable display of the status confirmation screens

(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the SET STATUS page of the OPERATION menu on the screen, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select the desired item, and press the MENU knob.
You can set the following items on the SET STATUS page.

Item	Description
STATUS ABNORMAL	Selects whether or not the ABNORMAL window is displayed (ON or OFF).
STATUS SYSTEM	Displays (ON) or hides (OFF) the SYSTEM menu.
STATUS FUNCTION	Selects whether or not the FUNCTION window is displayed (ON or OFF).
STATUS AUDIO	Selects whether or not the STATUS AUDIO window is displayed (ON or OFF).

3 Turn the MENU knob to change the setting, and press the MENU knob.

4 Repeat steps 2 and 3 until you have set all of the desired items.

Adjustments and Settings From Menus

Setting gain values for the GAIN selector positions

You can set the gain values for the L, M, and H positions of the GAIN selector, which switches the gain of the video amplifier.
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the GAIN SW page of the OPERATION menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select the item for the switch position, then press the MENU knob.
You can set the following items on the GAIN SW page.

Item	Description
GAIN LOW	Sets the gain value corresponding to the L position of the GAIN selector.
GAIN MID	Sets the gain value corresponding to the M position of the GAIN selector.
GAIN HIGH	Sets the gain value corresponding to the H position of the GAIN selector.
GAIN TURBO	Sets the gain value corresponding to TURBO GAIN function.
TURBO SW IND	**OFF:** When you operate the GAIN selector after pressing the button to which the TURBO GAIN function has been assigned once, the video gain is changed according to the GAIN selector operation. **ON:** When the video gain is boosted to the video gain to the value preset by pressing the button to which the TURBO GAIN function has been assigned once, the video gain is not changed even if you operate the GAIN selector, until you press the button once more.
SHOCK-LESS GAIN	Turns shockless gain on or off.

3 Turn the MENU knob to select the gain value, and press MENU knob.
Any of –6, –3, 0, 3, 6, 9, 12, 18, 24, 30, 36 or 42 dB can be set for each of the L, M, H, and TURBO positions, in any sequence.

4 Repeat steps 2 and 3 until you have set all of the desired items.

Selecting the output signals

(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the OUTPUT 1 page of the OPERATION menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select the desired item, and press the MENU knob.
You can set the following items on the OUTPUT 1 page.

Item	Setting
HD SDI OUT	Selects the signal output from the HDSDI OUT connector. **OFF:** Do not output video. **HDSDI:** Output HDSDI.

Item	Setting
HD/SD SDI OUT	Selects the signal output from the HD/SD SDI OUT connector. **OFF:** Do not output video. **HDSDI:** Output HDSDI. **SDSDI:** Output SDSDI
HD/SD SDI SUPER	Selects whether to superimpose (ON) or not superimpose (OFF) text information on the signal output from the HD/SD SDI OUT connector.
TEST OUT SELECT	Selects the output signal from the TEST OUT connector. **VBS:** Output composite video signal. When you select VBS, connect to the VIDEO IN connector of your monitor. **Y:** Output HD-Y signal. **R/G/B:** Output HD RGB signal.
TEST OUT SUPER	Selects whether to superimpose (ON) or not superimpose (OFF) text information on the signal output from the TEST OUT connector.

3 Turn the MENU knob to change the setting, and press the MENU knob.

4 Repeat steps 2 and 3 until you have set all of the desired items.

Assigning functions to ASSIGN switches

You can assign the desired function to any of the ASSIGN 1/2/3/4/5 switches or RET button on the lens.
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the ASSIGNABLE SW page of the OPERATION menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

You can assign functions by using the following items.

Item	Description
ASSIGN SW <1>	Assigns the function to ASSIGN 1 (push-type) switch.
ASSIGN SW <2>	Assigns the function to ASSIGN 2 (slide-type) switch.
ASSIGN SW <3>	Assigns the function to ASSIGN 3 (push-type) switch.
ASSIGN SW <4>	Assigns the function to ASSIGN 4 (push-type) switch.
ASSIGN SW <5>	Assigns the function to ASSIGN 5 (push-type) switch.
ASSIGN SW <RET>	Assigns the function to RET button on the lens.

2 Select the desired switch or button, and press the MENU knob.

A selection screen for the selected switch or button appears. You can use these screens to assign one of the following functions.

Functions to be assigned to the ASSIGN 1/3/4/5 (push-type) switch or RET button on the lens

Function	Description
OFF	Assigns no function.
FRONT MIC MONO/STEREO	Assigns the function that switches between stereo and monaural when a stereo microphone is connected.
PICTURE CACHE ON/OFF	Assigns execution of recording in picture cache mode.
SUPER (VFDISP&MENU)	Assigns the function of a switch to select mixing or no mixing of superimposed viewfinder and menu text data into the video signals output from the HD/SD SDI OUT or TEST OUT connector, when HD/SD SDI SUPER or TEST OUT SUPER on the OUTPUT 1 page of the OPERATION menu are set to ON.
MARKER	Assigns the ON/OFF function to display all markers. [a]
RE-TAKE [b]	Assigns the function to delete the last recorded take.

Function	Description
ATW	Assigns the ON/OFF function of auto tracing white balance.
RETURN VIDEO	Assigns the ON/OFF function to display the image of the return video signal on the viewfinder to the switch. [c]
LENS RET	Assigns the same function as that of the RET button on the lens and other functions to the switch.
REC SWITCH	Assigns the recording start/stop function to the switch.
TURBO SWITCH	Assigns the turbo gain function to the switch.
ZEBRA	Assigns the zebra pattern display function to the switch.
ZOOM TELE/WIDE [d]	When using a lens that supports serial communications, assign the ZOOM TELE setting to ASSIGN 3, and the WIDE setting to ASSIGN 4.
ZOOM WIDE/TELE [d]	When using a lens that supports serial communications, assign the ZOOM WIDE setting to ASSIGN 3, and the TELE setting to ASSIGN 4.
PB MIX	Function to mix playback and camera video.
CC 5600K	Applies an electrical 5600K filter.
FOCUS MAG	Assigns the function that magnifies the central part of the viewfinder picture, for easier focus adjustment. (This function does not affect recorded video or other signal output.)
DIGITAL EXTENDER[e]	Assigns the function that electronically magnifies the central part of the picture. (All video output is magnified, including recorded video.)
UA01 to UA10 [f]	Assigns the items assigned in the ASSIGN SEL menu.

a) Even when the MARKER item is set to OFF on the MARKER 1 page of the USER menu, these switches allow you to display or not to display all markers.

b) This function cannot be assigned to the RET button on the lens.

c) Even if the RETURN VIDEO item is set to OFF on the ASSIGNABLE SW page of the OPERATION menu, you can use this switch to display the image of the return video signal on the viewfinder.

d) Only the Assign 3 SEL and Assign 4 SEL screens appear.

e) Video momentarily becomes black and audio is momentarily muted when the digital extender is switched on and off.

f) This does not appear if nothing is assigned in the Assign menu.

Functions to be assigned to the ASSIGN 2 (slide-type) switch

Function	Content
OFF	Assigns no function.
FRONT MIC MONO/STEREO	Assigns the function that switches between stereo and monaural when a stereo microphone is connected.
PICTURE CACHE ON/OFF	Assigns execution of recording in picture cache mode.
SUPER (VFDISP&MENU)	Assigns the function of a switch to select mixing or no mixing of superimposed viewfinder and menu text data into the video signals output from the HD/SD SDI OUT or TEST OUT connector, when HD/SD SDI SUPER or TEST OUT SUPER on the OUTPUT 1 page of the OPERATION menu are set to ON.
MARKER	Assigns the ON/OFF function to display all markers. [a]
ZEBRA	Assigns the zebra pattern display function to the switch.
DIGITAL EXTENDER[b]	Assigns the function that electronically magnifies the central part of the picture. (All video output is magnified, including recorded video.)
UA01 to UA10 [c]	Assigns the items assigned in the ASSIGN SEL menu.

a) Even when the MARKER item is set to OFF on the MARKER page of the USER menu, the ASSIGN 2 switch allows you to display or not to display all markers.
b) Video momentarily becomes black and audio is momentarily muted when the digital extender is switched on and off.
c) This does not appear if nothing is assigned in the Assign menu.

Note

For functions that are assigned to the ASSIGN 2 (slide-type) switch, you cannot change those settings using other menus. The function assigned to the ASSIGN 2 switch takes precedence over the menu setting.

3 Select the desired function, and press the MENU knob.

The function is assigned, and the ASSIGNABLE SW page appears again.

Operation of the ASSIGN 1/2/3/4/5 switches when UA01 to UA10 are assigned

When an on/off switchable function (or menu item) is assigned to one of the ASSIGN 1/2/3/4/5 switches or lens RET button, each time the switch or button is pressed toggles the function on or off.
When another type of menu item is assigned, pressing the switch displays the item and its setting value on the viewfinder screen.
You can then change the setting by pressing and turning the MENU knob.
The viewfinder screen display disappears approximately three seconds after the last operation.

Indication display times

When a viewfinder indication is assigned to the ASSIGN 1/3/4/5 switch (push type), it disappears from the viewfinder about three seconds after the operation that displayed it. When an indication is assigned to the ASSIGN 2 switch (slide type), it remains in the viewfinder as long as the switch is in the ON position (on the side to which the arrow points). To make it disappear, set the switch to the OFF position.

Setting the color temperature manually

You can manually adjust the value of the white balance by setting the color temperature.

(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the WHITE page of the PAINT menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select the desired item, and press the MENU knob.

You can set the following items on the WHITE page.

Item	Description
COLOR TEMP <A>	Sets the color temperature for the desired value. Adjust the value while looking at the real image because error tends to be bigger for adjustment of high color temperature.
C TEMP BAL <A>	Adjusts the value more precisely when the color temperature adjustment through COLOR TEMP is not satisfactory.
R GAIN <A>	Changes only the value of R GAIN.
B GAIN <A>	Changes only the value of B GAIN.

The above table shows the adjustment of the white balance of channel A. Items followed by <B> are used to adjust the white balance of channel B.

3 Turn the MENU knob to change the setting, and press the MENU knob.

4 Repeat steps 2 and 3 until you have set all of the desired items.

Specifying an offset for the auto white balance setting

By setting an offset for the value of auto white balance, you can make the picture warmer or colder.
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the OFFSET WHT page of the OPERATION menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select the desired item, and press the MENU knob.

You can set the following items in the OFFSET WHT page.

Item	Description
OFFSET WHITE <A>	When this item is set to ON, the offset adjusted on this page is added to the white balance for channel A.
WARM-COOL <A>	When OFFSET WHITE <A> is "ON", sets the offset for the white balance of channel A, using the color temperature. Adjust the value while looking at the real image because error tends to be bigger for adjustment of high color temperature.
WARM-COOL BAL <A>	Adjusts the value more precisely if the adjustment by WARM-COOL <A> is not satisfactory.

The above table shows the adjustment of the white balance of channel A. Items followed by <B> are used to adjust the white balance of channel B.

3 Set the WHITE BAL switch to the channel (A or B) that you want to set.

Note

If the WHITE BAL switch is not set to A or B, the adjusted value is not reflected in the video output even though you carry out the following operation.

4 Turn the MENU knob to change the setting, and press the MENU knob.

If you want to set the other channel, go back to step **2**.

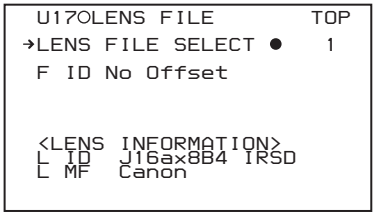
Selecting the lens file

The LENS FILE page of the USER menu allows you to change the lens file according to the lens in use.
(How to select an item in the menu screen: Turn the MENU knob to move ➔ to the desired item.)

1 Display the LENS FILE page of the USER menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

The LENS FILE page shows the name (F.ID) of the currently selected lens file.
The lens name (L.ID) and manufacturer (L.MF) appear when a lens that supports serial communications is mounted.



2 Select LENS FILE SELECT, and press the MENU knob.

3 Turn the MENU knob to change the setting, and press the MENU knob.

Setting the UMID data

What is a UMID?

The UMID (Unique Material Identifier) is a unique identifier for audio-visual material defined by the SMPTE330M-2003 standard. The UMID may be used either as the 32-byte Basic UMID or as the Extended UMID, which includes an additional 32 bytes of Source Pack to make a total 64 bytes.

For details, refer to SMPTE 330M.

Globally unique ID is automatically recorded in clip units.
The Extended UMID is metadata that provides additional information such as location, time/date, company and so on.

Using the Extended UMID

You have to enter a country code, organization code and user code. Set the country code referring to the ISO-3166 table, and set the organization code and user code independently.

For details, see "About UMID ownership information" (page 142).

Functions of UMID data

The UMID data enables the followings:

- Add a globally unique ID to every take of audio-visual material. The unique ID is used to detect the material source and to link it with the original source material.
- Distinguishing between original material and copied material. 00 is added to the Instance Number for original material.
- Recording based on the UTC. The UTC is used when recording the UMID. This enables uniform control of source material recorded all over the world based on the universal timecode.
- Calculating the date difference among source materials. The source material is recorded based on the MJD (Modified Julian Date), which enables easy calculation of date difference among source materials.

To set UMID ownership information

(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the UMID SET page of the OPERATION menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Set the following item.

Item	Contents
EX-OWNERSHIP REC	Specifies whether to record the user data
COUNTRY CODE	Country code
ORGANIZATION	Organization code
USER CODE	User code
INSTANCE NO	Specifies how to generate the instance number
TIME ZONE	Time difference from UTC
MACHINE	Displays the machine-specific number

For details on how to enter characters, see "Setting the shot ID" (page 135).

3 Press the MENU knob.

About UMID ownership information

COUNTRY CODE

Enter an abbreviated alphanumeric string (4-byte alphanumeric strings) according to the values defined in ISO 3166-1.
There are about 240 country codes.
Find your own country code on the following home page.
Refer to ISO-3166-1:
http://www.iso.org/iso/country-codes/iso_3166_code_lists.htm

When the country code is less than 4 bytes, the active part of the code will occupy the first part of the 4-bytes and the remainder must be filled with the space character (20h).

Example: In the case of Japan
For Japan, if the country code is JP, it is 2 bytes, if JPN, it is 3 bytes.
Thus, enter the following:
JP_ _
or
JPN _
where _ represents a space.

ORGANIZATION (organization code)

Enter an abbreviated 4-byte alphanumeric string for the organization code.

Notes

- Organization codes must be acquired by applying to the SMPTE registration office.
  When no organization code has been acquired, it is forbidden to enter an arbitrary string. As a rule, the code "00" must be entered. Freelance operators who do not belong to an origination should enter "~".
- There are no problems in recording or playing back audio-video signals, if ORGANIZATION is not set.

USER CODE

Enter the 4-byte alphanumeric strings for user identification.
The user code is registered with each organization locally. It is usually not centrally registered.
When the user code is less than 4 bytes, enter the user code from the beginning of the 4 bytes and enter the space character (20h) in the remaining strings.
This user code is determined by the organization. The methods used depend on the organization.

Note

User code cannot be entered when no organization code has been entered.

TIME ZONE

Set the time difference from UTC.

Notes

- The UTC is calculated based on the local time, using the time zone. If the time zone is not set, the UTC is not recorded correctly.
- When you change the time zone, adjust the internal clock to local time and turn the power of the camcorder off and then the power on again.

Chapter 6 Saving and Loading User Setting Data

Handling the "Memory Stick"

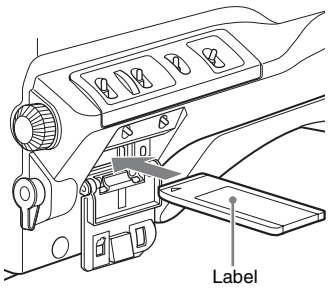
The "Memory Stick" can be inserted to or removed from the camcorder with the power turned on or off.

"Memory Stick" media usable with this camcorder

With this camcorder, you can use a Sony "Memory Stick", "Memory Stick Duo", "Memory Stick PRO" whose capacity does not exceed 4 GB, and "Memory Stick PRO Duo".

For details, see "About a "Memory Stick"" on page 172.

Inserting a "Memory Stick"



1 **Open the cover of the menu operating section.**

2 **Hold the "Memory Stick" with the notch facing downward and the arrow facing away from you, and insert the "Memory Stick" into the "Memory Stick" slot until it clicks into place. Then close the cover.**

Note

If it does not fit into the slot properly or if there is some resistance when you insert it, the "Memory Stick" may be turned around or upside down. Do not force the "Memory Stick" into the slot. Confirm the direction of the notch and arrow on the "Memory Stick" before inserting the "Memory Stick" and then try inserting it again.

To remove the "Memory Stick"

1 **Check that the access indicator is not lit, then gently press in the "Memory Stick" once and release.**
The "Memory Stick" pops out.

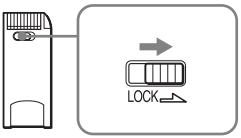
2 **Pull the "Memory Stick" towards you to withdraw it from the slot.**

Note

Do not remove the "Memory Stick" while the access indicator is lit. You may lose data, or damage the "Memory Stick".

To protect saved data

To prevent accidental erasure of important setup data, slide the LOCK switch on the "Memory Stick" right to the write protect position.



It is now impossible to write or delete data on the "Memory Stick". If you try to do so, the message "MEMORY STICK LOCKED" appears and the data cannot be overwritten or deleted.

Note

"Memory Stick Duo" and "Memory Stick PRO Duo" do not have this function.

To format a "Memory Stick"

Note

Do not format the "Memory Stick" using a PC.

(How to select an item in the menu screen: Turn the MENU knob to move ➡ to the desired item.)

1 Display the MEMORY STICK page of the FILE menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select M.S. FORMAT, and press the MENU knob.
A confirmation screen appears.

3 Select "YES" and press the MENU knob.

Saving and Recalling User Files

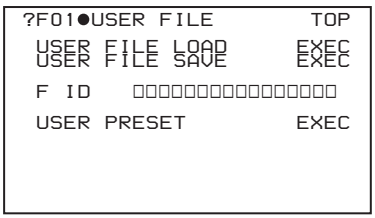
The camcorder is equipped with a "Memory Stick" slot, which enables you to save the settings in the USER menu as a user file onto the "Memory Stick". You can load these files from the "Memory Stick" for immediate recall of a particular setting configuration.
In addition to user files, you can save scene files, reference files, lens files and ALL files in a "Memory Stick".

Saving user menu data to the "Memory Stick"

You can save USER menu settings held in the camcorder as user files in the "Memory Stick". You can save up to 100 user files in the "Memory Stick".
Insert the "Memory Stick" then proceed as follows.
(How to select an item in the menu screen: Turn the MENU knob to move ➡ to the desired item.)

1 Display the USER FILE page of the FILE menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.



To set a file ID for the data to be saved
Set the file ID before going to step **2**.

For details on setting the file ID, see "To set the file ID" on page 146.

2 Select USER FILE SAVE, and press the MENU knob.
The USER SAVE page appears.

Up to 20 pages, from P00 to P19, can be used to save user files to the "Memory Stick". Each page can hold up to five files.

3 Turn the MENU knob until the page which contains the desired file number appears, and press the MENU knob.

4 Select the desired file number, and press the MENU knob.
The message "SAVE OK? YES ➧ NO" appears.
If a file number is followed by "NEW FILE", this means that the file is empty. If data is stored in the file, the file number is followed by the file name.

5 To carry out the save, select YES and press the MENU knob.
To cancel, press the MENU knob leaving ➧ pointing to NO.

The access indicator lights. When the saving is completed, the message "COMPLETE" appears and the access indicator goes off.

If no "Memory Stick" has been inserted
The message "NO MEMORY STICK" will appear. Insert a "Memory Stick" and carry out the operation once again.

If you select a file number where data has already been saved
The message "OVERWRITE OK? YES ➧ NO" appears.
- To stop overwriting, press the MENU knob leaving ➧ pointing to NO.
- To overwrite, select YES and press the MENU knob.

You can select the information displayed on each USER SAVE or USER LOAD page.

For details, see "To select the file information items to be displayed" on page 147.

About the USER menu settings to be saved in the "Memory Stick"

Settings for items on all pages of the USER menu are saved in the "Memory Stick" as a user file.

If data cannot be saved

If one of the following error messages appears during or after the save operation, then the data was not saved.

Error message	Cause	Action
NO MEMORY STICK (flashing)	No "Memory Stick" is inserted.	Insert or reinsert the "Memory Stick".
MEMORY STICK LOCKED	The LOCK switch on the "Memory Stick" is set to the write protect position.	Set the LOCK switch to the write enable position.
MEMORY STICK ERROR (flashing)	Circuit or "Memory Stick" fault.	Recheck and consult a Sony service representative.

To set the file ID

You can set an file ID before you save your data as a user file. This will help you identify the user file quickly. The file ID that has been set is saved together with the data.

Note

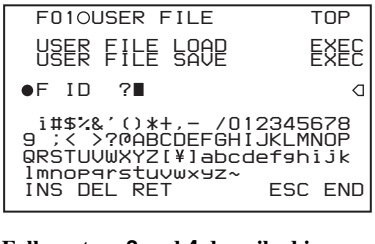
Set the file ID before saving data in the "Memory Stick". Otherwise, the file ID is not saved with the other data.

(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the USER FILE page of the FILE menu.

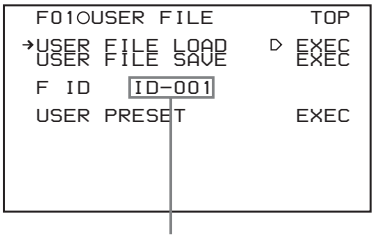
For details on menu operations, see "Basic menu operations" on page 119.

2 Select F. ID, and press the MENU knob.
A character table appears.



3 Follow steps 3 and 4 described in "Setting the shot ID" on page 135 to enter characters.

4 When you have finished entering the file ID, turn the MENU knob to move ■ to END, and press the MENU knob.
The entered file ID is now displayed.



File ID that has been set appears.

When you carry out a user file save operation *(see page 145)*, the set file ID is saved to the "Memory Stick" together with the data.

To select the file information items to be displayed

You can select the user file information items to be displayed on the USER FILE SAVE page and USER FILE LOAD page (P00 to P19), that are the pages used to save and call up the data to and from "Memory Stick".
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the USER FILE LOAD page or USER FILE SAVE page of the USER FILE menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select the DISPLAY MODE, and press the MENU knob.

3 Select the desired type of file information, and press the MENU knob.

Display type	Description
ALL	File ID (10 characters) and date (year/month/day)
F.ID	File ID (16 characters)
DATE	Date saved (year/month/day/ hours/minutes/seconds)
MODEL	Information on the model

Loading saved data from a "Memory Stick"

Note

The data loaded from the "Memory Stick" overwrites the data saved in the camcorder.

(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the USER FILE page of the FILE menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select USER FILE LOAD, and press the MENU knob.
The USER LOAD page appears.

3 Turn the MENU knob until the page which contains the desired file number appears, then press the MENU knob.

4 Select the desired file number, and press the MENU knob.
The message "LOAD OK? YES ➧ NO" appears.

5 To carry out the load, select YES and press the MENU knob.
To cancel, press the MENU knob leaving ➧ pointing to NO.

The access indicator lights.
When the load is completed, the message "COMPLETE" appears and the access indicator goes off.

If data cannot be loaded

If one of the following error messages appears during or after the load operation, then the data was not loaded.

Error message	Cause	Action
NO MEMORY STICK (flashing)	No “Memory Stick” is inserted.	Insert or reinsert the “Memory Stick”.
MEMORY STICK ERROR (flashing)	Circuit or “Memory Stick” fault.	Recheck, and consult a Sony service representative.
FILE ERROR (flashing)	The “Memory Stick” contains data that cannot be loaded into this camcorder.	Data saved to a “Memory Stick” using a camcorder whose model is not the same as this camcorder cannot be loaded into this camcorder.

Returning the user file settings to the standard settings

(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the USER FILE page of the FILE menu, and press the MENU knob.

For details on menu operations, see “Basic menu operations” on page 119.

2 Select USER PRESET, and press the MENU knob.

Saving and Loading Scene Files

You can save various settings for shooting a particular scene as a scene file. By loading the scene file, you can quickly recreate setup conditions suitable for the scene. You can save up to five scene files in the camcorder memory and up to 100 scene files in a “Memory Stick” .
You can also load data from the “Memory Stick” into the camcorder memory.

Data that can be saved in a scene file

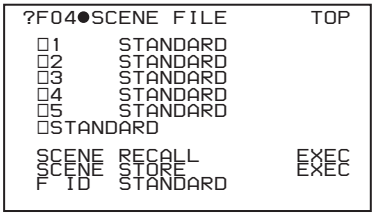
You can save the following data in a scene file:
- Values adjusted using the PAINT menu
- Shutter speed settings made in the standard mode and ECS mode
- The white balance data included in a scene file depends on the SCENE WHITE DATA setting on the REFERENCE page of the FILE menu.

Saving a scene file

To save a scene file to the “Memory Stick”, insert the “Memory Stick” into the “Memory Stick” slot before starting the following operation.
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the SCENE FILE page of the FILE menu, and press the MENU knob.

For details on menu operation, see “Basic menu operations” on page 119.



To set a file ID for the data to be saved
Set the file ID before going to step **2**.

For details on setting the file ID, see “To set the file ID” on page 146.

2 Select SCENE STORE, and press the MENU knob.
The SCENE STORE page appears.

3 Press the MENU knob, then select the desired file number, and press the MENU knob again.
The file to be saved is selected.

When no "Memory Stick" is inserted
Select the desired memory number, and press the MENU knob.
When the save is completed, the SCENE FILE page appears again.

When you select a file number where data has already been saved
The message "OVERWRITE OK? YES ➧ NO" appears.
- To cancel the overwriting, press the MENU knob leaving ➧ pointing to NO.
- To overwrite, select YES and press the MENU knob.

When a "Memory Stick" is inserted
You can use up to 20 pages, from P01 to P20, to save scene files in the "Memory Stick". Each page can hold up to five files.

① Turn the MENU knob until the page which contains the desired file number appears, then press the MENU knob.
② Select the desired file number, and press the MENU knob.
The message "STORE OK? YES ➧ NO" appears.
③ To carry out the save, select YES and press the MENU knob.
To cancel, press the MENU knob leaving ➧ pointing to NO.

You can select the file information items to be displayed on each page of SCENE STORE and SCENE RECALL.

For details, see "To select the file information items to be displayed" on page 147.

To save scene files stored in the camcorder memory to the "Memory Stick"

The five scene files stored in the camcorder memory can be saved to the "Memory Stick" all in a single operation.

(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the SCENE FILE page of the FILE menu, and press the MENU knob.

For details on menu operations, see "Basic menu operations" on page 119.

2 Select SCENE STORE, and press the MENU knob.
One of the SCENE STORE pages appears.

3 Turn the MENU knob to select the desired SCENE STORE page, and press the MENU knob.

4 Select 5FILE SAVE ➧ MEM1-5, and press the MENU knob.
The message "STORE OK? YES ➧ NO"appears.

5 To carry out the save, select YES and press the MENU knob.
To cancel, press the MENU knob leaving ➧ pointing to NO.

When the save is completed, the message "COMPLETE" appears.

Note

If files have been saved in the page selected in step **3**, those files are replaced with files loaded from the camcorder memory. For example, files from 001 to 005 are replaced by the above procedure.

To set the file ID

You can set an file ID before you save your data as a scene file. This will help you identify the scene file quickly. The file ID that has been set is saved together with the data.

You can carry out a scene file ID setting operation on the SCENE FILE page of the FILE menu.

*For details about this operation, see the description of step **2** and following of "To set the file ID" on page 146.*

To select the file information items to be displayed

You can select the items of file information to be displayed on the SCENE STORE pages (P01 to P20) or the SCENE RECALL pages (P01 to P20) used for saving data to or loading data from a “Memory Stick”.
You can select the scene file information items to be displayed on the SCENE STORE page and SCENE RECALL page of the SCENE FILE menu.

For details about item selection, see the description of step **2** *and following of “To select the file information items to be displayed” on page 147.*

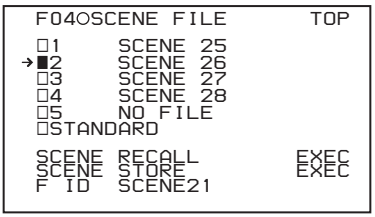
Loading scene files

(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 Display the SCENE FILE page of the FILE menu, and press the MENU knob.

For details on menu operations, see “Basic menu operations” on page 119.

2 To load the scene file stored in the camcorder, select the desired file number, and press the MENU knob.
☐ on the left of the file number changes to ■. The camcorder is set up according to the loaded scene file.



To cancel the selected scene file
Turn the MENU knob to move ➧ to ■, and press the MENU knob again. ■ changes to ☐. The camcorder returns to the settings before selecting this scene file.

To load a scene file saved in the “Memory Stick”

① Select SCENE RECALL, and press the MENU knob.
The SCENE RECALL page appears.
② Turn the MENU knob until the page which contains the desired file number appears, then press the MENU knob.
③ Select the desired file number, and press the MENU knob.
The message “RECALL OK? YES ➧ NO” appears.

3 To carry out the recall, select YES and press the MENU knob.
To cancel, press the MENU knob leaving ➧ pointing to NO.
When the loading is completed, the message “COMPLETE” appears. The camcorder is set up according to the loaded scene file. If no file is present with a particular file number, this is shown as “NO FILE”.

To load scene files from the “Memory Stick” into the camcorder memory

You can load up to five scene files stored in the “Memory Stick” into the camcorder memory all in a single operation.
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

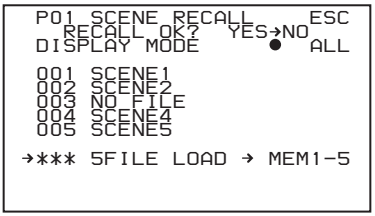
1 Display the SCENE FILE page of the FILE menu, and press the MENU knob.

For details on menu operations, see “Basic menu operations” on page 119.

2 Select SCENE RECALL, and press the MENU knob.
The SCENE RECALL page appears.

3 Turn the MENU knob until the SCENE RECALL page which contains the desired scene files appears, and press the MENU knob.

4 Select 5FILE LOAD ➧ MEM 1-5, and press the MENU knob.
The message “RECALL OK? YES ➧ NO” appears.



5 **To carry out the load (recall), select YES and press the MENU knob.**
To cancel, press the MENU knob leaving ➧ pointing to NO.

When loading is complete, the message "COMPLETE" appears and the access indicator goes off.

Notes

- The scene files loaded from the "Memory Stick" overwrite data saved in the camcorder memory.
- To load the scene file saved in the camcorder memory when the "Memory Stick" is inserted, return to the P00 SCENE RECALL page and load the desired scene file in the camcorder memory.
- When there is no file to be loaded (shown as "NO FILE"), an existing file of the same number is unaffected. In the example shown in step **4**, MEM3 is not overwritten.

Returning the scene file settings to the standard settings

(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 **Display the SCENE FILE page of the FILE menu, and press the MENU knob.**

For details on menu operations, see "Basic menu operations" on page 119.

2 **Select STANDARD, and press the MENU knob.**
☐ displayed on the left of STANDARD changes to ■. When ■ changes to ☐ once again, the settings of the camcorder are reset to the standard settings.

If you press the MENU knob again while ■ is displayed, the operation is cancelled and the camcorder returns to the settings before STANDARD was selected.

Jumping to a File-Related Menu Page When Inserting a "Memory Stick"

A "Memory Stick" enables you to save user files, scene files, lens files, reference files and ALL files.
The camcorder menu system allows you to make a setting so that when a "Memory Stick" holding these files is inserted while in menu operating mode, a menu page relating to the desired file is automatically displayed on the screen. Thus you can proceed to file operation quickly. This is very convenient especially when you manage data files using "Memory Stick"s.
(How to select an item in the menu screen: Turn the MENU knob to move ➧ to the desired item.)

1 **Display the MEMORY STICK page of the FILE menu, and press the MENU knob.**

For details on menu operations, see "Basic menu operations" on page 119.

2 **Select MS IN > JUMP TO, and press the MENU knob.**
The MS IN > JUMP TO page allows you to select one of the following settings.

Setting	Description
OFF	Disables this function. Menu pages do not change when a "Memory Stick" is inserted.
USER	Jumps to the USER FILE page.
ALL	Jumps to the ALL FILE page.
SCENE	Jumps to the SCENE FILE page.
LENS	Jumps to the LENS FILE 1 page.
REFER	Jumps to the REFERENCE page.
USER 1	Jumps to the USER 1 FILE page.

3 **Turn the MENU knob until the name of the desired file page appears, then press the MENU knob.**

Note

IIn the following cases, jumping to the target page is impossible.

- When the power is turned on after you insert a "Memory Stick".
- When OFF is selected on the MS IN > JUMP TO page.

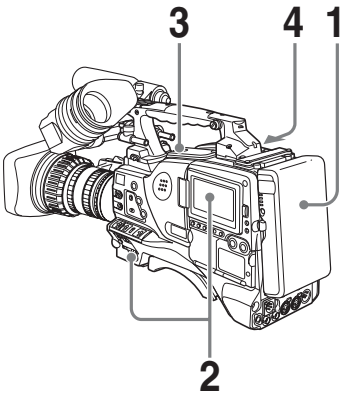
- When any of the following menu pages is already displayed.
  - A file-related page such as the USER FILE page of the FILE menu
  - MEMORY STICK, ALL FILE, SCENE FILE, LENS FILE, REFERENCE or ROM VERSION page

Chapter 7 Maintenance

Testing the Camcorder Before Shooting

Check the functions of the camcorder before setting out for a shooting session, preferably by operating the camcorder together with a color video monitor.

Preparations for Testing



1 Attach a fully charged battery pack.

2 Set the POWER switch to ON and check that the HUMID indicator does not appear and that the BATT indicator shows at least five segments.

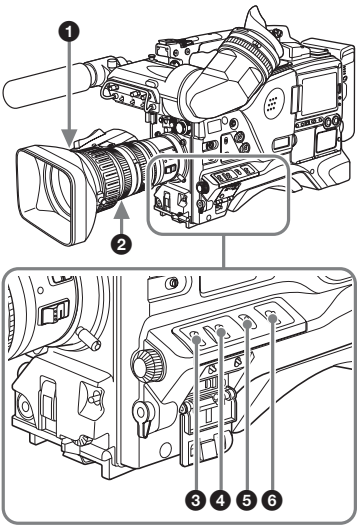
- If the HUMID indicator appears, wait until it disappears.
- If the BATT indicator does not show at least five segments, replace the battery pack with a fully charged one.

3 Check that there are no obstructions near the cassette compartment, and then press the EJECT button to open the cassette compartment lid.

4 After confirming that the cassette tape is not write-protected, load the cassette tape and close the cassette compartment lid.

Testing the Camera

Set the switches and selectors as follows.



❶ Iris switch: Automatic
❷ Zoom selector: SERVO/MAN
❸ VTR SAVE/STBY switch: SAVE
❹ GAIN selector: Set as low as possible.
❺ OUTPUT/DCC switch: BARS
❻ WHITE BAL switch: A or B

Testing the viewfinder

1 Adjust the position of the viewfinder.

2 Check that the color bars are displayed on the viewfinder screen, and adjust the BRIGHT, CONTRAST, and PEAKING controls to give the best color bar display.

3 Check each of the following operations.

- The menu is displayed on the viewfinder screen.
- Turn the MENU knob and check that the menu page changes to the next page.
- Press the MENU knob and check that settings of each item of the selected page are displayed.
- Turn the MENU knob and check that ➧ moves within the page.
- Press the MENU knob and check that ➧ placed before the item changes to ● and ● placed before the setting of the item changes to **?**.
- Turn the MENU knob and check that the setting of the selected item changes.

4 Set the OUTPUT/DCC switch to CAM, and change the FILTER selector (inner knob) position in the sequence of 1, 2, 3, and 4. Then, change the FILTER selector (outer knob) position in the sequence of A, B, C, and D.

Check that the FILTER indicator on the viewfinder screen displays the correct numbers.

5 Carry out of the following operations, and check that the ! indicator lights if the corresponding item has been turned on on the '!' LED page of the USER menu.

- Set the gain to anything but 0 dB by using the GAIN selector and the GAIN SW page of the OPERATION menu.
- Set the SHUTTER selector to ON.
- Set the WHITE BAL switch to PRST.
- Use the lens extender.
- Set the FILTER selector (inner knob) other than 1.
- Set the FILTER selector (outer knob) other than B.
- Set the reference value of the auto iris to other than the standard value.

Note

The above may not apply if you have changed the lighting conditions of the ! indicator on the '!' LED page of the USER menu.

6 Flick the SHUTTER selector from ON to SELECT repeatedly, and check that the shutter setting changes on the viewfinder screen.

7 Pointing the camera at a suitable subject, focus the camera and check the picture on the viewfinder screen.

8 Set both of the AUDIO IN switches to FRONT, and check that when sound is input to a microphone connected to the MIC IN connector on the front of the camcorder, the audio level indicators appear on the viewfinder screen.

9 Check that setting the ZEBRA switch to ON and OFF makes the zebra pattern appear and disappear on the viewfinder screen.

Note

The results of checking in steps **3** to **9** may not be as expected, depending on the settings relating to the viewfinder display function. In this case, set the desired items on the VF DISP 1 and VF DISP 2 pages of the USER menu.

For details, see "Selecting the display items" on page 130.

Testing the iris and zoom functions

1 Set the zoom to automatic zoom mode and check that the power zoom operates correctly.

2 Set the zoom to manual zoom mode and check the zoom functions manually.

3 Set the iris switch on the lens to AUTO and point the camera at objects of different brightness. Check that the automatic iris adjustment operates correctly.

4 Set the iris switch on the lens to MANUAL and check that turning the iris ring manually adjusts the iris correctly.

5 Set the iris switch on the lens back to AUTO and check the following points when the GAIN selector is moved from L to M to H.

- Even when the brightness of the object does not change, the iris is automatically adjusted in accordance with the change in the gain setting.
- The gain indicator on the viewfinder screen changes to correspond to the change in setting.

6 If an extender mechanism is incorporated in your lens, put the extender lever of the lens into the 2× position and check the following points.
- The indication "EX" appears at the top left on the viewfinder screen.
- The auto iris functions correctly.

Testing the VTR

Perform tests (1) to (7) consecutively.

(1) Testing the recording and playback functions

1 Set the VTR SAVE/STBY switch to SAVE and check that the SAVE indicator in the viewfinder goes on.

2 Set the VTR SAVE/STBY switch to STBY and check that the SAVE indicator in the viewfinder goes off.

3 Set the switches located below the color LCD as follows.
BRIGHT switch: H, M or L
DISP SEL button: STATUS
DISPLAY switch: CTL

4 Set the PRESET/REGEN/CLOCK switch to PRESET, and set the F-RUN/SET/R-RUN switch to R-RUN.

5 Press the REC START button and check the following points.
- The tape reels are turning.
- The indication in the counter display on each of the LCD monitor and monochrome LCD is changing.
- The REC indicator in the viewfinder is on.
- The RF1, RF2, and SERVO indicators on the color LCD are off.

6 Press the REC START button again.
Check that recording stops and that the REC indicator in the viewfinder goes off.

7 Repeat the checks of steps 5 and 6, this time using the VTR button on the lens.
Press the RESET button and check that the indication in the counter display on each of the LCD monitor and monochrome LCD is "00:00:00:00".

8 Press the REW button to rewind the tape for a while, then press the PLAY button.
Check that rewind and playback are normally performed.

9 Press the STOP button, then press the F FWD button.
Check that playback stops and fast forward is normally performed.

(2) Testing the automatic audio level adjusting functions

1 Set the AUDIO IN CH-1/CH-2 switches to FRONT.

2 Set the AUDIO SELECT CH-1/CH-2 switches to AUTO.

3 Set the AUDIO IN CH-3/CH-4 switches to F (FRONT).

4 On the AUDIO 3 page of the MAINTENANCE menu, set both AUDIO SELECT CH3 and AUDIO SELECT CH4 to AUTO.

5 Aim the microphone connected to the MIC IN connector at a suitable sound source. Check that the level indications for channels 1 to 4 correspond to the sound level, respectively.

(3) Testing the manual audio level adjusting functions

1 Set the AUDIO IN CH-1/CH-2 switches to FRONT.

2 Set the AUDIO SELECT CH-1/CH-2 switches to MANUAL.

3 **Turn the MIC LEVEL control. Check that the channel-1 and -2 audio level meters on the LCD monitor show more and more segments as you turn the control counterclockwise as seen from the front of the camcorder.**

4 **Set the AUDIO IN CH-3/CH-4 switches to F (FRONT).**

5 **On the AUDIO 3 page of the MAINTENANCE menu, set both AUDIO SELECT CH3 and AUDIO SELECT CH4 to MANU.**

6 **On the AUDIO 3 page of the MAINTENANCE menu, increase the values of LVL CONTROL CH3 and LVL CONTROL CH4. Check that the audio level meters for channels 3 and 4 show the higher levels.**

(4) Testing the earphone and speaker

1 **Turn the MONITOR knob and check that the speaker volume changes accordingly.**

2 **Connect an earphone to the front or rear EARPHONE jack.**

3 **Check that the speaker sound is cut off and that you can hear the sound from the microphone in the earphone.**

4 **Turn the MONITOR knob and check that the earphone volume changes accordingly.**

5 **Connect the earphone to the other EARPHONE jack. Check the earphone as in step 3.**

(5) Testing external microphones

1 **Connect external microphones to the AUDIO IN CH1/CH2 connectors.**

2 **Set the +48V/OFF switches as follows.**
- If the connected microphone is of the internal power supply type, set the switch to OFF.
- If the connected microphone is of the external power supply type, set the switch to +48V.

3 **Set the LINE / AES/EBU / MIC selectors to MIC.**

4 **Set the AUDIO IN switches to REAR.**

5 **Aim the microphones at a sound source.**

6 **Check that the audio level meters on the LCD monitor and the audio level indicators in the viewfinder reflect the changing sound level.**

(6) Checking the XLR connection automatic detection function

Before starting to check, remove the front microphone connected to the MIC IN connector if it is connected.

1 **Perform the operations of steps 1 and 2 explained in "(5) Testing external microphones".**

2 **Set the AUDIO IN CH-1/CH-2 switches to FRONT.**

3 **Perform the operations of steps 5 and 6 explained in "(5) Testing external microphones".**
If the audio level meters on the color and monochrome LCDs and the audio level indicators in the viewfinder reflect the changing sound level, the function of the XLR connection automatic detection is working correctly.
If it does not reflect the changing sound level, the function of the XLR connection automatic detection function is off. Set REAR XLR AUTO to ON on the AUDIO 1 page of the MAINTENANCE menu.
If it does not reflect even after making this setting, the XLR connection automatic detection function does not work correctly.

(7) Checking the user bit and timecode functions

1 **Set the user bits as required.**

For the operation, see "Setting the user bits" on page 60.

2 Set the timecode.

For the operation, see "Setting the timecode" on page 60.

3 Set the F-RUN/SET/R-RUN switch to R-RUN.

4 Press the REC START button, and check that recording starts and that the timecode indication in the counter display changes.

5 Press the REC START button again, and check that the tape stops and that the timecode indication stops changing.

6 Set the F-RUN/SET/R-RUN switch to F-RUN, and check that the timecode indication changes regardless of whether the tape is running.

7 Set the DISPLAY switch to DATA, and the DATA DISPLAY switch to U-BIT, then check that the user bit data that was set is displayed.

Maintenance

Cleaning the video heads

To clean the video heads, use a Sony BCT-HD12CL Cleaning Cassette. Follow the instructions given with the cleaning cassette, as incorrect or excessive use could damage the video heads.
To clean the heads, perform the following:

Load the cleaning cassette according to the procedure described in "Loading a cassette" on page 64.
The tape runs automatically in PLAY mode for about 5 seconds to clean the head.
After the tape runs, the cleaning cassette is automatically ejected.

Note

Do not run the cleaning cassette more than 5 times consecutively.

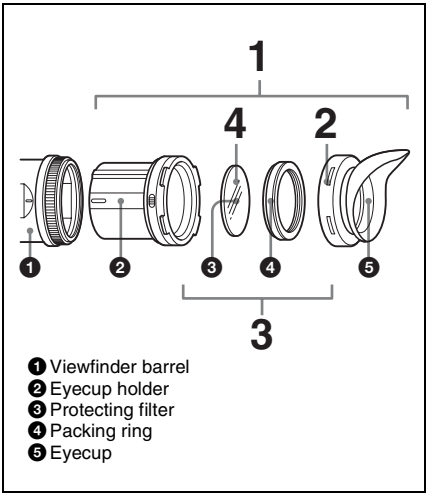
Cleaning the viewfinder

Use a dust blower to clean the CRT screen and mirror inside the viewfinder barrel.
Clean the lens and protecting filter with a commercially available lens cleaner.

Caution

Never use organic solvents such as thinners.

Disassembling the eyepiece for cleaning



1 Detach the eyepiece from the viewfinder barrel.

For the detaching procedure, see "Detaching the eyepiece" on page 34.

2 Remove the eyecup from the eyecup holder.

3 Remove the protecting filter, together with the packing ring, from inside the eyecup holder.

4 Detach the protecting filter from the packing ring.

Fog-proof filter

Depending on the temperature and humidity, the protecting filter may mist because of vapor or your breath. To ensure that the viewfinder is always clear, replace the protecting filter with a fog-proof filter (option, part No. 1-547-341-11).

Fitting the fog-proof filter

Replace the protecting filter on the packing ring with the fog-proof filter.
Be sure to correctly assemble the fog-proof filter, the packing ring, and the eyecup so that the reassembled eyepiece is waterproof.

Note

When cleaning the fog-proof filter, wipe it very gently with a soft cloth to avoid damaging the anti-fogging coating.

Cleaning the tape transport system

In order to utilize the capability and obtain the best performance of the camcorder and to prolong the life of the camcorder and the cassette tape, cleaning the tape transport system regularly is recommended.

For details on how and when to clean the tape transport system, contact your nearest Sony dealer.

Performing maintenance after use under severe condition

After using the camcorder in dusty location, or near beach or hot spring, or when water has got inside the camcorder due to bad weather or similar situations, inspection and cleaning is recommended.

For details on inspection and cleaning, contact your nearest Sony dealer.

Note about the battery terminal

The battery terminal of this unit (the connector for battery packs and AC adaptors) is a consumable part.
Power may not be supplied to the unit properly if the pins of the battery terminal are bent or deformed by shock or vibrations, or if they become corroded due to prolonged outdoor use. Periodic inspections are recommended to keep the unit working properly and to prolong its usable lifetime.
Contact a Sony service or sales representative for more information about inspections.

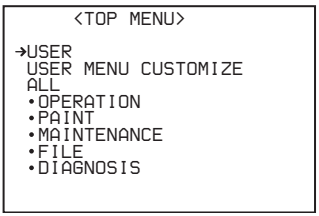
Periodic Inspection

In order to utilize the capability and obtain the best performance of the camcorder and to prolong the life of the camcorder and the cassette tape, periodic inspection is recommended.

Hours meter

To display the hours meter on the viewfinder, proceed as follows.
It is recommended to use the hour meter indication as a guide for periodic inspection.

1 Set the MENU ON/OFF switch to ON while pressing the MENU knob.



2 Turn the MENU knob to select DIAGNOSIS, then press the MENU knob.

3 When the CONTENTS page is displayed, press the MENU knob once, then turn the MENU knob to select HOURS METER, and then press the MENU knob.
When other page is displayed, turn the MENU knob until the HOURS METER page appears.
The following items are indicated.

Indication	Meaning
RESET METER	Resets the resettable meters (-2).
DRUM RUNNING	Displays the total time the drum has rotated.
TAPE RUNNING	Displays the accumulated time the tape has run.
OPERATION	Display the time that the unit has been powered on.
THREADING	Displays the number of times of tape threading.
DRUM RUNNING-2	Displays the total time the drum has rotated. a)
TAPE RUNNING-2	Displays the accumulated time the tape has run. a)
OPERATION-2	Displays the times that the unit has been powered on. a)
THREADING-2	Displays the number of times of tape threading. a)

a) Resettable

4 To turn off the hours meter, set the MENU ON/OFF switch to OFF.

List of parts for the periodic inspection

The table below indicates the approximate time until each part needs replacement or maintenance. Note that the indicated time does not necessarily mean the guaranteed period of service condition.

The time when the part needs replacement or maintenance differs depending on the environment and conditions of use.

No.	Part	Guide for replacement or maintenance	Hours		
			2000	4000	6000
1	Upper drum assembly	A	R	↓	R
2	Slip ring assembly	A	R	↓	R
3	Brush assembly	A	R	↓	R
4	Total drum assembly	A	-	R	-
5	AHC roller assembly	A	R	R	R
6	CR washer	A	R	R	R
7	Timing belt	B	-	R	-
8	S tension regulator band assembly	B	R	R	R
9	T tension regulator band assembly	B	R	R	R
10	Pinch roller assembly	B	R	R	R
11	Reel drive assembly	A	O	O	R
12	S tension regulator arm assembly	A	G	G	R
13	S idler assembly (LOW)	A	R	R	R
14	T idler assembly	A	R	R	R

A: "1. DRUM RUNNING" or "5. DRUM RUNNING-2" of the hours meter (duration of drum rotation (in units of hour)).

B: "2. TAPE RUNNING" or "6. TAPE RUNNING-2" of the hours meter (duration of tape transport (in units of hour)).

R: Replacement is required.

↓: Replaced with the part pointed by the arrow (↓).

O: Coat with oil.

G: Coat with grease.

For details on periodic inspection, contact your nearest Sony dealer.

Operation Warnings

If a problem occurs when the camcorder is powered or is being operated, a warning is issued by various visible and audible indicators. These visible and audible indicators are:

- A warning indication (“A”)
- The WARNING indicator on the side panel of the camcorder (“B”), and a warning sound from the speaker and earphones (“C”)
- An indicator (“D”)

The volume of the warning sound can be adjusted with the ALARM knob. Set the ALARM knob to the minimum position to suppress the sound.

Layout of the table of warning messages

Warning indication	State	WARNING indicator	Warning sound	REC/TALY	BATT
A		B	C	D	D

Problem	VTR operation	Action to take

- The operation of the WARNING indicator and the indicators in the viewfinder is represented by graphic symbols as follows.
  ☼ : Continuous
  ☀ : 1 flash/s
  ☀))☼ : 4 flashes/s
- The warning sounds are represented by graphic symbols as follows.
  •))))))))))))))))))))))))))) : Continuous beep
  •)))))))))))))): 1 beep/s
  •))) •))) •))) •))) : 4 beeps/s

Warning messages

Warning indication	State	WARNING indicator	Warning sound	REC/TALLY	BATT
RF 1	Lit a)	☼●)))	●))) ●))) ●))) ●))) a)	☼●)))	—

Problem	VTR operation	Action to take
Video head gap clogged or problem in recording circuit	Detect head clogging and output warning. Recording continues but may be substandard.	Clean the head. (If recording is still substandard, power the unit off, and consult your Sony service representative.)

Warning indication	State	WARNING indicator	Warning sound	REC/TALLY	BATT
RF2	Lit a)	☼●)))	●))) ●))) ●))) ●))) a)	☼●)))	—

Problem	VTR operation	Action to take
Error in recording drum power supply	Detect error in recording drum power supply and output warning. Recording continues but may be substandard.	Power the unit off and consult your Sony service representative.

Warning indication	State	WARNING indicator	Warning sound	REC/TALLY	BATT
SERVO	Lit	☼●)))	●))) ●))) ●))) ●)))	☼●)))	—

Problem	VTR operation	Action to take
Servo lock lost	Recording continuous but may be substandard.	Turn off the power and contact your Sony service representative. (This indication may be given momentarily when the tape starts moving, but this does not indicate a problem.)

Warning indication	State	WARNING indicator	Warning sound	REC/TALLY	BATT
HUMID	Lit	☼	●))) ●))) ●))) ●))) a) ●)))))))))))))))))))))))))) b)	☼●)))	—

Problem	VTR operation	Action to take
Condensation	Recording continues but stops if the tape sticks to the head drum. Playback, fast forward, and rewind do not operate.	Stop the tape, and wait until the HUMID indicator disappears.

Warning indication	State	WARNING indicator	Warning sound	REC/TALLY	BATT
SLACK	Lit				—
Problem		**VTR operation**		**Action to take**	
Failure in the tape transport mechanism.		An error code appears in the operation/alarm message display area of the status area of the LCD monitor, and at the timecode display position on the monochrome LCD. Look up the error code in the Maintenance Manual. Operation stops.		Remove the cassette by the method described in the Maintenance Manual. Close the cassette compartment lid without loading a cassette, turn off the power, and consult your Sony service representative.	
Warning indication	**State**	**WARNING indicator**	**Warning sound**	**REC/TALLY**	**BATT**
TAPE	Flashing a)	 a)			—
Problem		**VTR operation**		**Action to take**	
Near the end of tape.		Operation continues.		Be prepared to change the cassette.	
Warning indication	**State**	**WARNING indicator**	**Warning sound**	**REC/TALLY**	**BATT**
TAPE and E	Flashing				—
Problem		**VTR operation**		**Action to take**	
End of tape		Recording, playback, and fast forward stop.		Change the cassette. Or, rewind the tape.	
Warning indication	**State**	**WARNING indicator**	**Warning sound**	**REC/TALLY**	**BATT**
BATT	Flashing e)		 c)		
Problem		**VTR operation**		**Action to take**	
Battery almost exhausted.		Operation continues. d)		Change the battery.	
Warning indication	**State**	**WARNING indicator**	**Warning sound**	**REC/TALLY**	**BATT**
BATT and E	Flashing f)				
Problem		**VTR operation**		**Action to take**	
Battery exhausted.		Operation stops.		Change the battery.	

a) During recording
b) During playback, fast forward, rewinding or stop
c) During recording or in stop mode
d) The VTR once stops recording in interval recording mode.
e) 1 flash/s
f) 4 flash/s

For details about the warning displays and alarm messages on the viewfinder, see the next item.

Operation/alarm messages

An operation or alarm message is displayed in the operation/alarm message display area *(see page 29)* of the viewfinder screen.

AUTO INTERVAL **MS**	Indicates the camera is in the Auto Interval Rec mode. **M**S indicates the shooting interval.
MANU INTERVAL *FRAME	Indicates the camera is in the single shot mode of the Manual Interval Rec mode. *FRAME indicates the number of frames.
INTERVAL **S(M/H) *FRAME	Indicates the camera is in the consecutive mode of the Manual Interval Rec mode. **S(M/H) indicates the trigger interval and *FRAME indicates the number of frames.
LOW LIGHT	Appears, if set to ON on the menu, to indicate the subject illumination is inadequate.
TAPE REC INH.	Appears when recording on a write-protected cassette.
Retake Search Failed	Appears when the camcorder fails to position the tape at recording starting point when recording using the retake function. a)
Humid Disturbed INT REC	Appears when there are portions where recording has failed due to condensation while shooting pictures at intervals (using the interval rec function).
INVALID OPERATION !	Appears when: there is only one recorded cut when recording using the RE-TAKE function. the recorded cuts are less than 3 sec. when recording using the RE-TAKE function. the RE-TAKE function was denied for some reason, e.g. as Picture Cache was on. when you execute the RE-TAKE operation before the recording pause operation has completed.
ON-BOARD BATTERY EMPTY	Appears when the backup battery for the internal clock has been used up. b)
Power OFF & Manual Eject	Indicates a failure in the tape transport mechanism (the tape is slack). Turn off the power, and then unload the cassette manually. c)
VTR ERROR! POWER OFF ➔ ON	Indicates that trouble has been detected in the MCU that controls the VTR section. b)
HIGH TEMPERATURE	Indicates that the temperature inside the unit has reached an abnormal level. Power the unit off and wait for a while before using it again.

a) In this case, position the tape at the point where you want to start the recording manually.

b) Contact your nearest Sony dealer.

c) For details on how to unload the cassette manually, see "Unloading a cassette manually (manual eject)" on page 65.

Appendix

Important Notes on Operation

Use and storage

Do not subject the unit to severe shocks
The internal mechanism may be damaged or the body warped.

Do not cover the unit while operating
Putting a cloth, for example, over the unit can cause excessive internal heat build-up.

After use
Always turn off the POWER switch.

Before storing the camcorder for a long period
Remove the battery pack.

Shipping
- Remove the cassette before transporting the unit.
- If sending the unit by truck, ship, air or other transportation service, pack it in the shipping carton of the unit.

In the event of operating problems
If you should experience problems with the unit, contact a Sony representative.

Use and storage locations

Store in a level, ventilated place. Avoid using or storing the unit in the following places.
- In excessive heat or cold (operating temperature range: 0°C to 40°C (32°F to 104°F))
- Remember that in summer in warm climates the temperature inside a car with the windows closed can easily exceed 50°C (122°F).
- In damp or dusty locations
- Locations where the unit may be exposed to rain
- Locations subject to violent vibration
- Near strong magnetic fields
- Close to radio or TV transmitters producing strong electromagnetic fields.
- In direct sunlight or close to heaters for extended periods

To prevent electromagnetic interference from portable communications devices
The use of portable telephones and other communications devices near this unit can result in malfunctions and interference with audio and video signals.
It is recommended that the portable communications devices near this unit be powered off.

Note on laser beams
Laser beams may damage the CCDs.
If you shoot a scene that includes a laser beam, be careful not to let the laser beam be directed into the lens of the camera.

Condensation

If you move the camcorder from a very cold place to a warm place, or use it in a damp location, condensation may form on the head drum. Then, if the camcorder is operated in this state, the tape may adhere to the drum and cause a failure or even permanent damage. Do the following to prevent this from happening.
- When moving the camcorder from a cold place to a warm place, be sure no cassette is loaded in the camcorder.
- Whenever you turn on the power, check that the HUMID indicator does not appear on the color LCD. If it appears, wait until it disappears before loading a cassette.

For details, see "Loading and unloading a cassette" on page 64 and "Operation Warnings" on page 161.

Fitting the zoom lens

It is important to fit the lens correctly, as otherwise damage may result. Be sure to refer to the section "Mounting the Lens" on page 37.

Viewfinder

- Do not leave the unit with the eyepiece pointing directly at the sun.
  The eyepiece lens can concentrate the sun's rays and melt the interior of the viewfinder.

- Do not use the viewfinder close to strong magnetic fields. This can cause picture distortion.

About the LCD panels

The LCD panel fitted to this unit is manufactured with high precision technology, giving a functioning pixel ratio of at least 99.99%. Thus a very small proportion of pixels maybe “stuck”, either always off (black), always on (red, green, or blue), or flashing. In addition, over a long period of use, because of the physical characteristics of the liquid crystal display, such “stuck” pixels may appear spontaneously. These problems are not a malfunction. Note that any such problems have no effect on recorded data.

Phenomena specific to CCD image sensors

The following phenomena that may appear in images are specific to CCD (Charge Coupled Device) image sensors. They do not indicate malfunctions.

White flecks

Although the CCD image sensors are produced with high-precision technologies, fine white flecks may be generated on the screen in rare cases, caused by cosmic rays, etc.
This is related to the principle of CCD image sensors and is not a malfunction.

The white flecks especially tend to be seen in the following cases:

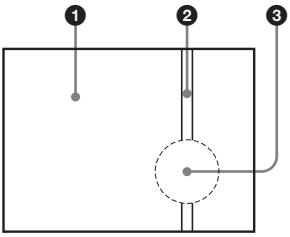
- When operating at a high environmental temperature
- When you have raised the master gain (sensitivity)

The problem may be alleviated by executing the APR (automatic pixel noise reduction) function on the APR page of the MAINTENANCE menu *(see page 113)*. Correction can be attained to some extent by automatic black balance adjustment *(see page 49)*, but the detection capabilities of that function are limited. For the most effective correction, execute the APR function.
If “No More White Pixel” appears after the APR function is executed, then there are no more detectable white flecks.

In SLS mode, white flecks are more prominent when you set the shutter speed (number of frames) to higher values. Executing the APR(SLS) function on the APR page *(see page 113)* may alleviate the problem of white flecks in SLS mode.

Vertical smear

When an extremely bright object, such as a strong spotlight or flashlight, is being shot, vertical tails may be produced on the screen, or the image may be distorted.



❶Monitor screen
❷Vertical tails shown on the image
❸Bright object (e.g. strong spotlight, strong reflected light, flashlight, the sun)

Aliasing

When fine patterns, stripes, or lines are shot, they may appear jagged or flicker.

Specifications

General

Power voltage
12 V DC +5.0/–1.0 V

Power consumption
Approx. 35 W (with 12 V DC supply, when recording, LCD monitor off)

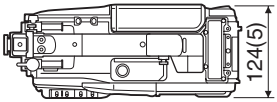
Operating temperature
0°C to +40°C (32°F to 104°F)

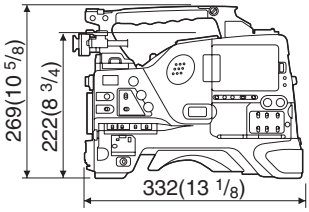
Operating humidity
25% to 85% (relative humidity)

Storage temperature
–20°C to +60°C (–4°F to +140°F)

Mass
Approx. 4.2 kg (9 lb 4 oz)

Dimensions in mm (inches)





Video camera section

Imager
$^2/_3$-inch type, 1920 (H) × 1080 (V)

Imager Configuration
RGB 3 CCDs

Spectral system
F1.4 prism system (with quartz filter)

Built-in filters
CC filter (optical)
A : Cross filter
B : 3200K
C : 4300K
D : 6300K
ND filter (optical)
1: Clear
2: $^1/_4$ ND
3: $^1/_{16}$ ND
4: $^1/_{64}$ ND

Lens mount
$^2/_3$-inch 48 bayonet mount

Sensitivity
F11 (system frequency: 59.94i)
F12 (system frequency: 50i)
(89.9% reflection chart, 2000 lx)

Minimum illumination
0.08 lx (F1.4, +42 dB, with 32-frame accumulation))

Video S/N ratio
54 dB (Noise suppressor off. 64 dB max. when noise suppressor is on.)

Modulation (at screen center)
45% or more

Registration
0.02% or less for entire screen area (excluding distortion due to lens)

Geometric distortion
None identified (excluding distortion due to lens)

Smear
–135 dB

LCD panel
3.5 inches
Pixel resolution: 250,880 pixels

VTR Section

General

Usable cassette tapes
BCT-6HD/12HD/22HD/32HD/40HD $^{1}/_{2}$-inch Digital HDCAM cassette tapes

Tape speed
96.7 mm/s (for 59.94i format)
80.7 mm/s (for 50i/25PsF format)
77.4 mm/s (for 23.98PsF format)

Record/playback time
For 59.94i format: 40 minutes (using BCT-40HD)
For 50i/25PsF format: 48 minutes (using BCT-40HD)
For 23.98PsF format: 50 minutes (using BCT-40HD)

Fast forward time
Approx. 5 minutes (using BCT-40HD video cassette)

Rewind time
Approx. 5 minutes (using BCT-40HD video cassette)

Continuous recording time [1)]
Approx. 120 minutes (using BP-GL95 Battery Pack)
Approx. 70 minutes (using BP-GL65 Battery Pack)

1) When using an optional HDVF-20A HD Electronic Viewfinder and operating at the normal temperature of 25°C (77°F)

Digital video

Sampling frequency
Y: 74.176 MHz (59.94i), 74.25 MHz (50i)
Pb/Pr: 37.088 MHz (59.94i), 37.125 MHz (50i)

Quantization
8 bits/sample

Compression
Coefficient recording system

Channel coding
S-NRZI PR-IV

Error correction
Reed-Solomon code

Error concealment
Adaptive three dimensional

Audio (with standard playback machine)

Frequency response
20 Hz to 20 kHz, +0.5 dB/–1.0 dB

Dynamic range
85 dB min. (Emphasis ON)

Distortion (THD)
0.08% max.

Cross talk
–70 dB max.

Wow and flutter
Below measurable limit

Input/output connectors

Signal inputs

AUDIO IN CH1/CH2: XLR type, 3-pin, female
–60 dBu/+4 dBu (0 dBu = 0.775 Vrms)

MIC IN: XLR type, 5-pin, female
–50 dBu (LPF ON)

GEN LOCK IN: BNC type
1.0 Vp-p, 75 Ω, unbalanced

TC IN: BNC type
0.5 V to 18 Vp-p, 10 kΩ

Signal outputs

TEST OUT: BNC type
VBS/Y (component): 1.0 Vp-p, 75 Ω, unbalanced

HDSDI OUT: BNC type
HD-SDI: 0.8 Vp-p, unbalanced

HD/SD SDI OUT: BNC type
HDSDI/SDSDI: 0.8 Vp-p, unbalanced

AUDIO OUT: XLR type, 5-pin, male
0 dBm

TC OUT: BNC type

1.0 Vp-p, 75 Ω

EARPHONE (minijack)
8 Ω, –∞ to –18 dBs variable

Others

DC IN: XLR type, 4-pin, male
11 to 17 V DC

DC OUT: 4-pin
11 to 17 V DC, maximum rated current 0.5 A

LENS: 12-pin
11 to 17 V DC, maximum rated current 0.7 A

REMOTE: 8-pin

LIGHT: 2-pin

Supplied accessories

Shoulder strap (1)
Operation manuals
English version (1)
Japanese version (1) (HDW-650 only)
CD-ROM manual (1)

Recommended additional equipment

Power supply and related equipment

BP- GL65/GL95/L60S/L80S Battery Pack

BC-M150/L500/L70 Battery Charger

AC-DN10/DN2B AC Adaptor

Viewfinder and related equipment

HDVF-20A/200/C35W Viewfinder

BKW-401 Viewfinder Rotation Bracket

Note

Contact a Sony service representative for information about the viewfinders able to use the BKW-401.

Equipment for remote control

RM-B150/B750 Remote Control Unit

HDCAM cassette tapes

BCT-6HD/12HD/22HD/32HD/40HD HDCAM cassette tapes

"Memory Stick"

"Memory Stick"

"Memory Stick PRO" (4 GB or less)

"Memory Stick Duo"

"Memory Stick PRO Duo"

Audio equipment

ECM-680S Stereo/Monaural Microphone

ECM-678/674 Monaural Microphone

CAC-12 Microphone Holder

DWR-S01D Digital Wireless Receiver

WRR-855S UHF Synthesized Tuner Unit

WRR-860A/861/862 UHF Synthesized Diversity Tuner

WRT-850/860 UHF Synthesized Transmitter

DWT-B01 Digital Wireless Transmitter

DMX-P01 Portable Digital Mixer

WRR Tuner Fitting (service part number: A-8278-057-A)

Equipment for maintenance and easier handling

BCT-HD12CL Cleaning Cassette

LC-777 Hard Carrying Case

LC-DS300SFT Soft Carrying Case

VCT-14 Tripod Adaptor

Rain cover (Part No. 3-191-064-02)

Maintenance Manual

Design and specifications are subject to change without notice.

Notes

- Always make a test recording, and verify that it was recorded successfully.
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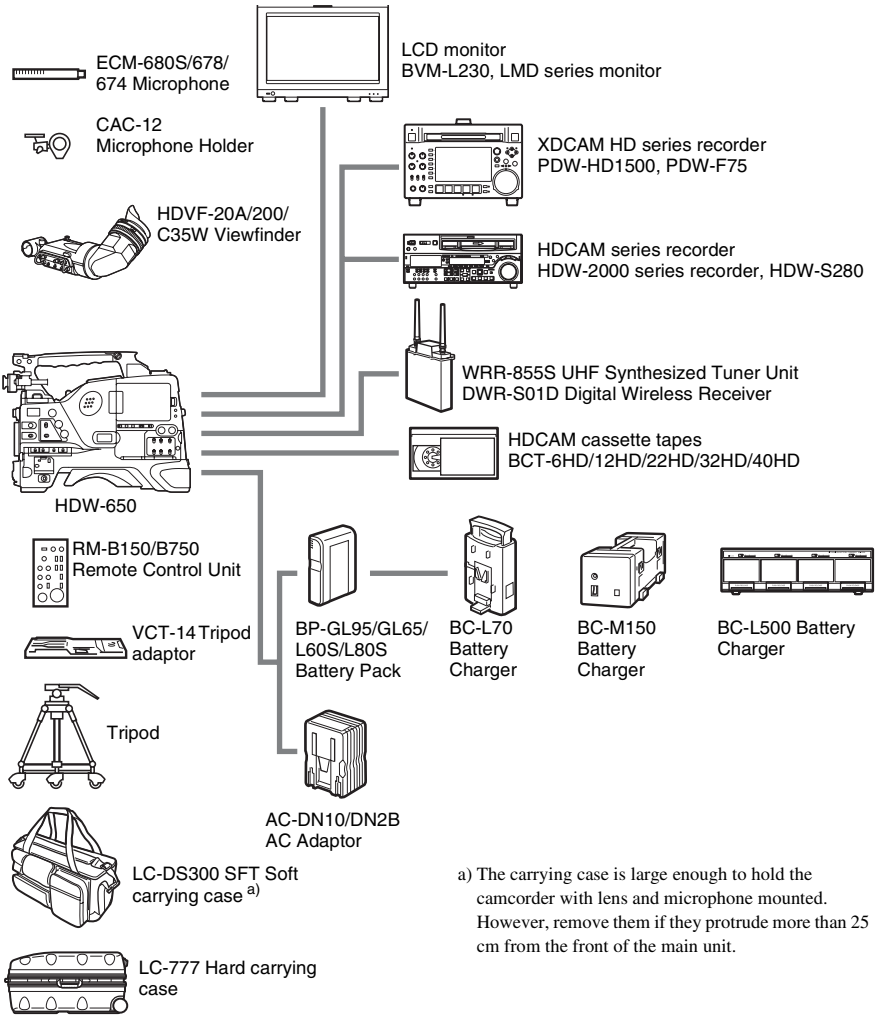
- Always verify that the unit is operating properly before use. SONY WILL NOT BE LIABLE FOR DAMAGES OF ANY KIND INCLUDING, BUT NOT LIMITED TO, COMPENSATION OR REIMBURSEMENT ON ACCOUNT OF THE LOSS OF PRESENT OR PROSPECTIVE PROFITS DUE TO FAILURE OF THIS UNIT, EITHER DURING THE WARRANTY PERIOD OR AFTER EXPIRATION OF THE WARRANTY, OR FOR ANY OTHER REASON WHATSOEVER.

Chart of Optional Components and Accessories



a) The carrying case is large enough to hold the camcorder with lens and microphone mounted. However, remove them if they protrude more than 25 cm from the front of the main unit.

About a “Memory Stick”

What is “Memory Stick”?

“Memory Stick” is a new compact, portable and versatile IC (Integrated Circuit) recording medium with a data capacity that exceeds a floppy disk. “Memory Stick” is specially designed for exchanging and sharing digital data among “Memory Stick” compatible products. Because it is removable, “Memory Stick” can also be used for external data storage.
“Memory Stick” is available in two sizes: standard size and compact “Memory Stick Duo” size.

Types of “Memory Stick”

“Memory Stick” is available in the following five types to meet various requirements in functions.

“Memory Stick-R”
Stored data are not overwritten. You can write data to “Memory Stick-R” with “Memory Stick-R” compatible products only. Copyright protected data that requires MagicGate copyright protection technology cannot be written to “Memory Stick-R”.

“Memory Stick”
Stores any type of data except copyright-protected data that requires the MagicGate copyright protection technology.

“MagicGate Memory Stick”
Equipped with the MagicGate copyright protection technology.

“Memory Stick-ROM”
Stores pre-recorded, read-only data. You cannot record on “Memory Stick-ROM” or erase the pre-recorded data.

“Memory Stick PRO”
Equipped with the MagicGate copyright protection technology, designed for use only with equipment compatible with “Memory Stick PRO”.

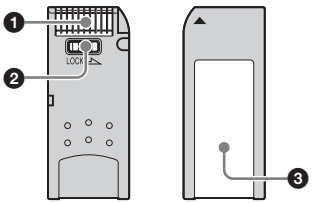
Available types of “Memory Stick”

With this camcorder, you can use a Sony “Memory Stick”, “Memory Stick Duo”, “Memory Stick PRO” whose capacity does not exceed 4 GB, and “Memory Stick PRO Duo”.

Note on data read/write speed
Data read/write speed may vary depending on the combination of the “Memory Stick” and “Memory Stick” compliant product you use.

What is MagicGate?
MagicGate is copyright protection technology that uses encryption technology.

Before using a “Memory Stick”



1 Terminal
2 Write-protect tab
3 Labeling position

- When you set the “Memory Stick” write-protect tab to “LOCK”, data cannot be recorded, edited, or erased. (“Memory Stick Duo” and “Memory Stick PRO Duo” do not have this function.)
- Data may be damaged if:
  - You remove the “Memory Stick” or turn off the unit while it is reading or writing data.
  - You use the “Memory Stick” in a location subject to the effects of static electricity or electric noise.
- We recommend that you make a backup copy of important data that you record on the “Memory Stick”.

Notes

- Do not attach anything other than the supplied label to the “Memory Stick” labeling position.
- Attach the label so that it does not stick out beyond the labeling position.
- Carry and store the “Memory Stick” in its case.
- Do not touch the connector of the “Memory Stick” with anything, including your finger or metallic objects.
- Do not strike, bend, or drop the “Memory Stick”.

- Do not disassemble or modify the “Memory Stick”.
- Do not allow the “Memory Stick” to get wet.
- Do not use or store the “Memory Stick” in a location that is:
  - Extremely hot, such as in a car parked in the sun
  - Under direct sunlight
  - Very humid or subject to corrosive substances

“Memory Stick” access indicator

If the access indicator is turned on or is flashing, data is being read from or written to the “Memory Stick”. At this time, do not shake the computer or product or subject them to shock. Do not turn off the power of the computer and product or remove the “Memory Stick”. This may damage the data.

Precautions

- To prevent data loss, make backups of data frequently. In no event will Sony be liable for any loss of data.
- Unauthorized recording may be contrary to the provisions of copyright law. When you use a “Memory Stick” that has been pre-recorded, be sure that the material has been recorded in accordance with copyright and other applicable laws.
- The “Memory Stick” application software of the camcorder may be modified or changed by Sony without prior notice.
- Note that there are certain restrictions on recording stage performances and other entertainment events, even if they are recorded for personal use only.

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