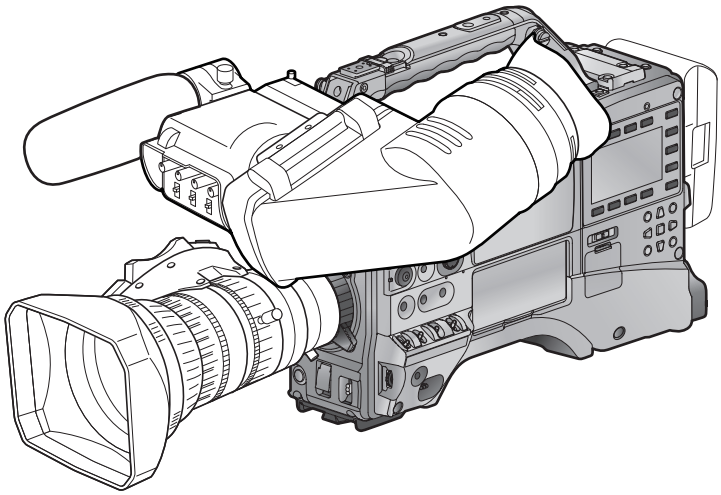
Panasonic

Operating Instructions

Memory Card Camera-Recorder

Model No. AJ-PX800G

P2HD



HDMI SDXC

AVC ULTRA AVC INTRA AVC LongG

DVCPRO HD DVCPRO 50 DVCPRO DV

Before operating this product, please read the instructions carefully and save this manual for future use.

W1014HM4017 -YI

ENGLISH

VQT5L20A-4(E)

Read this first!

indicates safety information.

WARNING:

- To reduce the risk of fire, do not expose this equipment to rain or moisture.
- To reduce the risk of fire, keep this equipment away from all liquids. Use and store only in locations which are not exposed to the risk of dripping or splashing liquids, and do not place any liquid containers on top of the equipment.

WARNING:

Always keep memory cards (optional accessory) out of the reach of babies and small children.

CAUTION:

Do not remove panel covers by unscrewing.
No user serviceable parts inside. Refer servicing to qualified service personnel.

CAUTION:

To reduce the risk of fire and annoying interference, use the recommended accessories only.

CAUTION:

To reduce the risk of fire, refer mounting of the optional interface boards to qualified service personnel.

CAUTION:

Do not jar, swing, or shake the unit by its handle while the conversion lens or another accessory is attached.
Due to the added weight of the conversion lens, any strong jolt to the handle may damage the unit or result in personal injury.

CAUTION:

In order to maintain adequate ventilation, do not install or place this unit in a bookcase, built-in cabinet or any other confined space. To prevent risk of fire hazard due to overheating, ensure that curtains and any other materials do not obstruct the ventilation.

CAUTION:

Do not lift the unit by its handle while the tripod is attached. When the tripod is attached, its weight will also affect the unit's handle, possibly causing the handle to break and hurting the user. To carry the unit while the tripod is attached, take hold of the tripod.

CAUTION:

Excessive sound pressure from earphones and headphones can cause hearing loss.

CAUTION:

Do not leave the unit in direct contact with the skin for long periods of time when in use.
Low temperature burn injuries may be suffered if the high temperature parts of this unit are in direct contact with the skin for long periods of time.
When using the equipment for long periods of time, make use of the tripod.

CAUTION:

A coin type battery is installed inside of the unit.
Do not store the unit in temperatures over 60 °C (140 °F).
Do not leave the unit in an automobile exposed to direct sunlight for a long period of time with doors and windows closed.

indicates safety information.

FCC NOTICE (USA)

Declaration of Conformity

Model Number: AJ-PX800G
Trade Name: Panasonic
Responsible Party: Panasonic Corporation of North America
Two Riverfront Plaza, Newark, NJ 07102
Support contact: 1-800-524-1448

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

CAUTION:

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.

The user may find the booklet “Something About Interference” available from FCC local regional offices helpful.

Warning:

To assure continued FCC emission limit compliance, follow the attached installation instructions and the user must use only shielded interface cables when connecting to host computer or peripheral devices. Also, any unauthorized changes or modifications to this equipment could void the user’s authority to operate this device.

NOTIFICATION (Canada)

CAN ICES-3(B)/NMB-3(B)

A rechargeable battery that is recyclable powers the product you have purchased.

EMC NOTICE FOR THE PURCHASER/USER OF THE APPARATUS

1. Applicable standards and operating environment

The apparatus is compliant with:

- standards EN55103-1 and EN55103-2, and
- electromagnetic environments E1, E2, E3 and E4.

2. Pre-requisite conditions to achieving compliance with the above standards

<1> Peripheral equipment to be connected to the apparatus and special connecting cables

- The purchaser/user is urged to use only equipment which has been recommended by us as peripheral equipment to be connected to the apparatus.
- The purchaser/user is urged to use only the connecting cables described below.

<2> For the connecting cables, use shielded cables which suit the intended purpose of the apparatus.

- Video signal connecting cables
  Use double-shielded coaxial cables, which are designed for 75-ohm type high-frequency applications, for SDI (Serial Digital Interface).
  Coaxial cables, which are designed for 75-ohm type high-frequency applications, are recommended for analog video signals.
- Audio signal connecting cables
  If your apparatus supports AES/EBU serial digital audio signals, use cables designed for AES/EBU.
  Use shielded cables, which provide quality performance for high-frequency transmission applications, for analog audio signals.
- Other connecting cables
  Use shielded cables, which provide quality performance for high-frequency applications, such as connecting cables for IEEE1394 or USB.
- When connecting to the HDMI signal terminal, use multilayer shielded cables, which provide quality performance for high-frequency applications.
- When connecting to the DVI signal terminal, use a cable with a ferrite core.
- If your apparatus is supplied with ferrite core(s), they must be attached on cable(s) following instructions in this manual.

3. Performance level

The performance level of the apparatus is equivalent to or better than the performance level required by these standards.

However, the apparatus may be adversely affected by interference if it is being used in an EMC environment, such as an area where strong electromagnetic fields are generated (by the presence of signal transmission towers, cellular phones, etc.). In order to minimize the adverse effects of the interference on the apparatus in cases like this, it is recommended that the following steps be taken with the apparatus being affected and with its operating environment:

1. Place the apparatus at a distance from the source of the interference.
2. Change the direction of the apparatus.
3. Change the connection method used for the apparatus.
4. Connect the apparatus to another power outlet where the power is not shared by any other appliances.

AEEE Yönetmeliğine Uygundur.
AEEE Complies with Directive of Turkey.

Декларація про Відповідність
Вимогам Технічного Регламенту Обмеження Використання деяких Небезпечних Речовин в
електричному та електронному обладнанні
(затвердженого Постановою №1057 Кабінету Міністрів України)

Виріб відповідає вимогам Технічного Регламенту Обмеження Використання деяких Небезпечних Речовин в електричному та електронному обладнанні (ТР ОВНР).

Вміст небезпечних речовин у випадках, не обумовлених в Додатку №2 ТР ОВНР, :
1. свинець(Pb) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон;
2. кадмій (Cd) – не перевищує 0,01 % ваги речовини або в концентрації до 100 частин на мільйон;
3. ртуть(Hg) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон;
4. шестивалентний хром (Cr^{6+}) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон;
5. полібромбіфеноли (PBB) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон;
6. полібромдефенілові ефіри (PBDE) – не перевищує 0,1 % ваги речовини або в концентрації до 1000 частин на мільйон.

For USA-California Only

This product contains a CR Coin Cell Lithium Battery which contains Perchlorate Material – special handling may apply.
See www.dtsc.ca.gov/hazardouswaste/perchlorate

Manufactured by: Panasonic Corporation, Osaka, Japan
Importer's name and address of pursuant to EU rules:
Panasonic Marketing Europe GmbH
Panasonic Testing Centre
Winsbergring 15, 22525 Hamburg, Germany

EU

TO REMOVE BATTERY

Main Power Battery (Ni-Cd / Ni-MH / Li-ion Battery)

- To detach the battery, please proceed in the reverse order of the installation method described in this manual.
- If a battery made by any other manufacturer is to be used, check the Operating Instructions accompanying the battery.

Back-up Battery (Lithium Battery)

- For the removal of the battery for disposal at the end of its service life, please consult your dealer.

Battery recycling symbol (valid only in Taiwan)
臺灣限定的廢電池回收標識。

廢電池請回收

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- Java and all Java-based trademarks are trademarks or registered trademarks of Sun Microsystems, Inc. in the United States.
- UniSlot is a registered trademark of Ikegami Tsushinki Co., LTD.
- All other names, company names, product names, etc., contained in this instruction manual are trademarks or registered trademarks of their respective owners.
- This product is licensed under the AVC Patent Portfolio License. All other acts are not licensed except private use for personal and non-profit purposes such as what are described below.
  - To record video in compliance with the AVC standard (AVC Video)
  - To play back AVC Video that was recorded by a consumer engaged in a personal and non-commercial activity
  - To play back AVC Video that was obtained from a video provider licensed to provide the video
    Visit the MPEG LA, LLC website (http://www.mpegla.com/) for details.
- Use of DCF Technologies under license from Multi-Format, Inc.

How to read this document

■ Illustrations

- Illustrations of the camera, menu screens, and other items, may vary from the actual items.

■ Conventions used in this manual

- Words and phrases in [ ] brackets indicate content displayed in the viewfinder or SmartUI.
- Words and phrases in < > brackets indicate design text used on this camera, such as button names.

■ Reference pages

- Reference pages in this document are indicated by (page 00).

■ Terminology

- SD memory card, SDHC memory card, and SDXC memory card are referred to as “SD memory card”.
- A memory card with the “P2” logo such as AJ-P2E064FG memory card (optional) is referred to as a “P2 memory card”.
- A memory card with the “microP2” logo such as “AJ-P2M032AG” memory card (optional) is referred to as a “microP2 memory card”. To use, insert it into the microP2 card adaptor AJ-P2AD1G (optional).
- P2 memory card and microP2 memory card are referred to only as “P2 card” unless distinguished otherwise.
- Media such as external hard disk drives (HDD) connected to USB are referred to as “storage devices”.
- Video that is created during a single recording operation is referred to as a “clip”.

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Chapter 1 Overview

Before using the camera, read this chapter.

Before using the camera

■ Before using the camera, always check if the built-in battery is not consumed, and then set the date/time.

The internal clock of the camera is reset when the built-in battery has been consumed. This may result in the metadata of the clip not recorded correctly, and it may not display correctly in the thumbnail screen.

Check if the built-in battery is not consumed before using. (page 41)

Also, set the correct date/time. (page 42)

■ Caution regarding laser beams

The MOS sensor may be damaged if the MOS sensor is subjected to light from a laser beam.

Take sufficient care to prevent laser beams from striking the lens when shooting in an environment where laser devices are used.

■ Note the following points.

- If you prepare to record important images, always shoot some advance test footage to verify that both pictures and sound are being recorded normally.
- Should video or audio recording fail due to a malfunction of the camera or the P2 cards used, we will not assume liability for such failure.
- Set up or check the calendar and time zone before recording. (page 42) These settings have an effect on the management and playback order of recorded contents.

■ Cautions when throwing memory cards away or transferring them to others

Formatting memory cards or deleting data using the functions of the camera or a computer will merely change the file management information: it will not completely erase the data on the cards. When throwing these cards away or transferring them to others, either physically destroy them or use a data deletion program for computers (commercially available) to completely erase the data. Users are responsible for managing the data stored in their memory cards.

■ Software information about this product

1 This product includes software licensed under GNU General Public License (GPL) and GNU Lesser General Public License (LGPL), and customers are hereby notified that they have rights to obtain, re-engineer, and redistribute the source code of these software.

2 This product includes software licensed under MIT-License.

3 This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org/).

4 This product includes software licensed under OpenBSD License.

5 This product includes PHP, freely available from <http://www.php.net/>.

6 This software is based in part on the work of the Independent JPEG Group.

7 This product includes software licensed under MOZILLA PUBLIC LICENSE.

For details (These details are originally provided in English.) on how to obtain the source code, visit the following website.

http://pro-av.panasonic.net/

We do not accept inquiries about the details of the source code obtained by the customer.

■ Precautions when installing USB drivers

For the latest information on the driver, visit the following website.

http://pro-av.panasonic.net/

- Install the required driver into your computer from the website.
- For installation procedure of the driver, refer to the installation manual on the website.

Setting the region of use (setting the frame frequency, etc.)

When the camera is shipped, the region of use is not set. Before you use the camera for the first time, follow the steps below to change the setting to the frame frequency of the region of use.

1 When the region of use is not set, connect the camera's power and set the <POWER> switch to <ON>.

The [AREA SELECT] screen for setting the region of use is displayed.

2 Use the jog button (or cursor buttons △/▽) to select the region of use from [NTSC]/[NTSC (J)] (Japan)/[PAL] and press the jog dial button (or <SET> button).

3 Select [YES] in the confirmation message, and press the jog dial button (or <SET> button).

The camera will be initialized according to the region of use selected and automatically restart.
After setting up the region of use once, this screen will not be displayed when subsequently turning the power on. To change the region of use, perform [OPTION MENU] → [AREA SETTING].

NOTE

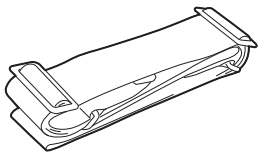
- When making this setting to use the camera for the first time, only the following items are changed on the camera. Menu setting values other than the following items stay at their factory settings.

	Factory settings	[NTSC]	[NTSC (J)]	[PAL]
[LINE&FREQ]	[1080-59.94i]	[1080-59.94i]	[1080-59.94i]	[1080-50i]
[REC FORMAT]	[AVC-I100/60i]	[AVC-I100/60i]	[AVC-I100/60i]	[AVC-I100/50i]
[CAMERA MODE]	[60i]	[60i]	[60i]	[50i]
[SETUP]	[7.5%A]	[7.5%A]	[0%]	[0%]
[HEADROOM]	[20dB]	[20dB]	[20dB]	[18dB]
[REC META DATA] → [LANGUAGE]*1	[ENGLISH]	[ENGLISH]	[JAPANESE]	[ENGLISH]
M/D/Y indication*2	M/D/Y	M/D/Y	Y/M/D	D/M/Y
[TIME ZONE]	+0:00	+0:00	+9:00	+0:00

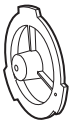
*1 For details, refer to "Setting metadata display language" (page 116).
*2 Does not included in the menu item. Each character indicates the following: M: Month, D: Day, Y: Year

Accessories

Shoulder strap (page 38)



Mount cap (already attached to the product) (page 16)



NOTE

- After unpacking the product, dispose of the packing material properly.

Use of the camera on a system

Parts other than the camera are optionally available. Use the following recommended parts.

Basic configuration devices

Equipment necessary for shooting with the camera, such as batteries, etc.

Part name	Part No.	Remark
Electronic HD color viewfinder	AG-CVF10G/AG-CVF15G/AJ-HVF21KG	—
Super-directional electret stereo microphone (phantom +48V)	AJ-MC700P/AG-MC200G	“Using front microphone” (page 36)
Lens (Bayonet type)	FUJINON/CANON	“Mounting and adjusting the lens” (page 30)
Battery	HYTRON140*1 DIONIC HC*1 V-mount type battery plate • ENDURA E-10	“Mounting and setting battery” (page 27)
SD memory card*2 P2 memory card*2 microP2 memory card*2	Visit the support desk at the website*2	“P2 card” (page 46)

*1 A battery holder is provided as standard on the body.

*2 For the latest information on P2 cards and SD memory cards that are not described in the Operating Instructions, visit the support desk at the following website:
http://pro-av.panasonic.net/

Expanded configuration devices

You can also use the following devices in addition to the basic configuration devices.

Part name	Part No.	Remark
Remote control cable	AJ-C10050G	—
Remote control unit	AJ-RC10G	“Connecting to the remote control unit (AJ-RC10G)” (page 178)
Extension control unit	AG-EC4G	“Connecting to the extension control unit (AG-EC4G)” (page 180)
Remote operation panel	AK-HRP200G	“Connecting to the remote operation panel (AK-HRP200G)” (page 181)
Wireless module	AJ-WM30/AJ-WM50	“For wireless module AJ-WM30/AJ-WM50” (page 186)
HD/SD SDI input board	AG-YA600G	“HD/SD SDI input board (AG-YA600G)” (page 212)
LCD monitor	BT-LH80W/BT-LH900, etc.	—
Storage device	—	—
UniSlot wireless microphone receiver	—	—
External DC power supply	—	“Using external DC power supply” (page 28)

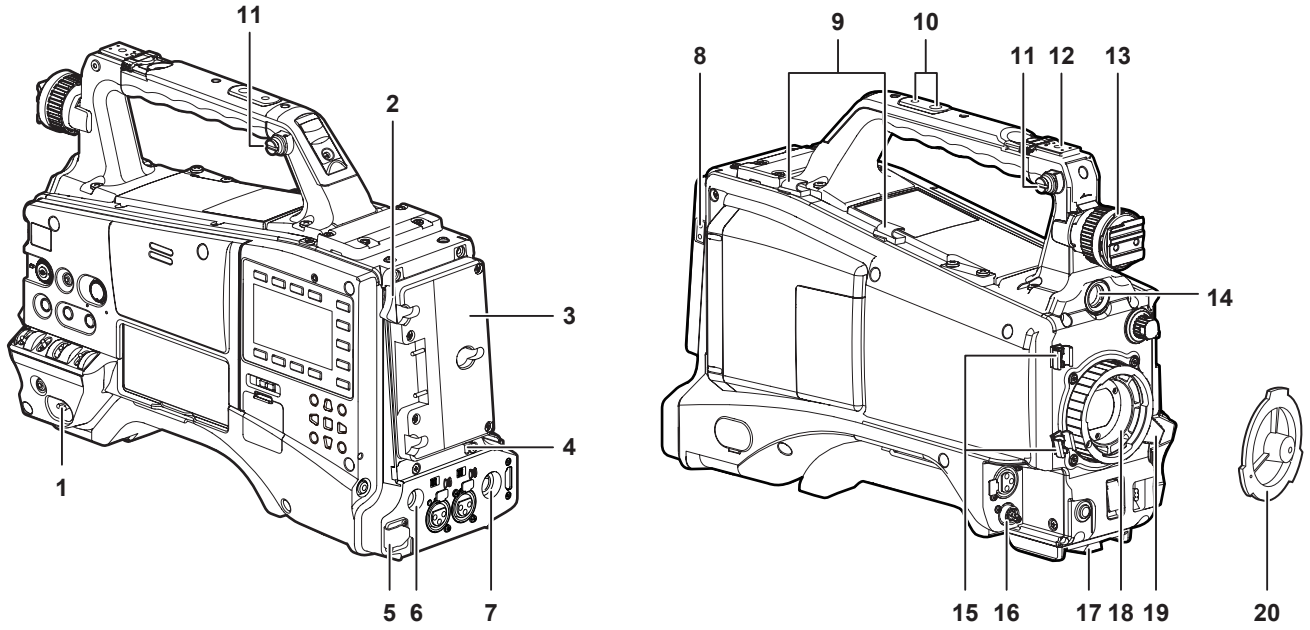
Accessories

Part name	Part No.	Remark
Soft carrying case	AJ-SC900	—
Microphone holder	AJ-MH800G	“Using front microphone” (page 36)
Rain cover	SHAN-RC700	“Attaching the rain cover” (page 39)
Tripod adaptor	SHAN-TM700	“Attaching a tripod” (page 38)

Chapter 2 Description of parts

This chapter describes the names, functions, and operations of parts on the camera. Details displayed on the [HOME] screen of the SmartUI are also described.

Power supply and accessory mounting section



1 <POWER> switch (page 52)
Switch on/off the power.

2 Battery release lever (page 27)
Pull this battery release lever down to release the battery.

3 Battery holder (page 27)
Mount the Anton/Bauer battery.

4 Light control switch (page 27)

5 <DC IN> terminal (page 28)
This is the external DC power supply input terminal. Connect to the external DC power supply.

6 <DC OUT> terminal (page 40)
This is the DC 12 V output terminal. It provides a maximum current of 1.5 A.

NOTE

- When connecting external equipment to this terminal, first fully check the polarities of the connection. Failure to do so may result in a malfunction.

7 <REMOTE> terminal (pages 178, 180)
Connect the remote control unit AJ-RC10G (optional) to remote-control some functions. For details, refer to “Connecting to the remote control unit (AJ-RC10G)” (page 178).
Connect the extension control unit AG-EC4G (optional) to remote-control some functions. For details, refer to “Connecting to the extension control unit (AG-EC4G)” (page 180).

8 Light output terminal
Connect the Ultralight 2 of Anton/Bauer (optional) or an equivalent video light of 50 W or under.
The battery charge level drops sharply when the light is illuminated. When using the light, using a battery of 90 Wh or more is recommended.

9 Cable holders
Used for clamping the light and microphone cables in place.

10 Accessory mounting holes
Attach accessories. Use only for the purpose of attaching accessories.
- Mounting hole size
  - 1/4-20 UNC (screw length 10 mm or shorter)
  - 3/8-16 UNC (screw length 10 mm or shorter)

11 Shoulder strap attachment fitting (page 38)
Attach the shoulder strap.

12 Light shoe
Attach the video light.
Mounting hole size
- 1/4-20 UNC (screw length 6 mm or shorter)

13 Viewfinder left-right positioning ring
To adjust the left/right position of the viewfinder, loosen this ring, and slide the viewfinder to the left or right to adjust it to an easy-to-view position. Tighten the ring to clamp the viewfinder in place after adjusting the viewfinder.

14 <VF> terminal
Attach the viewfinder AG-CVF15G (optional), etc.

15 Lens cable/microphone cable clamp (page 30)
Used for securing the lens and microphone cables.

16 <LENS> terminal (page 30)
Connect the lens connection cable. For a detailed description of the lens used, refer to the Operating Instructions for the lens.

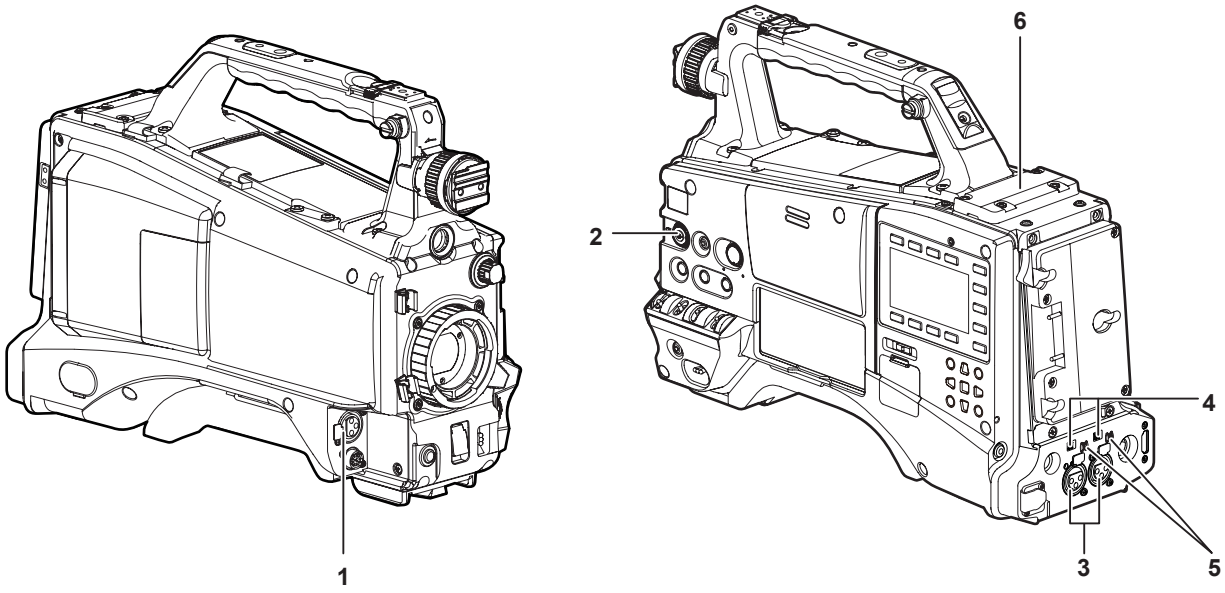
17 Tripod mount (page 38)
Attach the tripod adaptor SHAN-TM700 (optional) when mounting the camera on the tripod.

18 Lens mount (2/3 type bayonet) (page 30)
Mount the lens.

19 Lens lever (page 30)
After mounting the lens to the lens mount, tighten the lever to secure the lens.

20 Mount cap (page 30)
Raise the lens lever to remove the cap. Replace the cap when the lens is not mounted.

Audio (input) function section



1 <MIC IN> terminal (page 36)
Connect the microphone (optional).
- The phantom microphone can also be used. To use this, set [ON] in the main menu → [AUDIO SETUP] → [INPUT SETTING] → [FRONT MIC POWER]. When it is set to [ON] and a microphone is not connected, low frequency noise may occur. This is not a problem when a microphone is connected.

2 <F.AUDIO LEVEL> dial (page 66)
Adjust the recording level of audio channels 1 to 4.
- Setting the audio level adjustment method to [MANU] on the [AUD02:INPUT] screen of SmartUI allows you to adjust the audio level of the voice channel using this dial.
- You can use the main menu → [AUDIO SETUP] → [RECORDING CH SETTING] → [FRONT VR CH1], [FRONT VR CH2], [FRONT VR CH3], and [FRONT VR CH4] to set the controls so that this operation can be done from any input terminal.

3 <AUDIO IN CH1/3>, <AUDIO IN CH2/4> terminal (page 37)
Connect the audio equipment or the microphone.

4 <LINE>/<MIC> switch (pages 37, 44)
Switch audio input signals connected to the <AUDIO IN CH1/3>/<AUDIO IN CH2/4> terminal.
<LINE>: Select when audio equipment is connected by the line input.
<MIC>: Select when the external microphone is connected.

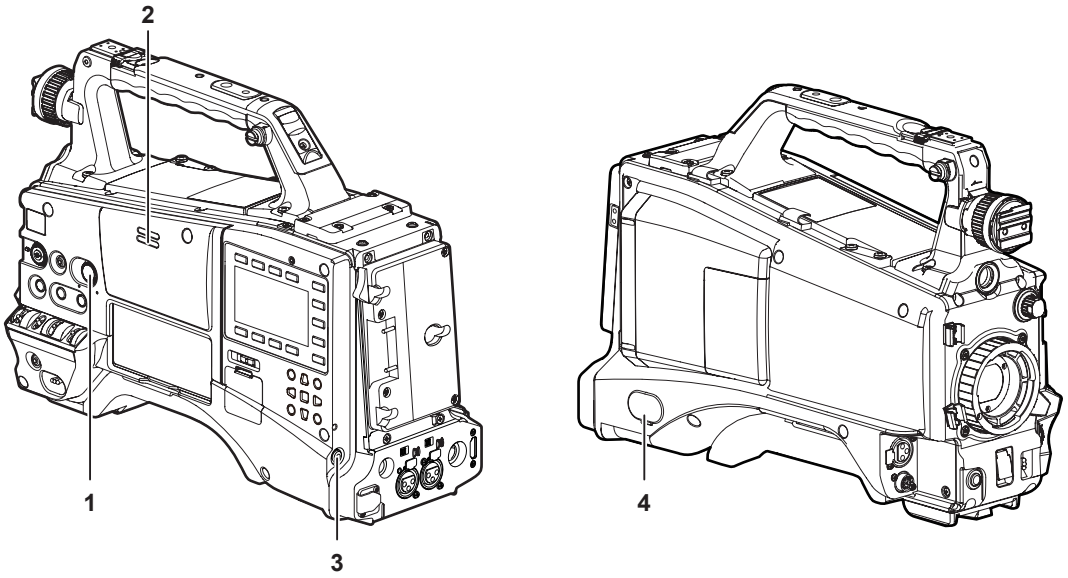
5 Microphone input power switch (page 44)
Switch to supply power to the microphones connected to <AUDIO IN CH1/3> and <AUDIO IN CH2/4> terminals.
<+48V>: Supplies +48 V power to the microphone.
<OFF>: Does not supply power to the microphone.

NOTE

- When microphone input <+48V> is set and microphones are not connected to the <AUDIO IN CH1/3> and <AUDIO IN CH2/4> terminals, low-frequency noise may occur. This is not a problem when a microphone is connected.

6 Wireless slot (page 36)
Mount the UniSlot wireless microphone receiver (optional).

Audio (output) function section



1 <MONITOR> dial
Adjust the volume of the speaker and earphones.

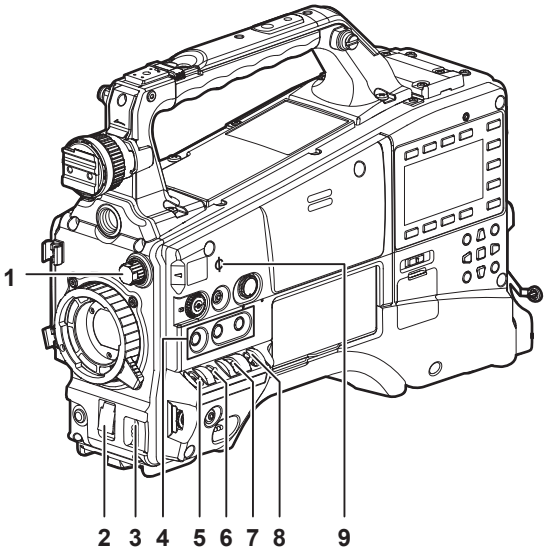
2 Internal speaker
During recording, EE audio can be monitored, and during playback, playback audio can be monitored.
Audio from the speaker automatically disappears when earphones are connected to the <PHONES> terminal.

3 <PHONES> terminal
This is the connecting terminal for audio monitor earphones (stereo mini-jack).

4 <AUDIO OUT> terminal(page 155)
Output audio signals recorded on audio channel 1/2 or 3/4.
- Select the output signal on the [AUD03:MONI] screen of SmartUI.

Shooting and recording/playback functions section

Shooting and recording (camera unit)



1 <ND FILTER> dial (page 53)
Select the filter to suit the brightness of the subject.
<1><CLEAR>: Does not use the ND filter.
<2><1/4ND>: Reduce the amount of light entering the MOS sensor to 1/4.
<3><1/16ND>: Reduce the amount of light entering the MOS sensor to 1/16.
<4><1/64ND>: Reduce the amount of light entering the MOS sensor to 1/64.

2 <SHUTTER> switch (page 61)
This is the electronic shutter switch.
<OFF>: Disables the electronic shutter.
<ON>: Enables the electronic shutter.
<SEL>: Changes the speed of the electronic shutter.
This switch is the spring switch. Each turn towards the <SEL> side alters the shutter speed.

3 <AUTO W/B BAL> switch (page 58)
<AWB>: Adjusts white balance automatically. When this switch is operated with the <WHITE BAL> switch on the side set to the <A> or <B> position, white balance is adjusted in several seconds and the adjusted value is stored in memory. When the <WHITE BAL> switch is at the <PRST> position, the value can be changed to the preset color temperature and user-specified variable value by setting the <AUTO W/B BAL> switch towards the <AWB> side, and setting it once again towards the <AWB> side while the color temperature is displayed.
<ABB>: Adjusts black balance automatically.

4 USER (<USER MAIN>/<USER1>/<USER2> button) (page 64)
Assign user-selected functions to each button. Pressing each button performs the assigned function.

5 <DISP/MODE CHK> switch (page 104)
This is the spring switch to check the status of the shooting, etc.
- Push this towards the <OFF> side to clear all displays except viewfinder operation status and frame displays such as the area display, and the counter, marker, and safety zone displays.
- Push this towards the <CHK> side to display in the viewfinder the setting status for all shooting functions, the list of functions assigned to the USER button, etc. while on stand-by or while shooting. Pushing it to the <CHK> side again while information is displayed switches the display to the next information page. The mode check information display disappears after approximately three seconds.

6 <GAIN> switch (page 58)
Switch the video amplifier gain according to the brightness of the subject to shoot.
- The gain settings for the <L>/<M>/<H> positions can be changed using main menu → [SW MODE] → [LOW GAIN], [MID GAIN], and [HIGH GAIN].
- Factory settings are L=0 dB, M=6 dB, and H=12 dB.

7 <OUTPUT>/<AUTO KNEE> selector switch
Select the video signals output to the memory, viewfinder and video monitor from the camera unit.
<CAM>/<ON>: Video captured with the camera is output and the auto knee function is activated. Instead of the auto knee function, the dynamic range stretcher (DRS) function can be assigned.
<CAM>/<OFF>: Video captured with the camera is output and the auto knee function is not activated. The knee point is fixed to the level set by menu operations.
<BARS>/<OFF>: Color bars signal is output. The auto knee function is not activated.

NOTE

- Auto knee function
  When you adjust the levels to shoot people or scenery, etc. against a strongly lit background, the background will be totally whited out, and buildings and scenery in the background will be blurred. In such a case, the auto knee function reproduces the background clearly.
  The auto knee function is effective when shooting the following scenes:
  - The subject is a person positioned in the shade under a clear sky.
  - When shooting people in a vehicle or building as well as the background visible through a window at the same time.

- The subject is a high-contrast scene.

8 <WHITE BAL> switch (pages 58, 59)

Select the method for adjustment of the white balance.

<PRST>: Set the switch to this position when you have no time or are otherwise unable to adjust the white balance.

- The factory setting is 3200 K.
- The color temperature can be changed successively to 3200 K, 5600 K, and the user-specified variable value by setting the main menu → [SW MODE] → [W.BAL PRESET], or by pushing the <AUTO W/B BAL> switch towards the <AWB> side, and pushing the <AUTO W/B BAL> switch towards the <AWB> side again while the color temperature is displayed. The variable value can be set with the jog dial button. (page 59)

<A>/<B>: Pushing the <AUTO W/B BAL> switch towards the <AWB> side adjusts the white balance automatically and saves the adjusted value to <A> or <B>.

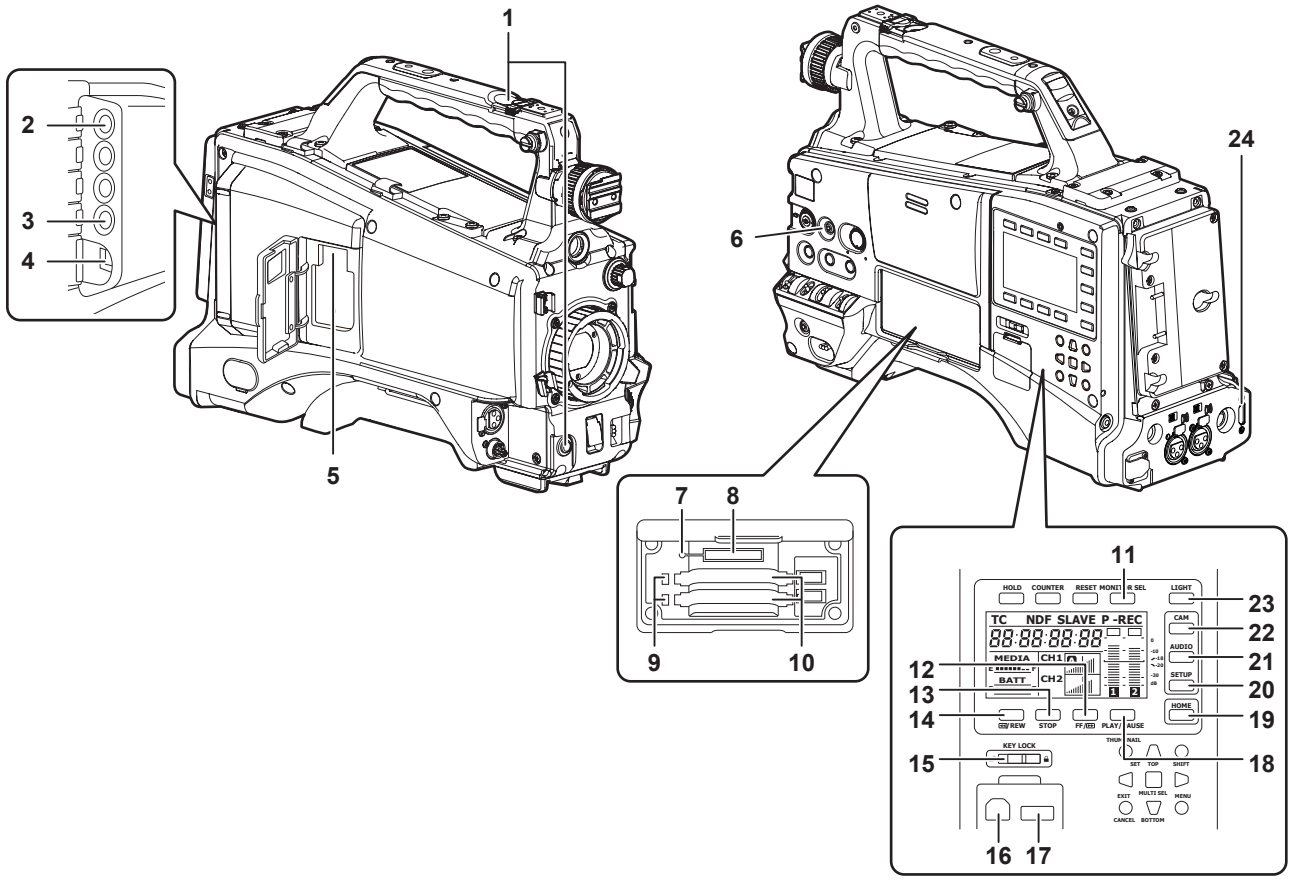
- Selecting [Bch] from the main menu → [SW MODE] → [ATW] allows you to assign auto tracking white balance (ATW) function to <B>. (page 59)

9 Focal plane index <ϕ>

Indicate the focal plane of the MOS sensor.

It provides a reference for measuring the accurate focal distance from the subject.

Shooting and recording/playback functions section (recording unit)



1 <REC> button (page 53)

Press this button to start recording. Press it again to stop recording.

This button has the same function as the VTR button on the lens side.

2 <SDI OUT/IN (OP)> terminal (page 80)

This is the output terminal for SDI signals.

- Attaching the HD/SD SDI input board AG-YA600G (optional) allows you to input the SDI signal. (page 212)

3 <MON OUT> terminal (page 80)

This is the output terminal of the video monitor. Video independent from the <SDI OUT/IN (OP)> terminal can be output. Also, you can select the HD SDI signal, the SD SDI signal that you down-converted, or the VBS signal on the [SET02:MON/HDMI FORMAT] screen of SmartUI. Cross-conversion and up-conversion are not supported.

4 <LAN> terminal (page 188)

Connect the LAN cable.

NOTE

- For the cable to be connected to the <LAN> terminal, use the shielded cable.

5 <USB2.0> terminal (sub-host) (pages 186, 187)

Mount the wireless module AJ-WM30/AJ-WM50 (optional). Or, attach the USB 2.0 extension cable connecting the body and the 4G/LTE USB modem (optional).

6 <FOCUS ASSIST> button (page 56)

Switch on/off the focus assist function.

7 Busy (active status indication) lamp (page 89)

Indicate the active status of the SD memory card, and is illuminated when the card is active.

NOTE

- Do not remove or insert the card while the lamp is lit. Doing so may damage the SD memory card.

8 SD memory card slot (page 88)

This is the insertion slot for the SD memory card (optional). Use the SD memory card for recording/opening the setting menu and scene files for the camera, uploading metadata, or proxy recording, etc.

NOTE

- Cautions when using SD memory cards
  - On the camera, use SD memory cards that conform to the SD standard, SDHC standard, or the SDXC standard. To record the proxy data, use SD, SDHC, or SDXC memory cards with an indication of class2 or higher.
    If the recording format of the proxy data is [SHQ 2CH MOV] or [AVC-G6 2CH MOV], use a card of class4 or higher.
  - MMC (Multi Media Card) cannot be used. (Bear in mind that taking pictures may no longer be possible if you use them.)
  - When using miniSD/microSD cards with the camera, always install the adaptor specially designed for miniSD/microSD cards. (The camera will not work properly if only the miniSD/microSD adaptor is installed. Make sure that the card has been inserted into the adaptor before use.)
  - Use of Panasonic SD memory cards and miniSD/microSD cards is recommended. Be sure to format cards on the camera before use.
  - Refer to our support desk at the following website for the latest information not included in these operating instructions.
    http://pro-av.panasonic.net/
  - SDHC memory cards are a standard that was established in 2006 by the SD Association for large-capacity memory cards that exceed 2 GB.
  - SDXC memory cards are a standard that was established in 2009 by the SD Association for large-capacity memory cards that exceed 32 GB.

9 P2 memory card access LED (page 47)

Indicate the access status of recording and playback of the card inserted in the P2 memory card slot.

10 P2 memory card slot (page 46)

11 <MONITOR SEL> button

Switch the audio channel that is output to the speaker, the <PHONES> terminal, and the <AUDIO OUT> terminal to [CH1/2] or [CH3/4] each time you press the button. The channel display of the audio channel level meter is switched together.
When a screen other than the [HOME] screen of SmartUI is displayed, the function corresponding to each setting screen is performed.

12 <FF/▶▶> button

Press this button during a pause to perform fast playback.
Press this button during playback to perform 4x speed playback.
If it is pressed with playback paused, the clip being played back is paused at the start point of the next clip (cued state).
When a screen other than the [HOME] screen of SmartUI is displayed, the function corresponding to each setting screen is performed.

13 <STOP> button

Press this button to stop playback.
Press this button when you stop interval recording or one-shot recording, or when you end combining to the clip of one-clip recording.
When a screen other than the [HOME] screen of SmartUI is displayed, the function corresponding to each setting screen is performed.

14 <◀◀/REW> button

Press this button during a pause to perform fast-reverse playback.
Press this button during playback to perform 4x speed reverse playback.
If it is pressed with playback paused, the clip being played back is paused at its start point (cued state).
When a screen other than the [HOME] screen of SmartUI is displayed, the function corresponding to each setting screen is performed.

15 <KEY LOCK> switch (page 152)

Disable button operations related to SmartUI and thumbnail operations. However, <LIGHT> button operation is available.

16 <USB2.0> terminal (device) (page 170)

17 <USB2.0> terminal (host) (page 170)

Connect the USB 2.0 cable.
Setting to [ON] using main menu → [NETWORK SETUP] → [USB MODE] allows you to transfer data using USB 2.0.
In this state, recording/playback and clip operations on the camera are limited.

18 <PLAY/PAUSE> button

Press this button to view playback image.
Press it during playback to pause playback.
When a screen other than the [HOME] screen of SmartUI is displayed, the function corresponding to each setting screen is performed.

19 <HOME> button (page 152)

Display the [HOME] screen on SmartUI.

20 <SETUP> button (page 157)

Display the [SETUP] screen on SmartUI.

21 <AUDIO> button (page 155)

Display the [AUDIO] screen on SmartUI.

22 <CAM> button (page 155)

Display the [CAMERA] screen on SmartUI.

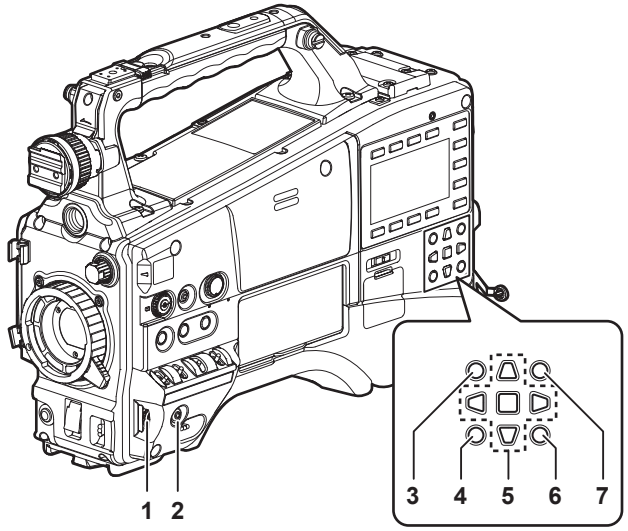
23 <LIGHT> button

Control lighting of SmartUI. Each press turns the light of the SmartUI on and off.

24 <HDMI> terminal (page 80)

This is the output terminal of the video for monitor.

Menu operation section and thumbnail operation section



1 Jog dial button (page 125)

- When the setting menu is displayed, navigate through the setting menu pages to select and set items. Turning the jog dial button toward the bottom moves the cursor toward the bottom. Turning it toward the top moves the cursor toward the top. Press the jog dial button to fix the settings.
- When the setting menu is not displayed, the following operation allows you to adjust the synchro scan speed. Press the <SHUTTER> switch from the <ON> position towards the <SEL> side several times to display the shutter speed in highlight and adjust using the jog dial button in synchro scan mode. (page 62)

2 <MENU> button (page 125)

Press this button to display [USER MENU]. Press this button for 3 seconds or more to display the main menu. Press it again to return to the original image.

During recording, button operation is disabled.

This button functions in the same way as the <THUMBNAIL MENU> button.

3 <THUMBNAIL> button (page 107)

Press the button to display the thumbnail screen on the viewfinder and the monitor screen connected to the camera. Button operations are disabled during recording and playback.

4 <EXIT>/<CANCEL> buttons (pages 109, 125)

Restore the display to the previous state while the setting menu or property screen is displayed.

Press this button while holding down the <SHIFT> button to act as the cancel button. This is convenient, for example, for batch-canceling clip selections.

5 Cursor/<SET> button (pages 109, 125)

Operate the setting menu and thumbnails.

The four triangular buttons are cursor buttons and the square button in the center is the <SET> button.

6 <THUMBNAIL MENU> button

Press this button to display [USER MENU]. Press this button for three seconds or more to display the main menu. Press it again to return to the original image.

During recording, button operation is disabled.

This button functions in the same way as the <MENU> button.

NOTE

- Use the cursor/<SET> button and the <EXIT>/<CANCEL> buttons to select thumbnails or operate menus. (page 109)

7 <SHIFT> button (pages 109, 125)

Use this button while using other buttons at the same time. Operations with the <SHIFT> button held down are displayed in orange at the bottom of each button.

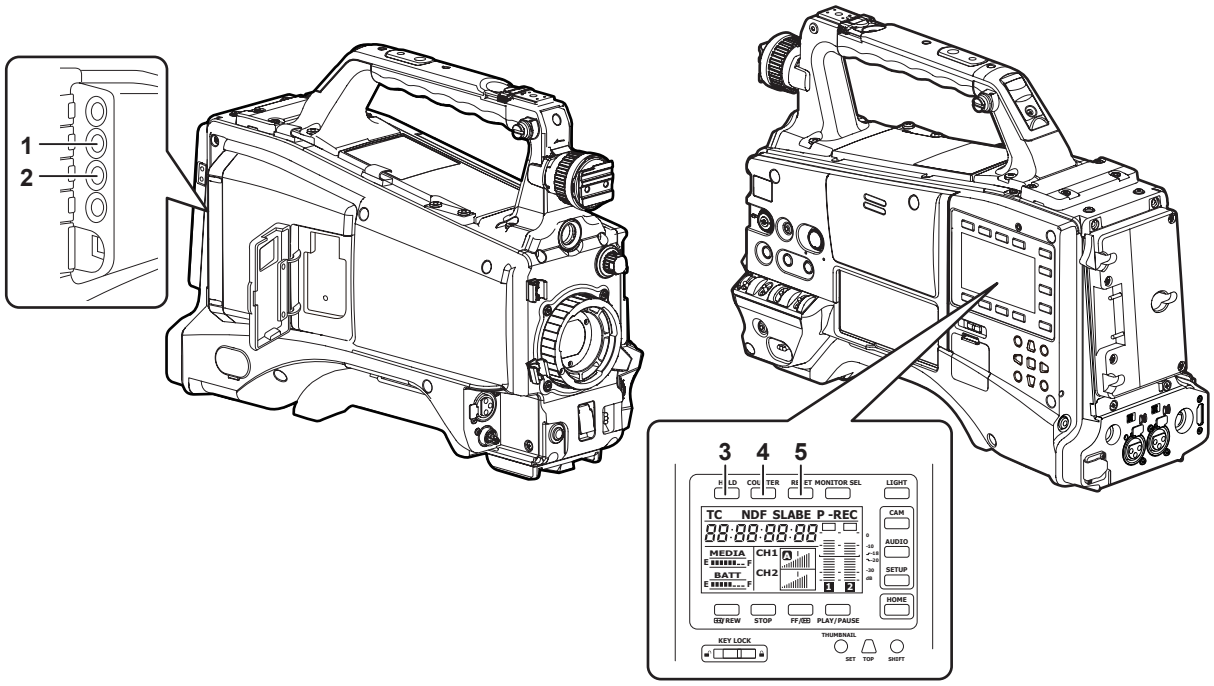
- Press the cursor button (△/▽) while holding down the <SHIFT> button.

  This moves the cursor to the thumbnail of the clip at the start or the end on the thumbnail screen.
- Press the <SET> button while holding down the <SHIFT> button

  This selects all clips from the previously selected clip up to the clip at the cursor position.
- Press the <EXIT>/<CANCEL> buttons while holding down the <SHIFT> button.

  This works as the cancelation function.

Time code section



1 <GENLOCK IN> terminal (page 100)

Input reference signal terminal when the genlock is on the camera unit or when externally locking the time code.

NOTE

- Supply Y signal of HD or composite signals as the input signal. However, the sub-carrier of the composite signal on the camera cannot be externally locked.

2 <TC IN/OUT> terminal (page 94)

This is the input/output terminal for time code.

- Switch input/output using the main menu → [IN/OUT SEL] → [TC IN/OUT SEL].
- Input the reference time code to this terminal when the time code is locked.
- Connect to the time code input terminal of the external device when locking the time code of the external device to the time code on the camera. (page 101)

3 <HOLD> button

The time data indication on the counter display area is retained for the duration that this button is held down. However, the time code generator continues to advance. Press again to release retained state.

This function is used to learn the time code or counter value of a particular recorded scene.

When a screen other than the [HOME] screen of SmartUI is displayed, the function corresponding to each setting screen is performed.

4 <COUNTER> button (page 98)

Each press of the button displays the counter value, time code, user bits, and VITC user bits information on the viewfinder.

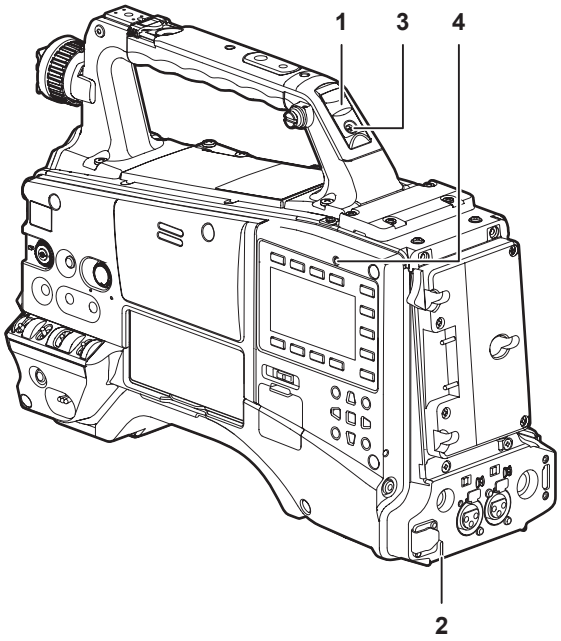
When a screen other than the [HOME] screen of SmartUI is displayed, the function corresponding to each setting screen is performed.

5 <RESET> button

Reset the counter value of the time code display.

When a screen other than the [HOME] screen of SmartUI is displayed, the function corresponding to each setting screen is performed.

Warning and status display section



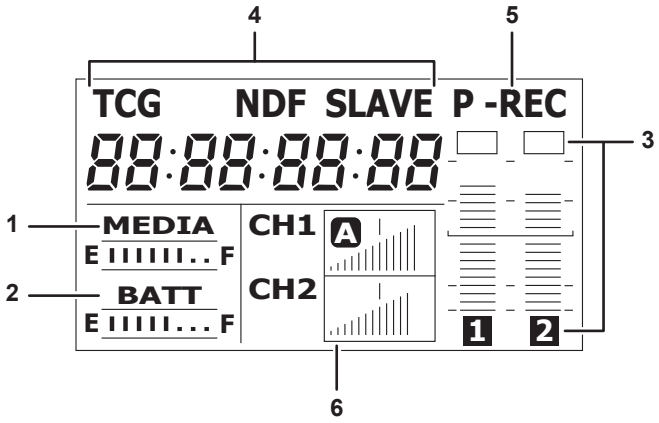
1 Back tally lamp
When the back tally switch is set to <ON>, the lamp acts in the same way as the front tally lamp at the viewfinder.

2 Rear tally lamp
When the back tally switch is set to <ON>, the lamp acts in the same way as the back tally lamp.

3 Back tally switch
Controls the operation of the battery tally lamp and rear tally lamp.
<ON>: Enables the back tally lamp and the rear tally lamp.
<OFF>: Disables the back tally lamp and the rear tally lamp.

4 <WARNING> lamp (page 206)
Starts flashing or is illuminated if something unusual occurs in the memory.

SmartUI display ([HOME] screen)



1 Media remaining space indicator bar

Displays the remaining free space in the P2 card using a 7-segment display.

Each segment is equivalent to three minutes, and the decreasing P2 card remaining time is indicated by the segments going out one segment at a time.

2 Battery charge level indicator bar

When a battery with a digital indication (% indication) is used, all seven segments up to the F position light if the battery charge level is 70% or higher.

When the battery charge level falls below 70%, the segments go out one by one for each 10% drop.

3 Audio channel level meter

One segment indicates 2 dB increment, with the smallest indication being –34 dB and the [OVER] indication displayed by ■ at the topmost position.

Each time you press the <MONITOR SEL> button, it switches between [CH1]/[CH2], stereo, [CH3]/[CH4], and the channel display of the level meter is switched along with it. (page 155)

Channels output to the monitor audio are displayed in white dropout.

When the stereo is selected, both channels are displayed in white dropout.

4 Time code indications

Each time you press the <COUNTER> button, the display changes in the order of [COUNTER]/[CLIP] → [TCG[R]] → [UBG[R]] → [VUBG[R]] → [COUNTER]/[CLIP] (not displayed in viewfinder)* → [COUNTER]/[CLIP].

* The time code on the viewfinder is not displayed.

[COUNTER]/[CLIP]: Displays the counter in hours:minutes:seconds. When [TOTAL] is selected from the main menu → [DISPLAY SETUP] → [REC COUNTER], [COUNTER] is displayed. When [CLIP] is selected, [CLIP] is displayed.

[TCG[R]]: Displays the time code value in hours:minutes:seconds:frame.

[UBG[R]]: Displays the user bits value.

[VUBG[R]]: Displays the user bits value of VITC.

[NDF]: Indicates when the time code is in the non-drop frame mode.

[DF]: Indicates when the time code is in the drop frame mode.

[HOLD]: Indicates when the time code generator/reader value is held.

[F-RUN]: Indicates when the time code is set to advance continuously regardless of the recording operation.

[R-RUN]: Indicates when the time code is set to advance only during recording.

[SLAVE]: Indicates when the time code is externally locked.

5 Recording mode display

[REC]: Standard recording

[P-REC]: Pre-recording

[I-REC]: Interval recording

[L-REC]: Loop recording

[S-REC]: Simultaneous recording

6 Status information

Audio level display: Indicates whether audio [CH1]/[CH3] or [CH2]/[CH4] audio volume and audio level are in auto adjustment mode. In the auto adjustment mode, [A] is displayed.

Audio input: Indicates audio [CH1], [CH2], [CH3], and [CH4] input settings.

When USB connected: Indicates when the main menu → [NETWORK SETUP] → [USB MODE] is set to [ON] and the device selected using [USB MODE SELECT] is connected.

- In the USB host mode: [USB STORAGE CONNECTED]/[USB STORAGE DISCONNECTED]
- In the USB device mode: [USB DEVICE CONNECTED]/[USB DEVICE DISCONNECTED]

Error, card warning display: Indicates the error code when something has caused an error in the camera.

Chapter 3 Preparation

Before you use the camera, mount the battery and lens following the procedures in this chapter. The mounting of accessories is also described in this chapter.

Power supply

A battery or external DC power supply can be used as the camera's power supply.

Using batteries

Connection of the following batteries to the camera has been verified.

■ **Anton/Bauer batteries**

HYTRON140
DIONIC HC

■ **IDX batteries**

ENDURA10

■ **PAG batteries**

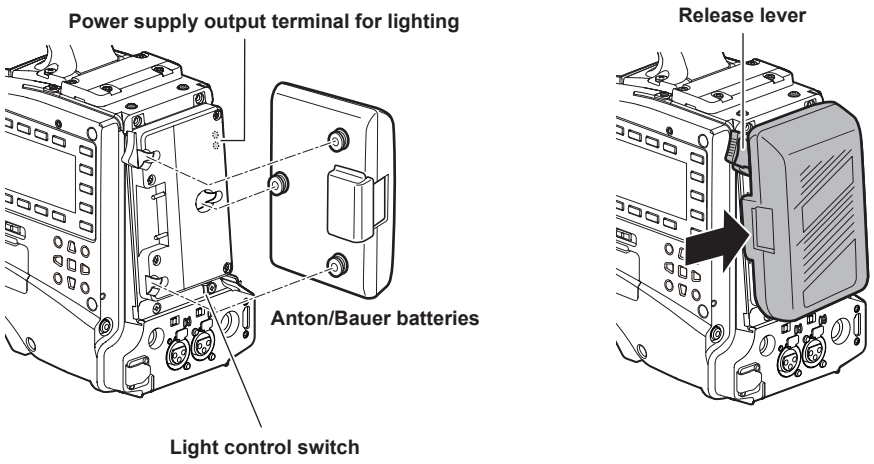
PAG L96e

NOTE

- Other batteries can be used by changing [BATTERY SELECT] using the main menu → [BATTERY SETUP]. Use of batteries that are already verified as connectable to the camera is recommended.
- Before you use a battery, charge it with a battery charger. (For details on charging, refer to each operation instructions.)

Mounting and setting battery

Using Anton/Bauer batteries



1 Mount the Anton/Bauer battery.

2 Insert the battery terminal and slide in the direction of the arrow.

3 Set the battery type.

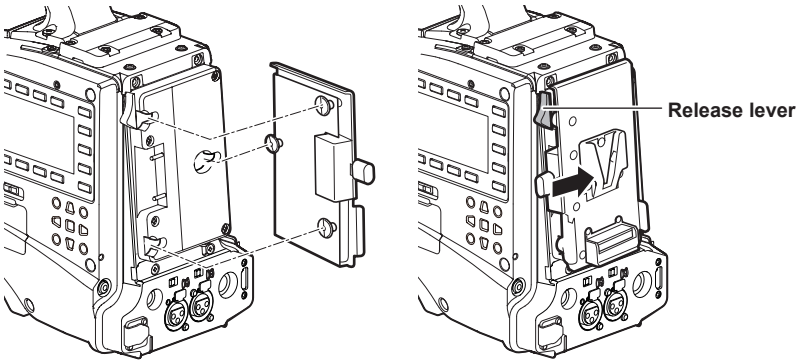
Select the type of battery from the main menu → [BATTERY SETUP] → [BATTERY SELECT].
For details, refer to "Setting menu basic operations" (page 125).

NOTE

- The Anton/Bauer battery holder includes both a power supply output terminal for lighting and a light control switch, which are convenient when installing light. Contact Anton/Bauer, Inc. for details on lighting systems.
- To remove the battery, keep the release lever of the battery holder completely down, slide the battery in the opposite direction of when you mounted it.

Using V-mount type batteries

Mount the V-mount type battery plate. As shown in the figure, insert and slide in the direction of the arrow.



1 Mount the V-mount type battery plate.

2 Slide in the direction of the arrow.

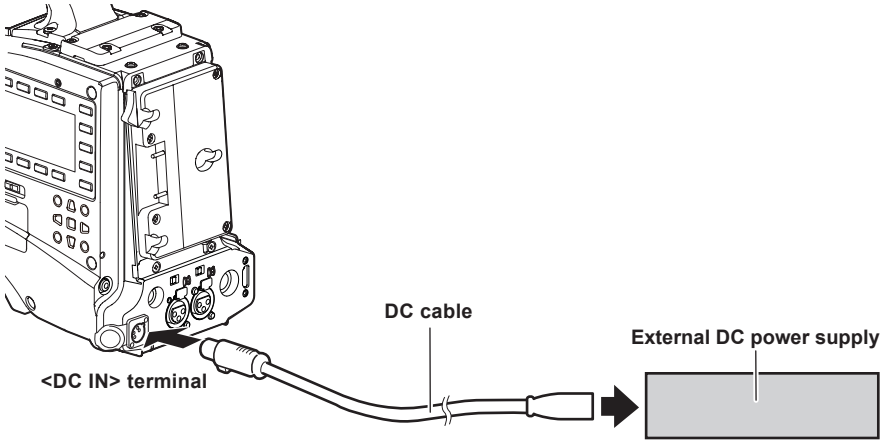
3 Set the battery type.

- Select the type of battery from the main menu → [BATTERY SETUP] → [BATTERY SELECT].

NOTE

- Contact your dealer for information about the V-mount type battery plate.
- When the V-mount type battery plate is used, % (percent) is not displayed even if batteries with a battery level indicator function are used.
- When removing the plate, remove by sliding the release lever.
- When using a battery that is not in the [BATTERY SELECT] item, set [TYPE A], [TYPE B], or [TYPE C], and set each item according to the characteristics of the battery.
  For details, refer to [BATTERY SETUP] (page 146).

Using external DC power supply



1 Connect the <DC IN> terminal of the camera to the external DC power supply.

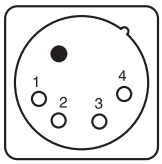
2 Turn on the <POWER> switch of the external DC power supply (if the external DC power supply has a <POWER> switch).

3 Turn the camera's <POWER> switch to <ON>.

■ External DC power supply

Connect after making sure that the output voltage of the external DC power supply is compatible with the rated voltage of the camera.
Select an output amperage for the external DC power supply with a margin above the total amperage of the connected devices.
The total amperage of connected devices can be calculated with the following formula.
Total power consumption ÷ voltage
When the power of the camera is turned on, inrush current is generated. Insufficient power supply when turning on the power may cause a malfunction. We recommend that you use an external DC power supply that can assure double the capacity of the total power consumption of the camera and connected devices that are turned on by interlock when the power of the camera is turned on (such as lenses, wireless microphone receivers). For the DC cable, use a dual-core shielded cord of AWG18 (nominal cross section area 0.824 mm^2) or thicker.

- Make sure of the pin alignment of the DC output terminal of the external DC power supply and the camera <DC IN> terminal, and connect the polarity correctly.
  If the +12 V power supply is mistakenly connected to the GND terminal, it may cause fire or malfunction.

DC IN		
	1	GND
	2	NC
	3	NC
	4	+12 V
	Panasonic Parts No.: K1AA104H0038 Manufacturer Parts No.: HA16RX-4P (SW1) (76) (Hirose Electric Co.)	

NOTE

- When both the battery and the external DC power supply are connected, the power supply from the external DC power supply has priority. The battery may be removed while using the external DC power supply.
- When using an external DC power supply, be sure to turn the camera's <POWER> switch to <ON> after turning on the <POWER> switch of the external DC power supply. If the operations are performed in reverse, the camera may malfunction because the external DC power supply output voltage rises too slowly.
- When power is supplied from the <DC IN> terminal, the light circuit does not function. The light circuit can be used only when power is supplied from the Anton/Bauer battery plate.
- When connecting the battery to the <DC IN> terminal, set the type of battery using the main menu → [BATTERY SETUP] → [EXT DC IN SELECT]. In this case, the remaining battery level is not displayed with % even when the battery has the battery level indicator function.

Mounting and adjusting the lens

Mounting the lens

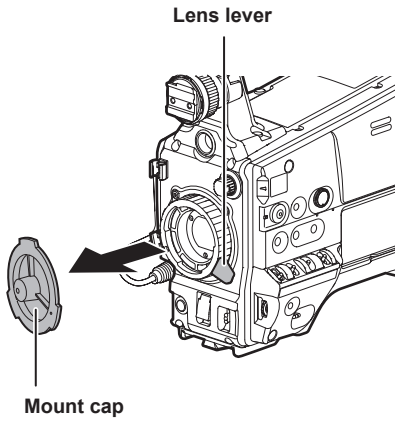


Fig. 1

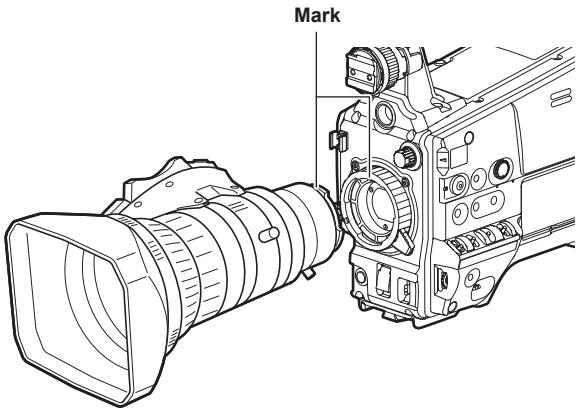


Fig. 2

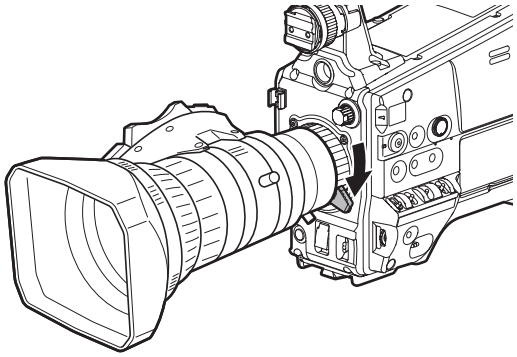


Fig. 3

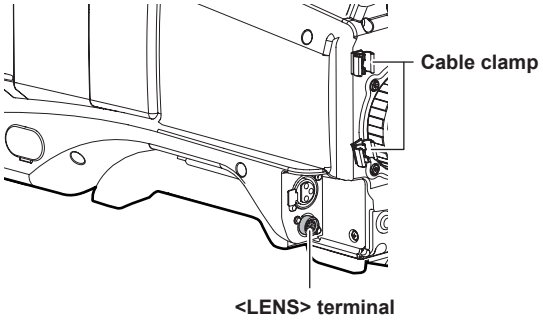


Fig. 4

1 Raise the lens lever and remove the mount cap. (Fig. 1)

2 Align the indentation at the top center of the lens mount with the center mark of the lens to mount the lens. (Fig. 2)

3 Lower the lens lever to firmly clamp the lens. (Fig. 3)

4 Secure the cable through the cable clamp and connect it to the <LENS> terminal. (Fig. 4)

5 Perform lens flange back adjustments.

For details, refer to “Lens flange back adjustment” (page 30).

NOTE

- For handling the lens, refer to the lens operating instructions.
- For details on the current from the <LENS> terminal, refer to “Details of the connector signals” (page 218).
- When the lens is removed, install the mount cap to protect the device.

Lens flange back adjustment

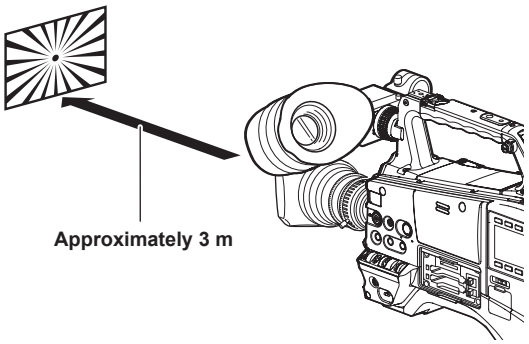
If images are not clearly focused at both telephoto and wide-angle positions during zoom operations, adjust the lens flange back (distance from the lens mounting surface to the image formation surface).

Once adjusted, the lens flange back does not need to be readjusted until the lens is changed.

NOTE

- Refer to the lens operating instructions for guidance on adjustment methods and positions of lens parts.

For a normal lens



1 Mount the lens on the camera.

Make sure to connect the lens cable.

2 Set the lens aperture to manual, and fully open the iris.

3 Place the lens flange back adjustment chart approximately 3 m from the lens and adjust the lighting on the chart to obtain an appropriate image output level.

If the image level is too high, use the filters or the shutter.

4 Loosen the F.f (Flange focus) ring clamping screw.

5 Set the zoom ring to the telephoto end position, either manually or by electric drive.

6 Aim the lens at the lens flange back adjustment chart and turn the distance ring to bring the chart into focus.

7 Set the zoom ring to the wide-angle end position and turn the F.f (Flange focus) ring to bring into focus.

At this time, do not move the distance ring.

8 Repeat steps 5 to 7 until the lens is in focus at both the telephoto and wide-angle positions.

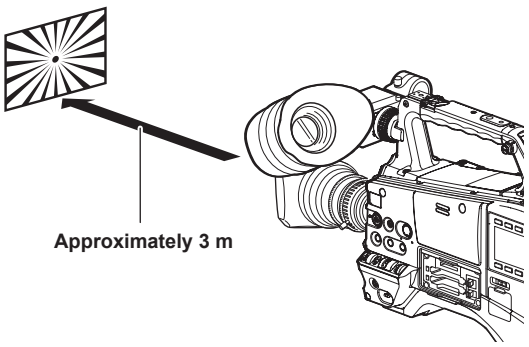
9 Firmly tighten the F.f (Flange focus) ring clamping screw.

NOTE

- F.b (Lens flange back) ring may be indicated on some lenses as the F.f (lens flange focus) ring.

For an auto-focus compatible lens

If an auto-focus compatible lens is used, perform the following procedure to operate zoom and focus automatically and adjust the lens flange back.



1 Mount the lens on the camera.

Turn the <POWER> switch of the camera to <OFF> before mounting the lens.
Make sure to connect the lens cable.

2 Set the lens iris to manual, and fully open the iris.

3 Place the lens flange back adjustment chart approximately 3 m away from the lens and adjust the lighting on the chart to obtain an appropriate image output level.

Do not place other subjects near the adjustment chart.

4 Set the <ZOOM> switch of the lens to the <SERVO> side. (Electric zoom mode)

5 Change the setting menu of the camera to adjust the lens flange back.

1) Select [EXECUTE] in the main menu → [MAINTENANCE] → [LENS ADJ.] → [FB ADJ.].

2) Select [YES] using the jog dial button, and then press the jog dial button.
The [ACTIVE...] message is displayed on the viewfinder screen during the adjustment.

The [FB ADJ. OK!] message is displayed on the viewfinder screen when the adjustment has completed.
The [FB ADJ. ERROR!] message is displayed on the viewfinder screen when the adjustment has not been performed correctly. In such a case, check the conditions of the subject and lighting, open the iris again, and perform adjustment again.

White shading compensation

Three optionally adjustable data items ([L1:LENS1], [L2:LENS2], and [L3:LENS3]) can be used for white shading compensation with the camera. Shading compensation is not performed when set to [OFF].

Selecting white shading data

1 Select [L1:LENS1], [L2:LENS2], [L3:LENS3], or [OFF] using main menu → [MAINTENANCE] → [WHITE SHADING] → [SHADING SELECT].

With factory settings, no compensation data is stored in [L1:LENS1], [L2:LENS2], and [L3:LENS3].
The title of the white shading data can be changed using the setting menu. (page 33)

Adjusting the white shading

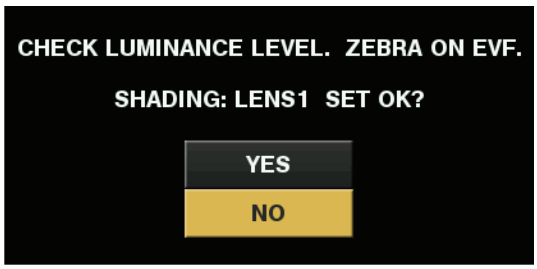


Fig. 1

1 Set the camera for adjustment.

1) Mount the lens on the camera.
   - Make sure to connect the lens cable.
2) Set the <SHUTTER> switch to <OFF>, and the <GAIN> switch to <L> (0 dB).
3) If the lens is equipped with an extender function, release the extender function.
4) Make sure it is set to either [L1:LENS1], [L2:LENS2], or [L3:LENS3] using main menu → [MAINTENANCE] → [WHITE SHADING] → [SHADING SELECT].
5) Select [EXECUTE] using main menu → [MAINTENANCE] → [WHITE SHADING].
   - The [CHECK LUMINANCE LEVEL. ZEBRA ON EVF.] message is displayed on the screen.

2 Set the screen.

1) Shoot a white sheet of paper with no unevenness of color for the whole screen.
2) Set the lens aperture to manual, and adjust it so that the zebra pattern covers the whole viewfinder screen. (Fig. 1)
   - Make sure that the lens aperture control is between F4 to F11.
   - Adjust the position of the lighting because the zebra pattern will not cover the whole screen if there is any unevenness in the lighting.
   - Make adjustments to avoid several light sources of different color temperature (e.g. fluorescent lights and halogen lamp) from illuminating on the white paper.

3 Adjust the white balance/black balance.

1) Set the <WHITE BAL> switch to <A> or <B>, and use the <AUTO W/B BAL> switch to adjust white balance automatically (AWB).
2) Use the <AUTO W/B BAL> switch to adjust black balance automatically (ABB).
3) Use the <AUTO W/B BAL> switch to adjust white balance automatically (AWB) again.

4 Repeat steps 2-2).

5 Adjust white shading.

1) Select [YES] and press the jog dial button.
   - The [ACTIVE...] message is displayed on the screen during the adjustment.
   - When the adjustment is complete after a few seconds, the [WHITE SHADING OK!] message is displayed.
   - If an error message such as [WHITE SHADING ERROR!], [LEVEL OVER], [WHITE SHADING ERROR!], or [LOW LIGHT] appears, readjust the iris.
   - The adjusted value is automatically stored in the selected memory ([L1:LENS1], [L2:LENS2], or [L3:LENS3]).

6 If the lens is equipped with an extender function, enable the extender function and repeat steps 2 to 5.

Adjusted values are stored on the camera as a single lens correction data including two ways for when the lens is equipped and not equipped with a lens extender.

Adjustment values are saved in memory, so there is no need to re-adjust white shading even after turning the camera off.

NOTE

- Coloring may occur in the vertical direction near where the lens aperture is open (OPEN) even when the white shading has been adjusted, but this is something that is inherent to optical systems. This is not a malfunction.
- When white shading adjustment is performed while image is being disturbed due to the genlock, adjustment may not be performed correctly. Try white shading adjustment again after the image returns to normal.
- Since fluorescent lights, mercury lamps, and other such kinds of lighting tend to flicker, use a light source which is less subject to flickering such as sunlight or a halogen lamp.
- Make sure to leave the <SHUTTER> switch at <OFF>.

Changing the white shading data title

1 Select the white shading data which title you want to change in the main menu → [MAINTENANCE] → [WHITE SHADING] → [SHADING SELECT], and press the <SET> button (or the jog dial button).

2 In the main menu → [MAINTENANCE] → [WHITE SHADING] →, select [NAME EDIT].

The title entry screen and keyboard are displayed.

3 Enter the characters you want to set on the keyboard using cursor buttons (or the jog dial button).

4 Select [OK] and press the <SET> button (or the jog dial button).

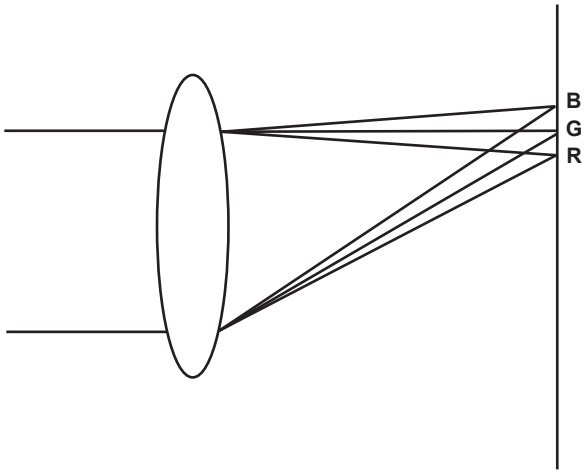
The title is updated.

Chromatic aberration compensation function (CAC)

The chromatic aberration compensation function minimizes color smearing in peripheral images. This function automatically compensates for registration error that is caused mainly due to slight chromatic aberration, which is hard to completely compensate with the lens itself, using the camera recorder unit.

When the lens compatible with the chromatic aberration compensation function is mounted, if the camera has the chromatic aberration compensation data of the lens, then the chromatic aberration compensation function is activated automatically.

What is lens chromatic aberration?



“Chromatic aberration” here refers to zoom factor chromatic aberration. Zoom factor chromatic aberration occurs since the diffraction ratio of a lens differs according to red (R)/green (G)/blue (B). Chromatic aberration on the lens itself is compensated for, but still remains in the periphery, in particular. Also, this chromatic aberration occurs on zoom lens due to a complex relationship between zoom ratio, iris and focal distance. In image terms, this is registration error.

Chromatic aberration compensation function

To compensate chromatic aberration, store the chromatic aberration characteristics of the lens regarding zoom ratio, iris and focal distance to the camera recorder beforehand. Connect a lens that matches those chromatic aberration characteristics, and perform compensation matched to the zoom ratio, iris and focal distance of that lens.

The following type of chromatic aberration compensation function data for lenses is stored in the camera before it is shipped.

Display on the camera	Corresponding lens parts number
XA16x 8A-XB4	XA16x 8A-XB4

NOTE

- For details on additions and modifications to lenses compatible with the chromatic aberration compensation function, visit the support desk at the following website:
  http://pro-av.panasonic.net/

Operation of chromatic aberration compensation function

Operate by the following procedure when lens data is already stored on the camera.

1 Mount the lens on the camera, and connect the lens connector to the camera.

2 Set to [ON] using main menu → [MAINTENANCE] → [CAC ADJ.] → [CAC CONTROL].

If the lens model number stored on the camera matches the model number of the connected lens, the chromatic aberration data stored on the camera will automatically be read.

Checking the operating status of the chromatic aberration compensation function

1 Push the <DISP/MODE CHK> switch towards the <CHK> side five times.

The mode check [CAC INFO] screen is displayed.
If [CAC CONT] is displayed as [ON] in the [CAC INFO] screen, the chromatic aberration compensation function is in operation. If other than [ON] is displayed, the chromatic aberration compensation function is not in operation.
Also, if [CAC ACTIVE] is displayed in the SmartUI [CAM01:STATUS] screen, the chromatic aberration compensation function is in operation. If other than [CAC ACTIVE] is displayed, the chromatic aberration compensation function is not in operation.

Loading the chromatic aberration compensation file from the SD memory card

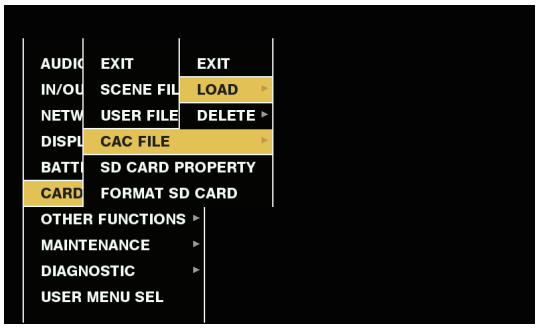


Fig. 1

Fig. 2

1 Insert the SD memory card written with the chromatic aberration compensation data you downloaded from our website into the camera.

For details on downloading, refer to the following website.
http://pro-av.panasonic.net/

2 Select [LOAD] in the main menu → [CARD FUNCTIONS] → [CAC FILE]. (Fig. 1)

The list of CAC files on the SD memory card is displayed.

3 Select the file number to load, and press the jog dial button (or <SET> button). (Fig. 2)

A confirmation screen is displayed.

4 Select the file number to save, and press the jog dial button (or <SET> button).

A confirmation screen is displayed.

5 Select [YES], and press the jog dial button (or <SET> button).

The CAC files are loaded to camera memory.

6 To store multiple chromatic aberration compensation data files in the camera repeat steps 2 to 5.

7 To end menu operations, press the <MENU> button.

The setting menu disappears, and the camera status display is returned to.

NOTE

- Up to 32 files can be loaded to the camera.
  To load a new file, delete any file before loading the new file.
  For details, refer to “Deleting the chromatic aberration compensation file from the camera” (page 35).

Deleting the chromatic aberration compensation file from the camera

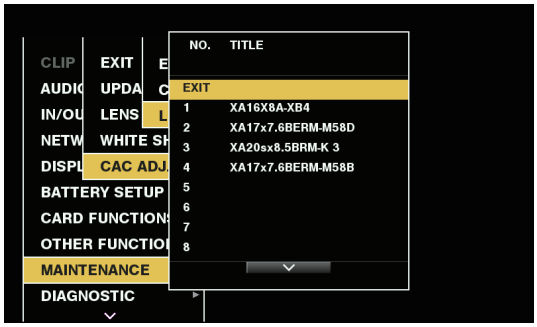


Fig. 1

1 Set to [OFF] using main menu → [MAINTENANCE] → [CAC ADJ.] → [CAC CONTROL].

2 In [LIST/DELETE], select the lens part no. you want to delete and press the jog dial button (or the <SET> button). (Fig. 1)

A confirmation screen is displayed.

3 Select [YES], and press the jog dial button (or <SET> button).

The file is deleted.

When the chromatic aberration compensation data is not functioning properly

When the chromatic aberration compensation function is not functioning properly, or when the chromatic aberration compensation data could not be loaded normally, the viewfinder displays an error message.

Error message	Meaning	Remedy
[CAC FILE DATA NOT FOUND]	There is no chromatic aberration compensation data matching the connected lens when the chromatic aberration compensation function is [ON]. This is displayed when the camera is turned on or the lens cable is connected.	Load chromatic aberration compensation data matching the connected lens to the camera.
[CAC LENS DATA INVALID]	The response data from the lens is not supported, or the response contains information other than that defined in the chromatic aberration compensation data.	The lens is not a lens compatible with the chromatic aberration compensation function. The chromatic aberration compensation will not function, but will not cause any problems in use.
[LENS INIT. NOT COMPLETED]	Position detection (focus zoom) of the lens is encoder type, and initialization is not completed.	Turn the focus/zoom ring to pass through the center of the operating range.

NOTE

- When mounting lens optical system accessories (converter lens attachments), the chromatic aberration compensation function sometimes does not function properly since the optical characteristics of the lens change. In this case, set the chromatic aberration compensation function to [OFF].
- When a focus servo is used on CANON lenses, enable recording after initialization is completed in the automatic initialization mode. Data is sometimes recording while the focus ring is moving.
- When an error message is also not displayed while the chromatic aberration compensation function is not functioning, the software version of the lens might be old. Contact the manufacturer of the lens you are using.

Preparing for audio input

Prepare the camera for connecting audio input devices.

Using front microphone

Attach microphones such as the microphone kit AJ-MC700P (optional), AG-MC200G (optional), etc.

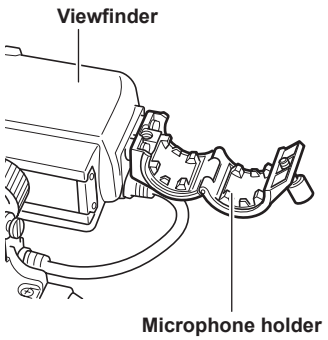


Fig. 1

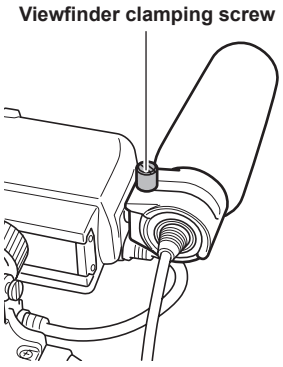


Fig. 2

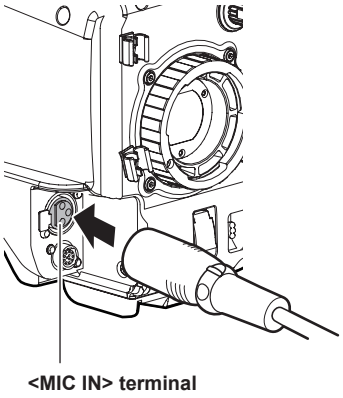


Fig. 3

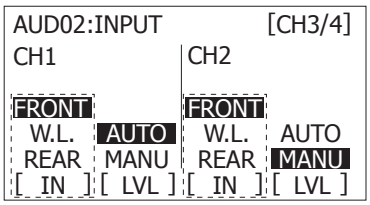


Fig. 4

1 **Open the microphone holder. (Fig. 1)**

2 **Mount the microphone and tighten the viewfinder clamping screw. (Fig. 2)**

3 **Connect the microphone connecting cable to the <MIC IN> terminal on the camera. (Fig. 3)**

4 **According to the audio channel to be recorded, switch the input signal to [FRONT] on the [AUD02:INPUT] screen of SmartUI. (Fig. 4)**

When using a wireless microphone receiver

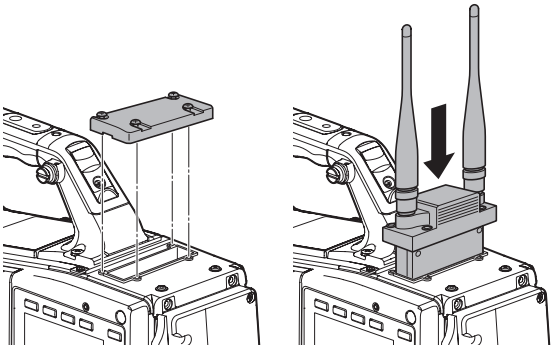


Fig. 1

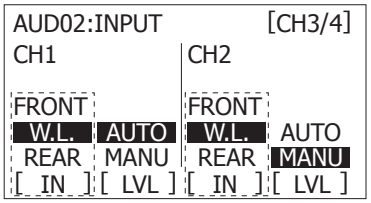


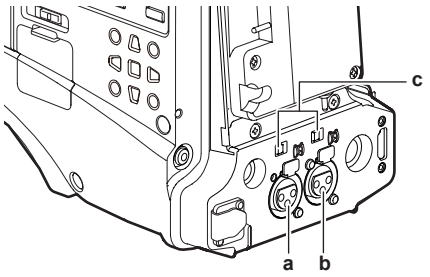
Fig. 2

1 **Remove the cover to insert the wireless microphone receiver and secure it with the screws. (Fig. 1)**

2 **According to the audio channel to be recorded, switch the input signal to [W.L.] on the [AUD02:INPUT] screen of SmartUI. (Fig. 2)**

3 **When using a two-channel wireless microphone receiver, set to [DUAL] using main menu → [AUDIO SETUP] → [INPUT SETTING] → [WIRELESS TYPE].**

Using audio devices



a: <AUDIO IN CH1/3> terminal

b: <AUDIO IN CH2/4> terminal

c: <LINE>/<MIC> switch

1 Connect the audio equipment to the <AUDIO IN CH1/3> or <AUDIO IN CH2/4> terminal of the camera with the XLR cable.

2 According to the channel to which the XLR cable is connected, switch the input signal to [REAR] on the [AUD02:INPUT] screen of SmartUI.

3 Switch the <LINE>/<MIC> switch on the rear screen to <LINE>.

Mounting accessories

Attaching a tripod

When attaching the camera to a tripod, use the tripod adaptor SHAN-TM700 (optional).

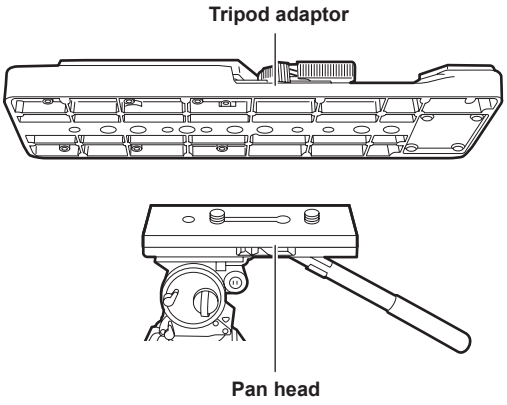


Fig. 1

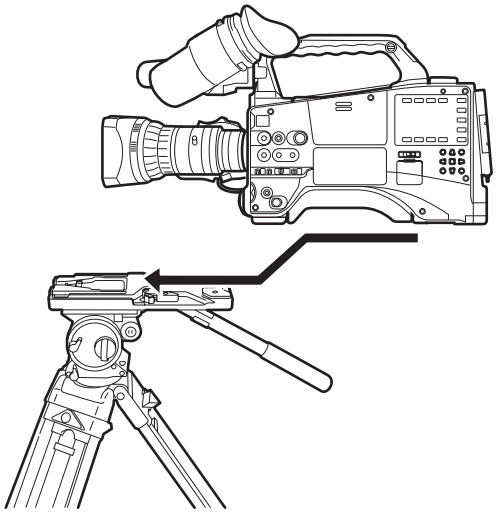


Fig. 2

1 Mount the tripod adaptor on the tripod. (Fig. 1)

2 Mount the camera on the tripod adaptor. (Fig. 2)

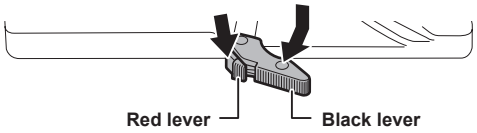
Slide the camera forward along the grooves until you hear a click.

NOTE

- Select an appropriate hole in the adaptor, taking into account the center of gravity of the camera and tripod adaptor combined. Also, make sure that the diameter of the selected hole matches the diameter of the pan head screw.

Removing the camera from the tripod adaptor

While holding the red lever down, move the black lever in the direction of the arrow, and slide the camera backward to remove it.



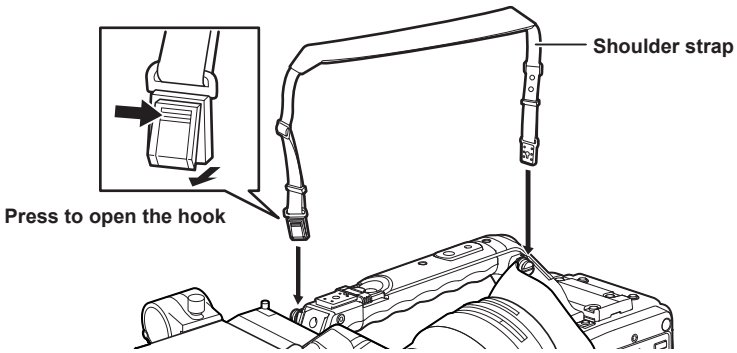
NOTE

- If the tripod adaptor pin does not return to its original position after the camera has been removed, hold the red lever down and move the black lever in the direction of the arrow again, in order to return the pin to its original position. You cannot attach it to the camera if the pin is left in the center. Be careful.

Attaching the shoulder strap

Attach to the shoulder strap fittings.

To detach the shoulder strap, first open the hooks, then detach the strap.

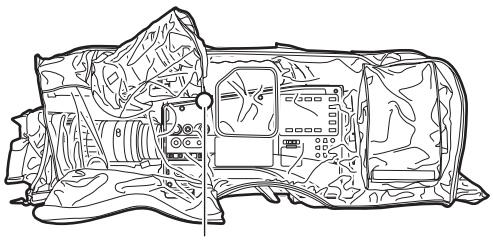


NOTE

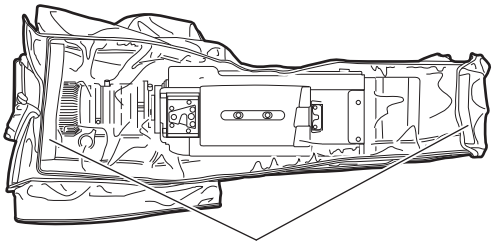
- Make sure that the shoulder strap is securely attached.

Attaching the rain cover

The figure below shows an example of use of the rain cover SHAN-RC700.



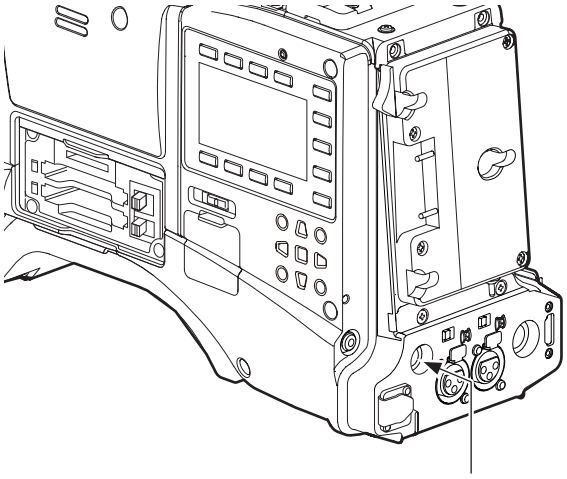
Tighten the cord



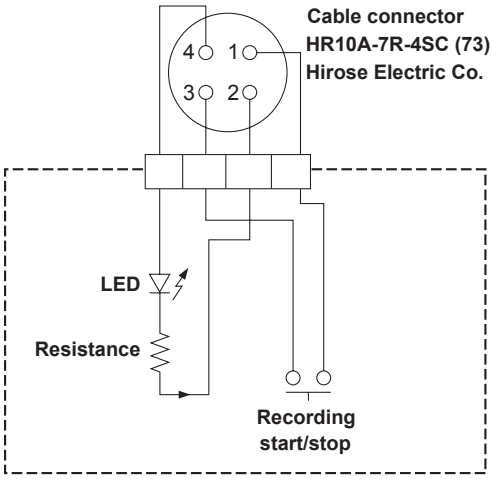
Secure with the surface fastener

Connecting the <DC OUT> terminal to the external recording start/stop switch

It is possible to retrieve 1.5 A current from the <DC OUT> terminal of the camera.
Recording start/stop can be controlled by connecting an external switch to this terminal.
An LED connected to this terminal can also be used as a tally lamp. This is useful for shooting video when fixing the camera on a crane.



(Connection example)



1 GND

2 TALLY OUT
Open collector output on the camera side
Tally lamp on: low impedance
Tally lamp off: high impedance

3 Recording start/stop switch
This is connected in parallel to the <REC> button on the camera and the <VTR> button on the lens.

4 +12 V

NOTE

- Make sure that polarity is correct before connecting an external device. Otherwise, a malfunction may result.

Charging the built-in battery

The date/time set in the camera is maintained by the built-in battery.

The built-in battery may be consumed when the power of the camera is not turned on for approximately a half year.

If [BACKUP BATT EMPTY] is displayed in the viewfinder for approximately five seconds when the <POWER> switch is set to <ON>, the built-in battery has been consumed.

Charge the built-in battery with the following procedure.

1 Make sure that the <POWER> switch is <OFF>.

2 Connect the batteries or the external DC power supply to the camera.

For details on the connection of batteries or external DC power supply, refer to “Power supply” (page 27).

3 Leave the camera for approx. four hours.

The built-in battery will be charged.
After charging completes, set the date and time and check the time code. Set the date and time of the internal clock when [SET DATE AND TIME] is displayed in the viewfinder.

4 Set the <POWER> switch to <ON>, and check that [BACKUP BATT EMPTY] is not displayed in the viewfinder.

Replacement of the built-in battery is required when [BACKUP BATT EMPTY] is displayed even after charging the battery. Consult your dealer.

Setting the date/time of the internal clock

The date/time and time zone are recorded as metadata in the content (clip) while shooting. The date/time metadata will affect the playback order by the thumbnail.

Always check and set the date/time and time zone before using the camera for the first time.

Do not change the setting of the date/time and time zone while shooting.

1 Press the <MENU> button for 3 seconds or more.

- The main menu screen is displayed in the viewfinder.

2 Select the main menu → [OTHER FUNCTIONS] → [TIME ZONE] to set the time difference from Greenwich Mean Time.

3 Select the main menu → [OTHER FUNCTIONS] → [CLOCK SETTING] to set the year, month, day, and time.

For details on the settings menu, refer to “Setting menu basic operations” (page 125).

NOTE

- The accuracy of the clock is approximately ±30 seconds per month. Check and reset the time when accurate time is required.

■ **Time zone table**

Time difference	Region	Time difference	Region
00:00	Greenwich	+01:00	Central Europe
−00:30		+01:30	
−01:00	Azores	+02:00	Eastern Europe
−01:30		+02:30	
−02:00	Mid-Atlantic	+03:00	Moscow
−02:30		+03:30	Tehran
−03:00	Buenos Aires	+04:00	Abu Dhabi
−03:30	Newfoundland	+04:30	Kabul
−04:00	Halifax	+05:00	Islamabad
−04:30	Caracas	+05:30	Mumbai
−05:00	New York	+06:00	Dakar
−05:30		+06:30	Yangon
−06:00	Chicago	+07:00	Bangkok
−06:30		+07:30	
−07:00	Denver	+08:00	Beijing
−07:30		+08:30	
−08:00	Los Angeles	+09:00	Tokyo
−08:30		+09:30	Darwin
−09:00	Alaska	+10:00	Guam
−09:30	Marquesas Islands	+10:30	Lord Howe Island
−10:00	Hawaii	+11:00	Solomon Islands
−10:30		+11:30	
−11:00	Midway Islands	+12:00	New Zealand
−11:30		+12:45	Chatham Islands
−12:00	Kwajalein Atoll	+13:00	Phoenix Islands
+00:30			

Inspections before shooting

Before recording, perform the following inspection to ensure that the system operates properly. It is recommended that you check the image using a color video monitor.

Preparing to inspect

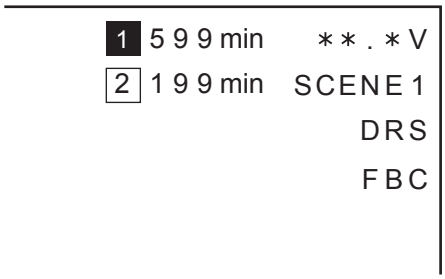


Fig. 1

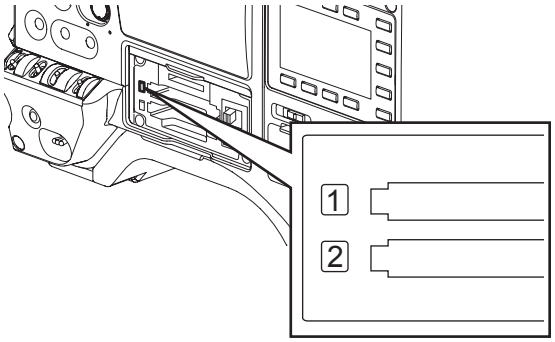


Fig. 2

1 Attach an adequately charged battery.

2 Set the <POWER> switch to <ON> and check the following items.

- [BACKUP BATT EMPTY] is not displayed on the viewfinder.
- There is sufficient battery charge level. (Fig. 1)

3 Insert a P2 card into a card slot and close the slot cover. (Fig. 2)

- Ensure that the P2 card access LED lights in orange for the card slot to which the P2 card is inserted. When P2 cards are inserted in the 2 slots, only the P2 card access LED will illuminate in orange for the P2 card inserted first (completed the access first). The P2 card access LED for the P2 card inserted subsequently will illuminate in green.
- If the P2 card access LED for the card slot to which the P2 card is inserted flashes in green or does not light up, that P2 card is not available for recording.

Inspecting the camera unit

1 Set the zoom to the electric zoom mode and check the behavior of the electric zoom.

Ensure that the image changes between telescopic and wide-angle.

2 Set the zoom to the manual zoom mode and check the behavior of the manual zoom.

Rotate the manual zoom lever and ensure that the image changes between telescopic and wide-angle.

3 Set the iris to automatic adjustment mode, and ensure that the automatic adjustment works when the lens is pointed at objects with different degree of brightness.

4 Set the iris to manual adjustment mode and rotate the iris ring to check the manual iris adjustment.

5 Set the iris back to automatic adjustment mode, and check the followings by switching the <GAIN> switch setting to <L>, <M>, and then <H>:

- The iris is adjusted for objects with same degree of brightness as the setting changes.
- The gain value display on the viewfinder changes as the setting changes.

6 If a lens with an extender is attached, set the extender to its usage position to ensure that it works properly.

Inspecting the memory recording functions

Perform procedures from “Inspecting the P2 card recording” to “Inspecting the earphones and speaker” successively.

Inspecting the P2 card recording

1 On the viewfinder display, ensure that the remaining P2 card capacity is sufficient.

For details, refer to “Screen display” (page 161).

2 Press the <REC> button and check the following:

- The P2 card access LED flashes in orange.
- The [REC] lamp in the viewfinder illuminates.
- No system warning is displayed on the viewfinder screen.

3 Press the <REC> button again.

Ensure that the P2 card access LED illuminates in orange, and that the [REC] lamp disappears from the viewfinder screen.

4 Use the <REC> button on the handle to check the same behaviors in steps 2 to 3.

Perform the same inspection for the <VTR> button on the lens.

5 Press the <THUMBNAIL> button to switch to the thumbnail screen, and from the thumbnail, playback the clip you just recorded.

Ensure that the clip plays back properly.

6 If two cards are inserted in the P2 card slots, press the USER button to which [SLOT SEL] is assigned and switch the target P2 card.

Perform steps **2** to **3** and step **5** to ensure that the recording and playback functions operate properly.

Inspecting the audio level automatic adjustment

1 Press the <AUDIO> button to display the [AUD02:INPUT] screen of SmartUI.

2 Set the [IN] in CH1/CH2 to [FRONT].

3 Set the [LVL] in CH1/CH2 to [AUTO].

4 Turn the microphone connected to the <MIC IN> terminal to an appropriate audio source, and ensure that both level displays for CH1/CH2 change according to the audio volume.

Inspecting the audio level manual adjustment

1 Press the <AUDIO> button to display the [AUD02:INPUT] screen of SmartUI.

2 Set the [IN] in CH1/CH2 to [FRONT].

3 Set the [LVL] in CH1/CH2 to [MANU].

4 Press the <AUDIO> button to display the [AUD01:LEVEL] screen of SmartUI.

5 Turn the microphone connected to the <MIC IN> terminal to an appropriate audio source, and adjust the audio volume settings for CH1/CH2.

6 Select the [+] item of CH1/CH2 to ensure that the level displays increase.

Inspecting the earphones and speaker

1 Adjust the <MONITOR> dial and ensure that the speaker volume changes.

2 Connect earphones to the <PHONES> terminal.

Ensure that the speaker is muted and the output from the microphone is directed to the earphones.

3 Adjust the <MONITOR> dial and ensure that the earphones volume changes.

Inspections for using an external microphone

1 Connect the external microphone to the <AUDIO IN CH1/3> terminal or <AUDIO IN CH2/4> terminal.

2 Set the <LINE>/<MIC> switch to <MIC>.

3 Toggle the microphone input power switch according to the power supply for the external microphone.

- Selection items
  - <+48V>: Microphones with an external power supply
  - <OFF>: Microphones with an internal power supply

4 Press the <AUDIO> button to display the [AUD02:INPUT] screen of SmartUI.

5 Set the [IN] in CH1/CH2 to [REAR].

6 Turn the microphone to an audio source, and confirm that the audio level display on the viewfinder or on SmartUI changes according to the audio volume.

You can check each channel by connecting one microphone to each channel.

Inspections for the clock, time code, and user bits

1 Set the user bits as needed.

For details, refer to “User bits settings” (page 97).

2 Set the time code.

For details, refer to “Setting the time code” (page 99).

3 Press the <HOME> button to display the [HOME] screen of SmartUI.

4 Press the <COUNTER> button to display [TCG].

5 Press the <SETUP> button to display the [SET01:TC/UB] screen of SmartUI.

6 Set the [TC_MD] to [R-RUN].

7 Press the <HOME> button to display the [HOME] screen of SmartUI.

8 Press the <REC> button.

Ensure that the number in the counter display changes when the recording starts.

9 Press the <REC> button again.

Ensure that the number in the counter display stops changing when the recording stops.

10 Press the <SETUP> button to display the [SET01:TC/UB] screen of SmartUI.

11 Set the [TC_MD] to [F-RUN].

12 Press the <HOME> button to display the [HOME] screen of SmartUI.

Ensure that the number in the counter display changes regardless of the recording status.

13 Push the <DISP/MODE CHK> switch towards the <CHK> side and check the date and time displayed on the viewfinder.

If [DATE], [TIME], and the time zone is incorrect, set the correct date/time. (page 42)

NOTE

- Note that date and time data based on [DATE], [TIME], and the time zone settings is recorded in the clip and affects the playback order in the thumbnail operations. Be careful.

P2 card

Inserting a P2 card

When using the camera for the first time, be sure to set the time data beforehand. (page 42)
A microP2 card adaptor AJ-P2AD1G (optional) is required when using a microP2 memory card.

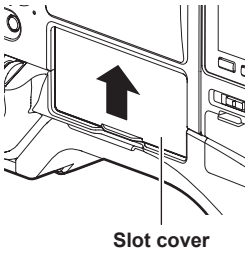


Fig. 1

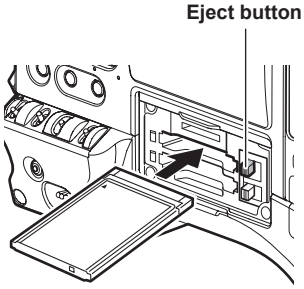


Fig. 2

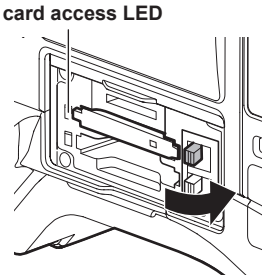


Fig. 3

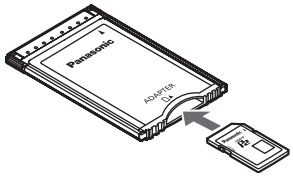


Fig. 4

1 Open the card slot cover. (Fig. 1)

2 Insert a card into the card slot.

- P2 memory cards
  - Insert the card with the logo facing upwards until the eject button pops out. (Fig. 2)
- microP2 memory cards
  - Insert the microP2 card adaptor. (Fig. 4) Insert the microP2 card adapter into the card slot with the logo facing upwards until the eject button pops out. (Fig. 2)

3 Press the eject button that pops up to the right (Fig. 3)

Make sure that the P2 card access LED illuminates in orange or green. (page 47)
When two P2 cards are inserted in the card slots, the P2 card with the smaller slot number will be recorded to first. Note, however, that regardless of the slot number, if a P2 card is inserted later, that P2 card will not be accessed until the previously inserted P2 card has been recorded to.

- **Example: When P2 cards are inserted in two slots**

  If both slots contain P2 cards, the P2 cards are recorded in order from slot number 1 → 2. However, if the P2 card in slot number 1 is removed and then re-inserted, the P2 cards will be used in the following order: slot number 2 → 1.

The P2 card number to be recorded to is held even if the camera is turned off. When the camera is next turned on, recording can be continued to the same P2 as before the camera was turned off.

4 Close the card slot cover.

NOTE

- Be sure to close the card slot cover in order to prevent dropping, dust, and static electricity.
- Be sure to format P2 cards only on a P2 device.
- If SDHC/SDXC memory cards other than microP2 memory cards are used in the microP2 card adaptor, operation is not guaranteed.
- If a P2 memory card is inserted slowly or there is dirt on the terminal of the card, [FORMAT ERROR!], [NOT SUPPORTED!], or [CHECK SLOT] (slot number) may be displayed. In such a case, insert the P2 memory card again.

Removing a P2 card

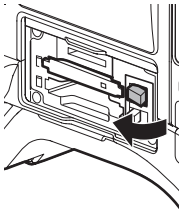


Fig. 1

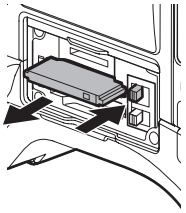


Fig. 2

1 Open the card slot cover.

2 Remove the card.

Lift the eject button (Fig. 1), and press in. (Fig. 2)

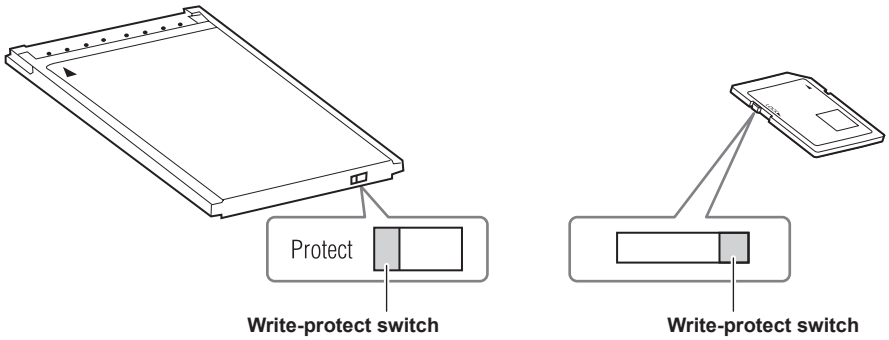
NOTE

- After insertion, do not remove the P2 card while it is being accessed or recognized (the P2 card access LED is flashing orange). Doing so may result in a malfunction.
- If you remove the P2 card while it is being accessed, [E-30] [TURN POWER OFF] is displayed in the viewfinder and the camera informs you of warning via the tally lamp, etc. All P2 card access LEDs flash rapidly in orange. Turn off the power. (page 206)
- If the P2 card is removed while being accessed, clips on it may become irregular. Check the clips and restore them, if required. (page 113)

- If the P2 card is removed while it is being formatted, formatting of the removed P2 card is not guaranteed. In this case, [E-30] [TURN POWER OFF] is displayed in the viewfinder. Turn the power off and then on again, and reformat the P2 card.
- If a P2 card is inserted into another slot during playback, the inserted card is not recognized and the P2 card access LED does not light up. The P2 card will be recognized when playback ends.
- Even if a P2 card is inserted in a vacant card slot during recording, the P2 card may not be recognized immediately in the following instance:
  - Immediately after a pre-recording
- The P2 card access LED can be set to continuously off in the main menu → [OTHER FUNCTIONS] → [ACCESS LED]. In this case, turn off the power before removing the card, or after the card is inserted or after operation (recording, playback, etc.) has stopped, and wait for the charging to complete before removing the card.

Preventing accidental erasure

In order to prevent erasing the recorded contents of the P2 card by mistake, turn the write protect switch on the P2 card to the Protect side (or the LOCK side).



NOTE

- Write-protect switch can be switched while the card is being accessed (during recording or playback), but does not take effect until accessing of the card stops.

P2 card access LEDs and status of P2 cards

P2 card access LED	P2 card status		Mode check display*
Is illuminated green	Recording possible	Reading/writing are both possible.	[ACTIVE]
Is illuminated orange	Recording target	Reading/writing are both possible. The card is currently the recording target (including loop recording).	[ACTIVE]
Flashing orange	Accessing card	Reading/writing are currently being performed.	[ACCESSING]
Flashing orange rapidly	The card is being recognized.	The P2 card is being recognized.	[INFO READING]
Flashing green slowly	Card full	There is no free space on the P2 card. Reading only is possible.	[FULL]
	Write protect	The write-protect switch on the P2 card is at the Protect position. Reading only is possible.	[PROTECTED]
	Unrecordable card	Recording is not possible by the currently set recording format since the SD memory card, etc. is inserted. To record the card, change the recording format or use a P2 card.	[REC IMPOSSIBLE]
Off	Card not supported	This card cannot be used on the camera. Replace the card.	[NOT SUPPORTED]
	Illegal format	The P2 card is not properly formatted. Reformat the card.	[FORMAT ERROR]
	No card	The P2 card is not inserted. The card is waiting to be recognized.	[NO CARD]
	Unauthenticated card	This microP2 memory card cannot be authenticated. Select the main menu → [CLIP] → [AUTHENTICATE], and enter the password. For details, refer to “Manual CPS authentication” (page 120).	[AUTH NG]
	USB non-access	The P2 card cannot be accessed since the mode is the USB device mode.	No display

* Mode check is displayed in the viewfinder. For details, refer to “Screen status display” (page 161).

P2 card recording time

■ P2 cards supported on the camera

Optional P2 memory cards and microP2 memory cards with a capacity of 4 GB to 64 GB can be used with the camera.

NOTE

- AJ-P2C002SG (2 GB) cards cannot be used.
- It cannot be recorded on following P2 card when AVC-Intra 200 or AVC-Intra 100 for 1080/59.94P or 1080/50P is selected.

- P2 memory cards of R, A, or E series
- microP2 memory card to which microP2 adaptor is attached

・The driver installed on the camera may be required to be updated depending on the type of P2 card. (page 210)
・Refer to our support desk at the following website for the latest information not included in these operating instructions.
http://pro-av.panasonic.net/

■ P2 card recording times

(Example when a 64 GB card is used)

System mode	Recording format (codec)	Recording time
1080i/P	AVC-Intra 100	Approx. 64 min (30PN, 25PN)
	AVC-LongG 25	Approx. 256 min (30PN, 25PN)
	AVC-LongG 12	Approx. 512 min (30PN, 25PN)
1080i, 720P	AVC-Intra 100	Approx. 64 min
	AVC-Intra 50	Approx. 128 min
	AVC-LongG 50	Approx. 128 min
	AVC-LongG 25	Approx. 256 min
	AVC-LongG 12	Approx. 480 min
	DVCPRO HD	Approx. 64 min
480i, 576i	DVCPRO50	Approx. 128 min
	DVCPRO	Approx. 256 min
	DV	Approx. 256 min

NOTE

・The above table shows values for regular recording. With native recording, even longer recording times are available depending on the system mode.
・In the case of 32 GB P2 cards, the recording time becomes 1/2 of the above recording times, in the case of 16 GB P2 cards, the recording time becomes 1/4, and in the case of 8 GB P2 cards, the recording time becomes 1/8.
・Indicated capacities include management and other area, so the space available for recording is less than the values in the table above.

Dividing clips recorded on P2 cards

If P2 cards with a capacity of 8 GB or more are used on the camera, recording is automatically continued as another clip when a single continuous recording time exceeds the following times. When thumbnails for clips are handled (displayed, deleted, restored, etc.) on P2 devices, they can be handled as a single clip. Clips may be displayed as separate clips in nonlinear editing software and on a computer. A clip will be divided into recording files of approximately 128 seconds each when [SHORT] is selected in the main menu → [RECORDING SETUP] → [FILE SPLIT]. They can be operated as a single clip when the thumbnails of clips are operated on the P2 device. The dividing unit of the recording files will become smaller when [SHORT] is selected while the rec during upload function is used, allowing to make the timing to start the clip transfer earlier. [SHORT] is disabled in interval recording, one-shot recording, and loop recording modes.

Recording format (excluding native recording)	Continuous recording time
AVC-Intra 100 (1080i) DVCPRO HD	Approx. 5 min
AVC-LongG 50 AVC-Intra 50 DVCPRO50	Approx. 10 min
AVC-LongG 25 DVCPRO DV	Approx. 20 min
AVC-LongG 12	Approx. 40 min

CPS (Content Protection System)

The microP2 memory card supports the security function “Content Protection System” that allows encryption formatting to prevent data leak to third parties.

To use the CPS function, set a CPS password to the body, and enable the microP2 memory card authentication and encryption formatting functions. An encrypted microP2 memory card will be automatically recognized between devices where the same CPS password is set, and recording and playback of the microP2 memory card are enabled. For details, refer to “Setting CPS password” (page 120).

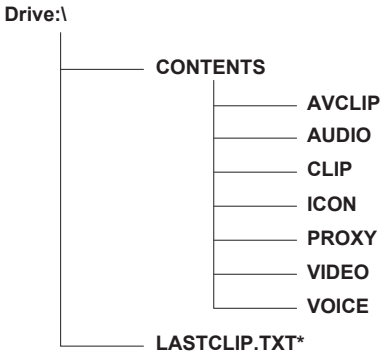
NOTE

・Setting or deleting of CPS can be performed in the main menu → [CLIP] → [PROPERTY] → [CPS PASSWORD].
・Up to 16 characters can be input.
・The encrypted microP2 memory card is not recognized on the SD card slot in a computer.
・If the card is unable to be recognized, authenticate with the correct password or format and use the card as recording media. Recording data on the card failed to be recognized cannot be checked. Do not perform any operation other than manual authentication and formatting with the failed card inserted.
・To access the encrypted card from a computer in the USB device mode, authenticate the encrypted card with P2 Viewer Plus.

How to handle data recorded on P2 cards

P2 cards are semiconductor memory cards that are used as the recording medium in the professional video production and broadcasting devices that make up the DVCPRO P2 series.

- Since data recorded in the P2 format is in a file format, they have excellent compatibility with computers. The file structure is a unique format, which in addition to video and audio data in MXF files contains various other important information items. The folder structure links data recorded in the P2 format as shown below.



All these folders are required.

If even part of this information is modified or deleted, the data may no longer be recognized as P2 data, or the card may no longer be able to be used with P2 devices.

*** This is the file to which the information of the final clip that was recorded with the P2 device is written.**

NOTE

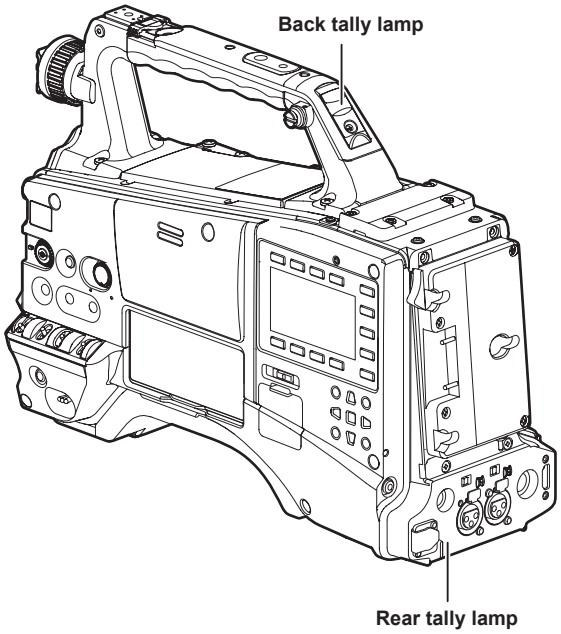
- P2 cards formatted on devices other than microP2 memory card compatible devices do not have the AVCLIP folder. For P2 cards without the AVCLIP folder, the folder will automatically be created when recording is performed on microP2 memory card compatible devices.
- When transferring data from a P2 card to a computer, or when rewriting data saved on a computer back to a P2 card, to prevent data loss be sure to download the special “P2 Viewer Plus” software. For details on downloading P2 Viewer Plus and the operating environment, visit the support desk at the following website:
  http://pro-av.panasonic.net/
- Follow the steps below to use general IT tools such as Microsoft Windows Explorer or Apple Finder to transfer the data to a computer. However, be sure to use P2 Viewer Plus when bringing data back to a P2 card.
  - Transfer the corresponding CONTENTS folder and LASTCLIP.TXT file together as a set.
  - Do not transfer individual files from the CONTENTS folder.
  - When copying, copy the LASTCLIP.TXT file at the same time as the CONTENTS folder.
  - When transferring the data in multiple P2 cards to a computer, create a folder for each P2 card to prevent clips with the same name from being overwritten.
  - Do not delete data from the P2 card.
  - Be sure to format P2 cards on a P2 device or P2 Viewer Plus.

Tally lamp

The tally lamp will flash when the camera is in the following status.

- When there is no remaining battery (once per second)
- The P2 card has less free space to record and the battery level is low (one time per second)
- The P2 card has been removed while being accessed (four times per second)
- The P2 card has no more space to record (four times per second)
- When warnings such as a system error or recording abnormality are displayed (four times per second)

For details, refer to “Warning system” (page 206).



Chapter 4 Shooting

This chapter describes the basic procedure for recording. It also describes special shooting methods such as pre-recording and loop recording.

Basic procedures

This section describes the basic procedures for shooting. Before you actually leave for shooting, pre-inspect your system to ensure that it works properly after making preparations. (page 43)

Preparation

Power supply setup to P2 card insertion

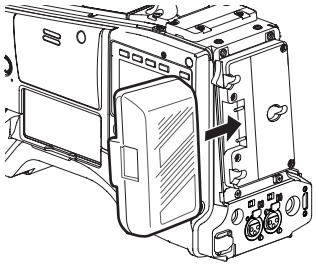


Fig. 1

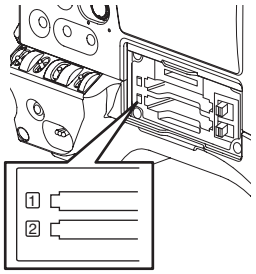


Fig. 2

1 Insert a charged battery pack. (Fig. 1)

2 Turn the <POWER> switch <ON>, and check the battery charge level.

Check the battery charge level indication on the viewfinder or the [HOME] screen of SmartUI.
If the battery charge level shows lower than actual, check the battery settings. (page 146) If the settings are correct, replace with a fully charged battery.

3 Insert a P2 card, make sure that the P2 card access LED is illuminated orange or green, and then close the slot cover. (Fig. 2)

When two P2 cards are inserted in the card slots, data will be recorded to the P2 card with the smaller slot number first. Note, however, that regardless of the slot number, if a P2 card is inserted later, recording to that P2 card will be performed after the previously inserted P2 card.

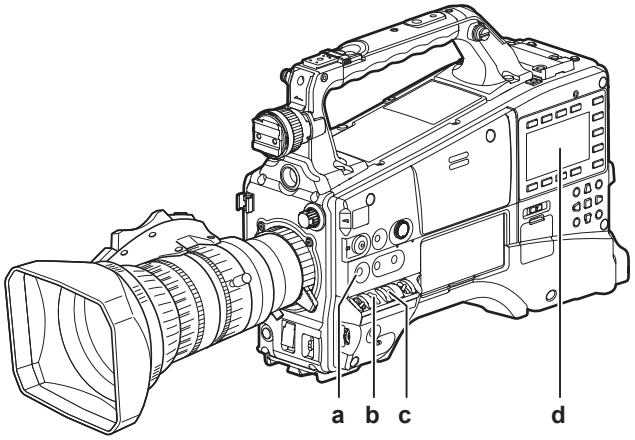
- **Example: When P2 cards are inserted in two slots**

  If P2 cards are inserted in both slots, recording to the P2 cards are performed in the order of slot number 1 → 2. However, if you remove the P2 card from slot 1 and then insert it again, recording of the P2 card will take place in the order from slot 2 → 1.

  The number of the P2 card to be recorded to is held even if the camera is turned off. When the camera is turned on the next time, recording can be continued to the same P2 card as that used before the camera was turned off.

Shooting and recording switch settings

After turning on the power and inserting the P2 card, set the switches as follows before starting operations.



a: <USER MAIN> button
The [Y GET] function is assigned in the factory settings.

b: <GAIN> switch
Normally, set this to <L> (0 dB). If conditions are too dark, set the gain to an appropriate value.

c: <OUTPUT>/<AUTO KNEE> selector switch
Set this switch to <CAM>/<ON>.

d: SmartUI

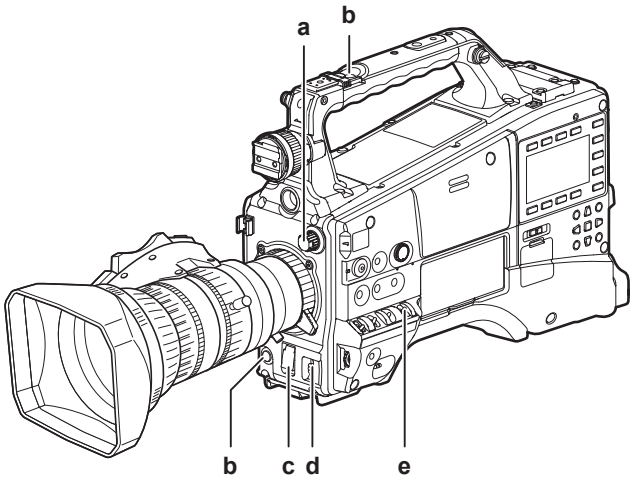
1 On the [SET01:TC/UB] screen, set [TC_MD] to [F-RUN] or [R-RUN].

2 On the [AUD02:INPUT] screen, set [LVL] to [AUTO].

For shooting

White/black balance adjustment to completion of recording

For shooting, use the following steps.



a: <ND FILTER> dial

b: <REC> button

c: <SHUTTER> switch

d: <AUTO W/B BAL> switch

e: <WHITE BAL> switch

1 Switch the <ND FILTER> dial setting according to the light conditions.

2 Operate the <WHITE BAL> switch.

■ When white balance is already saved in memory

- Set the <WHITE BAL> switch to <A> or <B>.

■ When neither white or black balance is saved in memory and you have no time to adjust the white balance

- Set the <WHITE BAL> switch to <PRST>.
  The value can be changed to 3200 K, 5600 K, or the user-specified variable value by pushing the <AUTO W/B BAL> switch towards the <AWB> side, and while the color temperature is displayed, pushing the <AUTO W/B BAL> switch towards the <AWB> side again. The variable value can be set with the jog dial button. (page 59)

■ To adjust the white balance on the spot

- Select the filter matched to the lighting conditions. Set the <WHITE BAL> switch to <A> or <B>, shoot a white subject at the center of the screen, and perform the following steps to adjust the white balance.

1) Push the <AUTO W/B BAL> switch towards the <AWB> side to adjust the white balance. (page 58)

2) Push the <AUTO W/B BAL> switch towards the <ABB> side to adjust the black balance. (page 59)

3) Push the <AUTO W/B BAL> switch towards the <AWB> side to adjust the white balance again.

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

4 When using the electronic shutter, set the shutter speed/shutter mode. (page 61)

5 Press the <REC> button to start recording.

6 To stop recording, press the <REC> button again.

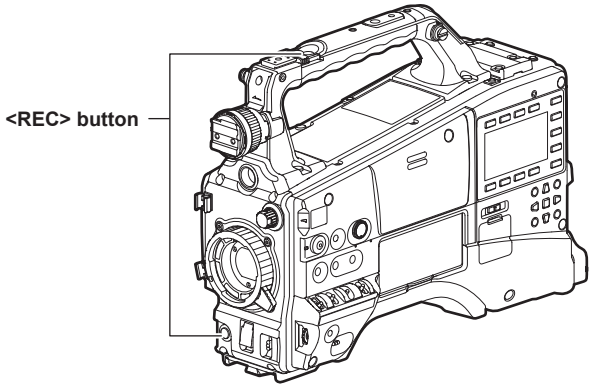
NOTE

- During recording, operation buttons (<◀◀/REW>, <FF/▶▶>, <PLAY/PAUSE>, <STOP>) do not function.
- When highly bright subjects (e.g. sun or lighting) are shot, the periphery of the subject might be colored.

Standard recording

Press the <REC> button to start recording of video and audio on the P2 card.

Data consisting of video and audio (including additional information) generated by a single shooting action is called a “clip”.



NOTE

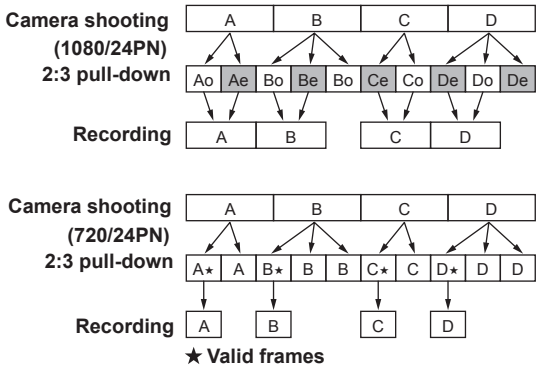
- In the following cases, it may take time to complete writing to the P2 card.
  - Stopping of short-term recording
  - When stopping recording immediately after recording is performed on the second P2 card
- If recording is not stopped even when the <REC> button is pressed, [REC PAUSE INVALID] is displayed at the center of the screen. Once stopping of recording becomes possible, the message disappears.
- Also immediately after inserting a P2 card or turning on the power, recording is started using the internal memory of the camera. In this case, recording cannot be stopped until the P2 card has been recognized.
  Push the <DISP/MODE CHK> switch towards the <CHK> side and check the P2 card status on the [SLOT1] and [SLOT2] rows displayed on the viewfinder.

Native recording

This recording method extracts and records valid frames at the shooting frame rates in 1080i/P recording and AVC-Intra recording in 720P.

With native recording, you can record longer than the normal recording time.

Even in native recording, the rate for outputting camera images and playback images is 59.94 frames or 50 frames that are pulled down.



NOTE

- Recording starts from the beginning of a 4-frame cycle for 24PN (native recording) and 2-frame cycle for 30PN of 720P (native recording). Therefore, the time code may become non-continuous when clips are recorded continuously in system modes with different recording cycles.
- Also immediately after inserting a P2 card or turning on the power, recording is started using the internal memory of the camera. In this case, recording cannot be stopped until the P2 card has been recognized.
  Push the <DISP/MODE CHK> switch towards the <CHK> side and check the P2 card status on the [SLOT1] and [SLOT2] rows displayed on the viewfinder.

Selecting the resolution, codec, and video format for recording

You can select the recording resolution (1080i/P, 1080i, 720P, 480i, 576i), recording codec (AVC-Intra, AVC-LongG, DVCPRO HD, etc.), and the recording frame rate.

Set in the main menu → [SYSTEM MODE] → [LINE&FREQ] and [REC FORMAT].

■ **Resolution: 1920×1080**

Setting			Recording format
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	
[1080-59.94i/P]	[AVC-I100/30PN] [AVC-G50/30PN] [AVC-G25/30PN] [AVC-G12/30PN]	—	1080/30PN Native
	[AVC-I100/24PN] [AVC-G50/24PN] [AVC-G25/24PN] [AVC-G12/24PN]		1080/24PN Native
[1080-59.94i]	[AVC-I100/60i] [AVC-I50/60i] [AVC-G50/60i] [AVC-G25/60i] [AVC-G12/60i]	—	1080/60i
	[DVCPRO HD/60i]		
[1080-50i/P]	[AVC-I100/25PN] [AVC-G50/25PN] [AVC-G25/25PN] [AVC-G12/25PN]	—	1080/25PN Native
[1080-50i]	[AVC-I100/50i] [AVC-I50/50i] [AVC-G50/50i] [AVC-G25/50i] [AVC-G12/50i]	—	1080/50i
	[DVCPRO HD/50i]		

■ **Resolution: 1280×720**

Setting			Recording format
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	
[720-60P]	[AVC-I100/60P] [AVC-I50/60P] [AVC-G50/60P] [AVC-G25/60P] [AVC-G12/60P]	—	720/60P
	[DVCPRO HD/60P]		
	[AVC-I100/30PN] [AVC-I100/24PN]		720/24PN Native
[720-50P]	[AVC-I100/50P] [AVC-I50/50P] [AVC-G50/50P] [AVC-G25/50P] [AVC-G12/50P]	—	720/50P
	[DVCPRO HD/50P]		
	[AVC-I100/25PN]		720/25PN Native

■ **Resolution: 720×480**

Setting			Recording format
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	
[480-59.94i]	[DVCPRO50/60i] [DVCPRO/60i] [DV/60i]	[60i]	480/60i
		[30P]	480/30P over 60i 2:2 Pull Down

■ **Resolution: 720×576**

Setting			Recording format
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	
[576-50i]	[DVCPRO50/50i] [DVCPRO/50i] [DV/50i]	[50i]	576/50i
		[25P]	576/25P over 50i 2:2 Pull Down

NOTE

- In 480i/576i mode, the video aspect ratio for recording and output can be changed.

Adjustable settings when shooting

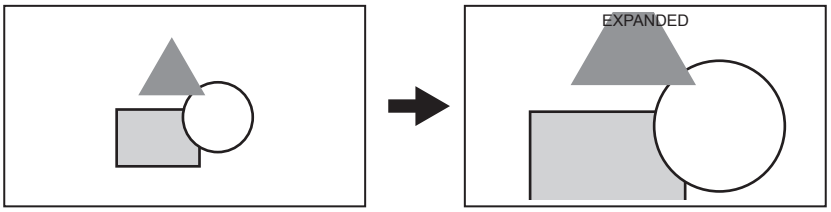
Configure the settings as necessary before you start shooting.

Focus assist function

The focus assist function enables you to focus the target easily.
Expanded display in the viewfinder, focus in red display (display with the contours of the image in red), and focus bar display are available.

Expanded display [EXPAND]

Set to [EXPAND] in the main menu → [SW MODE] → [FOCUS ASSIST MODE] beforehand.
When the <FOCUS ASSIST> button is pressed, the center of the screen is expanded approx. three times so that you can focus the image easily.



- In the expanded display, the status display and zebra pattern disappear, and [EXPANDED] is displayed at the top of the screen.
- The method to cancel the expanded display can be selected in the main menu → [SW MODE] → [EXPAND MODE].
  - **[10SEC]:** Cancels in 10 seconds.
  - **[HOLD]:** Does not cancel until the <FOCUS ASSIST> button is pressed again.
  - **[UNTIL REC]:** Cancels when recording starts. Expanded display is not available during recording.

NOTE

- The viewfinder screen is displayed enlarged.
- Expanded display is unavailable in the video output, SDI output, and HDMI output.
- Only displayed on the viewfinder.

Focus in red display [IN RED]

Set [IN RED] in the main menu → [SW MODE] → [FOCUS ASSIST MODE] beforehand.
Press the <FOCUS ASSIST> button to put red borders around the contours of the image. When this happens the screen frame will turn red.
Adjust the focus so that the contours of the subject you want to focus on turn red.

NOTE

- When various status information is displayed, they will disappear.
- Only displayed on the viewfinder.

Focus bar display [FOCUS BAR]

The focus bar can be displayed when [ON] is set in the main menu → [DISPLAY SETUP] → [FOCUS BAR].
The degree of focus is indicated by the length of the bar.

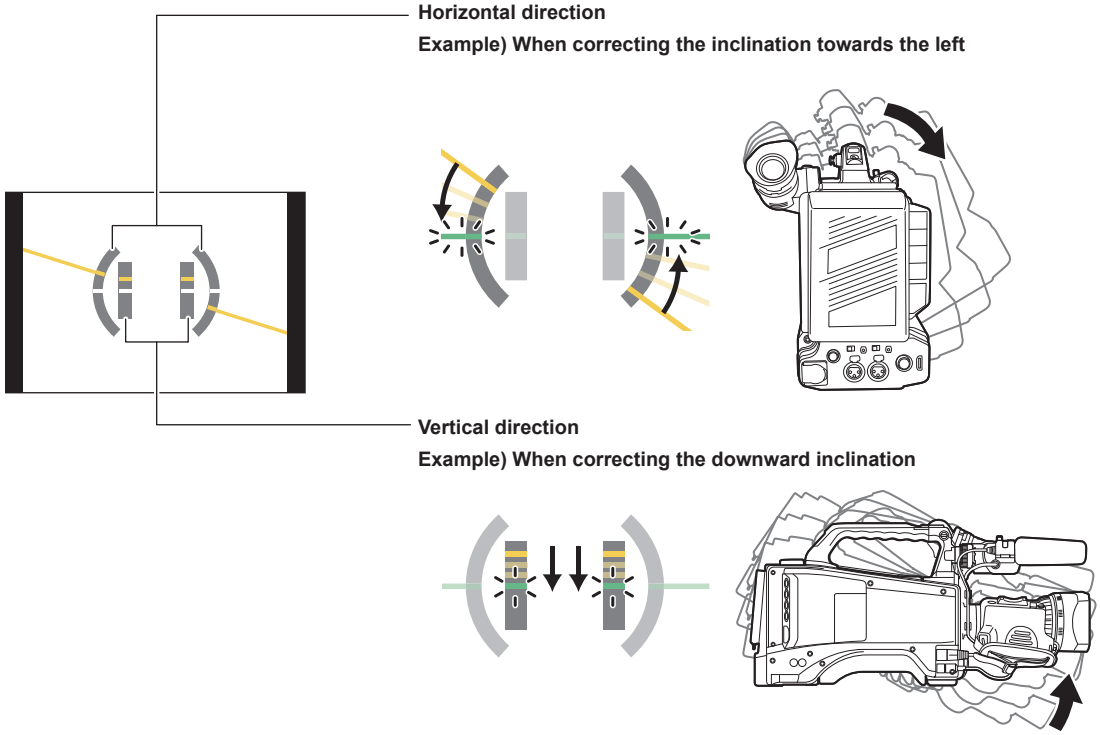
- White bar: Focus bar display
- Green line: Peak display

Not in focus

The bar extends to the right when the viewfinder is in-focus.

Level gauge function

A level gauge that indicates the horizontal and vertical inclinations of the camera recorder can be displayed in the viewfinder.



Orange lines will be displayed when inclined. Orange lines will be changed to green lines when there is almost no inclination. Inclinations will be displayed up to approximately ±45° in the horizontal direction, and up to ±30° in the vertical direction.

1 Select [ON] in the main menu → [DISPLAY SETUP] → [LEVEL GAUGE].

NOTE

- The level gauge display is not recorded.
- While moving the camera, the level gauge may not be displayed properly.
- When shooting while tilting the camera upward or downward greatly, the level gauge may not be displayed properly.
- When pressing the USER button where [LEVEL GAUGE] is assigned in the main menu → [USER SW], [ON] and [OFF] can be switched.
- When holding down the USER button where [LEVEL GAUGE RESET] is assigned in the main menu → [USER SW], the setting will be reset to the factory setting.
- When pressing the USER button where [LEVEL GAUGE RESET] is assigned in the main menu → [USER SW].

Adjusting the white and black balance

To obtain high-quality video at all times using the camera, the white and black balance must be adjusted according to conditions.
To obtain higher image quality, adjust in the order of AWB (white balance adjustment) → ABB (black balance adjustment) → AWB (white balance adjustment).

NOTE

- When white or black balance is adjusted while video is disrupted by the generator lock, adjustment may not be performed correctly. Adjust white or black balance again after video has returned to normal.

Adjusting the white balance

The white balance must be adjusted again when the lighting conditions change. Follow the steps below to adjust the white balance automatically.

■ When storing in <A> of the <WHITE BAL> switch

1 Set the <GAIN> switch.

Normally, set this to 0 dB. If it is too dark, set the gain to an appropriate value.

2 Set the <WHITE BAL> switch to <A>.

3 Switch the <ND FILTER> dial setting according to the light conditions.

4 Place the white pattern at a point where the light conditions match those for the light source for the subject, and zoom in on the white pattern so that the white color appears in the screen.

5 Adjust the lens aperture.

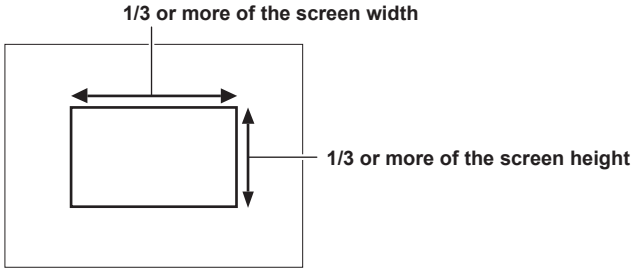
Adjust the iris so that the brightness of Y GET is approx. 70%.

6 Push the <AUTO W/B BAL> switch towards the <AWB> side.

White balance is automatically adjusted.

■ White pattern

- A white object (cloth or wall) near the subject may also be used for the white pattern.
- Required size of white pattern is as follows.



- Keep bright spotlights out of the screen.
- The white pattern must be placed at the center of the screen.

■ Message displayed in the viewfinder

Status	Message	Remark
During adjustment	[AWB Ach ACTIVE]	
Adjustment completed	[AWB A OK 3200K]	• The adjusted value is automatically stored in the specified memory (A or B).
When the color temperature of the subject is lower than 2000 K or higher than 15000 K	[AWB NG COLOR TEMP LOW] [AWB NG COLOR TEMP HIGH]	• [AWB NG COLOR TEMP LOW] indicates that the temperature is lower than the displayed temperature. [AWB NG COLOR TEMP HIGH] indicates that the temperature is higher than the displayed temperature.

■ [COLOR TEMP Ach SETTING]/[COLOR TEMP Bch SETTING] setting

- The color hue can be changed after the white balance has been adjusted automatically, after setting each item in the main menu → [SCENE FILE] → [COLOR TEMP Ach SETTING]/[COLOR TEMP Bch SETTING].
- Adjusting either one of [COLOR TEMP], [R Gain], [B Gain], and [G AXIS] changes the other three values.
- Applying white balance automatic adjustment again resets [COLOR TEMP], [R Gain], [B Gain], and [G AXIS].

When you have no time to adjust the white balance

- Set the <WHITE BAL> switch to <PRST>.

  The value can be changed to 3200 K, 5600 K, or the user-specified variable value by pushing the <AUTO W/B BAL> switch towards the <AWB> side, and while the color temperature is displayed, pushing the <AUTO W/B BAL> switch towards the <AWB> side again. The variable value can be changed with the jog dial button while the color temperature indication [V∗∗∗∗K] at the bottom of the screen is highlighted. At this time, if the jog dial button is turned while pressing, the setting value can be changed faster. Highlight disappears in several seconds if the setting is not changed.

When the white balance has not been automatically adjusted

- When the auto tracking white balance (ATW) function is operating, white balance cannot be adjusted.
- When the white balance has not been successfully adjusted, the viewfinder displays an error message.

Error message	Meaning	Remedy
[AWB Ach NG] or [AWB Bch NG]	The color temperature is too high, or too low.	Select the appropriate filter.
[LOW LIGHT]	There is insufficient light.	Increase the amount of light or increase gain.
[LEVEL OVER]	There is too much light.	Decrease the amount of light or decrease gain.
[COLOR TEMP LOW] or [COLOR TEMP HIGH]	The color temperature is too high, or too low.	Select the appropriate filter or light source.

Manual setting of color temperature

The color temperature of white balance can be adjusted by the setting menu.

1 Set the color temperature in the main menu → [SW MODE] → [W.BAL VAR].

This can be set from [2000K] to [15000K].

Viewfinder display for white balance

For details, refer to “Screen status display” (page 161).

Setting the auto tracking white balance (ATW) function

The camera is equipped with the Auto Tracking White Balance (ATW) function that automatically tracks the white balance of images according to the lighting conditions.

The auto tracking white balance function can be assigned to <B> of the <WHITE BAL> switch. Configure the settings in the main menu → [SW MODE] → [ATW].

Note that if the auto tracking white balance function is assigned to the USER button, the function follows the operation of the USER button.

For details, refer to “Assigning functions to USER buttons” (page 64).

Canceling the auto tracking white balance

Press the USER button to which auto tracking white balance function is assigned again or change the position of the <WHITE BAL> switch. Note that if the auto tracking white balance function is set to the <WHITE BAL> switch, the function cannot be canceled with the USER button.

NOTE

- This function does not guarantee 100% accuracy for the white balance. Note that the tracking performance relative to changes in ambient lighting and white balance performance has been given a certain degree of latitude.

Adjusting the black balance

Black balance must be adjusted in the following instances:

- When the camera is used for the first time
- When the camera has not been used for a long time
- When the ambient temperature has changed considerably
- When super gain is set with the USER button
- When changing the gain switch values
- When switching the items in the main menu → [SYSTEM MODE] → [REC FORMAT]

To shoot optimum video, we recommend adjusting the black balance immediately before shooting.

Before adjusting the black balance, prepare the conditions for adjusting the white balance.

1 Set the <WHITE BAL> switch to <A> or <B>.

2 Push the <AUTO W/B BAL> switch towards <ABB> and then release it.

The <AUTO W/B BAL> switch returns to the central position and the black balance is automatically adjusted.

■ **Message displayed in the viewfinder**

Status	Message	Remark
During adjustment	[ABB ACTIVE]	
Adjustment completed	[ABB OK]	• The adjusted value is automatically stored in memory.

NOTE

- During black balance adjustment, the aperture is set to automatically shut out light.
- During recording, black balance cannot be adjusted.
- During the automatic black balance execution, recording to the P2 card is not performed by pressing the <REC> button.
- The gain switching circuit is automatically switched during black balance adjustment. Flicker or noise sometimes appears on the viewfinder screen. This is not a malfunction.

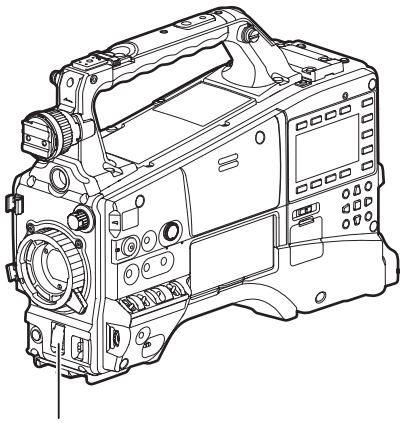
Black balance memory

Values stored to memory are saved even if the camera is turned off.

Setting the electronic shutter

Setting the shutter mode and speed

Switch the <SHUTTER> switch to set the shutter speed in the shutter mode.



1 Press the <SHUTTER> switch positioned at <OFF> towards the <ON> side.

2 Press the <SHUTTER> switch from <ON> towards the <SEL> side, and repeat this operation until the desired mode or speed is displayed on the viewfinder.

- If all modes and speeds are available, the display changes in the following order.

■ **In the case of 60i, 60P recording**

S/S → 1/15 → 1/30 → 1/60 → 1/100 → 1/120 → 1/250 → 1/500 → 1/1000 → 1/2000

■ **In the case of 50i, 50P recording**

S/S → 1/12.5 → 1/25 → 1/50 → 1/60 → 1/120 → 1/250 → 1/500 → 1/1000 → 1/2000

■ **In the case of 30P recording**

S/S → 1/15 → 1/30 → 1/50 → 1/60 → 1/120 → 1/250 → 1/500 → 1/1000

■ **In the case of 25P recording**

S/S → 1/12.5 → 1/25 → 1/50 → 1/60 → 1/120 → 1/250 → 1/500 → 1/1000

■ **In the case of 24P recording**

S/S → 1/12 → 1/24 → 1/50 → 1/60 → 1/120 → 1/250 → 1/500 → 1/1000

- [S/S] display is indicated in the synchro scan mode.

NOTE

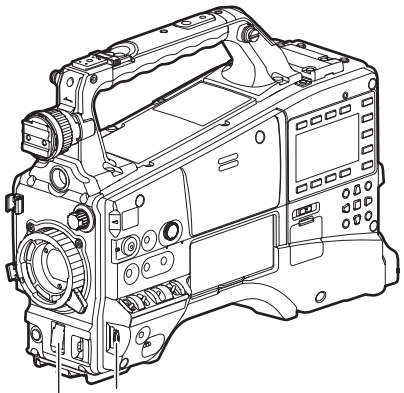
- Whichever mode the electronic shutter is used in, the higher the shutter speed, the lower the sensitivity of the camera becomes.
- When the aperture is in the automatic mode, it will increasingly open and the depth of focus will become shallower as the shutter speed is increased.
- The screen might be disrupted when the synchro scan and shutter settings are changed.
- Under lighting conditions using fluorescent lighting or other discharge tube, horizontal stripes might appear on screen. If this happens, this can be improved by adjusting the shutter speed.
- A subject that quickly crosses the camera may appear distorted when shot. This is due to the method applied for reading the signals from the pickup device (MOS sensor), and is not a malfunction.
- Red, blue, or green spots might appear on screen at slow shutter speeds, though this is not a malfunction.

Viewfinder display for shutter

For details, refer to “Screen status display” (page 161).

Setting the synchro scan mode

Perform the following steps to operate.



1 Press the <SHUTTER> switch from <ON> towards the <SEL> side to set the camera to synchro scan mode [S/S].

2 Change the setting value of the synchro scan shutter.

The setting value can be changed with the jog dial button while the synchro shutter indication displayed at the bottom of the screen is highlighted. At this time, if the jog dial button is turned while pressing, the setting value of the shutter speed can be changed faster. Highlight disappears in several seconds if the setting is not changed.

The shutter speed display in the synchro scan mode can be switched between seconds and angle in the main menu → [SCENE FILE] → [SYNC SCAN TYPE].

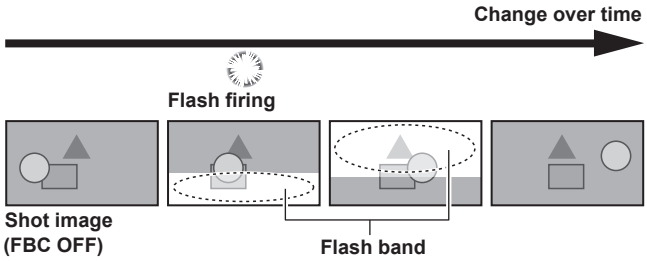
Variable ranges in each mode

60P/60i	1/60.0 – 1/250.0
50P/50i	1/50.0 – 1/250.0
25P/25PN	1/25.0 – 1/250.0
30P/30PN	1/30.0 – 1/250.0
24PN	1/24.0 – 1/250.0
When [deg] is selected in the main menu → [SCENE FILE] → [SYNC SCAN TYPE]	3.0d – 360.0d

- After the setting has been changed in the main menu → [SYSTEM MODE], the shutter speed may have been changed.
- If you set [deg] in the main menu → [SCENE FILE] → [SYNC SCAN TYPE], setting and display can be performed as in the shutter open angle.

Flash band compensation (FBC) function

The camera is equipped with a function for compensating and reducing band-like interference (called “flash band”) that occurs due to the MOS pickup device when shooting in environments where flash strobe light such as that from still cameras is present.

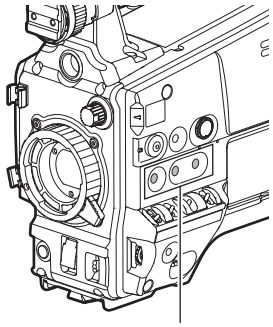


Setting the flash band compensation function

Assign the flash band compensation function to the USER buttons (<USER MAIN>/<USER1>/<USER2>).

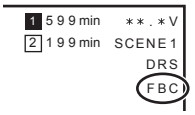
By pressing the USER button that is assigned with the flash band compensation function, the function turns on, and flash strobe from a still camera, etc. can be detected and compensated.

For details, refer to “Assigning functions to USER buttons” (page 64).



<USER MAIN>/<USER1>/<USER2> buttons

When the flash band compensation function is enabled, [FBC] is displayed on the status screen.



* Not displayed when [OFF] is set in the main menu → [DISPLAY SETUP] → [DISPLAY SETTING] → [FBC].

NOTE

- When the flash strobe lights, the following phenomena may occur. These are due to the flash band compensation function and are not malfunctions.
  - Moving subjects look as if they have been stopped for a moment.
  - The resolution drops when the flash strobe lights.
  - Horizontal lines appear in the video when the flash strobe lights.
  - Flash bands appear only in images shot at the time the flash strobe lights.

Using the flash band compensation function

The flash band compensation function is activated when there are large changes in brightness at the bottom of the screen regardless of whether there is flash strobe light. The flash band compensation function may be activated depending on the shooting environment such as where a bright window has zoomed in and then out. So, we recommend use of this function in shooting environments where flash strobe lighting is anticipated.

Even if flash strobe lighting occurs, sufficient flash band compensation function effect may not be obtained in some shooting environments.

Flash band compensation function operation conditions

- The flash band compensation function can be used when all of the following conditions are satisfied.
  - Either in 59.94i, 59.94P, 50i, or 50P mode
  - Scan reverse and digital zoom functions are not operating
  - <SHUTTER> switch is <OFF>
- Even if the flash band compensation function is enabled, the flash band compensation function is forcibly disabled if the camera is changed to a mode where the flash band compensation function cannot be used.

  To use the function again, return to a mode where the function can be used, and press the USER button to turn on the flash band compensation function.

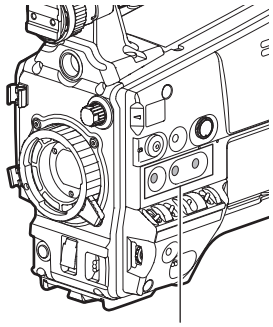
  The flash band compensation function is disabled once the power is turned off.
- Even if the flash band compensation function is active, the flash band compensation function temporarily turns off when the <SHUTTER> switch is turned <ON>. The flash band compensation function turns on again by turning the <SHUTTER> switch <OFF>.

Assigning functions to USER buttons

Selected functions can be assigned to the <USER MAIN>, <USER1>, <USER2>, and lens <RET> buttons.

Set each function to be assigned in the main menu → [USER SW], [USER MAIN], [USER1], [USER2], [RET SW].

In the factory settings, [Y GET] is assigned to the <USER MAIN> button, [TEXT MEMO] to the <USER1> button, [LEVEL GAUGE] to the <USER2> button, and [REC CHECK] to the <RET> button of the lens.



<USER MAIN>/<USER1>/<USER2> buttons

Selectable functions

The functions that can be assigned to the USER button are as follows:

Item	Description
[INHIBIT]	Disables assignment of functions.
[LEVEL GAUGE]	Assigns the function for switching the level gauge display function to enabled/disabled.
[LEVEL GAUGE RESET]	Assigns the function to set the level gauge using the current horizontal and vertical directions as reference values. Holding down the assigned button will reset to the factory setting.
[WFM]	Assigns the function for switching the waveform display of the waveform monitor. Select the waveform display from the main menu → [SW MODE] → [WFM MODE].
[D.ZOOM x2] [D.ZOOM x4]	Assigns the digital zoom function. Zooms in on the field angle by 2x/4x vertically and horizontally.
[DRS]	Assigns the function for switching the dynamic range stretcher function to enabled/disabled.
[FBC]	Assigns the function for switching the flash band compensation function to enabled/disabled.
[S.GAIN]	Assigns the function for switching the super gain function to enabled/disabled.
[1S.EXP.]	Assigns the function for switching the one second exposure function to enabled/disabled.
[ATW]	Assigns the function for switching the auto tracking white balance function to enabled/disabled.
[ATW LOCK]	Fixes the white balance value when pressing this item while the auto tracking white balance function is activated. Resumes the auto tracking white balance function when pressing again.
[SPOTLIGHT]	Assigns the function for switching the auto iris control function for the spotlight to enabled/disabled.
[BACKLIGHT]	Assigns the function for switching the auto iris control for the backlight compensation to enabled/disabled.
[Y GET]	Assigns the function for displaying the brightness level of the frame area displayed near the center.
[PUSH AF]	Assigns the function to enable/disable the function to temporarily activate auto focus in the manual focus mode. Set the operation mode in the main menu → [SW MODE] → [PUSH AF MODE].
[PRE REC]	Assigns the function for switching the pre-recording function to enabled/disabled.
[TEXT MEMO]	Assigns the text memo function.
[SHOT MARK]	Assigns the shot mark function.
[DEL LAST CLIP]	Assigns the function to delete the clip shot immediately beforehand.
[SLOT SEL]	Assigns the function for switching the card to record when two or more cards are inserted in the P2 memory card slot.
[AUDIO MON SEL]	Assigns the function for switching the output audio channel. If audio channel 1/2 is selected, every press of the assigned button switches the channel between audio channel 1 monaural, audio channel 1 and 2 stereo, and audio channel 2 monaural. If audio channel 3/4 is selected, every press of the assigned button switches the channel between audio channel 3 monaural, audio channel 3 and 4 stereo, and audio channel 4 monaural.
[REC CHECK]	Assigns the recording check function.
[USB MODE]	Assigns the function for switching the USB device mode or USB host mode to enabled/disabled.
[PLAYLIST]	Assigns the function for switching the playlist edit mode to transfer/end.
[EVF COLOR]	Assigns the function for switching whether to display the viewfinder image in color or in black and white.
[REC DURING UPLOAD]	Assigns the function for enabling/disabling the rec during upload function. This setting is linked to the setting value in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [REC DURING UPLOAD].
[UPLOAD LIST]	Assigns the function to display the upload list of the rec during upload function. To close the upload list, press the <EXIT> button.
[STREAMING START]	Assigns the function for starting/stopping streaming from the camera. This setting is linked to the setting value in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [START].
[LOAD USER FILE]	Assigns the function to display the selection screen for the user file saved on the SD memory card. This does not function in the thumbnail screen.

NOTE

- The following functions are also turned off when the camera is turned off.
  [WFM]/[D.ZOOM x2]/[D.ZOOM x4]/[FBC]/[S.GAIN]/[ATW]/[ATW LOCK]/[SPOTLIGHT]/[BACKLIGHT]/[Y GET]/[USB MODE]/[PLAYLIST]

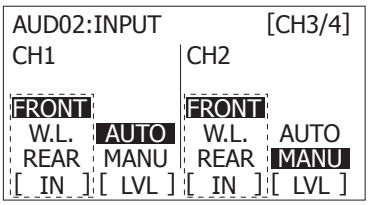
Selecting audio input and adjusting recording levels

The camera supports independent 4-channel sound recording in all recording formats (HD, SD).

When [LVL] is set to [AUTO] on the [AUD02:INPUT] screen of SmartUI, the recording level of audio channels 1/2/3/4 is automatically adjusted. Also, you can adjust the level manually by setting it to [MANU].

Selecting audio input signals

Select the input signal to be recorded to audio channels 1/2/3/4 in the [IN] setting on the [AUD02:INPUT] screen of SmartUI. (page 156)

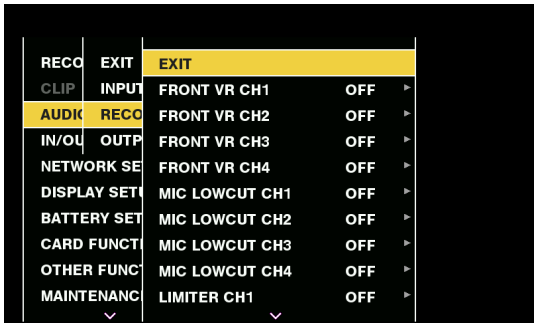


Set the switch settings and input line in the [AUD02:INPUT] screen of SmartUI. (page 156)

NOTE

- The audio signals recorded in 4-channel are output with SDI signals.

Set audio-related details in the main menu → [AUDIO SETUP]. (page 139)



Adjusting the recording level

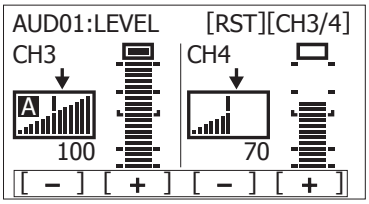
Adjust the recording level to audio channels 1/2 by the following procedure. Audio channels 3/4 can be set in the same manner.

1 Press the <MONITOR SEL> button on the [HOME] screen of SmartUI so that the audio channel level meter displays CH1 and CH2, and make sure that the display is 1 and 2.

2 Set [LVL] on the [AUD02:INPUT] screen of SmartUI to [MANU].

3 Adjust the level by [+] or [–] on the [AUD01:LEVEL] screen of SmartUI while viewing the audio channel level meter display.

When the topmost bar (0 dB) is exceeded, ▭ of the [OVER] display is illuminated to indicate that input audio is excessive. Adjust the maximum level so that the display does not reach 0 dB.



When you operate the camera alone while recording, use the <F.AUDIO LEVEL> dial to adjust the audio level.

Select the audio channel to be adjusted in advance, and while viewing the level meter of the viewfinder, adjust the level by the <F.AUDIO LEVEL> dial so that input does not become excessive.

Selecting the <F.AUDIO LEVEL> dial function

Adjust the audio level so that the input does not reach an excess while viewing the level meter on the viewfinder.

- Select the audio channel you want to adjust beforehand in the main menu → [AUDIO SETUP] → [RECORDING CH SETTING] → [FRONT VR CH1] to [FRONT VR CH4].
- Adjust with the <F.AUDIO LEVEL> dial.
- The audio level when the <F.AUDIO LEVEL> dial is at level 10 becomes the value set in the [AUD01:LEVEL] screen of SmartUI.

Adjusting image quality

The image quality of the video to be recorded can be set in the main menu → [SCENE FILE]. To change “Advanced settings”, measuring equipment such as vector scope is necessary.

Detail function

This function thickens or weakens the outlines of images. It effectively softens or sharpens images, but in some cases, the whole image may become rough due to emphasized noise and edges. To avoid such problems, it is necessary not to add this effect on parts where emphasizing is not needed and keep the details of the parts.

■ General settings

[MASTER DTL]: Sets the level of the detail effect of the whole part.

[DTL CORING]: Sets the level of signal (including noise) not to activate the detail effect.

■ Advanced settings

Set in the main menu → [SCENE FILE] → [DETAIL SETTING].

[DETAIL]: Sets [ON]/[OFF] of the detail function.

[V.DTL LEVEL]: Sets the intensity of the detail level in the vertical direction.

[H.DTL FREQ.]: Sets the thickness of the detail level in the horizontal direction.

[V. DTL FREQ.]: Sets the thickness of the detail level in the vertical direction.

[LEVEL DEPEND.]: When the detail of luminosity signal is emphasized, details in the darker parts are compressed. Details of bright areas are also compressed more when the value set for [LEVEL DEPEND.] is larger.

[KNEE APE LVL]: Sets the detail level of high luminosity areas (high-brightness areas). For operation, 0 is displayed as [OFF].

[DTL GAIN(+)]: Sets the detail level of + direction (to make brighter).

[DTL GAIN(–)]: Sets the detail level of – direction (to make darker).

Skin tone function

This function makes human skin look smoother in images.

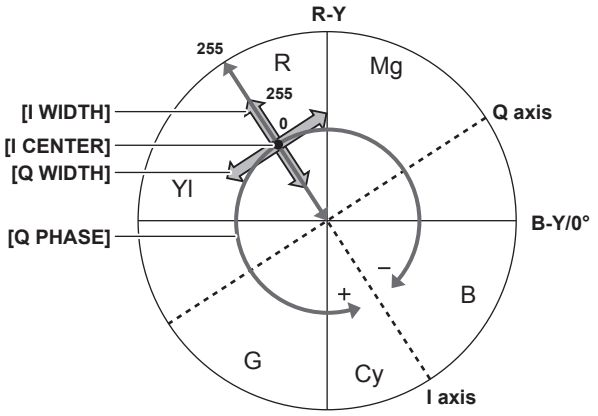


Fig. 1

■ General settings

[SKIN TONE DTL A]/[SKIN TONE DTL B]/[SKIN TONE DTL C]: Selects what kind of skin color where the skin tone detail function should work from the three data [SKIN TONE DTL A]/[SKIN TONE DTL B]/[SKIN TONE DTL C]. [SKIN TONE DTL A]/[SKIN TONE DTL B]/[SKIN TONE DTL C] can be set alone or in combination.

[SKIN TONE ZEBRA]: When [SKIN TONE DTL A]/[SKIN TONE DTL B]/[SKIN TONE DTL C] are enabled, displays the zebra pattern in the selected skin color field. The zebra pattern displays the area selected in [SKIN TONE DTL SETTING].

■ Advanced settings

Configure the settings in the main menu → [SCENE FILE] → [SKIN TONE DTL SETTING].

[DETECT TABLE]: Selects the skin color table of the object on which the skin tone table is applied.

[SKIN TONE GET]: Acquires the color information of [A], [B], or [C] selected in [DETECT TABLE] from the area around the center marker. By executing this menu, [I CENTER] to [Q PHASE] data are acquired automatically.

[SKIN DTL EFFECT]: Sets the effect level of the skin tone detail.

- The color composition of video signal (R/G/B) can be converted to color difference signal (R-Y/B-Y) as in (Fig. 1). Within those ranges, set the area on which the following skin tone is applied, using the axis across red and cyan (I axis) and the axis across green and magenta (Q axis).

  [I CENTER]: Sets the center position on the I axis (the area where the skin tone applied).

  [I WIDTH]: Sets the area width where the skin tone is applied, along the I axis with [I CENTER] in the center.

  [Q WIDTH]: Sets the area width where the skin tone is applied, along the Q axis with [I CENTER] in the center.

  [Q PHASE]: Sets the phase where the skin tone is applied, with the Q axis being the reference.

RB gain control function

This function makes settings to add or reduce intensity of red and blue colors according to the position of the <WHITE BAL> switch.

The function works when the switch is at the <PRST> position or when automatic white balance is active. It does not work when auto tracking white balance is activated.

■ General settings

Use the camera with the factory settings.

■ Advanced settings

Configure the settings in the main menu → [SCENE FILE] → [RB GAIN CONTROL SETTING].

- When the <WHITE BAL> switch is at <PRST> position

  [R GAIN AWB PRE]: Makes settings to add or reduce intensity of red color.

  [B GAIN AWB PRE]: Makes settings to add or reduce intensity of blue color.
- When the <WHITE BAL> switch is at <A> position

  [R GAIN AWB A]: Makes settings to add or reduce intensity of red color.

  [B GAIN AWB A]: Makes settings to add or reduce intensity of blue color.
- When the <WHITE BAL> switch is at <B> position

  [R GAIN AWB B]: Makes settings to add or reduce intensity of red color.

  [B GAIN AWB B]: Makes settings to add or reduce intensity of blue color.
- When setting the <WHITE BAL> switch to the <A> position and automatic white balance is performed

  [AWB A GAIN OFFSET]: Sets whether to keep the values set for [R GAIN AWB A] and [B GAIN AWB A] or reset them.
- When setting the <WHITE BAL> switch to the <B> position and automatic white balance is performed

  [AWB B GAIN OFFSET]: Sets whether to keep the values set for [R GAIN AWB B] and [B GAIN AWB B] or reset them.

Chroma setting function

This function sets color saturation and phase. It applies effects on whole images. It cannot be set to individual color hue.

■ General settings

[CHROMA LEVEL]: Sets the chroma level of the P_R signal and P_B signal. When the vector scope is used, the distance from the center (no color) increases in the whole image.

[CHROMA PHASE]: Finely adjusts the chroma phase of the P_R signal and P_B signal. When the vector scope is used, the whole image rotates clockwise or counter-clockwise.

■ Advanced settings

No setting items are provided.

Matrix function

This function sets the image color representation by selecting the matrix table. If the settings are changed, the representation of all the colors in the image will also be changed.

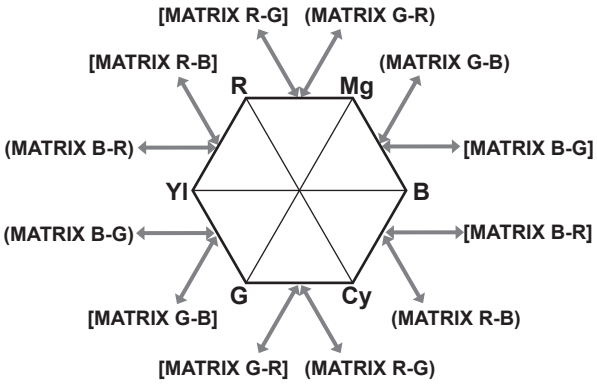


Fig. 1

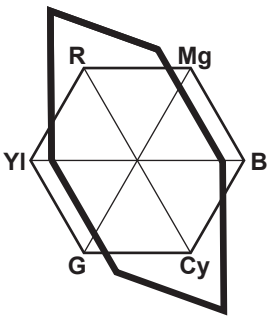


Fig. 2

■ General settings

[MATRIX]: Selects the matrix table to represent the color for shooting.

■ Advanced settings

Configure the settings in the main menu → [SCENE FILE] → [MATRIX SETTING].

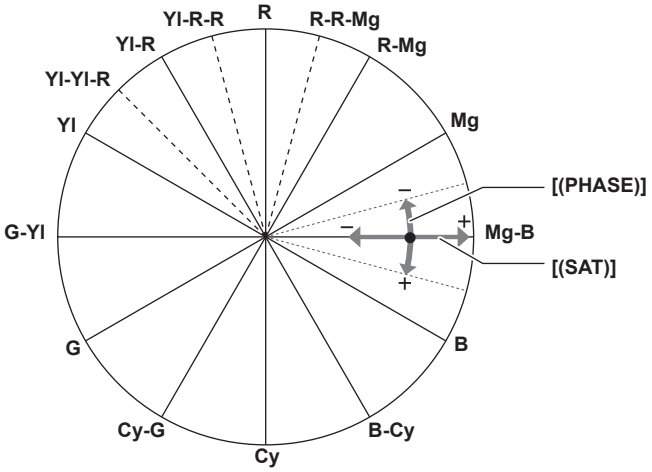
It performs fine adjustment relatively on the matrix table selected in [MATRIX].

Since the fine adjustment is performed relatively, if the matrix table selected in [MATRIX] differs, the color representation may differ even when the same value is set. (Fig. 1)

Example) When adjusting [MATRIX R-G] to the + side, and [MATRIX B-G] to the − side (Fig. 2)

Color correction function

This function sets color saturation and phase. It applies individual effect on 15 phases in an image. It can be set to individual color hue.



■ General settings

Use the camera with the factory settings.

■ Advanced settings

[R (PHASE)]/[R-R-Mg (PHASE)]/[R-Mg (PHASE)]/[Mg (PHASE)]/[Mg-B (PHASE)]/[B (PHASE)]/[B-Cy (PHASE)]/[Cy (PHASE)]/[Cy-G (PHASE)]/[G (PHASE)]/[G-Yl (PHASE)]/[Yl (PHASE)]/[Yl-Yl-R (PHASE)]/[Yl-R (PHASE)]/[Yl-R-R (PHASE)]: Changes the phases. + makes it rotate clockwise, and – makes it rotate counter-clockwise.

[R (SAT)]/[R-R-Mg (SAT)]/[R-Mg (SAT)]/[Mg (SAT)]/[Mg-B (SAT)]/[B (SAT)]/[B-Cy (SAT)]/[Cy (SAT)]/[Cy-G (SAT)]/[G (SAT)]/[G-Yl (SAT)]/[Yl (SAT)]/[Yl-Yl-R (SAT)]/[Yl-R (SAT)]/[Yl-R-R (SAT)]: Changes the saturation.

Black control function

This function sets the black level that is to be the reference of luminance.

■ General settings

[MASTER PED]: Sets the reference black level. RGB also changes by changing this setting. – makes the black color darker, and + makes it less dark.

■ Advanced settings

Configure the settings in the main menu → [SCENE FILE] → [RGB BLACK CONTROL SETTING].

[R PED]: Sets the pedestal level of Rch.

[G PED]: Sets the pedestal level of Gch.

[B PED]: Sets the pedestal level of Bch.

[PEDESTAL OFFSET]: Sets whether to keep the values set for each item of [R PED], [G PED], and [B PED] or reset them when automatic black balance adjustment is performed.

Gamma function

This function optimizes the tone of images.

■ General settings

[GAMMA MODE SEL]: Selects a gamma mode from seven types.

■ Advanced settings

Configure the settings in the main menu → [SCENE FILE] → [GAMMA SETTING].

[MASTER GAMMA]: Sets the master gamma in 0.01 steps.

- When [FILM-REC] is selected in [GAMMA MODE SEL]

  [F-REC DYNAMIC LVL]: Sets dynamic range.

  [F-REC BLACK STR LVL]: Sets black stretch.

- When [VIDEO-REC] is selected in [GAMMA MODE SEL]

  [V-REC KNEE SLOPE]: Sets knee slope.

  [V-REC KNEE POINT]: Sets knee point.

[BLACK GAMMA]: Sets the gamma curve compression and expansion of dark areas.

[B. GAMMA RANGE]: Sets the maximum level to perform compression/expansion.

Knee function

This function sets the compression of video signals to prevent halation in images.

■ General settings

Use the camera with the factory settings.

■ **Advanced settings**

Configure the settings in the main menu → [SCENE FILE] → [KNEE SETTING].

- When the <OUTPUT>/<AUTO KNEE> selector switch is set to <ON>, and [ON] is selected in the main menu → [SW MODE] → [AUTO KNEE SW]

[A.KNEE RESPONSE]: Sets the speed of response. Smaller values make the response faster.

- When the <OUTPUT>/<AUTO KNEE> selector switch is set to <OFF>, and [ON] is selected in the main menu → [SCENE FILE] → [KNEE SETTING] → [MANUAL KNEE]

[KNEE MASTER POINT]: Sets the knee point position in 0.5% steps.

[KNEE MASTER SLOPE]: Sets the knee inclination.

[KNEE MASTER SLOPE Rch]: Sets the knee inclination of Rch.

[KNEE MASTER SLOPE Bch]: Sets the knee inclination of Bch.

High color function

This function sets the color dynamic range.

■ **General settings**

[HI-COLOR SW]: Turns the mode that expands the color dynamic range [ON]/[OFF].

[HI-COLOR LVL]: Selects the level of mode that expands the color dynamic range.

■ **Advanced settings**

Use the camera in a general settings.

White clip function

This function sets the brightest part of video signals to be not brighter than a certain level.

■ **General settings**

Use the camera with the factory settings.

■ **Advanced settings**

Configure the settings in the main menu → [SCENE FILE] → [WHITE CLIP SETTING].

[WHITE CLIP]: Turns the white clip function [ON]/[OFF]. When the function is [ON], the setting value of [WHITE CLIP LVL] is enabled.

[WHITE CLIP LVL]: Sets the white clip level.

[Rch CLIP LVL]: Sets the clip level of Rch for white clips.

[Bch CLIP LVL]: Sets the clip level of Bch for white clips.

Acquiring position information from external device

This camera can acquire the position information (latitude, longitude, and altitude) from the bonding device connected via network.

Set the main menu → [OTHER FUNCTIONS] → [GPS] to [EXTERNAL].

The acquired position information is recorded in the clip as clip metadata.

The position information can be confirmed in the main menu → [NETWORK SETUP] → [NETWORK TOOLS] → [STATUS DISPLAY].

NOTE

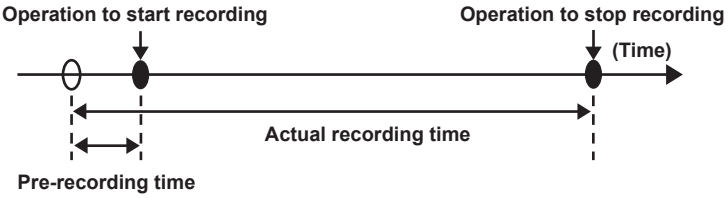
- The position information may not be acquired depending on the connected bonding device.
- For details on bonding device that can acquire the position information, visit the support desk at the following website: http://pro-av.panasonic.net/

Special recording functions

You can use special recording functions such as pre-recording and loop recording by setting the menu.

Pre-recording

This function enables recording of video and audio from a fixed amount of time (approx. 3 seconds during HD recording, and approx. 7 seconds during SD recording) before recording is actually started.



1 Check the settings of each item in the main menu → [SYSTEM MODE].

For details on system modes in which the pre-recording function can be used, refer to the table in “System modes and recording functions” (page 76).
For details on menu operations, refer to “Setting menu basic operations” (page 125).

2 Set [ON] in the main menu → [RECORDING SETUP] → [PRE REC].

3 Press the <REC> button.

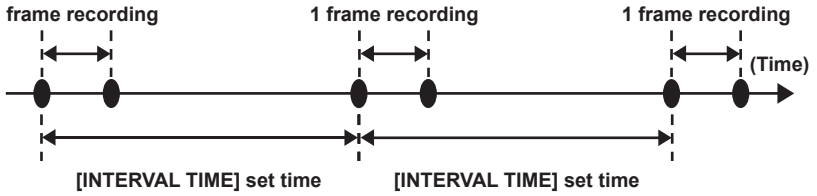
- [P-REC] is displayed while recording, and [P-] is displayed while paused. (page 164)

NOTE

- [P-REC] indication when [PRE REC] is set to [OFF]
  When [PRE REC] is set to [OFF], [REC] is displayed until recording of video or audio to the P2 card is completely finished after recording is stopped. Refer to “One clip recording mode status display” (page 164) for information about the [P-REC] indicator.
- Press the USER button to which [PRE REC] is assigned to simply toggle between [ON]/[OFF] of [PRE REC]. For details, refer to “Assigning functions to USER buttons” (page 64).
- Video and audio according to the preset time sometimes cannot be recorded in the following cases:
  - Immediately after the power is turned on
  - After recording-related settings have been altered in the setting menu
  - Immediately after the P2 card is inserted
  - After playback or recording check is performed
- The pre-recording function does not function in the following cases:
  - When an item other than [NORMAL] is selected in the main menu → [RECORDING SETUP] → [RECORDING]

Interval recording

The camera will record one frame at each set time interval.



1 Set all items in the main menu → [SYSTEM MODE].

2 Set [INTERVAL] in the main menu → [RECORDING SETUP] → [RECORDING].

3 Set the time in the main menu → [RECORDING SETUP] → [RECORDING SETTING] → [INTERVAL TIME].

4 Press the <REC> button.

- The camera will repeat the operation of one frame recording at each set time interval.
- To stop recording, press the <HOME> button to display the [HOME] screen of SmartUI, and press the <STOP> button. Recording cannot be stopped on screens other than [HOME], because the function other than stop function is assigned to the <STOP> button.
- To clear settings, set [NORMAL] in the main menu → [RECORDING SETUP] → [RECORDING].
- When [OFF] is set in the main menu → [RECORDING SETUP] → [RECORDING SETTING] → [RECORDING HOLD], interval recording settings are cleared by turning off the camera.
- [I-REC] is displayed while recording, and [I-] is displayed while paused. However, if the setting in step **3** is less than two seconds, [I-REC] flashes according to the set interval time.
- When recording is stopped, [I-] flashes.

NOTE

- Pre-recording and one-clip recording will not operate.
- Audio is not recorded.
- Recorded data (data recorded until the camera was stopped) is included in one clip.

One-shot recording

Recording takes place once for the set amount of time.

1 Set all items in the main menu → [SYSTEM MODE].

2 Select [ONE SHOT] in the main menu → [RECORDING SETUP] → [RECORDING].

3 Set the time with [ONE SHOT TIME] in the main menu → [RECORDING SETUP] → [RECORDING SETTING].

4 Press the <REC> button.

- Once recording has taken place for the set amount of time, recording will pause.
- To stop recording, press the <HOME> button to display the [HOME] screen of SmartUI, and press the <STOP> button. Recording cannot be stopped on screens other than [HOME], because the function other than stop function is assigned to the <STOP> button.
- To clear settings, set [NORMAL] in the main menu → [RECORDING SETUP] → [RECORDING].
- When [OFF] is set in the main menu → [RECORDING SETUP] → [RECORDING SETTING] → [RECORDING HOLD], one-shot recording settings are cleared by turning off the camera.
- [I-REC] is displayed while recording, and [I-] is displayed while paused.
- When recording is stopped, [I-] flashes.

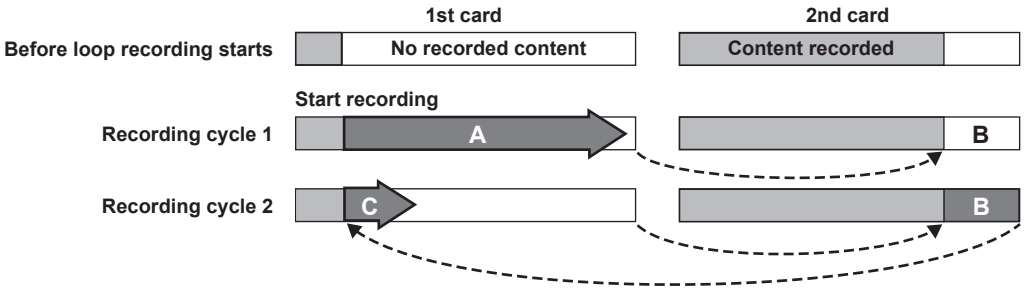
NOTE

- While in operation, other operations are unavailable.
- Pre-recording and one-clip recording will not operate.
- Audio is not recorded.
- Recorded data (data recorded until the camera was stopped) is included in one clip.
- When one-shot recording is continuously performed, the recording operation may be slower.

Loop recording

- This function successively records to two P2 cards inserted in the P2 card slots.
- When there is no more free space on the card, recording returns to the first card, and recording is continued while erasing existing data already saved on that card.

  For details, refer to “Dividing clips recorded on P2 cards” (page 48).



1 Check the settings of each item in the main menu → [SYSTEM MODE].

For details on system modes in which the loop recording function can be used, refer to the table in “System modes and recording functions” (page 76).

For details on menu operations, refer to “Setting menu basic operations” (page 125).

2 Set [LOOP] in the main menu → [RECORDING SETUP] → [RECORDING].

3 Press the <REC> button.

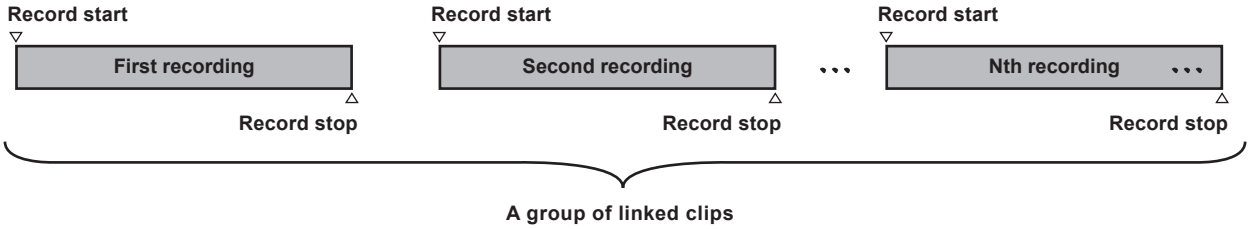
- Recording is started.
- To stop recording, press the <REC> button again.
- To clear settings, set [NORMAL] in the main menu → [RECORDING SETUP] → [RECORDING].
- When [OFF] is set in the main menu → [RECORDING SETUP] → [RECORDING SETTING] → [RECORDING HOLD], loop recording settings are cleared by turning off the camera.
- [L-REC] is displayed while recording, and [L-] is displayed while paused. When loop recording cannot be performed due to memory shortage, etc., [LOOP] flashes.

NOTE

- When this function is used, each of the two P2 cards must have at least one minute of free space.
- The remaining free space of the P2 card displayed in the mode check screen indicates the standard recording time in accordance with the recording format. When loop recording is stopped immediately after an old recording is erased, the time recorded on the card is sometimes less than the indicated time.
- Pre-recording and one-clip recording will not operate.
- It may take time for recording to stop. The subsequent operation is not accepted until the P2 memory card access LED status changes from blinking to illuminating.
- During loop recording P2 memory card access LEDs of all P2 cards used for recording are illuminated or flash orange. Loop recording stops when these P2 cards are removed. Be careful.
- Loop recording may stop when the input reference signal of the generator lock is disrupted during loop recording.

One-clip recording

You can record a single recording (from start to stop of recording) not as one clip but as a clip integrating several recordings.



*** A maximum of 99 recordings can be linked. When the 99th recording is finished, linking of clips ends automatically and the next reading will be a new clip.**

1 Set [ON] in the main menu → [RECORDING SETUP] → [ONE CLIP REC].

When one-clip recording mode is selected, [1-CLIP] is displayed.

2 Press the <REC> button.

The first recording starts and [START 1∗CLIP] is displayed.
Thereafter, each time recording takes place the clips are automatically linked, making a single group up to a maximum of 99 recordings.

Recording as a new clip

When you want to split the clip as a new clip, finish linking clips using one of the following operations.

- To stop recording, press the <HOME> button to display the [HOME] screen of SmartUI, and press the <STOP> button for approx. two seconds or more. (When operating while recording is paused)
- Press and hold the <REC> button for approx. two seconds during recording, to end recording. (To operate while recording)

By these operations, clip linking ends and [END 1-CLIP] is displayed. A new separate clip will start at the next recording.

NOTE

- In the following cases, the camera finishes clip linking and records as a new clip.
  - When the power is turned off
  - When a P2 card recorded immediately before is removed
  - When the P2 card is formatted or the clips are deleted (when the original linked clip no longer exists)
- When the menu and thumbnails are displayed, clip linking cannot be ended even if you press and hold the <STOP> button for approx. two seconds or more.

Ending one-clip recording mode

Set [OFF] in the main menu → [RECORDING SETUP] → [ONE CLIP REC].

NOTE

- Combining a clip cannot be ended by pressing the <STOP> or <REC> button on the remote control unit (AJ-RC10G) and on the extension control unit (AG-EC4G).

Cueing up linked parts of clips

Each time recording starts, a text memo is automatically added to the recording start position so that you can cue up when playing back. You can also check the thumbnail of its position.

To automatically add a text memo to the recording start point, set [ON] in the main menu → [RECORDING SETUP] → [START TEXT MEMO].

To view or play back the point of the added text memo, select [TEXT MEMO CLIPS] in the main menu → [CLIP] → [REPOSITION] and place the cursor on the target clip.

For details, refer to “Playing back from the text memo position” (page 112).

To cue up the text memo position while playing back, set [CLIP&TEXT MEMO] in the main menu → [OTHER FUNCTIONS] → [SEEK POS SEL] and press <◀◀/REW>/<FF/▶▶> while playback is paused.

Proxy recording in one-clip recording mode

You can carry out proxy recording in one-clip recording mode.

The group proxy data also can be combined as the same type of linked clip so that you can handle it as a single clip with the P2 Viewer Plus, etc.

However, when recording proxy data on an SD memory card, be careful of the following points.

- When you remove the SD memory card and replace it while continuously making clip links, proxy recording will not take place on the SD memory card until the subsequent clips are linked. Use after making sure that there is sufficient available space and number of files (maximum of 1000 clips can be recorded).
- When continuing proxy recording after replacing the SD memory card part-way through, carry out the following operation.
  - Press the <HOME> button to display the [HOME] screen of SmartUI, and press the <STOP> button for approx. two seconds or more to finish combining, and start recording as a new clip.
- The proxy data on the SD memory card that was discontinued during recording is not recognized as proxy data for the clip recorded on the P2 card and will remain incomplete.

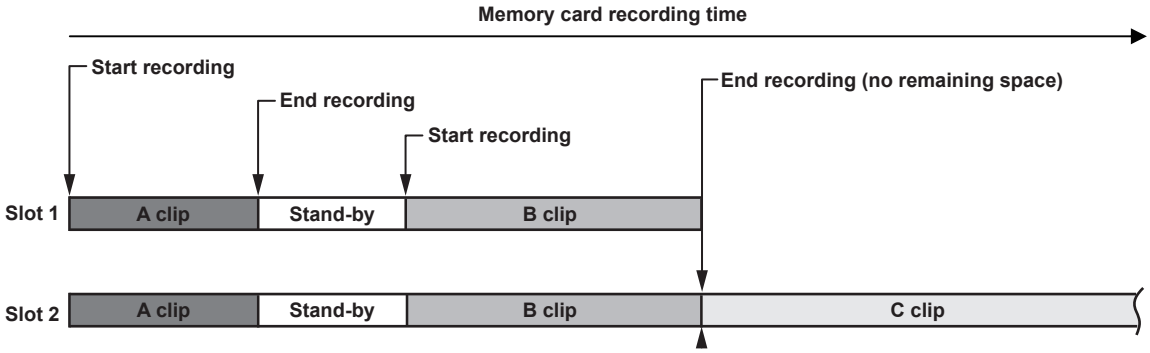
When using one-clip recording mode

- When interval recording, one-shot recording, loop recording, and simultaneous recording functions are selected, it will not operate.

- While continuing clip linking, menu and thumbnail operations are subject to the following restrictions. They can be operated after pressing the <STOP> button continuously for approx. two seconds or more and ending clip linking.
  - You cannot change the following menu items.
    [LINE&FREQ], [REC FORMAT], [CAMERA MODE], [AUDIO SMPL RES], [ASPECT CONV], [SCAN REVERSE]
  - When reading/exporting to the SD memory card and reading setting files, the following menu items cannot be executed.
    Main menu → [SCENE FILE] → [LOAD/SAVE/INITIALIZE]
    All items in the main menu → [CARD FUNCTIONS]
    Main menu → [OTHER FUNCTIONS] → [USER FILE]
    Main menu → [OTHER FUNCTIONS] → [USER FILE] → [INITIALIZE]
    Main menu → [OTHER FUNCTIONS] → [MENU INITIALIZE]
  - The following thumbnail items cannot be selected and operated.
    Main menu → [CLIP] → [COPY]
- In order to make it possible to link clips in the next recording, the processing time required to end recording may take slightly longer than standard recording.
- When playing back, fade processing of unlinked audio will not be done at the time recordings are linked within clips.
- When a clip with a large number of links is edited using nonlinear editing software, etc., the software may not operate properly depending on the type of software.
- Refer to the support desk at the following website for the latest information on software whose operability has been confirmed.
  http://pro-av.panasonic.net/

Simultaneous recording

This function records the same video onto two P2 cards when the two P2 cards are inserted into two slots.



Selecting [ON] in the main menu → [RECORDING SETUP] → [SIMUL REC] will set the camera to simultaneous recording mode.

The remaining time that can be simultaneously recorded (the remaining time of the memory card that has less available recording space) is displayed in the media remaining space indicator on the screen, and [SIMUL] is displayed.

When the P2 card in the slot with less remaining recording space becomes full, simultaneous recording stops.

When starting simultaneous recording again, replace the P2 card in the slot with full capacity with a new P2 card, and press the <REC> button. When the simultaneous recording cannot be performed, [SIMUL] indication is displayed with a diagonal line.

If you press the <REC> button without replacing the P2 card, normal recording will be performed on the P2 card in slot 2 (the slot with remaining memory space).

For details on system modes in which simultaneous recording can be used, refer to the table in “System modes and recording functions” (page 76).

NOTE

- Start recording when two P2 cards are recognized. When recording is started before both P2 cards are recognized, standard recording is performed using the P2 card that has been recognized. The card status is checked after recording ends. At that time, if both cards are recognized, simultaneous recording is performed.
- Simultaneous recording cannot be used together with loop recording, interval recording, one-shot recording, or dual codec recording.
- If recording stops because a recording malfunction occurs in one of the P2 cards during simultaneous recording, the camera will continue recording onto the other P2 card. However, if the card is removed while being accessed, recording will stop.
- If there is space in one of the P2 cards after simultaneous recording has ended, the P2 card with more space will automatically be the recording target. Press the <REC> button again to record normally.
- If only one P2 card is inserted when simultaneous recording mode is set, the camera will start standard recording.

Hot swap recording

When P2 cards are inserted in two P2 card slots, recording can be performed continuously across two cards.

Also, the card other than the one currently being recorded to can be swapped and recording can be continued on three or more cards (hot swap recording).

Note that P2 card recognition may take time depending on the timing when the P2 card is inserted into the vacant card slot (immediately after pre-recording or before and after continuous recording across two card slots). When inserting a P2 card, make sure that there is at least one minute of free space on the card to be recorded to.

NOTE

- Change slots while recording is on stand-by. You cannot change slots during recording.
- Hot swap playback is not supported.

Recording check function

- After recording ends, press the <RET> button of the lens to automatically play back approximately three seconds of video and audio of the last clip. In this way, you can check whether video has been recorded properly. After playback, the camera is again ready to start recording.
- The [REC CHECK] function can be assigned to the USER button. (page 64)
- Press and hold the <RET> button for one second to play back from the last ten seconds of the latest clip. During playback at recording check, press the <RET> button again to stop the playback.

Shot mark recording function

The shot mark is the mark added to the thumbnail of each clip to distinguish that clip from other clips.

Only clips with shot marks attached can be displayed or played back.

Adding shot marks

You must assign [SHOT MARK] to the USER button beforehand. For details, refer to “Assigning functions to USER buttons” (page 64).

1 Press the USER button to which [SHOT MARK] is assigned.

- [MARK ON] is displayed, and the shot mark is added to the most recently recorded clip.
- Another press of the button displays [MARK OFF] and the shot mark disappears.

NOTE

- When the shot mark is added during a recording pause, it is added to the clip recorded immediately before.
- Shot marks can also be added while the thumbnail is being displayed. (page 112)
- Shot marks cannot be added during loop recording, interval recording, or one-shot recording. If an operation is invalid, [SHOT MARK INVALID] is displayed when the button is pressed.
- During playback, setting or canceling the shot mark is not available. While pausing the playback, setting or canceling the shot mark is available.
- To add shot marks to combined clips, such as those recorded over multiple P2 cards, or delete them, there are following restrictions.
  - All P2 cards constituting clips must be inserted into the slots.
  - A shot mark is added only to the top clip among combined clips.

Text memo recording function

Text memos can be added to any video point while a clip is being recorded or played back.

Only clips with a text memo added can be selected and displayed as thumbnails. Also, thumbnails at text memo positions can be displayed in order and played back from text memo points, and only required portions can be selected and copied. (page 112)

Adding text memos

You must assign [TEXT MEMO] to the USER button beforehand. For details, refer to “Assigning functions to USER buttons” (page 64).

1 During recording or a playback, press the USER button to which the [TEXT MEMO] is assigned.

[TEXT MEMO] is displayed, and the text memo is added to the video clip that was displayed when the button was pressed.

NOTE

- Up to 100 text memos can be recorded to a single clip.
- Text memos cannot be added during loop recording, interval recording, or one-shot recording. If an operation is invalid, [TEXT MEMO INVALID] is displayed when the button is pressed.

Multi formats

Selecting recording signals

This camera can record HD (1080i/P, 1080i, 720P) signals in a combined format of AVC-Intra, AVC-LongG, and DVCPRO HD codecs, and can record SD (480i/576i) signals in a combined format of DVCPRO50, DVCPRO, and DV codecs.

Recording and shooting signals can be selected in the main menu → [SYSTEM MODE].

Setting		Description of settings
[SYSTEM MODE]	[LINE&FREQ]	Select the signal format from 1080i/P, 1080i, 720P, 480i, and 576i. If this setting has been changed, select [YES] on a confirmation message and restart the camera.
	[REC FORMAT]	Select the codec of AVC-Intra, AVC-LongG, and DVCPRO HD in the HD mode, and select the codec of DVCPRO50, DVCPRO, and DV in the SD mode.
	[AUDIO SMPL RES]	Select the number of audio bits ([24BIT] or [16BIT]) when [REC FORMAT] is [AVC-I100] or [AVC-I50]. At [REC FORMAT] other than these, recording is performed at the number of audio bits fixed to 24 bits or 16 bits. For details, refer to “System modes and recording functions” (page 76).
	[ASPECT CONV]	In the SD mode, select the video aspect ratio for recording and output.

NOTE

- When [LINE&FREQ] or [REC FORMAT] is changed, video or audio may be interrupted. This is not a malfunction.
- When 1080i/P is selected in [LINE&FREQ], recording as 24PN/30PN/25PN is available, but recording as 60P/50P is unavailable. The 1080/59.94i or 1080/50i signal is output from the <SDI OUT/IN (OP)> terminal. For details, refer to “System modes and recording functions” (page 76), “Selecting video output” (page 79), and “Recording/playback and output format list” (page 80).

System modes and recording functions

The following shows the relationship between system modes and recording functions on this camera.

- “✓” are supported, and “—” are not supported.

System mode				Recording function		
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	[AUDIO SMPL RES]	Standard recording	Pre-recording	Interval recording
[1080-59.94i/P]	[AVC-I100/30PN]	—	[24BIT]/[16BIT]	✓	—	—
	[AVC-I100/24PN]	—		✓	—	—
	[AVC-G50/30PN]	—	[24BIT]	✓	—	—
	[AVC-G50/24PN]	—		✓	—	—
	[AVC-G25/30PN]	—		✓	—	—
	[AVC-G25/24PN]	—		✓	—	—
	[AVC-G12/30PN]	—	[16BIT]	✓	—	—
	[AVC-G12/24PN]	—		✓	—	—
[1080-50i/P]	[AVC-I100/25PN]	—	[24BIT]/[16BIT]	✓	—	—
	[AVC-G50/25PN]	—	[24BIT]	✓	—	—
	[AVC-G25/25PN]	—		✓	—	—
	[AVC-G12/25PN]	—	[16BIT]	✓	—	—
[1080-23.98PsF]	[AVC-I100/24PN]	—	[24BIT]/[16BIT]	✓	—	—
	[AVC-G50/24PN]	—	[24BIT]	✓	—	—
	[AVC-G25/24PN]	—		✓	—	—
	[AVC-G12/24PN]	—	[16BIT]	✓	—	—
[1080-59.94i]	[AVC-I100/60i]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I50/60i]	—		✓	✓	✓
	[AVC-G50/60i]	—	[24BIT]	✓	✓	—
	[AVC-G25/60i]	—		✓	✓	—
	[AVC-G12/60i]	—	[16BIT]	✓	✓	—
	[DVCPRO HD/60i]	—		✓	✓	✓
[1080-50i]	[AVC-I100/50i]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I50/50i]	—		✓	✓	✓
	[AVC-G50/50i]	—	[24BIT]	✓	✓	—
	[AVC-G25/50i]	—		✓	✓	—
	[AVC-G12/50i]	—	[16BIT]	✓	✓	—
	[DVCPRO HD/50i]	—		✓	✓	✓

System mode				Recording function		
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	[AUDIO SMPL RES]	Standard recording	Pre-recording	Interval recording
[720-59.94P]	[AVC-I100/60P]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I100/30PN]	—		✓	—	—
	[AVC-I100/24PN]	—		✓	—	—
	[AVC-I50/60P]	—		✓	✓	✓
	[AVC-G50/60P]	—	[24BIT]	✓	✓	—
	[AVC-G25/60P]	—		✓	✓	—
	[AVC-G12/60P]	—	[16BIT]	✓	✓	—
	[DVCPRO HD/60P]	—		✓	✓	✓
[720-50P]	[AVC-I100/50P]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I100/25PN]	—		✓	—	—
	[AVC-I50/50P]	—		✓	✓	✓
	[AVC-G50/50P]	—	[24BIT]	✓	✓	—
	[AVC-G25/50P]	—		✓	✓	—
	[AVC-G12/50P]	—	[16BIT]	✓	✓	—
	[DVCPRO HD/50P]	—		✓	✓	✓
[480-59.94i]	[DVCPRO50/60i]	[60i]	[16BIT]	✓	✓	✓
		[30P]		✓	—	—
	[DVCPRO/60i]	[60i]		✓	✓	✓
		[30P]		✓	—	—
	[DV/60i]	[60i]		✓	✓	✓
		[30P]		✓	—	—
[576-50i]	[DVCPRO50/50i]	[50i]	[16BIT]	✓	✓	✓
		[25P]		✓	—	—
	[DVCPRO/50i]	[50i]		✓	✓	✓
		[25P]		✓	—	—
	[DV/50i]	[50i]		✓	✓	✓
		[25P]		✓	—	—

System mode				Recording function		
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	[AUDIO SMPL RES]	One-shot recording	Loop recording	One-clip recording
[1080-59.94i/P]	[AVC-I100/30PN]	—	[24BIT]/[16BIT]	—	—	—
	[AVC-I100/24PN]	—		—	—	—
	[AVC-G50/30PN]	—	[24BIT]	—	—	—
	[AVC-G50/24PN]	—		—	—	—
	[AVC-G25/30PN]	—		—	—	—
	[AVC-G25/24PN]	—		—	—	—
	[AVC-G12/30PN]	—	[16BIT]	—	—	—
	[AVC-G12/24PN]	—		—	—	—
[1080-50i/P]	[AVC-I100/25PN]	—	[24BIT]/[16BIT]	—	—	—
	[AVC-G50/25PN]	—	[24BIT]	—	—	—
	[AVC-G25/25PN]	—		—	—	—
	[AVC-G12/25PN]	—	[16BIT]	—	—	—
[1080-23.98PsF]	[AVC-I100/24PN]	—	[24BIT]/[16BIT]	—	—	—
	[AVC-G50/24PN]	—	[24BIT]	—	—	—
	[AVC-G25/24PN]	—		—	—	—
	[AVC-G12/24PN]	—	[16BIT]	—	—	—
[1080-59.94i]	[AVC-I100/60i]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I50/60i]	—		✓	✓	✓
	[AVC-G50/60i]	—	[24BIT]	—	✓	✓
	[AVC-G25/60i]	—		—	✓	✓
	[AVC-G12/60i]	—	[16BIT]	—	✓	✓
	[DVCPRO HD/60i]	—		✓	✓	✓
[1080-50i]	[AVC-I100/50i]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I50/50i]	—		✓	✓	✓
	[AVC-G50/50i]	—	[24BIT]	—	✓	✓
	[AVC-G25/50i]	—		—	✓	✓
	[AVC-G12/50i]	—	[16BIT]	—	✓	✓
	[DVCPRO HD/50i]	—		✓	✓	✓

System mode				Recording function		
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	[AUDIO SMPL RES]	One-shot recording	Loop recording	One-clip recording
[720-59.94P]	[AVC-I100/60P]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I100/30PN]	—		—	—	—
	[AVC-I100/24PN]	—		—	—	—
	[AVC-I50/60P]	—		✓	✓	✓
	[AVC-G50/60P]	—	[24BIT]	—	✓	✓
	[AVC-G25/60P]	—		—	✓	✓
	[AVC-G12/60P]	—	[16BIT]	—	✓	✓
	[DVCPRO HD/60P]	—		✓	✓	✓
[720-50P]	[AVC-I100/50P]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I100/25PN]	—		—	—	—
	[AVC-I50/50P]	—		✓	✓	✓
	[AVC-G50/50P]	—	[24BIT]	—	✓	✓
	[AVC-G25/50P]	—		—	✓	✓
	[AVC-G12/50P]	—	[16BIT]	—	✓	✓
	[DVCPRO HD/50P]	—		✓	✓	✓
[480-59.94i]	[DVCPRO50/60i]	[60i]	[16BIT]	✓	✓	✓
		[30P]		—	—	—
	[DVCPRO/60i]	[60i]		✓	✓	✓
		[30P]		—	—	—
	[DV/60i]	[60i]		✓	✓	✓
		[30P]		—	—	—
[576-50i]	[DVCPRO50/50i]	[50i]	[16BIT]	✓	✓	✓
		[25P]		—	—	—
	[DVCPRO/50i]	[50i]		✓	✓	✓
		[25P]		—	—	—
	[DV/50i]	[50i]		✓	✓	✓
		[25P]		—	—	—

System mode				Recording function		
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	[AUDIO SMPL RES]	Simultaneous recording	Dual codec recording	
					HD proxy*1	SD proxy*2*3
[1080-59.94i/P]	[AVC-I100/30PN]	—	[24BIT]/[16BIT]	✓	—	—
	[AVC-I100/24PN]	—		✓	—	—
	[AVC-G50/30PN]	—	[24BIT]	✓	—	—
	[AVC-G50/24PN]	—		✓	—	—
	[AVC-G25/30PN]	—		✓	—	—
	[AVC-G25/24PN]	—		✓	—	—
	[AVC-G12/30PN]	—	[16BIT]	✓	—	—
	[AVC-G12/24PN]	—		✓	—	—
[1080-50i/P]	[AVC-I100/25PN]	—	[24BIT]/[16BIT]	✓	—	—
	[AVC-G50/25PN]	—	[24BIT]	✓	—	—
	[AVC-G25/25PN]	—		✓	—	—
	[AVC-G12/25PN]	—	[16BIT]	✓	—	—
[1080-23.98PsF]	[AVC-I100/24PN]	—	[24BIT]/[16BIT]	✓	—	—
	[AVC-G50/24PN]	—	[24BIT]	✓	—	—
	[AVC-G25/24PN]	—		✓	—	—
	[AVC-G12/24PN]	—	[16BIT]	✓	—	—
[1080-59.94i]	[AVC-I100/60i]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I50/60i]	—		✓	—	✓
	[AVC-G50/60i]	—	[24BIT]	✓	✓	✓
	[AVC-G25/60i]	—		✓	✓	✓
	[AVC-G12/60i]	—	[16BIT]	✓	—	—
	[DVCPRO HD/60i]	—		✓	—	—
[1080-50i]	[AVC-I100/50i]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I50/50i]	—		✓	—	✓
	[AVC-G50/50i]	—	[24BIT]	✓	✓	✓
	[AVC-G25/50i]	—		✓	✓	✓
	[AVC-G12/50i]	—	[16BIT]	✓	—	—
	[DVCPRO HD/50i]	—		✓	—	—

System mode				Recording function		
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	[AUDIO SMPL RES]	Simultaneous recording	Dual codec recording	
					HD proxy*1	SD proxy*2*3
[720-59.94P]	[AVC-I100/60P]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I100/30PN]	—		✓	✓	—
	[AVC-I100/24PN]	—		✓	✓	—
	[AVC-I50/60P]	—		✓	—	✓
	[AVC-G50/60P]	—	[24BIT]	✓	✓	✓
	[AVC-G25/60P]	—		✓	✓	✓
	[AVC-G12/60P]	—	[16BIT]	✓	—	—
	[DVCPRO HD/60P]	—		✓	—	—
[720-50P]	[AVC-I100/50P]	—	[24BIT]/[16BIT]	✓	✓	✓
	[AVC-I100/25PN]	—		✓	✓	—
	[AVC-I50/50P]	—		✓	—	✓
	[AVC-G50/50P]	—	[24BIT]	✓	✓	✓
	[AVC-G25/50P]	—		✓	✓	✓
	[AVC-G12/50P]	—	[16BIT]	✓	—	—
	[DVCPRO HD/50P]	—		✓	—	—
[480-59.94i]	[DVCPRO50/60i]	[60i]	[16BIT]	✓	—	✓
		[30P]		✓	—	—
	[DVCPRO/60i]	[60i]		✓	—	✓
		[30P]		✓	—	—
	[DV/60i]	[60i]		✓	—	✓
		[30P]		✓	—	—
[576-50i]	[DVCPRO50/50i]	[50i]	[16BIT]	✓	—	✓
		[25P]		✓	—	—
	[DVCPRO/50i]	[50i]		✓	—	✓
		[25P]		✓	—	—
	[DV/50i]	[50i]		✓	—	✓
		[25P]		✓	—	—

*1 [AVC-G6 2CH MOV]

*2 When [LINE&FREQ] is set to [720-60P] or [720-50P], [LOW 2CH MOV] cannot be selected.

*3 When [LINE&FREQ] is set to [480-59.94i] or [576-50i], proxy recording mode is fixed to [LOW 2CH MOV]. The selection menu of the proxy recording mode (the menu → [RECORDING SETUP] → [DUAL CODEC SETTING] → [PROXY REC MODE]) is not displayed.

List of recording settings and recording functions

The recording modes of the camera act as follows depending on the setting of [RECORDING] in the main menu → [RECORDING SETUP]. Even in “Available” cases, recording functions are restricted in some system modes. For details, refer to the table in “System modes and recording functions”.

Setting	Recording setting (setting menu)	Recording/operation enabled/disabled		
Operation mode	[RECORDING]	Pre-recording	One-clip recording	Simultaneous recording
Interval recording	[INTERVAL]	Not available	Not available	Not available
One-shot recording	[ONE SHOT]	Not available	Not available	Not available
Loop recording	[LOOP]	Not available	Not available	Not available
Standard recording	[NORMAL]	Refer to “System modes and recording functions”.		

Setting	Recording setting (setting menu)	Recording/operation enabled/disabled		
Operation mode	[RECORDING]	Dual codec recording	Text memo	Shot mark
Interval recording	[INTERVAL]	Not available	Not available	Not available
One-shot recording	[ONE SHOT]	Not available	Not available	Not available
Loop recording	[LOOP]	Not available	Not available	Not available
Standard recording	[NORMAL]	Refer to “System modes and recording functions”.		

Selecting video output

The video output method can be selected.

Video output can be selected, for example, in the setting menus and SmartUI.

Setting item	Description of settings
[MON] ([SET02:MON/HDMI FORMAT] screen of SmartUI)	Select the signal type used to output to the <MON OUT> and <HDMI> terminals.

Setting item	Description of settings
[SETUP] (Main menu → [SYSTEM MODE])	Select the setup level of the signal (composite) to output to the <MON OUT> terminal. • [0%]: 0% setup for both output and recording • [7.5%A]: 7.5% setup for output only (recording 0%) The [SETUP] menu setting is valid also at playback.
[D.CON] ([SET02:MON/HDMI FORMAT] screen of SmartUI)	Select the screen type at down-conversion output (composite and SD SDI output) in the HD mode (1080i, 720P).

Selecting video output from each terminal

[LINE&FREQ]	Monitor output setting ([SET02:MON/HDMI FORMAT] screen of SmartUI)*		Video output		
	[MON]	[HDMI]	<SDI OUT/IN (OP)> terminal	<MON OUT> terminal	<HDMI> terminal
[1080-59.94i/P] [1080-59.94i]	[AUTO]	[1080i/720P]	1080/59.94i	1080/59.94i (HD SDI)	1080/59.94i
	[480i]	[480P]		480/59.94i (SD SDI)	480/59.94P
	[VBS]	[480P]		480/59.94i (VBS)	480/59.94P
[1080-23.98PsF]	[AUTO]	[1080i/720P]	1080/23.98PsF	1080/59.94i (HD SDI)	1080/59.94i
	[480i]	[480P]		480/59.94i (SD SDI)	480/59.94P
	[VBS]	[480P]		480/59.94i (VBS)	480/59.94P
[720-59.94P]	[AUTO]	[1080i/720P]	720/59.94P	720/59.94P (HD SDI)	720/59.94P
	[480i]	[480P]		480/59.94i (SD SDI)	480/59.94P
	[VBS]	[480P]		480/59.94i (VBS)	480/59.94P
[480-59.94i]	[SDI]	[480P]	480/59.94i	480/59.94i (SD SDI)	480/59.94P
	[VBS]	[480P]		480/59.94i (VBS)	480/59.94P
[1080-50i/P] [1080-50i]	[AUTO]	[1080i/720P]	1080/50i	1080/50i (HD SDI)	1080/50i
	[576i]	[576P]		576/50i (SD SDI)	576/50P
	[VBS]	[576P]		576/50i (VBS)	576/50P
[720-50P]	[AUTO]	[1080i/720P]	720/50P	720/50P (HD SDI)	720/50P
	[576i]	[576P]		576/50i (SD SDI)	576/50P
	[VBS]	[576P]		576/50i (VBS)	576/50P
[576-50i]	[SDI]	[576P]	576/50i	576/50i (SD SDI)	576/50P
	[VBS]	[576P]		576/50i (VBS)	576/50P

* [MON] and [HDMI] are interlocked.

Recording/playback and output format list

• Frequencies in signal methods are annotated without fractions.
- 59.94 → 60 / 23.98 → 24 / 29.97 → 30

Setting			Recording format	<SDI OUT/IN (OP)> terminal	
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]		Video format	Audio
[1080-59.94i/P]	[AVC-I100/30PN] [AVC-G50/30PN] [AVC-G25/30PN] [AVC-G12/30PN]	Disabled	1080/30PN Native	1080/29.97P over 59.94i 2:2	4ch
	[AVC-I100/24PN] [AVC-G50/24PN] [AVC-G25/24PN] [AVC-G12/24PN]		1080/24PN Native	1080/23.98P over 59.94i 2:3	4ch
[1080-59.94i]	[AVC-I100/60i] [AVC-I50/60i] [AVC-G50/60i] [AVC-G25/60i] [AVC-G12/60i]	Disabled	1080/60i	1080/59.94i	4ch
	[DVCPRO HD/60i]	—	1080/60i	1080/59.94i	4ch
[1080-50i/P]	[AVC-I100/25PN] [AVC-G50/25PN] [AVC-G25/25PN] [AVC-G12/25PN]	Disabled	1080/25PN Native	1080/25P over 50i 2:2	4ch
[1080-50i]	[AVC-I100/50i] [AVC-I50/50i] [AVC-G50/50i] [AVC-G25/50i] [AVC-G12/50i]	Disabled	1080/50i	1080/50i	4ch
	[DVCPRO HD/50i]	—	1080/50i	1080/50i	4ch
[1080-23.98PsF]	[AVC-I100/24PN] [AVC-G50/24PN] [AVC-G25/24PN] [AVC-G12/24PN]	Disabled	1080/24PN Native	1080/23.98PsF	4ch

Setting			Recording format	<SDI OUT/IN (OP)> terminal	
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]		Video format	Audio
[720-59.94P]	[AVC-I100/60P] [AVC-I50/60P] [AVC-G50/60P] [AVC-G25/60P] [AVC-G12/60P]	Disabled	720/60P	720/59.94P	4ch
	[AVC-I100/30PN]		720/30PN Native	720/30P over 60P 2:2	4ch
	[AVC-I100/24PN]		720/24PN Native	720/24P over 60P 2:3	4ch
	[DVCPRO HD/60P]		720/60P	720/59.94P	4ch
[720-50P]	[AVC-I100/50P] [AVC-I50/50P] [AVC-G50/50P] [AVC-G25/50P] [AVC-G12/50P]	Disabled	720/50P	720/50P	4ch
	[AVC-I100/25PN]		720/25PN Native	720/25P over 50P 2:2	4ch
	[DVCPRO HD/50P]		720/50P	720/50P	4ch
[480-59.94i]	[DVCPRO50/60i] [DVCPRO/60i] [DV/60i]	[60i]	480/60i	480/59.94i	4ch
		[30P]	480/30P over 60i 2:2 Pull Down	480/29.97PsF over 59.94i 2:2	
[576-50i]	[DVCPRO50/50i] [DVCPRO/50i] [DV/50i]	[50i]	576/50i	576/50i	4ch
		[25P]	576/25P over 50i 2:2 Pull Down	576/25PsF over 50i 2:2	

Dual codec recording

Recording in different formats for main recording and sub recording can be performed on the camera.
For sub recording, HD proxy (AVC-LongG 6 format) and SD proxy can be selected according to the [LINE&FREQ] setting.
The file format is MOV that is suitable for nonlinear editing.
For the combination with the main recording, refer to “System modes and recording functions” (page 76).

Dual codec recording setting

Setting menu

When recording proxy data with the camera, set in the main menu → [RECORDING SETUP] → [DUAL CODEC SETTING].

Item	Description of settings
[CODEC USAGE]	Selects media for recording proxy data. **[PROXY REC(P2)]:** Records proxy data to a P2 card. **[PROXY REC(P2&SD)]:** Records proxy data to both of a P2 card and SD memory card. **[STREAMING]:** Outputs video stream. **[OFF]:** Does not record proxy data or output streaming. • Factory setting: [OFF]
[PROXY REC MODE]	Sets the recording mode of proxy data. **[LOW 2CH MOV], [HQ 2CH MOV], [SHQ 2CH MOV], [AVC-G6 2CH MOV]** • Factory setting: [HQ 2CH MOV]
[STREAMING MODE]	Sets the transfer mode for streaming. **[LOW], [HQ], [AVC-G6], [SHQ (QoS)], [AVC-G (QoS)]** • Factory setting: [HQ]
[PROXY DISP]	Selects whether to display proxy data recorded information or messages in the viewfinder. **[ON]:** Displays proxy recording information and SD memory card remaining capacity at the start of recording. Warning information is displayed at all times. **[OFF]:** Displays proxy and SD memory card warning information for only three seconds when warning occurs. • Factory setting: [OFF]
[QoS MAX RATE]	Sets the maximum bitrate for video data when the QoS is operating. This setting is used when the streaming distribution is started from the operation of the camera. This can be set when [CAMERA] is selected in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [START TRIGGER]. **[256Kbps], [512Kbps], [1Mbps], [1.5Mbps], [2.5Mbps], [3.5Mbps], [6Mbps], [9Mbps]** • Factory setting: [9Mbps] [9Mbps] cannot be selected when [STREAMING MODE] is set to [SHQ (QoS)].
[QoS MIN RATE]	Sets the minimum bitrate for video data when the QoS is operating. This setting is used when the streaming distribution is started from the operation of the camera. This can be set when [CAMERA] is selected in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [START TRIGGER]. **[256Kbps], [512Kbps], [1Mbps], [1.5Mbps], [2.5Mbps], [3.5Mbps], [6Mbps], [9Mbps]** • Factory setting: [256Kbps]
[STREAMING LATENCY]	Sets the delay mode during the streaming distribution. This setting is used when the streaming distribution is started from the operation of the camera. This can be set when [CAMERA] is selected in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [START TRIGGER]. **[NORMAL]:** Set this to prioritize the stability of streaming. **[SHORT]:** Set this to prioritize the reduction of streaming delay. • Factory setting: [NORMAL]

- For details on relations between dual codec recording and system mode, refer to “System modes and recording functions” (page 76).
- When streams are output, proxy data is not recorded.
- If [CODEC USAGE] cannot be changed, change the [PROXY REC MODE] or [STREAMING MODE] setting.
- When the main menu → [SYSTEM MODE] → [LINE&FREQ] is set to [480-59.94i] or [576-50i], proxy recording mode is fixed to [LOW 2CH MOV], and [PROXY REC MODE] is not displayed.
- When the main menu → [SYSTEM MODE] → [LINE&FREQ] is set to [1080-59.94P], [1080-50P], [1080-23.98PsF], [480-59.94i], or [576-50i], the streaming function is disabled and the following items are not displayed.
  - [STREAMING MODE]
  - [QoS MAX RATE]
  - [QoS MIN RATE]
  - [STREAMING LATENCY]

Checking the setting status

Push the <DISP/MODE CHK> switch on the camera towards the <CHK> side twice to check the setting values of [CODEC USAGE], [PROXY REC MODE], and [STREAMING MODE] with the mode check function.

Recording modes and recording signals (video/audio)

The following settings are available only when the main recording is set to [1080-59.94i], [1080-50i], [720-59.94P], or [720-50P] from the main menu → [SYSTEM MODE] → [LINE&FREQ]. For details, refer to “System modes and recording functions” (page 76).

■ **Video**

Recording mode	File format	Resolution	Codec	Frame rate	Bitrate
[AVC-G6 2CH MOV]	MOV	1920×1080*1	H.264 High Profile	30 fps/25 fps	6 Mbps
		1280×720*2		60 fps/50 fps	
				30 fps/25 fps/24 fps	3 Mbps
[SHQ 2CH MOV]	MOV	960×540	H.264 High Profile	30 fps/25 fps	3500 kbps
[HQ 2CH MOV]	MOV	640×360	H.264 High Profile	30 fps/25 fps	1500 kbps
[LOW 2CH MOV]	MOV	480×270 352×240*3 352×288*4	H.264 Baseline Profile	30 fps/25 fps	800 kbps

*1 When [LINE&FREQ] is [1080-59.94i] or [1080-50i]
*2 When [LINE&FREQ] is [720-59.94P] or [720-50P]
*3 480/59.94i mode
*4 576/50i mode

■ **Audio**

Recording mode	File format	Codec	Number of channels	Bitrate per channel	Sampling frequency
[AVC-G6 2CH MOV]	MOV	AAC-LC	2ch	64 kbps	48 kHz
[SHQ 2CH MOV]	MOV	LPCM	2ch	768 kbps	48 kHz
[HQ 2CH MOV]	MOV	AAC-LC	2ch	64 kbps	48 kHz
[LOW 2CH MOV]	MOV	AAC-LC	2ch	64 kbps	48 kHz

Recording the proxy data

Select [PROXY REC(P2)] or [PROXY REC(P2&SD)] in main menu → [RECORDING SETUP] → [DUAL CODEC SETTING] → [CODEC USAGE] and press the <REC> button to start proxy recording at the same time as recording of the materials.

Push the <DISP/MODE CHK> switch towards the <CHK> side twice to display the proxy data recording information on the viewfinder.

Recording to the SD memory card

To record the proxy data, use SD, SDHC, or SDXC memory cards with an indication of class2 or higher.

If the recording format of the proxy data is [SHQ 2CH MOV] or [AVC-G6 2CH MOV], use a card of class4 or higher.

For the latest information not included in these Operating Instructions, refer to the support desk at the following website.

http://pro-av.panasonic.net/

When recording the proxy data to an SD memory card, always format the card using the camera.

Checking the SD memory card

1 Insert the SD memory card into the camera.

2 Select the main menu → [CARD FUNCTIONS] → [SD CARD PROPERTY].

- The format status is displayed in [SD STANDARD].
  If [NOT SUPPORTED] is displayed, format the card with the camera.
- In the [PROXY REM] item, check the remaining recording time of the proxy data.
  The remaining SD memory card capacity displayed ([PROXY REM]) indicates the remaining proxy recording, but it may differ from the actual available space. If short recordings are repeated, the available recording time may decrease significantly compared to the available space. When the remaining capacity exceeds 999 min, [999min] is displayed.
  If the proxy is not recorded to the SD memory card, the remaining time is not displayed.
- In the [NUMBER OF CLIPS] item, check the number of clips recorded in the SD memory card.
  If the number of clips is 1000 or more, no additional proxy data can be recorded to the SD memory card even if there is available capacity.
- Shot marks and text memos cannot be added to the clips in the SD memory card,
- Deleting the clips recorded on the P2 card on the thumbnail screen does not delete the proxy data recorded on the SD memory card.

NOTE

- While recording is performed to the SD memory card, the remaining capacity can be checked also with the mode check on the viewfinder.
- If proxy data cannot be recorded to the SD memory card, even when the main menu → [RECORDING SETUP] → [DUAL CODEC SETTING] → [CODEC USAGE] → [PROXY REC(P2&SD)] is set, [SD WR ERR] is displayed. In this case, check the SD memory card. For details, refer to “Error displays about proxy data recordings” (page 85).
- Data deleted as a result of formatting cannot be restored. Always check the data before formatting.

Formatting SD memory cards

1 Insert the SD memory card into the camera.

2 Select [YES] in the main menu → [CARD FUNCTIONS] → [FORMAT SD CARD].

This completes formatting the SD memory card.

Proxy data recording time (approximate)

Recording mode	Total recording rate	Recording time (per 1 GB)
[AVC-G6 2CH MOV]	Approx. 6 Mbps	Approx. 13 min
[SHQ 2CH MOV]	Approx. 5060 kbps	Approx. 25 min
[HQ 2CH MOV]	Approx. 1650 kbps	Approx. 78 min
[LOW 2CH MOV]	Approx. 950 kbps	Approx. 135 min

(These are reference values for continuous recording with Panasonic products. The recording time may differ depending on the scene or the number of clips.)

Checking the proxy data

- The P indicator is displayed for the material clips with the proxy data recorded.
- The detailed information of the recorded proxy data can be viewed in the clip property.
  For details on operations, refer to “Checking detailed information of the proxy data” (page 84).
- The proxy data is recorded to the P2 card or SD memory card as a video/audio file and real-time metadata file.
  - Audio file: XXXXXXXX.MOV
  - Real-time metadata file: XXXXXXXX.BIN
    The time code, user bits, and information are recorded to the frame unit.

  Use P2 Viewer Plus to check the proxy data. Some versions of P2 Viewer Plus may not be able to check the data.
  For information on P2 Viewer Plus, visit the following website:
  http://pro-av.panasonic.net/

NOTE

- Clips with proxy data recorded with the camera are handled as unknown clips by some P2 devices. ? (unknown clip indicator) is displayed on the thumbnail, and the following operations become unavailable.
  - [DELETE]
  - [REPAIR CLIP]
  - [RE-CONNECTION]
  - [COPY]
  - [EXCH. THUMBNAIL]
  - Adding and deleting [TEXT MEMO] and [SHOT MARK]

  Playback is possible.
  On these devices, clips with proxy data made of linked multiple clips are displayed as individual incomplete clips !.

Checking detailed information of the proxy data

Operation methods and panels may differ by version.

1 Press the <THUMBNAIL> button.

The thumbnail screen appears on the viewfinder.

2 Select [CLIP PROPERTY] in the main menu → [CLIP] → [PROPERTY].

The clip property screen is displayed.

3 Use the cursor buttons to select [PROXY].

4 Press the <SET> button.

Detailed information about the proxy data is displayed as below.

■ **Detailed information about proxy data**

[FORMAT]	The file format of the recorded data is displayed.
[VIDEO CODEC]	Video codec information of the recorded data is displayed.
[VIDEO FRAME RATE]	Video frame rate information of the recorded data is displayed.
[VIDEO BIT RATE]	Video bitrate information of the recorded data is displayed.
[VIDEO RESOLUTION]	The video resolution of the recorded data is displayed.
[ASPECT RATIO]	The aspect ratio of the recorded data is displayed.
[TC SUPER]	An indication whether the TC (time code) display is superimposed over the recorded video.
[AUDIO CODEC]	Audio codec information of the recorded data is displayed.
[AUDIO BIT RATE]	Audio bitrate information of the recorded data is displayed.
[AUDIO SAMPLING RATE]	Audio sampling rate information of the recorded data is displayed.
[NUM.OF AUDIO CH]	The number of audio channels of the recorded data is displayed.

Error displays about proxy data recordings

If an error occurs during recording the proxy data, check the entries in the following table and take necessary actions.

Error displays (Viewfinder)	Behavior and cause	Action to take
[PROXY ERROR] or [PROXY REC WARNING]	Stops recording of proxy data. This may also stop recording of materials. • An error occurred in the internal proxy module. [PROXY ERROR] • A proxy data recording error occurred. [PROXY REC WARNING] • If a proxy data recording error occurs, the proxy data currently being recorded will be processed as below: - The proxy data being recorded to the P2 card will be deleted. - The proxy data being recorded to the SD memory card will not be restored.	The proxy data will not be properly recorded. Turn off the camera and turn on it again to check the recording and playback. If the error continues to occur, please consult your dealer.
[SD 0 min]	Recording of the materials and proxy data will continue. • The remaining SD memory card capacity is getting low. (approximately shorter than one minute)	After finishing recording, insert a new SD memory card.
[SD END]	Proxy data recording to the SD memory card will stop, but recording to the P2 card will continue. • No SD memory card capacity remains.	After finishing recording, insert a new SD memory card. • The proxy data being recorded to the SD memory card will be deleted. To restore the deleted proxy data, select clips in the P2 card and copy them to the SD memory card. (page 85)
[SD WR ERR]	Proxy data recording to the SD memory card will stop, but recording to the P2 card will continue. This is displayed when proxy data cannot be recorded in the SD memory card even when the main menu → [RECORDING SETUP] → [DUAL CODEC SETTING] → [CODEC USAGE] is set to [PROXY REC(P2&SD)]. ■ **If the error message is displayed when recording starts:** • The SD memory card format is different. • The SD memory card contains 1000 clips or more. ■ **If the error message is displayed during recording:** • The SD memory card was ejected during recording. • An error occurred in recording to the SD memory card.	Check the status of the SD memory card and insert a recordable card. (page 83)
[SD --min] or [SD WP]	Proxy data will not be recorded to the SD memory card, but recording to the P2 card will be performed. • No SD memory card is inserted. [SD --min] • The SD memory card is write-protected. [SD WP]	Check the status of the SD memory card.

Copying proxy data to the SD memory card

1 Press the <THUMBNAIL> button to display the thumbnail screen.

2 Use the cursor buttons to move the cursor to the clip to be copied, and press the <SET> button.

3 Select [SD CARD] in the main menu → [CLIP] → [COPY].

4 Select [YES] in the confirmation message and press the <SET> button.

NOTE

- If [SD END] is displayed and the proxy data being recorded to the SD memory card is deleted, perform this procedure to copy the proxy data from the P2 card, and enable the deleted proxy data to be restored.
- Source data is not copied.

Streaming function

You can perform live streaming of audio and video from the camera over the network (wired LAN, wireless LAN, 4G/LTE).

Streaming video from the camera or an application software (e.g. P2 Browser, P2 Streaming Receiver) of a device connected to the camera through a network is transmitted to a server capable of receiving such signal.

There are two ways to start streaming: streaming from an application software and streaming from the camera.

NOTE

- To display the streaming video in the P2 Browser, start the streaming distribution by operation from the application software. The streaming video cannot be displayed when operated from the camera.

Setting the network connection

The network settings of the camera are configured according to the settings of application software.

For details on the network connection when starting streaming from the camera or an application software such as P2 Streaming Receiver, refer to “Connection settings for the streaming function” (page 195).

Using the streaming function

After you finish configuring the network connection, you can configure the streaming function.

1 Select [STREAMING] in the main menu → [RECORDING SETUP] → [DUAL CODEC SETTING] → [CODEC USAGE].

Streaming function is enabled.

2 Set the streaming mode in the main menu → [RECORDING SETUP] → [DUAL CODEC SETTING] → [STREAMING MODE].

- Select either [LOW], [HQ], [AVC-G6], [SHQ (QoS)], or [AVC-G (QoS)].
- For details on combinations of system modes and streaming modes, refer to the table in “List of system modes and supported streaming output” (page 87).

3 Set the method for starting streaming.

- **When starting streaming through operation from an application software**
  - Select [RECEIVER] in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [START TRIGGER].
- **When starting streaming through operation from the camera**
  - Select [CAMERA] in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [START TRIGGER].
  - Perform following settings when the streaming mode is set to [SHQ (QoS)] or [AVC-G (QoS)] in Step **2**.
    Set the main menu → [RECORDING SETUP] → [DUAL CODEC SETTING] → [QoS MAX RATE] and [QoS MIN RATE].
  - Set the delay mode during streaming in the main menu → [RECORDING SETUP] → [DUAL CODEC SETTING] → [STREAMING LATENCY]. [NORMAL] is set when the stability of streaming is to be prioritized. [SHORT] is set when reducing of the streaming delay is to be prioritized.

4 Start streaming.

- **When starting streaming through operation from an application software**

  If you started streaming using an application software, the camera starts the transmission of streaming video.
- **When starting streaming through operation from the camera**

  Select [ON] in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [START].

  The transmission of streaming video is started when the camera is connected to to the transmission destination via network.

  To stop the transmission of streaming video, select [OFF] in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [START].

  Also, the start and stop of the streaming image distribution can be controlled by the USER button when [STREAMING START] is assigned to the USER button with the main menu → [USER SW].

NOTE

- To display streaming video using the P2 Browser, VLC Media Player is required for Windows OS and QuickTime Player is required for Mac OS. However, the P2 Browser does not support the QoS function.
- For details on downloading the video streaming compatible application software and the operating environment, visit the support desk at the following website:
  http://pro-av.panasonic.net/
- The streaming function cannot be used together with the dual codec recording or simultaneous recording.
- The streaming function cannot be used together with the rec during upload function.
- If available bandwidth of the network is low and streaming playback is interrupted, playback condition can be improved by selecting a lower bitrate mode in [STREAMING MODE], or selecting either [SHQ (QoS)] or [AVC-G (QoS)]. In addition, if [SHQ (QoS)] or [AVC-G (QoS)] is selected, the terminal that receives streaming data needs to support the QoS function.
- The streaming video from the camera will be a black screen in the playback mode (including the recording check).

List of system modes and supported streaming output

The following shows the relationship between system modes and streaming modes on this camera. When [LINE&FREQ] is set to [480-59.94i] or [576-50i], the streaming function is disabled.

- "✓": Supported; "—": Not supported

[SYSTEM MODE]		[STREAMING MODE]	
[LINE&FREQ]	[REC FORMAT]	HD streaming [AVC-G6], [AVC-G (QoS)]	SD streaming [HQ], [LOW], [SHQ (QoS)]
[1080-59.94i]	[AVC-I100/60i]	✓	✓
	[AVC-I50/60i]	—	✓
	[AVC-G50/60i]	✓	✓
	[AVC-G25/60i]	✓	✓
[1080-50i]	[AVC-I100/50i]	✓	✓
	[AVC-I50/50i]	—	✓
	[AVC-G50/50i]	✓	✓
	[AVC-G25/50i]	✓	✓
[720-59.94P]	[AVC-I100/60P]	✓	✓*
	[AVC-I50/60P]	—	✓*
	[AVC-G50/60P]	✓	✓*
	[AVC-G25/60P]	✓	✓*
[720-50P]	[AVC-I100/50P]	✓	✓*
	[AVC-I50/50P]	—	✓*
	[AVC-G50/50P]	✓	✓*
	[AVC-G25/50P]	✓	✓*

* [LOW] cannot be selected.

List of streaming modes and resolution/frame rates

Streaming mode	Resolution	Codec	Frame rate	Bitrate
[AVC-G6]	1920×1080*1	Video: H.264 High Profile Audio: AAC-LC 2ch	30 fps/25 fps	6 Mbps
	1280×720*2		60 fps/50 fps	
[HQ]	640×360		30 fps/25 fps	1500 kbps
[LOW]	480×270	Video: H.264 Baseline Profile Audio: AAC-LC 2ch	30 fps/25 fps	800 kbps
[AVC-G (QoS)]	1920×1080*1	Video: H.264 High Profile Audio: AAC-LC 2ch	30 fps/25 fps	Receiving side: Variable depending on the application Maximum 9 Mbps
	1280×720*2		60 fps/50 fps	
[SHQ (QoS)]	960×540	Video: H.264 High Profile Audio: AAC-LC 2ch	30 fps/25 fps	Receiving side: Variable depending on the application Maximum 6 Mbps

*1 When [LINE&FREQ] is [1080-59.94i] or [1080-50i]

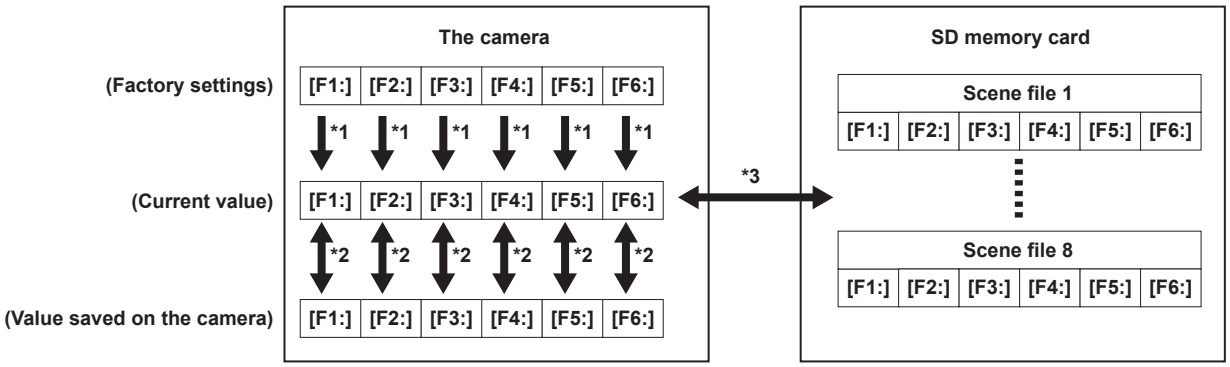
*2 When [LINE&FREQ] is [720-60P] or [720-50P]

Handling setting data

Setting data file configuration

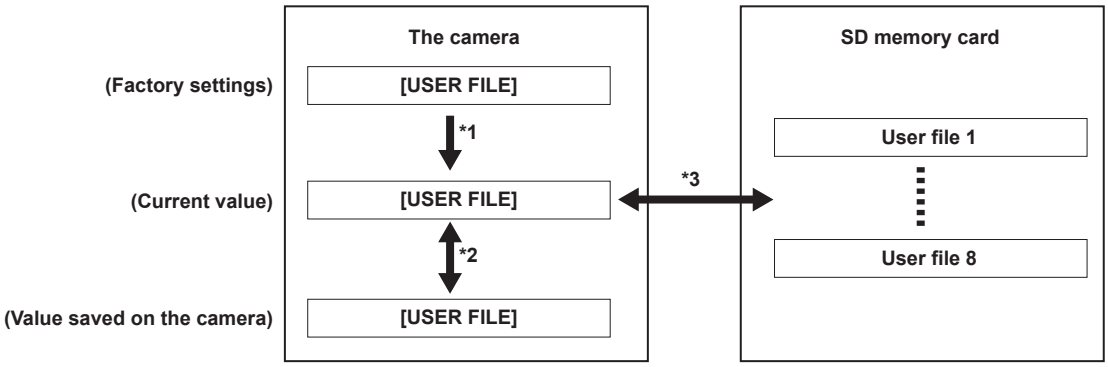
[F1:] to [F6:] scene files can be saved internally on the camera according to scene file numbers.
Scene file data ([F1:] to [F6:]) can be saved as a file, and up to eight files can be saved on the SD memory card at a time, which can be loaded and used.
Setting menu values (including SmartUI setting values) can be saved as one user file on the camera, and can be saved as up to eight user files in the SD memory card.
Setting data file structure of the camera is as follows.

■ **Scene file**



*1 Select [INITIALIZE] in the main menu → [SCENE FILE] → [LOAD/SAVE/INITIALIZE].
By scene file unit as selected in [FILE] in the [CAM02:SCENE FILE] screen of SmartUI
*2 Select [LOAD] or [SAVE] in the main menu → [SCENE FILE] → [LOAD/SAVE/INITIALIZE].
By scene file unit as selected in [FILE] in the [CAM02:SCENE FILE] screen of SmartUI
*3 Select [LOAD] or [SAVE] in the main menu → [CARD FUNCTIONS] → [SCENE FILE].
[F1:] to [F6:] at once

■ **User file**

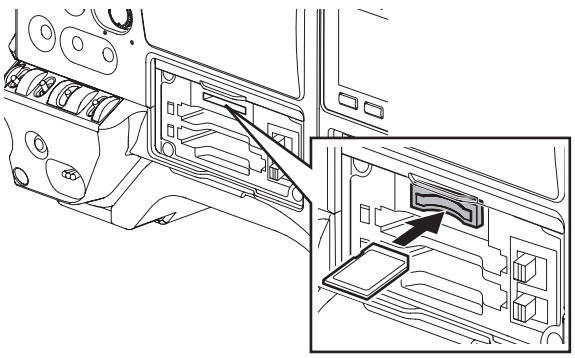


*1 Select [INITIALIZE] in the main menu → [OTHER FUNCTIONS] → [USER FILE].
*2 Select [LOAD] or [SAVE] in the main menu → [OTHER FUNCTIONS] → [USER FILE].
*3 Select [LOAD] or [SAVE] in the main menu → [CARD FUNCTIONS] → [USER FILE].

Handling SD memory cards

The SD memory card can be removed and inserted, either before or after the power is turned on.

Inserting SD memory cards



1 Open the slot cover.

2 Insert the SD memory card into the SD memory card slot with the label side of the card upward, and close the slot cover.

NOTE

- Before inserting the SD memory card, confirm that the orientation of the SD memory card is correct. If the SD memory card is hard to insert, it may be reversed or upside-down. Do not force it into the slot. Check the orientation of the card before reinserting it.
- On the camera, use SD memory cards that are compliant with the SD, the SDHC, or the SDXC standards.
- For details on handling SD memory cards, refer to “Cautions when using SD memory cards” (page 21).

Removing SD memory cards

After opening the slot cover and making sure that the busy lamp is not illuminated, push the SD memory card further into the camera and then release. This releases the SD memory card from the card slot. Remove the SD memory card and close the slot cover.

Note the following points when using or storing memory cards.

- Avoid high temperature and humidity.
- Avoid water droplets.
- Avoid charging with electricity.

Store the SD memory card with the card still inserted into the camera and with the slot cover closed.

Performing operations on SD memory cards

To perform operations such as formatting an SD memory card, writing setting data to an SD memory card, or reading the written data, use [FORMAT SD CARD] and [SCENE FILE]/[USER FILE] in the main menu → [CARD FUNCTIONS].

If the SD memory card that was formatted in a standard other than the SD/SDHC/SDXC standards on a device other than the camera is inserted, [LOAD] or [SAVE] operation of the file cannot be performed. Format the SD memory card again.

Formatting SD memory cards

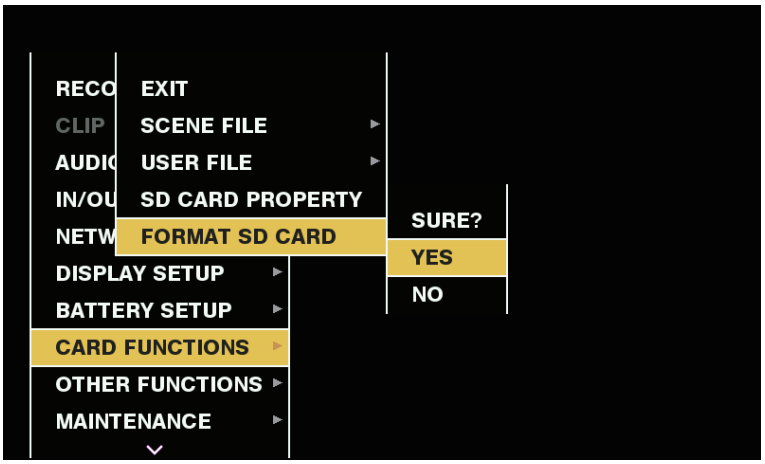


Fig. 1

1 Select the main menu → [CARD FUNCTIONS] → [FORMAT SD CARD].

The confirmation screen is displayed.

2 Select [YES] in the confirmation screen, and press the <SET> button (or the jog dial button). (Fig. 1)

When you do not want to format the memory card, select [NO], and press the <SET> button (or the jog dial button).

3 When the completion message is displayed, select [OK] and press the <SET> button (or the jog dial button).

For details on error messages, refer to “During thumbnail and menu operation” (page 207).

NOTE

- SD memory cards can also be formatted from the thumbnail screen.
  For details, refer to “Formatting SD memory cards” (page 117).
- Data deleted as a result of formatting cannot be restored. Always check the data before formatting.

How to use user data

The content of setting data can be written to and read written data from user area on the internal memory of the camera.

Use of this data allows you to quickly reproduce optimum setup states.

Writing setting data to user area

1 Select [SAVE] in the main menu → [OTHER FUNCTIONS] → [USER FILE].

The confirmation screen is displayed.

2 Select [YES] and press the <SET> button (or the jog dial button).

3 When the completion message is displayed, press the <SET> button (or the jog dial button).

Loading written user data

1 Select [LOAD] in the main menu → [OTHER FUNCTIONS] → [USER FILE].

The confirmation screen is displayed.
If [SYSTEM RESTART] is displayed on the confirmation screen, the camera will restart after reading out is complete.

2 Select [YES] and press the <SET> button (or the jog dial button).

Loading of the file begins.

How to use scene file data

The content of setting data can be written to and read written data from scene file area on the internal memory of the camera. Six types of scene files can be registered. Use of this data allows you to quickly reproduce optimum setup states.

■ **Factory settings**

[F1:]: File that is suitable for standard shooting.
[F2:FLUO.]: The file suitable for shooting when the characteristics of fluorescent light should be considered (such as shooting indoors).
[F3:SPARK]: The file that sharpens the color hue and contrast and that has suitable resolution for SD shooting.
[F4:B-STR]: The file suitable for shooting when the tone level of darker areas are to be stretched (such as shooting at sunset).
[F5:CINE V]: The file suitable for shooting cinematic video that has shaper contrast.
[F6:CINE D]: The file suitable for shooting cinematic video that has wider dynamic range.

NOTE

- [SYSTEM MODE] does not change even if the scene file is changed. Set all items in the main menu → [SYSTEM MODE].

Saving scene file setting data to the camera memory

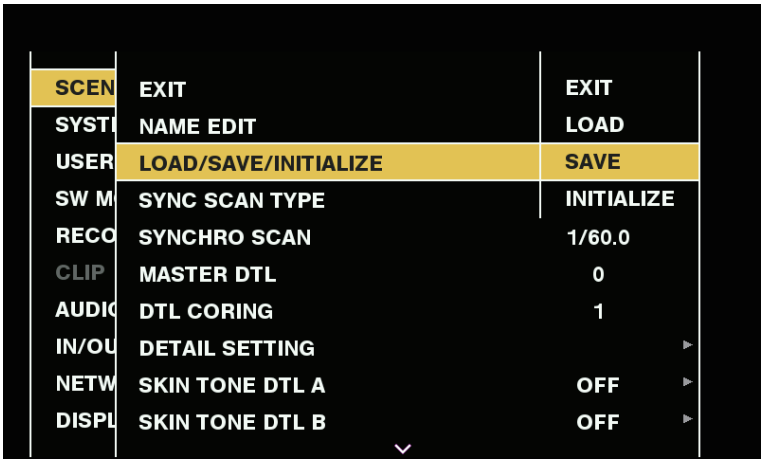


Fig. 1

1 Select a scene file to save in [FILE] in the [CAM02:SCENE FILE] screen of SmartUI.

2 Select [SAVE] in the main menu → [SCENE FILE] → [LOAD/SAVE/INITIALIZE]. (Fig. 1)

A confirmation screen is displayed.

3 Select [YES] and press the <SET> button (or the jog dial button).

The selected scene file is saved to the camera.

Loading the scene file saved in the camera

1 Select a scene file to load in [FILE] in the [CAM02:SCENE FILE] screen of SmartUI.

2 Select [LOAD] in the main menu → [SCENE FILE] → [LOAD/SAVE/INITIALIZE].

The confirmation screen is displayed.

3 Select [YES] and press the <SET> button (or the jog dial button).

The selected scene file is loaded from the camera.

Restoring the scene file setting data to the factory settings

1 Select the scene file to restore to the factory settings in [FILE] in the [CAM02:SCENE FILE] screen of SmartUI and press the <SET> button (or the jog dial button).

2 Select [INITIALIZE] in the main menu → [SCENE FILE] → [LOAD/SAVE/INITIALIZE].

The confirmation screen is displayed.

3 Select [YES] and press the <SET> button (or the jog dial button).

The selected scene file is restored to the factory settings.

Changing the scene file title

1 Select the scene file to change the title in [FILE] in the [CAM02:SCENE FILE] screen of SmartUI and press the <SET> button (or the jog dial button).

2 Select [NAME EDIT] in the main menu → [SCENE FILE].

The title entry screen and keyboard are displayed.

3 Enter the characters you want to set on the keyboard using cursor buttons (or the jog dial button).

4 Select [OK] and press the <SET> button (or the jog dial button).

The file name is updated.

How to restore the scene file or menu setting status to the factory settings

All the scene files and menu settings of the camera can be collectively restored to the factory settings.

1 Select [MENU INITIALIZE] in the main menu → [OTHER FUNCTIONS].

2 Select [EXECUTE] and press the <SET> button (or the jog dial button).

[SYSTEM RESTART] indication appears on the confirmation screen.

3 Select [YES] and press the <SET> button (or the jog dial button).

The camera is restarted and data are restored to the factory settings.

Saving to an SD memory card and loading saved data

Scene files and other setting values that you have set can be saved as a file, and up to 8 files can be saved on the SD memory card, and saved data can be loaded.

- For scene files, the current setting values are saved in the camera automatically, and you can write the saved data to an SD memory card. When they are loaded from the SD memory card, the current setting values are overwritten as well as the data saved in the camera.
- All scene files [F1:] to [F6:] are overwritten.

Saving scene files

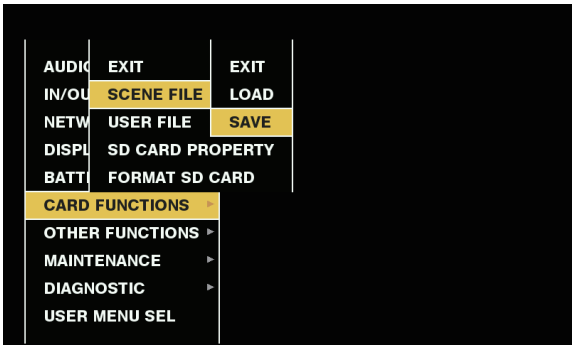


Fig. 1

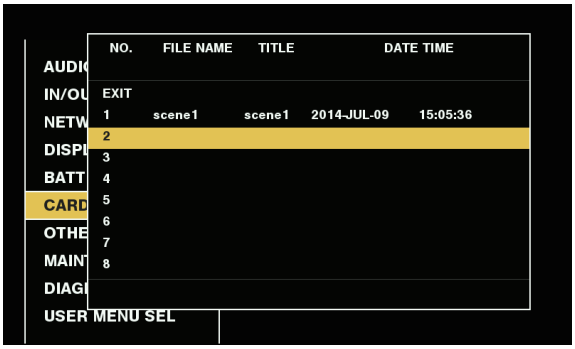


Fig. 2

1 Select [SAVE] in the main menu → [CARD FUNCTIONS] → [SCENE FILE]. (Fig. 1)

2 Select the file number (1 to 8) and press the <SET> button (or the jog dial button). (Fig. 2)

The title entry screen and keyboard are displayed.

3 Enter desired characters using cursor buttons (or the jog dial button).

4 Select [OK] on the keyboard and press the <SET> button (or the jog dial button).

A confirmation screen is displayed.

5 Select [YES] and press the <SET> button (or the jog dial button).

The file is written with the entered title on the SD memory card, and the screen of Fig. 2 returns.

Loading scene files

1 Select [LOAD] in the main menu → [CARD FUNCTIONS] → [SCENE FILE].

2 Select the file number (1 to 8) and press the <SET> button (or the jog dial button).

A confirmation screen is displayed.

3 Select [YES] and press the <SET> button (or the jog dial button).

When loading is completed, [LOAD OK!] is displayed.

Saving and loading user files

Select [SAVE] or [LOAD] in the main menu → [CARD FUNCTIONS] → [USER FILE]. The operations onward are the same as for scene files.

Selection of external reference signal and generator lock setting

Locking the video signal to the external reference signal

The video signal output from the camera can be locked to the reference signal supplied from an external source.
The camera can receive external reference signals from the <GENLOCK IN> terminal.

Genlocking to the reference signal supplied from the <GENLOCK IN> terminal

HD-Y or composite signal that suits the system frame frequency is supplied to the <GENLOCK IN> terminal. Select the output signal to lock to the input reference signal in the main menu → [OTHER FUNCTIONS] → [GL PHASE] (not available at 480i, 576i).
Adjust the horizontal phase of the reference signal and output signal in the main menu → [OTHER FUNCTIONS] → [H PHASE].

NOTE

- The subcarrier of the composite signal of the camera is not locked to the subcarrier of the reference signal.

Output status

The output status changes as follows according to selection of the external reference signal and generator lock setting.
Set [GL PHASE] in the main menu → [OTHER FUNCTIONS].

Selection of external reference signal		Generator lock setting	Output signal status (phase relationship with external reference signal)
System mode	Input signal	[GL PHASE]	
1080i, 1080i/P	HD-Y	[HD SDI]	HD SDI output matches the HD-Y input signal. Down converter output has a delay of approx. 90 H from the HD-Y input signal.
		[COMPOSITE]	Down converter output matches the HD-Y input signal. HD SDI output has an advance of approx. 90 H from the HD-Y input signal.
	Composite	[HD SDI]	HD SDI output matches the composite input signal. Down converter output has a delay of approx. 90 H from the composite input signal.
		[COMPOSITE]	Down converter output matches the composite input signal. HD SDI output has an advance of approx. 90 H from the composite input signal.
720P	HD-Y	[HD SDI]	HD SDI output matches the HD-Y input signal. Down converter output has a delay of approx. 120 H from the HD-Y input signal.
		[COMPOSITE]	Down converter output matches the HD-Y input signal. HD SDI output has an advance of approx. 120 H from the HD-Y input signal.
	Composite	[HD SDI]	HD SDI output matches the composite input signal. Down converter output has a delay of approx. 120 H from the composite input signal.
		[COMPOSITE]	Down converter output matches the composite input signal. HD SDI output has an advance of approx. 120 H from the composite input signal.
480i, 576i	Composite	—	SD SDI output matches the composite input signal. Composite output matches the composite input signal.
	HD-Y	—	SD SDI output is not locked to the HD-Y input signal. Composite output is not locked to the HD-Y input signal.

NOTE

- In the system mode of 1080i/P or 720P, a genlock is applied to the video signal when the HD-Y signal is input. In this case, time code may shift by one frame.
- Down converter output refers to the output from the <MON OUT> and <SDI OUT/IN (OP)> terminals.
- When the system mode is 1080/23.98PsF, the setting is fixed to [HD SDI] regardless of the settings of [GL PHASE].

Setting the time data

The camera provides time codes, user bits, and date and time (real time) data as time data, and they are recorded in the frame in sync with video. They are also recorded as data for clip metadata files.

Definition of time data

■ Time code

Rec run and free run can be switched by [TC_MD] in the [SET01:TC/UB] screen of SmartUI.

- **[F-RUN]:** The time code always advances even when the power is turned off, and it can be handled in the same way as the actual time. It can also be slaved to the time code input to the <TC IN/OUT> terminal.
- **[R-RUN]:** The time code advances only during recording. The number of the previously recorded clip is usually succeeded. The counter value is held even after the camera is turned off or the P2 card to be recorded to is removed.

NOTE

- In the following case, the values are not continuous.
  - When deleting recorded clips
  - When switching to 24PN and 30PN (25PN)
  - When recording is interrupted due to a malfunction of [REC WARNING], etc. during recording.

■ User bits

Two types of user bits are built in.

- LTC UB: Recorded as LTC and output from the <TC IN/OUT> terminal. It is also output as LTC of the HD SDI signal.
- VITC UB: Recorded as VITC (recorded to VIDEO AUX area by DVCPRO). It is also output as VITC of the HD SDI signal.

LTC UB can select and record user set values, time, year/month/day, the same value as time codes, camera frame rate information, and input value of external signals from the <TC IN/OUT> terminal, etc.

VITC UB records the camera frame rate information.

The LTC UB value of the recording start time can be recorded on the user bits of the clip metadata.

■ Date/time (real time)

- By means of the internal clock, year, month, day, and time can be displayed on the viewfinder and on the output image of the <MON OUT> terminal, etc.
- The internal clock is used for measuring the free run time code while the power is off and as time and year/month/day data of the user bits. It is also used as the reference for file generation times during clip recording, which determine the sorting order of thumbnails and the order of playback.
- It is also used to generate clip metadata and UMID (Unique Material Identifier).

  For details, refer to “Setting the date/time of the internal clock” (page 42).

Recording of time codes and user bits

Recording of time codes

Setting			Recording TC	
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	LTC	VITC
[1080-59.94i/P]	[AVC-I100/30PN] [AVC-G50/30PN] [AVC-G25/30PN] [AVC-G12/30PN]	—	Recording run/free run* [DF]/[NDF] 30 valid frames	Same value as LTC
	[AVC-I100/24PN] [AVC-G50/24PN] [AVC-G25/24PN] [AVC-G12/24PN]		Recording run/free run* [NDF] 24 valid frames	
[1080-59.94i]	[AVC-I100/60i] [AVC-I50/60i] [AVC-G50/60i] [AVC-G25/60i] [AVC-G12/60i]	—	Recording run/free run* [DF]/[NDF] 30 frames	Same value as LTC
	[DVCPRO HD/60i]			
[1080-50i/P]	[AVC-I100/25PN] [AVC-G50/25PN] [AVC-G25/25PN] [AVC-G12/25PN]	—	Recording run/free run* 25 frames	Same value as LTC
[1080-50i]	[AVC-I100/50i] [AVC-I50/50i] [AVC-G50/50i] [AVC-G25/50i] [AVC-G12/50i]	—	Recording run/free run* 25 frames	Same value as LTC
	[DVCPRO HD/50i]			
[1080-23.98PsF]	[AVC-I100/24PN] [AVC-G50/24PN] [AVC-G25/24PN] [AVC-G12/24PN]	—	Recording run/free run* [NDF] 24 frames	Same value as LTC

Setting			Recording TC	
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	LTC	VITC
[720-59.94P]	[AVC-I100/60P] [AVC-I50/60P] [AVC-G50/60P] [AVC-G25/60P] [AVC-G12/60P] [AVC-I100/30PN]	—	Recording run/free run* [DF]/[NDF] 30 frames	Same value as LTC
	[DVCPRO HD/60P]			
	[AVC-I100/24PN]	—	Recording run/free run* 24 frames	Same value as LTC
[720-50P]	[AVC-I100/50P] [AVC-I50/50P] [AVC-G50/50P] [AVC-G25/50P] [AVC-G12/50P] [AVC-I100/25PN]	—	Recording run/free run* 25 frames	Same value as LTC
	[DVCPRO HD/50P]			
[480-59.94i]	[DVCPRO50/60i] [DVCPRO/60i] [DV/60i]	[60i]	Recording run/free run* [DF]/[NDF] 30 frames	Same value as LTC (No recording in [DV/60i]/ [DV/50i])
		[30P]		
[576-50i]	[DVCPRO50/50i] [DVCPRO/50i] [DV/50i]	[50i]	Recording run/free run* 25 frames	Same value as LTC (No recording in [DV/60i]/ [DV/50i])
		[25P]		

* For free run, the time code is slaved to the input TC of the <TC IN/OUT> terminal.

Output of time codes

Setting			Output TC	
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	TC OUT	LTC, VITC of HD SDI
[1080-59.94i/P]	[AVC-I100/30PN] [AVC-G50/30PN] [AVC-G25/30PN] [AVC-G12/30PN]	—	LTC is output.	LTC is output.
	[AVC-I100/24PN] [AVC-G50/24PN] [AVC-G25/24PN] [AVC-G12/24PN]		LTC is converted to 30 frames and output.	LTC is converted to 30 frames and output.
[1080-59.94i]	[AVC-I100/60i] [AVC-I50/60i] [AVC-G50/60i] [AVC-G25/60i] [AVC-G12/60i]	—	LTC is output.	LTC is output.
	[DVCPRO HD/60i]			
[1080-50i/P]	[AVC-I100/25PN] [AVC-G50/25PN] [AVC-G25/25PN] [AVC-G12/25PN]	—	LTC is output.	LTC is output.
[1080-50i]	[AVC-I100/50i] [AVC-I50/50i] [AVC-G50/50i] [AVC-G25/50i] [AVC-G12/50i]	—	LTC is output.	LTC is output.
	[DVCPRO HD/50i]			
[1080-23.98PsF]	[AVC-I100/24PN] [AVC-G50/24PN] [AVC-G25/24PN] [AVC-G12/24PN]	—	LTC is output.	LTC is output.
[720-59.94P]	[AVC-I100/60P] [AVC-I50/60P] [AVC-G50/60P] [AVC-G25/60P] [AVC-G12/60P] [AVC-I100/30PN]	—	LTC is output.	LTC is output.
	[DVCPRO HD/60P]			
	[AVC-I100/24PN]	—	LTC is converted to 30 frames and output.	LTC is converted to 30 frames and output.
[720-50P]	[AVC-I100/50P] [AVC-I50/50P] [AVC-G50/50P] [AVC-G25/50P] [AVC-G12/50P] [AVC-I100/25PN]	—	LTC is output.	LTC is output.
	[DVCPRO HD/50P]			

Setting			Output TC	
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	TC OUT	LTC, VITC of HD SDI
[480-59.94i]	[DVCPRO50/60i] [DVCPRO/60i] [DV/60i]	[60i]	LTC is output.	None
		[30P]		
[576-50i]	[DVCPRO50/50i] [DVCPRO/50i] [DV/50i]	[50i]	LTC is output.	None
		[25P]		

Recording of user bits

Setting			Recording TC	
[LINE&FREQ]	[REC FORMAT]	[CAMERA MODE]	LTC UB	VITC UB
[1080-59.94i/P]	[AVC-I100/30PN] [AVC-G50/30PN] [AVC-G25/30PN] [AVC-G12/30PN]	—	Follows [UBG MODE]*1	Frame information lock
	[AVC-I100/24PN] [AVC-G50/24PN] [AVC-G25/24PN] [AVC-G12/24PN]			
[1080-59.94i]	[AVC-I100/60i] [AVC-I50/60i] [AVC-G50/60i] [AVC-G25/60i] [AVC-G12/60i]	—	Follows [UBG MODE]*1	Follows [VITC UBG MODE]
	[DVCPRO HD/60i]			
[1080-50i/P]	[AVC-I100/25PN] [AVC-G50/25PN] [AVC-G25/25PN] [AVC-G12/25PN]	—	Follows [UBG MODE]*1	Frame information lock
[1080-50i]	[AVC-I100/50i] [AVC-I50/50i] [AVC-G50/50i] [AVC-G25/50i] [AVC-G12/50i]	—	Follows [UBG MODE]*1	Follows [VITC UBG MODE]
	[DVCPRO HD/50i]			
[1080-23.98PsF]	[AVC-I100/24PN] [AVC-G50/24PN] [AVC-G25/24PN] [AVC-G12/24PN]	—	Follows [UBG MODE]	Frame information lock
[720-59.94P]	[AVC-I100/60P] [AVC-I50/60P] [AVC-G50/60P] [AVC-G25/60P] [AVC-G12/60P] [AVC-I100/30PN] [AVC-I100/24PN]	—	Follows [UBG MODE]*1	Frame information lock
	[DVCPRO HD/60P]			
[720-50P]	[AVC-I100/50P] [AVC-I50/50P] [AVC-G50/50P] [AVC-G25/50P] [AVC-G12/50P] [AVC-I100/25PN]	—	Follows [UBG MODE]*1	Frame information lock
	[DVCPRO HD/50P]			
[480-59.94i]	[DVCPRO50/60i] [DVCPRO/60i] [DV/60i]	[60i]	Follows [UBG MODE]*1	Follows [VITC UBG MODE]*2
		[30P]		
[576-50i]	[DVCPRO50/50i] [DVCPRO/50i] [DV/50i]	[50i]	Follows [UBG MODE]*1	Follows [VITC UBG MODE]*2
		[25P]		

*1 With [EXT], UB of the <TC IN/OUT> terminal is slaved.

*2 When [CAMERA MODE] is set to [30P] and [25P], frame rate information will be fixed.

Output of user bits

Setting			Output UB		
[LINE&FREQ]	**[REC FORMAT]**	**[CAMERA MODE]**	**UB for TC OUT**	**LTC UB for HD SDI**	**VITC UB for HD SDI**
[1080-59.94i/P]	[AVC-I100/30PN] [AVC-G50/30PN] [AVC-G25/30PN] [AVC-G12/30PN]	—	LTC UB is output.	LTC UB is output.	VITC UB is output.
	[AVC-I100/24PN] [AVC-G50/24PN] [AVC-G25/24PN] [AVC-G12/24PN]		Outputs along to over 60P, based on LTC UB.	Outputs along to over 60P, based on LTC UB.	
[1080-59.94i]	[AVC-I100/60i] [AVC-I50/60i] [AVC-G50/60i] [AVC-G25/60i] [AVC-G12/60i]	—	LTC UB is output.	LTC UB is output.	VITC UB is output.
	[DVCPRO HD/60i]				
[1080-50i/P]	[AVC-I100/25PN] [AVC-G50/25PN] [AVC-G25/25PN] [AVC-G12/25PN]	—	LTC UB is output.	LTC UB is output.	VITC UB is output.
[1080-50i]	[AVC-I100/50i] [AVC-I50/50i] [AVC-G50/50i] [AVC-G25/50i] [AVC-G12/50i]	—	LTC UB is output.	LTC UB is output.	VITC UB is output.
	[DVCPRO HD/50i]				
[1080-23.98PsF]	[AVC-I100/24PN] [AVC-G50/24PN] [AVC-G25/24PN] [AVC-G12/24PN]	—	LTC UB is output.	LTC UB is output.	LTC UB is output.
[720-59.94P]	[AVC-I100/60P] [AVC-I100/30PN] [AVC-I50/60P] [AVC-G50/60P] [AVC-G25/60P] [AVC-G12/60P]	—	LTC UB is output.	LTC UB is output.	VITC UB is output.
	[DVCPRO HD/60P]				
	[AVC-I100/24PN]		Outputs along to over 60P, based on LTC UB.	Outputs along to over 60P, based on LTC UB.	
[720-50P]	[AVC-I100/50P] [AVC-I100/25PN] [AVC-I50/50P] [AVC-G50/50P] [AVC-G25/50P] [AVC-G12/50P]	—	LTC UB is output.	LTC UB is output.	VITC UB is output.
	[DVCPRO HD/50P]				
[480-59.94i]	[DVCPRO50/60i] [DVCPRO/60i] [DV/60i]	[60i]	LTC UB is output.	None	None
		[30P]			
[576-50i]	[DVCPRO50/50i] [DVCPRO/50i] [DV/50i]	[50i]	LTC UB is output.	None	None
		[25P]			

User bits settings

Sets the user bits to be recorded in the sub code area in the main menu → [RECORDING SETUP] → [UBG MODE].

Item	Description
[USER]	Records internal user values. User values can be set at [UBG] in the [SET01:TC/UB] screen of SmartUI. Setting values are held even when the power is turned off. For details, refer to “How to input user bits” (page 98).
[TIME]	Records the time measured by the internal clock.
[DATE]	Records the hour digit of year/month/day/date-time measured by the internal clock.
[EXT]	Records the user bits values currently entered to the <TC IN/OUT> terminal.
[TCG]	Records the time code value.
[FRAME RATE]	Records the camera photo frame rate information. When playing back clips recorded in native format, the same frame rate information as VITC UB is output regardless of the recorded value. Use at this setting when the editing device such as a computer uses the frame rate information of the user bits.
[REGEN]	Reads the user bit last recorded to P2 card that is currently to be recorded to and recording this value as it is.

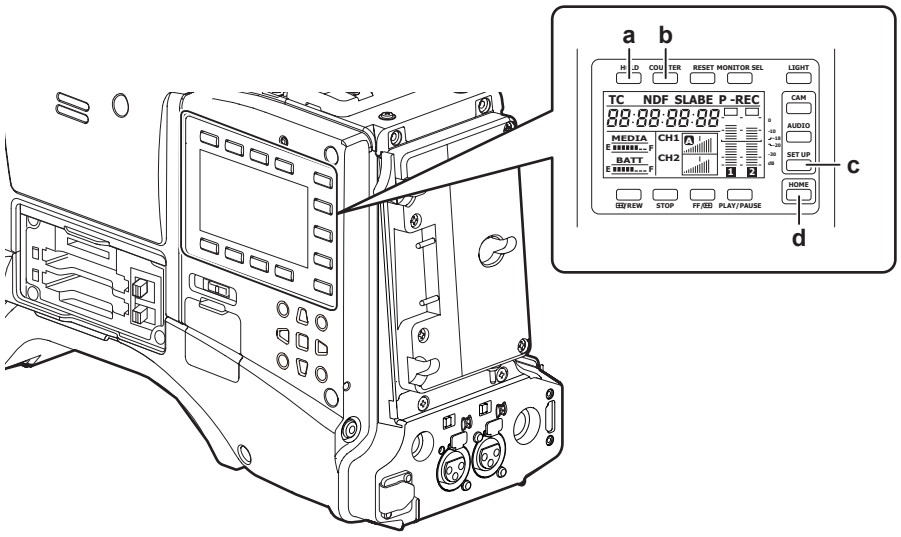
NOTE

- When slave-lock to the user bits value input to the <TC IN/OUT> terminal, set to [EXT].
- While the user bits are slaved, the [UBG[R]] display is in black and white inversion.

- After executing slave once, even if input from the <TC IN/OUT> terminal stops, the slave status will continue. However, in the following cases, the slave status of the user bits will be released.
  - When [UBG MODE] is set to other than [EXT]
  - When user bits are set in the [SET01:TC/UB] screen of SmartUI
  - When the power is turned off
- The internal [USER] value retains the slaved value even after slave lock is released.
- To input external time codes from the <TC IN/OUT> terminal, set [TC IN] in the main menu → [IN/OUT SEL] → [TC IN/OUT SEL].

How to input user bits

By setting user bits, information such as memos (date, time) up to eight digits long (hexadecimal) can be recorded.



a: <HOLD> button

b: <COUNTER> button

c: <SETUP> button

d: <HOME> button

1 Press the <SETUP> button to display the [SET01:TC/UB] screen of SmartUI.

2 Press the <COUNTER> button to set the counter display to [UB].

3 Press the <◀◀/REW> button to set [UBG] to [SET].

4 Set the user bits.

- Press the upper or lower buttons that correspond to the following screen displays.
  - [→]: The digit to be set moves to the right.
  - [+]: The digit to be set moves to the left.
  - [–]: The value of the digit to be set is incremented by one.
  - [RST]: The value of the digit to be set is decremented by one.

5 Press the <◀◀/REW> button, enter the values of user bits, and exit the user bits settings screen.

6 Select [USER] in the main menu → [RECORDING SETUP] → [UBG MODE].

NOTE

- If you exit the user bits setting screen without pressing the <◀◀/REW> button, the set values are disabled.

Retention of user bits in memory

User bit settings are automatically recorded and are retained even if the power is turned off.

Frame rate information recorded on user bits

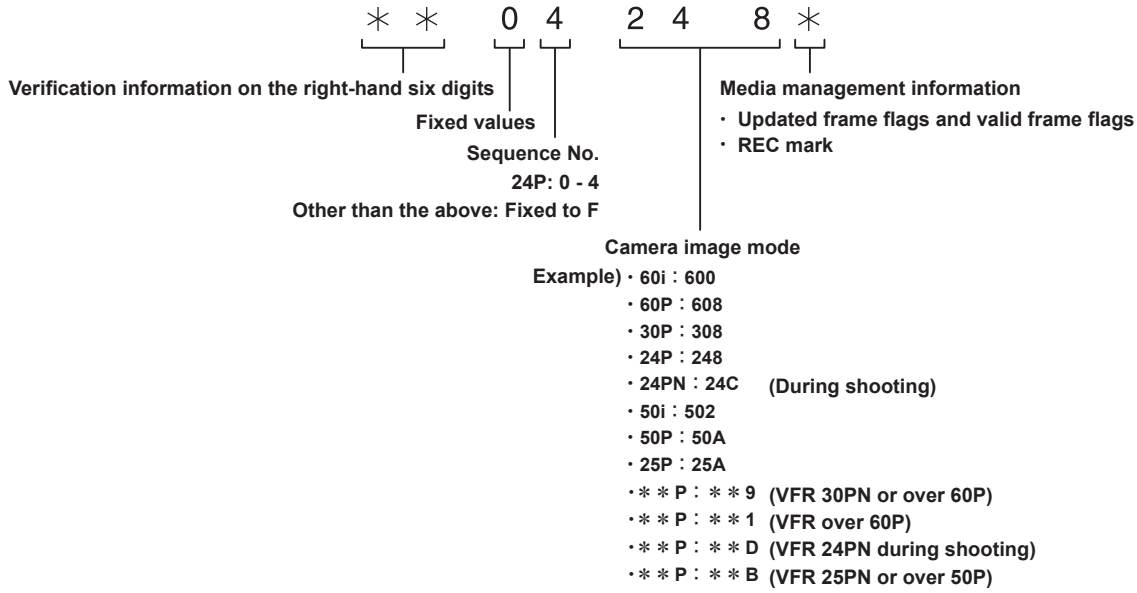
Saving the frame rate values for the image information shot/saved according to the frame rate set in the main menu → [SYSTEM MODE] to user bits allows you to use the editor (personal computer editing software).

Information is always saved in VITC UB.

In addition, selecting [FRAME RATE] in the main menu → [RECORDING SETUP] → [UBG MODE] saves the information also in user bits (LTC UB). In playback of clips recorded in native format, the same values as the frame rate information obtained by playing back recorded user bits are also output as HD SDI output signals or user bits of TC output from the <TC IN/OUT> terminal.

Frame rate information

The relationship between frame rates, image pull-down, and time codes/user bits is as follows.



Setting the time code

1 Set [DF] or [NDF] in the main menu → [RECORDING SETUP] → [DF MODE].

- Set [DF] to advance the time code in the drop frame mode, and set [NDF] to advance it in the non-drop frame mode. However, note that the time code runs by [NDF] at all times in the 24PN mode.

2 Press the <SETUP> button to display the [SET01:TC/UB] screen of SmartUI.

3 Press the <COUNTER> button to set the counter display to [UB].

4 Press the <◀◀/REW> button to set [TCG] to [SET].

5 Set the time code.

- Press the upper or lower buttons that correspond to the following screen displays.
  - [→]: The digit to be set (flashing) moves to the right.
  - [+]: The digit to be set (flashing) moves to the left.
  - [–]: The value of the digit to be set (flashing) is incremented by one.
  - [RST]: The value of the digit to be set (flashing) is decremented by one.

6 Press the <◀◀/REW> button, enter the setting values of the time code, and exit the time code settings screen.

7 Press the <HOME> button to display the [HOME] screen of SmartUI.

Settable time code range

For 59.94 Hz (except for 24PN)	00:00:00:00 to 23:59:59:29
24PN	00:00:00:00 to 23:59:59:23
For 50 Hz	00:00:00:00 to 23:59:59:24

NOTE

- When used in 24PN mode, the time code settings are adjusted in multiples of 4. For 720/30PN and 720/25PN, the time code settings are adjusted to even numbers. Also, the time code cannot be set during recording.
- If you exit the time code setting screen without pressing the <◀◀/REW> button, the set values are disabled.
- When the <RESET> button is pressed while in the time code setting screen, the value is reset to 0.

Time code function during battery replacement

Even during battery replacement, the backup mechanism functions, allowing the time code generator to continue operating.

When each item of the system mode has been changed, the time code of free run may shift. Turn on the power again, check the time code, and reset it, if necessary.

NOTE

- When the <POWER> switch has been switched to <ON> → <OFF> → <ON>, the backup accuracy of the time code in the free run mode is approximately ±2 frames.

Externally locking the time code

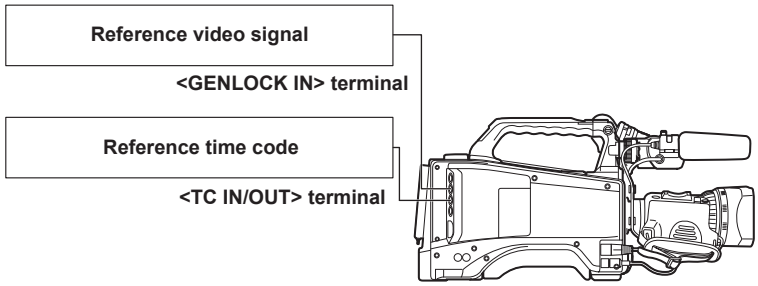
The internal time code generator of the camera can be locked to an external generator. In addition, the time code generator of an external device can be locked to the internal time code generator of the camera.

Example of connections for external locking

As shown in the figure, connect both the reference video signal and the reference time code.

For details on reference signal and generator lock, refer to “Selection of external reference signal and generator lock setting” (page 93).

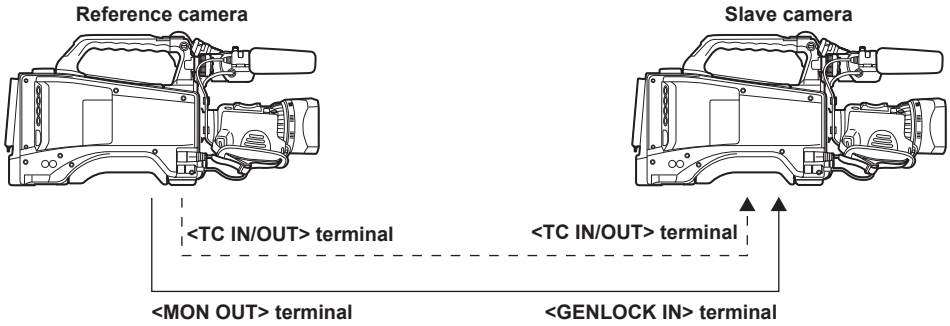
■ **When locking onto an external signal**



NOTE

- You can input Y reference signals of HD and composite video signals as reference videos signals.
- When the system mode is 480i (576i) (SD), 1080i/P, and 720P, input the composite video signal.
- When the system mode is 1080i/P and 720P, if you input the HD-Y signal, genlock will be applied to the image signal, but the time code may be shifted by one frame.
- If the genlock input reference signal becomes disrupted, a normal recording cannot be performed and [TEMPORARY PAUSE IRREGULAR FRM SIG] flashes on the viewfinder, then clips are divided. The continuity of the time code is not guaranteed. Recording will be resumed when the signal returns to normal. However, interval recording, one-shot recording, and loop recording are not resumed.

■ **When two cameras are connected and one is used as a reference camera**



NOTE

- Set the <TC IN/OUT> terminal to output or input in the main menu → [IN/OUT SEL] → [TC IN/OUT SEL].
- For all devices, set [RECORDING] in the main menu → [IN/OUT SEL] → [TC OUTPUT REF] and set [COMPOSITE] in the main menu → [OTHER FUNCTIONS] → [GL PHASE].
- If you set [RECORDING] in the main menu → [IN/OUT SEL] → [TC OUTPUT REF], the two cameras will be able to record with the same time code in the image.
- You cannot externally lock the composite signal subcarrier output from the <MON OUT> terminal of the camera.

External lock operation procedure

To externally lock the time code, follow the steps below.

1 Set [TC IN] in the main menu → [IN/OUT SEL] → [TC IN/OUT SEL].

2 Press the <SETUP> button to display the [SET01:TC/UB] screen of SmartUI.

3 Press the <COUNTER> button to set the counter display to [TC].

4 Press the <STOP> button to set [TC_MD] to [F-RUN].

5 Input a reference time code and reference video signal that are in a phase relationship (that conforms to time code specifications) to the <TC IN/OUT> terminal and the <GENLOCK IN> terminal.

The built-in time code generator is locked to the reference time code. When approximately ten seconds has elapsed after locking, the external lock status will be held even if the reference time code from the external device is disconnected.

- When the input reference signal of genlock is disrupted, recording cannot be performed normally. [TEMPORARY PAUSE IRREGULAR SIG] is displayed in the viewfinder, and the clip is divided. The continuity of the time code is not guaranteed. Recording will be resumed when the signal returns to normal. However, during loop recording, recording does not resume.
- When external lock is performed, the time code is instantaneously locked to the external time code, the same value as the value of the external time code is output to the counter display area, and the [TCG[R]] display is black and white inverted. Do not set to the recording mode for several seconds until the sync generator has stabilized. Also, lock the time code to the <TC IN/OUT> terminal signal.
- When using the camera with [ON] set in the main menu → [RECORDING SETUP] → [PRE REC], disrupted images or stopped time codes may be recorded if the time code is switched from recording run to free run immediately before recording or an external time code is input to be slave-locked to the <TC IN/OUT> terminal.
- If you execute the slave once, even if there is no longer <TC IN/OUT> terminal and <GENLOCK IN> terminal input, the slave status is maintained. However, in the following cases, the slave status will be released.
  - When time code is set on the [SET01:TC/UB] screen of SmartUI
  - When the power is turned off
  - When switching between [DF]/[NDF] in [DF MODE]
  - When [TC_MD] is set to [R-RUN] on the [SET01:TC/UB] screen of SmartUI
  - When switching between [REC FORMAT] and [CAMERA MODE]

Setting of user bits when the time code is externally locked

To lock user bits to the input values from an external source, set the main menu → [RECORDING SETUP] → [UBG MODE] to [EXT]. Regardless of the setting of recording run/free run, it is slaved to user bits values input to the <TC IN/OUT> terminal.

Canceling the external lock

After stopping supply of the external time code, set the main menu → [RECORDING SETUP] → [UBG MODE] to other than [EXT].

Cautions when switching the power supply from the battery to the external DC power supply while an external lock is active

To keep on the time code generator power supply continuously, connect an external DC power supply to the <DC IN> terminal and then remove the battery pack. If the battery pack is removed first, there is no guarantee that the time code will stay externally locked.

External synchronization of the camera unit while an external lock is active

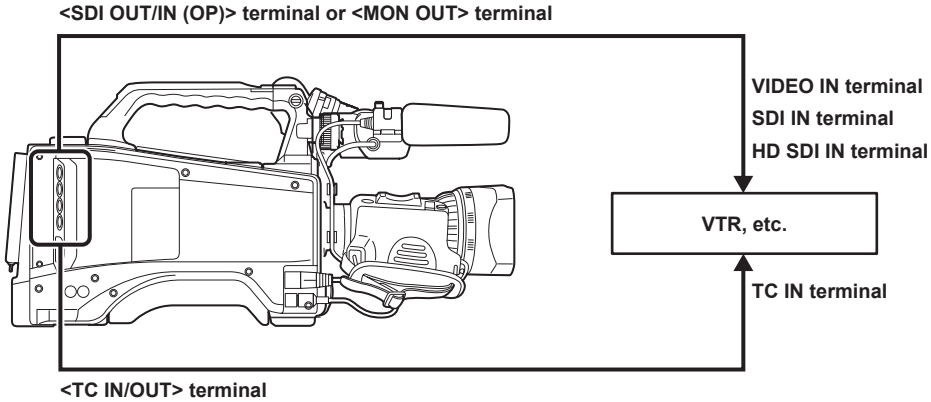
While an external lock is active, the genlock is activated on the camera unit by the reference video signal input to the <GENLOCK IN> terminal.

NOTE

- To externally lock multiple units with the camera as the master device, set to the same setting as on the camera. Note that in a system using a mixture of interlaced and progressive scanning, the continuity of the video and time codes is not guaranteed.
- When externally locking in 24PN Native mode, be sure to input non-drop frame time codes. An external lock is not possible using drop frames. Also, images may be disrupted the instant that the external lock is activated, though this is due to alignment of the 5-frame cycle and is not a malfunction.

Supplying the time code externally

You can supply the output time codes to a VTR or other recording device from the camera by matching the camera images or the replayed images.



1 Set [MON OUT] in the main menu → [IN/OUT SEL] → [TC OUTPUT REF].

2 Set [HD SDI] or [COMPOSITE] in the main menu → [OTHER FUNCTIONS] → [GL PHASE] to match the supplied video output.

3 Set [TCG/TCR] in the main menu → [IN/OUT SEL] → [TC OUT].

4 Set [TC OUT] in the main menu → [IN/OUT SEL] → [TC IN/OUT SEL].

NOTE

- If you set [TC OUTPUT REF] to [MON OUT] in the main menu → [IN/OUT SEL], the input time code will be output to match the video output delay.

Connecting and setting the genlock and time code input/output

The relationship of the connecting and settings between the genlock and time code input/output is shown in the table.

When the genlock input and the camera output phase match, ✓ is displayed, and when they do not match, × is displayed.

■ **When the camera recording format is 1080i/P, 1080i**

Camera usage conditions	Image and standard signals supplied externally	SDI	VIDEO	SDI	VIDEO
	Genlock input	1080i		SD (480i/576i)	
Camera settings	[GL PHASE]	[HD SDI]	[COMPOSITE]	[HD SDI]	[COMPOSITE]
Genlock input and camera output phase	SDI output (HD)	✓	90H advance	✓	90H advance
	Video output and SDI output (SD)	90H delay	✓	90H delay	✓
	Time code output	✓	✓	✓	✓

■ **When the camera recording format is 720P**

Camera usage conditions	Image and standard signals supplied externally	SDI	VIDEO	SDI	VIDEO
	Genlock input	720P		SD (480i/576i)	
Camera settings	[GL PHASE]	[HD SDI]	[COMPOSITE]	[HD SDI]	[COMPOSITE]
Genlock input and camera output phase	SDI output (HD)	✓	120H advance	✓	120H advance
	Video output and SDI output (SD)	120H delay	✓	120H delay	✓
	Time code output	×	×	✓	✓

■ **When the camera recording format is 480i/576i**

Camera usage conditions	Image and standard signals supplied externally	SDI	VIDEO
	Genlock input	SD (480i/576i)	
Camera settings	[GL PHASE]	Disabled	
Genlock input and camera output phase	SDI output (HD)	None	
	Video output and SDI output (SD)	✓	
	Time code output	✓	

Setting and displaying the counter

When the counter display is set by using the <COUNTER> button, the counter value is displayed on the time code display area of the viewfinder. Counter value is displayed as “hour:minute:second.frame”. The counter value is also displayed during playback.

You can set either of two types in the main menu → [DISPLAY SETUP] → [REC COUNTER].

[TOTAL]: The camera will continuously count until it is reset with the <RESET> button. The counter value is retained even if the P2 card is replaced or the power is turned off.

[CLIP]: Each time you start recording the counter value will clear and the count will start from 0. You can shoot always while checking the recording time of the clip you are currently shooting.

NOTE

- If the <RESET> button is pressed while the counter value is displayed, the counter value is reset. It will start again from 0.
- The counter value is displayed by the frame unit.

Convenient shooting functions

Scan reverse shooting

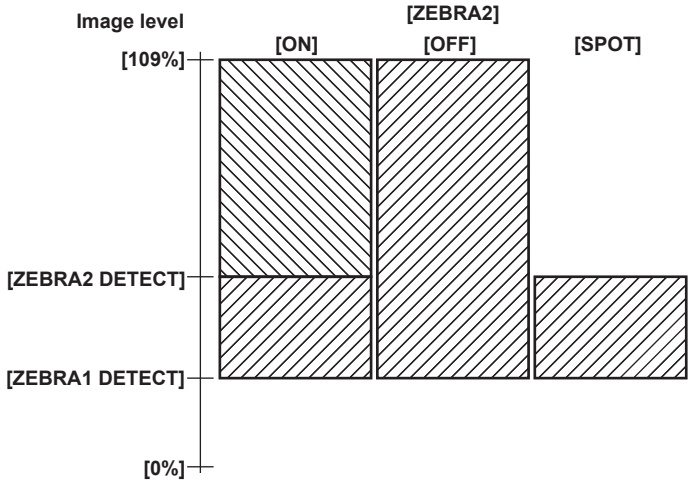
Set [ON] in the main menu → [SYSTEM MODE] → [SCAN REVERSE] to display and record the image in vertically or horizontally reverse.

Zebra patterns display

The camera can display two types of zebra patterns.
When the <ZEBRA> switch of the viewfinder is set to <ON>, the zebra pattern currently set in the menu is displayed.
Zebra patterns can also be displayed in the video from the <MON OUT> terminal according to the menu setting.
The level for zebra pattern display can be set in the main menu → [DISPLAY SETUP].

Item	Description of settings
[ZEBRA1 DETECT]	Sets the extraction level of zebra pattern 1. **[0%]…[109%]** • Factory setting: [70%]
[ZEBRA2 DETECT]	Sets the extraction level of zebra pattern 2. **[0%]…[109%]** • Factory setting: [85%]
[ZEBRA2]	Sets on/off of zebra pattern 2 and selects the type. **[ON], [SPOT], [OFF]** • Factory setting: [SPOT]

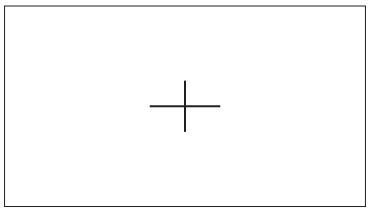
[SPOT]: The image level from the setting value of [ZEBRA1 DETECT] to the setting value of [ZEBRA2 DETECT] is displayed in the zebra pattern.



To display the zebra pattern in the image from the monitor output terminal (<MON OUT>, <HDMI>), set using either of the following operations.
• In the main menu → [IN/OUT SEL] → [MON/HDMI ZEBRA], set [ON].
• In the [SET03:MON/HDMI SETUP] screen of SmartUI, set [ZBR] to [ON].

Displaying the center marker

Displays when setting an item other than [OFF] in the main menu → [DISPLAY SETUP] → [CENTER MARK].



NOTE

- The center marker display is not displayed in the images of terminals <SDI OUT/IN (OP)>, <MON OUT>, and <HDMI>.

Displaying the safety zone marker

The items you select the main menu → [DISPLAY SETUP] → [SAFETY MARK] are displayed.
The size of the safety zone marker can be changed in the main menu → [DISPLAY SETUP] → [SAFETY AREA].

NOTE

- The safety zone marker display is not displayed in the images of terminals <SDI OUT/IN (OP)>, <MON OUT>, and <HDMI>.

Displaying frame marker

Displays when [ON] is set in the main menu → [DISPLAY SETUP] → [FRAME MARK].

Set the angle of view in the main menu → [DISPLAY SETUP] → [FRAME SIG].

Set the outside level in the main menu → [DISPLAY SETUP] → [FRAME LVL].

Checking and displaying the shooting status

<DISP/MODE CHK> switch is the spring switch to check the shooting status of the camera during recording standby or recording.

- Push this switch towards the <OFF> side to clear all displays except the operation status display of the viewfinder, frame display such as an area frame, counter, marker, and safety zone.
- Pushing this towards the <CHK> side will display information on the screen such as setting status of all shooting functions, the list of functions assigned to the USER buttons, etc. Each press of the button switches the information page.

Changing image size

When recording in 480i/576i mode, you can change the size (aspect ratio) of the recorded image. Select the main menu → [SYSTEM MODE] → [ASPECT CONV].

[SIDE CROP]: Record using standard 4:3 mode. Cut both the left and right edges.

[LETTER BOX]: Record in 16:9 aspect ratio. A black band is recorded at the top and bottom of the screen. When set to [LETTER BOX], black bands at the top and bottom are not displayed because the screen size of the viewfinder is 16:9. [LT.BOX] is displayed on the screen.

[SQUEEZE]: Camera images are compressed in the horizontal direction when recording. Replaying recorded images on a TV monitor that supports a wide screen will convert the images to an aspect ratio of 16:9.

Dynamic range stretcher function

You can increase the dynamic range by compressing the image signal for the extremely bright areas that are overexposed during normal shooting while maintaining contrast.

The knee function, black gamma function, and gamma mode function do not work when the dynamic range stretcher function is activated.

A slight difference in coloring might occur by switching the dynamic range stretcher function on/off.

You can change the level of compression in the main menu → [SCENE FILE] → [DRS EFFECT DEPTH].

[ON]/[OFF] of [DRS] can be assigned to the USER button.

Backlight compensation

When shooting a subject in backlight, press the USER button to which the [BACKLIGHT] function is assigned.

[BACK] is displayed on the viewfinder.

The auto iris control for the backlight compensation prevents darkening of the image of the subject.

Press the USER button again to cancel backlight compensation.

Color bars

Setting the <OUTPUT>/<AUTO KNEE> selector switch to <BARS> allows you to display the color bars, which are a convenient tool for adjusting image quality on a TV or external monitor.

Four types of color bar ([SMPTE]/[FULL BARS]/[SPLIT]/[ARIB]) can be selected in the main menu → [SW MODE] → [BARS TYPE].

Final clip delete function

You can delete the last clip you shot.

Press the USER button to which [DEL LAST CLIP] is assigned, [YES]/[NO] appears on the screen.

Select [YES] to delete the last shot clip, [DELETION IS COMPLETED!] appears on the screen.

Not to delete the clip, select [NO].

- The clip will not be able to delete when the following are performed after recording.
  - When the power is turned off once and then turned on again
  - When the camera restarts such as switching to the USB mode
  - When all the P2 cards constructing the video data created by a single recording like with the hot swap recording are not inserted in the slots
  - When set to one-clip recording
  - When it is in the thumbnail mode or the playback mode (including recording check)

Waveform monitor function

Press the USER button to which [WFM] is assigned to display the image waveform. Press the button again to return to the normal display.

- The waveform and vector displays can be switched using [WFM MODE] in the main menu → [SW MODE].
- The waveform is not displayed while the focus assist function ([EXPAND]/[IN RED]) is active.
- The waveform display cannot be recorded.

Chapter 5 Playback

Data including additional information such as images, audio, text memo, and metadata that are created from one shooting are saved as a clip. You can play back and edit clips with the camera.

Normal and variable speed playback

Playback of clips can be performed on the thumbnail screen. To display the thumbnail screen, press the <THUMBNAIL> button.

■ Normal speed playback

Color playback images can be viewed on the viewfinder by pressing the <PLAY/PAUSE> button. Likewise, color playback images can be viewed on a color video monitor connected to the monitor output terminal (<SDI OUT/IN (OP)>, <HDMI> and <MON OUT>).

Playback can also be paused by pressing the <PLAY/PAUSE> button during playback.

■ Fast-forward and fast-reverse playback

The <FF/▶▶> and <◀◀/REW> buttons provide 32x and 4x fast-forward and fast-reverse playback. Pressing these buttons during a stop fast-forwards or fast-reverses at 32x speed, and during playback at 4x speed.

■ Playing back clips

Press the <THUMBNAIL> button to display the thumbnail screen. Playback of clips can be performed on the thumbnail screen.

■ Cueing clips

If the <FF/▶▶> button is pressed with playback paused, the clip being played back is paused at the start point of the next clip (cued up state). If the <◀◀/REW> button is pressed with playback paused, the clip being played back is paused at the start point of the clip currently being played back (cued up state).

NOTE

- Immediately after removing or inserting a P2 card or in some other conditions, operation may take time to read the clip information. During this time, [UPDATING..] is displayed on the thumbnail screen.
- If a P2 card is inserted while another card is being played back, the clips on the inserted card cannot be played back. A P2 card inserted during playback is recognized after playback ends.
- When playing back clips recorded over multiple P2 cards at variable speed, audio might be instantaneously interrupted. This is not a malfunction.
- To play back clips in the different system modes, match [LINE&FREQ] to the format of the clip in the main menu → [SYSTEM MODE] and set the camera again.
- Audio of CH5 to CH8 recorded on another device cannot be played back.

Thumbnail operations

Thumbnail operation overview

A clip is a group of data created from one shooting session, which includes additional information such as images, audio, text memo, and metadata that are created from one shooting.

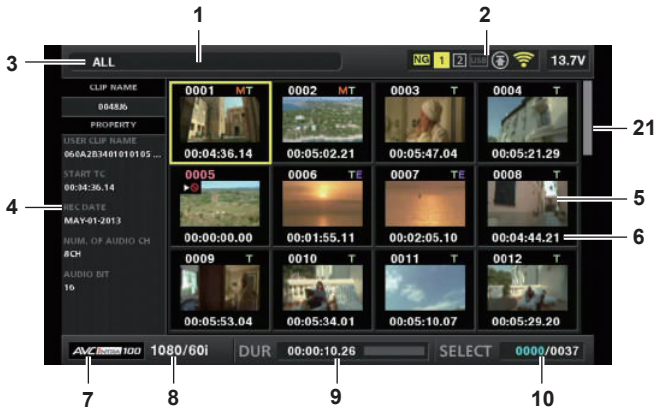
The following operations can be performed while viewing the clip thumbnails displayed in the viewfinder.

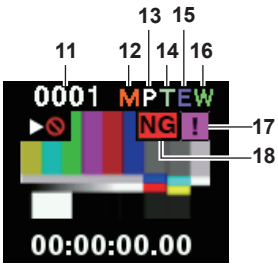
- Play back, delete, copy, or restore clips.
- Adding or deleting a shot mark and text memo to the clip
- Copying part of a clip using the text memo
- Changing the thumbnail image using the text memo
- Format P2 cards and SD memory cards.
- Upload and edit clip metadata from the SD memory card.

Thumbnail screen

Press the <THUMBNAIL> button to display the thumbnail screen in the viewfinder. Press the <THUMBNAIL> button again to return to the regular display. Also, when the regular display has been changed to the thumbnail screen display, all clips will be displayed on the thumbnail screen.

Press the <MENU> button on the thumbnail screen to enable thumbnail menu operations.





1 Status message

A message showing the process status is displayed. [UPDATING..] and the icon are displayed while the screen is being refreshed.

2 Status displays for card slot, storage device, and network connection

The status conditions of the P2 card, storage device, and network connection are displayed as follows:

NG (Yellow)	Displayed when there is at least one defective clip that may be restored in the inserted P2 card. (page 109)
NG (Red)	Displayed when there is at least one defective clip that cannot be restored in the inserted P2 card. (page 109)
1 (White)	The card slot number in which the P2 card is inserted is displayed in white.
1 (Yellow)	The card slot number of the P2 card in which the clip in the cursor position is saved is displayed in yellow. If the clips are recorded across multiple P2 cards, all slot numbers of those cards that contain the clips are displayed. ***NOTE*** • The frame turns red if the inserted P2 card is in any of the following conditions: - [RUN DOWN CARD] The maximum number of overwrites on the P2 card has been exceeded. - [DIR ENTRY NG] The directory structure on the P2 card is not supported. - [AUTH NG CARD] Indicates that the card is a microP2 memory card which cannot authenticate a CPS password.
USB (Gray)	Displayed in gray when a storage device is not connected.
USB (White)	Displayed in white when a storage device can be used.
USB (Yellow)	Displayed in yellow when the thumbnails of clips in the storage device are displayed.
USB (Red)	Displayed in red when a storage device is connected but cannot be used.

(Gray)	Displayed in gray when the wired LAN is not activated properly.
(White)	Displayed in white when the wired LAN is not connected.
(Yellow)	Displayed in yellow while the wired LAN is connected.
(Red)	Displayed in red when there is a problem with the connection of wired LAN.
(Gray)	Displayed in gray when the wireless LAN is not activated properly.
(White)	Displayed in white when the wireless LAN is not connected.
(Yellow)	Displayed in yellow while the wireless LAN is connected.
(Red)	Displayed in red when there is a problem with the connection of wireless LAN.
(Gray)	Displayed in gray when the 4G/LTE USB modem is not activated properly.
(White)	Displayed in white when the 4G/LTE USB modem is not connected.
(Yellow)	Displayed in yellow when the 4G/LTE USB modem is connected. Signal strength is displayed with yellow bars.
(Red)	Displayed in red when there is a problem with the connection of 4G/LTE USB modem.
(Gray)	Displayed in gray when upload has not started, or upload is complete.
(Yellow)	Displayed in yellow during upload.
(Red)	Displayed from when upload error occurred until when the next transfer starts.

NOTE

- When remote control is possible in an IP connection, “R” is displayed on the network status indicator.
- The status display of the defective clip is not displayed in the thumbnail screen of the storage device or the thumbnail screen of the FTP.

3 Display mode

Displays the types of the thumbnails to be displayed on the screen and the types of other information screens. To switch between displays, refer to “Setting thumbnail screen display” (page 110).

[ALL]	Displays all clips.
[SAME FORMAT]	Displays clips in the same format as the system format.
[SELECT]	Displays clips selected with the cursor buttons.
[MARKER]	Displays clips with shot marks.
[TEXT MEMO]	Displays clips with text memo data.
[SLOT n]	Displays clips in the specific P2 card. (n: indicates slot number 1 to 2.)
[NG CLIPS]	Displays defective clips.
[P2/REMAIN]	Displays the media information (remaining capacity).
[P2/USED]	Displays the media information (used capacity).
[META DATA]	Displays the set metadata.

4 Simple properties display

Displays the various properties of the clip on which the pointer is positioned. You can select the items to display from the menu. For details, refer to “Properties” (page 117).

NOTE

- If the maximum number of characters is exceeded, it will only display the maximum number of characters that can be displayed.

5 Thumbnail

Displays the thumbnail recorded in each clip. You can change this thumbnail using the [EXCH. THUMBNAIL] function.
For details, refer to “Setting thumbnail screen display” (page 110).

6 Clip information display

By setting this item, displays either one of the time code [TC]/user bits [UB]/time of shooting [TIME]/date of shooting [DATE]/time and date of shooting [DATE TIME]/clip name [CLIP NAME]/user clip name [USER CLIP NAME]/card slot number [SLOT]/time code of thumbnail [THUMBNAIL TC] at the start of clip recording.

7 Recording mode

Displays the recording mode for the clip on which the cursor is positioned.

8 System format

Displays the format for the clip on which the cursor is positioned.

9 Duration

Displays the clip length (duration) at the cursor position and the current rough playback position against the clip length.
Playback position display is enabled when [RESUME] is selected in the main menu → [CLIP] → [THUMBNAIL SETUP] → [PB POSITION].
The approximate playback position is displayed when the playback start position is not at the beginning.

10 Number of selected clips and playback time display and bonding device information display

Displays the number of clips selected in the thumbnail screen and playback time of the clip when [THUMBNAIL INFO.] is selected in the main menu → [CLIP] → [THUMBNAIL SETUP] → [INFORMATION SEL.]. For details, refer to “Displaying the number of clips and playback time” (page 111).
Displays the signal strength and the remaining battery of the bonding device when [BONDING DEV. INFO.] is selected in the main menu → [CLIP] → [THUMBNAIL SETUP] → [INFORMATION SEL.]. For details, refer to “Setting the bonding device information display” (page 111).

11 Clip number

Displays the number assigned to the clip on the P2 card, normally in the order from the earliest recording date and time. The clip numbers of clips that cannot be played are shown in red, and the unplayable indicator is also displayed.
For details, refer to “Setting thumbnail screen display” (page 110).

12 Shot mark indicator
Displayed for the clip of a thumbnail with a shot mark attached.
For details, refer to “Shot mark recording function” (page 75).

13 Indicator for clips with proxy
Displayed for clips with proxy attached.

14 Text memo indicator
Displayed for clips with text memo data attached.

15 Edit copied clip indicator
Displayed for the edit copied clip.

16 Wide clip indicator
Displayed for clips recorded with the 16:9 aspect ratio. However, it does not accompany clips in HD format.

17 Incomplete clip indicator
Displayed when clips are saved across multiple P2 cards and either of the P2 cards is not inserted in a card slot.

18 NG/NG Defective clip indicator, ? Unknown clip indicator
Displayed for defective clips, which may result from various causes such as turning off the power during recording.
Clips with yellow defective clip indicators can sometimes be restored.
For details, refer to “Restoring clips” (page 113).
Clips with red defective clip indicators cannot be restored and must be deleted. If the clip cannot be deleted, format the P2 card.
? is displayed for clips which differ in format from the P2 standard.

19 Rec during upload status indicator
Rec during upload status indicator shows the status of maximum 100 clips registered in the upload list as follows.

(Gray)	Displayed until upload starts.
(Yellow)	Displayed during upload.
(Green)	Displayed when upload is completed normally and registered in the upload list.
(Red)	Displayed when transfer error occurred during upload and registered in the upload list.

20 [P.only] indicator
Displayed for clips only with proxy, in which video and audio data of main recording are not included, on the FTP explorer screen.

21 Thumbnail scroll bar
Indicates which part of the whole thumbnail is currently being viewed.

Selecting thumbnails

Multiple thumbnails can be randomly selected on the thumbnail screen.

Selecting clips

You can select multiple clips randomly.

1 Use the cursor buttons to move the cursor over the desired clip.

2 Press the <SET> button.
A light blue frame and ☑ are displayed on the clip where the cursor is put. This indicates that it is selected.

3 To select additional clips, repeat steps 1 to 2.
It is possible to display only the selected clips on the thumbnail screen for playback.

NOTE

- While holding down the <SHIFT> button, press the cursor buttons (△/▽) to move the cursor to the first or last clip.
- After selecting a clip, move the cursor to another clip and while holding down the <SHIFT> button, press the <SET> button to select all clips from the previously selected clip to the cursor position.
- As clips are selected, the number of selected clips displayed on the lower right corner of the screen changes according to the selection.

Deselecting clips

1 Move the cursor to the selected clip and press the <SET> button.
This deselects the clip.

NOTE

- While holding down the <SHIFT> button, press the <EXIT> button to deselect all the clips at once.

Setting thumbnail screen display

You can customize the thumbnail screen according to usage.

Setting example for thumbnail screen ([INDICATOR])

1 Select [THUMBNAIL SETUP] in the main menu → [CLIP].

The thumbnail setting items ([INDICATOR], [DATA DISPLAY], [THUMBNAIL SIZE], [PB POSITION], [PROPERTY DISP.], [THUMBNAIL INFO.], [TEXT MEMO IND]) are displayed. For details, refer to “Setting items that display properties” (page 110).

Setting thumbnails to be displayed

1 Select [REPOSITION] in the main menu → [CLIP].

2 Use the cursor buttons to move the cursor to the type of the clip you want to display.

3 Press the <SET> button.

Setting the thumbnail size

You can customize the thumbnail size.

1 Select [THUMBNAIL SIZE] in the main menu → [CLIP] → [THUMBNAIL SETUP].

2 Use the cursor buttons to move the cursor to the size of the thumbnail you want to display.

3 Press the <SET> button.

Setting the clip information display

You can customize the clip information display contents according to your preference.

1 Select [DATA DISPLAY] in the main menu → [CLIP] → [THUMBNAIL SETUP].

2 Use the cursor buttons to place the cursor on the item you want to set.

3 Press the <SET> button.

Setting items that display properties

You can set simple properties item displayed on the left of the thumbnail.

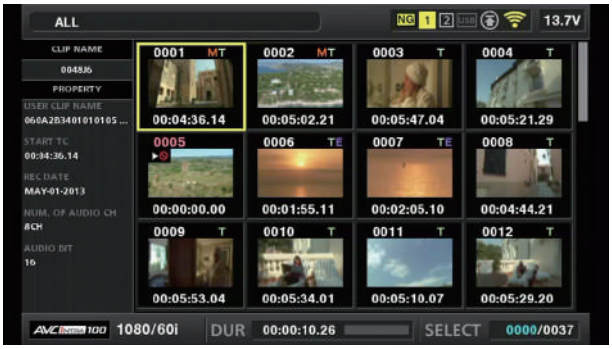


Fig. 1

Fig. 2

1 Open the thumbnail screen. (Fig. 1)

2 Select [PROPERTY DISP.] in the main menu → [CLIP] → [THUMBNAIL SETUP].

3 Press the <SET> button to enter the item menu. (Fig. 2)

The selected item has a check mark on it.

4 Press the <SET> button.

Pressing the <SET> button will check unchecked items and uncheck items that are already checked.

NOTE

- Property items can be displayed by selecting [SMALL] in the main menu → [CLIP] → [THUMBNAIL SETUP] → [THUMBNAIL SIZE].
- A maximum of six items can be displayed at the same time.
- When six items are already selected, all unchecked items cannot be selected. You can change your item selection by unchecking selected items.

Displaying the number of clips and playback time

Display the number of selected clips and playback time of clip, etc.

1 Select [THUMBNAIL INFO.] in the main menu → [CLIP] → [THUMBNAIL SETUP] → [INFORMATION SEL.].

2 Press the <SET> button.

3 Select [THUMBNAIL INFO.] from the main menu → [CLIP] → [THUMBNAIL SETUP].

4 Use the cursor buttons to place the cursor on the item you want to set.

[NUM. OF CLIPS]: Displays the number of selected clips.
[DUR. OF SEL CLIPS]: Displays the total playback time of selected clips.
[TOTAL DURATION]: Displays the total playback time of the displayed clip.

5 Press the <SET> button.

Setting the bonding device information display

1 Select [BONDING DEV. INFO.] in the main menu → [CLIP] → [THUMBNAIL SETUP] → [INFORMATION SEL.].

2 Press the <SET> button.

NOTE

- This is not displayed when the information cannot be acquired from the bonding device.

Changing thumbnails

Replace thumbnails with images that include previously attached text memos while images are recorded or played back.

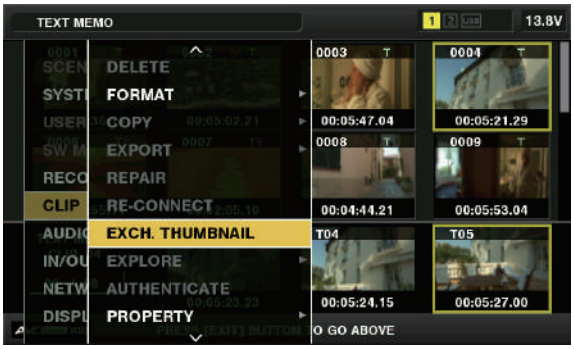


Fig. 1

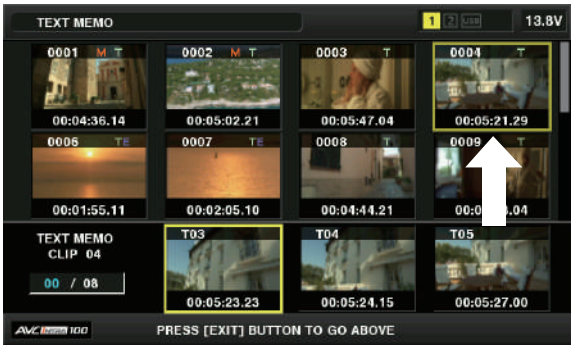


Fig. 2

1 Add text memos to images to be changed.

For details on adding text memos, refer to “Text memo recording function” (page 75).

2 Select [TEXT MEMO CLIPS] in the main menu → [CLIP] → [REPOSITION] and display the thumbnails of clips with text memos.

3 Move the cursor over the clip where you want to change the thumbnail and press the <SET> button, and then move the cursor to the text memo display on the lower row.

4 Select the thumbnail to be replaced from the text memos, place the cursor on it, and select [EXCH. THUMBNAIL] in the main menu → [CLIP]. (Fig. 1)

5 Press the <SET> button, and select [YES] using the cursor buttons on the confirmation screen that is displayed.

The menu closes and the thumbnail for the clip is replaced. (Fig. 2)

NOTE

- You can view the thumbnail position (number of frames from the top of the clip) from the [THUMBNAIL] item of the clip information display. Since thumbnails usually come from the top of the clip, 0 is displayed.
- Even if you change the thumbnail, playback from the thumbnail screen will still start from the beginning of the clip.
- The thumbnail image with the [!] mark may be displayed for clips of a format with a different number of lines and frequencies when displaying a text memo clip without displaying the thumbnail of the text memo position displayed at the bottom section.

Shot mark

Shot marks can be added to a clip thumbnail to distinguish the clip from other clips.

You must assign [SHOT MARK] to the USER button beforehand. For details, refer to “Assigning functions to USER buttons” (page 64).

1 Use the cursor buttons to move the cursor over the clip to which you want to add a shot mark.

2 Press the USER button to which [SHOT MARK] is assigned.

- A shot mark is added to the thumbnail of the clip at the cursor position.
- To delete a shot mark, place the cursor on the clip again and press the USER button to which [SHOT MARK] is assigned.

NOTE

- You can attach a shot mark during recording.
- Add shot marks after recording stops to attach the shot mark to the most recently recorded clip. For details, refer to “Shot mark recording function” (page 75).
- When adding a shot mark to or deleting the shot mark from a clip recorded across multiple P2 cards, do this with all these P2 cards inserted into card slots.

Text memo

You can add text memos during recording or playback. Text memos can be used to play clips at some point or break clips into chunks and copy the necessary portions.

Adding the text memo

You must assign [TEXT MEMO] to the USER button beforehand. For details, refer to “Assigning functions to USER buttons” (page 64).

1 Press the USER button to which [TEXT MEMO] is assigned while recording, playback, thumbnails.

- Pressing this button while recording or playing back adds a text memo at the instance when the button was pressed. At this time, [TEXT MEMO] (when successful) or [TEXT MEMO INVALID] (when unsuccessful) is displayed.
- Pressing this button while the thumbnail screen is displayed inserts a text memo in the clip thumbnail (normally at the beginning) position.

NOTE

- Up to 100 text memos can be recorded to a single clip.
- Playback may stop for a moment when the USER button to which [TEXT MEMO] is assigned is pressed. This is not a malfunction.
- You can hide the text memo indicator of a clip to which a text memo with card serial number is added. Set this in the main menu → [CLIP] → [THUMBNAIL SETUP] → [TEXT MEMO IND]. (page 138)

Playing back from the text memo position

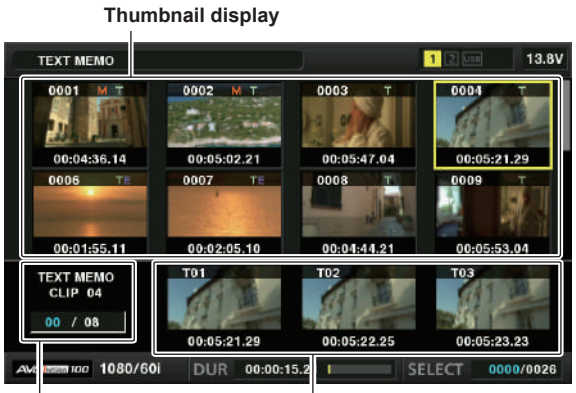


Fig. 1

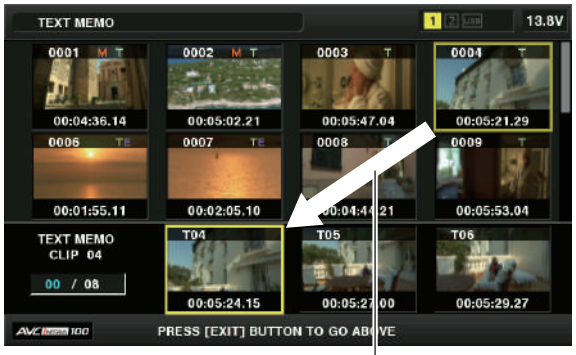


Fig. 2

1 Select [TEXT MEMO CLIPS] in the main menu → [CLIP] → [REPOSITION].

The clip thumbnails with text memos attached are displayed in the upper section of the viewfinder. The lower section of the viewfinder shows information on the text memo on the clip selected by the cursor. (Fig. 1)

2 Move the cursor over the clip that contains the text memo to be played back and press the <SET> button.

The cursor moves to the lower section of the viewfinder. (Fig. 2)

3 With the cursor located in the lower section, press the cursor buttons (◁/▷) to move the cursor to the text memo number to be played back, and then press the <PLAY/PAUSE> button.

- Playback starts from the time code position of the text memo where the cursor is located.
  If the <STOP> button is pressed during playback or the playback has finished at the end of the clip, the thumbnail screen appears again and the cursor returns to the thumbnail of the text memo where the playback started.
- While holding down the <SHIFT> button, press the cursor buttons (△/▽) to move the cursor to the beginning or end of the text memo.

- Press the <EXIT> button to return the cursor to the upper section of the thumbnail screen.

NOTE

- Pressing the <REC> button while the text memo screen is displayed does not start shooting.
- For clips in AVC-Intra and AVC-LongG formats with different settings (different system frequencies) in the main menu → [SYSTEM MODE], the thumbnail of the text position may not be displayed and a thumbnail image with the [!] mark may be displayed.

Deleting text memos

1 Perform steps 1 to 2 in "Playing back from the text memo position" (page 112) to select the desired text memo in a clip.

2 Move the cursor over the text memo to be deleted and press the <SET> button.

3 Select [DELETE] in the main menu → [CLIP].

4 Use the cursor buttons to select [YES].

This deletes the text memo.

Using a text memo to divide a clip and copy the necessary portion

1 Perform steps 1 to 2 in "Playing back from the text memo position" (page 112) to select the desired text memo in a clip.

2 Move the cursor over the text memo to be copied and press the <SET> button.

You can select multiple text memos.

3 Select [COPY] in the main menu → [CLIP].

4 Select the copy target slot using the cursor buttons and select [YES].

- Copying starts.
- The portion between the selected text memo and the next one is copied. If no text memo is found after the selected one, then the part after the selected text memo to the end of the clip is copied.
- If multiple text memos are selected, the selected sections are copied.
- While the clip is being copied, the progress of the copy process and cancelation will be displayed. To discontinue the copy process, press the <SET> button. When the [YES]/[NO] confirmation screen is displayed, use the cursor buttons to select [YES].

NOTE

- In clip division and copying using the text memo, the area copied may be automatically modified and copied depending on the recording method of the clip.

Deleting clips

1 Use the cursor buttons to move the cursor over the clip to be deleted, and press the <SET> button to select the clip.

2 Select [DELETE] in the main menu → [CLIP].

3 Use the cursor buttons to select [YES].

The clip is deleted. All selected clips (in blue-green frames) are deleted by this operation.

NOTE

- To discontinue the deletion process, press the <SHIFT> button + <EXIT> button or the <SET> button to cancel the operation. Once a clip is deleted halfway, it cannot be restored even if the deletion process is aborted.

Restoring clips

You can restore clips that were made defective as a result of sudden power-down during recording or removal of the P2 card being accessed.

1 Use the cursor buttons to move the cursor over the clip to be restored (defective clips are indicated by defective clip marks) and press the <SET> button to select the clip.

2 Select [REPAIR] in the main menu → [CLIP].

3 Use the cursor buttons to select [YES].

This restores the clip.

NOTE

- To find defective clips, set the main menu → [CLIP] → [REPOSITION] to [NG CLIPS]. Only defective clips are displayed. For details, refer to "Setting thumbnails to be displayed" (page 110).
- You can restore clips with yellow defective clip indicators. Delete clips with red defective clip indicators. If the clips cannot be deleted, format the P2 card.
  During restoration of the clips, however, the defective clip indicator may change from yellow to red, and result in the inability to restore the clips.
- When defective clips containing proxy data are restored, proxy data will be deleted.

Reconnecting incomplete clips

Incomplete clips may be generated when clips recorded on multiple P2 cards (connected clips) are separately copied from each card. The reconnection function generates one clip (the original, connected clip) from incomplete clips.

1 Use the cursor buttons and the <SET> button to select incomplete clips to be reconnected.

Usually, thumbnails of incomplete clips (clips with ! indication) are displayed next to each other.

2 Select [RE-CONNECT] in the main menu → [CLIP].

3 Use the cursor buttons to select [YES].

This reconnects incomplete clips.

NOTE

- Incomplete clip indicators will remain displayed when only some clips are reconnected, unless all the constituent clips of the original clip are reconnected.

Copying clips

Selected clips can be copied to a P2 card in the desired slot, a connected USB storage device, or an FTP server.

1 Use the cursor buttons to move the cursor over the clip to be copied, and press the <SET> button to select the clip.

2 In the main menu → [CLIP], move the cursor from the [COPY] list over the copy destination and press the <SET> button.

- When multiple clips are selected, the number of selected clips is displayed after pressing the <SET> button.
- If the copy destination is a storage device, select the copy destination properties.
- If the copy destination is [SD CARD] and [FTP(PROXY)], video and audio of the main recording will not be copied and only proxy-related data will be copied.

3 Move the cursor to [YES] in the confirmation message and press the <SET> button.

This starts copying of the clip.

4 When the completion message appears, press the <SET> button.

NOTE

- Turning off the power or inserting/removing a card during copying may damage the P2 card. If you accidentally make these mistakes, it can result in defective clips. After deleting the defective clips redo copying.
- Copying is not performed when the following error messages are displayed.
  - [LACK OF CAPACITY!]
    Copying could not be performed because the recording capacity of the copy destination is insufficient.
  - [UNKNOWN CONTENTS FORMAT!]
    Copying could not be performed because a defective clip is selected.
  - [NO COPY TO SAME CARD!]
    Copying could not be performed because you are attempting to copy to the same card.
  - [TOO MANY CLIPS!]
    Copying could not be performed because there are too many clips selected.
- If the copying is performed while a text memo is selected in the lower part of the text memo, the section between the selected text memo position and the next text memo will be copied. If no text memo is found after the selected one, then the part after the selected text memo to the end of the clip is copied. For details, refer to “Using a text memo to divide a clip and copy the necessary portion” (page 113).
- To discontinue copying, press the <SHIFT> button + <EXIT> button or the <SET> button to cancel the operation. The clip being copied will be deleted from the copy destination.
- When identical clips (same [GLOBAL CLIP ID]) exist on the destination, [OVERWRITE?] is displayed. Select [YES] when overwriting the clip, and select [NO] when not overwriting the clip.

Setting clip metadata

Information such as the name of the person who shot the video, the name of the reporter, the shooting location, or text memos can be loaded from an SD memory card, and can be recorded as clip metadata.

Clip metadata items

Clip metadata includes the following items. Underlined items can be set by loading the metadata upload file on the SD memory card. Other items are set automatically during shooting. Using the latest update version of P2 Viewer Plus, metadata upload files can be written to SD memory cards using a computer. Download and install the latest version of P2 Viewer Plus from the following website.

http://pro-av.panasonic.net/

For details on SD memory cards to be used, refer to “Cautions when using SD memory cards” (page 21).

NOTE

- Files which were not edited by P2 Viewer Plus are displayed as [UNKNOWN DATA!] and may not be readable.

[GLOBAL CLIP ID]	Displays the global clip ID that shows the shooting status of the clip.
[USER CLIP NAME]	Displays the clip name set by the user.*1
[VIDEO]	Displays [FRAME RATE] (frame rate of the clip), [PULL DOWN] (pull-down format), and [ASPECT RATIO].
[AUDIO]	Displays [SAMPLING RATE] (sampling frequency of recorded audio) and [BITS PER SAMPLE] (quantizing bits for recorded audio).

[ACCESS]	Displays [CREATOR] (person who recorded the clip), [CREATION DATE] (date when the clip was recorded), [LAST UPDATE DATE] (date of the latest update of the clip), and [LAST UPDATE PERSON] (person who made the latest update of the clip).
[DEVICE]	Displays [MANUFACTURER] (name of the device manufacturer), [SERIAL NO.] (serial number of the device), and [MODEL NAME] (model name of the device).
[SHOOT]	Displays [SHOOTER] (name of the person who shot the video), [START DATE] (start date of shooting), [END DATE] (end date of shooting), and [LOCATION]/[ALTITUDE]/[LONGITUDE]/[LATITUDE]/[SOURCE]/[PLACE NAME] (altitude, longitude, latitude, and source of the information and name of the location).
[SCENARIO]	Displays [PROGRAM NAME], [SCENE NO.], and [TAKE NO.].
[NEWS]	Displays [REPORTER] (name of the reporter), [PURPOSE] (purpose of shooting), and [OBJECT] (object of shooting).
[MEMO]*2	Displays [NO.] (the number of the text memo), [OFFSET] (location of the frame where the text memo is added), [PERSON] (person who recorded the text memo added to the clip), and [TEXT] (content of the text memo).
[THUMBNAIL]	Displays the location of the frame (frame offset) and the size (height and width) of the image selected as the thumbnail image.
[PROXY]	Displays information such as proxy format when proxy is added.

*1 You can select the [USER CLIP NAME] recording method. For details, refer to “Selecting the [USER CLIP NAME] recording method” (page 116).

*2 When entering [MEMO], make sure to enter [TEXT]. It is not possible to record only [PERSON] (the person inputting the memo), or [OFFSET] (the recording position).

Loading clip metadata (metadata upload)

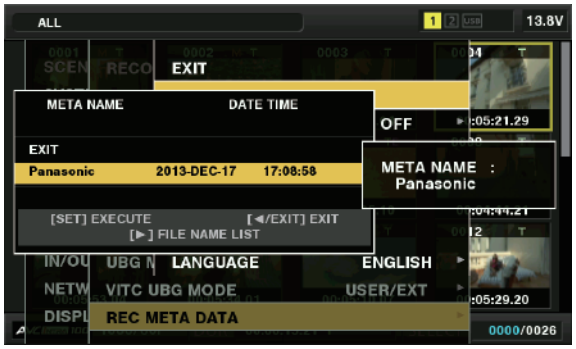


Fig. 1

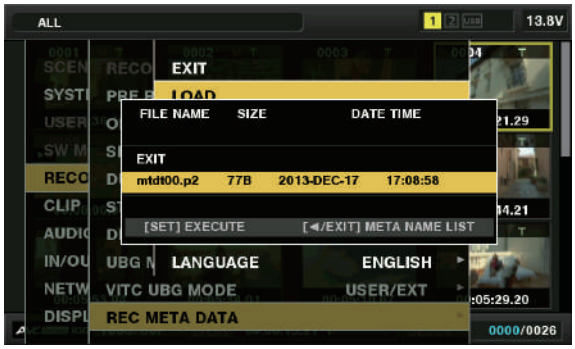


Fig. 2

1 Insert the SD memory card that contains the clip metadata (metadata upload file).

2 Select [LOAD] in the main menu → [RECORDING SETUP] → [REC META DATA].

The metadata name of the metadata upload file on the SD memory card is displayed. (Fig. 1)

3 Use the cursor buttons to select the file to be loaded, and select [YES].

- Upload starts.
- Uploaded metadata is retained even if the power is turned off.
- For confirmation of uploaded data, refer to “Checking and modifying uploaded metadata” (page 115).

NOTE

- While displaying metadata names, press the cursor button (▷) to switch to file name display. (Fig. 2)
  Press the cursor button (◁) to return to metadata name display.

Checking and modifying uploaded metadata

Details of metadata uploaded from an SD memory card can be checked.

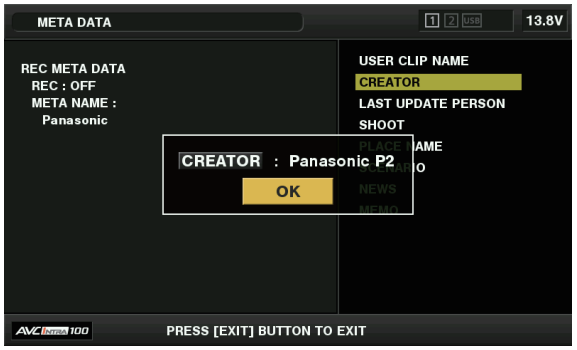


Fig. 1

Fig. 2

1 Select [PROPERTY] in the main menu → [RECORDING SETUP] → [REC META DATA].

The metadata list is displayed.

2 Use the cursor buttons to move the cursor over the item to be checked, and press the <SET> button.

Settings of the uploaded metadata can be checked. (Fig. 1)

3 While checking the settings for the metadata, use the cursor buttons to move the cursor over the item where you want to change the setting, and press the <SET> button.

- A software keyboard screen is displayed, allowing you to modify the setting. (Fig. 2)
- While holding down the <SHIFT> button, press the cursor buttons (△/▽) to move to the beginning or end of the setting details to be changed.

Setting whether to record the uploaded metadata

Set [ON]/[OFF] in the main menu → [RECORDING SETUP] → [REC META DATA] → [RECORD]. [OFF] is set in the factory settings.

Selecting the [USER CLIP NAME] recording method

Select the [USER CLIP NAME] recording method from the two of [TYPE1] and [TYPE2] in the main menu → [RECORDING SETUP] → [REC META DATA] → [USER CLIP NAME].

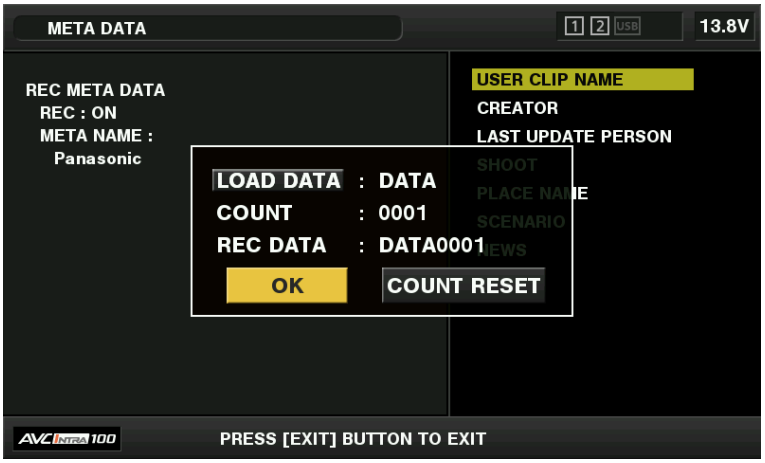
■ [TYPE1] (factory settings)

Status of clip metadata	[USER CLIP NAME] to be recorded
When clip metadata has been loaded	Uploaded data
When no clip metadata has been loaded, or when setting disables recording of loaded clip metadata	Same as [GLOBAL CLIP ID]

■ [TYPE2]

Status of clip metadata	[USER CLIP NAME] to be recorded
When clip metadata has been loaded	Uploaded data + [COUNT] value*
When no clip metadata has been loaded, or when setting disables recording of loaded clip metadata	Same as [CLIP NAME]

* The [COUNT] value is indicated as a four-digit number.
The [COUNT] value is incremented each time a new clip is generated, if the clip metadata has been loaded and [TYPE2] has been selected as the recording method.
The [COUNT] value can be reset using the following method.
When you select [PROPERTY] in the main menu → [RECORDING SETUP] → [REC META DATA] and then select [USER CLIP NAME], the following screen is displayed. Move the cursor over [COUNT RESET], and press the <SET> button to reset the [COUNT] value to 1.



Selecting the [CARD SERIAL] recording

When [ON] is selected in the main menu → [RECORDING SETUP] → [REC META DATA] → [CARD SERIAL], the function that records the serial number of the P2 card as metadata (text memo without offset) is enabled.

Initializing the metadata setting

Select [INITIALIZE] in the main menu → [RECORDING SETUP] → [REC META DATA]. Select [YES] when the confirmation screen is displayed.
The settings in the main menu → [RECORDING SETUP] → [REC META DATA] and later items, including loaded metadata, are initialized.

Setting metadata display language

When [NTSC (J)] is selected for the region of use, the language used to display metadata can be set.
Select [LANGUAGE] in the main menu → [RECORDING SETUP] → [REC META DATA], select the display language, and press the <SET> button.
For a language, select either [ENGLISH] or [JAPANESE].

NOTE

- Characters that cannot be displayed in English are not displayed properly but are displayed as "∗".
- Only alphanumeric characters can be entered.

Formatting a P2 card

1 Select [FORMAT] in the main menu → [CLIP].

- Select the slot number where the P2 card to be formatted is inserted, and press the <SET> button.
- Select [EXIT] when you do not wish to format the card.

2 Use the cursor buttons to select [YES].

The selected P2 card is formatted.

NOTE

- Data deleted as a result of formatting cannot be restored. Always check the data before formatting.
- If the CPS password has been set, the confirmation message whether to select the encrypted format [CPS(ENCRYPT)] or normal format [NORMAL] is displayed when selecting a slot. When the encrypted format is selected, the microP2 memory card is encrypted.

Formatting SD memory cards

SD memory cards can also be formatted in the thumbnail screen. With an SD memory card inserted into the camera, perform the following operation.

1 Select [FORMAT] in the main menu → [CLIP].

- Select [SD CARD], and press the <SET> button.
- Select [EXIT] when you do not wish to format the card.

2 Use the cursor buttons to select [YES].

The SD memory card is formatted.

NOTE

- SD memory cards can also be formatted in the main menu → [CARD FUNCTIONS] → [FORMAT SD CARD].
  For details, refer to “Formatting SD memory cards” (page 89).
- Data deleted as a result of formatting cannot be restored. Always check the data before formatting.

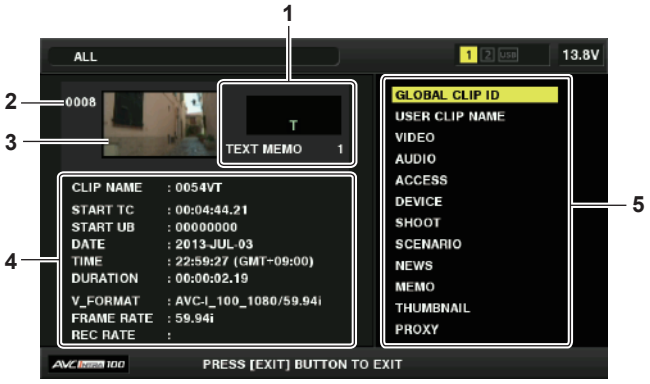
Properties

Clip properties and P2 card status are displayed.

It is possible to edit and rewrite the recorded clip metadata while clip properties are displayed.

Clip properties

Select [CLIP PROPERTY] in the main menu → [CLIP] → [PROPERTY].



1 Clip information

Displays the indicators added to the clip and the number of added text memos.

The mark will be displayed if the P2 card in which the clip is recorded is write-protected.

2 Clip number

NOTE

- For clips that cannot be played back, the number and the unplayable indicator are displayed in red.

3 Thumbnail

4 Clip information

Displays detailed information about the clip.

[CLIP NAME]	Displays clip names.
[START TC]	Displays the time code value at the start of the recording.
[START UB]	Displays the user bit value at the start of the recording.
[DATE]	Displays the date of the recording.
[TIME]	Displays the time at the start of recording.
[DURATION]	Displays the time length of the clip.
[V_FORMAT]	Displays the recording format of the clip.
[FRAME RATE]	Displays the frame rate for playback.

[REC RATE]	Displays the recording frame rate.

5 Clip metadata

The items for referencing clip properties (clip metadata) are displayed.
For details, refer to “Setting clip metadata” (page 114).

Modifying recorded clip metadata

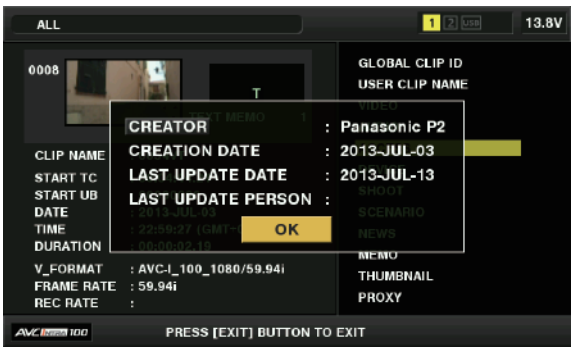


Fig. 1

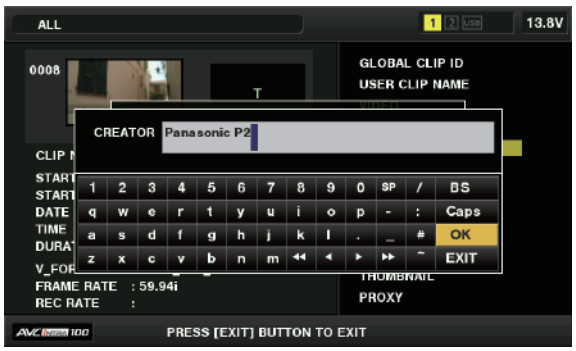


Fig. 2

1 Display the metadata details window for the clip to be modified on the clip properties screen.

2 Use the cursor buttons to place the cursor on the item to be modified. (Fig. 1)

The items of the metadata with the gray buttons in background can be modified.

3 Press the <SET> button.

Information about keyboard operation is the same as “Checking and modifying uploaded metadata” (page 115).

- The input window (software keyboard) for modifying metadata is displayed. (Fig. 2)
- Enter characters with the keyboard to modify the metadata.

4 Select [OK] on the keyboard.

The modified metadata is written on the clip and the screen returns to the metadata details window.

NOTE

- To delete each item in [LOCATION] (shooting location data) of [SHOOT], the item cannot be deleted alone. By setting the [ALTITUDE] item to empty, other [LONGITUDE] and [LATITUDE] items are collectively deleted.
- Metadata of clips with ! (incomplete clip indicator) cannot be repaired. Repair of metadata of clips recorded across multiple P2 cards must be performed after inserting all of the P2 cards.
- Any [MEMO] with 101 characters or more cannot be modified.

Displaying P2 card status

■ P2 card status display settings

You can select the P2 card status display from either remaining capacity or used capacity of the P2 card.

1 Press the <THUMBNAIL> button.

The thumbnail screen appears on the viewfinder.

2 Select [REMAIN] (remaining capacity) or [USED] (used capacity) in the main menu → [CLIP] → [PROPERTY] → [REMAIN SETUP]. (Fig. 1)

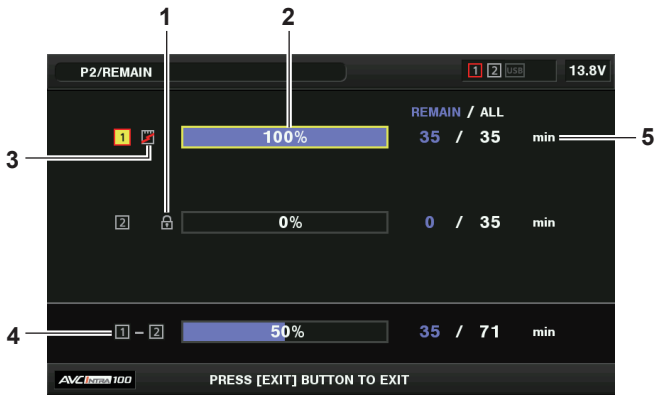
■ P2 card status display items

[REMAIN]	Displays remaining capacity on the P2 card as the P2 card status display. (Factory setting)
[USED]	Displays used memory capacity on the P2 card as the P2 card status display.

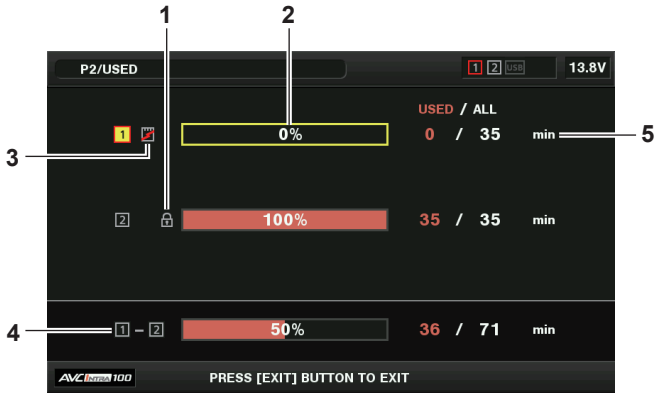
Contents of P2 card status display settings

Select [CARD STATUS] in the main menu → [CLIP] → [PROPERTY].

■ **When [REMAIN] is selected**



■ **When [USED] is selected**



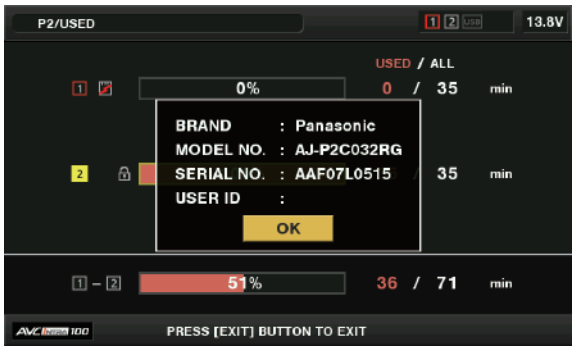


Fig. 1

1 Write-protected mark

The mark appears when the P2 card is write-protected.

2 P2 card status (remaining capacity)

The remaining memory capacity of the P2 card is shown as a bar graph and percentage. The bar graph indicator moves to the left as the remaining capacity decreases.

The following displays may also appear, depending on the card status.

[FORMAT ERROR!]	An unformatted P2 card is inserted.
[NOT SUPPORTED!]	An unsupported card is inserted.
[NO CARD]	No P2 card is inserted.
[AUTH NG CARD]	Indicates that the card is a microP2 memory card which cannot authenticate a CPS password.

Use the cursor buttons to place the cursor on the P2 card for data to be accessed and press the <SET> button to display detailed information on the P2 card. Specific information such as the serial number can be checked. (Fig. 1)

When the maximum number of clips that can be recorded in the P2 card has been reached, [OVER MAX NUMBER CLIPS] is displayed in the P2 card detailed information showing that the upper limit has been reached.

3 Warning card mark

When P2 cards are the following status, the mark is displayed.

[RUN DOWN CARD]	The maximum number of overwrites on the P2 card has been exceeded.
[DIR ENTRY NG]	The directory structure on the P2 card is not supported.

The warning can be checked on the P2 card detailed information in “P2 card status (remaining capacity)” (page 119).

4 Total slot memory remaining capacity (or used capacity)
This displays the total remaining memory capacity (or used capacity) of the two slots.
The available space of a write-protected P2 card is not included in the total available space.

5 P2 card remaining capacity (or used capacity) / total capacity
This displays the remaining capacity (or used capacity) / total capacity of the P2 card. Since only the figures in minutes are displayed, the remaining memory capacity (or used capacity) for each P2 card may not match the total capacity.

Setting CPS password

To set a CPS password, either load the password from the SD memory card or use the menu of the camera to enter the password.
Only one CPS password can be set on the camera. Loading the CPS password again overwrites the previously saved password.

Loading CPS password from SD memory card

1 Download and install the latest P2 Viewer Plus into a computer.

2 With P2 Viewer Plus, generate a CPS password and write it to the SD memory card.

3 Load the CPS password file.

1) Start the camera, and insert the SD memory card into the SD card slot.

2) Open the thumbnail screen and select [LOAD] in the main menu → [CLIP] → [PROPERTY] → [CPS PASSWORD].
The password file list is displayed.

3) Select the file to be used and press the <SET> button.
- When loading of the CPS password has succeeded, the message [LOADING PASSWORD COMPLETED!] is displayed.
- When loading of the CPS password has failed, a warning message is displayed. For an explanation of warnings, refer to “Warning system” (page 206).

NOTE

- The CPS password file generated on the SD memory card is encrypted. If it is no longer used, format the SD memory card for security risk management.

Setting CPS password using the menu of the camera

1 Open the thumbnail screen and select [SET] in the main menu → [CLIP] → [PROPERTY] → [CPS PASSWORD].
The software keyboard to enter the CPS password is displayed.

2 Enter the CPS password with the keyboard.
Enter [PASSWORD] and [RETRY PASSWORD] for verification, and select [OK] to set the CPS password.
- When entry of the CPS password has succeeded, the message [SETTING PASSWORD COMPLETED!] is displayed.
- When entry of the CPS password has failed, the warning message is displayed. For warnings description, refer to “During thumbnail and menu operation” (page 207).

NOTE

- Up to 16 characters can be input.
- The entered password cannot be displayed on the device. Do not forget the password.

Deleting CPS password

When the CPS function is no longer used, delete the CPS password.

1 Open the thumbnail screen and select [DELETE] in the main menu → [CLIP] → [PROPERTY] → [CPS PASSWORD].
[DELETING PASSWORD COMPLETED!] is displayed and the CPS password is deleted.

NOTE

- When the CPS password is deleted, automatic authentication of the encrypted microP2 memory card and encryption format function are disabled.

Manual CPS authentication

An encrypted microP2 memory card is authenticated on the camera automatically, and can be used only if the authentication has succeeded.
Authentication fails if the CPS password set to device and the CPS password set to microP2 memory card differ. To temporarily use a microP2 memory card whose authentication has failed, manually enter the CPS password authorized for the microP2 memory card in accordance with the following procedures. If the code matches, you can use the card.

1 Confirm that authentication has failed.

1) Open the thumbnail screen and select [CARD STATUS] in the main menu → [CLIP] → [PROPERTY].
For the card whose authentication has failed, the slot number frame at the top right of the screen turns red, and [AUTH NG CARD] is displayed on the remaining capacity bar. Press the cursor buttons (△/▽) to select the card.

2 Perform manual authentication.

1) On the card status screen, select [AUTHENTICATE] in the main menu → [CLIP].
The software keyboard to enter the CPS password is displayed.

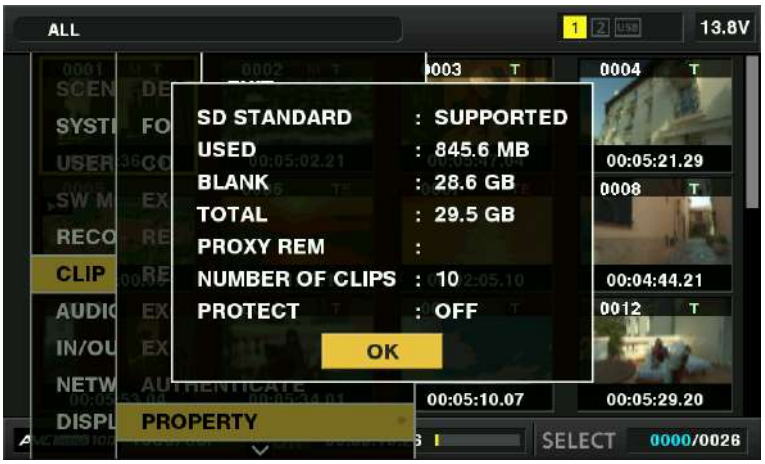
2) Enter the password set on the microP2 memory card and select [OK].
   - When entry of the CPS password has succeeded, the message [AUTHENTICATED SUCCESSFULLY!] is displayed.
   - When entry of the CPS password has failed, the warning message (page 207) is displayed.

NOTE

- Manual authentication is valid temporarily. If the target microP2 memory card is removed or power is turned off, the CPS password set manually is disabled.
- Visit the following website for conditions where manual authentication is valid.
  http://pro-av.panasonic.net/
- The encrypted microP2 memory card is not recognized on the SD card slot in a computer.
- If the card is unable to be recognized, authenticate with the correct password, or format the card and use it as recording media, or remove it from the camera. Do not perform any operation other than manual authentication and formatting with the failed card inserted.

SD memory card status display

The status display enables confirmation of the SD memory card format condition, available memory space, etc.



Select [SD CARD] in the main menu → [CLIP] → [PROPERTY]. The same information can be displayed from the main menu → [CARD FUNCTIONS] → [SD CARD PROPERTY].

[SD STANDARD]	Indicates whether an SD memory card is formatted according to the SD/SDHC/SDXC standard. • [SUPPORTED]: Complies with SD/SDHC/SDXC standards • [NOT SUPPORTED]: Does not comply with SD/SDHC/SDXC standards
[USED]	Used capacity (bytes)
[BLANK]	Available space (bytes)
[TOTAL]	Total capacity (bytes)
[PROXY REM]	Remaining capacity for proxy recording
[NUMBER OF CLIPS]	The number of clips on an SD memory card when clips have been copied to an SD memory card
[PROTECT]	Write-protected status

Chapter 6 Menu Operations

This chapter describes how to operate the camera menus, the structure, and details of the setting menu.

Setting menu structure

Menu types and how to open them

Menu type	Use	How to open
[USER MENU]	In the main menu → [USER MENU SEL], you can select the desired items and pages and register to [USER MENU]. You can select them depending on the purpose or frequency of use to make a unique menu structure. For details, refer to “Setting [USER MENU]” (page 126).	Displayed by pressing the <MENU> button.
Main menu	You can set all items in the setting menu. The main menu has a structure of categorized layers according to intended use and setting frequency.	Displayed by pressing and holding the <MENU> button for three seconds or more.
[OPTION MENU]	Menu items are prepared to take into account additional functions in the future. Please consult your vendor for more details.	Displayed by pressing the <MENU> button while holding down the <LIGHT> button.

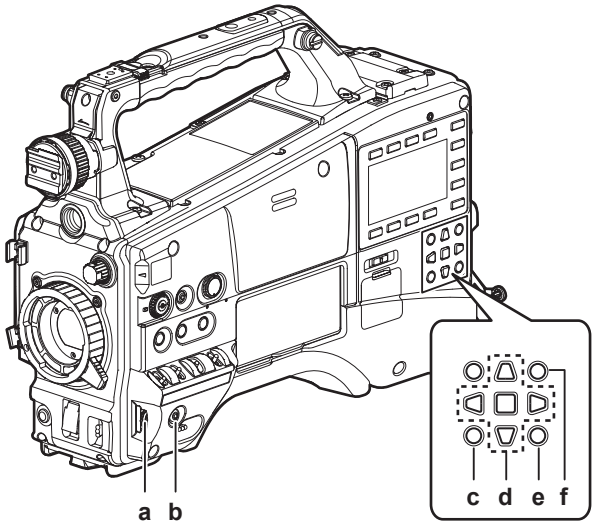
Main menu structure

[SCENE FILE]	Configures the settings for scene files. This item is used to configure detailed image quality settings of the camera images, to select scene files, and to configure the settings for reading/writing of scene file data to the internal memory. This menu item cannot be set when the thumbnail screen is displayed.
[SYSTEM MODE]	Configures the settings for the recording format of video and audio.
[USER SW]	Sets the function to be assigned to the USER button and the <RET> button of the lens.
[SW MODE]	Configures the operations of each mode when switched the mode using each switch. This menu item cannot be set when the thumbnail screen is displayed.
[RECORDING SETUP]	Configures various settings when performing recording and playback. Set the system frequency, the number of lines, recording format, and recording method.
[CLIP]	This item is used to perform various tasks, such as playing back, deleting, and copying clips, and editing metadata, while checking the thumbnails of the clips displayed in the viewfinder. This menu item is enabled when the thumbnail screen is displayed. Clip operations such as [DELETE] or [COPY] are enabled when the target thumbnail is selected. Some items are displayed only in specific situations such as in USB host mode or on the explorer screen.
[AUDIO SETUP]	Configures the settings for audio input/output.
[IN/OUT SEL]	Configure the settings regarding video output from <SDI OUT/IN (OP)>, <HDMI>, <MON OUT>, and <TC IN/OUT> terminals.
[NETWORK SETUP]	Configures the settings for network.
[DISPLAY SETUP]	Configures the settings for the details to be displayed in the viewfinder. This menu item cannot be set when the thumbnail screen is displayed.
[BATTERY SETUP]	Configures the settings for the battery.
[CARD FUNCTIONS]	Configures the settings for reading/writing of scene files and user files to SD memory cards.
[OTHER FUNCTIONS]	Configures the settings for reading/writing of user files to internal memory and initialization, and the camera settings.
[MAINTENANCE]	Used for performing maintenance of the camera. This item is used when updating the firmware version of the camera.
[DIAGNOSTIC]	Displays the firmware version, product name, serial number, and energized time of the camera.
[USER MENU SEL]	Sets the items to be displayed in [USER MENU].

Setting menu display

Setting menu basic operations

You can change camera settings using the setting menu according to the shooting scene and recording details.
The menu is divided into the main menu, submenu, and setting item menu.
Set data are written and saved in the internal memory of the camera.
This section describes main menu operations. Main menu operation is the same as the other menus except when opening the menu screen.



a: Jog dial button

b: <MENU> button

c: <EXIT>/<CANCEL> button

d: △▽◁▷ cursor buttons
□<SET> button

e: <THUMBNAIL MENU> button
This button functions in the same way as the <MENU> button.

f: <SHIFT> button

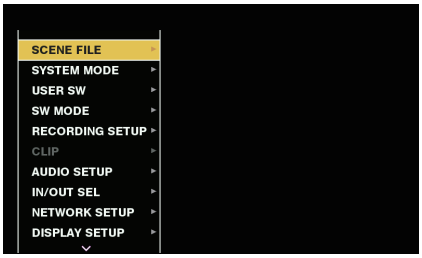


Fig. 1

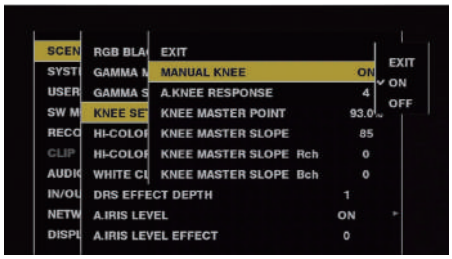


Fig. 2

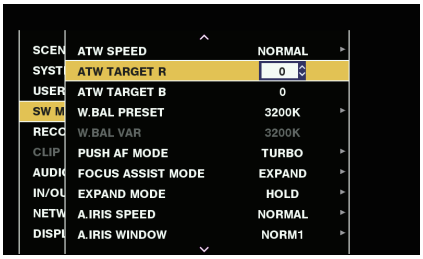


Fig. 3

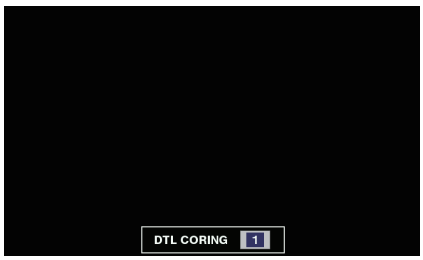


Fig. 4

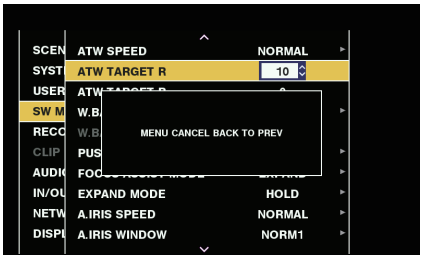


Fig. 5

1 Press and hold the <MENU> button for three seconds or more when not recording.

- The main menu screen appears on the viewfinder.

2 Use the jog dial button (or the cursor buttons (△/▽)) to place the cursor on the corresponding menu item. (Fig. 1)

- Press the cursor buttons (△/▽) to move the cursor up or down.
- If there is a menu in the next level, [►] is displayed in the menu items.
  Press the jog dial button, the cursor button (▷), or the <SET> button to open lower-level menus. (Fig. 2)
- Press the cursor button (◁) or the <EXIT> button to return to the upper-level menu. You can go back to the upper levels by using the jog dial button to place the cursor on the topmost line ([EXIT]) then pressing it.

3 Press the jog dial button (or the <SET> button).

- The confirmation screen is displayed depending on the menu item.
  Select the process using the cursor buttons (△/▽/◁/▷), and press the <SET> button.
  A checkmark is placed in front of the set item.
- In some menus, a screen for setting value is displayed on the menu screen (Fig. 3) or at the bottom of the screen (Fig. 4).
- In some menus, a message is displayed if a menu cannot be executed.

4 Press the <MENU> button to close the menu.

- This brings you back automatically to the previous screen depending on the menu item.

■ **Performing cancellation while setting**

1 Press the <EXIT> button while holding down the <SHIFT> button.

[MENU CANCEL BACK TO PREV] is displayed. (Fig. 5)

2 Press the <EXIT> button while holding down the <SHIFT> button.

The changed value returns to the value before being changed.

NOTE

・ You will need to restart the camera if the number of lines and frequency setting of the system change.

Setting [USER MENU]

1 Select the main menu → [USER MENU SEL].

2 Select and display various items according to level.

3 Put checkmarks [✓] on the items to be displayed in [USER MENU].

You can select menu items in each item or page. You can select up to 64 items.
Selected items are displayed on the main menu page or item in order.

Setting menu initialization

The values set in the setting menu are saved in the user file and scene file. Both the user file and scene file can be initialized to the factory settings.

Initializing user file (all items except for the scene file)

1 Select [INITIALIZE] in the main menu → [OTHER FUNCTIONS] → [USER FILE].

Initializing selected scene file

1 Select a scene file to initialize in [FILE] in the [CAM02:SCENE FILE] screen of SmartUI.

2 Select [INITIALIZE] in the main menu → [SCENE FILE] → [LOAD/SAVE/INITIALIZE].

Initializing user file and all scene files simultaneously

1 Select the main menu → [OTHER FUNCTIONS] → [MENU INITIALIZE].

2 Select [YES].

Menu list

[SCENE FILE]

Configure the settings regarding scene files.
This menu is used to set fine image quality settings of the camera images, select scene files, and read/write scene file data to the internal memory.
These menu items cannot be set when the thumbnail screen is displayed.

Item		Description of settings
[NAME EDIT]		Edits the name of the scene file selected in the scene file menu. (Maximum of six characters)
[LOAD/SAVE/INITIALIZE]		Loads/saves/initializes the setting values allocated on the current scene file number (any one from 1 to 6). **[LOAD]:** Selects and loads a scene file saved in the camera memory. **[SAVE]:** Specifies a title and file number for the current setting values and saves them as a scene file in the camera memory. **[INITIALIZE]:** Initializes the selected scene files (1 to 6) to the factory settings.
[SYNC SCAN TYPE]		Switches the synchro scan display settings. **[sec]:** Displays in time. **[deg]:** Displays at shutter open angle. • Factory setting: [sec]
[SYNCHRO SCAN]		Displays the speed of the synchro scan shutter that is used when shooting video for television etc. When [SYNC SCAN TYPE] = [sec], and [SYSTEM MODE] = 59.94 Hz: • 60i/60p: **[1/60.0]…[1/250.0]** • 30P: **[1/30.0]…[1/250.0]** • 24P: **[1/24.0]…[1/250.0]** When [SYNC SCAN TYPE] = [sec], and [SYSTEM MODE] = 50 Hz: • 50i/50P: **[1/50.0]…[1/250.0]** • 25P: **[1/25.0]…[1/250.0]** When [SYNC SCAN TYPE] = [deg] (in 0.5 d steps, angle display): **[3.0d]…[360.0d]** • Factory setting: [1/60.0] (when [SYNC SCAN TYPE] = [sec], and [SYSTEM MODE] = 59.94 Hz)
[MASTER DTL]		Sets the level of the detail effect of the whole part. **[−31]…[31]** • Factory setting: [0]
[DTL CORING]		Sets the level of signal (including noise) that does not activate the detail effect. **[0]…[60]** • Factory setting: [1]
[DETAIL SETTING]	[DETAIL]	Sets [ON]/[OFF] of the detail function. **[ON], [OFF]** • Factory setting: [ON]
	[V.DTL LEVEL]	Sets the intensity of the detail level in the vertical direction. **[−7]…[7]** • Factory setting: [0]
	[H.DTL FREQ.]	Sets the thickness of the detail level in the horizontal direction. **[−7]…[7]** • Factory setting: [0]
	[V. DTL FREQ.]	Sets the thickness of the detail level in the vertical direction. **[0]…[2]** • Factory setting: [1]
	[LEVEL DEPEND.]	When the detail of luminosity signal is emphasized, details in the darker parts are compressed. Details of bright areas are also compressed more when the value set for [LEVEL DEPEND.] is larger. **[−7]…[7]** • Factory setting: [0]
	[KNEE APE LVL]	Sets the detail level of high luminosity areas (high-brightness areas). For operation, 0 is displayed as [OFF]. **[OFF], [1]…[5]** • Factory setting: [2]
	[DTL GAIN(+)]	Sets the detail level of + direction (to make brighter). **[−31]…[31]** • Factory setting: [0]
	[DTL GAIN(−)]	Sets the detail level of − direction (to make darker). **[−31]…[31]** • Factory setting: [0]
[SKIN TONE DTL A]		Selects the skin tone table that will display the skin tone detail. Create the skin tone table with [DETECT TABLE]. You can shoot smoother skin tones by displaying the skin tone detail. [SKIN TONE DTL A] can be used alone or used in combination with [SKIN TONE DTL B] and [SKIN TONE DTL C]. **[ON], [OFF]** • Factory setting: [OFF]
[SKIN TONE DTL B]		Selects the skin tone table that will display the skin tone detail. Create the skin tone table with [DETECT TABLE]. You can shoot smoother skin tones by displaying the skin tone detail. [SKIN TONE DTL B] can be used alone or used in combination with [SKIN TONE DTL A] and [SKIN TONE DTL C]. **[ON], [OFF]** • Factory setting: [OFF]

Item		Description of settings
[SKIN TONE DTL C]		Selects the skin tone table that will display the skin tone detail. Create the skin tone table with [DETECT TABLE]. You can shoot smoother skin tones by displaying the skin tone detail. [SKIN TONE DTL C] can be used alone or used in combination with [SKIN TONE DTL A] and [SKIN TONE DTL B]. **[ON], [OFF]** • Factory setting: [OFF]
[SKIN TONE ZEBRA]		Set to display a zebra pattern in the skin tone area displayed in the viewfinder. The zebra pattern is displayed when this item is set to [ON] and [SKIN TONE DTL A]/[SKIN TONE DTL B]/[SKIN TONE DTL C] is activated. The zebra pattern displays the area selected in [SKIN TONE DTL SETTING]. **[ON], [OFF]** • Factory setting: [ON]
[SKIN TONE DTL SETTING]	[DETECT TABLE]	Selects the skin tone table of the subject that displays the skin tone detail. **[A], [B], [C]** • Factory setting: [A]
	[SKIN TONE GET]	Obtains the color information of [A], [B], or [C] selected in [DETECT TABLE] from near the center marker. If executed, data from [I CENTER] to [Q PHASE] are automatically obtained. The obtained data becomes the table data of [A], [B], or [C] selected in [DETECT TABLE]. Multiple color information for [A], [B], and [C] cannot be obtained simultaneously.
	[SKIN DTL EFFECT]	Sets the effective level of the skin tone detail. **[0]…[31]** • Factory setting: [16]
	[I CENTER]	Sets the center position of the upper I axis (setting the area that displays the skin tone). **[0]…[255]** • Factory setting: [35]
	[I WIDTH]	Sets the width of the area that displays the skin tone of the upper I axis that focus on [I CENTER]. **[0]…[255]** • Factory setting: [55]
	[Q WIDTH]	Sets the width of the area that displays the skin tone of the upper Q axis that focus on [I CENTER]. **[0]…[90]** • Factory setting: [10]
	[Q PHASE]	Sets the phase of the area that displays the skin tone regarding to the Q axis. **[–180]…[179]** • Factory setting: [0]
[RB GAIN CONTROL SETTING]	[R GAIN AWB PRE]	Sets the Rch gain when the <WHITE BAL> switch is on <PRST>. **[–200]…[200]** • Factory setting: [0]
	[B GAIN AWB PRE]	Sets the Bch gain when the <WHITE BAL> switch is on <PRST>. **[–200]…[200]** • Factory setting: [0]
	[R GAIN AWB A]	Sets the Rch gain when the <WHITE BAL> switch is on <A>. **[–200]…[200]** • Factory setting: [0]
	[B GAIN AWB A]	Sets the Bch gain when the <WHITE BAL> switch is on <A>. **[–200]…[200]** • Factory setting: [0]
	[R GAIN AWB B]	Sets the Rch gain when the <WHITE BAL> switch is on <B>. **[–200]…[200]** • Factory setting: [0]
	[B GAIN AWB B]	Sets the Bch gain when the <WHITE BAL> switch is on <B>. **[–200]…[200]** • Factory setting: [0]
	[AWB A GAIN OFFSET]	Sets the Rch gain and Bch gain when performing automatic white balance after the <WHITE BAL> switch is on <A>. **[ON]:** Keeps the values set in [R GAIN AWB A] and [B GAIN AWB A]. **[OFF]:** Sets the value of Rch gain and Bch gain to [0]. • Factory setting: [OFF]
	[AWB B GAIN OFFSET]	Sets the Rch gain and Bch gain when performing automatic white balance after the <WHITE BAL> switch is on <B>. **[ON]:** Keeps the values set in [R GAIN AWB B] and [B GAIN AWB B]. **[OFF]:** Sets the value of Rch gain and Bch gain to [0]. • Factory setting: [OFF]
[COLOR TEMP Ach SETTING]	[COLOR TEMP]	Displays the color temperature when the <WHITE BAL> switch is at the <A> position and automatic white balance is working, or when it is preset. Also, in automatic white balance operation, the color temperature can be changed by changing the output balance of Rch and Bch. **[2000K]…[15000K]** • Factory setting: [3200K]
	[R Gain]	Displays the Rch output when the <WHITE BAL> switch is at the <A> position and automatic white balance is working, or when it is preset. Also, in automatic white balance operation, the color can be changed on the Rch axis by changing the output of Rch. **[–400]…[400]** • Factory setting: [0]

Item		Description of settings
	[B Gain]	Displays the Bch output when the <WHITE BAL> switch is at the <A> position and automatic white balance is working, or when it is preset. Also, in automatic white balance operation, the color can be changed on the Bch axis by changing the output of Bch. **[–400]…[400]** • Factory setting: [0]
	[G AXIS]	Displays the G axis output when the <WHITE BAL> switch is at the <A> position and automatic white balance is working, or when it is preset. Also, in automatic white balance operation, the color can be changed on the G axis by changing the output of Rch/Bch. **[–400]…[400]** • Factory setting: [0]
[COLOR TEMP Bch SETTING]	[COLOR TEMP]	Displays the color temperature when the <WHITE BAL> switch is at the <B> position and automatic white balance is working, or when it is preset. Also, in automatic white balance operation, the color temperature can be changed by changing the output balance of Rch and Bch. **[2000K]…[15000K]** • Factory setting: [3200K]
	[R Gain]	Displays the Rch output when the <WHITE BAL> switch is at the <B> position and automatic white balance is working, or when it is preset. Also, in automatic white balance operation, the color can be changed on the Rch axis by changing the output of Rch. **[–400]…[400]** • Factory setting: [0]
	[B Gain]	Displays the Bch output when the <WHITE BAL> switch is at the <B> position and automatic white balance is working, or when it is preset. Also, in automatic white balance operation, the color can be changed on the Bch axis by changing the output of Bch. **[–400]…[400]** • Factory setting: [0]
	[G AXIS]	Displays the G axis output when the <WHITE BAL> switch is at the <B> position and automatic white balance is working, or when it is preset. Also, in automatic white balance operation, the color can be changed on the G axis by changing the output of Rch/Bch. **[–400]…[400]** • Factory setting: [0]
[CHROMA LEVEL]		Sets the chroma level of P_R and P_B signals. **[–99%]…[40%], [OFF]** • Factory setting: [0%]
[CHROMA PHASE]		Finely adjusts the chroma phase of the P_R signal and P_B signal. **[–31]…[31]** • Factory setting: [0]
[MATRIX]		Selects the matrix table to display the color for shooting. **[NORM1]:** Displays the color suitable for shooting outdoors of under a halogen lamp. **[NORM2]:** Displays more vivid color than [NORM1]. **[FLUO.]:** Displays the color suitable for shooting indoors under fluorescent light. **[CINELIKE]:** Displays the color suitable for shooting cinematic video. • Factory setting: [NORM1]
[MATRIX SETTING]	[MATRIX R-G]	Adjusts the linear matrix. (Red - Green) **[–63]…[63]** • Factory setting: [0]
	[MATRIX R-B]	Adjusts the linear matrix. (Red - Blue) **[–63]…[63]** • Factory setting: [0]
	[MATRIX G-R]	Adjusts the linear matrix. (Green - Red) **[–63]…[63]** • Factory setting: [0]
	[MATRIX G-B]	Adjusts the linear matrix. (Green - Blue) **[–63]…[63]** • Factory setting: [0]
	[MATRIX B-R]	Adjusts the linear matrix. (Blue - Red) **[–63]…[63]** • Factory setting: [0]
	[MATRIX B-G]	Adjusts the linear matrix. (Blue - Green) **[–63]…[63]** • Factory setting: [0]
[COLOR CORRECTION SETTING]	[R (SAT)]	Corrects red color saturation. **[–63]…[63]** • Factory setting: [0]
	[R (PHASE)]	Corrects the red hue. **[–63]…[63]** • Factory setting: [0]
	[R-R-Mg (SAT)]	Corrects the color saturation between red and “colors between red and magenta”. **[–63]…[63]** • Factory setting: [0]
	[R-R-Mg (PHASE)]	Corrects the hue between red and “colors between red and magenta”. **[–63]…[63]** • Factory setting: [0]
	[R-Mg (SAT)]	Corrects the color saturation between red and magenta. **[–63]…[63]** • Factory setting: [0]

Item		Description of settings
	[R-Mg (PHASE)]	Corrects the hue between red and magenta. **[–63]…[63]** • Factory setting: [0]
	[Mg (SAT)]	Corrects magenta color saturation. **[–63]…[63]** • Factory setting: [0]
	[Mg (PHASE)]	Corrects the magenta hue. **[–63]…[63]** • Factory setting: [0]
	[Mg-B (SAT)]	Corrects the color saturation between magenta and blue. **[–63]…[63]** • Factory setting: [0]
	[Mg-B (PHASE)]	Corrects the hue between magenta and blue. **[–63]…[63]** • Factory setting: [0]
	[B (SAT)]	Corrects blue color saturation. **[–63]…[63]** • Factory setting: [0]
	[B (PHASE)]	Corrects the blue hue. **[–63]…[63]** • Factory setting: [0]
	[B-Cy (SAT)]	Corrects the color saturation between blue and cyan. **[–63]…[63]** • Factory setting: [0]
	[B-Cy (PHASE)]	Corrects the hue between blue and cyan. **[–63]…[63]** • Factory setting: [0]
	[Cy (SAT)]	Corrects cyan color saturation. **[–63]…[63]** • Factory setting: [0]
	[Cy (PHASE)]	Corrects the cyan hue. **[–63]…[63]** • Factory setting: [0]
	[Cy-G (SAT)]	Corrects the color saturation between cyan and green. **[–63]…[63]** • Factory setting: [0]
	[Cy-G (PHASE)]	Corrects the hue between cyan and green. **[–63]…[63]** • Factory setting: [0]
	[G (SAT)]	Corrects green color saturation. **[–63]…[63]** • Factory setting: [0]
	[G (PHASE)]	Corrects the green hue. **[–63]…[63]** • Factory setting: [0]
	[G-Yl (SAT)]	Corrects the color saturation between green and yellow. **[–63]…[63]** • Factory setting: [0]
	[G-Yl (PHASE)]	Corrects the hue between green and yellow. **[–63]…[63]** • Factory setting: [0]
	[Yl (SAT)]	Corrects yellow color saturation. **[–63]…[63]** • Factory setting: [0]
	[Yl (PHASE)]	Corrects the yellow hue. **[–63]…[63]** • Factory setting: [0]
	[Yl-Yl-R (SAT)]	Corrects the color saturation between yellow and “colors between yellow and red”. **[–63]…[63]** • Factory setting: [0]
	[Yl-Yl-R (PHASE)]	Corrects the hue between yellow and “colors between yellow and red”. **[–63]…[63]** • Factory setting: [0]
	[Yl-R (SAT)]	Corrects the color saturation between yellow and red. **[–63]…[63]** • Factory setting: [0]
	[Yl-R (PHASE)]	Corrects the hue between yellow and red. **[–63]…[63]** • Factory setting: [0]
	[Yl-R-R (SAT)]	Corrects the color saturation between “colors between yellow and red” and red. **[–63]…[63]** • Factory setting: [0]

Item		Description of settings
	[YI-R-R (PHASE)]	Corrects the hue between “colors between yellow and red” and red. **[–63]…[63]** • Factory setting: [0]
[MASTER PED]		Sets the master pedestal. **[–200]…[200]** • Factory setting: [16]
[RGB BLACK CONTROL SETTING]	[R PED]	Sets the Rch pedestal level. **[–100]…[100]** • Factory setting: [0]
	[G PED]	Sets the Gch pedestal level. **[–100]…[100]** • Factory setting: [0]
	[B PED]	Sets the Bch pedestal level. **[–100]…[100]** • Factory setting: [0]
	[PEDESTAL OFFSET]	Sets the Rch, Gch, and Bch pedestal levels after adjusting the automatic black balance. **[ON]:** Keeps each of the values set in [R PED], [G PED], and [B PED]. **[OFF]:** Sets the pedestal level of Rch, Gch, and Bch to [0]. • Factory setting: [OFF]
[GAMMA MODE SEL]		Selects the gamma curve. **[HD]:** The video gamma feature for HD (High Definition). **[SD]:** Increases gain in darker areas more than HD gamma. **[FILMLIKE1]:** Feature that reproduces more highlight areas compared to HD gamma. **[FILMLIKE2]:** Feature that reproduces more highlight areas compared to [FILMLIKE1]. **[FILMLIKE3]:** Feature that reproduces more highlight areas compared to [FILMLIKE2]. **[FILM-REC]:** The cine gamma feature for film. **[VIDEO-REC]:** The cine gamma feature for video. • Factory setting: [HD]
[GAMMA SETTING]	[MASTER GAMMA]	Sets the master gamma in 0.01 steps. **[0.30]…[0.75]** • Factory setting: [0.45]
	[F-REC DYNAMIC LVL]	When [FILM-REC] is selected in [GAMMA MODE SEL], dynamic range is set. If an item other than [FILM-REC] is selected, no settings are changed. **[200%], [300%], [400%], [500%], [600%]** • Factory setting: [600%]
	[F-REC BLACK STR LVL]	When [FILM-REC] is selected in [GAMMA MODE SEL], black stretch is set. If an item other than [FILM-REC] is selected, no settings are changed. **[0%]…[30%]** • Factory setting: [0%]
	[V-REC KNEE SLOPE]	When [VIDEO-REC] is selected in [GAMMA MODE SEL], knee slope is set. If an item other than [VIDEO-REC] is selected, no settings are changed. **[150%], [200%]…[500%]** • Factory setting: [500%]
	[V-REC KNEE POINT]	When [VIDEO-REC] is selected in [GAMMA MODE SEL], knee point is set. If an item other than [VIDEO-REC] is selected, no settings are changed. **[30%]…[107%]** • Factory setting: [30%]
	[BLACK GAMMA]	Sets the gamma curves of dark areas. **[–8]…[–1]:** Compresses the dark areas. **[OFF]:** Standard state **[1]…[8]:** Expands the dark areas. • Factory setting: [OFF]
	[B. GAMMA RANGE]	Sets the maximum level of compression/expansion. **[1]:** About 20% **[2]:** About 30% **[3]:** About 40% • Factory setting: [1]
[KNEE SETTING]	[MANUAL KNEE]	Selects the operation mode when the <OUTPUT>/<AUTO KNEE> selector switch is set to <OFF>. **[ON], [OFF]** • Factory setting: [ON]
	[A.KNEE RESPONSE]	Sets the auto knee response speed. The smaller the setting value, the faster the response speed is. **[1]…[8]** • Factory setting: [4]
	[KNEE MASTER POINT]	Sets the knee point position in 0.5% steps. **[70.0%]…[107.0%]** • Factory setting: [93.0%]
	[KNEE MASTER SLOPE]	Sets the knee inclination. **[0]…[99]** • Factory setting: [85]
	[KNEE MASTER SLOPE Rch]	Sets the knee inclination of Rch. **[–31]…[31]** • Factory setting: [0]
	[KNEE MASTER SLOPE Bch]	Sets the knee inclination of Bch. **[–31]…[31]** • Factory setting: [0]

Item		Description of settings
[HI-COLOR SW]		Turns the mode that expands the color dynamic range [ON]/[OFF]. **[ON], [OFF]** • Factory setting: [ON]
[HI-COLOR LVL]		Selects the level of the mode that expands the color dynamic range. **[1]…[32]** • Factory setting: [32]
[WHITE CLIP SETTING]	[WHITE CLIP]	Turns the white clip function [ON]/[OFF]. This enables the [WHITE CLIP LVL] setting value when the function is [ON]. **[ON], [OFF]** • Factory setting: [ON]
	[WHITE CLIP LVL]	Sets the white clip level. **[90%]…[109%]** • Factory setting: [109%]
	[Rch CLIP LVL]	Sets the clip level Rch for the white clips. **[−31]…[31]** • Factory setting: [0]
	[Bch CLIP LVL]	Sets the clip level Bch for the white clips. **[−31]…[31]** • Factory setting: [0]
[DRS EFFECT DEPTH]		Sets the compression level of the high-brightness areas of the dynamic range stretcher function. By compressing the video signal levels of the high-brightness areas that are blown out in normal shooting, the dynamic range can be expanded. **[1], [2], [3]** • Factory setting: [1]
[A.IRIS LEVEL]		Enables/disables the auto iris level function. **[ON], [OFF]** • Factory setting: [ON]
[A.IRIS LEVEL EFFECT]		Adjusts the brightness in the auto iris mode. Increase the value to brighten, and decrease the value to darken the convergence of auto iris. **[−50]…[50]** • Factory setting: [0]

[SYSTEM MODE]

Configure the settings regarding the recording format of video and audio.

Item	Description of settings
[LINE&FREQ]	Sets the signal format of the camera. If this setting has been changed, select [YES] on a confirmation message and restart the camera. **[1080-59.94i/P], [1080-50i/P], [1080-59.94i], [1080-50i], [1080-23.98PsF], [720-59.94P], [720-50P], [480-59.94i], [576-50i]**
[REC FORMAT]	Selects the codec for recording and the mode for shooting and recording. **[AVC-I100/60P], [AVC-I100/60i], [AVC-I100/50P], [AVC-I100/50i], [AVC-I100/30PN], [AVC-I100/24PN], [AVC-I100/25PN], [AVC-I50/60P], [AVC-I50/60i], [AVC-I50/50P], [AVC-I50/50i], [AVC-G50/60P], [AVC-G50/60i], [AVC-G50/50P], [AVC-G50/50i], [AVC-G50/30PN], [AVC-G50/24PN], [AVC-G50/25PN], [AVC-G25/60P], [AVC-G25/60i], [AVC-G25/50P], [AVC-G25/50i], [AVC-G25/30PN], [AVC-G25/24PN], [AVC-G25/25PN], [AVC-G12/60P], [AVC-G12/60i], [AVC-G12/50P], [AVC-G12/50i], [AVC-G12/30PN], [AVC-G12/24PN], [AVC-G12/25PN], [DVCPRO HD/60P], [DVCPRO HD/60i], [DVCPRO HD/50P], [DVCPRO HD/50i], [DVCPRO50/60i], [DVCPRO50/50i], [DVCPRO/60i], [DVCPRO/50i], [DV/60i], [DV/50i]**
[CAMERA MODE]	Sets the camera shooting mode while in the SD mode. **[60i], [50i], [30P], [25P]**
[AUDIO SMPL RES]	Selects the number of audio bits ([24BIT] or [16BIT]) when [REC FORMAT] is [AVC-I100] or [AVC-I50]. At [REC FORMAT] other than these, recording is performed at the number of audio bits fixed to 24 bits or 16 bits. **[16BIT], [24BIT]** • Factory setting: [16BIT]
[REC SIGNAL]	Switches the input signal. At this time, SDI signal is output from the <SDI OUT/IN (OP)> terminal. **[CAM]:** Records the camera shooting signal of the camera. **[SDI]:** Records input signals from the <SDI OUT/IN (OP)> terminal. • Factory setting: [CAM] Once the power is turned off, it is always set to [CAM] the next time power is turned on. This menu item is displayed only when the HD/SD SDI input board AG-YA600G (optional) is attached.
[ASPECT CONV]	Selects the aspect ratio of the video to be recorded in 480i, 576i. **[SIDE CROP], [LETTER BOX], [SQUEEZE]** • Factory setting: [SIDE CROP]
[SCAN REVERSE]	Enables/disables the scan reverse shooting function for vertical/horizontal inversion of images. **[ON], [OFF]** • Factory setting: [OFF]
[SETUP]	Sets the setup level of 480i video signals. **[0%], [7.5%A]**

Item	Description of settings
[SHOOTING MODE]	Sets the shooting mode according to the shooting environment. **[NORMAL]:** Selects the shooting mode for an environment at normal brightness. **[HIGH SENS.]:** Selects high-sensitivity. (Appropriate when shooting in a dark environment.) The viewfinder shows [H.SENS.]. • Factory setting: [NORMAL]

[USER SW]

Set the function to be assigned to the USER button and the <RET> button of the lens.

Item	Description of settings
[USER MAIN]	Sets the function to be assigned to the <USER MAIN> button. **[INHIBIT], [LEVEL GAUGE], [LEVEL GAUGE RESET], [WFM], [D.ZOOM x2], [D.ZOOM x4], [DRS], [FBC], [S.GAIN], [1S.EXP.], [ATW], [ATW LOCK], [SPOTLIGHT], [BACKLIGHT], [Y GET], [PUSH AF], [PRE REC], [TEXT MEMO], [SHOT MARK], [DEL LAST CLIP], [SLOT SEL], [AUDIO MON SEL], [REC CHECK], [USB MODE], [PLAYLIST], [REC DURING UPLOAD], [UPLOAD LIST], [STREAMING START], [EVF COLOR], [LOAD USER FILE]** • Factory setting: [Y GET]
[USER1]	Sets the function to be assigned to the <USER1> button. **[INHIBIT], [LEVEL GAUGE], [LEVEL GAUGE RESET], [WFM], [D.ZOOM x2], [D.ZOOM x4], [DRS], [FBC], [S.GAIN], [1S.EXP.], [ATW], [ATW LOCK], [SPOTLIGHT], [BACKLIGHT], [Y GET], [PUSH AF], [PRE REC], [TEXT MEMO], [SHOT MARK], [DEL LAST CLIP], [SLOT SEL], [AUDIO MON SEL], [REC CHECK], [USB MODE], [PLAYLIST], [REC DURING UPLOAD], [UPLOAD LIST], [STREAMING START], [EVF COLOR], [LOAD USER FILE]** • Factory setting: [TEXT MEMO]
[USER2]	Sets the function to be assigned to the <USER2> button. **[INHIBIT], [LEVEL GAUGE], [LEVEL GAUGE RESET], [WFM], [D.ZOOM x2], [D.ZOOM x4], [DRS], [FBC], [S.GAIN], [1S.EXP.], [ATW], [ATW LOCK], [SPOTLIGHT], [BACKLIGHT], [Y GET], [PUSH AF], [PRE REC], [TEXT MEMO], [SHOT MARK], [DEL LAST CLIP], [SLOT SEL], [AUDIO MON SEL], [REC CHECK], [USB MODE], [PLAYLIST], [REC DURING UPLOAD], [UPLOAD LIST], [STREAMING START], [EVF COLOR], [LOAD USER FILE]** • Factory setting: [LEVEL GAUGE]
[RET SW]	Sets the function to be assigned to the <RET> button of lens. **[INHIBIT], [PUSH AF], [D.ZOOM x2], [D.ZOOM x4], [REC CHECK], [TEXT MEMO], [SHOT MARK], [REC DURING UPLOAD], [UPLOAD LIST], [STREAMING START], [EVF COLOR]** • Factory setting: [REC CHECK]

[SW MODE]

Configure the settings of each mode when switched using each switch.

These menu items cannot be set when the thumbnail screen is displayed.

Item	Description of settings
[LOW GAIN]	Sets the gain value to be assigned to the <L> position of the <GAIN> switch. (3 dB steps) ([–6dB] is only for [HIGH SENS.]) **[–6dB]…[30dB]** • Factory setting: [0dB]
[MID GAIN]	Sets the gain value to be assigned to the <M> position of the <GAIN> switch. (3 dB steps) ([–6dB] is only for [HIGH SENS.]) **[–6dB]…[30dB]** • Factory setting: [6dB]
[HIGH GAIN]	Sets the gain value to be assigned to the <H> position of the <GAIN> switch. (3 dB steps) ([–6dB] is only for [HIGH SENS.]) **[–6dB]…[30dB]** • Factory setting: [12dB]
[SUPER GAIN]	Sets the super gain to be assigned to the USER button. **[30dB], [36dB], [42dB]** **[ALL]:** Each time the USER button is pressed, the setting toggles [30dB] → [36dB] → [42dB] → (off) in order. • Factory setting: [30dB]
[ATW]	Assigns the auto tracking white balance function to the <WHITE BAL> switch. **[Bch], [OFF]** • Factory setting: [OFF]
[ATW SPEED]	Sets the control speed of the auto tracking white balance function. **[FAST], [NORMAL], [SLOW]** • Factory setting: [NORMAL]
[ATW TARGET R]	Finely adjusts the Rch output for convergence with auto tracking white balance operation. **[–10]…[10]** • Factory setting: [0]
[ATW TARGET B]	Finely adjusts the Bch output for convergence with auto tracking white balance operation. **[–10]…[10]** • Factory setting: [0]
[W.BAL PRESET]	Sets the color temperature to be assigned to the <PRST> position of the <WHITE BAL> switch. **[3200K], [5600K], [VAR]** • Factory setting: [3200K]

Item	Description of settings
[W.BAL VAR]	Sets the value of [VAR] in [W.BAL PRESET]. It can also be operated by the jog dial button. Enabled when [W.BAL PRESET] is set to [VAR] and the <WHITE BAL> switch is at <PRST>. **[2000K]…[15000K]** • Factory setting: [3200K]
[PUSH AF MODE]	Assigns the operation mode when the USER button and the <RET> button of the lens to which [PUSH AF] is assigned are pressed. **[TURBO]:** Performs high-speed focusing automatically until the image is focused, once the button is pressed. **[NORMAL]:** Performs automatic focusing while pressing the button. • Factory setting: [TURBO]
[FOCUS ASSIST MODE]	Sets the operation mode of the focus assist function. **[EXPAND]:** The center of the viewfinder is displayed enlarged. **[IN RED]:** Outlines the contour of the video in red. • Factory setting: [EXPAND]
[EXPAND MODE]	Selects the method to cancel expanded display when [EXPAND] is selected in [FOCUS ASSIST MODE]. **[10SEC]:** Cancels in 10 seconds. **[HOLD]:** Does not cancel until the <FOCUS ASSIST> button is pressed again. **[UNTIL REC]:** Cancels when recording starts. Expanded display is not available during recording. • Factory setting: [10SEC]
[IRIS GAIN]	Sets whether to perform the iris correction on the camera or on the lens. **[CAM]:** Performs the iris correction on the camera. **[LENS]:** Performs the iris correction on the lens. • Factory setting: [CAM]
[IRIS GAIN VALUE]	Sets the adjustment value of [IRIS GAIN]. When [CAM] is selected in [IRIS GAIN], this setting is enabled. **[1]…[20]** • Factory setting: [10]
[A.IRIS WINDOW]	Selects the auto iris detection window. **[NORM1]:** Window that is near screen center. **[NORM2]:** Window that is near screen bottom. **[CENTER]:** Window that is a spot in the screen center. • Factory setting: [NORM1]
[AGC]	Sets the operation of the auto gain control. **[ON]:** Performs the operation of the [AGC] function that automatically adjusts camera gain. **[OFF]:** Does not perform the operation of the [AGC] function that automatically adjusts camera gain. • Factory setting: [OFF]
[AGC LIMIT]	Sets the maximum gain value during [AGC] operation. **[3dB], [6dB], [12dB], [18dB]** • Factory setting: [12dB]
[AGC POINT]	Sets the F value to switch control from auto iris to [AGC] during [AGC] operation. **[F2.8], [F4.0], [F5.6]** • Factory setting: [F2.8]
[AUTO KNEE SW]	Enables/disables the auto knee and dynamic range stretcher functions. **[DRS]:** Activates the dynamic range stretcher function when the <OUTPUT>/<AUTO KNEE> selector switch is set to <ON>. **[ON]:** Activates the auto knee function when the <OUTPUT>/<AUTO KNEE> selector switch is set to <ON>. **[OFF]:** Does not activate the auto knee and dynamic range stretcher functions when the <OUTPUT>/<AUTO KNEE> selector switch is set to <ON>. • Factory setting: [ON]
[WFM MODE]	Selects the type of waveform to be displayed in the viewfinder when the USER button to which the [WFM] function is assigned is pressed. **[WAVE]:** Displays as a waveform. **[VECTOR]:** Displays as a vector. **[WAVE/VECTOR]:**The display changes in order of (no display) → [WAVE] (waveform) → [VECTOR] (vector) → (no display) every time the USER button assigned with [WFM] is pressed. • Factory setting: [WAVE]
[BARS TYPE]	Selects the color bar to use. **[SMPTE]:** Uses the color bar in the SMPTE standard. **[FULL BARS]:** Uses full color bars. **[SPLIT]:** Uses SPLIT color bars for SNG (Satellite News Gathering). **[ARIB]:** Uses ARIB standard color bars. • Factory setting: [SMPTE]

[RECORDING SETUP]

These are various types of setting items when performing camera recording and playback.

Select the recording format.

Item		Description of settings
[FILE SPLIT]		Selects the split method of the recording file. **[NORMAL]:** Divides the file every 4 GB regardless of the recording format. **[SHORT]:** Divides the file every 128 seconds regardless of the recording format. • Factory setting: [NORMAL] A clip will be divided to recording files of approximately 128 seconds when [SHORT] is selected, but they can be operated as a single clip when the thumbnails of clips are operated on the P2 device. A single continuous recording time is approximately 3.5 hours. [SHORT] is disabled in interval recording, one-shot recording, and loop recording modes.
[RECORDING]		Selects the recording format. **[NORMAL]:** Performs standard recording. **[INTERVAL]:** Performs interval recording. **[ONE SHOT]:** Performs one-shot recording. **[LOOP]:** Performs loop recording. • Factory setting: [NORMAL]
[RECORDING SETTING]	[RECORDING HOLD]	Selects whether to hold [RECORDING] settings. **[ON]:** Holds the settings. **[OFF]:** Does not hold the settings. It will always be [NORMAL] the next time when the power is turned on. • Factory setting: [OFF]
	[ONE SHOT TIME]	Sets the recording duration of one-shot recording. **[1frm], [2frm], [4frm], [8frm], [16frm], [1s]** • Factory setting: [1frm]
	[INTERVAL TIME]	Sets the interval duration for interval recording. **[2frm], [4frm], [8frm], [16frm], [1s], [2s], [5s], [10s], [30s], [1min], [5min], [10min]** • Factory setting: [2frm]
	[START DELAY]	Selects whether to delay the recording start time by approximately one second when performing interval recording or one-short recording. **[ON], [OFF]** • Factory setting: [OFF]
[PRE REC]		Selects whether to perform pre-recording. If [ON] is selected, pre-recording is performed for approximately three seconds in HD, and for approximately seven seconds in SD. **[ON], [OFF]** • Factory setting: [OFF]
[ONE CLIP REC]		Selects whether to perform one-clip recording. **[ON], [OFF]** • Factory setting: [OFF]
[SIMUL REC]		Selects whether to perform simultaneous recording. **[ON], [OFF]** • Factory setting: [OFF]
[DUAL CODEC SETTING]	[CODEC USAGE]	Selects media for recording proxy data. **[PROXY REC(P2)]:** Records proxy data to a P2 card. **[PROXY REC(P2&SD)]:** Records proxy data to both of a P2 card and SD memory card. **[STREAMING]:** Outputs video stream. **[OFF]:** Does not record proxy data or output streaming. • Factory setting: [OFF] If [CODEC USAGE] cannot be changed, change the [PROXY REC MODE] or [STREAMING MODE] setting.
	[PROXY REC MODE]	Sets the recording mode of proxy data. **[LOW 2CH MOV], [HQ 2CH MOV], [SHQ 2CH MOV], [AVC-G6 2CH MOV]** • Factory setting: [HQ 2CH MOV]
	[STREAMING MODE]	Sets the transfer mode for streaming. **[LOW], [HQ], [AVC-G6], [SHQ (QoS)], [AVC-G (QoS)]** • Factory setting: [HQ]
	[PROXY DISP]	Selects whether to display proxy data recorded information or messages in the viewfinder. **[ON]:** Displays proxy recording information and SD memory card remaining capacity at the start of recording. Warning information is displayed at all times. **[OFF]:** Displays proxy and SD memory card warning information for only three seconds when warning occurs. • Factory setting: [OFF]
	[QoS MAX RATE]	Sets the maximum bitrate for video data when the QoS is operating. This setting is used when the streaming distribution is started from the operation of the camera. This can be set when [CAMERA] is selected in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [START TRIGGER]. **[256Kbps], [512Kbps], [1Mbps], [1.5Mbps], [2.5Mbps], [3.5Mbps], [6Mbps], [9Mbps]** • Factory setting: [9Mbps] [9Mbps] cannot be selected when [STREAMING MODE] is set to [SHQ (QoS)].
	[QoS MIN RATE]	Sets the minimum bitrate for video data when the QoS is operating. This setting is used when the streaming distribution is started from the operation of the camera. This can be set when [CAMERA] is selected in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [START TRIGGER]. **[256Kbps], [512Kbps], [1Mbps], [1.5Mbps], [2.5Mbps], [3.5Mbps], [6Mbps], [9Mbps]** • Factory setting: [256Kbps]

Item		Description of settings
	[STREAMING LATENCY]	Sets the delay mode during the streaming distribution. This setting is used when the streaming distribution is started from the operation of the camera. This can be set when [CAMERA] is selected in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [START TRIGGER]. **[NORMAL]:** Set this to prioritize the stability of streaming. **[SHORT]:** Set this to prioritize the reduction of streaming delay. • Factory setting: [NORMAL]
[START TEXT MEMO]		Selects whether to automatically add a text memo at recording start position each time recording is started. **[ON], [OFF]** • Factory setting: [OFF]
[DF MODE]		Sets the counting method of the built-in time code generator. **[DF]:** Uses the drop frame mode. **[NDF]:** Uses the non-drop frame mode. • Factory setting: [DF]
[UBG MODE]		Selects the user bits mode. **[USER]:** Selects the user bits value that has been set. **[TIME]:** Selects the local time. (hh, mm, ss) **[DATE]:** Selects the local date and time. (YY, MM, DD, hh) **[EXT]:** Records the user bits values currently input to the <TC IN/OUT> terminal. **[TCG]:** The value of [TCG] is recorded as user bits. **[FRAME RATE]:** Selects camera imaging information (such as frame rate). **[REGEN]:** Reads the value recorded to the card and continuously records that value. • Factory setting: [USER]
[VITC UBG MODE]		Selects the VITC user bits mode. **[USER/EXT]:** When [UBG MODE] is [EXT], follows the value and when other than [EXT], records the user value set in [USER]. **[TIME]:** Selects the local time. (hh, mm, ss) **[DATE]:** Selects the local date and time. (YY, MM, DD, hh) **[TCG]:** The value of time code generator is recorded as user bits. **[FRAME RATE]:** Selects camera imaging information (such as frame rate). **[REGEN]:** Reads the value recorded to the card and continuously records that value. • Factory setting: [USER/EXT]
[REC META DATA]	[LOAD]	Loads the metadata upload file saved to the SD memory card.
	[RECORD]	Sets whether to add loaded metadata at a recording. **[ON]:** Adds metadata. **[OFF]:** Does not add metadata. • Factory setting: [OFF]
	[USER CLIP NAME]	Sets data to be recorded to [USER CLIP NAME]. (When [RECORD] is [ON]) **[TYPE1]:** Records setting values of the loaded data. **[TYPE2]:** Records the loaded data and counter value. (When [RECORD] is [OFF]) **[TYPE1]:** Records the same value as [GLOBAL CLIP ID]. **[TYPE2]:** Records the same value as [CLIP NAME]. • Factory setting: [TYPE1]
	[CARD SERIAL]	Enables/disables the function for storing the text memo with the serial number or the type of card as metadata. **[ON], [OFF]** • Factory setting: [OFF]
	[INITIALIZE]	Deletes all loaded metadata and initializes.
	[PROPERTY]	Checks and corrects loaded metadata.
	[LANGUAGE]	Sets the language used to display metadata. (Only when [NTSC(J)] is selected as the region of use) **[ENGLISH], [JAPANESE]**

[CLIP]

This item is used to perform various tasks, such as playing back, deleting, copying clips, and editing metadata, while checking the thumbnails of the clips displayed in the viewfinder.

These menu items are enabled when the thumbnail screen is displayed.

Clip operations such as [DELETE] or [COPY] are enabled when the target thumbnail is selected.

Some items are displayed only in specific situations such as in USB host mode or on the explorer screen.

Item	Description of settings
[REPOSITION]	Selects a clip to be displayed on the thumbnail screen. **[ALL CLIP]:** Displays all clips as thumbnails. **[SAME FORMAT CLIPS]:** Displays only the clips recorded in the same format as the system format as thumbnails. Clips recorded in the same format means that each item of [LINE&FREQ], [REC FORMAT], and [AUDIO SMPL RES] in the main menu → [SYSTEM MODE] matches the current setting status. Example) [1080-59.94i/P], [AVC-I100], [24BIT] **[SELECTED CLIPS]:** Displays only the clips selected with the cursor buttons as thumbnails. The thumbnails appear in the selected order. **[MARKED CLIPS]:** Displays only the clips with shot marks added as thumbnails. **[TEXT MEMO CLIPS]:** Displayed only clips with text memo data attached as thumbnails. **[SLOT CLIPS]:** Displays only the clips of the selected slot as thumbnails. **[NG CLIPS]:** Displays only the clips with the defective clip indicator in the thumbnail. • Factory setting: [ALL CLIP]

Item		Description of settings
[DELETE]		Deletes selected clips.
[FORMAT]		When the [FORMAT] menu is selected, format the P2 card of the specified slot. **[SLOT 1], [SLOT 2], [SD CARD]** • When a CPS password is set, you can select [NORMAL] (normal unencrypted format) or [CPS(ENCRYPT)] (encrypted format). • Data deleted as a result of formatting cannot be restored. Always check the data before formatting.
[FORMAT(STORAGE)]		Formats a storage device connected to the <USB2.0> terminal (host) using the specified file system. **[TYPE S]:** Formats in the [TYPE S] format. **[FAT]:** Formats in the [FAT] format. This item is enabled only while the storage explorer screen or storage thumbnail screen is displayed.
[COPY]		Copies the selected clip to a P2 card in any card slot or a storage device. **[SLOT 1], [SLOT 2], [SD CARD], [STORAGE], [FTP], [FTP(PROXY)]**
[EXPORT]		Exports (writes) clips from the P2 card or SD memory card to a storage device or FTP by units of card. **[ALL SLOT], [SLOT 1], [SLOT 2]:** Exports clips from the P2 card to a storage device. **[SD CARD]:** Exports from the SD memory card to FTP.
[IMPORT]		Imports (writes back) clips, etc. from a storage device or FTP to the P2 card or SD memory card by units of card. **[SLOT 1], [SLOT 2], [SD CARD], [STORAGE], [FTP]**
[REPAIR]		Repairs a clip displayed in the defective clip indicator (yellow) occurring as a result of sudden power loss during recording or other reasons.
[RE-CONNECT]		If clips that were recorded over multiple P2 cards are not recognized as consecutive clips and the incomplete clip indicator ! is displayed, use this function to restore the clips to the consecutive clips (the original combined clips).
[EXCH. THUMBNAIL]		Changes the clip thumbnail to an image with any text memo. This can be executed while the text memo clip is displayed.
[EXPLORE]		When in USB host mode, switches to the information display screen for storage device and network connection. **[STORAGE]:** Switches to the information display screen for storage device. **[FTP]:** Switches to the information display screen for FTP server.
[AUTHENTICATE]		When this menu is selected from the card status screen, a software keyboard is displayed to enter the CPS password. If the password is entered and [OK] is selected, the CPS password is set to the camera. When the set CPS password is successfully authenticated, the message [AUTHENTICATED SUCCESSFULLY!] is displayed. When the set CPS password authentication fails, a warning message is displayed.
[CHANGE PARTITION NAME]		When in USB host mode, sets/changes the partition name of the storage device. • The default value is the date and time when the partition was created. • This item is enabled only for the [TYPE S] storage device. • This item is displayed only when the storage explore screen is displayed.
[DELETE LAST PARTITION]		When in USB host mode, deletes the last storage partition. • The partition can be deleted only when the cursor is placed on the last partition. • This item is displayed only when the storage explore screen is displayed.
[DELETE FOLDER]		Delete folders in the storage device in the FAT format.
[PROPERTY]	[CLIP PROPERTY]	Detailed clip information is displayed on the screen. Items can be individually corrected.
	[CARD STATUS]	Displays the card status of a card slot.
	[CPS PASSWORD]	Sets the CPS encrypted password of the microP2 memory card. **[LOAD]:** Loads CPS password from an SD memory card. **[SET]:** Enters the CPS password. **[DELETE]:** Deletes the password saved to the device, and disables encrypted formats.
	[SD CARD]	Displays SD memory card information.
	[REMAIN SETUP]	Sets which is displayed, remaining capacity or used capacity, when P2 card information is displayed. **[REMAIN]:** Displays remaining capacity. **[USED]:** Displays used capacity. • Factory setting: [REMAIN]
	[FREE CAP. OF PARTITION]	Displays available space in a partition. • This is displayed while the thumbnail screen for the [TYPE S] storage device is displayed.
[THUMBNAIL SETUP]	[INDICATOR]	Selects an item to display and press the <SET> button. Checked items are displayed. When [ALL HIDE] is selected, other items cannot be selected. **[ALL HIDE]:** Hides all indicators. **[MARKER]:** Displays the shot mark indicator. **[TEXT MEMO]:** Displays the text memo indicator. **[WIDE]:** Displays the wide indicator. **[PROXY]:** Displays the proxy indicator. • Factory setting: [MARKER], [TEXT MEMO], [WIDE], [PROXY]

Item		Description of settings
	[DATA DISPLAY]	Selects the content to be displayed in the time code display area. **[TC]:** Displays the time code. **[UB]:** Displays the user bits. **[TIME]:** Displays the record time. **[DATE]:** Displays the record date. **[DATE TIME]:** Displays the record date and time. **[CLIP NAME]:** Displays clip names. **[USER CLIP NAME]:** Displays a maximum of the first 15 letters (for an English language display) of a user clip name. **[SLOT]:** Displays slot number. **[THUMBNAIL TC]:** Displays the time code of the thumbnail position. • Factory setting: [TC]
	[THUMBNAIL SIZE]	Sets the thumbnail size displayed in a thumbnail on the screen. **[SMALL]:** Small (thumbnail display: with 4×3 and property display) **[MEDIUM]:** Standard (thumbnail display: 4×3) **[LARGE]:** Large (thumbnail display: 3×2) • Factory setting: [MEDIUM]
	[PB POSITION]	Sets the playback start position during playback from the thumbnail screen. **[RESUME]:** Plays back from the position where playback stopped. **[THUMBNAIL TC]:** Plays back from the time code of the thumbnail position. **[START TC]:** Plays back from the start time code (beginning of the clip). • Factory setting: [START TC]
	[PROPERTY DISP.]	Sets simple properties item displayed on the left of the thumbnail when [SMALL] is selected for [THUMBNAIL SIZE]. **[USER CLIP NAME]:** Displays the user clip name. **[START TC]:** Displays the start time code. **[REC DATE]:** Displays the recorded date. **[REC TIME]:** Displays the recorded time. **[NUM. OF AUDIO CH]:** Displays the number of audio channels. **[AUDIO RATE]:** Displays the audio sampling rate. **[AUDIO BIT]:** Displays the audio bitrate. **[CREATOR]:** Displays the person who recorded the clip. **[SHOOTER]:** Displays the videographer. **[PLACE NAME]:** Displays the shooting location. **[PROGRAM NAME]:** Displays the program name. **[SCENE NO.]:** Displays the scene number. **[TAKE NO.]:** Displays the take number. **[REPORTER]:** Displays the reporter. **[PURPOSE]:** Displays the purpose of shooting. **[OBJECT]:** Displays the object of shooting. **[START UB]:** Displays the start user bits. **[REC RATE]:** Displays the recording frame rate. **[LAST UP DATE]:** Displays the date of last update. **[LAST UP PERSON]:** Displays the last person who updated. **[MANUFACTURER]:** Displays the equipment manufacturer name. **[SERIAL NO.]:** Displays the serial number. **[MODEL NAME]:** Displays the model name. **[ALTITUDE]:** Displays an altitude. **[LONGITUDE]:** Displays a longitude. **[LATITUDE]:** Displays a latitude. **[1ST TEXT MEMO]:** Displays the first text memo content. **[THUMBNAIL OFFSET]:** Displays the thumbnail recording position.
	[INFORMATION SEL.]	Selects to display the thumbnail information such as the number of selected clips or playback time of the clip, or to display the information of the bonding device. **[THUMBNAIL INFO.]:** Displays the thumbnail information such as the number of selected clips or playback time of the clip. **[BONDING DEV. INFO.]:** Displays the information of the bonding device. • Factory setting: [THUMBNAIL INFO.]
	[THUMBNAIL INFO.]	Displays the number of selected clips and playback time of clip, etc. **[NUM. OF CLIPS]:** Displays the number of selected clips at the lower right of the thumbnail screen. **[DUR. OF SEL CLIPS]:** Displays the total playback time of selected clips. **[TOTAL DURATION]:** Displays the total playback time of the displayed clip. • Factory setting: [NUM. OF CLIPS]
	[TEXT MEMO IND]	Sets the display mode of the text memo indicator displayed for clips on the thumbnail screen. **[ALL]:** Displays the indicator for all clips with text memos attached. **[HIDE CARD SERIAL]:** Hides the text memo indicator for clips with the following types of text memos attached. • Text memo with the serial number of card written • Other text memos for which offset is not set with clip metadata To record a text memo with the serial number of card written as metadata, set the main menu → [RECORDING SETUP] → [REC META DATA] → [CARD SERIAL] to [ON]. Check [OFFSET] of [MEMO] on the clip properties screen to see whether offset is set for a text memo. • Factory setting: [ALL]
[STORAGE COPY SETUP]	[VERIFY]	Sets whether to verify or not when exporting in USB host mode. **[ON]:** Verifies. **[OFF]:** Does not verify.

[AUDIO SETUP]

Configure the settings regarding audio input/output.

Item		Description of settings
[INPUT SETTING]	[FRONT MIC POWER]	Selects the phantom power of the front microphone. **[ON], [OFF]** • Factory setting: [ON]
	[FRONT MIC LVL]	Sets the level of an external microphone connected to the <MIC IN> terminal. Enabled only when a microphone is connected. **[–40dB], [–50dB], [–60dB]** • Factory setting: [–50dB]
	[REAR MIC CH1 LVL]	Sets the level of an external microphone connected to the <AUDIO IN CH1/3> terminal. Enabled only when a microphone is connected. **[–50dB], [–60dB]** • Factory setting: [–60dB]
	[REAR MIC CH2 LVL]	Sets the level of an external microphone connected to the <AUDIO IN CH2/4> terminal. Enabled only when a microphone is connected. **[–50dB], [–60dB]** • Factory setting: [–60dB]
	[WIRELESS WARN]	Selects whether to display a warning when the reception status of the wireless microphone receiver is poor. **[ON], [OFF]** • Factory setting: [OFF]
	[WIRELESS TYPE]	Selects the type of wireless microphone receiver. **[SINGLE]:** Selects a single channel type wireless microphone receiver. **[DUAL]:** Selects a double channel type wireless microphone receiver. • Factory setting: [SINGLE]
[RECORDING CH SETTING]	[FRONT VR CH1]	Selects whether to enable the <F.AUDIO LEVEL> dial for input signals selected for audio channel 1. **[FRONT]:** Enabled only when [FRONT] is selected. **[W.L.]:** Enabled only when wireless microphone receiver is selected. **[REAR]:** Enabled only when [REAR] is selected. **[ALL]:** Enabled when any input is selected. **[OFF]:** Disabled regardless of the input selected. Recording levels do not change even if the volume dial is turned. • Factory setting: [OFF]
	[FRONT VR CH2]	Selects whether to enable the <F.AUDIO LEVEL> dial for input signals selected for audio channel 2. **[FRONT]:** Enabled only when [FRONT] is selected. **[W.L.]:** Enabled only when wireless microphone receiver is selected. **[REAR]:** Enabled only when [REAR] is selected. **[ALL]:** Enabled when any input is selected. **[OFF]:** Disabled regardless of the input selected. Recording levels do not change even if the volume dial is turned. • Factory setting: [OFF]
	[FRONT VR CH3]	Selects whether to enable the <F.AUDIO LEVEL> dial for input signals selected for audio channel 3. **[FRONT]:** Enabled only when [FRONT] is selected. **[W.L.]:** Enabled only when wireless microphone receiver is selected. **[REAR]:** Enabled only when [REAR] is selected. **[ALL]:** Enabled when any input is selected. **[OFF]:** Disabled regardless of the input selected. Recording levels do not change even if the volume dial is turned. • Factory setting: [OFF]
	[FRONT VR CH4]	Selects whether to enable the <F.AUDIO LEVEL> dial for input signals selected for audio channel 4. **[FRONT]:** Enabled only when [FRONT] is selected. **[W.L.]:** Enabled only when wireless microphone receiver is selected. **[REAR]:** Enabled only when [REAR] is selected. **[ALL]:** Enabled when any input is selected. **[OFF]:** Disabled regardless of the input selected. Recording levels do not change even if the volume dial is turned. • Factory setting: [OFF]
	[MIC LOWCUT CH1]	Enables/disables the lowcut filter for audio channel 1. **[ON], [OFF]** • Factory setting: [OFF]
	[MIC LOWCUT CH2]	Enables/disables the lowcut filter for audio channel 2. **[ON], [OFF]** • Factory setting: [OFF]
	[MIC LOWCUT CH3]	Enables/disables the lowcut filter for audio channel 3. **[ON], [OFF]** • Factory setting: [OFF]
	[MIC LOWCUT CH4]	Enables/disables the lowcut filter for audio channel 4. **[ON], [OFF]** • Factory setting: [OFF]
	[LIMITER CH1]	Enables/disables the limiter for audio channel 1. **[ON], [OFF]** • Factory setting: [OFF]
	[LIMITER CH2]	Enables/disables the limiter for audio channel 2. **[ON], [OFF]** • Factory setting: [OFF]

Item		Description of settings
	[LIMITER CH3]	Enables/disables the limiter for audio channel 3. **[ON], [OFF]** • Factory setting: [OFF]
	[LIMITER CH4]	Enables/disables the limiter for audio channel 4. **[ON], [OFF]** • Factory setting: [OFF]
	[HEADROOM]	Sets the headroom (standard level). **[18dB], [20dB]** • Factory setting: [20dB]
[OUTPUT SETTING]	[TEST TONE]	Outputs rated level 1 kHz tone signal according to the reference level. The standard level varies depending on the setting of [HEADROOM]. **[NORMAL]:** Outputs the test tone to CH1/CH2/CH3/CH4 when the <OUTPUT>/<AUTO KNEE> selector switch is switched to <BARS> and audio channel 1 is set to [FRONT] at the [IN] item on the [AUD02:INPUT] screen of SmartUI. **[ALWAYS]:** Always outputs the test tone to CH1/CH2/CH3/CH4 when the <OUTPUT>/<AUTO KNEE> selector switch is switched to <BARS>. **[CHSEL]:** Outputs the test tone to the channel where the [IN] item on the [AUD02:INPUT] screen of SmartUI is set to [FRONT] when the <OUTPUT>/<AUTO KNEE> selector switch is switched to <BARS>. (Does not output to CH3/CH4.) **[OFF]:** Does not output the test tone. • Factory setting: [NORMAL]

[IN/OUT SEL]

Configure the settings regarding output from <SDI OUT/IN (OP)>, <HDMI>, <MON OUT>, and <TC IN/OUT> terminals.

Item		Description of settings
[SDI OUT]		Sets video output from the <SDI OUT/IN (OP)> terminal. **[ON]:** Outputs video. **[OFF]:** Does not output video. • Factory setting: [ON]
[SDI OUT CHAR]		Selects whether to superimpose characters on images output from the <SDI OUT/IN (OP)> terminal. **[ON]:** Superimposes. **[OFF]:** Does not superimpose. • Factory setting: [OFF] When main menu → [SYSTEM MODE] → [LINE&FREQ] is set to [1080-23.98PsF], characters are not superimposed on the output images from the <SDI OUT/IN (OP)> terminal, and this menu item is not displayed.
[SDI EDH]		Selects whether to superimpose EDH when output from the <SDI OUT/IN (OP)> terminal is SD signal (480i and 576i). **[ON]:** Superimposes. **[OFF]:** Does not superimpose. • Factory setting: [ON]
[HD SDI REMOTE]		Sets whether to use the control function of recording operation for an external device (such as a recorder) connected to the <SDI OUT/IN (OP)> terminal at HD SDI output. **[ON]:** Controls the recording operation of the external device. **[OFF]:** Does not control the recording operation of the external device. • Factory setting: [OFF]
[DOWNCON SETTING]	[DETAIL]	Turns detail function for the down converter output signal [ON]/[OFF]. **[ON], [OFF]** The down converter output signal contains detail components set during HD signal processing. This setting superimposes the detail components exclusive to down converter output to that signal. • Factory setting: [ON]
	[H.DTL LEVEL]	Sets horizontal detail correction level for the down converter output signal. **[0]…[31]** • Factory setting: [8]
	[V.DTL LEVEL]	Sets vertical detail correction level for the down converter output signal. **[0]…[31]** • Factory setting: [4]
	[DTL CORING]	Sets the detail noise removal level. **[0]…[15]** • Factory setting: [1]
	[H.DTL FREQ]	Selects the horizontal detail frequency. **[2.5MHz], [3MHz], [3.5MHz], [4MHz], [4.5MHz]** • Factory setting: [3.5MHz]
[MON/HDMI ZEBRA]		Selects whether to superimpose the zebra pattern over the video signals output from the monitor output terminals (<HDMI>, <MON OUT>). **[ON]:** Superimposes. **[OFF]:** Does not superimpose. • Factory setting: [OFF]
[TC IN/OUT SEL]		Selects whether to use the <TC IN/OUT> terminal for input or for output. **[TC OUT]:** Uses as output. **[TC IN]:** Uses as input. • Factory setting: [TC OUT]

Item	Description of settings
[TC OUT]	Sets the type of time code output from the <TC IN/OUT> terminal. **[TCG]:** Outputs the time code generator value of the camera at all times. **[TCG/TCR]:** Outputs the time code generator value for camera image output, and the time code value of the video being played back for video playback output. • Factory setting: [TCG]
[TC OUTPUT REF]	Sets the output delay of time code output from the <TC IN/OUT> terminal. **[RECORDING]:** Outputs the recorded time code with no delay. This is used when performing simultaneous recording on two cameras with the time code of this camera as the master. **[MON OUT]:** Matches to output images. • Factory setting: [MON OUT]

[NETWORK SETUP]

Configure the settings regarding the network.

Item		Description of settings
[USB MODE SELECT]		Sets the camera operation mode when an external device is connected to the USB. **[STORAGE]:** Sets the mode to be used with connected devices such as an external hard disk drive. **[DEVICE]:** Selects the USB device mode for using P2 cards as mass storage, using computers or other devices connected via USB 2.0. • Factory setting: [STORAGE]
[USB MODE]		Enables/disables the mode selected in [USB MODE SELECT]. **[ON], [OFF]** • Factory setting: [OFF]
[NETWORK SEL]		Sets the connection method when connecting the camera with an external device (such as a computer) via network. **[WLAN]:** Connects via wireless LAN. **[4G/LTE]**: Connects via 3G/4G/LTE. **[LAN]:** Connects via the <LAN> terminal. **[OFF]:** Does not connect. • Factory setting: [OFF]
[NETWORK FUNC]	[HTTP SERVER]	Configures the settings regarding the HTTP server. **[BROWSE]:** Enables the P2 browser function. **[BROWSE (+CTRL)]:** Enables the HTTP server function, starting and stopping recording at the terminal side, and preset control of time code or user bits. **[DISABLE]:** Disables the HTTP server function. • Factory setting: [DISABLE]
	[PLAYLIST]	Sets entering/exiting of the playlist edit mode. **[ON], [OFF]** • Factory setting: [OFF]
	[IP REMOTE]	**[ENABLE]:** Enables remote control with IP connection. **[DISABLE]:** Disables remote control with IP connection. • Factory setting: [DISABLE]
	[USER ACCOUNT]	Sets the user account name.
	[ACCOUNT LIST]	Displays the currently set user account name. Registering of new accounts, deleting accounts, or changing password can also be performed.
[FTP CLIENT SERVICE]	[SETTING DATA]	Sets the source from where client service settings are acquired. **[INTERNAL]:** Uses the setting value set on the camera. **[SD CARD]:** Uses the setting value of the file inside the SD memory card inserted in the SD card slot. When this item is set to [SD CARD], insert an SD memory card before turning on the power of the camera. • Factory setting: [INTERNAL]
	• [SERVER URL]	Sets the server name or an address to connect to.
	• [LOGIN USER]	Sets the user ID to connect to.
	• [LOGIN PASSWORD]	Sets the password to connect to. The menu setting value is displayed with [∗].
	• [SSH]	Sets when transferring files using SSH. **[ENABLE]:** Uses SSH. **[DISABLE]:** Does not use SSH. • Factory setting: [DISABLE]
	• [SSH PORT]	Sets the network port number when SSH is used. Set the same number as that of the server side. The menu setting value is displayed with [∗]. • Factory setting: [22]
	• [LOAD (SD CARD)]	Loads the setting value of the client service from the SD memory card.
	• [SAVE (SD CARD)]	Saves the setting value of the client service onto the SD memory card.
	[REC DURING UPLOAD]	Sets whether to use the rec during upload function. **[ENABLE]:** Uses the rec during upload function. **[DISABLE]:** Does not use the rec during upload function. • Factory setting: [DISABLE]
	[AUTO COPY]	Sets whether to enable the function to register clips recorded using the camera automatically to the upload list when recording stops, and if enabled, sets the type of target clip. **[REC CLIP(PROXY)]:** Upload target is proxy data of recorded clips. **[REC CLIP]:** Upload target is recorded clips (main recording data and proxy data). **[DISABLE]:** Does not automatically upload recorded clips. • Factory setting: [DISABLE]

Item		Description of settings
	[UPLOAD LIST]	Displays the list information of clips to upload.
	[SAVE LOG (SD CARD)]	Save up to the latest 1000 logs for clip information (month and date, clip number (global clip ID), status) registered in the upload list to an SD memory card.
[STREAMING SETTING]	[START TRIGGER]	Sets the method for starting video streaming. **[CAMERA]:** Starts/stops streaming from the camera. **[RECEIVER]:** Operates the start/stop of the streaming distribution from the terminal on the network using the P2 Browser or the P2 Streaming Receiver. • Factory setting: [RECEIVER]
	[SETTING DATA]	Sets the source from where settings for streaming is acquired when [CAMERA] is selected in [START TRIGGER]. **[INTERNAL]:** Uses the setting value set on the camera. **[SD CARD]:** Uses the setting value of the file inside the SD memory card inserted in the SD card slot. When this item is set to [SD CARD], insert an SD memory card before turning on the power of the camera. • Factory setting: [INTERNAL]
	[SERVER ADDR.]	Sets the IP address of the device receiving the streaming video when [CAMERA] is selected in [START TRIGGER].
	[RTSP PORT]	Sets the RTSP port number required for streaming when [CAMERA] is selected in [START TRIGGER]. • Factory setting: [554]
	[LOAD (SD CARD)]	When [CAMERA] is selected in [START TRIGGER] and [INTERNAL] is selected in [SETTING DATA], the connection information necessary for streaming distribution is loaded from the SD memory card.
	[SAVE (SD CARD)]	When [CAMERA] is selected in [START TRIGGER] and [INTERNAL] is selected in [SETTING DATA], the connection information necessary for streaming distribution is saved to the SD memory card.
	[START]	When [CAMERA] is selected in [START TRIGGER], the streaming distribution is started/stopped from the camera. **[ON]:** Starts streaming. **[OFF]:** Stops streaming.
[LAN PROPERTY]	[MAC ADDRESS]	Displays the MAC address of the <LAN> terminal on the camera. (Cannot be changed.)
	[DHCP]	Sets whether to use automatic acquisition via DHCP. (Mutually exclusive with [DHCP SERVER] setting) **[ENABLE]:** Uses automatic acquisition. **[DISABLE]:** Does not use automatic acquisition. Set [IP ADDRESS], [SUBNET MASK], [DEFAULT GATEWAY], [PRIMARY DNS], and [SECONDARY DNS]. • Factory setting: [ENABLE]
	[IP ADDRESS]	Sets the IP address when [DISABLE] is selected in [DHCP]. • Factory setting: [192.168.0.1]
	[SUBNET MASK]	Sets the subnet mask when [DISABLE] is selected in [DHCP]. • Factory setting: [255.255.255.0]
	[DEFAULT GATEWAY]	Sets the default gateway when [DISABLE] is selected in [DHCP]. • Factory setting: [192.168.0.254]
	[PRIMARY DNS]	Sets the primary DNS server when [DISABLE] is selected in [DHCP]. • Factory setting: [0.0.0.0]
	[SECONDARY DNS]	Sets the secondary DNS server when [DISABLE] is selected in [DHCP]. • Factory setting: [0.0.0.0]
	[DHCP SERVER]	Sets whether to use the DHCP SERVER function when connected via wired LAN. (Mutually exclusive with [DHCP] setting) **[ENABLE]:** Uses the DHCP SERVER function. **[DISABLE]:** Does not use the DHCP SERVER function. • Factory setting: [DISABLE]
[WIRELESS PROPERTY]	[MAC ADDRESS]	Displays the MAC address of the wireless LAN of the camera. (Cannot be changed.)
	[TYPE]	Sets the connection method. **[DIRECT]:** Accesses to the network function of the camera directly from a smartphone, tablet, or computer. **[INFRA]:** Connects to the wireless access point. • Factory setting: [DIRECT]
	[SSID INPUT MODE]	Sets the setting method of SSID. When [TYPE] in [WIRELESS PROPERTY] is set to [INFRA], this item can be set. **[SELECT]:** Selects from the access point list. **[MANUAL]:** For entering the access point manually. • Factory setting: [SELECT]
	[SSID]	Displays network name (SSID). • Factory setting: [AJ-PX800] (When the main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] → [TYPE] is set to [DIRECT])
	[BAND]	Switches between two transmission methods (2.4 GHz or 5 GHz). **[2.4GHz], [5GHz]** • Factory setting: [2.4GHz]
	[CHANNEL (2.4GHz)]	Sets the channels to be used when [DIRECT] is selected in [TYPE], [2.4GHz] is selected in [BAND], and the camera is connected via wireless LAN. **[AUTO], [CH1], [CH6], [CH11]** • Factory setting: [AUTO]
	[CHANNEL (5GHz)]	Sets the channels to be used when [DIRECT] is selected in [TYPE], [5GHz] is selected in [BAND], and the camera is connected via wireless LAN. **[AUTO], [CH36], [CH40], [CH44], [CH48]** • Factory setting: [AUTO]

Item		Description of settings
	[ENCRYPTION]	Sets the encryption format used when the main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] → [TYPE] is set to [DIRECT]. **[WPA-TKIP], [WPA-AES], [WPA2-TKIP], [WPA2-AES], [NONE]** • Factory setting: [WPA2-AES]
	[ENCRYPT KEY]	Sets the encryption key. Set the key using a string of 8 to 63 characters or a hexadecimal number with 64 digits. The menu setting value is displayed with [∗]. • Factory setting: [0123456789012345678 9abcdef] (When the main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] → [TYPE] is set to [DIRECT])
	[DHCP]	Sets whether to use automatic acquisition via DHCP when [INFRA] is selected in [TYPE]. **[ENABLE]:** Uses automatic acquisition. **[DISABLE]:** Does not use automatic acquisition. Set [IP ADDRESS], [SUBNET MASK], [DEFAULT GATEWAY], [PRIMARY DNS], and [SECONDARY DNS]. • Factory setting: [ENABLE]
	[IP ADDRESS]	Sets the IP address when [DISABLE] is selected in [DHCP]. • Factory setting: [192.168.0.1]
	[SUBNET MASK]	Sets the subnet mask when [DISABLE] is selected in [DHCP]. • Factory setting: [255.255.255.0]
	[DEFAULT GATEWAY]	Sets the default gateway when [INFRA] is selected in [TYPE] and [DISABLE] is selected in [DHCP]. • Factory setting: [192.168.0.254]
	[PRIMARY DNS]	Sets the primary DNS server when [INFRA] is selected in [TYPE] and [DISABLE] is selected in [DHCP], or when [ENABLE] is selected in [DHCP] and the primary DNS server cannot be obtained. • Factory setting: [0.0.0.0]
	[SECONDARY DNS]	Sets the secondary DNS server when [INFRA] is selected in [TYPE] and [DISABLE] is selected in [DHCP], or when [ENABLE] is selected in [DHCP] and the primary DNS server cannot be obtained. • Factory setting: [0.0.0.0]
	[DHCP SERVER]	Sets whether to use the DHCP SERVER function when [DIRECT] is selected in [TYPE] and the camera is connected via wireless LAN. **[ENABLE]:** Uses the DHCP SERVER function. **[DISABLE]:** Does not use the DHCP SERVER function. • Factory setting: [ENABLE]
[4G/LTE PROPERTY]	[APN]	Sets the APN (Access Point Name) provided by the provider.
	[USER ID]	Sets the user name provided by the provider.
	[PASSWORD]	Sets the password provided by the provider.
	[DIAL NO.]	Sets the phone number. For details, refer to the manual of the provider you have contracted.
[NETWORK TOOLS]	[LOG DISPLAY]	Displays the connection log.
	[STATUS DISPLAY]	Displays the network status.
	[INITIALIZE]	Restores the network setting status to the factory settings.
	[PING]	Checks network connection using PING commands.

[DISPLAY SETUP]

Configure the settings for the details to be displayed in the viewfinder.
These menu items cannot be set when the thumbnail screen is displayed.

Item	Description of settings
[ZEBRA1 DETECT]	Sets the extraction level of zebra pattern 1. **[0%]…[109%]** • Factory setting: [70%]
[ZEBRA2 DETECT]	Sets the extraction level of zebra pattern 2. **[0%]…[109%]** • Factory setting: [85%]
[ZEBRA2]	Sets on/off of zebra pattern 2 and selects the type. **[ON], [SPOT], [OFF]** • Factory setting: [SPOT]
[CENTER MARK]	Controls the center mark. **[1]:** + (large) **[2]:** Open center (large) **[3]:** + (small) **[4]:** Open center (small) **[OFF]:** Does not display. • Factory setting: [1]
[SAFETY MARK]	Selects the type of frame for the safety zone marker. **[1]:** Box **[2]:** Corners **[OFF]:** Does not display. • Factory setting: [2]
[SAFETY AREA]	Sets the size of the safety zone marker. The constant ratio of length to width can be set in 1% increments. **[80%]…[100%]** • Factory setting: [90%]

Item		Description of settings
[FRAME MARK]		Enables/disables frame marker. **[ON], [OFF]** • Factory setting: [OFF]
[FRAME SIG]		Sets frame marker aspect ratio. **[4:3], [13:9], [14:9], [1.85:1], [2.35:1]** • Factory setting: [4:3]
[FRAME LVL]		Sets the level of the outside of the frame marker. **[0]…[15]** • Factory setting: [15]
[LEVEL GAUGE]		Enables/disables level gauge. **[ON], [OFF]** • Factory setting: [OFF]
[FOCUS BAR]		Displays/hides the focus bar indicating the degree of focus. **[ON], [OFF]** • Factory setting: [OFF]
[ZOOM/FOCUS]		Switches the units of zoom and focus values when a serial lens is connected. **[NUMBER]:** Displays position value of zoom from [000] to [999], and position value of focus from [0] to [99]. **[mm/feet]:** Zoom is displayed in units of millimeters, and focus in units of feet. **[mm/m]:** Zoom is displayed in units of millimeters, and focus in units of meters. **[OFF]:** Neither zoom nor focus is displayed. • Factory setting: [NUMBER]
[LEVEL METER]		Displays/hides audio level meter. **[ON], [OFF]** • Factory setting: [ON]
[DATE/TIME]		Sets date and time display. **[TIME]:** Displays the hour, minute, and second. **[DATE]:** Displays the year, month, and date. **[TIME&DATE]:** Displays the hour, minute, and second, as well as year, month, and date. **[OFF]:** Does not display. • Factory setting: [OFF]
[REC COUNTER]		Sets operation of the counter for recording. **[TOTAL]:** Performs continuous counting until it is reset using the <RESET> button. **[CLIP]:** Clears the counter value at the start of recording and counts the time for each recording. • Factory setting: [TOTAL]
[P2CARD REMAIN]		Turns display of the remaining recording capacity for the P2 card [ON]/[OFF]. **[ON], [OFF]** • Factory setting: [ON]
[BATTERY]		Turns the battery charge level indicator [ON]/[OFF]. **[ON], [OFF]** • Factory setting: [ON]
[REC DURING UPLOAD]		Selects [ON]/[OFF] of the rec during upload status display. **[ON], [OFF]** • Factory setting: [ON]
[STREAMING]		Selects [ON]/[OFF] of the status display indicating the distribution status of the streaming video. **[ON], [OFF]** • Factory setting: [ON]
[OTHER DISPLAY]		Sets display details of other information. **[PARTIAL]:** Displays information partly. **[ALL]:** Displays all information. **[USER]:** Displays the information set in [DISPLAY SETTING]. • Factory setting: [PARTIAL]
[DISPLAY SETTING]	[IRIS]	Displays/hides F value and auto iris control status. **[ON], [OFF]** • Factory setting: [ON]
	[GAIN]	Displays/hides gain value. **[ON], [OFF]** • Factory setting: [ON]
	[SHUTTER]	Displays/hides shutter speed. **[ON], [OFF]** • Factory setting: [ON]
	[WHITE BALANCE]	Displays/hides the <WHITE BAL> switch position. **[ON], [OFF]** • Factory setting: [ON]
	[ND]	Displays/hides the set value of ND filter. **[ON], [OFF]** • Factory setting: [ON]
	[EXTENDER]	Displays/hides the lens extender. **[ON], [OFF]** • Factory setting: [ON]
	[Y GET]	Displays/hides brightness of Y GET. **[ON], [OFF]** • Factory setting: [ON]

Item		Description of settings
	[D.ZOOM]	Displays/hides digital zoom display. **[ON], [OFF]** • Factory setting: [ON]
	[SCENE FILE]	Displays/hides scene file name. **[ON], [OFF]** • Factory setting: [ON]
	[CAC]	Displays/hides the operation when the chromatic aberration compensation function is activated. **[ON], [OFF]** • Factory setting: [ON]
	[DRS]	Toggles whether to display when the dynamic range stretcher function is activated. **[ON], [OFF]** • Factory setting: [ON]
	[FBC]	Toggles whether to display when the flash band compensation function is activated. **[ON], [OFF]** • Factory setting: [ON]
	[SHOOTING MODE]	Displays/hides high-sensitivity mode. **[ON], [OFF]** • Factory setting: [ON]
	[PB MODE]	Displays/hides the operation status of playback. **[ON], [OFF]** • Factory setting: [ON]
	[SYSTEM MODE]	Displays/hides system mode. **[ON], [OFF]** • Factory setting: [OFF]
	[REC FORMAT]	Displays/hides recording format display. **[ON], [OFF]** • Factory setting: [ON]
	[FRAME RATE]	Displays/hides frame rate. **[ON], [OFF]** • Factory setting: [ON]
	[ASPECT]	Displays/hides letterbox recording display. **[ON], [OFF]** • Factory setting: [ON]
	[ONE CLIP REC]	Displays/hides the status of one-clip recording mode. **[ON], [OFF]** • Factory setting: [ON]
	[REC MODE]	Displays/hides simultaneous recording mode display. **[ON], [OFF]** • Factory setting: [ON]
	[PROXY]	Displays/hides proxy information. **[ON], [OFF]** • Factory setting: [ON]
	[GPS]	Displays/hides the position information acquired from external device. **[ON], [OFF]** • Factory setting: [ON]
[EVF DETAIL]		Adjusts the contour of the video in the viewfinder to make it easier to focus. **[ON], [OFF]** • Factory setting: [OFF]
[EVF PEAK LEVEL]		Adjusts the peaking level of the viewfinder. **[–7]…[7]** • Factory setting: [0]
[EVF PEAK FREQ]		Adjusts the peaking frequency of the viewfinder. **[HIGH], [LOW]** • Factory setting: [LOW]
[EVF TYPE]		Selects the type of viewfinder to be connected. **[COLOR]:** Connects the color viewfinder. (AG-CVF10G, AG-CVF15G) **[B/W]:** Connects the black and white viewfinder. • Factory setting: [COLOR]
[EVF COLOR]		Selects whether to display viewfinder images in color or in black and white. **[ON]:** Displays in color. **[OFF]:** Displays in black and white. • Factory setting: [ON]

[BATTERY SETUP]

Configure the settings for the battery to use.

Item		Description of settings
[BATTERY SELECT]		Selects the battery to use. **[HYTRON140], [DIONIC HC], [ENDURA10], [PAG L96e]:** Detects the battery charge level according to the selected battery when the HYTRON140, DIONIC HC by Anton/Bauer, ENDURA10 (E-10) by IDX, or PAG L96e by PAG battery is selected. **[TYPE A], [TYPE B], [TYPE C]:** Select either item when a battery other than [HYTRON140], [DIONIC HC], [ENDURA10], and [PAG L96e] is used. At this time, set [FULL] (full voltage), [NEAR END] (near end warning voltage), or [END] (end voltage) in the main menu → [BATTERY SETUP] → [BATTERY SETTING] (page 146) according to the battery in use. **[BATT STAT]:** By selecting [BATT STAT] when using a battery whose charge level is detected as a percentage value, near end and end operations are conducted according to the percentage value of the charge level. Set the percentage value of [BATT STAT NEAR END] (near end) and [BATT STAT END] (end) in the main menu → [BATTERY SETUP] → [BATTERY SETTING] (page 146) according to the battery in use. **[ENDURA STAT]:** Select it when ENDURA battery by IDX is used to perform near end and end operations according to the percentage value of the charge level information. Set the percentage value of [ENDURA STAT NEAR END] (near end) and [ENDURA STAT END] (end) in the main menu → [BATTERY SETUP] → [BATTERY SETTING] (page 146) according to the battery in use. • Factory setting: [DIONIC HC] When the battery charge level percentage cannot be detected even if [BATT STAT] or [ENDURA STAT] is set, it will follow the setting value of [TYPE A]. Make sure that the [TYPE A] setting values for [FULL] (fully charged), [NEAR END] (near end), and [END] (end) are appropriate for the battery in use.
[EXT DC IN SELECT]		Sets the type of charge level detection when a battery is connected to the <DC IN> terminal. Also detects a charge level that corresponds to the selected type. Selection of a battery type is the same as that of [BATTERY SELECT]. Displays the analog voltage in the viewfinder. **[DC PWR SUPPLY], [HYTRON140], [DIONIC HC], [ENDURA10], [PAG L96e], [TYPE A], [TYPE B], [TYPE C]** • Factory setting: [DC PWR SUPPLY]
[BATT NEAR END CANCEL]		If set to [ON], the warning sound and warning display output can be canceled when the <DISP/MODE CHK> switch is pushed towards the <CHK> side at battery near end. **[ON], [OFF]** • Factory setting: [ON]
[BATT REMAIN FULL]		Sets the content of the battery remaining charge bar of SmartUI when a battery with charge level display function is used. **[70%]:** Displays as full at 70%. **[100%]:** Displays as full at 100%. • Factory setting: [70%]
[BATTERY SETTING]	[BATTERY MODE]	Selects whether to set the near end voltage of a battery. **[AUTO]:** Automatically set. **[MANUAL]:** Manually set. • Factory setting: [AUTO]
	[HYTRON140 NEAR END]	Selects the near end voltage in steps of 0.1 V when [HYTRON140] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. This item is enabled when [BATTERY MODE] is set to [MANUAL]. **[12.0V]…[15.0V]** • Factory setting: [13.1V]
	[DIONIC HC NEAR END]	Selects the near end voltage in steps of 0.1 V when [DIONIC HC] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. This item is enabled when [BATTERY MODE] is set to [MANUAL]. **[12.0V]…[15.0V]** • Factory setting: [13.1V]
	[ENDURA10 NEAR END]	Selects the near end voltage in steps of 0.1 V when [ENDURA10] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. This item is enabled when [BATTERY MODE] is set to [MANUAL]. **[12.0V]…[15.0V]** • Factory setting: [13.1V]
	[PAG L96e NEAR END]	Selects the near end voltage in steps of 0.1 V when [PAG L96e] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. This item is enabled when [BATTERY MODE] is set to [MANUAL]. **[12.0V]…[15.0V]** • Factory setting: [13.1V]
	[TYPE A FULL]	Selects the voltage for full display in steps of 0.1 V when [TYPE A] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. The [TYPE A] factory setting corresponds to the IDX ENDURA ELETE. **[13.0V]…[17.0V]** • Factory setting: [15.6V]
	[TYPE A NEAR END]	Selects the near end voltage in steps of 0.1 V when [TYPE A] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. The [TYPE A] factory setting corresponds to the IDX ENDURA ELETE. **[11.0V]…[15.0V]** • Factory setting: [13.2V]

Item		Description of settings
	[TYPE A END]	Selects the end voltage in steps of 0.1 V when [TYPE A] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. The [TYPE A] factory setting corresponds to the IDX ENDURA ELETE. **[11.0V]…[15.0V]** • Factory setting: [12.5V]
	[TYPE B FULL]	Selects the voltage for full display in steps of 0.1 V when [TYPE B] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. The [TYPE B] factory setting corresponds to the Anton/Bauer DIONIC HC. **[13.0V]…[17.0V]** • Factory setting: [15.9V]
	[TYPE B NEAR END]	Selects the near end voltage in steps of 0.1 V when [TYPE B] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. The [TYPE B] factory setting corresponds to the Anton/Bauer DIONIC HC. **[11.0V]…[15.0V]** • Factory setting: [12.9V]
	[TYPE B END]	Selects the end voltage in steps of 0.1 V when [TYPE B] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. The [TYPE B] factory setting corresponds to the Anton/Bauer DIONIC HC. **[11.0V]…[15.0V]** • Factory setting: [12.5V]
	[TYPE C FULL]	Selects the voltage for full display in steps of 0.1 V when [TYPE C] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. **[13.0V]…[17.0V]** • Factory setting: [15.9V]
	[TYPE C NEAR END]	Selects the near end voltage in steps of 0.1 V when [TYPE C] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. **[11.0V]…[15.0V]** • Factory setting: [13.2V]
	[TYPE C END]	Selects the end voltage in steps of 0.1 V when [TYPE C] is selected in the main menu → [BATTERY SETUP] → [BATTERY SELECT]. **[11.0V]…[15.0V]** • Factory setting: [12.5V]
	[BATT STAT NEAR END]	Selects the near end percent value. When the battery charge level percentage cannot be detected, this will follow the near end voltage value set for [TYPE A]. **[4%], [5%], [6%], [7%], [8%], [9%], [10%], [12%], [14%], [16%], [18%], [20%]** • Factory setting: [5%] If a battery whose remaining charge is displayed in units of 10% is used, the setting value and actual near end warning may vary slightly.
	[BATT STAT END]	Selects the end percent value. When the battery charge level percentage cannot be detected, this will follow the end voltage value set for [TYPE A]. **[1%]…[10%]** • Factory setting: [1%] When using a battery which displays battery charge level by units of 10%, an end is determined only in two stages: when it is set between [1%] and [5%], or when it is set between [6%] and [10%].
	[ENDURA STAT NEAR END]	Selects the near end percent value. When the battery charge level percentage cannot be detected, this will follow the near end voltage value set for [TYPE A]. **[4%], [5%], [6%], [7%], [8%], [9%], [10%], [12%], [14%], [16%], [18%], [20%]** • Factory setting: [5%] If a battery whose remaining charge is displayed in units of 10% is used, the setting value and actual near end warning may vary slightly.
	[ENDURA STAT END]	Selects the end percent value. When the battery charge level percentage cannot be detected, this will follow the end voltage value set for [TYPE A]. **[1%]…[10%]** • Factory setting: [1%] When using a battery which displays battery charge level by units of 10%, an end is determined only in two stages: when it is set between [1%] and [5%], or when it is set between [6%] and [10%].

[CARD FUNCTIONS]

Configure the settings regarding reading/writing of the scene files and user files to SD memory cards.

Item	Description of settings
[SCENE FILE]	Loads scene files from an SD memory card or saves them to an SD memory card. **[LOAD]:** Loads scene files. **[SAVE]:** Saves scene files.
[USER FILE]	Loads user files from an SD memory card or saves them to an SD memory card. **[LOAD]:** Loads user files. **[SAVE]:** Saves user files.
[CAC FILE]	Loads CAC files from an SD memory card or deletes CAC files stored in the SD memory card. **[LOAD]:** Loads CAC files. Specifies the file number when saving a loaded CAC file in the SD memory card to the camera. **[DELETE]:** Deletes CAC files stored in the SD memory card.

Item	Description of settings
[SD CARD PROPERTY]	Displays the SD memory card status. The format condition, available space, etc. can be checked.
[FORMAT SD CARD]	Formats an SD memory card.

[OTHER FUNCTIONS]

Configure these items to make settings for reading/writing, initialization of user file data on the internal memory, and the camera settings.

Item	Description of settings
[USER FILE]	Loads/saves/initializes user files on the camera memory. **[LOAD]:** Loads user files. **[SAVE]:** Saves user files. **[INITIALIZE]:** Restores user files to the factory settings.
[ACCESS LED]	Selects whether to light the access LED of the P2 card. **[ON], [OFF]** • Factory setting: [ON]
[REC TALLY]	Sets the tally lamp display in the viewfinder. **[RED]:** Illuminates the red tally lamp on the viewfinder during recording with the camera. The front tally lamp and the back and rear tally lamps on the body are also illuminated. **[GREEN]:** Illuminates the green tally lamp in the viewfinder during recording with the camera. The front tally lamp or the tally lamps on the body are not illuminated **[CHAR]:** During recording with the camera, the tally lamp in the viewfinder is not illuminated and the recording status is displayed only with text on the screen. No tally lamps are illuminated. • Factory setting: [RED]
[WARNING ALARM]	Selects if the warning sound is output or not when the camera detects any abnormality, such as a system error or recording error. **[ON]:** Outputs the warning sound. **[OFF]:** Does not output the warning sound. • Factory setting: [ON]
[CLOCK SETTING]	Sets the built-in calendar (date and time).
[TIME ZONE]	For GMT, set using 30 minute intervals from −12:00 to +13:00 (however, +12:45 is possible). After setting the time, when changing the setting value for [TIME ZONE], the displayed and registered times switch to the time with the time difference.
[GL PHASE]	When in HD (1080i, 720P) mode, selects the output signal of phase to be locked to the signal input to the <GENLOCK IN> terminal. **[HD SDI]:** Locks the HD SDI output signal to genlock input. **[COMPOSITE]:** Locks the down-converted composite output signals (signal from the <MON OUT> terminal and 480i, 576i signals from the <SDI OUT/IN (OP)>terminal) to genlock input. • Factory setting: [HD SDI]
[H PHASE]	Adjusts the horizontal phase when the phase is to be locked to the signal input to the <GENLOCK IN> terminal. **[−512]…[512]** • Factory setting: [0]
[SEEK POS SEL]	Selects the position to move when the <FF/▶▶>/<◀◀/REW> button is pressed while playback is paused. **[CLIP]:** Top of the clip **[CLIP&TEXT MEMO]:** Top of the clip and text memo location • Factory setting: [CLIP]
[GPS]	Sets the position information acquisition from external device. Acquired position information is recorded in the shooting location of the metadata. The position information is not recorded in the metadata if the position information cannot be acquired. **[EXTERNAL]:** Acquires the position information from the external device connected to the camera via network. **[OFF]:** Does not acquire the position information from the external device. Position information is not recorded. • Factory setting: [OFF]
[P.OFF GPS DATA]	Retains the GPS location information when the camera is turned off. Sets whether to record the retained data at the next turning on until a positioning is performed. **[HOLD]:** Retains and records data. **[CLEAR]:** Clears the data at the time when the camera is turned off. Records 0 (No-Info) at the next turning on until a positioning is performed. • Factory setting: [CLEAR]
[MENU INITIALIZE]	Restores the whole setting menu including all scene files (1 to 6) and user files to the factory settings.

[MAINTENANCE]

These are items for performing maintenance inspection of the camera. This menu is used for updating the firmware version of the camera.

Item		Description of settings
[UPDATE]		Performs an update of the camera firmware. (Enabled only when there is a dedicated update file on the SD memory card.)
[LENS ADJ.]	[F2.8 ADJ.]	Only when this item is set to [ON], sets the iris to F2.8. (Adjusts so that it becomes F2.8 at the lens.) **[ON], [OFF]** • Factory setting: [OFF]
	[F16 ADJ.]	Only when this item is set to [ON], sets the iris to F16. (Adjusts so that it becomes F16 at the lens.) **[ON], [OFF]** • Factory setting: [OFF]

Item		Description of settings
	[FB ADJ.]	Adjusts the lens flange back. This can be adjusted only when an auto-focus compatible lens is attached.
[WHITE SHADING]	[SHADING SELECT]	Sets the white shading data. **[L1:LENS1], [L2:LENS2], [L3:LENS3], [OFF]** • Factory setting: [OFF]
	[NAME EDIT]	Edits the title of the white shading data. (Up to six characters)
	[EXECUTE]	Sets the white shading compensation parameter for the data selected in [SHADING SELECT]. (This cannot be set if [OFF] is selected).
[CAC ADJ.]	[CAC CONTROL]	Enables/disables the chromatic aberration compensation function (CAC). **[ON]:** Compensates for chromatic aberration. **[OFF]:** Does not compensate for chromatic aberration. • Factory setting: [ON]
	[LIST/DELETE]	Performs such operations as viewing the list of CAC stored in the camera internal memory and deleting files of the numbers selected from the list of CAC. **[No1]…[No32]** • Factory setting: [No1]

[DIAGNOSTIC]

This menu is used to display the firmware version, product name, serial number, and operation time of the camera.

Item	Description of settings
[VERSION]	Displays the information of the camera. **[VERSION]:** Displays the version (representative version) of all firmware in the camera. **[MODEL NAME]:** Displays the product name of the camera. **[SERIAL NO.]:** Displays the serial number of the camera. **[NETWORK ID]:** Displays the network ID of the camera. **[UID]:** Displays the unique ID of the camera. Turn the jog dial button (or press the cursor button) to display the list of each firmware version.
[OPERATION]	Displays the operation time of the camera.

[USER MENU SEL]

Configure the items to be displayed in [USER MENU].

[OPTION MENU] list

[AREA SETTING]

Select the region in which you use the camera. The following settings can be made on the [AREA SELECT] screen.

[NTSC]: Selects an NTSC region other than Japan.

[NTSC (J)]: Selects Japan.

[PAL]: Selects the PAL region.

[AWB PRE CONTROL]

Change the output display or output value for the white balance preset value [3200K].

Item	Description of settings
[R Gain]	Displays the output of Rch of preset [3200K]. The color can be changed on the Rch axis by changing the output of Rch. **[–400]…[400]** • Factory setting: [0]
[B Gain]	Displays the output of Bch of preset [3200K]. The color can be changed on the Bch axis by changing the output of Bch. **[–400]…[400]** • Factory setting: [0]
[G AXIS]	Displays the output of G axis of preset [3200K]. The color can be changed on the G axis by changing the output of Rch/Bch. **[–400]…[400]** • Factory setting: [0]

[ENG SECURITY]

Select whether to place restrictions on opening and closing the menu screen.

[ON]: Disables opening of menu items other than [USER MENU]. To release, consult your dealer.

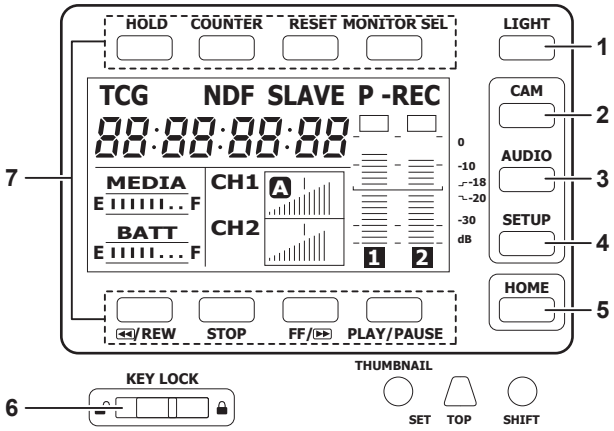
[OFF]: Opening and closing are not restricted.

Chapter 7 SmartUI operation

This chapter describes an interface consisting of an LCD display and multiple switches. It enables scene file setting, audio input/output setting, time code setting and so on.

SmartUI basic operations

Buttons used with SmartUI



When the camera is turned on, the [HOME] screen is displayed. The status of the [HOME] screen at previous start-up is retained.

1 <LIGHT> button

Switches the SmartUI backlight on and off. This can be operated regardless of the status of the <KEY LOCK> switch.

2 <CAM> button

Displays a settings screen related to the camera image ([CAMERA] screen).
Each time you press the button, the settings screens change in order.

3 <AUDIO> button

Displays a settings screen related to audio ([AUDIO] screen).
Each time you press the button, the settings screens change in order.

4 <SETUP> button

Displays a settings screen related to time code and image output ([SETUP] screen).
Each time you press the button, the settings screens change in order.

5 <HOME> button

- While another screen is displayed, press this button to return to the [HOME] screen.
- While the [HOME] screen is displayed, press this button to change the status information display at the bottom of the screen.

6 <KEY LOCK> switch

Slide to the right to lock the operations of all buttons of SmartUI. Slide to the left to unlock.

* Buttons for thumbnail operations will be locked as well.

7 <HOLD> button, <COUNTER> button, <RESET> button, <MONITOR SEL> button, <◀◀/REW> button, <STOP> button, <FF/▶▶> button, and <PLAY/PAUSE> button

- When the [HOME] screen is displayed

  The function printed above or below each button is performed.
- When the [CAMERA] screen, the [AUDIO] screen, or the [SETUP] screen is displayed

  Instead of the printed functions, the functions in the [ ] of SmartUI are assigned to upper or lower buttons corresponding to each setting screen. For details, refer to “SmartUI menu list” (page 155).

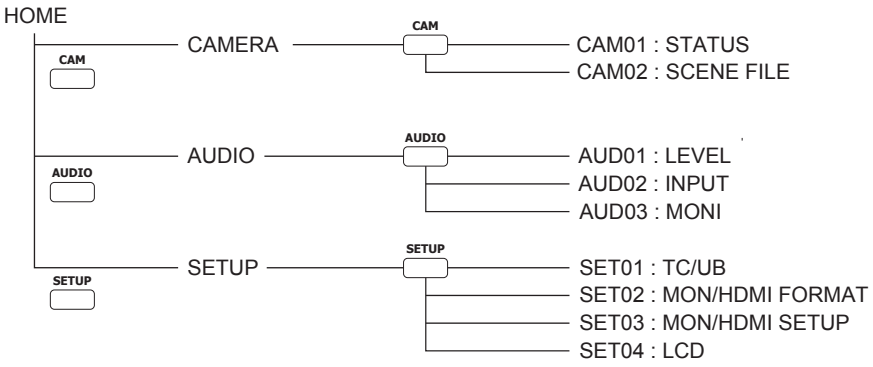
Initializing SmartUI menu items

Items configured with SmartUI are saved in the user file.

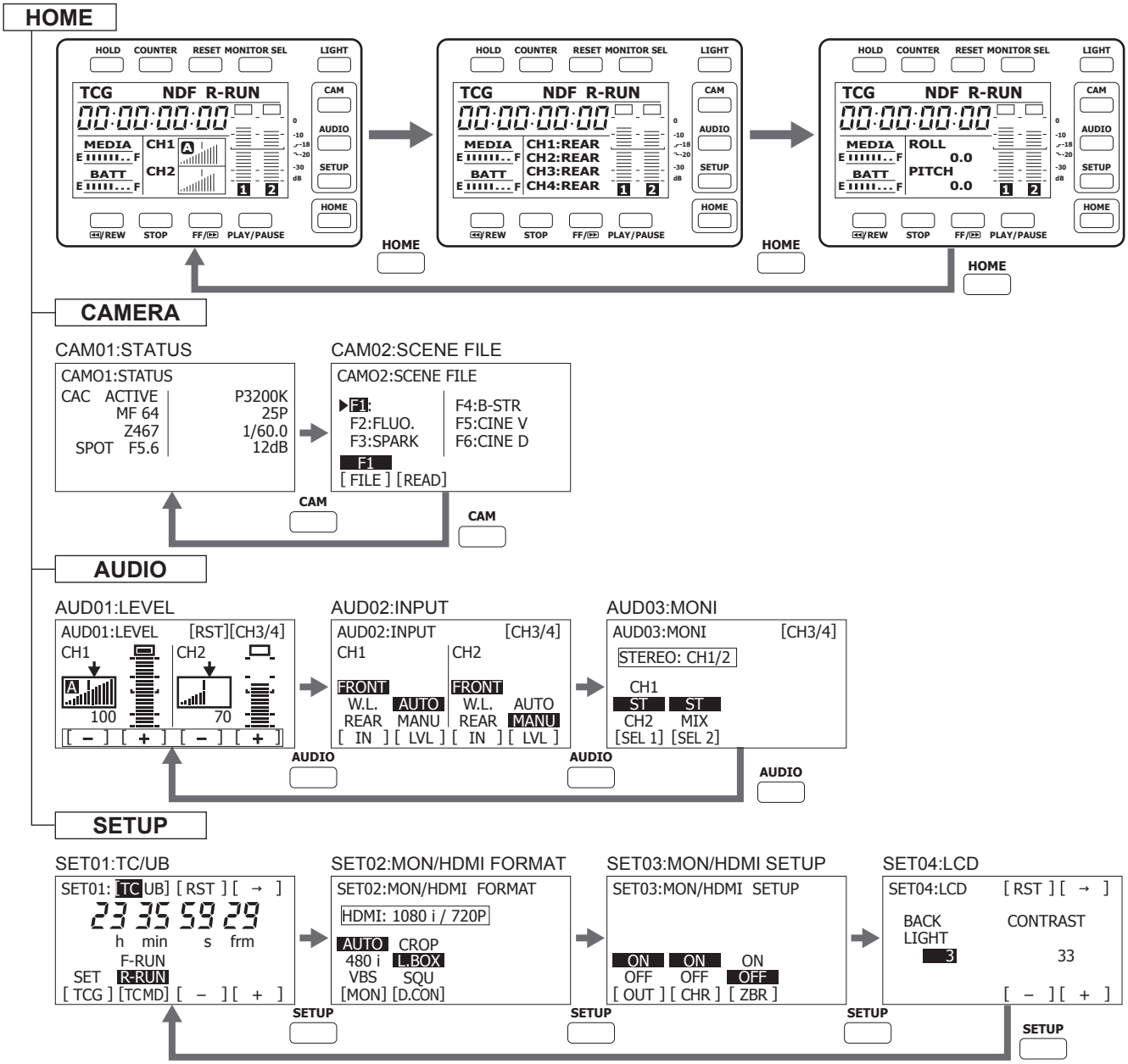
By selecting [INITIALIZE] in the main menu → [OTHER FUNCTIONS] → [USER FILE], you can restore the user file menu setting to its factory setting.

Use the main menu → [OTHER FUNCTIONS] → [MENU INITIALIZE] to restore all of the user files and six scene files to their factory settings.

SmartUI menu structure



SmartUI menu operation overview

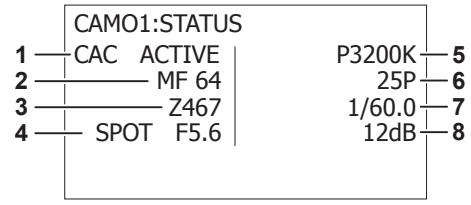


SmartUI menu list

[CAMERA] screen

[CAM01:STATUS]

Displays the camera image related status.



1 Chromatic aberration compensation function
Displays whether the chromatic aberration compensation function is activated.
Displayed only when the lens that supports the chromatic aberration compensation function is attached.
[CAC ACTIVE]

2 Focus control information
Displays the focus control information.
Displayed only when an auto focus compatible lens is attached.
[MF∗∗], [AF∗∗]
One of [99] - [00] is displayed at ∗∗. When the distance to the in-focus subject becomes shorter, the value decreases.

3 Zoom position
Displays the zoom position.
[Z999] - [Z000], [Z∗∗∗mm]

4 Auto iris setting, iris F value
Displays the auto iris settings and the iris F value.
[BACK], [SPOT], [F∗.∗], [OPEN], [CLOSE], [LENS NC]

5 White balance control mode, color temperature
Displays the white balance control mode and the color temperature.
[ATW], [ATW LOCK], [AWB Ach], [AWB Bch], [P3200K], [P5600K], [VAR∗∗∗∗∗K]

6 Frame rate
Displays the frame rate.
[∗∗P], [60i (50i)], [∗∗PN]

7 Shutter value
Displays the shutter value.
[1/∗∗∗], [∗∗∗.∗d]

8 Gain status
Displays the gain status.
[–6dB] - [42dB]

[CAM02:SCENE FILE]

Switches the scene files.

Corresponding button	Setting details and setting value	
<◀◀/REW> button	**[FILE]** Selects the number to switch the scene files.	**[F1]…[F6]** • Factory setting: [F1]
<STOP> button	**[READ]** Changes the operation according to the selected scene file.	

NOTE

- Switching between scene files cannot be done during recording or while the menu is displayed.

[AUDIO] screen

[AUD01:LEVEL]

Configures the audio levels for audio channel 1/2 and audio channel 3/4.

■ **When audio channel 1/2 is selected**

Corresponding button	Setting details and setting value
<◀◀/REW> button	**[–]** Decreases the audio volume value of audio channel 1.
<STOP> button	**[+]** Increases the audio volume value of audio channel 1.
<FF/▶▶> button	**[–]** Decreases the audio volume value of audio channel 2.

Corresponding button	Setting details and setting value
<PLAY/PAUSE> button	**[+]** Increases the audio volume value of audio channel 2.
<RESET> button	**[RST]** Resets the audio volume of audio channel 1/2 to the user-preset value. Press this button for three seconds to save the current audio volume values of audio channel 1/2 as the user-preset values. The user-preset position is indicated as the down arrow ↓ on the audio volume display.
<MONITOR SEL> button	**[CH3/4]** Toggles the audio volume setting screen between audio channel 3 and 4. This operation also switches the audio channels output to the speaker, earphone, and <AUDIO OUT> terminal. The display channels for audio level meter and audio volume on the [HOME] screen also switch.

■ **When audio channel 3/4 is selected**

Corresponding button	Setting details and setting value
<◀◀/REW> button	**[–]** Decreases the audio volume value of audio channel 3.
<STOP> button	**[+]** Increases the audio volume value of audio channel 3.
<FF/▶▶> button	**[–]** Decreases the audio volume value of audio channel 4.
<PLAY/PAUSE> button	**[+]** Increases the audio volume value of audio channel 4.
<RESET> button	**[RST]** Resets the audio volume of audio channel 3/4 to the user-preset value. Press this button for three seconds to save the current audio volume values of audio channel 3/4 as the user-preset values. The user-preset position is indicated as the down arrow ↓ on the audio volume display.
<MONITOR SEL> button	**[CH1/2]** Toggles the audio volume setting screen between audio channel 1 and 2. This operation also switches the audio channels output to the speaker, earphone, and <AUDIO OUT> terminal. The display channels for audio level meter and audio volume on the [HOME] screen also switch.

[AUD02:INPUT]

Selects the audio input signal and sets the recording adjustment method.

■ **When audio channel 1/2 is selected**

Corresponding button	Setting details and setting value	
<◀◀/REW> button	**[IN]** Selects the input signal to be recorded to audio channel 1.	**[FRONT]** Records the microphone input signal connected to the <MIC IN> terminal. **[W.L.]** Records the input signal from the wireless microphone receiver. **[REAR]** Records the audio input signal from the microphone or audio device connected to the <AUDIO IN CH1/3> or <AUDIO IN CH2/4> terminal. • Factory setting: [REAR]
<STOP> button	**[LVL]** Selects the method to adjust the recording level for audio channel 1.	**[AUTO]** Enables automatic adjustment. **[MANU]** Enables manual adjustment. The setting contents are the same as [AUD01:LEVEL]. • Factory setting: [AUTO]
<FF/▶▶> button	**[IN]** Selects the input signal to be recorded to audio channel 2.	The setting contents are the same as audio channel 1.
<PLAY/PAUSE> button	**[LVL]** Selects the method to adjust the recording level for audio channel 2.	The setting contents are the same as audio channel 1.
<MONITOR SEL> button	**[CH3/4]** Toggles the audio input setting screen between CH3/CH4. Setting contents that switch in coordination are the same as the [AUD01:LEVEL] screen.	

■ **When audio channel 3/4 is selected**

Corresponding button	Setting details and setting value	
<◀◀/REW> button	**[IN]** Selects the input signal to be recorded to audio channel 3.	The setting contents are the same as audio channel 1.
<STOP> button	**[LVL]** Selects the method to adjust the recording level for audio channel 3.	The setting contents are the same as audio channel 1.
<FF/▶▶> button	**[IN]** Selects the input signal to be recorded to audio channel 4.	The setting contents are the same as audio channel 1.

Corresponding button	Setting details and setting value	
<PLAY/PAUSE> button	**[LVL]** Selects the method to adjust the recording level for audio channel 4.	The setting contents are the same as audio channel 1.
<MONITOR SEL> button	**[CH1/2]** Toggles the audio input setting screen between CH1/CH2. Setting contents that switch in coordination are the same as the [AUD01:LEVEL] screen.	

[AUD03:MONI]

Selects the audio to be output to the speaker, the <PHONES> terminal, and the <AUDIO OUT> terminal.

■ **When audio channel 1/2 is selected**

Corresponding button	Setting details and setting value	
<◀◀/REW> button	**[SEL1]** Selects the audio to be output to the speaker, the <PHONES> terminal, and the <AUDIO OUT> terminal.	**[CH1]** Monaural output from audio channel 1. **[ST]** Stereo output from audio channel 1 and 2. **[CH2]** Monaural output from audio channel 2. • Factory setting: [ST]
<STOP> button	**[SEL2]** Selects the audio to be output from the speaker, the <PHONES> terminal, and the <AUDIO OUT> terminal when [ST] is selected at [SEL1].	**[ST]** Stereo output from audio channel 1 and 2. **[MIX]** Mixed output from audio channel 1 and 2. • Factory setting: [ST]
<MONITOR SEL> button	**[CH3/4]** Toggles the audio monitor setting screen between CH3/CH4. Setting contents that switch in coordination are the same as the [AUD01:LEVEL] screen.	

■ **When audio channel 3/4 is selected**

Corresponding button	Setting details and setting value	
<◀◀/REW> button	**[SEL1]** Selects the audio to be output to the speaker, the <PHONES> terminal, and the <AUDIO OUT> terminal.	**[CH3]** Monaural output from audio channel 3. **[ST]** Stereo output from audio channel 3 and 4. **[CH4]** Monaural output from audio channel 4. • Factory setting: [ST]
<STOP> button	**[SEL2]** Selects the audio to be output from the speaker, the <PHONES> terminal, and the <AUDIO OUT> terminal when [ST] is selected at [SEL1].	**[ST]** Stereo output from audio channel 3 and 4. **[MIX]** Mixed output from audio channel 3 and 4. • Factory setting: [ST]
<MONITOR SEL> button	**[CH1/2]** Toggles the audio monitor setting screen between CH1/CH2. Setting contents that switch in coordination are the same as the [AUD01:LEVEL] screen.	

[SETUP] screen

[SET01:TC/UB]

Sets the time code or user bits.

On the [HOME] screen, press the <COUNTER> button and select TC to display the time code setting screen and select UB to display the user bits setting screen.

■ **Time code settings screen:**

- To set the time code, press the <◀◀/REW> button to change to the time code setting mode.
- The setting values of each digit of the time code are from **[0] to [9]** (decimal).

Corresponding button	Setting details and setting value	
<◀◀/REW> button	**[TCG]** Starts and exits the time code setting mode. • The time code setting is applied when the setting mode exits.	When the <◀◀/REW> button is pressed, [SET] is displayed in black and white inversion, and the time code setting mode is set. When the <◀◀/REW> button is pressed again, [SET] returns to the normal display, and the time code setting mode exits.

Corresponding button	Setting details and setting value	
<STOP> button	**[TC_MD]** Selects the advance setting mode for the built-in time code generator.	**[F-RUN]** Use this function to advance the time code continuously, regardless of the P2 card recording operation. Set to this position to, for example, set the time code to the current time or externally lock the time code. **[R-RUN]** Use this function to advance the time code only during recording. A time code recorded normally will be continuously recorded. • If a clip is deleted, or if the frame rate is set to [24PN] and the recording continues to a clip other than [24PN], continuous recording may fail. • Factory setting: [F-RUN]
<FF/▶▶> button	**[–]** Decreases the setting value of the selected digit in the time code.	
<PLAY/PAUSE> button	**[+]** Increases the setting value of the selected digit in the time code.	
<COUNTER> button	**[TC/UB]** Switches to the user bits setting screen.	
<RESET> button	**[RST]** Resets all time code setting values to 0.	
<MONITOR SEL> button	**[→]** Moves the selected digit in the time code to the right. When the selected digit moves to the right edge, it moves back to the left edge.	

■ **User bits settings screen:**

- To set the user bits, press the <◀◀/REW> button to change to the user bits setting mode.
- The setting values of each digit of the user bits are from **[0] to [F]** (hexadecimal).

Corresponding button	Setting details and setting value	
<◀◀/REW> button	**[UBG]** Starts and exists the user bits setting mode. • The user bits setting is applied when the setting mode exits.	When the <◀◀/REW> button is pressed, [SET] is displayed in black and white inversion, and the user bits setting mode is set. When the <◀◀/REW> button is pressed again, [SET] returns to the normal display, and the user bits setting mode exits.
<STOP> button	**[TC_MD]** Switches to the advance setting mode for the built-in time code generator. The setting contents are the same as when [TCG] is selected.	
<FF/▶▶> button	**[–]** Decreases the setting value of the selected digit in the user bits.	
<PLAY/PAUSE> button	**[+]** Increases the setting value of the selected digit in the user bits.	
<COUNTER>	**[TC/UB]** Switches to the time code setting screen.	
<RESET> button	**[RST]** Resets all user bits setting values to 0.	
<MONITOR SEL> button	**[→]** Moves to the right of the selected digit in the user bits. When the selected digit moves to the right edge, it moves back to the left edge.	

[SET02:MON/HDMI FORMAT]

Sets the formats and aspects of video output from the <MON OUT> and <HDMI> terminals.

Corresponding button	Setting details and setting value	
<◀◀/REW> button	**[MON]** Sets the signal format type output from the <MON OUT> terminal. With this setting, the signal format to be output from the <HDMI> terminal is also switched.	**[AUTO] (HDMI: [1080i/720P])** Displayed only in the HD mode. Outputs the SDI signal according to main menu → [SYSTEM MODE] → [LINE&FREQ] setting. • The 1080i or 720P signal is also output from the <HDMI> terminal according to the [LINE&FREQ] setting. • For [1080-23.98PsF], the signal pulled down to 1080/59.94i is output from both <MON OUT> and <HDMI> terminals. **[480i] or [576i] (HDMI: [480P] or [576P])** Displayed only in the HD mode. The SDI signal of 480i or 576i is output. • The 480P or 576P signal is output from the <HDMI> terminal. **[SDI] (HDMI: [480P] or [576P])** Displayed only in the SD mode. Outputs the SDI signal for 480i or 576i according to main menu → [SYSTEM MODE] → [LINE&FREQ] setting. • The 480P or 576P signal is output from the <HDMI> terminal. **[VBS] (HDMI: [480P] or [576P])** A composite video signal is output. • The 480P or 576P signal is output from the <HDMI> terminal. • Factory setting: [AUTO]

Corresponding button	Setting details and setting value	
<STOP> button	**[D.CON]** Sets the aspect for the down-conversion output signal in the HD mode. This item is not displayed in the SD mode.	**[CROP]** Side-crop mode (Crops the left and right edges.) **[L.BOX]** Letterbox mode (Adds black bands at the top and bottom of the image.) **[SQU]** Squeeze mode (Squeezes images horizontally.) • Factory setting: [L.BOX]

[SET03:MON/HDMI SETUP]

Sets the output setting of the <MON OUT> terminal and <HDMI> terminal.

Corresponding button	Setting details and setting value	
<◀◀/REW> button	**[OUT]** Sets whether to output from the <MON OUT> terminal and the <HDMI> terminal.	**[ON], [OFF]** • Factory setting: [ON]
	This setting is disabled and signals are always output when the remote control unit (AJ-RC10G), the extension control unit (AG-EC4G), or the remote operation panel (AK-HRP200G) is connected.	
<STOP> button	**[CHR]** Specifies whether characters are superimposed over the output from <MON OUT>, <HDMI>, and <REMOTE> terminals.	**[ON], [OFF]** • Factory setting: [ON]
	This setting is disabled when the remote control unit (AJ-RC10G), the extension control unit (AG-EC4G), or the remote operation panel (AK-HRP200G) is connected, and the setting on the remote control unit or the extension control unit will be applied.	
<FF/▶▶> button	**[ZBR]** Specifies whether the zebra pattern is superimposed over the output from <MON OUT>, <HDMI>, and <REMOTE> terminals. • This setting is not available when the setting menu on the viewfinder is open.	**[ON], [OFF]** • Factory setting: [OFF]

[SET04:LCD]

Sets the display settings of SmartUI.

Corresponding button	Setting details and setting value	
<FF/▶▶> button	**[–]** Decreases the setting value of the selected item. Press and hold this button to continuously decrease the setting value.	
<PLAY/PAUSE> button	**[+]** Increases the setting value of the selected item. Press and hold this button to continuously increase the setting value.	
<RESET> button	**[RST]** Resets the setting value of the selected item to its factory setting value.	
<MONITOR SEL> button	**[→]** Moves the item selection to the right. When the item selection moves to the right edge, it moves back to the left edge.	
	[BACK LIGHT] Sets the luminance of SmartUI.	**[1]…[5]** • Factory setting: [3]
	[CONTRAST] Sets the contrast of SmartUI. • The SmartUI screen may be hidden depending on the setting value. In such a case, press the <HOME> to return to the [HOME] screen and hold down the <LIGHT> and <RESET> buttons. The setting value of [CONTRAST] is reset to the factory setting.	**[0]…[63]** • Factory setting: [33]

Chapter 8 Display

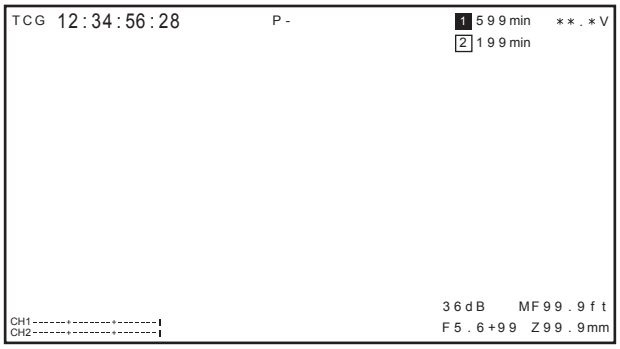
Details displayed on the viewfinder are described.

Screen status display

The viewfinder displays not only the video, but also the messages that indicate the camera settings and operation status, a center marker, safety zone marker, zebra patterns, and other information.

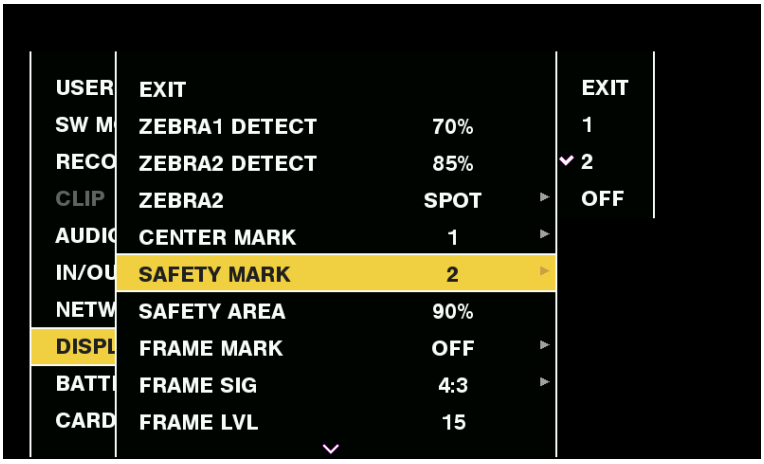
Configuration of status display on screen

The screen displayed in normal status is displayed as shown below.

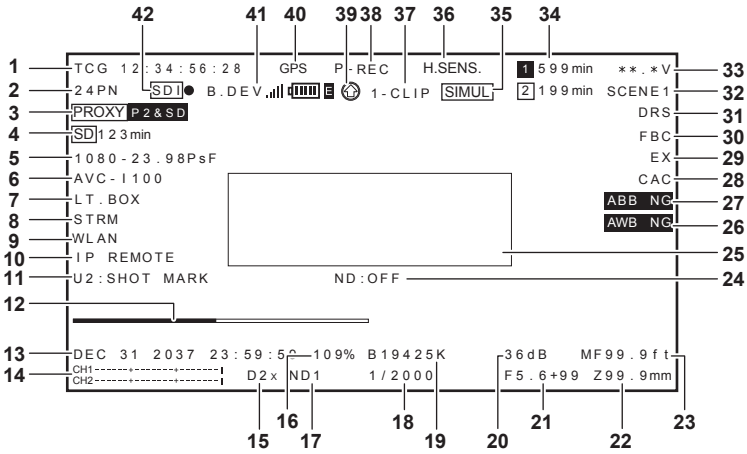


Selecting display items on screen

To select display items on the viewfinder, switch [ON]/[OFF] or the type of the respective item in the main menu → [DISPLAY SETUP].
For details, refer to “Setting menu basic operations” (page 125).



Screen display



1 Time code display

Every press of the <COUNTER> button switches to the next data (or no display).

- Counter: Counter value
- [CLIP]: Clip counter value (recording mode only)
  Clip counter value for each recording
  Displayed when [CLIP] is set in the main menu → [DISPLAY SETUP] → [REC COUNTER].
- [TCG]: Time code value
  When operating in drop frame mode, the “:” (colon) mark between the second and frame changes to “.” (dot).
  During playback, [TCR] is displayed.

- [UBG]: User bits value
  During playback, [UBR] is displayed.
- [VUBG]: User bits value of VITC
  During playback, [VUBR] is displayed.

NOTE

- Display status of the counter value is held even when the power is turned off.
- For [TCG] and [UBG], if they are locked to the input signal from the <TC IN/OUT> terminal, [TCG] and [UBG] are displayed in white letters with outlines.
- The time code during playback with 24PN is displayed converted into 30 frames.

2 Frame rate display
Shows the number of recording/playback frames.

3 Proxy information display
Displays the proxy recording information.
- [PROXY P2]/[PROXY P2&SD]: Displayed when proxy recording is started.
- [PROXY ERR]: Displayed when there is an error in proxy recording.

4 SD memory card status display
- [WP]: Write protected
- [END]: No remaining free space
- [WR ERR]: Write error
- [SD ∗∗∗min]: The remaining free space is displayed when proxy is recorded to an SD memory card. (Displayed only in the regular mode check.)
  Flashing when the remaining capacity is one minute or less. [–––min] is displayed when there is no SD memory card.

5 System mode display
Displays the mode in which the camera is operating.
- [1080-59.94i/P]
- [1080-59.94i]
- [1080-50i/P]
- [1080-50i]
- [1080-23.98PsF]
- [720-59.94P]
- [720-50P]
- [480-59.94i]
- [576-50i]

6 Recording format display
Displays the recording method.
- [AVC-I100]
- [AVC-I50]
- [AVC-G50]
- [AVC-G25]
- [AVC-G12]
- [DVCPRO HD]
- [DVCPRO50]
- [DVCPRO]
- [DV]

7 Letterbox recording display
Displayed while letterbox recording is performed when the recording format is 480i/576i and [LETTER BOX] is set in the main menu → [SYSTEM MODE] → [ASPECT CONV].

8 Streaming mode status display
Displays the streaming status.
Displayed only when the <DISP/MODE CHK> switch is pushed towards the <CHK> side.
- [STREAM]: When the streaming mode is set and enabled
- [STRM ERR]: When the streaming mode is set but cannot operate due to other setting condition
- No display: When the streaming mode is not set

9 Network mode status display
Displays the status of the network function.
Displayed only when the <DISP/MODE CHK> switch is pushed towards the <CHK> side.
- [WLAN]: When the wireless LAN is connected (link state)
- [WLAN !]: When the wireless LAN is not connected (unlinked state)
- [WLAN ERR]: When there is a problem with the wireless LAN connection
- [LAN]: When the wired LAN is connected (link state)
- [LAN !]: When the wired LAN is not connected (unlinked state), or when there is a problem
- [4G/LTE]: During 4G/LTE connection
- [4G/LTE !]: When 4G/LTE connection is set but not connected
- [4G/LTE ERR]: When 4G/LTE connection is set but 4G/LTE USB modem is not connected or not operating correctly
- No display: When the network function is disabled

10 Remote control display in an IP connection

The remote control status in an IP connection is displayed when main menu → [NETWORK SETUP] → [NETWORK FUNC] → [IP REMOTE] is set to [ENABLE].

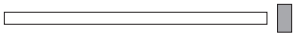
- [IP REMOTE] (flashing): Displayed during connection waiting status in an IP connection.
- [IP REMOTE] (illuminated): Displayed when remote control is possible in an IP connection.

11 USER button information display

When the USER button is pressed, “USER button name: assigned function name” is displayed for three seconds. The USER button name is indicated by [UM], [U1], [U2], or [RET].

12 Focus bar display

Displays the following items in the bottom left of the viewfinder. The high-frequency component of the video is displayed in a numerical value.



- White bar: Focus bar display
- Green line: Peak display

13 Date and time display

Displayed in the order of “mmm dd yyyy hh:mm:ss”.

The display/hide status differ depending on the settings in the main menu → [DISPLAY SETUP] → [DATE/TIME].

- mmm: Month (JAN (January), FEB (February), MAR (March), APR (April), MAY (May), JUN (June), JUL (July), AUG (August), SEP (September), OCT (October), NOV (November), DEC (December))
- dd: Date
- yyyy: Year (2000 to 2037)
- hh: Hour
- mm: Minute
- ss: Second

14 Audio level meter display

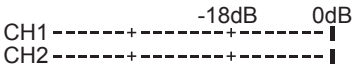
Switches between level meter display of audio output channels 1/2 and 3/4 while holding down the USER button where [LEVEL METER] is assigned.

The peak display on right edge is displayed in red during peak over.

The standard level display will switch as follows depending on the main menu → [AUDIO SETUP] → [RECORDING CH SETTING] → [HEADROOM] setting.

- When set to [20dB]

- When set to [18dB]



15 Digital zoom display

Displays the digital zoom ratio.

- [D2×]: two times
- [D4x]: four times

16 Y GET brightness display

In the Y GET mode, the image level in the frame displayed near the center of the screen is displayed as 0% to 109%.

17 ND filter display

Displays the selected ND filter.

When [ND–] is displayed, the <ND FILTER> dial is shifted to position out of <1> to <4>. Check the position of the <ND FILTER> dial.

18 Shutter speed display

Displays the shutter speed. When synchro scan is performed, the display shows the content set in the main menu → [SCENE FILE] → [SYNC SCAN TYPE] (time (minutes) or open angle image).

19 <WHITE BAL> switch position display

Displays the position currently selected. Also, the white balance operation is indicated when the automatic white balance is preset. In auto tracking white balance (white balance with automatic tracking) mode, [ATW] is indicated, and when auto tracking white balance mode is locked, [LOCK] is indicated.

20 Gain display

Displays the gain value of the image amplifier configured.

[AGC] is displayed when auto gain control is active.

21 Iris display

Displays the F value.

[NC] is displayed when a lens connector is not connected.

22 Zoom position display

Displays the zoom position from [Z000] (maximum wide angle) to [Z999] (maximum zoom). Note, however, that this item is not displayed in the case of lenses without a zoom position return even if it is set to be displayed.

When a serial lens is connected, the display unit can be changed in main menu → [DISPLAY SETUP] → [ZOOM/FOCUS].

23 Focus control information display

Displays the focus control information from [99] to [00]. This item is not displayed, when other than a serial lens is connected or a lens that has no return of focus control information is connected.

When a serial lens is connected, the display unit can be changed in main menu → [DISPLAY SETUP] → [ZOOM/FOCUS].

24 Recommended ND filter display
Displays the ND filter recommended for the current shooting conditions.

25 Camera warning, notification display area (pages 165, 206)

26 Automatic white balance abnormal display
Displayed when the automatic white balance is abnormal during mode check.

27 Automatic black balance abnormal display
Displayed when the automatic black balance is abnormal during mode check.

28 Chromatic aberration compensation function display
Displayed when the chromatic aberration compensation function is active.

29 Lens extender display
Displayed when the lens extender is used.

30 Flash band compensation function display
Displayed when the flash band compensation function is activated.

31 Dynamic range stretcher function display
Displayed when the dynamic range stretcher function is working.

32 Scene file name display
Indicates the scene file name [F1:] to [F6:].

33 Battery charge level indicator
- [∗∗.∗V]: Displays the battery charge level in 0.1 V unit.
- [∗∗∗%]: Displays the charge level of batteries with charge level information in %.
- [EMP]: Displayed when there is no charge level on batteries with charge level information or the level is at the near end setting value or below.
- [MAX]: Displayed when batteries with charge level information are fully charged.

34 P2 card remaining free space
- 1: This is the slot No. This is displayed in black and white inversion when the slot No. is recording destination. It flashes while the card is being recognized.
- [∗∗∗min]: Displays the remaining space on the media in each slot. During a near end, it flashes. 0 to 599 indicates minutes, while 600 minutes or longer indicates hours.
- No display: Not displayed when a card is not inserted.
- [END]: Displayed when there is no space remaining on each card.
- [WP]: Displayed when the P2 card is write-protected.
- [ERR]: Displayed in case of format errors or authentication errors.
- [LOOP ∗∗∗min]: Displayed when the loop recording mode is set. [LOOP] flashes when loop recording is not possible, for example, when there is no more space remaining on the P2 card. During the mode check, the second line displays the standard recording time of loop recording.

35 Simultaneous recording mode display
- [SIMUL]: Displayed when the simultaneous recording is set. When the simultaneous recording cannot be performed, [SIMUL] indication is displayed with a diagonal line.

36 High-sensitivity mode display
Displayed when [HIGH SENS.] is set in the main menu → [SYSTEM MODE] → [SHOOTING MODE].

37 One clip recording mode status display
- [1-CLIP]: The status where a new clip is to be recorded in one-clip recording
- [1∗CLIP]: The status where recording can be performed by combining to the previous clip in one-clip recording

38 Recording/playback operation status display
- [REC]*1: Recording
- No display: Recording standby
- [❚❚]: Playback pause
- [▶]: Playback
- [❚❚▶] ([◀❚❚]): Frame-by-frame playback (frame-by-frame rewind)
- [▶▶] ([◀◀]): Fast-forwarding/fast-forward playback (fast-reversing/fast-reverse playback)
- [CLIP❚❚▶] ([CLIP◀❚❚]): Clip forwarding (clip rewinding), cueing up by clips
- [CLIP&T❚❚▶] ([CLIP&T◀❚❚]): Cueing up (rewinding) by clip and text memo (when [CLIP&TEXT MEMO] is set in the main menu → [OTHER FUNCTIONS] → [SEEK POS SEL])
- [START]*1: Displayed when recording of a new clip is started in one-clip recording.
- [END]*1: Displayed when combining of clips is ended in one-clip recording.
- [L-]*2: Loop recording
- [I-]*2: Interval recording, one-shot recording
- [P-]*2: Pre-recording

*1 Even if the display is set to [OFF], only [REC], [START], and [END] are displayed. Also, when pre-recording, loop recording, interval recording, or one-shot recording is set, it is displayed.

*2 Displayed when [INTERVAL], [ONE SHOT], or [LOOP] is set in the main menu → [RECORDING SETUP] → [RECORDING], or when [ON] is set in the main menu → [RECORDING SETUP] → [PRE REC].

39 Rec during upload status and streaming distribution status display
Displays the status of rec during upload.
- [⚙]: Displayed when the rec during upload function is enabled.
  The display will blink when recording is started immediately after the power is turned on or the P2 card is inserted, and the upload will not be performed until the recording is stopped.
- [⚙]: Displayed during upload.

- [⦸]: Displayed from when transfer error occurred during upload until when the next upload starts.

Displays the streaming status.

- [(( ))] (blinking): Blinks while the camera is being connected to a device which will receive the streaming video.
- [(( ))] (illuminated): Displayed when the camera is connected to a device receiving the streaming video and the camera is transmitting streaming video.

  The display turns off when a connection could not be established properly.

NOTE

- Depending on the network status, the [(( ))] display may not be able to follow during actual operation.

40 GPS display

Displays when the main menu → [OTHER FUNCTIONS] → [GPS] is set to [EXTERNAL].

- The strength of signal reception is not displayed.

41 4G/LTE connection status and the bonding device status display

Displays the 4G/LTE connection status. Displays at the 4G/LTE connection. Displays the strength of the signal reception in six levels. Displays the radio wave strength with the number of vertical bars. It is not displayed when the setting of 4G/LTE is disabled.

- [4G/LTE ▂▄▆▇]: During 4G/LTE connection
- [4G/LTE ▂▄▆▇ !]: When not connected with4G/LTE
- [4G/LTE ▂▄▆▇ E]: When there is a problem with the 4G/LTE connection

Displays the bonding device status. Displays the device status received from the bonding device. Displays the strength of the signal reception of the bonding device in six levels, and remaining battery in six levels. [E] is displayed when there is an error in the bonding device.

NOTE

- Depending on the USB modem that is supported, vertical bars that indicate the signal strength may not be displayed.
- The device status may not be acquired depending on the connected bonding device.
- For details on bonding device that the camera can acquire the device status, visit the support desk at the following website: http://pro-av.panasonic.net/

42 HD SDI REMOTE recording status display

Displays the control status of whether recording has started or stopped for an external device which is connected to the <SDI OUT/IN (OP)> terminal.

When [ON] is set in the main menu → [IN/OUT SEL] → [HD SDI REMOTE], the status will always be displayed regardless of the setting in the main menu → [DISPLAY SETUP].

- [SDI●]: Status where the recording is being instructed for an external device
- [SDI❚❚]: Status where recording stop is being instructed for an external device

Camera status display

These are indicated in the information display area in the center.

[ABB]: Displayed while automatic black balance operation is active.

[ATW MODE]: Displayed when the <AUTO W/B BAL> switch is pushed to the <AWB> side while auto tracking white balance is active. This is also displayed when the <WHITE BAL> switch is turned to <B> if [ATW] is allocated.

[AWB]: Displayed while automatic white balance operation is active.

[WHITE:PRE ∗∗∗∗K]: Displays the set color temperature when the <WHITE BAL> switch is switched.

[AWB PRESET ∗∗∗∗K]: Displayed when the <WHITE BAL> was set to <PRST> in an attempt to execute automatic white balancing.

[BACK LIGHT]: Displayed when pressing the USER button to which [BACKLIGHT] is allocated for iris control, and switching the status.

[GAIN∗∗dB]: Displayed when gain is switched.

[SHUTTER 1/∗∗∗∗]/[SHUTTER OFF]: Displayed when you switch the shutter speed.

[SPOT LIGHT]: Displayed when pressing the USER button to which [SPOTLIGHT] is allocated for iris control, and switching the status.

Checking and displaying the shooting status

Also, the mode check [STATUS] screen is displayed when the <DISP/MODE CHK> switch is pushed towards the <CHK> side. During mode check, almost all items are displayed including usually hidden items so that the shooting status can be checked. For details on the mode check, refer to “Mode check display” (page 166).

The list shows the display/hide status of each item in the [STATUS] screen. The display/hide status differ depending on the <DISP/MODE CHK> switch settings and settings in the main menu → [DISPLAY SETUP] → [OTHER DISPLAY].

- “✓” indicates displaying, and “—” indicates hiding.
- [ON]/[OFF] for each item can be selected in the main menu → [DISPLAY SETUP] → [DISPLAY SETTING].

No	Item	Shooting	Playback	<DISP/ MODE CHK>: <CHK>	<DISP/MODE CHK>: <OFF>	<DISP/MODE CHK>: <ON>		
						[OTHER DISPLAY]		
						[ALL]	[PARTIAL]	[USER]
1	Time code display	✓	✓	—*1	—*1	—*1	—*1	—*1
2	Frame rate display	✓	✓	✓	—	✓	✓	✓
3	Proxy information display	✓	—	✓	—*2	—*1	—*1	✓
4	SD memory card status display	✓	—	✓	—*2	✓	✓	✓
5	System mode display	✓	✓	✓	—	✓	—	✓
6	Recording format display	✓	✓	✓	—	✓	—	✓
7	Letterbox recording display	✓	—	✓	—	✓	—	✓
8	Streaming mode status display	✓	—	✓	—	—	—	—

No	Item	Shooting	Playback	<DISP/MODE CHK>: <CHK>	<DISP/MODE CHK>: <OFF>	<DISP/MODE CHK>: <ON>		
						[OTHER DISPLAY]		
						[ALL]	[PARTIAL]	[USER]
9	Network mode status display	✓	—	✓	—	—	—	—
10	Remote control display in an IP connection	✓	—	✓	—	—*1	—*1	—*1
11	USER button information display	✓	—	—*1	—*1	—*1	—*1	—*1
12	Focus bar display	✓	—	—*1	—*1	—*1	—*1	—*1
13	Date and time display	✓	—	✓	—	—*1	—*1	—*1
14	Audio level meter display	✓	✓	✓	—	—*1	—*1	—*1
15	Digital zoom display	✓	—	✓	—	✓	✓	✓
16	Y GET brightness display	✓	—	✓	—	✓	✓	✓
17	ND filter display	✓	—	✓	—	✓	—	✓
18	Shutter speed display	✓	—	✓	—	✓	✓	✓
19	<WHITE BAL> switch position display	✓	—	✓	—	✓	✓	✓
20	Gain display	✓	—	✓	—	✓	✓	✓
21	Iris display	✓	—	✓	—	✓	✓	✓
22	Zoom position display	✓	—	✓	—	—*1	—*1	—*1
23	Focus control information display	✓	—	✓	—	—*1	—*1	—*1
24	Recommended ND filter display	✓	—	✓	—	—*1	—*1	—*1
25	Camera warning, notification display area	✓	✓	✓	✓	—*1	—*1	—*1
26	Automatic white balance abnormal display	✓	—	✓	—	—	—	—
27	Automatic black balance abnormal display	✓	—	✓	—	—	—	—
28	Chromatic aberration compensation function display	✓	—	✓	—	✓	✓	✓
29	Lens extender display	✓	—	✓	—	✓	✓	✓
30	Flash band compensation function display	✓	—	✓	—	✓	✓	✓
31	Dynamic range stretcher function display	✓	—	✓	—	✓	✓	✓
32	Scene file name display	✓	—	✓	—	✓	—	✓
33	Battery charge level indicator	✓	✓	✓	—*2	—*1	—*1	—*1
34	P2 card remaining free space	✓	✓	✓	—*2	—*1	—*1	—*1
35	Simultaneous recording mode display	✓	—	✓	—	✓	—	✓
36	High-sensitivity mode display	✓	—	✓	—	✓	✓	✓
37	One clip recording mode status display	✓	—	✓	—	✓	✓	✓
38	Recording/playback operation status display	✓	✓	✓	—*3	✓	✓	✓
39	Rec during upload status and streaming distribution status display	✓	✓	—	—	—*1	—*1	—*1
40	GPS display	✓	—	✓	—	✓	—	✓
41	4G/LTE connection status and the bonding device status display	✓*4	—	✓*4	—	✓*4	✓*4	✓*4
42	HD SDI REMOTE recording status display	✓*4	—	✓*4	—	✓*4	✓*4	✓*4

*1 May be displayed depending on other settings.
*2 Displayed when the remaining capacity becomes smaller.
*3 Displayed during shooting.
*4 Always displayed when 4G/LTE connection is set, bonding device is connected, and [HD SDI REMOTE] setting is set.

Mode check display

The camera settings and status can be displayed on the viewfinder.

Each time the <DISP/MODE CHK> switch on the camera is pushed towards the <CHK> side, the five screens are switched.

[STATUS] screen display → [FUNCTION] screen display → [AUDIO] screen display → [USER SW] screen display → [CAC INFO] screen display → no display

Each screen is displayed for approximately five seconds. Pushing the <DISP/MODE CHK> switch towards the <CHK> side while the screen is displayed moves to the next screen.

[FUNCTION] screen

Displays the video output status and information of the recording media.

[SDI OUT]	—	Displays the status of the signal output from the <SDI OUT/IN (OP)> terminal.
	[TYPE]	Displays the format of the signal output from the <SDI OUT/IN (OP)> terminal by [HD-SDI]/[SD-SDI].
	[CHAR]	Displays the superimposition status of characters selected in the main menu → [IN/OUT SEL] → [SDI OUT CHAR] by [ON]/[OFF].

[P2CARD STATUS]	—	Displays the status of the P2 card inserted in the card slot, remaining capacity, and total used capacity. The statuses of cards to be displayed are as follows: [ACTIVE]/[ACCESSING]/[INFO READING]/[FULL]/[PROTECTED]/[NOT SUPPORTED]/[FORMAT ERROR]/[AUTH NG]/[REC IMPOSSIBLE]/[NO CARD] For details, refer to “P2 card access LEDs and status of P2 cards” (page 47).
	[TOTAL P2/mP2]	Displays the remaining capacity/total capacity of slots 1 and 2 altogether.
	[SLOT1]	Displays the status of the P2 card in slot 1 and remaining capacity/total capacity.
	[SLOT2]	Displays the status of the P2 card in slot 2 and remaining capacity/total capacity.
[PROXY]	[MEDIA]	Displays the media selection status for proxy recording. [P2]/[P2&SD]/[OFF]
	[MODE]	Displays the setting status for proxy recording mode. [AVC-G6 2CH MOV]/[SHQ 2CH MOV]/[HQ 2CH MOV]/[LOW 2CH MOV]
	[PROXY ERROR]	Displays the operation error on the proxy module.
[NETWORK]	[NETWORK]	Displays the network to be used and its status.

[AUDIO] screen

Displays audio settings and the selection status of each recording channel.

[AUDIO]	[SAMPLE RES]	Displays the audio recording bits.
[A.IN]	[CH1/2/3/4]	Displays the input status of each channel. [FRONT] (front), [REAR] (rear), [W.L.] (wireless)
[LEVEL]	[CH1/2/3/4]	Displays the recording level adjustment method currently selected on each channel. • [MANU]: Displayed when manual adjustment is set. • [AUTO]: Displayed when automatic adjustment is set. Settings are performed in the SmartUI [AUD01:LEVEL] screen.
[F.VR]	[CH1/2/3/4]	Displays by [ON]/[OFF] whether the <F.AUDIO LEVEL> dial is enabled on the channel to which [VR] (manual adjustment by adjustment dial) is displayed in [LEVEL].
[LIMITER]	[CH1/2/3/4]	Displays the limiter settings of each channel.
[LOWCUT]	[CH1/2/3/4]	Displays the lowcut filter status of each channel.
[METER]	[CH1/2/3/4]	Displays the recording level of each channel.

[USER SW] screen

Displays the assignment status of each USER button. For details, refer to “Assigning functions to USER buttons” (page 64).

[OTHER ASSIGN]	[GAIN L]	Displays the gain value assigned to <L> of the <GAIN> switch.
	[GAIN M]	Displays the gain value assigned to <M> of the <GAIN> switch.
	[GAIN H]	Displays the gain value assigned to <H> of the <GAIN> switch.
	[S.GAIN]	Enumerates and displays the gain value assigned as super gain.
	[WHITE BAL A]	Displays the color temperature assigned to <A> of the <WHITE BAL> switch.
	[WHITE BAL B]	Displays the color temperature assigned to <B> of the <WHITE BAL> switch.
	[WHITE BAL PRE]	Displays the color temperature assigned to <PRST> of the <WHITE BAL> switch.
[USER SW]	[USER M]	Displays the assignment to the <USER MAIN> button.
	[USER 1]	Displays the assignment to the <USER1> button.
	[USER 2]	Displays the assignment to the <USER2> button.
	[RET SW]	Displays the assignment to the <RET> button on the lens.

[CAC INFO] screen

Display the operation status or information of CAC.

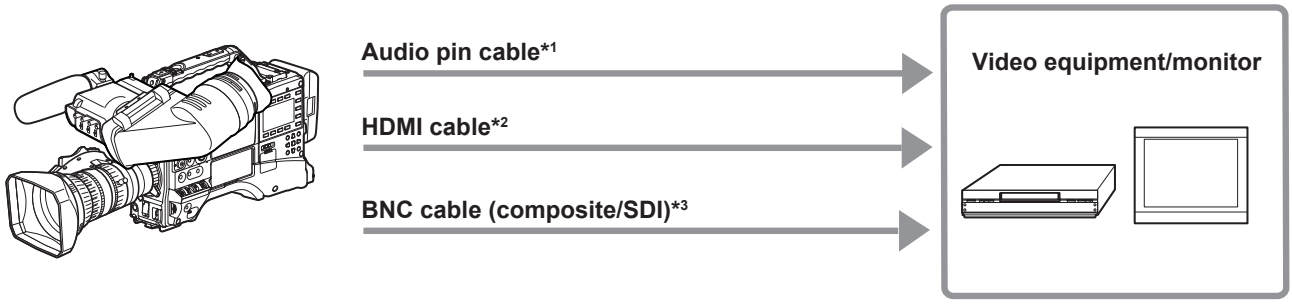
[CAC CONT]	Displays the operation status of CAC. • [ON]: [ON] has been set in the main menu → [MAINTENANCE] → [CAC ADJ.] → [CAC CONTROL] and CAC is active. • [STOP]: [ON] has been set in the main menu → [MAINTENANCE] → [CAC ADJ.] → [CAC CONTROL], however, CAC operation stops under certain data or lens conditions. • [OFF]: [OFF] has been set in the main menu → [MAINTENANCE] → [CAC ADJ.] → [CAC CONTROL] and CAC is not active.
[CAC MODE]	Displays the operation mode of CAC. • [AUTO]: The CAC file is automatically selected.
[CONNECT LENS TYPE]	Displays the lens ID of the currently connected digital lens.
[SELECT FILE TITLE]	Displays the title and the file version of the CAC file currently used in the operation. The CAC file can be set in the main menu → [MAINTENANCE] → [CAC ADJ.].
[CAC WARNING]	Displays a warning when operation of CAC has stopped. • [CAC LENS DATA INVALID]: This is displayed, for example, when the response data from the lens is not supported. • [LENS INIT. NOT COMPLETED]: This is displayed, for example, when initialization of the lens cannot complete. • [CAC FILE DATA NOT FOUND]: Displayed when the chromatic aberration compensation function is set to [ON] and the chromatic aberration compensation data matching the connected lens.

Chapter 9 Connecting to External Devices

This chapter describes the external devices that can be connected to the camera.

Connecting to video equipment/monitor

Video equipment or monitor can be connected as shown in the following figure.



*1 Cables are optionally available. They are not supplied with the camera.

*2 Prepare the HDMI cable (optional) with double or more shielded. For the HDMI cable, using Panasonic HDMI cable is recommended.

*3 For the BNC cable (optional) connected to the <SDI OUT/IN (OP)> and <MON OUT> terminals, prepare a double-shielded cable equivalent to 5C-FB.

Connection through the <USB2.0> terminal

Connecting to a computer in the USB device mode

By connecting the camera to a computer via USB 2.0, the P2 card inserted in the camera can be used as mass storage.

Connecting to a computer

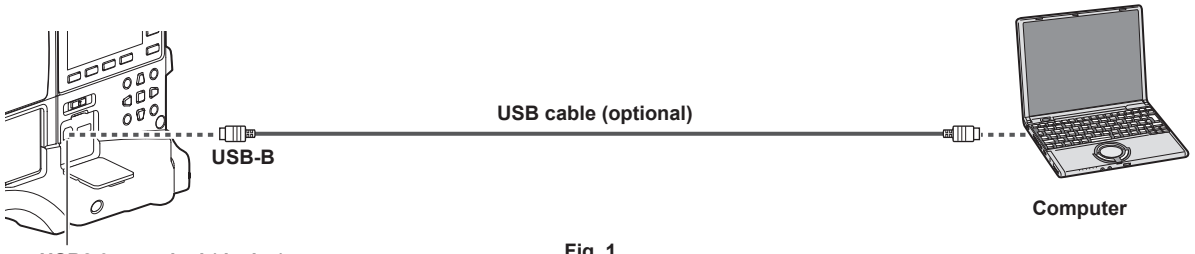


Fig. 1

1 Connect the USB cable to the <USB2.0> terminal (device). (Fig. 1)

2 Set [DEVICE] in the main menu → [NETWORK SETUP] → [USB MODE SELECT].

For details, refer to “Setting menu basic operations” (page 125).

3 Set [ON] in the main menu → [NETWORK SETUP] → [USB MODE].

During USB connection, [USB DEVICE CONNECTED] is displayed in the center of the viewfinder.
If the USB connection is being moved or it is not connected properly, [USB DEVICE CONNECTING...] is displayed.

4 Exit the USB device mode.

There are three methods:

- Turn the <POWER> switch of the camera to <OFF>.
- Press the <EXIT> button.
  In USB device mode, [Push EXIT to Return to CAMERA MODE] is displayed at the bottom of the viewfinder
- Press the USER button to which [USB MODE] has been assigned.

Returns to camera shooting status in approx. five seconds when the USB device mode ends.

NOTE

- The USB 2.0 cable is not supplied with the camera. Prepare a commercial USB 2.0 cable (double-shielded for noise suppression).
- Before making USB connection for the first time, install P2 Viewer Plus software to your computer.
- Download the USB driver from the website and install it into your computer. For installation procedure of the driver, refer to the installation manual on the website.
  For the latest information on the driver, visit the following website.
  http://pro-av.panasonic.net/
- The camera supports only USB 2.0. Ensure your computer supports USB 2.0.
- When connecting the camera to a computer via USB, ensure that no other device is connected to the computer via USB.
- When connecting the camera via USB, do not eject the P2 card.
- When USB is connected, the P2 card access LED turns off when not accessed.
- When the camera is operating in the USB device mode, no camera shooting, recording/playback operation or clip thumbnail operation is allowed.
- When the camera is operating in the USB device mode, the P2 card remaining capacity and status are not displayed. Also, video/audio cannot be output or displayed.

Connecting to external devices in USB host mode

You can save data on cards by connecting a storage device such as hard disk drive or solid-state drive that can be connected via USB 2.0 to the <USB2.0> terminal (host).

Switching to the USB host mode

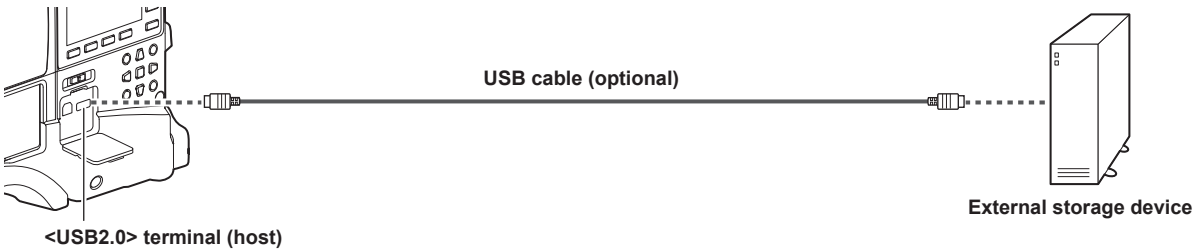


Fig. 1

1 Connect the storage device to the <USB2.0> terminal (host). (Fig. 1)

2 Set [STORAGE] in the main menu → [NETWORK SETUP] → [USB MODE SELECT].

For details, refer to “Setting menu basic operations” (page 125).

3 Set [ON] in the main menu → [NETWORK SETUP] → [USB MODE].

- The camera is switched to the USB host mode.
- During USB host mode, [USB STORAGE CONNECTED] is displayed in the center of the viewfinder. If the USB connection is being moved or the hard disk drive is not connected properly, [USB STORAGE CONNECTING...] is displayed.

4 Press the <THUMBNAIL> button.

- The thumbnail screen is displayed.
- Ensure that USB (white) is displayed at the top right of the screen.
- If a storage device is connected, the icon that indicates storage device status at the top right illuminates. However, a red mark indicates that the device cannot be used.

5 Exit the USB host mode.

There are two methods:

- Turn the <POWER> switch of the camera to <OFF>.
- With the thumbnail screen closed, set [OFF] in the main menu → [NETWORK SETUP] → [USB MODE].
- Press the USER button to which [USB MODE] has been assigned. Note that this is disabled when a menu or thumbnail is open.

NOTE

- The USB 2.0 cable is not supplied with the camera. Prepare a commercially available USB 2.0 cable (double-shielded for noise suppression).
- In USB host mode, a P2 card can be played back. Camera image and external input cannot be recorded. Clips written to the hard disk drive cannot be played back on the camera.
- A storage device cannot be connected to the <USB2.0> terminal (sub-host) (page 20).
- While connecting a storage device, use the fully charged battery or connect an external DC power supply to the camera to avoid problems in copying or formatting operations.
- The <USB2.0> terminal also supports USB bus power (5 V, 0.5 A). However, there are certain devices that cannot run depending on the storage device used. In such cases, add a separate power supply to the storage device.
- Some storage devices may not function properly depending on the storage device and cable used.
- Do not connect multiple storage devices using a hub even if the storage devices are turned off. Do not connect other devices together with your storage device using a hub.
- During a format or copy operation, do not unplug the cable, eject the target P2 card, or turn off the camera or the storage device. Rebooting the camera and the storage device is required.
- A storage device with the SATA (Serial ATA) or PATA (Parallel ATA) interface connected using a USB conversion cable may not be recognized.
- Do not connect or disconnect the cable during playback on the camera. Playback may not be performed properly.

Storage device types and available functions

The available functions differ depending on the storage device you will use. The storage device type is displayed after [PARTITION] on the left side of the storage device explorer screen.

For details, refer to “Storage device information display (explorer screen)” (page 174).

■ Storage device type

Storage device type	Features
[TYPE S]	A special format to read/write data with high speed by card.
[P2STORE]	Indicates P2 STORE (AJ-PCS060G). Writing is disabled.
[FAT]	Storage devices where the primary partition is FAT16 or FAT32. The partition root or CONTENTS folder under any folders* is the target.
[OTHER]	Indicates other storage devices other than the above. File systems other than FAT16 and FAT32, such as NTFS.

* The hierarchy of folders is down to the third level and the maximum number of folders is 100. Folders are displayed from the upper hierarchy. Long file names and file names with double-byte characters are not supported. Examples of folder displays are shown below.

/CONTENTS	Can be displayed.
/SAMPLE/CONTENTS	Can be displayed.
/SAMPLE/20140101/CONTENTS	Can be displayed.
/SAMPLE/20140101/1200/CONTENTS	Cannot be displayed. (Cannot be displayed since this is a fourth level folder)

■ Storage device types and available functions

Available functions		Storage device type			
		[TYPE S]	**[P2STORE]**	**[FAT]**	**[OTHER]**
Thumbnail display		✓	✓	✓	—
Card unit	**Card*1 → Storage**	✓	—	✓	—
	Card*2 → Storage	—	—	—	—
	Storage → Card*1	✓	✓	—	—
	Storage → Card*2	—	—	—	—
Clip unit	**Card → Storage**	✓*4	—	✓	—
	Storage → Card	✓	✓	✓	—
Playback check*3		—	—	—	—
Clip image display		✓	✓	✓	—
Format		✓	—	✓	✓*5

*1 P2 memory card, or microP2 memory card with 32 GB or lower
*2 microP2 memory cards that exceed 32 GB
*3 Playback from the storage device cannot be performed on the camera. Import the contents to the P2 card before playing back.
*4 If you perform additional clip writing, you will not be able to write back to that partition by card.
*5 Storage devices with a capacity of 2 TB or more cannot be formatted.

NOTE

- microP2 memory card here is indicated as used inserted in the microP2 card adaptor AJ-P2AD1G (optional).
- Storage devices with capacities exceeding 2 TB (2048 GB) are not supported.
- Use a storage device within its guaranteed operational range (temperature, etc.).
- Do not place the storage device in a location that is unstable or subject to vibration.
- Use a storage device with sufficient capacity for copying.
- Because the storage device is very sensitive, reading, and writing data may become invalid depending on your usage. Please note that Panasonic has no responsibility for data loss caused from a storage device failure or other defects and any direct or indirect damage related to these.
- If the contents of the storage device used for copying data from the camera are replaced using another computer, the camera operations and storage device data cannot be guaranteed.
- For P2 cards containing defective clips, it is recommended that you copy data to a storage device after restoring in advance.

Formatting a storage device

You can initialize the storage device to a usable format using the [TYPE S] or the [FAT] file system.

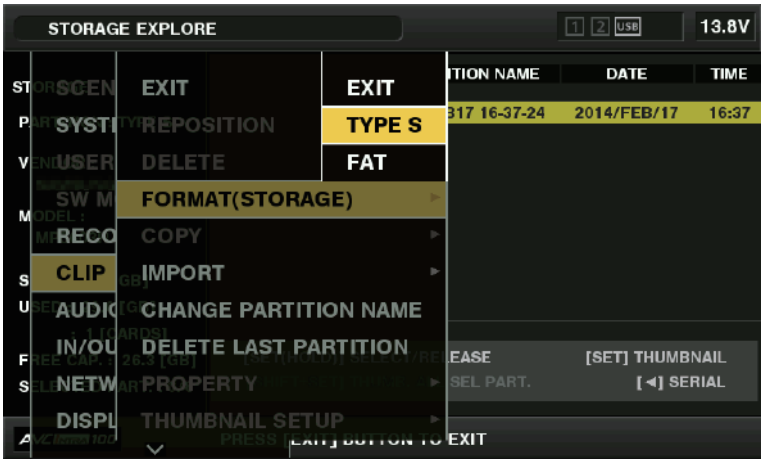


Fig. 1

1 Select [STORAGE] in the main menu → [CLIP] → [EXPLORE].

This opens the explorer screen.

2 Select the desired format ([TYPE S], [FAT]) in the main menu → [CLIP] → [FORMAT(STORAGE)]. (Fig. 1)

3 Select [YES] in the confirmation message and press the <SET> button.

4 Select [YES] again when the confirmation message appears and press the <SET> button.

This formats the storage device.

NOTE

- Formatting the storage devices erases all of its contents. Data cannot be recovered once it is formatted. Always check the data before formatting.

Exporting to a storage device by card

You can export to a storage device (write to a storage device from a P2 card) by P2 card. The copy results and the maximum number of items that can be copied vary depending on format type of the storage device. You cannot perform copying once the capacity of the storage device is exceeded.

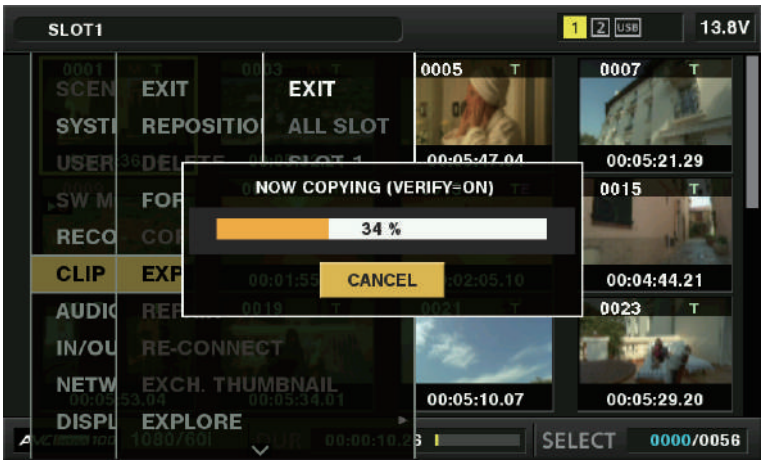


Fig. 1

■ [TYPE S]

A partition is created for each card, and all data included in the card are copied there. You can check the part numbers and serial numbers of the P2 cards that have been copied on the explorer screen of the camera.

The maximum number of items that can be copied is 23.

■ [FAT]

A folder is created for each card. All data included in the card are copied there. You can check the folder names in the explorer screen of the camera.

Folders are created in two levels; the date folders on the first level and the time folders on the second.

Example) When the exported date and time is 12:34:56, August 30, 2014, the directory is /14-08-30/12-34-56.

The maximum number of items that can be copied is 100.

1 Select [EXPORT] in the main menu → [CLIP].

2 Move the cursor to the card slot number of the copy source and press the <SET> button.

For [TYPE S], selecting [ALL SLOT] exports all cards currently inserted.

3 Select [YES] in the confirmation message and press the <SET> button.

Exporting begins. A progress bar appears during exporting. (Fig. 1)
[COPY COMPLETED!] is displayed when exporting is completed.

NOTE

- For export with [TYPE S], P2 card data and copied data can be verified (compared) automatically after exporting. Verification at the time of export is enabled in the factory setting. When you set to disable verification at the time of export, exported data is not verified, and the time until export completes will shorten. To disable verification, set [VERIFY] to [OFF] in the main menu → [CLIP] → [STORAGE COPY SETUP]. For [FAT], verification is not performed regardless of this setting.
- To discontinue the export process, press the <SET> button. On the [CANCEL] confirmation message that appears, select [YES] and press the <SET> button.
- Even if you cancel the process during verification, copying to the P2 card will continue until it is completed.
- microP2 memory cards that exceed 32 GB cannot be exported and imported. Use copied clips.

Copying to a storage device by clip

You can copy only the selected clips to a storage device.

1 Go to the thumbnail screen. Use the cursor buttons to place the cursor on a clip you want to copy and press the <SET> button.

You can also select multiple clips.

2 Select [STORAGE] in the main menu → [CLIP] → [COPY].

A list of folders or partitions in the storage device is displayed.

3 Select the copy destination and press the <SET> button.

4 Select [YES] in the confirmation message and press the <SET> button.

This starts the copying process. A progress bar is displayed during copying.
[COPY COMPLETED!] is displayed when copying is completed.

NOTE

- When the storage device has a [FAT] file system, the folders displayed are as follows:
  - Root
  - Folders down to the third level including the CONTENTS folder

- To copy to a [TYPE S] storage device, one or more partitions are required. You can either format the storage device to [FAT] or perform copying after creating a partition through the export process.
- To cancel the copy process, use the cursor buttons to place the cursor on [CANCEL] and press the <SET> button. On the [CANCEL] confirmation message that appears, select [YES] and press the <SET> button. Clips copied halfway to the copy destination are deleted.
- If you have copied clips to a [TYPE S] storage device, you will not be able to import to that partition by card. Also, the part number display of the card at that instance will display [UNKNOWN].

Storage device information display (explorer screen)

You can perform the following operations in the explorer screen display.

- Storage device information display
- Storage device partition or folder thumbnail display and selection
- Target partition or folder selection

Explorer screen can be displayed by selecting [STORAGE] in the main menu → [CLIP] → [EXPLORE].

1 Storage device indicator
This displays the connected / not connected status and the storage device type.

2 Display mode
This indicates that the explorer screen of the storage device is currently displayed.

3 Device information
For [TYPE S] and [P2STORE] (storage devices that allow reading/writing by card)

[PARTITION]	[TYPE S]/[P2STORE]
[VENDOR]	Vendor name
[MODEL]	Model name
[SIZE]	Total capacity (unit: GB)
[USED]	Used capacity (unit: GB) Used P2 card area (unit: number of clips), maximum of 23
[FREE CAP.]	Remaining capacity (unit: GB)
[SELECTED PART.]	Number of partitions selected

For [FAT] and [OTHER] (other storage devices)

[PARTITION]	[FAT]/[OTHER]
[VENDOR]	Vendor name
[MODEL]	Model name
[SIZE]	Total capacity (unit: GB)
[FREE CAP.]	Remaining capacity (unit: GB)
[SELECTED PART.]	Number of folders selected

4 Partition or folder information
For [TYPE S] and [P2STORE] (partition information)

☑	Displays a checkmark when a target partition is selected
[NO.]	Partition number
[MODEL]	P2 card model name
[PARTITION NAME]	Name assigned to the partition
[DATE]	Partition record date
[TIME]	Partition record time
[SERIAL]	P2 card serial number

For [FAT] and [OTHER] (folder information)

☑	Displays a checkmark when a target partition is selected
[NO.]	Folder number
[FOLDER NAME]	Folder name (excluding the CONTENTS folder)
[DATE]	Folder creation date
[TIME]	Folder creation time

NOTE

- For [TYPE S] storage devices, you can switch between the partition name and serial name display using the cursor buttons.
- If there is an invalid partition in [P2STORE], the partition information is displayed in gray.
- The remaining free space of the corresponding partition can be checked in the main menu → [CLIP] → [PROPERTY] → [FREE CAP. OF PARTITION].

Selecting the target folder/partition in the explorer screen

You can display all clips included in the selected partition/folder as thumbnails by selecting partitions/folders as targets. You can display up to six partitions/folders. When the seventh partition/folder is specified, setting is disabled and a warning is displayed.

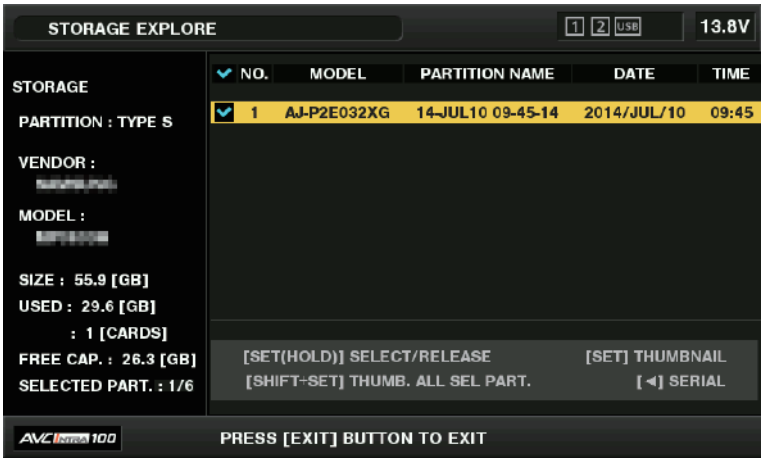


Fig. 1

1 In the explorer screen, place the cursor on the partition/folder.

2 Press and hold the <SET> button (for one second or more).

The partition/folder is selected and a checkmark is displayed. (Fig. 1)
The selected target partition/folder is valid until the storage device is disconnected or the power is turned off. To cancel the selected partition/folder, hold down the <SET> button (for one second or more) again on the selected partition.
Press the <CANCEL> button to deselect all partitions/folders.

NOTE

- In [TYPE S] storage devices, [MODEL] is [UNKNOWN] and clips recorded across other partitions will not be one normal clip. Copying clips to a [TYPE S] storage device changes the partition of the copy destination [MODEL] to [UNKNOWN].
- The partition name can be set when a [TYPE S] storage device is used. The partition name that has been set is displayed in [PARTITION NAME] on the explorer screen.

Setting a partition name in the explorer screen

When the storage device is [TYPE S], the name (up to 20 characters) can be set to the partition. The preset partition name is displayed in [PARTITION NAME] on the explorer screen.

1 In the explorer screen, place the cursor on the partition you want to set up.

You can display the thumbnail list and set a name for the partition by pressing the <SET> button.

2 Select [CHANGE PARTITION NAME] in the main menu → [CLIP].

This displays the soft keyboard.

3 Enter the partition name and select [OK].

The partition name is set.

Deleting the last partition in the explorer screen

You can delete the last partition on a [TYPE S] type storage device.

1 In the explorer screen, place the cursor on the last partition.

2 Select [DELETE LAST PARTITION] in the main menu → [CLIP].

NOTE

- You can only delete the last partition when using a [TYPE S] storage device. You can only delete the last partition. You cannot delete other partitions.
- Since deleted partitions cannot be recovered, perform a check thoroughly before deleting.

Clip thumbnail display of the storage device

Displaying thumbnails

You can display and manage clips saved in a storage device, as well as display the thumbnail screen for clips saved in a P2 card attached to the camera.

1 Open the explorer screen.

Partitions or folders are displayed in a list.

2 Use the cursor buttons to place the cursor on the partition or folder you want to display on the thumbnail screen, and press the <SET> button.

This displays the thumbnails of clips in the partition or folder. You can go back to the main explorer screen by clicking the <EXIT> button.

NOTE

- When target partitions are selected, you can display thumbnails in all partitions selected as targets by pressing the <SET> button while holding down the <SHIFT> button.

■ **Information display items**

1 Storage device information

For [TYPE S]

[SERIAL]	P2 card serial number
[MODEL]	P2 card model name
[SELECTED PART.]	Displays a checkmark when a target partition is selected
[SELECTED PART. NO.]	List of selected partition numbers (only displayed when multiple partitions are selected)
[NO.]	Partition number
[DATE]	Partition record date
[TIME]	Partition record time
[VERIFY]	Verification settings and results during recording, [ON/FAILED] • [ON/FINISHED]: Verification performed. Items match. • [ON/FAILED]: Verification performed but no match found. (For [P2STORE], [—] is displayed.) • [OFF]: Verification not performed
[NAME]	Partition name defined by the user
[SIZE]	Total capacity of the storage device
[USED]	Used storage device capacity
[FREE CAP.]	Remaining storage device capacity

For [FAT]

[SELECTED PART.]	Displays a checkmark when a target partition is selected
[SELECTED PART. NO.]	List of selected folder numbers (only displayed when multiple folders are selected)
[NO.]	Folder number
[DATE]	Folder creation date
[TIME]	Folder creation time

[FOLDER]	Folder name (creation date and time are not displayed in the root folder)
[SIZE]	Total capacity of the storage device
[FREE CAP.]	Remaining storage device capacity

NOTE

- You can change the thumbnail screen display if necessary.
- The 1001st clips onwards are not displayed.

Displaying clip information

You can display metadata of clips saved in a storage device. The procedure to display is the same as that of the P2 card clip properties.

1 In the storage device thumbnail screen, move the cursor to the target clip.

2 Select [CLIP PROPERTY] in the main menu → [CLIP] → [PROPERTY].

This cannot be modified.

Deleting clips

You can delete unnecessary clips saved in a storage device.

1 In the storage device thumbnail screen, select the clip you want to delete.

2 Select [DELETE] in the main menu → [CLIP].

3 Move the cursor to [YES] in the confirmation message and press the <SET> button.

NOTE

- You may not be able to delete clips with defective clip or unknown clip indicators.

Writing back to the P2 card from a storage device (import)

Importing from a [TYPE S] storage device or [P2STORE] by partition

You can import (write back to a P2 card from as storage device) to a P2 card with the same part number as the source card by partition (card).

1 Insert a P2 card that will serve as the input destination.

Make sure to insert a formatted P2 card.

2 Connecting a storage device.

3 Select [STORAGE] in the main menu → [CLIP] → [EXPLORE] to display the explorer screen.

4 In the explorer screen, display the partition thumbnails to be imported.

5 Select [IMPORT] in the main menu → [CLIP].

6 Place the cursor on the import destination P2 card slot number and press the <SET> button.

Start importing by selecting [YES] in the confirmation message.
[COPY COMPLETED!] is displayed when importing is completed.

NOTE

- Importing to a P2 card that is different from the source P2 card may result in incomplete clips depending on the clips. In this case, use the reconnection function to reconfigure the clips. For details, refer to “Reconnecting incomplete clips” (page 114).
- You can select whether to perform verification at the time of copying in the main menu → [CLIP] → [STORAGE COPY SETUP] → [VERIFY].
- You cannot import by partition to a P2 card of a different model. Perform copying by clip instead.

Copying to a P2 card by clip

You can specify a storage device clip and copy it to a P2 card.

1 Open the storage device thumbnail screen.

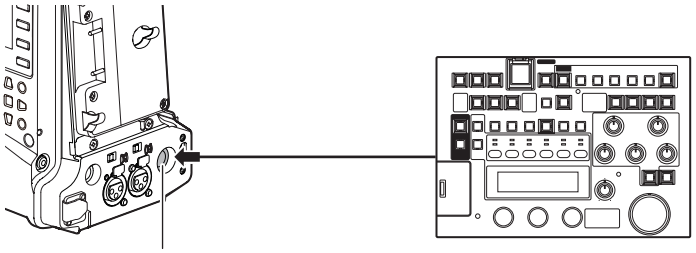
2 Select the clip you want to copy.

3 In the main menu → [CLIP] → [COPY] → [STORAGE] list, move the cursor over the copy destination and press the <SET> button.

Start importing by selecting [YES] in the confirmation message.
[COPY COMPLETED!] is displayed when copying is completed.

Connecting to the remote control unit (AJ-RC10G)

- Connect the remote control unit AJ-RC10G (optional) to remote-control some functions.
- When you connect AJ-RC10G and set the <POWER> switches of the camera and AJ-RC10G to <ON>, the camera automatically enters the remote control mode.
- Remove AJ-RC10G, or ensure the AJ-RC10G <POWER> switch is <OFF> to release remote control mode.
- You cannot go to the AJ-RC10G remote control mode when remote control in an IP connection is enabled. Remote control in an IP connection is enabled when [IP REMOTE] is illuminated or flashing on the [STATUS] screen of the mode check displayed when you turn the <DISP/MODE CHK> switch to the <CHK> side. Set the camera's main menu → [NETWORK SETUP] → [NETWORK FUNC] → [IP REMOTE] to [DISABLE].



<REMOTE> terminal **AJ-RC10G**

Switch functionality in remote control mode

The following switches and buttons on the camera do not function in remote control mode.

- <SHUTTER> switch
- <MENU> button
- Jog dial button
- <GAIN> switch
- <OUTPUT>/<AUTO KNEE> selector switch
- <WHITE BAL> switch
- <USER MAIN> button
- <USER1> button
- <USER2> button

Recording and playback operations in remote control mode

Recording/playback operations can be performed both on the camera and AJ-RC10G when the remote control unit is connected.

Remote control mode menu operations

The following menu items of the camera is not available when the remote control unit is connected.

- Main menu → [SCENE FILE] → [RB GAIN CONTROL SETTING]
- Main menu → [SCENE FILE] → [RGB BLACK CONTROL SETTING]

Remote control unit connected to the camera

When AJ-RC10G is connected to the camera, the operations of the following functions differ from the descriptions in the Operating Instructions supplied with AJ-RC10G.

■ <A.KNEE ON> button

You can enable/disable the dynamic range stretcher function from the camera's main menu → [SW MODE] → [AUTO KNEE SW]. The button illuminates when [DRS] is set, and the light is off when [OFF] is set.

■ <CHARA ON> button

Select whether to superimpose the characters over the video signals output to the <MON OUT> and <HDMI> terminals of the camera.

The setting of the [CHR] item in [SET03:MON/HDMI SETUP] of SmartUI will be disabled.

■ <FILTER ND/CC> button, <MATRIX ON> button, <HIGH COLOR ON> button

Operation is not available.

■ <USER2> button

Has the same function as the camera's <THUMBNAIL> button.

The thumbnail screen on the viewfinder and the monitor screen connected to the camera.

[CAMERA MENU OPEN] is displayed on the LCD screen of AJ-RC10G, and the <MENU ON> button lights up at the same time.

■ Scene files

Scene files created on other models cannot be loaded. If you try to load such a file, [NG] is displayed on the LCD of AJ-RC10G.

■ **Menu**

[BLACK]	• 1st level: [RPED] [GPED] [BPED] • 2nd level: [BLACK-VR-CONTROL] • 3rd level: [BLACK-VR-MODE] • 4th level: [BLACK-VR-RANGE]
[WHITE]	• 1st level: [RGAIN] [BGAIN] • 4th level: [GAIN-VR-MODE] • 5th level: [GAIN-VR-RANGE]
[KNEE]	• 3rd level: [WCLIP] [WCLIPLVL]
[SHUTTER]	• 1st level: [MODE] [SPED] [ACTION] The variable range of [SPED] when [FIX] is selected in [MODE] varies depending on the camera mode. Refer to “Setting the electronic shutter” (page 61). • [SYNCHRO SCAN DISP] is added in the second level. When [S.S] is selected in [MODE], select the unit of the value to be displayed in [SPED] from either [SEC] or [DEG]. This change in the unit is also applied to the camera. The variable range varies depending on the camera mode. Refer to “Setting the synchro scan mode” (page 62).
[FUNC]	• 6th level: [RC-DATA-SAVE]
[SYSTEM]	• 1st level: [CARD-READ] [TITLE] • 2nd level: [CARD-WRITE] [TITLE] • 3rd level: [CARD-DELETE] [TITLE] • 4th level: [CARD-CONFIG] • 5th level: [BUZZER] • 6th level: [LCD CONTRAST] • 7th level: [SW BRIGHT] • 8th level: [RCU-FACTORY] • 9th level: [VERSION]

■ **<SHAD> lamp, <FLARE> lamp, <MATRIX> lamp, <GAMMA> lamp, <DTL> lamp, <SKIN DTL> lamp, <KNEE> lamp**

When connected to the camera, AJ-RC10G menu operations are disabled even if these lamps are illuminated.

■ **<BLACK> volume**

Works only as volume adjustment for the pedestal ([PED]).

However, this does not work when [FLR] (flare) is selected in [BLACK-VR-CONTROL] in the AJ-RC10G menu.

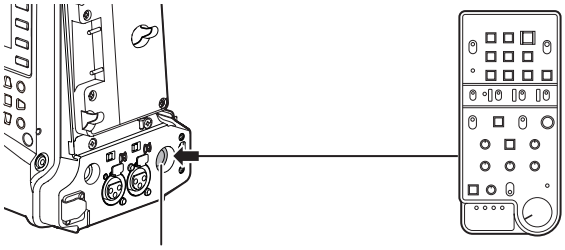
Also, when automatic black balancing (ABB) is performed, the <VR ACTIVE> button light goes off and the <BLACK> volume setting value is cleared to 0.

NOTE

- The status adjusted with AJ-RC10G connected will always be recorded on the camera. The setting of [FUNC] → [RC-DATA-SAVE] in the AJ-RC10G menu is currently disabled.
- When connecting or removing a dedicated cable, be sure to set the <POWER> switch of the camera and AJ-RC10G to <OFF>.
- Use a cable or optional cable that is dedicated for AJ-RC10G. Otherwise, a malfunction may result.
- The USER buttons on the camera (<USER MAIN>/<USER1>/<USER2>) and <MENU> button do not function when AJ-RC10G is connected.
- For details on the current from the <REMOTE> terminal, refer to “Details of the connector signals” (page 218).
- For the software version of AJ-RC10G, use Ver.1.20 or higher.
  For the updated versions of AJ-RC10G software, refer to the support information for P2 in the following website.
  http://pro-av.panasonic.net/

Connecting to the extension control unit (AG-EC4G)

- Connect the extension control unit AG-EC4G (optional) to remote-control some functions.
- When you connect AG-EC4G and set the <POWER> switches of the camera and AG-EC4G to <ON>, the camera automatically enters the remote control mode.
- Remove AG-EC4G, or ensure the AG-EC4G <POWER> switch is <OFF> to release remote control mode.
- You cannot go to the AG-EC4G remote control mode when remote control in an IP connection is enabled. Remote control in an IP connection is enabled when [IP REMOTE] is illuminated or flashing on the [STATUS] screen of the mode check displayed when you turn the <DISP/MODE CHK> switch to the <CHK> side. Set the camera's main menu → [NETWORK SETUP] → [NETWORK FUNC] → [IP REMOTE] to [DISABLE].



<REMOTE> terminal **AG-EC4G**

Switch functionality in remote control mode

The following switches and buttons on the camera do not function in remote control mode.

- <SHUTTER> switch
- <MENU> button
- Jog dial button
- <GAIN> switch
- <OUTPUT>/<AUTO KNEE> selector switch
- <WHITE BAL> switch
- <USER MAIN> button
- <USER1> button
- <USER2> button

Recording and playback operations in remote control mode

Recording/playback operations can be performed both on the camera and AG-EC4G when the remote control unit is connected.

Remote control unit connected to the camera

When AG-EC4G is connected to the camera, the operations of the following functions differ from the descriptions in the Operating Instructions supplied with AG-EC4G.

■ <CHARA> button

Select whether to superimpose the characters over the video signals output to the <MON OUT> and <HDMI> terminals of the camera.

The setting of the [CHR] item in [SET03:MON/HDMI SETUP] of SmartUI will be disabled.

■ <USER2> button

Has the same function as the camera's <THUMBNAIL> button.

The thumbnail screen is displayed on the viewfinder and the monitor screen connected to the camera.

NOTE

- The status adjusted with AG-EC4G connected will always be recorded on the camera. The setting of the <DATA SAVE> switch for AG-EC4G is currently disabled.
- When connecting or removing a dedicated cable, be sure to set the <POWER> switch of the camera and AG-EC4G to <OFF>.
- Use a cable or optional cable that is dedicated for AG-EC4G. Otherwise, a malfunction may result.
- For details on the current from the <REMOTE> terminal, refer to "Details of the connector signals" (page 218).
- For details, refer to the Operating Instructions of AG-EC4G.

Connecting to the remote operation panel (AK-HRP200G)

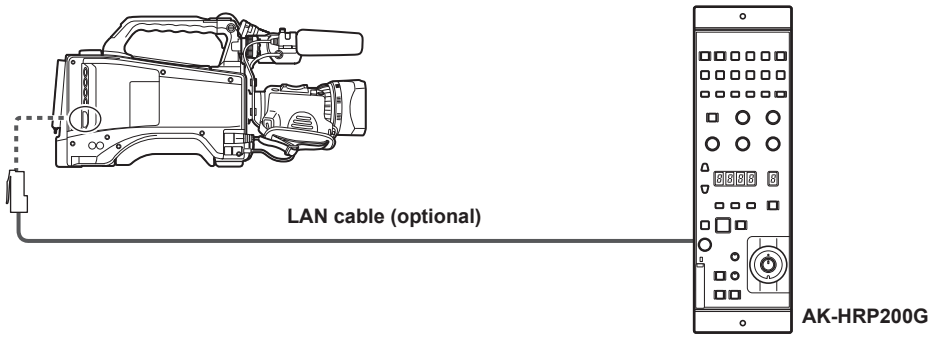
Part of the functions can be remotely controlled by connecting the remote operation panel AK-HRP200G (optional) to the <LAN> terminal or the <REMOTE> terminal of the camera.

It is necessary to set AK-HRP200G with the ROP setup software included in AK-HRP200G for the IP connection between AK-HRP200G and the <LAN> terminal of the camera, or for the serial connection with the <REMOTE> terminal of the camera.

For detailed setting procedure, refer to the Operating Instructions of AK-HRP200G.

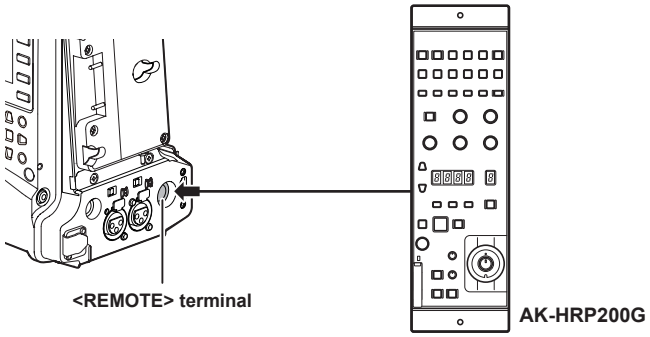
■ When connecting to the <LAN> terminal of the camera

- When you connect AK-HRP200G via wired LAN and perform network settings of the camera and the AK-HRP200G, the camera automatically enters the remote control mode. For the settings of connection, refer to “Setting for connection with remote operation panel (AK-HRP200G)” (page 195).
- The remote control mode is canceled by pressing the <HEAD POWER> switch of AK-HRP200G to terminate the connection while the camera and AK-HRP200G are connected, or by removing the network cable and changing the <POWER> switch from <OFF> to <ON>.



■ When connecting to the <REMOTE> terminal of the camera

- The camera will automatically go into the remote control mode when the serial connection is made between AK-HRP200G in which the serial connection setting has been made and the camera, and the <POWER> switch of the camera is set to <ON>.
- The remote control mode is canceled with the following methods.
  - Disconnect the cable connecting the camera with AK-HRP200G.
  - Terminate the connection by pressing the <HEAD POWER> switch of AK-HRP200G while it is still connected.



Switch functionality in remote control mode

The following switches and buttons on the camera do not function while in the IP connection and the serial connection and in remote control mode.

- <SHUTTER> switch
- <MENU> button
- Jog dial button
- <GAIN> selector switch
- <OUTPUT> switch
- <WHITE BAL> switch

The following buttons on the camera do not function while in the serial connection and in remote control mode.

- <USER MAIN> button
- <USER1> button
- <USER2> button

Recording and playback operations in remote control mode

Playback operation cannot be performed from the remote operation panel AK-HRP200G. You can only perform the operation from the camera.

Recording operation can be performed using the following procedures.

- For normal recording/loop recording/simultaneous recording
  Start and stop recording: Press the <VF POWER> and <STORE> buttons simultaneously.
- For interval recording/one-shot recording
  Start recording: Press the <VF POWER> and <STORE> buttons simultaneously.
  Stop recording: Press the <VF POWER> and <SCENE4> buttons simultaneously.
- For one-clip recording
  Start and stop recording: Press the <VF POWER> and <STORE> buttons simultaneously.

Clip linking in one-clip recording cannot end from the AK-HRP200G. You can only perform the operation from the camera.

NOTE

- During recording, the tally/call button (<TALLY/CALL>) in AK-HRP200G lights in red.

Remote control unit connected to the camera

When AK-HRP200G is connected to the camera, AK-HRP200G button operations are as follows:

■ Skin tone detail button (<SKINDTL>)

Operation varies depending on the lighting status of the button.

- When the button illuminates, operation is available with the menu setting value of the camera (setting for skin tone detail).
- When the button light goes off, the function of the skin tone detail is set to [OFF], regardless of the camera's menu setting value.

After restarting the camera, the menu setting value is reflected in AK-HRP200G.

However, this function does not operate when the camera and AK-HRP200G have a serial connection.

■ User file selection buttons (<USER1> to <USER3>)

You can select the camera's scene file F1 to F3. F4 to F6 cannot be selected.

However, this function does not operate when the camera and AK-HRP200G have a serial connection.

■ R flare/pedestal volume (<FLARE/PED R>), B flare/pedestal volume (<FLARE/PED B>)

Flare adjustment is not supported. Works only with the pedestal.

■ 5600 K button (<5600K>), Matrix button (<MATRIX>), DTL control (<DTL>)

Operation is not available.

■ Tally/call button (<TALLY/CALL>)

Lights when the camera is recording.

■ Setting display (4 digits), ND filter/CC filter display selection button (<ND/CC>)

ND filter, zoom, focus, auto focus, and variable frame rate are not supported.

■ Character/menu button (<CHARA/MENU>)

Switches the display of status and menu.

- Short press (light on): [CHR] of the [SET03:MON/HDMI SETUP] screen in SmartUI turns to [ON], and the status is displayed.
- Long press (light on): [CHR] of the [SET03:MON/HDMI SETUP] screen in SmartUI turns to [ON], and the menu is displayed.
- Long press (light off): [CHR] of the [SET03:MON/HDMI SETUP] screen in SmartUI turns to [OFF], and the menu and the status are not displayed.

NOTE

- To use the camera as a standalone device, the remote control mode must be disabled.
- The operation of connecting via IP and remote controlling the camera from multiple devices such as the AK-HRP200G cannot be guaranteed.
- For details, refer to the Operating Instructions of AK-HRP200G.
- When the camera is connected to AK-HRP200G via IP, the P2 playlist editing function is not available.

Connecting to P2 ROP application

Using a P2 ROP application that operates on an iPad connected to the camera via wireless LAN, you can remotely control some functions of the camera.

For the setting for network connection, refer to “Setting for connection with P2 ROP application” (page 194).

For details on operation of the P2 ROP application, refer to the help file for P2 ROP application.

Switch functionality in remote control mode

The following switches and buttons on the camera do not function in remote control mode.

- <SHUTTER> switch
- <MENU> button
- Jog dial button
- <GAIN> switch
- <OUTPUT>/<AUTO KNEE> selector switch
- <WHITE BAL> switch
- <USER MAIN> button
- <USER 1> button
- <USER 2> button

Recording and playback operations in remote control mode

When connected to the P2 ROP application, recording and playback can be performed with either the camera or the P2 ROP application.

NOTE

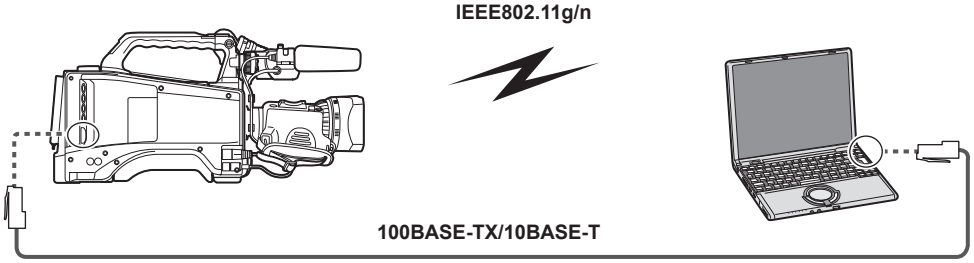
- The status adjusted by connecting the P2 ROP application will always be recorded on the camera.
- When the camera is connected to the P2 ROP application, the P2 playlist editing function is not available.

Chapter 10 Network Connection

This chapter describes how to use the camera by connecting to network.

Network connection

The camera can be connected to the network via wireless LAN, wired LAN, or 4G/LTE.
Also, high speed network connection is possible when connected to the bonding device to wireless LAN or wired LAN.
For details on wireless module and bonding device that can be connected, refer to the support desk at the following website:
http://pro-av.panasonic.net/
To use wireless LAN, attach AJ-WM30/AJ-WM50 (optional) to the <USB2.0> terminal (sub-host).
To use wired LAN, connect a LAN cable to the <LAN> terminal on the rear side.
To use 4G/LTE, connect a USB modem that is compliant with the <USB2.0> terminal (sub-host).



Available functions

When the camera is connected to network, the following functions are available.

- Checking camera status
- Checking thumbnail images
- Proxy playback
- Downloading proxy file/clip management information
- Displaying/editing metadata
- Adding/deleting metadata (shot mark/text memo)
- Camera remote control (collective operations of recording control and time code/user bits)
- Sending/receiving clips from/to the camera (clip transfer via FTP client function)
- IP remote controlling the camera from the Remote Operation Panel (AK-HRP200G) (wired LAN only)
- Connecting P2 ROP application
- Clip transfer function with FTP
- Streaming function

Operating environment

The following operating environment is required to connect to network.

- Windows
  Microsoft Windows® 8.1 Professional 32/64 bit, Internet Explorer 11 (classic view)
- Macintosh
  Mac OS X v10.9.x (Mavericks)*, Safari 7
  * Operation is guaranteed only when preinstalled or clean installed.
- iPad/iPhone
  iOS v7.x

Web browser

A Web browser is required to perform web control.

Media player

QuickTime is required for proxy video playback.
To display streaming video using the P2 Browser, VLC Media Player is required for Windows OS and QuickTime Player is required for Mac OS.

NOTE

- Refer to the following website.
  http://pro-av.panasonic.net/

Preparing for connection

For wireless module AJ-WM30/AJ-WM50

Connect the wireless module AJ-WM30/AJ-WM50 (optional) to the camera.

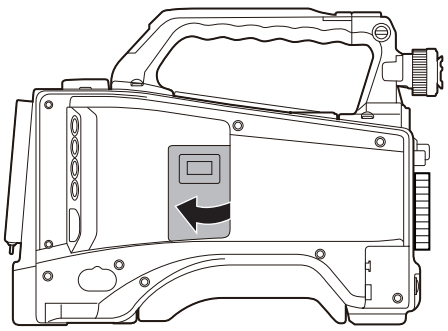


Fig. 1

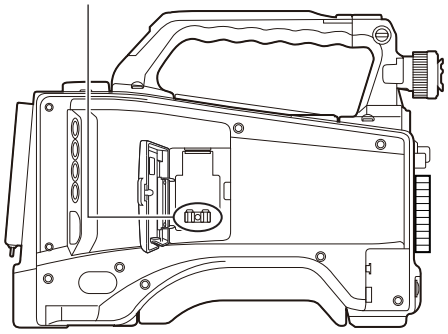


Fig. 2

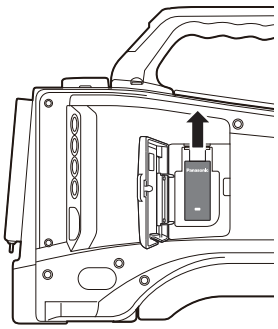


Fig. 3

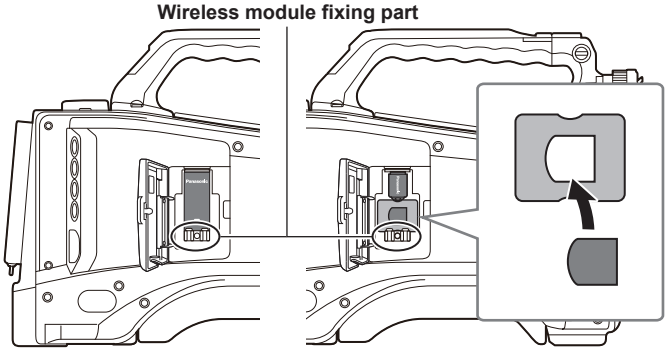


Fig. 4

1 Open the cover. (Fig. 1)

2 Remove the wireless module fixing part from the camera. (Fig. 2)

The wireless module fixing part is secured with a screw.

3 Securely attach the wireless module to the <USB2.0> terminal (sub-host). (Fig. 3)

4 (AJ-WM50 only) Place the module holder under the wireless module. (Fig. 4)

- Mount the cap of the wireless module to the hole of the module holder.

5 Fix the wireless module fixing part removed in Step 2 with a screw. (Fig. 4)

6 Close the cover.

NOTE

- When removing the wireless module, pull it down straight.
- When connected with the wireless LAN, attach the wireless module securely and close the cover.
- When using a wireless module other than AJ-WM30/AJ-WM50, refer to “For wireless module other than AJ-WM30/AJ-WM50” (page 187).

Cautions when using wireless module AJ-WM30/AJ-WM50

Read the operating manual of the wireless module thoroughly and understand it before using.

For the latest information, visit the following website:

http://pro-av.panasonic.net/

For wireless module other than AJ-WM30/AJ-WM50

Connect the wireless module other than AJ-WM30/AJ-WM50 (optional) to the camera.

Turn off the power of the camera before connecting or disconnecting the wireless module.

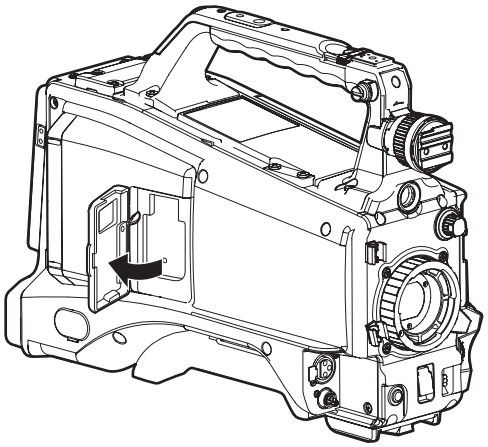


Fig. 1

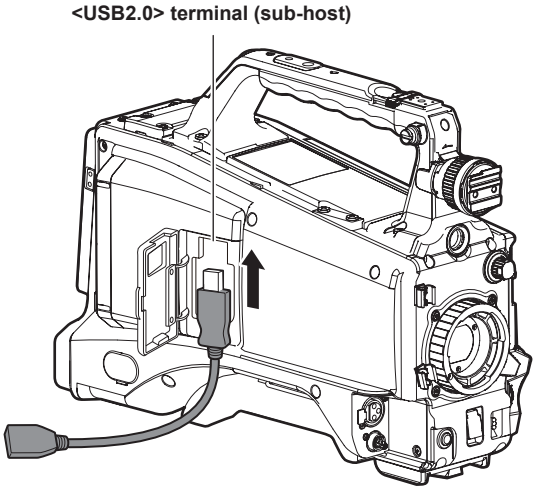


Fig. 2

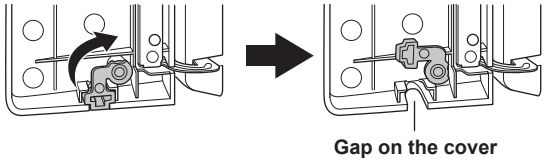


Fig. 3

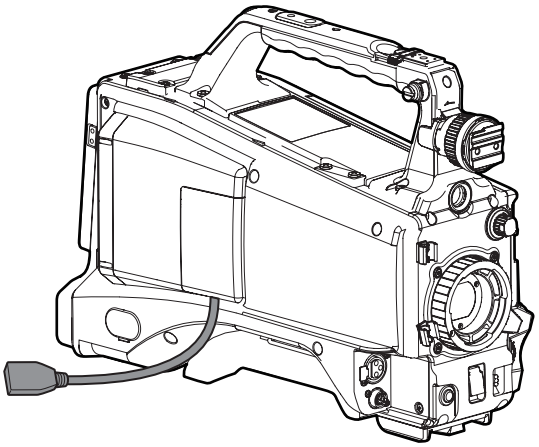


Fig. 4

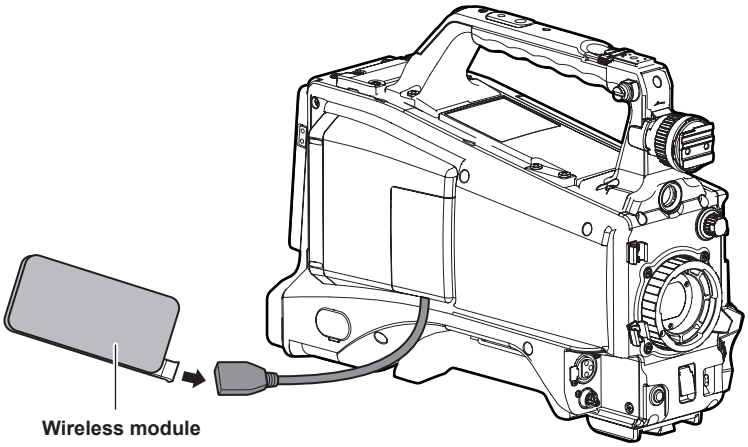


Fig. 5

1 Open the cover. (Fig. 1)

2 Attach the USB 2.0 extension cable to the <USB2.0> terminal (sub-host). (Fig. 2)

3 Rotate the part at the bottom of the cover in the direction of the arrow (Fig. 3) and close the cover so that the USB 2.0 extension cable goes through the gap. (Fig. 4)

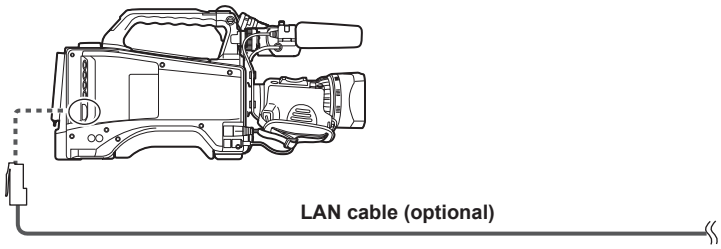
4 Connect the wireless module. (Fig. 5)

NOTE

- For the USB 2.0 extension cable (optional), using a cable of A type male/female, 0.5 m or shorter, and with double shielding process for noise suppression is recommended.
- For details on wireless modules that can be connected, refer to the support desk at the following website.
  http://pro-av.panasonic.net/en/sales_o/p2/server/4glte.html
  http://pro-av.panasonic.net/en/sales_o/p2/server/wireless_module.html

For wired LAN

Connect a LAN cable.



1 Connect the LAN cable to the <LAN> terminal on the rear side.

Network settings

To use wireless LAN or wired LAN, configuration of each setting is required. Configure the settings according to the function to use. When the main menu → [NETWORK SETUP] → [USB MODE SELECT] is set to [STORAGE], the network function cannot be used.

Wireless LAN settings

This section describes the settings to connect the camera to mobile devices (iPad/iPhone), computers, or wireless access point via wireless LAN.

[DIRECT] mode

Use the following procedures when accessing to the network function of the camera directly from a smartphone, tablet, or computer.

1 Select [DIRECT] in the main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] → [TYPE].

2 Set each item in the main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] as necessary.

[MAC ADDRESS]: MAC address of wireless LAN (cannot be changed)
[SSID]: Network name of the camera (SSID) (Factory setting: [AJ-PX800])
[BAND]: Setting that switches between 2 transmission methods (2.4 GHz or 5 GHz) (Factory setting: [2.4GHz])(When using AJ-WM30: [2.4GHz]/ When using AJ-WM50: [2.4GHz] or [5GHz])
[CHANNEL (2.4GHz)]: Channel used when set to 2.4 GHz (Factory setting: [AUTO])
[CHANNEL (5GHz)]: Channel used when set to 5 GHz (Factory setting: [AUTO])
[ENCRYPTION]: Encryption format to be used (Factory setting: [WPA2-AES]) (cannot be set)
[ENCRYPT KEY]: WPA2 encryption key (Factory setting: [0123456789012345678 9abcdef])
[DHCP]: Setting whether to use automatic acquisition via DHCP (**[ENABLE]:** Use automatic acquisition/**[DISABLE]:** Does not use automatic acquisition) (Factory setting: [ENABLE]) (cannot be set)
[IP ADDRESS]: IP address of the camera (Factory setting: [192.168.0.1]).
[SUBNET MASK]: Subnet mask (Factory setting: [255.255.255.0])
[DEFAULT GATEWAY]: Default gateway (Factory setting: [192.168.0.254]) (cannot be set)
[PRIMARY DNS]: Primary DNS server setting (Factory setting: [0.0.0.0]) (cannot be set)
[SECONDARY DNS]: Secondary DNS server setting (Factory setting: [0.0.0.0]) (cannot be set)
[DHCP SERVER]: Setting whether to use DHCP SERVER function (**[ENABLE]:** Use DHCP SERVER function/**[DISABLE]:** Does not use DHCP SERVER function) (Factory setting: [ENABLE])

3 Select [WLAN] in the main menu → [NETWORK SETUP] → [NETWORK SEL].

If the setting is changed, the camera will restart as necessary.

4 Select SSID from the list of the access points for mobile devices or computers and enter the password (encryption key).

Display the access point list screen in wireless setting and select [SSID] of the camera.
- Factory setting: [AJ-PX800]

When the password confirmation screen appears, enter the password (encryption key).
- Factory setting: [0123456789012345678 9abcdef]

5 Check the network connection.

When the setting is completed, confirm that network connection of mobile devices (iPad/iPhone) and computers is made properly.
Application (P2 Browser) which requires network can be used when network connect is made properly. However, if connected with [DIRECT], the FTP client function cannot be used.

NOTE

- The AJ-WM30 can only operate when the communication method is 2.4 GHz. When [BAND] is set to [5GHz], it will automatically change [BAND] to [2.4GHz] and [CHANNEL (2.4GHz)] to [AUTO] before operation .
- The startup time after turning on the power may be longer due to starting of the network.
- When you change the settings of [NETWORK SEL], the changes will not be reflected until the camera is restarted. After the settings have been changed, the setting screen termination may take time due to the restart of the network service.
- All of the IP address, subnet mask, and default gateway must be correctly set.
  If a warning [CANNOT ACCESS GATEWAY!] appears at the termination of the setting screen, contact the administrator of the network you use.
- If you do not use default gateway and DNS, set them to [0.0.0.0].
- DHCP and DNS may not function properly depending on the network environment.

[INFRA] mode (when SSID is manually entered)

Use the following procedures when manually connecting to a wireless access point.

1 Select [INFRA] in the main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] → [TYPE].

2 Set each item in the main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] as necessary.

[MAC ADDRESS]: MAC address of wireless LAN (cannot be changed)
[BAND]: Setting that switches between 2 transmission methods (2.4 GHz or 5 GHz) (Factory setting: [2.4GHz]) (cannot be set)
[CHANNEL (2.4GHz)]: Channel used when set to 2.4 GHz (Factory setting: [AUTO]) (cannot be set)
[CHANNEL (5GHz)]: Channel used when set to 5 GHz (Factory setting: [AUTO]) (cannot be set)
[DHCP]: Setting whether to use automatic acquisition via DHCP ([ENABLE]: Use automatic acquisition/[DISABLE]: Does not use automatic acquisition) (Factory setting: [ENABLE])
[IP ADDRESS]: IP address of the camera (Factory setting: [192.168.0.1]).
[SUBNET MASK]: Subnet mask (Factory setting: [255.255.255.0])
[DEFAULT GATEWAY]: Default gateway (Factory setting: [192.168.0.254])

[PRIMARY DNS]: Primary DNS server setting (Factory setting: [0.0.0.0]) (When [DHCP] is set to [ENABLE] and can be acquired from the DNS server, the DNS server value which is acquired externally is overwritten. When the value is [0.0.0.0], the server is not set.)
[SECONDARY DNS]: Secondary DNS server setting (Factory setting: [0.0.0.0]) (When [DHCP] is set to [ENABLE] and can be acquired from the DNS server, the DNS server value which is acquired externally is overwritten. When the value is [0.0.0.0], the server is not set.)

3 Select [WLAN] in the main menu → [NETWORK SETUP] → [NETWORK SEL].

If the setting is changed, the camera will restart as necessary.

4 Enter information on the wireless access point to connect to.

Select [MANUAL] in [SSID INPUT MODE].
Enter SSID of the wireless access point for destination in [SSID] of the camera.
Select the encryption method to be used from the camera's [ENCRYPTION].
- Factory setting: [WPA2-AES]

Enter a password of the wireless access point for destination in [ENCRYPT KEY] of the camera.

5 Check the network connection.

When the setting is completed, confirm that network connection between the camera and the wireless access point is made properly.
When network connection is made properly, the network status icon at the upper right of the thumbnail screen changes in yellow, and applications (P2 Browser, FTP client function) which require network can be used.

NOTE

- The startup time after turning on the power may be longer due to starting of the network.
- When you change the settings of [NETWORK SEL], the changes will not be reflected until the camera is restarted. After the settings have been changed, the setting screen termination may take time due to the restart of the network service.
- All of the IP address, subnet mask, and default gateway must be correctly set.
  If a warning [CANNOT ACCESS GATEWAY!] appears at the termination of the setting screen, contact the administrator of the network you use.
- If you do not use default gateway and DNS, set them to [0.0.0.0].
- DHCP and DNS may not function properly depending on the network environment.

[INFRA] mode (when SSID is selected from the list)

Use the following procedures when the wireless access point to connect to is selected from a list.

1 Select [INFRA] in main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] → [TYPE].

2 Set each item in main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] as necessary.

[MAC ADDRESS]: MAC address of wireless LAN (cannot be changed)
[BAND]: Setting that switches between 2 transmission methods (2.4 GHz or 5 GHz) (Factory setting: [2.4GHz]) (cannot be set)
[CHANNEL (2.4GHz)]: Channel used when set to 2.4 GHz (Factory setting: [AUTO]) (cannot be set)
[CHANNEL (5GHz)]: Channel used when set to 5 GHz (Factory setting: [AUTO]) (cannot be set)
[DHCP]: Setting whether to use automatic acquisition via DHCP ([ENABLE]: Use automatic acquisition/[DISABLE]: Does not use automatic acquisition) (Factory setting: [ENABLE])
[IP ADDRESS]: IP address of the camera (Factory setting: [192.168.0.1]).
[SUBNET MASK]: Subnet mask (Factory setting: [255.255.255.0])
[DEFAULT GATEWAY]: Default gateway (Factory setting: [192.168.0.254])
[PRIMARY DNS]: Primary DNS server setting (Factory setting: [0.0.0.0]) (When [DHCP] is set to [ENABLE] and can be acquired from the DNS server, the DNS server value which is acquired externally is overwritten. When the value is [0.0.0.0], the server is not set.)
[SECONDARY DNS]: Secondary DNS server setting (Factory setting: [0.0.0.0]) (When [DHCP] is set to [ENABLE] and can be acquired from the DNS server, the DNS server value which is acquired externally is overwritten. When the value is [0.0.0.0], the server is not set.)

3 Select [WLAN] in main menu → [NETWORK SETUP] → [NETWORK SEL].

If the setting is changed, the camera will restart as necessary.

4 Enter information on the wireless access point to connect to.

1) Select [SELECT] in [SSID INPUT MODE].

2) Press the cursor buttons to select SSID, and press the <SET> button.
   - "SSID connection destination list screen" (page 191) is displayed.
   - Selected SSID can be deleted from the connection history by selecting SSID and pressing the <EXIT> button while pressing the <SHIFT> button, or tilting the <DISP/MODE CHK> switch toward <CHK>.
   - All the connection histories for SSID can be deleted by selecting [DELETE ALL HISTORY] and pressing the <SET> button.

3) Enter the password of the wireless access point to connect to the camera's [ENCRYPT KEY].

5 Check the network connection.

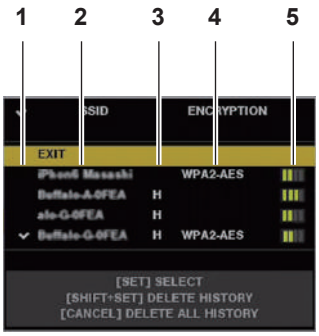
When the setting is completed, confirm that network connection between the camera and the wireless access point is made properly.
When network connection is made properly, the network status icon at the upper right of the thumbnail screen changes in yellow, and applications (P2 Browser, FTP client function) which require a network connection can be used.

NOTE

- The startup time after turning on the power may be longer due to starting of the network.
- When you change the settings of [NETWORK SEL], the changes will not be reflected until the camera is restarted. After the settings have been changed, the setting screen termination may take time due to the restart of the network service.
- All of the IP address, subnet mask, and default gateway must be correctly set.
  If a warning [CANNOT ACCESS GATEWAY!] appears at the termination of the setting screen, contact the administrator of the network you use.

- If you do not use default gateway and DNS, set them to [0.0.0.0].
- DHCP and DNS may not function properly depending on the network environment.
- A maximum of 20 connections are saved in the connection history. When this number is exceeded, the oldest entries are deleted.
- The status of SSID connection destination list is current at the time the list was displayed and is not automatically refreshed.

■ **SSID connection destination list screen**



1 Selection status
A checkmark [✓] is displayed on the currently selected SSID. (This does not show the connection status).

2 SSID
The SSID list registered in the detected SSID and the connection history is displayed. SSIDs are displayed in order from the one with the strongest signal.

3 Whether there is connection history
[H] is displayed in the SSID that has a past connection history. SSID with past connection histories are displayed even if the camera is outside the service area.

4 Encryption format
This is the encryption method used by the access point.

5 Radio wave strength
This shows the signal strength of the access point.

4G/LTE setting

[4G/LTE] mode

Use the following procedure when you connect the camera with the 4G/LTE USB modem.

1 Select [4G/LTE] in the main menu → [NETWORK SETUP] → [NETWORK SEL].

2 Select [4G/LTE PROPERTY] and set items as necessary when the main menu → [NETWORK SETUP] → [4G/LTE PROPERTY] is enabled.

When the setting of [4G/LTE PROPERTY] is required for the connected 4G/LTE USB modem, [4G/LTE PROPERTY] will become enabled.
When following setting is required, enter the information provided from the provider accurately.
[APN]: Sets the APN (access point name) provided from the provider.
[USER ID]: Sets the user name provided from the provider.
[PASSWORD]: Sets the password provided from the provider.
[DIAL NO.]: Sets the phone number. For details, refer to the manual of the provider you have contracted.

3 Check the network connection.

Check whether to connect the camera to the network with 4G/LTE.
[4G/LTE] is displayed in the screen when network connection is correct. The network status icon on top right of the thumbnail screen will be displayed in yellow, and the application using the network (FTP) can also be used.

NOTE

- The startup time after turning on the power may be longer due to starting of the network.
- When you change the settings of [NETWORK SEL], the changes will not be reflected until the camera is restarted. After the settings have been changed, the setting screen termination may take time due to the restart of the network service.

Wired LAN settings

The settings to connect to computers using the wired LAN are as follows.

1 Set each item in the main menu → [NETWORK SETUP] → [LAN PROPERTY] as necessary.

[DHCP] and [DHCP SERVER] are mutually exclusive.
[MAC ADDRESS]: MAC address of wired LAN (cannot be changed)
[DHCP]: Setting whether to use automatic acquisition via DHCP (**[ENABLE]:** Use automatic acquisition/**[DISABLE]:** Does not use automatic acquisition (Factory setting: [ENABLE])
[IP ADDRESS]: IP address (Factory setting: [192.168.0.1])
[SUBNET MASK]: Subnet mask (Factory setting: [255.255.255.0])
[DEFAULT GATEWAY]: Default gateway (Factory setting: [192.168.0.254])
[PRIMARY DNS]: Primary DNS server setting (Factory setting: [0.0.0.0])
[SECONDARY DNS]: Secondary DNS server setting (Factory setting: [0.0.0.0])

[DHCP SERVER]: Setting whether to use the DHCP SERVER function (**[ENABLE]:** Uses the DHCP SERVER function/**[DISABLE]:** Does not use the DHCP SERVER function) (Factory setting: [DISABLE])

2 Select [LAN] in the main menu → [NETWORK SETUP] → [NETWORK SEL].

3 Configure the settings of wired LAN of your computer.

(For Windows)

Display [Properties] in [Internet Protocol Version 4 (TCP/IPv4)] and configure the settings. For details on how to display the screen, refer to [Start] → [Help and Support].

- When [DHCP SERVER] is set to [ENABLE] on the camera

  Select [Obtain an IP address automatically] and [Obtain DNS server address automatically] in the [General] tab. Select [Automatic private IP address] in the [Alternate Configuration] tab.
- When [DHCP SERVER] is set to [DISABLE] on the camera

  In the [General] tab, select [Use the following IP address], and enter the following items.
  - [IP address]
  - [Subnet mask]
  - [Default gateway]/[Preferred DNS server]/[Alternate DNS server]: Not necessarily to be entered.

(For Mac OS)

- When [DHCP SERVER] is set to [ENABLE] on the camera

  [Configure IPv4]: Select [Using DHCP].

  [Configure IPv6]: Select [Automatically].
- When [DHCP SERVER] is set to [DISABLE] on the camera

  [Configure IPv4]: Select [Manually] and enter the following items.
  - [IP Address]
  - [Subnet Mask]
  - Entering [Router] is not required. Leave it blank.

  [Configure IPv6]: Select [Automatically].

NOTE

- The startup time after turning on the power may be longer due to starting of the network.
- When you change the settings of [NETWORK SEL], the changes will not be reflected until the camera is restarted. After the settings have been changed, the setting screen termination may take time due to the restart of the network service.
- All of the IP address, subnet mask, and default gateway must be correctly set.
  If a warning [CANNOT ACCESS GATEWAY!] appears at the termination of the setting screen, contact the administrator of the network you use.
- If you do not use default gateway and DNS, set them to [0.0.0.0].
- DHCP and DNS may not function properly depending on the network environment.

Network function

P2 browser function settings

Starting application (P2 Browser) from web browser

After completing the network connection with your mobile device or computer, start the browser of the mobile device or computer, and then start the application (P2 Browser).

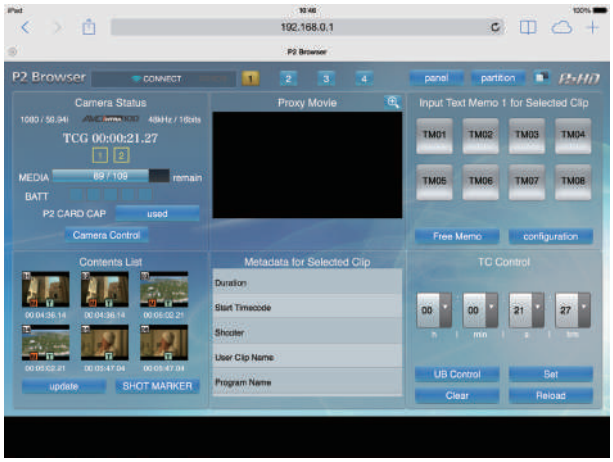


Fig. 1

1 Select [BROWSE] or [BROWSE (+CTRL)] in the main menu → [NETWORK SETUP] → [NETWORK FUNC] → [HTTP SERVER].

P2 browser function is enabled.

2 Start the browser of your mobile device or computer (Safari, Internet Explorer).

3 Enter the IP address set for the camera in the address entry field of the browser.

- Factory setting: [192.168.0.1]

4 If you use a computer, press the Enter key, and if you use iPad/iPhone, tap the GO button.

The web application (P2 Browser) starts up.

5 Enter [USER NAME] and [PASSWORD] on the entry screen.

Enter [USER ACCOUNT] (Factory setting: [guest]) and [PASSWORD] (Factory setting: [p2guest]) that have been set for the camera.
When a screen like (Fig. 1) appears, the connection has been established.
User account name and password can be set in the main menu → [NETWORK SETUP] → [NETWORK FUNC] → [USER ACCOUNT].
Accounts can be created or deleted, and the passwords can be changed in the main menu → [NETWORK SETUP] → [NETWORK FUNC] → [ACCOUNT LIST].
Enter up to 31 characters for a user account, and characters between 6 and 15 for a password.
For information on P2 Browser, refer to the User Guide of “P2 Web Application” on the following website:
http://pro-av.panasonic.net/en/manual/index.html

NOTE

- When [NETWORK SEL] is [OFF] or set to [4G/LTE], the P2 browse function cannot be used.

Network operation status display (mode check function)

Push the <DISP/MODE CHK> switch on the camera towards the <CHK> side twice to check the network operation status in the mode check [FUNCTION] screen.

For details, refer to “[FUNCTION] screen” (page 166).

P2 playlist edit function setting

Starting application (P2 Playlist Editor) from web browser

After completing the network connection with your mobile device or computer, start the browser of the mobile device or computer, and then start the application (P2 Playlist Editor).

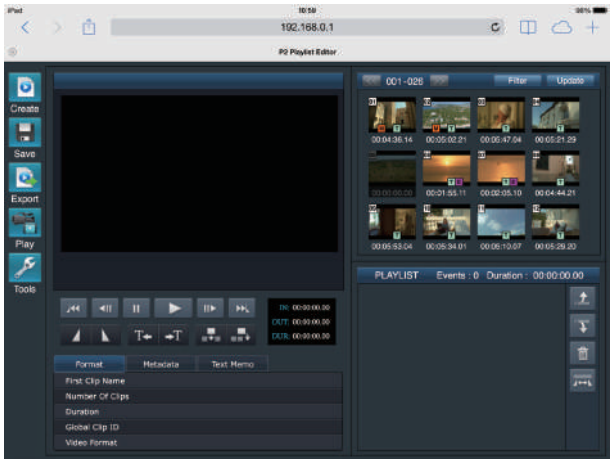


Fig. 1

1 Select [ON] in main menu → [NETWORK SETUP] → [NETWORK FUNC] → [PLAYLIST].

Changes the mode to the playlist edit mode.

2 Start the browser of your mobile device or computer (Safari, Internet Explorer).

3 Enter the IP address set for the camera in the address entry field of the browser.

- Factory setting: [192.168.0.1]

4 If you use a computer, press the Enter key, and if you use iPad/iPhone, tap the GO button.

The web application (P2 Playlist Editor) starts up.

5 When the confirmation screen is displayed, enter [USER NAME] and [PASSWORD] on the entry screen.

Enter [USER ACCOUNT] (Factory setting: [guest]) and [PASSWORD] (Factory setting: [p2guest]) that have been set for the camera.
When a screen like (Fig. 1) appears, the connection has been established.
User account name and password can be set in the main menu → [NETWORK SETUP] → [NETWORK FUNC] → [USER ACCOUNT].
Accounts can be created or deleted, and the passwords can be changed in the main menu → [NETWORK SETUP] → [NETWORK FUNC] → [ACCOUNT LIST].
Enter up to 31 characters for a user account name, and characters between 6 and 15 for a password.
For information on P2 Playlist Editor, refer to the User Guide of “P2 Web Application” on the following website:
http://pro-av.panasonic.net/en/manual/index.html

NOTE

- When [NETWORK SEL] is [OFF] or set to [4G/LTE], the P2 playlist editing function cannot be used.
- The number of clients that can be connected simultaneously during the playlist edit function is 1.

Setting for connection with P2 ROP application

Using the P2 ROP application on an iPad connected to the camera via wireless LAN, you can remotely control some functions.
To connect an iPad to the camera via wireless LAN, configure the settings in the following procedure.

Network setting on the camera

1 Set wireless LAN.

Perform the setting referring to steps **1** to **3** in “[DIRECT] mode”.

2 Set the remote control function.

1) Set the main menu → [NETWORK SETUP] → [NETWORK FUNC] → [HTTP SERVER] to [BROWSE (+CTRL)].

2) Set the main menu → [NETWORK SETUP] → [NETWORK FUNC] → [IP REMOTE] to [ENABLE].

3 Set each item in the main menu → [NETWORK SETUP] → [NETWORK FUNC] → [USER ACCOUNT].

[USER NAME]: Sets the user account name. (Factory setting: [guest])
[PASSWORD]: Sets the password. (Factory setting: [p2guest]) The user account name should be 31 characters or less, and the password should be between 6 and 15 characters.

iPad setting

Refer to the help file of P2 ROP application.

NOTE

- To connect an iPad to the camera via wireless LAN, the following information of the camera is required.
  - User account name
  - Password
  - IP address (it is not necessary to set IP address when the camera's main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] → [DHCP SERVER] is set to [ENABLE]).

Setting for connection with remote operation panel (AK-HRP200G)

You can remotely control some functions by connecting the remote operation panel AK-HRP200G (optional) via IP connection.

To connect the AK-HRP200G via wired LAN to remotely control the camera, configure the settings in the following procedure.

1 Configure the network settings of the AK-HRP200G.

For the network settings, use ROP setup software that is supplied with AK-HRP200G.

2 Configure the network settings of the camera.

Set main menu → [NETWORK SETUP] → [LAN PROPERTY] → [DHCP] to [DISABLE], and refer to steps **1** to **2** in "Wired LAN settings" (page 191) to configure the network settings.

3 Set each item in the camera's main menu → [NETWORK SETUP] → [NETWORK FUNC] → [USER ACCOUNT].

[USER ACCOUNT]: Sets the user account name. (Factory settings: [guest])
[PASSWORD]: Sets the password. (Factory settings: [p2guest])
Enter up to 31 characters for a user account name, and characters between 6 and 15 for a password.

4 Set the camera's main menu → [NETWORK SETUP] → [NETWORK FUNC] → [IP REMOTE] to [ENABLE].

The camera will restart. The IP connection will be possible after the camera is started. The camera will also restart when [IP REMOTE] is set to [DISABLE]. The IP connection mode is canceled after the camera is started.

NOTE

- The following information is required to connect to AK-HRP200G.
  - User account name
  - Password
  - IP address
  - Port number: 49152
- Use Ver3.00.00 or later versions of AK-HRP200G.
- For details on the operations of ROP setup software, refer to the Operating Instructions of the AK-HRP200G.
- Use Ver3.0.0.0 or later versions of ROP setup software.

Connection settings for the streaming function

You can perform live streaming of audio and video from the camera via the network (wired LAN, wireless LAN, 4G/LTE).

Streaming can be performed through an application software (e.g. P2 Browser, P2 Streaming Receiver) of a device connected to the camera through a network, or through a server that is capable of receiving streaming video sent from the camera.

There are two ways to start streaming: streaming from an application software and streaming from the camera. This section describes the camera's network connection method for each method.

For procedure to use the streaming function, refer to "Using the streaming function" (page 86).

NOTE

- To display the streaming video in the P2 Browser, start the streaming distribution by operation from the application software. The streaming video cannot be displayed when operated from the camera.

Setting when starting streaming through operation from an application software

1 Set the connection method when connecting the camera to a network.

Select [WLAN], [4G/LTE], or [LAN] in the main menu → [NETWORK SETUP] → [NETWORK SEL]. For detail of each connection method, refer to "Wireless LAN settings" (page 189) or "Wired LAN settings" (page 191).

NOTE

- [4G/LTE] is disabled when connecting to the P2 Browser.

Setting when starting streaming through operation from the camera

There are two ways to configure the network settings on the camera: configuring the settings from the camera menu or using the settings contained in the SD memory card.

Configuring the settings from the camera

The followings are the steps to configure the settings from the camera menu.

1 Set the connection method when connecting the camera to a network.

Select [WLAN], [4G/LTE], or [LAN] in the main menu → [NETWORK SETUP] → [NETWORK SEL]. For detail of each connection method, refer to "Wireless LAN settings" (page 189) or "Wired LAN settings" (page 191).

2 Configure the network settings of the camera.

1) Select [INTERNAL] in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [SETTING DATA].

2) Set each item in accordance with the connection destination in the main menu → [NETWORK SETUP] → [STREAMING SETTING].

[SERVER ADDR.]: Sets the IP address of the connection destination.
[RTSP PORT]: Sets the RTSP port number of the connection destination.

NOTE

- The content set in Step **2)** can be saved on the SD memory card. Insert the SD memory card and select [SAVE (SD CARD)] in the main menu → [NETWORK SETUP] → [STREAMING SETTING].

Configuring the setting values by directly referring to the setting values contained in the SD memory card

Configure the setting values by directly referring to the setting values contained in the SD memory card without saving it in the camera.
Insert the SD memory card that contains the setting values before turning on the power of the camera.

1 Set the connection method when connecting the camera to a network.

Select [WLAN], [4G/LTE], or [LAN] in the main menu → [NETWORK SETUP] → [NETWORK SEL]. For detail of each connection method, refer to “Wireless LAN settings” (page 189) or “Wired LAN settings” (page 191).

2 Configure the network settings of the camera.

Select [SD CARD] in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [SETTING DATA].

NOTE

- The setting values of the SD memory card can be saved in following method.
  - Select [SAVE (SD CARD)] in the main menu → [NETWORK SETUP] → [STREAMING SETTING].

Configuring the setting values after saving the setting values contained in the SD memory card to the camera

Configure the setting values after saving the setting values contained in the SD memory card to the camera.

1 Set the connection method when connecting the camera to a network.

Select [WLAN], [4G/LTE], or [LAN] in the main menu → [NETWORK SETUP] → [NETWORK SEL]. For detail of each connection method, refer to “Wireless LAN settings” (page 189) or “Wired LAN settings” (page 191).

2 Configure the network settings of the camera.

1) Select [INTERNAL] in the main menu → [NETWORK SETUP] → [STREAMING SETTING] → [SETTING DATA].

2) Insert the SD memory card containing the setting values and select [LOAD (SD CARD)] in the main menu → [NETWORK SETUP] → [STREAMING SETTING].

Using FTP client function

To use the FTP client function, network configuration (wireless LAN, wired LAN) and FTP client settings are necessary in advance.

FTP client function setting

By connecting the camera to network using wireless LAN (wireless access point connection), 4G/LTE, or wired LAN, you can transfer clips to a server device on the network.

Client settings

To transfer clips with the FTP client function, you need to set the connection destination and other settings in advance.

1 Set each item in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE].

[SETTING DATA]: Sets from where the setting values of the client service are acquired from.
- [INTERNAL]: Uses the setting values set on the camera.
- [SD CARD]: Uses the setting values of the file inside the SD memory card inserted in the SD card slot. When this item is set to [SD CARD], insert the SD memory card before turning on the power of the camera.

[SERVER URL]: Sets the name or address of the server to connect to. (Up to 500 characters)
[LOGIN USER]: Sets the user ID to connect to. (Up to 31 characters)
[LOGIN PASSWORD]: Sets the password to connect to. (Up to 15 characters) The set password cannot be displayed on the camera.
[SSH]: Sets when transferring files using SSH.
- **[ENABLE]:** Uses SSH.
- **[DISABLE]:** Does not use SSH.

[SSH PORT]: Sets the port number when the SSH is used. Set to the same number as the server.

NOTE

- The FTP client function does not function when [WLAN] is set in the main menu → [NETWORK SETUP] → [NETWORK SEL], and [DIRECT] is set in the main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] → [TYPE].
- The setting values of the SD memory card can be saved in following method.
  - Select [SAVE (SD CARD)] in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE].

Saving the setting value of the client service in the SD memory card

1 Select [SAVE (SD CARD)] in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE].

The setting values for [SERVER URL], [LOGIN USER], [LOGIN PASSWORD], [SSH], and [SSH PORT] in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] are saved in the SD memory card.

Loading the setting value of the client service from the SD memory card

1 Select [LOAD (SD CARD)] in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE].

The client service settings loaded from the SD memory card are reflected on the settings of the camera.

Operation check tools, status indication, and initialization

You can check FTP client network connection status as follows.

■ **Checking connection (PING)**

1 Press the <THUMBNAIL> button.

The thumbnail screen is displayed.

2 Select [PING] in the main menu → [NETWORK SETUP] → [NETWORK TOOLS].

3 Perform status check of the connection with the address that has been set.

When a connection is confirmed, [PING SUCCESSFUL!] appears.
If a connection cannot be established within approximately 30 seconds, [PING FAILED!] appears. The log may indicate the cause of the failure.

■ **Displaying the connection log (LOG)**

1 Select [LOG DISPLAY] in the main menu → [NETWORK SETUP] → [NETWORK TOOLS].

The log appears.

2 After checking the log, press the <EXIT> button.

The setting menu screen returns.

NOTE

- Some operations may not generate any information in the log.
- The password is indicated as [∗] in the log.

■ **Displaying the status**

1 Select [STATUS DISPLAY] in the main menu → [NETWORK SETUP] → [NETWORK TOOLS].

The connection status is displayed.

2 After checking the log, press the <EXIT> button.

The setting menu screen returns.

NOTE

- The status information is not updated in real-time. To view the most recent data, perform the procedure again.
- If [ENABLE] is set in the main menu → [NETWORK SETUP] → [LAN PROPERTY] → [DHCP] or in the main menu → [NETWORK SETUP] → [WIRELESS PROPERTY] → [DHCP], IP address and other necessary information are assigned automatically. However, the status information is not displayed correctly while the address information is being obtained.
- The default gateway is displayed as status information only when correctly set up.
- If only [SECONDARY DNS] is set without setting [PRIMARY DNS] for the network setting (wireless LAN, wired LAN), [DNS1] is displayed.

■ **Initializing network settings**

1 Select [INITIALIZE] in the main menu → [NETWORK SETUP] → [NETWORK TOOLS].

2 Press the <SET> button.

When initialization completes, the setting menu screen returns.

FTP server folder list (FTP explorer screen)

The information and subfolder list of folders in the FTP server can be displayed. You can also display the thumbnail list of a desired CONTENTS folder (folder storing clips of P2 card).

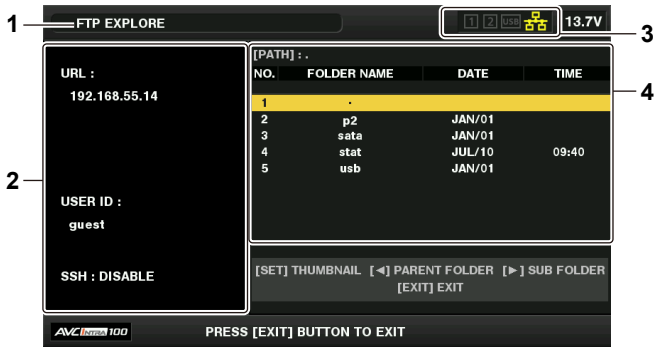
1 Press the <THUMBNAIL> button.

The thumbnail screen is displayed.

2 Select [FTP] in the main menu → [CLIP] → [EXPLORE].

The FTP explorer screen appears.

FTP explorer screen



1 Status indication
Indicates that the screen is the FTP explorer screen.

2 FTP server information
[URL]: The address of the connected FTP server
[USER ID]: ID of the user who has logged in
[SSH]: [ENABLE]/[DISABLE] indication of [SSH]

3 Media status
Indicates the P2 card insertion status, hard disk connection status, type, and network connection status.
For the indicators of media status, refer to “Status displays for card slot, storage device, and network connection” (page 107).

NOTE

- The display of the network status indicator is updated a few seconds behind the actual state.

4 Folder information
[PATH]: The path of the current folder on the FTP server
[NO.]: Folder number
[FOLDER NAME]: Folder name
[DATE]: Date of last update
[TIME]: Time of last update

NOTE

- The folder list displays only folders, and does not display ordinary files or link files.
- [.] indicates the current folder. No date and time information is displayed.
- The date and time information displays either local time or world standard time, which depends on the information from the FTP server. In some cases, only the year or time is displayed.
- Whether text is case sensitive or not depends on the FTP server.
- Folder names using multi-byte characters are not displayed correctly.
- Up to 100 folders can be displayed in one folder. The 101st folder and subsequent folders cannot be accessed from the FTP explorer screen. However, if you have directly entered the folder name in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [SERVER URL], you can access the folder even when it is the 101st or later.
- Connectivity and folder appearance may differ from those when connected to an FTP server with a computer, etc.

- Depending on the FTP server and the connection environment, error messages may not be displayed correctly.
- To discontinue the connection procedure, press the <SET> button.
- If an error occurs, perform the operation again.
- An error may occur when a network operation is performed immediately after inserting a LAN cable or connecting via wireless LAN, or when an operation is performed again immediately after cancelling the previous operation.
- If the connector error persists even after several operations, check first with the main menu → [NETWORK SETUP] → [NETWORK TOOLS] → [PING]. Note that connection to FTP may succeed even when [PING] fails. If connection cannot be established even after checking with PING, consult the system administrator in charge of the network environment.
- When [PING] fails, check the following items.
  - Network configuration is correct
  - LAN cable is correctly inserted
  - Hubs and routers in the path operates normally
- When connection is not established even after [PING] has succeeded, check the following items.
  - Server function services of the FTP server are running
  - There is not a firewall in the communication path
  - User ID and password that permits access to the FTP server have been set
- Some on-screen operations may not be possible for a while after the use of FTP client function has been cancelled.

Cursor button operation on the FTP explorer screen

▷: Contents of the subfolder at the cursor position are displayed.

◁: Contents of higher-level folder to the current folder are displayed.

△/▽: The cursor moves.

<SHIFT> button + cursor buttons (△/▽): Moves the cursor to the top/bottom folder on the list.

NOTE

- Depending on server operating specifications or access rights setting, folder contents or folder path may not be displayed correctly.
- The cursor position of the previous folder is stored. If an error occurs, the cursor position will be reset to the top folder.
- If a thumbnail has been displayed, only the cursor position in the previously displayed folder list will be stored.

FTP thumbnail screen

1 FTP server/folder information

[URL]: The address of the connected FTP server

[USER ID]: ID of the user who has logged in

[SSH]: [ENABLE]/[DISABLE] indication in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [SSH]

[PATH]: Path in the FTP server of the folder where currently displayed thumbnails are contained

[DATE]: Date of last update

[TIME]: Time of last update

NOTE

- When a proxy recording clip is displayed on the FTP explorer screen, [P.only] is displayed on the thumbnail. This is displayed only on proxy clips to indicate that the main recording video and audio data are not included.
- Press the <EXIT> button to return to the explorer screen.
- The 1001st clip and subsequent clips cannot be displayed.
- The date and time information displays either local time or world standard time, which depends on the information from the FTP server.
- Opening thumbnails using [.] will not display the date and time of the folder.

Deleting clips on the FTP server

Clips on the FTP server that are no longer necessary can be deleted in the same way as clips on P2 cards.

For details, refer to “Deleting clips” (page 113).

NOTE

- If you leave the FTP thumbnail screen displayed, the FTP server may be disconnected after a while. After the server has been disconnected, clips cannot be deleted. In this case, return to the FTP explorer screen, display the FTP thumbnail screen again, and then delete clips.

Viewing information of clips on FTP server

You can view metadata of clips on the FTP server.

The information and the procedure to display are the same as that of P2 card clip properties.

1 Move the cursor to the target clip on the FTP thumbnail screen.

The detailed information of a clip can be displayed and checked on the screen.

2 Select [CLIP PROPERTY] in the main menu → [CLIP] → [PROPERTY].

NOTE

- Metadata can be viewed but cannot be edited.
- If you leave the FTP thumbnail screen or clip properties displayed, the FTP server may be disconnected after a while. After the server has been disconnected, thumbnails may not be able to be displayed. In this case, return to the FTP explorer screen and display the FTP thumbnail screen again.

Transferring from a P2 card to an FTP server (copy)

Clips on P2 cards can be transferred to the FTP server.

1 Press the <THUMBNAIL> button.

The thumbnail screen is displayed.

2 Select a clip to be transferred.

3 Select [FTP] in the main menu → [CLIP] → [COPY].

If you copy only proxy recording, select [FTP(PROXY)] in the main menu → [CLIP] → [COPY].
The folders of FTP server are displayed.

4 Select the transfer destination folder using the cursor buttons.

Press the <SET> button while pressing the <SHIFT> button (<MULTI SEL>) to create a new folder in the current folder list. Numbers that indicate date and time are automatically entered as the name of the new folder. You can also use the software keyboard to set the folder name. However, some characters cannot be used depending on the FTP server. You cannot set a folder name that is same as an existing folder.

5 Move the cursor to [YES] and press the <SET> button.

Copying starts.
For the procedure to import by clips, refer to “Copying clips” (page 114).
When copying is completed, [COPY COMPLETED!] appears.

NOTE

- When proxy recording clips falling under the following categories are transferred to the FTP server, they are displayed separately in the server.
  - Recorded clips that exceed the continuous recording time in the memory card
  - Clips recorded across multiple memory cards
  - Clips recorded through one-clip recording
- Folder names using multi-byte characters are not displayed correctly.
- Depending on the number of clips on the server and network conditions, it may take some time to display thumbnails or to copy them.
- To cancel the copy process, use the cursor buttons to place the cursor on [CANCEL] and press the <SET> button. On the [CANCEL] confirmation message that appears, select [YES] and press the <SET> button. If the network has not been disconnected, the partially copied clips at the copy destination are deleted. If the network has been disconnected, incomplete clips may remain on the FTP server.
- After copying starts, disconnection errors will no longer be detected. Cancel the copy operation if the copying progress has stalled.
- Contact your FTP server administrator for the amount of free space on the FTP server in advance, as it cannot be checked automatically before copying starts.
- Whether an error is generated when the remaining capacity of the FTP server reaches 0 depends on the FTP server. If an error is not generated, cancel the copy operation.
- Clips cannot be copied to an FTP server destination folder that contains more than 1000 clips.
- To transfer clips using SSH, the FTP server must support SSH.
- Using SSH will reduce the transfer speed.
- To check the transfer result on a computer or another device, refreshing the display on the computer or another device may be necessary.

Writing back from an FTP server to a P2 card (copy)

You can write back the selected clips from an FTP server on the network to a P2 card.

1 Display the FTP thumbnail screen

2 Select a clip to be copied.

3 Select either of [SLOT 1]/[SLOT 2] in the main menu → [CLIP] → [COPY].

Copying starts.
When copying is completed, [COPY COMPLETED!] appears.

NOTE

- Only clips that include images and sounds of the main recording can be written back to the P2 card from the FTP server. Only proxy recording clips cannot be written back to the P2 card from the FTP server. (An error message [UNKNOWN CONTENTS FORMAT!] is displayed).
- Proxy recording clip only write-backs to an SD memory card is possible.
  Refer to “Writing back from an FTP server to an SD memory card (import)” (page 201) for the writing back procedure.

This function cannot be used in normal applications such as playback and metadata editing only for proxy recording clips that do not include images and sounds of the main recording.
- Depending on the number of clips on the server and network conditions, it may take some time to display thumbnails or to copy them.
- To cancel the copy process, use the cursor buttons to place the cursor on [CANCEL] and press the <SET> button. On the [CANCEL] confirmation message that appears, select [YES] and press the <SET> button. Clips copied halfway to the copy destination are deleted.
- After copying starts, disconnection errors will no longer be detected. Cancel the copy operation if the copying progress has stalled.
- Clips cannot be copied to the copy destination P2 card folder that contains more than 1000 clips.
- To transfer clips using SSH, the FTP server must support SSH.
- Using SSH will reduce the transfer speed.
- After an error occurred during an operation such as copying, the FTP server may be disconnected and the operation can no longer be continued. In this case, return to the FTP explorer screen, display the FTP thumbnail screen again, and then restart the copying or another operation.

Transferring from an SD memory card to an FTP server (export)

You can collectively transfer the data in an SD memory card to the FTP server.

1 Press the <THUMBNAIL> button.

The thumbnail screen is displayed.

2 Select [SD CARD] in the main menu → [CLIP] → [EXPORT].

The folders of FTP server are displayed.

3 Select the transfer destination folder using the cursor buttons.

Press the <SET> button while pressing the <SHIFT> button (<MULTI SEL>) to create a new folder in the current folder list. Numbers that indicate date and time are automatically entered as the name of the new folder. You can also use the software keyboard to set the folder name. However, some characters cannot be used depending on the FTP server. You cannot set a folder name that is same as an existing folder.

4 Move the cursor to [YES] and press the <SET> button.

Exporting starts.
[COPY COMPLETED!] is displayed when exporting is completed.

NOTE

- You cannot select clips to be exported.
- Folder names using multi-byte characters are not displayed correctly.
- Depending on factors such as the number of files, file sizes, and network conditions, exporting may take time.
- To discontinue the export process, press the <SET> button. On the [CANCEL] confirmation message that appears, select [YES] and press the <SET> button. If the network has not been disconnected, the partially exported files remaining on the FTP server are deleted. If the network has been disconnected, incomplete files may remain on the FTP server.
- After exporting starts, disconnection errors will no longer be detected. Cancel the export operation if the copying progress has stalled.
- Contact your FTP server administrator for the amount of free space on the FTP server in advance, as it cannot be checked automatically before exporting starts.
- Whether an error is generated when the remaining capacity of the FTP server reaches 0 depends on the FTP server. If an error is not generated, cancel the export operation.
- If existing folders are selected and a file that has the same path name as data in the SD memory card is included in the selected folders, the file is overwritten. However, if the path names are the same but the types differ (folder and file), an error is generated.
- To prevent unintended overwriting, create new folders to export data whenever possible.
- To transfer clips using SSH, the FTP server must support SSH.
- Using SSH will reduce the transfer speed.

Writing back from an FTP server to an SD memory card (import)

You can write back the selected folders from an FTP server on the network to an SD memory card.

1 Display the FTP explorer screen.

The folders of the server that has been set are displayed.

2 Select folders to be written back.

3 Select [SD CARD] in the main menu → [CLIP] → [IMPORT].

A confirmation message appears. Select [OK] to start writing back to the SD memory card.
When writing back is completed, [COPY COMPLETED!] appears.

NOTE

- To cancel the writing back process, press the <SET> button. On the [CANCEL] confirmation message that appears, select [YES] and press the <SET> button. Files partially written back in the SD memory card are deleted, but successfully written files remain.
- After writing starts, disconnection errors will no longer be detected. Cancel the import operation if the copying progress has stalled.
- Depending on factors such as the number or sizes of files in the selected folder, and network conditions, writing back may take time.
- Any files with the same path names as the one in the SD memory card will be overwritten. However, if the path names are the same but the types differ (folder and file), an error is generated.
- To prevent unintended overwriting, format the SD memory card before writing back whenever possible.
- To transfer clips using SSH, the FTP server must support SSH.
- Using SSH will reduce the transfer speed.

Rec during upload function

Clips recorded in the P2 card can be automatically transferred to a server device on the network during recording/playback with the camera.
The rec during upload function has the following two modes:

- Automatic transfer mode: After the rec during upload function is enabled, uploads recorded clips automatically in order.
- Manual selection mode: Uploads clips selected beforehand.

To use the rec during upload function, network settings and FTP client settings need to be configured beforehand.

Transferring recorded clips automatically (automatic transfer mode)

1 Establish the network connection between the camera and a server device.

Perform the setting referring to “FTP client function setting” (page 197).

2 Set the camera’s main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [REC DURING UPLOAD] to [ENABLE].

3 Select the type of the clip to upload in the camera’s main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [AUTO COPY].

[REC CLIP(PROXY)]: Upload target is proxy data of recorded clips.
[REC CLIP]: Upload target is recorded clips (main recording data and proxy data).
[DISABLE]: Recorded clips are not upload targets.

4 Shoot.

Clips are registered in the upload list immediately after recording is stopped, and then recorded clips are automatically transferred.
The viewfinder or LCD monitor shows the operation status of the rec during upload function. In addition, the thumbnail screen shows the operation status of the rec during upload function and the transfer status of clips.

NOTE

- Uploading of the clip will start after the rec during upload function is enabled. To prevent the upload error, do not remove the card from the P2 memory card slot and the microP2 memory card slot until the upload is completed.
- Up to 100 clips can be registered in the upload list for the upload of clips. Clips exceeding 100, excluding the uploaded clips and clips failed to upload cannot be registered.
- While recording is stopped, you can add recorded clips to transfer. Select the clips to transfer by selecting the main menu → [CLIP] → [COPY] → [FTP] or [FTP(PROXY)] from the thumbnail screen. The selected clips are registered in the upload list.
- Clips are also automatically transferred during recording, playback, and thumbnail display.
- The dividing unit of the recording files will become smaller when [SHORT] is selected in the main menu → [RECORDING SETUP] → [FILE SPLIT] while the rec during upload function is used, allowing to make the timing to start the clip transfer earlier while recording.
- If the network is disconnected during transfer, or the power of the camera is turned off and on again, transfer resumes in clip units.
- Only the recorded clip in the slot 1 is automatically transferred during the simultaneous recording.
- Clips of interval recording, loop recording, one-clip recording, and one-shot recording are not automatically transferred.
- While the rec during upload function is enabled, the last clip delete function is disabled.
- While the rec during upload function is enabled, the streaming function is disabled.
- The directory on the FTP server is not listed in the FTP explorer screen during the transmission or waiting to transmit the clips registered in the upload list.
- The setting value in the main menu → [NETWORK SETUP] cannot be changed or initialized while the rec during upload function is set enabled.
- The copying between the P2 cards will not operate during the transmission or waiting to transmit the clips registered in the upload list.
- The clip delete function will not operate during the transmission or waiting to transmit the clips registered in the upload list.
- The format function of the P2 card will not operate during the transmission or waiting to transmit the clips registered in the upload list.

Transferring selected clips automatically (manual selection mode)

Fig. 1

1 Establish the network connection between the camera and a server device.

Perform the setting referring to “FTP client function setting” (page 197).

2 Set the camera’s main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [REC DURING UPLOAD] to [ENABLE].

3 Select [DISABLE] in the camera’s main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [AUTO COPY].

4 Select the clips to transfer by selecting the main menu → [CLIP] → [COPY] → [FTP] or [FTP(PROXY)] from the thumbnail screen. (Fig. 1)

Selected clips are registered in the upload list, and transferred automatically.
The transfer status of the clip registered in the upload list can be checked in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [UPLOAD LIST].
The viewfinder or LCD monitor shows the operation status of the rec during upload function. In addition, the thumbnail screen shows the operation status of the rec during upload function and the transfer status of clips.

NOTE

- The clips selected with the manual selection mode will be transferred prioritized to the clips registered to the upload list with the automatic transfer mode.
- Uploading of the clip will start after the rec during upload function is enabled. To prevent the upload error, do not remove the card from the P2 memory card slot and the microP2 memory card slot until the upload is completed.
- Up to 100 clips can be registered in the upload list for the upload of clips. Clips exceeding 100, excluding the uploaded clips and clips failed to upload cannot be registered.
- Clips are also automatically transferred during recording, playback, and thumbnail display.
- The dividing unit of the recording files will become smaller when [SHORT] is selected in the main menu → [RECORDING SETUP] → [FILE SPLIT] while the rec during upload function is used, allowing to make the timing to start the clip transfer earlier while recording.
- If the network is disconnected during transfer, or the power of the camera is turned off and on again, transfer resumes in clip units.
- While the rec during upload function is enabled, the last clip delete function is disabled.
- While the rec during upload function is enabled, the streaming function is disabled.
- The directory on the FTP server is not listed in the FTP explorer screen during the transmission or waiting to transmit the clips registered in the upload list.
- The setting value in the main menu → [NETWORK SETUP] cannot be changed or initialized while the rec during upload function is set enabled.
- The copying between the P2 cards will not operate during the transmission or waiting to transmit the clips registered in the upload list.
- The clip delete function will not operate during the transmission or waiting to transmit the clips registered in the upload list.
- The format function of the P2 card will not operate during the transmission or waiting to transmit the clips registered in the upload list.

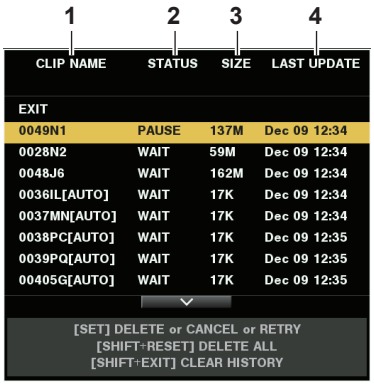
Displaying the upload list

The upload list allows you to check the transfer status of clips to be uploaded.

1 Select the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [UPLOAD LIST].

The upload list is displayed.

Upload list screen



1 [CLIP NAME]
Displays clip names. For the clip where automatic transfer is set, [AUTO] is displayed after the clip name.

2 [STATUS]
Displays the upload status.
[OK]: Uploaded
[ERROR]: Upload failed
[PAUSE]: Preparing the upload
[COPY]: Uploading
[WAIT]: Waiting for upload

3 [SIZE]
Displays the file size.

4 [LAST UPDATE]
Displays the date and time when the [STATUS] display was changed.

Operations on the upload list screen

You can delete, cancel, or re-transfer items from the upload list.

1 Select an item from the upload list.

2 Perform one of the following operations.

- To delete an item, select [DELETE] with the control stick.
- To cancel upload, select [CANCEL] with the control stick.

- To re-transfer an item, select [RETRY] with the control stick.
- To delete all items, press the <SHIFT> button and the <RESET> button simultaneously. The confirmation screen is displayed, so select [YES] using the control stick. The current log of the clip information registered to the upload list will also be deleted at this time.
- To delete the history (items where [STATUS] is [OK] or [ERROR]), press the <SHIFT> button and <EXIT> button simultaneously. The confirmation screen is displayed, so select [YES] using the control stick.

NOTE

- The screen is not updated when the [STATUS] display is changed while the upload list is displayed.
- Save up to the latest 1000 logs for clip information (month and date, clip number (global clip ID), status) registered in the upload list to an SD memory card.

Chapter 11 Maintenance

Maintenance and error messages of the camera are described.

Warning system

If an error is detected immediately after the camera is turned on or during operation, the viewfinder, <WARNING> lamp, and tally lamp indicate the error. Deal with the error by following the indications.

Cases indicated by error codes

Error code	Display	Description	Behavior and cause
[E-30]	[TURN POWER OFF] [P2 CARD]	An error occurred in the camera built-in memory because the P2 card being accessed was ejected. • Tally lamp flashes four times per second. • <WARNING> lamp flashes four times per second.	• Cannot operate. • Follow the message to turn off the power once and turn on the power again. • Ensure that there is no error in the clips on the ejected card, and restore the clips as necessary.
[E-31]	[TURN POWER OFF] [SYSTEM MODE]	System mode error occurred. • Tally lamp flashes four times per second. • <WARNING> lamp flashes four times per second.	• Cannot operate. • Follow the message to turn off the power once, turn on the power again, and check that there is no error display.
[E-33]	[SYSTEM ERROR] [CAMERA]	Camera unit error occurred. • Tally lamp flashes four times per second. • <WARNING> lamp flashes four times per second.	• The operation stops. • Contact your dealer.
[E-35]	[SYSTEM ERROR] [CODEC]	Codec control error occurred. • Tally lamp flashes four times per second. • <WARNING> lamp flashes four times per second.	• The operation stops. • Contact your dealer.
[E-36]	[SYSTEM ERROR] [P2 SYSTEM]	P2 system error occurred. • Tally lamp flashes four times per second. • <WARNING> lamp flashes four times per second.	• The operation stops. • Contact your dealer.
[E-37]	[SYSTEM ERROR] [P2CS]	P2CS microcomputer error occurred. • Tally lamp flashes four times per second. • <WARNING> lamp flashes four times per second.	• The operation stops. • Contact your dealer.
[E-39]	[SYSTEM ERROR] [INITIALIZE]	Video initialization error occurred. • Tally lamp flashes four times per second. • <WARNING> lamp flashes four times per second.	• The operation stops. • Contact your dealer.
[E-63]	No display	System control microcomputer error occurred. • Tally lamp flashes four times per second. • <WARNING> lamp flashes four times per second.	• The operation stops. • Contact your dealer.
[E-64]	[SYSTEM ERROR] [FRAME SIGNAL] (or no display)	Reference signal error occurred. • Tally lamp flashes four times per second. • <WARNING> lamp flashes four times per second.	• The operation stops. • Contact your dealer.

Cases indicated by error messages

During recording/playback

Display	Description	Behavior and cause
[AUTH NG CARD] (slot number)	CPS authentication of microP2 memory card has failed. The microP2 memory card whose CPS authentication failed cannot be recorded or played back.	• The current operation will continue. • Select [AUTHENTICATE] in the main menu → [CLIP], and enter the password.
[BACKUP BATT EMPTY]	Displays any reduced voltage detected on the backup battery in the internal clock when the power is turned on.	• The current operation will continue. • Charge the built-in battery.
[CARD ERROR] (slot number)	Displayed when an data error caused by the P2 card occurs during recording. Displayed after recording stops until the next operation. Also displayed for three seconds during playback when a P2 card error causes playback to stop. • If the error occurs during recording, the tally lamp and <WARNING> lamp flash four times per second for approx. three seconds after recording stops. • The tally lamp does not flash when an error occurs during playback.	• The operation will stop. • After it stops, the P2 card on which the error occurred is write-protected. Replace the P2 card of the slot where the error occurred.
[CLIP DISCONTINUED]	Displayed when clips cannot be linked with the subsequent recording operations due to the inconsistency as linked clips during recording in one-clip recording mode.	• The current operation will continue.
[DIR NG CARD] (slot number)	The directory position is not correct.	• The current operation will continue. • Make a card backup immediately and format the card to use it again.
[PB INTERMITTENT]	Playback is interrupted on the SDHC/SDXC memory card. A card whose playback performance cannot be assured is inserted.	• The current operation will continue. • Use of microP2 or P2 memory card is recommended.

Display	Description	Behavior and cause
[PROXY ERROR]	An error occurred in the internal proxy module.	• The current operation will continue. • Turn off the camera and turn on it again to check the recording and playback. If the error continues to occur, please consult your dealer.
[PROXY REC WARNING]	A proxy data recording error occurred.	• The current operation will continue. • Turn off the camera and turn on it again to check the recording and playback. If the error continues to occur, please consult your dealer.
[REC IMPOSSIBLE] (slot number)	A SDHC/SDXC memory card inserted in a microP2 card adaptor is inserted into the P2 memory card slot. Recording to the SDHC/SDXC memory card is disabled.	• The current operation will continue. • Record to microP2 or P2 memory cards.
[REC WARNING] [FRAME SIGNAL]	Displayed when a video or audio error occurs during recording. • Tally lamp flashes four times per second during continuous recording.	• The current operation will continue. When input signals are disrupted, recording continues while disrupted images are recorded. Check the signal to be input to the camera. • Turn off the power and on before using it again.
[REC WARNING] [OVER MAX# CLIPS]	Displayed when attempting to record in excess of the maximum total number of clips allowed for one P2 card. • The tally lamp and <WARNING> lamp flash four times per second during continuous recording.	• The operation will stop. • Replace the P2 card or delete unnecessary clips.
	Displayed after approximately 3.5 hours has elapsed from the time when operation to start a single recording is executed, when [SHORT] is selected in the main menu → [RECORDING SETUP] → [FILE SPLIT].	• The operation will stop.
[REC WARNING] [PULL DOWN]	(Occurs during recording) The video pull-down sequence and time code values are not synchronized. • Tally lamp flashes four times per second during continuous recording.	• The current operation will continue. • Check the signal.
[REC WARNING] [PULL DOWN ERROR]	(Occurs at times other than during recording) The video pull-down sequence and time code values are not synchronized.	• The current operation will continue. • Check the signal.
[REC WARNING] [REC DATA]	Displayed when an error occurs in recorded data during recording. • The tally lamp and <WARNING> lamp flash four times per second during continuous recording.	• The operation will continue or stop. • Turn off the power and on before using it again.
[RUNDOWN CARD] (slot number)	The maximum number of overwrites has been exceeded.	• The current operation will continue. • Replacement of the P2 card is recommended.
[CHECK SLOT] (slot number)	The memory card may not be recognized correctly due to reasons such as the P2 memory card being inserted slowly or the terminal of the memory card may be dirty.	• The current operation will continue. Recording cannot be performed on the inserted P2 memory card. • Check the P2 memory card that is inserted.
[TEMPORARY PAUSE] [IRREGULAR SIG]	Correct recording is not possible due to disruption of input signals of the <GENLOCK IN> or <SDI OUT/ IN (OP)> terminal, etc., and recording is suspended temporarily. The clip will be divided. • Tally lamp flashes four times per second during continuous recording.	• The operation will pause. • Recording resumes when the signal returns to normal. However, during loop recording, recording does not resume.
[WIRELESS-RF]	Audio wireless reception status is poor. • The tally lamp flashes four times per second during continuous recording. • The <WARNING> lamp flashes four times per second during continuous recording and recording standby.	• The current operation will continue.
[UP LIST #99/100]	The number of registrations in the upload list of the rec during upload function has reached 99.	• The current operation will continue. One more clip to the upload list can be registered. Delete unnecessary clips in the upload list.
[UP LIST #100/100]	The number of registrations in the upload list of the rec during upload function has reached the upper limit.	• The current operation will continue. When more additional clips need to be registered, delete unnecessary clips in the upload list.
[UP LIST OVER MAX #]	Clips cannot be added for registration because the number of registrations in the upload list of the rec during upload function has reached the upper limit.	• The current operation will continue. When additional clips need to be registered, delete unnecessary clips in the upload list.

During thumbnail and menu operation

Display	Description	Behavior and cause
[AUTHENTICATION ERROR!]	Manual authentication failed.	Enter the correct password.
[CANNOT ACCESS!]	Data cannot be accessed due to a content defect or some other reason.	Ensure the health of the media and the clips.
[CANNOT CHANGE!]	For a clip with the ! mark, where a thumbnail cannot be generated, the thumbnail cannot be modified in the text memo position.	Correct the settings and content to enable display of the thumbnail.

Display	Description	Behavior and cause
[CANNOT DELETE!]	The content versions do not match. Cannot delete.	Match the device and contents version.
[CANNOT FORMAT!]	A P2 card problem or some other reason prevents formatting.	Check the P2 card.
[CANNOT RE-CONNECT!]	Clips cannot be remerged because either clips not recorded across multiple P2 cards are selected or other reasons.	Check the selected content.
[CANNOT REPAIR IN SELECTION!]	Some of the selected clips cannot be repaired.	Check the selected content.
[CANNOT REPAIR!]	Content that cannot be repaired is selected.	Check the selected content.
[CANNOT SAVE!][FILE NAME IN USE]	A settings file of the same name exists on the SD memory card.	Use another name to save the file.
[CARD FULL!]	The P2 card or SD memory card is full.	Insert a card with free space available.
[COPY IMPOSSIBLE. TOO LARGE CLIP CONTAINED!] [CLIP NAME:] (clip name)	Files exceeding 4 GB cannot be copied to P2 memory cards or microP2 memory card with 32 GB or smaller capacity.	Copy to a microP2 memory card with 32 GB or larger capacity.
[INVALID VALUE!]	The data value you entered is invalid.	Enter data within the normal range.
[INVALID DELETE]	The clip recorded last cannot be deleted with the last clip delete function.	To close the dialog, press the [SET] button. For details on conditions that clip cannot be deleted, refer to “Final clip delete function” (page 104).
[LACK OF CAPACITY!]	There is not enough recording capacity left on the card.	Insert a card with sufficient recording capacity.
[MISSING CLIP!]	Shot marks cannot be attached to the clips unless all clips recorded over multiple P2 cards are present.	Insert all P2 cards over which recording extended.
[NO CARD!]	No P2 or SD memory card is inserted.	Insert the relevant media.
[NO COPY TO SAME CARD!]	A clip cannot be copied to the card storing the original clip.	Copy the selected clip to a card that does not contain the original clip.
[NO FILE!]	The specified file does not exist.	Check the file.
[NO INPUT!]	No data is entered.	Enter data and then set.
[NO SD CARD!]	No SD memory card.	Insert an SD memory card.
[NOT SELECTED!]	Attempted to delete without selecting clips.	Select clips to delete.
[SAME CLIP IS SELECTED!]	Multiple instances of the same clip (copies) are included in the clips selected.	Multiple instances of the same clip (copies) cannot be copied simultaneously. Remove instances of the same clip from selected items.
[TOO MANY CLIPS!]	Too many clips are selected.	Reduce the number of selected clips.
[UNKNOWN CONTENTS FORMAT!]	This is a warning of the contents for the version that is not supported by the camera.	Match the device and content versions.
	You cannot write back only proxy recording clips from the FTP server to the P2 card.	Write back (import) proxy recording clips to an SD memory card.
[UNKNOWN DATA!]	The metadata character code is invalid.	The metadata character code is UTF-8. Enter valid characters using a viewer.
	There is a problem with data in the file.	Create the file again.
[USER CLIP NAME MODIFIED!]	When adding a counter value to the clip name, characters must be deleted.	For the counter addition setting, the user clip name plus the counter value can only contain up to 100 bytes. Characters in the clip name are automatically deleted when the total number of characters exceeds this limit.
[WRITE PROTECTED!]	The P2 card or SD memory card is write-protected.	Insert write-accessible media.
[CANNOT OPERATE THIS MENU, WHILE "REC DURING UPLOAD" ENABLED.]	The menu cannot be executed.	Set [DISABLE] in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [REC DURING UPLOAD] before execution.

During soft keyboard operation

Display	Description	Behavior and cause
[AUTHENTICATION ERROR!]	Manual authentication failed.	Enter the correct password.
[CANNOT CHANGE!]	An attempt is made to enter the [PERSON] item (user who enters the memo) when there is no text memo.	Enter the [TEXT] (text information) first.
[CANNOT SET!] [INVALID VALUE!]	The entered value is invalid.	Change the input value.
[CANNOT SET!] [NO INPUT!]	There is not input to the software keyboard.	Enter the password.
[CANNOT SET!] [RETRY PASSWORD IS DIFFERENT!]	The re-entered password is different.	Enter the correct reference password.

During USB host mode

Message	Description	Measure
[CANNOT ACCESS CARD!]	An error occurred while accessing the P2 card.	Check the P2 card.
[CANNOT ACCESS TARGET!]	An error occurred while accessing the connection target.	Check the storage device status and connection.
[CANNOT COPY!][FORMAT STORAGE DEVICE TO FAT]	The partition that can copy clips does not exist on the storage device.	Reformat in FAT format, or export the P2 card to create a partition.
[CANNOT FORMAT!]	The storage device cannot be formatted.	Change the connected storage device.

Message	Description	Measure
[CANNOT RECOGNIZE STORAGE DEVICE!]	The storage device is not correctly recognized.	Reboot the storage device or connect another storage device.
[CANNOT SELECT!][MAX. 6 PARTITIONS]	Storage devices with more than six partitions cannot be selected (mounted simultaneously).	Release selected partitions.
[CARD IS EMPTY! CANNOT COPY!]	The P2 card to copy is empty.	The copy operation is not performed because the card is empty.
[FORMAT P2 CARD!]	Cannot import to a P2 card containing clips.	Format the P2 card.
[LACK OF CAPACITY!]	Not enough space left on the storage device.	Use a new storage device with sufficient available space or a formatted storage device.
[MISMATCH COMPONENT!]	The P2 card model number of the copy source and copy destination do not match. Cannot copy.	Use the P2 cards of the same model number, or import on a clip basis.
[STORAGE DEVICE DISCONNECTED!]	The connection with the storage device is disconnected.	Reconnect the USB cable to the <USB2.0> terminal (host). When it does not function normally after that, turn off the power once and turn on the power again.
[TOO MANY PARTITIONS!]	There are too many partitions.	The maximum number of partitions on the storage device is 23. Either reformat, or use a new storage device.
[UNKNOWN DEVICE CONNECTED!]	A non-compatible DVD drive or other device is connected.	Change the connected device to the correct storage device, and then turn off the power once and turn on it again.
[VERIFICATION FAILED!]	The compare check performed after copying failed.	Copy it again.

Network

Message	Description	Measure
[CANNOT CONNECT!]	A connection to the network cannot be established.	Check that the LAN settings are correct. Check that the LAN cable is connected correctly and the network you use is running.
[CANNOT FIND FTP-SERVER!]	The connection destination FTP server cannot be found.	Check that the setting in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [SERVER URL] is correct.
[LOGIN FAILED!]	Logging in to the connection destination FTP server failed.	Check that the settings in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [LOGIN USER] and [LOGIN PASSWORD] are correct.
[PING FAILED!]	The [PING] failed.	Check that the LAN setting and the setting in the main menu → [NETWORK SETUP] → [FTP CLIENT SERVICE] → [SERVER URL] are correct. Check that the LAN cable is connected correctly and the network you use is running.
[CANNOT ACCESS GATEWAY!]	The gateway server cannot be accessed.	Check that the LAN settings are correct.
[CHECK LAN SETTING]	The gateway server cannot be accessed.	Check that the LAN settings are correct.
[IP ADDRESS IS USED!]	The set IP address is being used by another device.	Consult your network administrator and set another IP address.
[INVALID VALUE!]	The entered data value is invalid.	Enter data in a valid range.
[ENCRYPTION IS NOT SUPPORT!]	Encryption is not supported.	Check the encryption setting on the destination.

Updating the camera firmware

Check the version of the camera in the main menu → [DIAGNOSTIC] → [VERSION], access the latest information on the firmware from the website described in NOTE, and then download the firmware as needed.

NOTE

- Update completes by loading the downloaded files to the camera via the SD memory card. For details on update, visit the support desk at the following website:
  http://pro-av.panasonic.net/

Chapter 12 Additional Functions from the Optional Board

This chapter describes the optional board that can be installed to the camera.

HD/SD SDI input board (AG-YA600G)

High-quality recording through the digital input is possible using the <SDI OUT/IN (OP)> terminal by installing the HD/SD SDI input board AG-YA600G (optional).

When installing the board, consult the shop of purchase. For instructions to install the board, refer to the installation guide supplied with the HD/SD SDI input board.

■ HD/SD SDI input board (AG-YA600G)

- SDI input settings

To record SDI input signal on the camera, select [SDI] in the main menu → [SYSTEM MODE] → [REC SIGNAL]. (page 132)

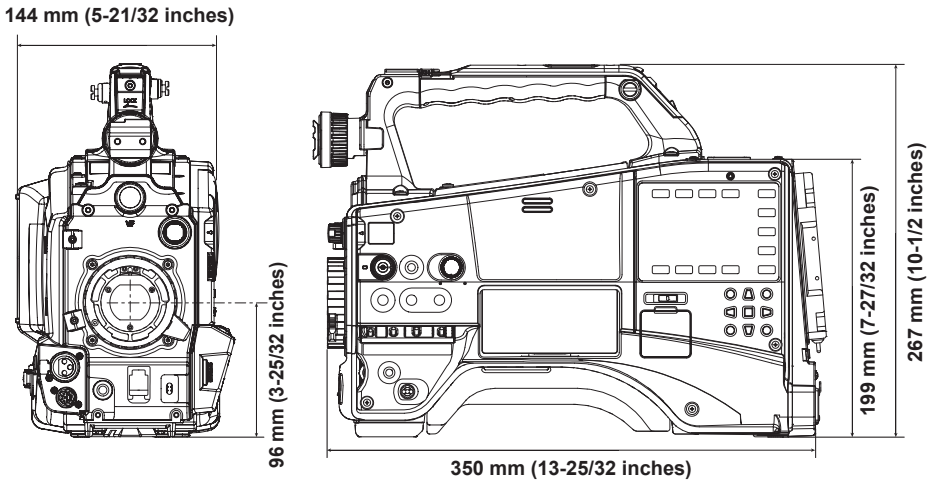
Item	Description of settings
[REC SIGNAL]	Switches the input signal. At this time, SDI signal is output from the <SDI OUT/IN (OP)> terminal. **[CAM]:** Records the camera shooting signal of the camera. **[SDI]:** Record the input from the <SDI OUT/IN (OP)> terminal. • Factory setting: [CAM] Once the power is turned off, it is always set to [CAM] the next time power is turned on.

Chapter 13 Specification

This chapter describes the specifications of this product.

Specifications

Dimensions



Specifications

General

Power
DC ⎓ 12 V (11.0 V – 17.0 V)
Power consumption
22 W (body only or when the optional board AG-YA600G is installed)

▭ indicates safety information.

Ambient operating temperature	0 °C – 40 °C (32 °F – 104 °F)
Ambient operating humidity	10% – 85% (relative humidity)
Storage temperature	–20 °C – 60 °C (–4 °F – 140 °F)
Weight	Approx. 2.8 kg (6.2 lbs.) (body only, excluding the battery and accessories)
Dimensions (W×H×D)	Body only 144 mm×267 mm×350 mm (5-21/32 inches×10-1/2 inches×13-25/32 inches) (excluding protrusion)

Camera unit

Pickup device	2/3-type 2.2 million pixels, MOS×3
Lens mount	2/3-type bayonet
ND filter	1: <CLEAR>, 2: <1/4ND>, 3: <1/16ND>, 4: <1/64ND>
Gain	[NORMAL] mode • –3, 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30 dB [HIGH SENS.] mode • –6, –3, 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30 dB
Super gain (S.GAIN)	Can select from 30, 36, 42 dB
Shutter speed	• 60i/60p mode: 1/60 (shutter off), 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000 sec. • 30p mode: 1/30 (shutter off), 1/50, 1/60, 1/120, 1/250, 1/500, 1/1000 sec. • 24p mode: 1/24 (shutter off), 1/50, 1/60, 1/120, 1/250, 1/500, 1/1000 sec. • 50i/50p mode: 1/50 (shutter off), 1/60, 1/120, 1/250, 1/500, 1/1000, 1/2000 sec. • 25p mode: 1/25 (shutter off), 1/50, 1/60, 1/120, 1/250, 1/500, 1/1000 sec.

Slow shutter speed	• 60i/60p mode: 1/15, 1/30 sec. • 30p mode: 1/15 sec. • 24p mode: 1/12 sec. • 50i/50p mode: 1/12.5, 1/25 sec. • 25p mode: 1/12.5 sec.
Synchro scan shutter	• 60i/60p mode: 1/60.0 – 1/250.0 sec. • 30p mode: 1/30.0 – 1/250.0 sec. • 24p mode: 1/24.0 – 1/250.0 sec. • 50i/50p mode: 1/50.0 – 1/250.0 sec. • 25p mode: 1/25.0 – 1/250.0 sec.
Shutter open angle	Configurable between 3 deg and 360.0 deg (in 0.5 deg steps)
Sensitivity	• [NORMAL] mode F9 (2000 lx, 3200 K, 89.9% reflection, 1080/59.94i) F10 (2000 lx, 3200 K, 89.9% reflection, 1080/50i) • [HIGH SENS.] mode F12 (2000 lx, 3200 K, 89.9% reflection, 1080/59.94i) F13 (2000 lx, 3200 K, 89.9% reflection, 1080/50i)
Minimum subject illumination	Approx. 0.004 lx ([HIGH SENS.] mode, F1.4, +42 dB (S.GAIN), [1S.EXP.] mode)
Image S/N	62 dB (standard)
Horizontal resolution	1000 TV or higher (center)

Memory card recorder

Recording media	P2 memory card, microP2 memory card (microP2 card adaptor required)
System format	1080/59.94i, 1080/23.98psF, 720/59.94p, 480/59.94i 1080/50i, 720/50p, 576/50i
Recording format	AVC-Intra 100/AVC-Intra 50 AVC-LongG 50/AVC-LongG 25/AVC-LongG 12 Switching DVCPRO HD/DVCPRO50/DVCPRO/DV formats
Recording video signal	1080/59.94i, 1080/29.97pN, 1080/23.98pN 720/59.94p, 720/29.97pN, 720/23.98pN 480/59.94i, 480/29.97p 1080/50i, 1080/25pN 720/50p, 720/25pN 576/50i, 576/25p
Recording and playback time	• AVC-Intra 100/DVCPRO HD 16 GB×1 approx. 16 min 32 GB×1 approx. 32 min 64 GB×1 approx. 64 min • AVC-Intra 50/AVC-LongG 50/DVCPRO50 16 GB×1 approx. 32 min 32 GB×1 approx. 64 min 64 GB×1 approx. 128 min • AVC-LongG 25/DVCPRO/DV 16 GB×1 approx. 64 min 32 GB×1 approx. 128 min 64 GB×1 approx. 256 min • AVC-LongG 12 16 GB×1 approx. 120 min 32 GB×1 approx. 240 min 64 GB×1 approx. 480 min
	Figures are for continuous recording as one clip. Depending on the number of clips, the overall recording time may be shorter than the above.

Digital video

Sampling frequency	• AVC-Intra 100/AVC-LongG 50/AVC-LongG 25/AVC-LongG 12/DVCPRO HD Y: 74.1758 MHz, P_B/P_R: 37.0879 MHz (59.94 Hz) Y: 74.2500 MHz, P_B/P_R: 37.1250 MHz (50 Hz) • DVCPRO50 Y: 13.5 MHz, P_B/P_R: 6.75 MHz • DVCPRO Y: 13.5 MHz, P_B/P_R: 3.375 MHz
Quantizing	• AVC-Intra 100/AVC-Intra 50/AVC-LongG 50/AVC-LongG 25: 10 bits • AVC-LongG 12/DVCPRO HD/DVCPRO50/DVCPRO/DV: 8 bits
Video compression format	• AVC-Intra 100/AVC-Intra 50: MPEG-4 AVC/H.264 Intra Profile • AVC-LongG 50/AVC-LongG 25/AVC-LongG 12: MPEG-4 AVC/H.264 • DVCPRO HD/DVCPRO50/DVCPRO: DV-Based Compression • DV: DV Compression

Digital audio

Recording audio signal	• AVC-Intra 100/ AVC-Intra 50: 48 kHz/16 bits, 4CH and 48 kHz/24 bits, 4CH switch • AVC-LongG 50/AVC-LongG 25: 48 kHz/24 bits, 4CH • AVC-LongG 12/DVCPRO HD/DVCPRO50/DVCPRO/DV: 48 kHz/16 bits, 4CH
Headroom	18 dB/20 dB switchable menu

AVC proxy

Video compression format	H.264/AVC Baseline Profile H.264/AVC High Profile
Audio compression format	AAC-LC Linear PCM
Approximate recording time (1 GB)	• AVC-G6 2CH MOV: Approx. 13 min • SHQ 2CH MOV: Approx. 25 min • HQ 2CH MOV: Approx. 78 min • LOW 2CH MOV: Approx. 135 min
	These are reference values for continuous recording using the Panasonic products. The recording time may differ depending on the scene or the number of clips.

Video input/output

<SDI OUT/IN (OP)> terminal	BNC×1
	HD SDI (1.5G), SD SDI: 0.8 V [p-p], 75 Ω
<MON OUT> terminal	BNC×1
	Can be switched to HD SDI/SD SDI/analog composite on SmartUI
	HD SDI (1.5G), SD SDI: 0.8 V [p-p], 75 Ω Composite: 1.0 V [p-p], 75 Ω
<HDMI> terminal	HDMI×1 (HDMI type A terminal, not compatible with VIERA Link)

Audio input/output

<AUDIO IN CH1/3>, <AUDIO IN CH2/4> terminals	XLR×2, 3-pin <LINE>/<MIC> switch selection • <LINE>: 0 dBu • <MIC>: –50/–60 dBu (menu selection), <+48V>/<OFF> (switch selection)

<MIC IN> terminal	XLR×1, 3-pin +48 V supported (menu selection) –40/–50/–60 dBu (menu selection)
Wireless slot	25-pin, D-SUB, –40 dBu, 2ch supported
<AUDIO OUT> terminal	Pin jack×2 (CH1, CH2) Output level: 600 Ω, 316 mV
<PHONES> terminal	3.5 mm diameter stereo mini jack ×1
Speaker	20 mm diameter, round ×1

Other input/output

<GENLOCK IN> terminal	BNC×1, 1.0 V [p-p], 75 Ω
<TC IN/OUT> terminal	BNC×1 Used as the input and output terminals (menu selection) • Input: 0.5 V – 8.0 V [p-p], 10 kΩ • Output: 2.0 V ± 0.5 V [p-p], low impedance
<LAN> terminal	100BASE-TX/10BASE-T
<USB2.0> terminal (device)	Type B connector, 4-pin
<USB2.0> terminal (host)	Type A connector, 4-pin
<USB2.0> terminal (sub-host)	Type A connector, 4-pin (for the wireless module)
<DC IN> terminal	XLR×1, 4-pin, DC 12 V (DC 11.0 V – 17.0 V)
<DC OUT> terminal	4-pin, DC 12 V (DC 11.0 V – 17.0 V), maximum output current 1.5 A
<REMOTE> terminal	10-pin
<LENS> terminal	12-pin
<VF> terminal	20-pin

Options

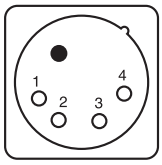
HD/SD SDI input board	AG-YA600G
Wireless module	AJ-WM30, AJ-WM50

Supported formats when the HD/SD SDI input board (AG-YA600G) is installed

Weight	Approx. 13 g (0.03 lbs.)
Dimensions (W×H×D)	70 mm×50 mm×7 mm
Video format (complies to the AJ-PX800G video format)	HD: 1080/59.94i, 1080/50i, 720/59.94P, 720/50P SD: 480/59.94i, 576/50i
Audio format (complies to the AJ-PX800G audio recording format)	48 kHz, 16 bit/24 bit selection, 4CH (AVC-Intra 100, AVC-Intra 50) 48 kHz, 24 bit, 4CH (AVC-LongG 50, AVC-LongG 25) 48 kHz, 16 bit, 4CH (AVC-LongG 12, DVCPRO HD, DVCPRO50, DVCPRO, DV)

Details of the connector signals

DC IN



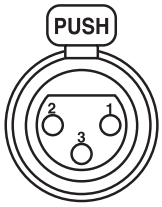
1	GND
2	NC
3	NC
4	+12 V

Panasonic Parts No.: K1AA104H0038
Manufacturer Parts No.: HA16RX-4P (SW1) (76) (Hirose Electric Co.)

NOTE

- Make sure that the polarity of the external power supply is correct.

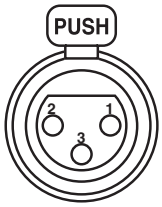
FRONT MIC IN



1	GND
2	AUDIO IN (H)
3	AUDIO IN (C)

Panasonic Parts No.: K1AY103A0001
Manufacturer Parts No.: HA16PRM-3SG (72) (Hirose Electric Co.)

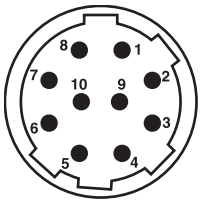
AUDIO IN



1	GND
2	AUDIO IN (H)
3	AUDIO IN (C)

Panasonic Parts No.: K1AY103A0001
Manufacturer Parts No.: HA16PRM-3SG (72) (Hirose Electric Co.)

REMOTE



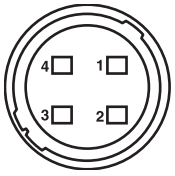
1	CAM DATA (H)
2	CAM DATA (C)
3	CAM CONT (H)
4	CAM CONT (C)
5	R/C ON
6	R/C VIDEO OUT
7	R/C VIDEO GND
8	NC
9	UNREG+12 V (max. 0.6 A)
10	GND

Panasonic Parts No.: K1AY110JA001
Manufacturer Parts No.: HR10A-10R-10SC (71) (Hirose Electric Co.)

NOTE

- Ensure that the total current from the <DC OUT> terminal, <REMOTE> terminal, <VF> terminal, <LENS> terminal does not exceed 2.5 A.

DC OUT



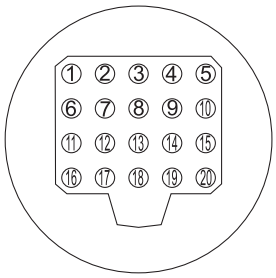
1	GND
2	R TALLY (open collector)
3	REC SW
4	UNREG+12 V (max. 1.5 A)

Panasonic Parts No.: K1AY104J0001
Manufacturer Parts No.: HR10A-7R-4SC (73) (Hirose Electric Co.)

NOTE

- Ensure that the total current from the <DC OUT> terminal, <REMOTE> terminal, <VF> terminal, <LENS> terminal does not exceed 2.5 A.

VF



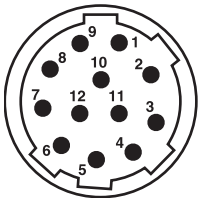
1	UNREG-12V	DC 12 V power supply
2	UNREG-12V	DC 12 V power supply
3	A9.0V	DC 9 V power supply (not used)
4	VF-P_B-GND	Viewfinder P_B signal GND
5	VF-P_R-GND	Viewfinder P_R signal GND
6	VF-Y	Viewfinder Y signal output
7	VF-Y-GND	Viewfinder Y signal GND
8	VF-CLK	Serial data clock pulse signal
9	VF-WR	Pulse signal for serial/parallel conversion data reading
10	VF-DATA	Serial data signal for serial/parallel conversion
11	UNREG-GND	GND
12	ZEBRA-SW	Zebra signal ON/OFF
13	PEAKING	Peaking control (not used)
14	SPARE	Spare (not used)
15	VF-P_R	Viewfinder P_R signal output
16	VF-P_B	Viewfinder P_B signal output
17	MARKER-SW	Marker ON/OFF (not used)
18	FRONT-VR	F.AUDIO LEVEL adjustment (not used)
19	VR-GND	F.AUDIO LEVEL GND (not used)
20	UNREG-GND	GND

Panasonic Parts No.: K1AB120H0001
Manufacturer Parts No.: HR12-14RA-20SC (Hirose Electric Co.)

NOTE

- Ensure that the total current from the <DC OUT> terminal, <REMOTE> terminal, <VF> terminal, <LENS> terminal does not exceed 2.5 A.

LENS



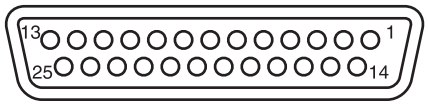
1	RET-SW
2	REC
3	GND
4	IRIS-AUTO
5	IRIS-CONT
6	UNREG+12 V (max. 0.4 A)
7	IRIS-POSI
8	IRIS-G-MAX
9	EXT-POSI
10	ZOOM-POSI
11	FOCUS-POSI
12	SPARE

Panasonic Parts No.: K1AY112JA001
Manufacturer Parts No.: HR10A-10R-12SC (71) (Hirose Electric Co.)

NOTE

- Ensure that the total current from the <DC OUT> terminal, <REMOTE> terminal, <VF> terminal, <LENS> terminal does not exceed 2.5 A.

Wireless microphone receiver interface



1	CH-1 SHIELD	GND
2	CH-1 HOT	Audio input from the wireless microphone receiver: CH1 HOT
3	CH-1 COLD	Audio input from the wireless microphone receiver: CH1 COLD
4	GND	GND
5	UNREG +12 V	Power supply to the wireless microphone receiver
6	RX ON	Power remote output to the wireless microphone receiver
7	RF WARN	RF warning input from the wireless microphone receiver
8	RM5	Not used
9	RM4	Not used
10	SPARE 1	Not used
11	SPARE 2	Not used
12	EXT CLK	Not used
13	CLK SHIELD	Not used
14	CH-2 SHIELD	GND
15	CH-2 HOT	Audio input from the wireless microphone receiver: CH2 HOT
16	CH-2 COLD	Audio input from the wireless microphone receiver: CH2 COLD
17	+5.6 V	Power supply to the wireless microphone receiver
18	VIDEO OUT	Not used
19	VIDEO RET	Not used
20	VIDEO EN	Not used
21	RM 1 (RM CLK)	Not used
22	RM 2 (RM DATA)	Not used
23	RM 3 (RM WR)	Not used
24	RM+5 V	Not used
25	RM GND	Not used
Panasonic Parts No.: K1GB25A00010 Manufacturer Parts No.: HDBB-25S (05) (Hirose Electric Co.)		

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Disposal of Old Equipment and Batteries
Only for European Union and countries with recycling systems
These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries must not be mixed with general household waste.
For proper treatment, recovery and recycling of old products and used batteries, please take them to applicable collection points in accordance with your national legislation.

By disposing of them correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment.

EU

For more information about collection and recycling, please contact your local municipality, dealer or supplier.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

Note for the battery symbol (bottom symbol):
This symbol might be used in combination with a chemical symbol. In this case it complies with the requirement set by the Directive for the chemical involved.

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