Panasonic®
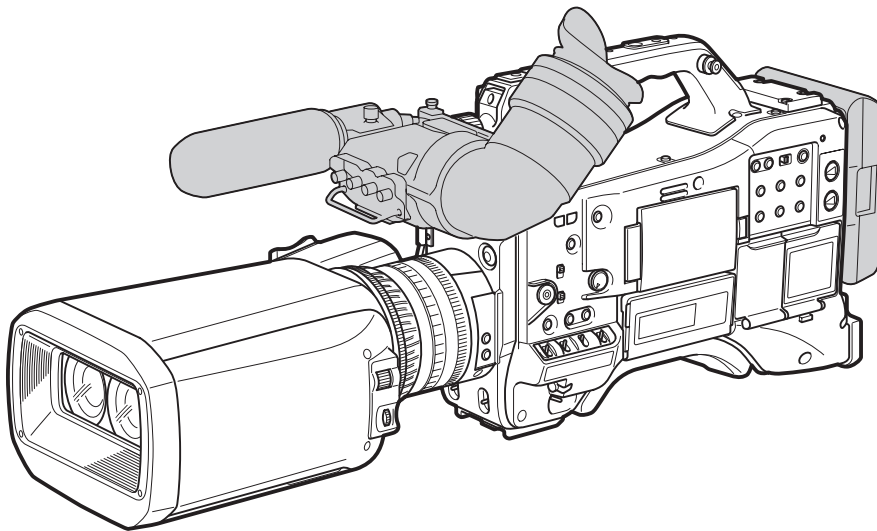
Operating Instructions

Memory Card Camera-Recorder

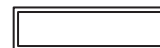Model No. **AG-3DP1G**

P2HD

3D PROFESSIONAL

AVC INTRA   **SDHC™**   **HDMI™** HIGH-DEFINITION MULTIMEDIA INTERFACE

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

ENGLISH

VQT3U56

Read this first!

indicates safety information.

WARNING:
- To reduce the risk of fire or electric shock, do not expose this equipment to rain or moisture.
- To reduce the risk of fire or electric shock hazard, 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) or accessories (BNC cap, XLR connector cap, microphone holder) out of the reach of babies and small children.

CAUTION:
Do not remove panel covers by unscrewing them.
To reduce the risk of electric shock, do not remove the cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

CAUTION:
To reduce the risk of fire or electric shock and annoying interference, use the recommended accessories only.

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 electric shock or 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 ºC (140 ºF).
Do not leave the unit in an automobile exposed to direct sunlight for a long period of time with doors and windows closed.

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

3D image shooting/viewing
- Do not set a wide parallax (parallax between the left and right eyes) when shooting a 3D image. Viewing the 3D image shot with a wide parallax may cause eyestrain or other adverse effects.
  For details on the parallax, see "Adjusting the Convergence Point." (Page 54)
- When viewing 3D images, observe the viewing precautions indicated in the operating instructions of the monitor. If you continue viewing 3D images in incorrect conditions, it may cause eyestrain or other adverse effects.
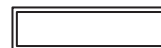
indicates safety information.

FCC NOTICE (USA)

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 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.

FCC 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)

This class B digital apparatus complies with Canadian ICES-003.

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 2009, 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.

EEE Yönetmeliğine Uygundur.
EEE Complies with Directive of Turkey.

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.

Pursuant to at the directive 2004/108/EC, article 9(2)
Panasonic Testing Centre
Panasonic Service Europe, a division of Panasonic Marketing Europe GmbH
Winsbergring 15, 22525 Hamburg, F.R. Germany

- SDHC Logo is a trademark of SD-3C, LLC.
- HDMI, the HDMI logo, and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC in the United States and/or other countries.
- MMC (Multi Media Card) is a registered trademark of Infineon Technologies AG.
- Microsoft®, Windows®, and Windows Vista® are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.
- Screenshots are used in accordance with Microsoft Corporation guidelines.
- Apple®, Macintosh®, and Mac OS® are trademarks of Apple Inc., registered in the United States and other countries.
- Unislot is a registered trademark of Ikegami Tsushinki Co., LTD.
- Other model names, company names, and product names listed in these operating instructions are trademarks or registered trademarks of their respective companies.
- This product is licensed under the AVC Patent Portfolio License for the personal and non-commercial use of a consumer, and no license is granted or shall be implied for any use other than the personal uses detailed below.
  – To encode video in compliance with the AVC standard ("AVC Video")
  – To decode AVC Video that was encoded by a consumer engaged in a personal and non-commercial activity
  – To decode AVC Video that was obtained from a video provider licensed to provide AVC Video
    • Additional information may be obtained from MPEG LA, LLC (http://www.mpegla.com).

Note concerning illustrations in these instructions
- Illustrations (camera-recorder, menu screens, etc.) in these operating instructions differ slightly from the actual camera-recorder.

References
- References are shown as (Page 00).

Terminology
- Both SD Memory Cards and SDHC Memory Cards as referred to as "SD Memory Cards" in these operating instructions.
- Memory cards that have the "P2" logo (e.g., AJ-P2C064AG, an optional accessory) are referred to as "P2 cards" in these operating instructions.
- Video that is created during a single recording operation is referred to as a "clip" in these operating instructions.

Precautions for Use

Caution regarding laser beams

The MOS sensor may be damaged if it is exposed to laser light.
When using the camera-recorder in locations where laser irradiation equipment is used, be careful not to allow the laser beam to shine directly on the lens.

PLEASE NOTE:

- When preparing to record important events, 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 this camera-recorder or the P2 cards used, we will not assume liability for such failure.

Disposing and transferring ownership of memory card devices

Formatting or deleting a memory card device in this camera or a PC will only change file management data and leave data on the card intact. It is recommended that the card either be physically destroyed or that commercially sold software be used to completely delete any data on the card. Note that managing card data is the owner's responsibility.

Information on software for this product

1. Included with this product is software licensed under the GNU General Public License (GPL) and GNU Lesser General Public License (LGPL), and users are hereby informed that they have the right to obtain, change and redistribute the source codes of this software.
   To obtain the source codes, go to the following home page:

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

   The manufacturer asks users to refrain from directing inquiries concerning the source codes they have obtained and other details to its representatives.
2. Included with this product is software which is licensed under MIT-License.

Details can be found on the installation CD provided with the unit. Refer to the folder called "LDOC". (Details are given in the original (English-language) text.)

P2HD 5 Year Warranty Repair Program*1

Thank you for purchasing this Panasonic P2HD device.
Register as a user for this device to receive a special service warranty up to five years of free warranty repairs.

Customers who register as users on the website will receive an extended warranty repair valid for up to five years.

	1st year	2nd year	3rd year	4th year	5th year*5
P2HD device*2	Basic warranty*3	Extended warranty repair*4			

*1: Please note that this extended warranty is not available in some countries/regions. *2: Not all models eligible for extended warranty coverage. *3: The basic warranty period may vary depending on the country/region. *4: Not all repair work is covered by this extended warranty. *5: The maximum warranty period may be adjusted depending on the number of hours the device has been used.

Purchase P2 product → Register online within 1 month → "Registration Notice" e-mail sent → **Free 5 years of Warranty Repairs**

Make sure to save the "Registration Notice" e-mail during the warranty period.

Details about user registration and the extended warranty: 🖱http://panasonic.biz/sav/pass_e

Please note, this is a site that is not maintained by Panasonic Canada Inc. The Panasonic Canada Inc. privacy policy does not apply and is not applicable in relation to any information submitted. This link is provided to you for convenience.

Contents

Chapter 1 Overview

Chapter 2 Parts and Their Functions

Chapter 3 Recording and Playback

Chapter 4 Adjustments and Settings for Recording

Chapter 5 Preparation

Chapter 6 Manipulating Clips with Thumbnails

Chapter 7 Menu Operations

Chapter 8 Connecting to External Devices

Chapter 9 Maintenance and Inspections

Chapter 10 Index

Chapter 11 Specifications

Chapter 1 Overview

> **Attention**
> Perform the following settings before using the unit for the first time.
> • The unit is delivered from the factory with the settings not yet specified for your area. Revise the settings for the TV standard of your area, etc., following the procedures described on page 13.

The AG-3DP1 P2 memory card camera-recorder features a camera unit equipped with two lenses and a 1/3-type 2.2-megapixel 3MOS sensor, and a recording and playback unit that provides AVC-Intra 100 compression recording as standard to provide HD full pixel and full sampling for high sensitivity, superb image quality, and high-quality video.
The P2 card provides reliability, speed, and IT functionality that no other media can match, and it is destined to revolutionize workflow for production of 3D programs, from shooting to editing.

■ Secure and comfortable 3D recording

The camera is provided with the 3D assist function. It enables you to check by colors on the LCD monitor screen the convergence point area and any excessive pop-out and/or receded area generated by parallax and to adjust the parallax appropriately. The effects of the 3D assist function can be output to the viewfinder and an external monitor.
The camera also features auto iris, auto focus, and manually selectable ND filters, for easy shooting.

■ 3D image and convergence point

When shooting   **When viewing a 3D image**

Convergence point

3D glasses
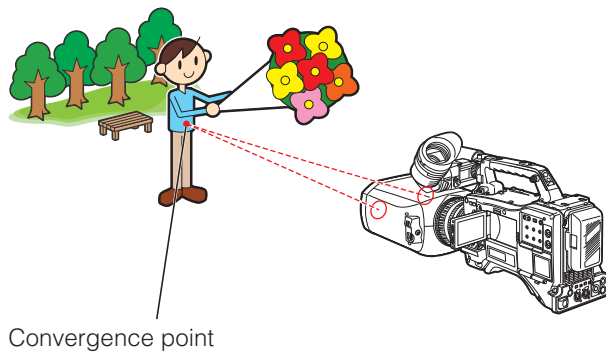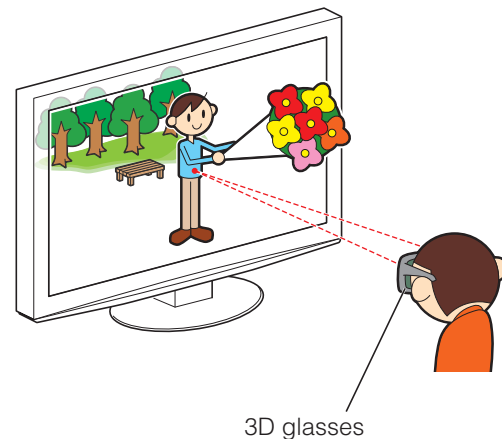
• The illustration above is an image for explanation.

The convergence point is a point where the optical axes of the left and right lenses converge. This indicates the reference plane when viewing a 3D image.
When shooting, adjust the convergence point by shooting the subject you want to set on the reference plane so that the image of the subject from the left lens is completely superimposed onto that from the right lens.
When viewing the 3D image, a subject located closer than the convergence point is displayed in front of the screen, and a subject located farther than the convergence point is displayed behind the screen.

■ High quality and high sensitivity

The camera uses an AVC-Intra codec (MPEG-4 AVC/H.264), which provides high reliability for broadcasting equipment.
A 1/3-type 2.2-megapixel 3MOS sensor enables high-sensitivity HD full pixel recording for high-resolution video.
The camera also enables high-quality and uncompressed, 16-bit, 48-kHz, 4-channel recording of audio.

■ Wide zoom range

The camera is equipped newly developed HD lenses (left and right) that enable wide to 17.0 × optical zooming. It expands the capability of supporting a wide range of applications

■ Multi-camera recording supported

The camera features GENLOCK input and TC input, to allow simultaneous recording from multiple connected cameras. This makes multi-camera live recording and multi-camera editing with this unit easy and convenient.

■ 2D LL recording mode supported

The camera supports 2D LL recording mode, for recording the left-lens (L) image on the left and right P2 cards simulatneously. With this function you can record images with no parallax difference or make a backup copy, which is made easy and convenient by use of two card slots.

Camera Unit Features

■ Variable frame rate makes speed effects possible (in the 720P format)

The AG-3DP1 comes with the variable frame rate feature developed for the VariCam HD Cinema camera. In 720P mode*[1], the frame rate can be set to any of 20 steps between 12P and 60P (50P). This puts features such as undercranking (dropping frames) and overcranking (high frame rate) for quick motion and slow motion cine-like effects at the disposal of the camera crew.

■ Native mode

Playing back a recording made at a frame rate set in the camera at the normal rate provides speed effects without using a frame rate converter. Native mode also extends the recording time of a P2 card. (720P)

■ 14-bit digital circuit

The high-performance DSP (Digital Signal Processor) in the camera offers 14-bit signal input and 20-bit internal processing. It handles gamma settings and other adjustments for each R/G/B color in 1080/60i (50i) video as well as conversion to all HD/SD formats (P/I conversion, line conversion and down conversion). Because of this high-quality images can be produced in all video formats.

■ Six gamma curves including cine-like gamma

To expand camera capabilities, the AG-3DP1 offers six gamma curves including cine-like gamma to easily produce recordings with the characteristic warm tone of film.

■ Slow, synchro and high speed shutter

The shutter speed can be set from a slow speed of 1/12 s up to a maximum speed of 1/250 s. Combined with the variable frame rate functions, this allows you to create blurring or stop motion effects. The AG-3DP1 also features a synchro scan function that is ideal for capturing screen shots from a computer monitor.

■ Scene files

Six preset files are provided, and you can change the file names and their settings as desired. You can also save up to four files to an SD or SDHC memory card (both referred to as "SD memory card" below) and load files from an SD memory card.

■ Shooting assist functions

● USER buttons:
   Three USER buttons each of which can be assigned a frequently used function for immediate access.
● Focus assist:
   Magnifies the center portion of the image and displays a focus bar to facilitate focusing.
● Variable color temperature:
   Allows fine adjustment after setting the white balance.
● REC CHECK:
   Provides a quick check of the last few seconds of the most recently recorded clip.
● 4-position optical ND filter provided.

■ Remote control support

This camera supports the AJ-RC10G remote control unit (optional accessory) and the AG-EC4G extension control unit (optional accessory). The remote control allows you to adjust camera image and recording controls at a distance while viewing what you are shooting.

■ Camera extension system support

This camera can be connected to the AG-CA300G camera adapter (optional accessory) and the AG-BS300 base station (optional accessory) to enable camera extension system recording. For details on connections to these devices, refer to the connection instructions and precautions found in the instruction manuals for the AG-CA300G and AG-BS300, and observe the instructions for the AG-HPX300P/AG-HPX301E.

*[1] 1080 recording is performed at a fixed frame rate of 24P/30P (25P).

Recording and Playback Features

■ **P2 cards for high capacity, high speed and high reliability**

In addition to exceptional resistance to shock, vibration and temperature fluctuations, the P2 (Professional Plug-in) card has a reliability that guarantees long-term repeated recording/initialization that a tape or hard disk system with their moving parts could never match.

The connectors are professional grade to withstand long-term continual insertion and removal.

The P2 card stores the AV data for each shooting session as a single file that is immediately accessible for nonlinear editing or transfer over a network without digitizing. Transfer speeds far surpassing those of optical disks also help to speed up production processes. The P2 card complies with PC card standards and can be directly plugged into the PC card slot on a computer.*[1]

■ **Immediate startup and reliable data protection**

When you press the REC button in standby mode, the camera instantly finds a blank area on the P2 card and begins recording. Unlike a VTR system, there is no need to locate a blank section before recording. In normal use, there is no chance of accidentally deleting a recording. Recordings will not be erased unless you intentionally delete a file or initialize the card.

■ **Interval REC**

Recording one frame at a time at set intervals (from 2 frames to 10 minutes), this mode is useful for monitoring, supervision and special ultra undercranking effects.

■ **Clip thumbnail preview**

The camera records each cut as a clip (file) and automatically attaches a thumbnail image and file information to it. To preview a clip on the LCD monitor or to check clip data, simply choose the clip you want from the list of thumbnails. These thumbnails and the file data can be viewed on a PC (P2 Viewer*[2]) or processed in a nonlinear editing program.

■ **Shot marker**

If desired, you can add a simple OK/reject shot marker to each clip either during or after recording. When a P2 card is mounted in a PC (P2 Viewer), the PC will display only marked clips.

■ **SD memory card slot**

The camera provides an SD memory card slot for saving and loading scene files and user settings. A metadata upload file (created using P2 Viewer) containing the name of the person who shot the video, the name of the reporter, the shooting location, and other information can be saved to an SD memory card. This data file can be loaded as clip metadata.

■ **Fine adjustment of sound recording level**

The camera features a front-mounted control for fine adjustment of the sound recording level. This control is particularly useful for adjusting the sound level when you have to control both video and audio recording. The control can be disabled.

■ **Unislot wireless receiver compatible**

The AG-3DP1 is designed to work with optional slot wireless receivers.
The camera supports 2-channel wireless receivers.

---

*[1] This requires the installation of a P2 card driver (provided with each device). For details on the system requirements of the P2 card driver, visit the support desk at the following website.
http://pro-av.panasonic.net/

*[2] "P2 Viewer" is a Windows® PC viewing software that can be downloaded free of charge by P2 card users.

Setting for Your Area (Color TV Standard Setting)

This unit is delivered with the area setting, such as the color TV standard, not yet specified. To revise the settings, perform the following steps:

1 After connecting the unit to the power supply then turning on the power, hold down the DISP/MODE CHK button and press the MENU button.

```
          MAIN MENU
     9.CARD  FUNCTIONS
    10.3D  ASSIST
    11.OTHER  FUNCTIONS
    12.DIAGNOSTIC
    13.OPTION  MENU


       PUSH  MENU  TO  EXIT
```
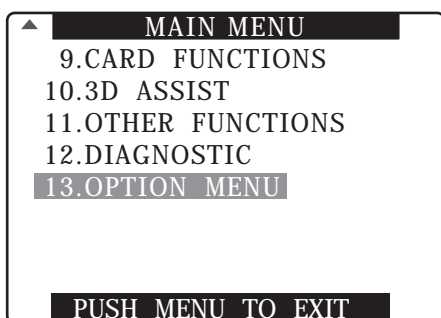
2 Check that OPTION MENU is selected then press the JOG dial button.

The OPTION MENU screen opens.

3 Turn the JOG dial button to move the cursor to the AREA SELECT item then press the JOG dial button.

For details on menu operations, refer to [Using the Menus] (page 106).

```
          OPTION MENU
   AREA  SELECT      ▶    NTSC
      ----→SET            >>>




       PUSH  MENU  TO  RETURN
```
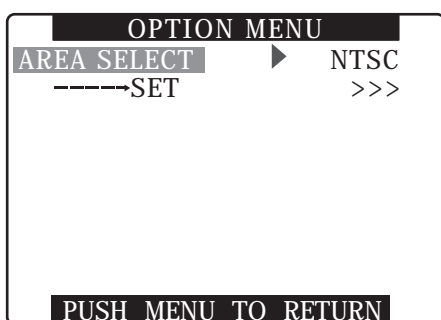
4 Turn the JOG dial button to select the color TV standard of your area, NTSC or PAL, then press the JOG dial button.

```
          OPTION MENU
   AREA  SELECT          NTSC
      ----→SET           PAL




       PUSH  MENU  TO  RETURN
```
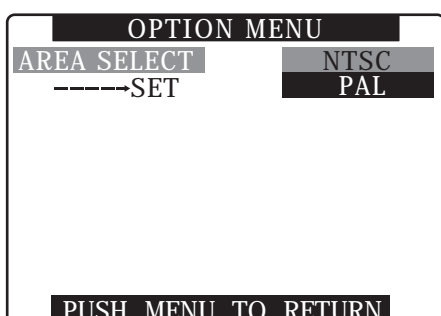
5 Turn the JOG dial button to select SET then press the JOG dial button.

```
          OPTION MENU
   AREA  SELECT          NTSC
      ----→SET     ▶     >>>




       PUSH  MENU  TO  RETURN
```
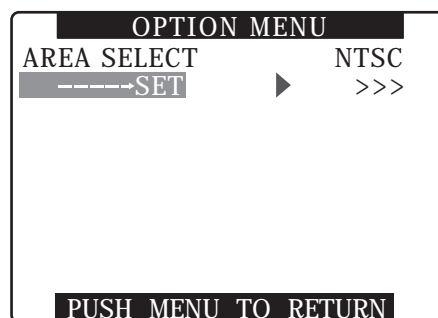
6 Select EXECUTE then press the JOG dial button.

```
          OPTION MENU
   AREA  SELECT          NTSC
      ----→SET          RETURN
                        EXECUTE



       PUSH  MENU  TO  RETURN
```
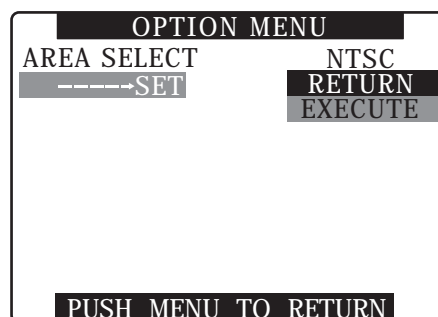
7 Turn the JOG dial button to select YES then press the JOG dial button.

```
          AREA  SETTING


     INIT  NTSC  SETTING

     ARE  YOU  SURE ?
        YES  ----→  PUSH SET
        NO

```
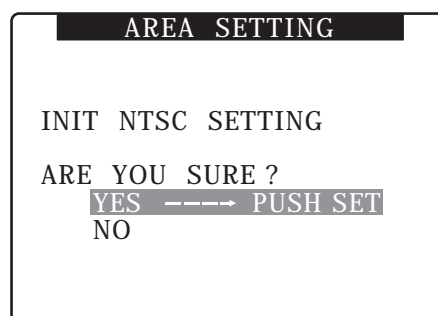
The message "TURN POWER OFF" appears on the screen.

8 Turn the power off and then turn it back on again.

• The setting selected in step 4 is reflected in factory defaults and current operating status values.

If you perform this setting when using the unit for the first time, only the settings of the following five options are changed, leaving the other factory settings unchanged.
If you perform it after making various adjustments with the setup menu or thumbnail menu, all options other than the following five options return to their factory settings.

Setup menu option	Factory settings	NTSC	PAL
SYSTEM MODE	1080-59.94i	1080-59.94i	1080-50i
REC FORMAT	AVC-I 100/60i	AVC-I 100/60i	AVC-I 100/50i
TC MODE	DF	DF	Not displayed
HEADROOM	20 dB	20 dB	18 dB
DATE FORMAT (Thumbnail menu)	M-D-Y	M-D-Y	D-M-Y

System Configuration

Viewfinder
AJ-CVF100G
AJ-HVF21KG

Shotgun microphone
(Phantom +48V)
AJ-MC900G

Tripod adapter
SHAN-TM700

SD Memory cards $*^2$
P2 cards $*^2$

Unislot wireless
microphone receiver

AG-3DP1

Remote control unit $*^3$
AJ-RC10G

Remote control cable
AJ-C10050G

Extension control unit
AG-EC4G

Battery $*^1$
HYTRON140
DIONIC90/160

V-mount type battery plate
ENDURA 10

External power supply

LCD monitor

$*^1$ The camera is equipped with a battery holder as standard.
$*^2$ For the latest information on P2 cards and SD memory cards not available in the Operating Instructions, visit the support desk at the following website.
http://pro-av.panasonic.net/
$*^3$ For details, refer to the AJ-RC10G Operating Guide on the supplied CD-ROM.
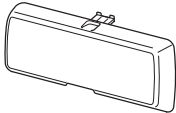
Standard Accessories

Shoulder belt	Microphone holder	CD-ROM
For details, refer to [Attaching the Shoulder Strap] (page 89).	For details, refer to [When Using the Front Microphone] (page 87).	• Operating Instructions • Utility Software*

* For how to install the Utility Software, refer to the Installation Manual included in the CD-ROM.

The following accessories are attached to the unit.

Lens cap	XLR connector cap	BNC cap

◆ **NOTE**

• **Be sure to appropriately dispose of the packing material when you have unpacked the product.**
• **Consult your supplier regarding purchases of accessories.**

Chapter 2 Parts and Their Functions

Power Supply and Accessory Mounting Section
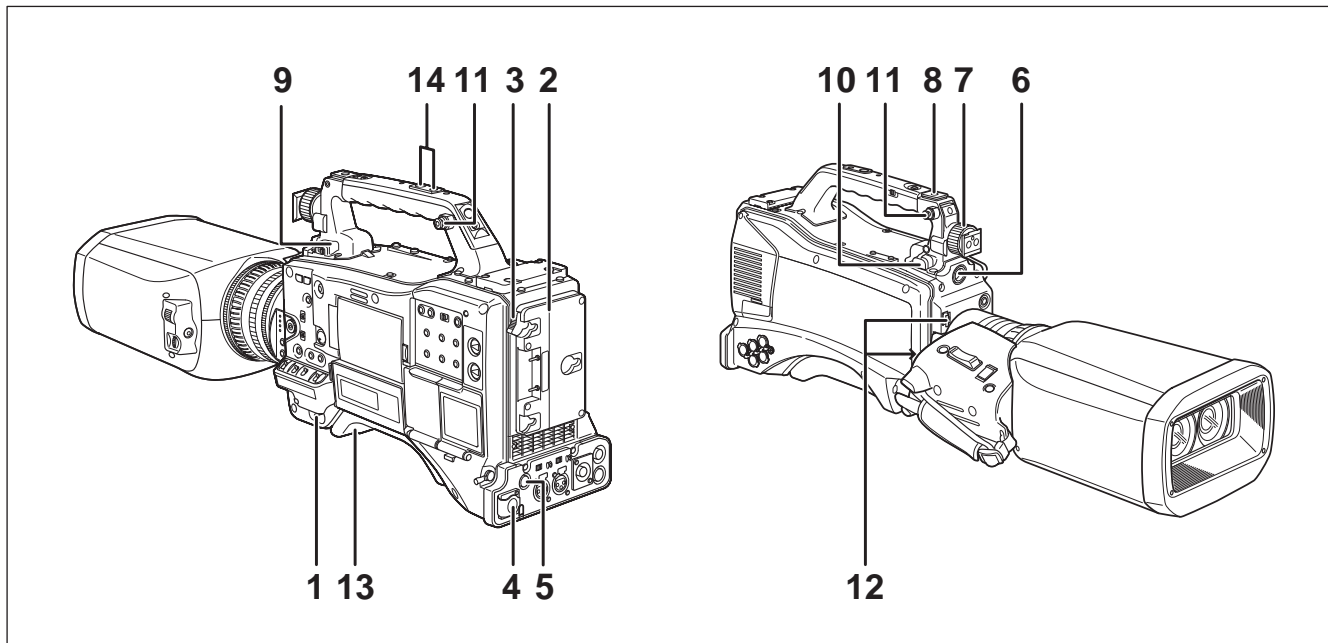
1 POWER switch
Use to turn the power on and off.

2 Battery holder
An Anton/Bauer battery is mounted here.
For details, refer to [Mounting the Battery and Setting the Battery Type] (page 84).

3 Battery release lever
Pull down the release lever to release the battery.

4 DC IN (external power input) socket (XLR, 4P)
Connect this camera to an external DC power supply.
For details, refer to [Use of the External DC Power Supply] (page 85).

5 DC OUT (DC power supply) output socket
This is a 12 V DC output socket that provides a maximum current of 1.5 A.

◆ **NOTE**
Be sure to check polarity before connecting an external device as incorrect connection could lead to damage.

6 VF connector (20-pin)
Installs the viewfinder (AJ-CVF100G/AJ-HVF21KG, optional).
Refer to [Viewfinder] (page 27).

7 Viewfinder left-right positioning ring

8 Light shoe
A video light or similar accessory can be attached here.
(Size of holes for securing screws)
• 1/4-20UNC (6 mm or shorter screws)

9 Light switch
Use to select how to turn on/off the video light connected to the Light connector.
AUTO: Keep the POWER switch on the video light ON, so that the video light turns on when the camera starts recording and turns off when the camera stops recording.
MANUAL: The video light is turned on/off with the POWER switch of the light.

10 Light connector
You can connect an Anton/Bauer Ultralight 2 or equivalent product under 50 W for the video light. When the light is lit, the battery charge level goes down sharply. When using the light, we recommend using a battery above 90 Wh.

11 Shoulder strap fittings
The shoulder strap is attached here.
For details, refer to [Attaching the Shoulder Strap] (page 89).

12 Microphone cable clamp
This clamp secures the microphone cables.

13 Tripod mount
To mount the camera on a tripod, attach the optional tripod adapter (SHAN-TM700) here.
For details, refer to [Mounting the Camera on a Tripod] (page 89).

14 Accessory mounting hole
Accessories can be attached here. Do not use this hole for purposes other than attaching accessories.
(Size of holes for securing screws)
• 1/4-20UNC (10 mm or shorter screws)
• 3/8-16UNC (10 mm or shorter screws)

Audio (input) Function Section
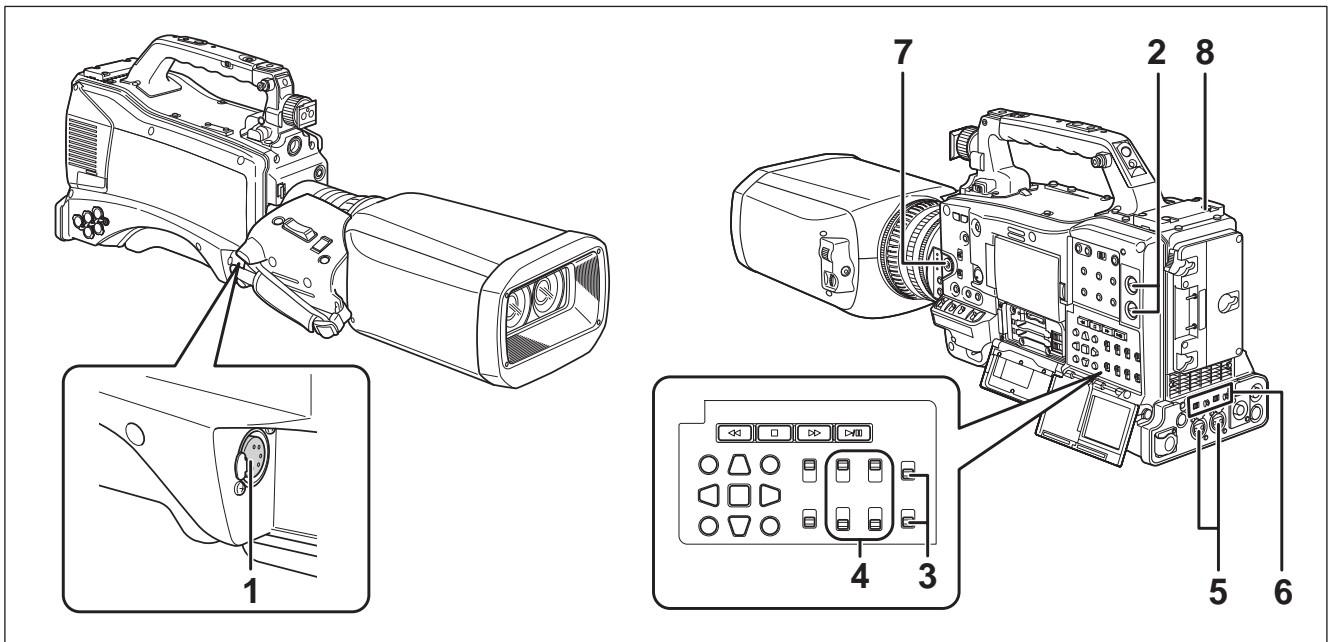
1 MIC IN (front microphone input) +48V jack (XLR, 5-pin)

Connect a microphone (optional accessory) to this jack.
A phantom-powered microphone may be connected.
To use a phantom-powered microphone, set the menu option F.MIC POWER to ON in the AUDIO SETUP screen.
For details, refer to [Preparing for Audio Input] (page 87).

2 AUDIO LEVEL CH1/CH2 (audio channel 1/2 recording level adjustment) controls

With the AUDIO SELECT CH1/CH2 switch positioned to MAN, these controls can be used to adjust the recording levels for audio channels 1 and 2.
Note that the controls are designed to be locked. For adjustment, each control must be depressed while turning.

3 AUDIO SELECT CH1/CH2 (audio channel 1/2 automatic/manual level adjustment selector) switch

Use this switch to select recording level control mode for audio channels 1 and 2.
AUTO: Recording level automatically controlled.
MAN: Recording level manually controlled.
For details, refer to [Adjusting Recording Levels] (page 51).

4 AUDIO IN (audio input selector) switch

Use this switch to select signals recorded through audio channels 1 – 4.
FRONT: Records signals from a microphone connected to the MIC IN jack.
W.L.(WIRELESS):
Records signals from a wireless receiver.
REAR: Records signals from audio devices or microphones connected to the AUDIO IN CH1/CH2 connectors.

◆ **NOTE**

To record 2-channel wireless input, switch both CH1 and CH2 to W.L. position and set the menu option WIRELESS TYPE in the AUDIO SETUP screen to DUAL.

5 AUDIO IN CH1/CH2 (audio channel 1/2) connectors (XLR, 3-pin)

Audio devices or microphones may be connected here.
For details, refer to [When Using Audio Devices] (page 88).

6 LINE/MIC (line input/mic input) selector switch and +48V switch

Use to select audio signals to be input to the AUDIO IN CH1/CH2 connectors.
LINE: Line input for audio signals input from an audio device
MIC: Audio signal input from a microphone input

The +48V switch turns the internal power supply to a phantom microphone on/off.
+ 48V: Supplies power to the microphone.
OFF: Does not supply power the microphone.

◆ **NOTE**

Power is supplied to the microphone when the menu option R.MIC POWER in the AUDIO SETUP screen is set to ON.

7 F. AUDIO LEVEL (front audio recording level adjustment) control

This control adjusts the recording level of audio channels 1 and 2.
With the AUDIO SELECT CH1/CH2 switch positioned to MAN, this control can be used to adjust the recording levels for audio channels 1 and 2.
Use the menu options FRONT VR CH1 and FRONT VR CH2 in the AUDIO SETUP screen to select the input connector this control will be used for.

8 Wireless slot

A Unislot wireless receiver (optional accessory) may be attached here.

Audio (output) Function Section
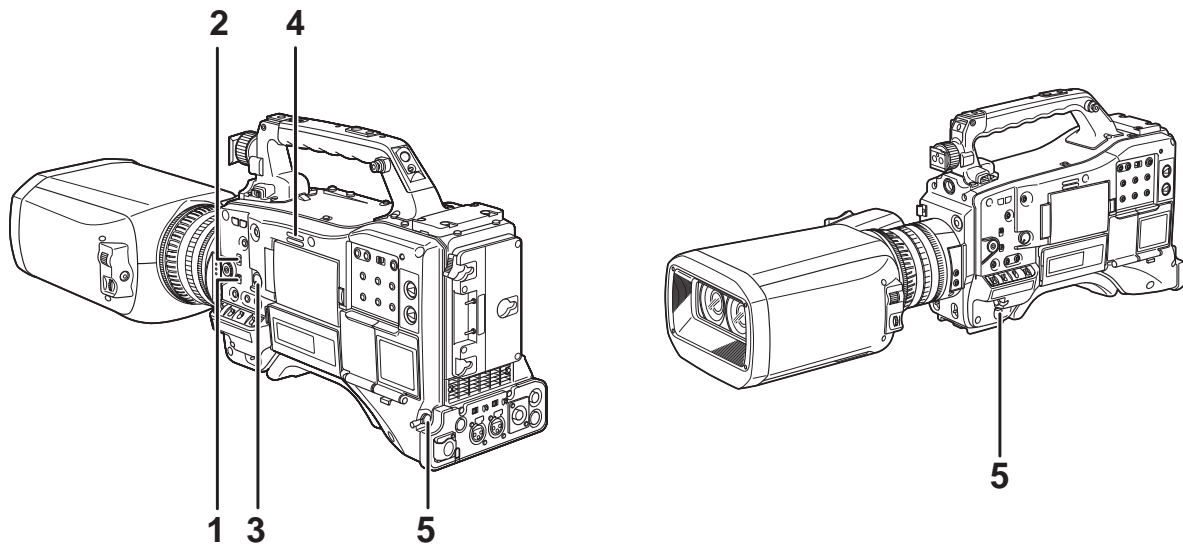
1 MONITOR SELECT (audio channel) CH1/2, CH3/4 selector switch

Use this switch to select the audio channel whose signals are output to the speaker or earphones.
CH1/2: Signal output of audio channels 1 and 2.
CH3/4: Signal output of audio channels 3 and 4.
The channel indications of the audio level meters on the LCD monitor and in the viewfinder show the channels selected with this switch.

2 MONITOR SELECT (audio selection) CH1/3, ST, CH2/4 selector switch

This switch and the MONITOR SELECT CH1/2, CH3/4 switch select the audio signal output to the speaker or earphones.

MONITOR SELECT switch (upper)		MONITOR SELECT switch (lower)	
		CH1/2	CH3/4
MONITOR SELECT	CH1/3	Audio Channel 1	Audio Channel 3
	ST	Stereo signals from Audio Channels 1 and 2*¹	Stereo signals from Audio Channels 3 and 4*¹
	CH2/4	Audio Channel 2	Audio Channel 4

*¹ MIX in the menu option MONITOR SELECT in the AUDIO SETUP screen allows you to change stereo signals to a mixed signal.

3 MONITOR (volume) control

Use to control the alarm sound volume and volume of sound output from the monitor speaker and earphones.

4 Speaker

The speaker outputs EE sound during recording and reproduced sound during playback. The speaker emits an alarm sound when the WARNING lamp and indicator light or blink. EE sound and reproduced sound are not output during alarm sound output.
When earphones are connected to the PHONES connector, the sound from the speaker is automatically muted.

5 PHONES (earphones) jack (mini jack)

This connector is designed for audio monitoring (stereo) earphones.

Shooting and Recording/Playback Functions Section
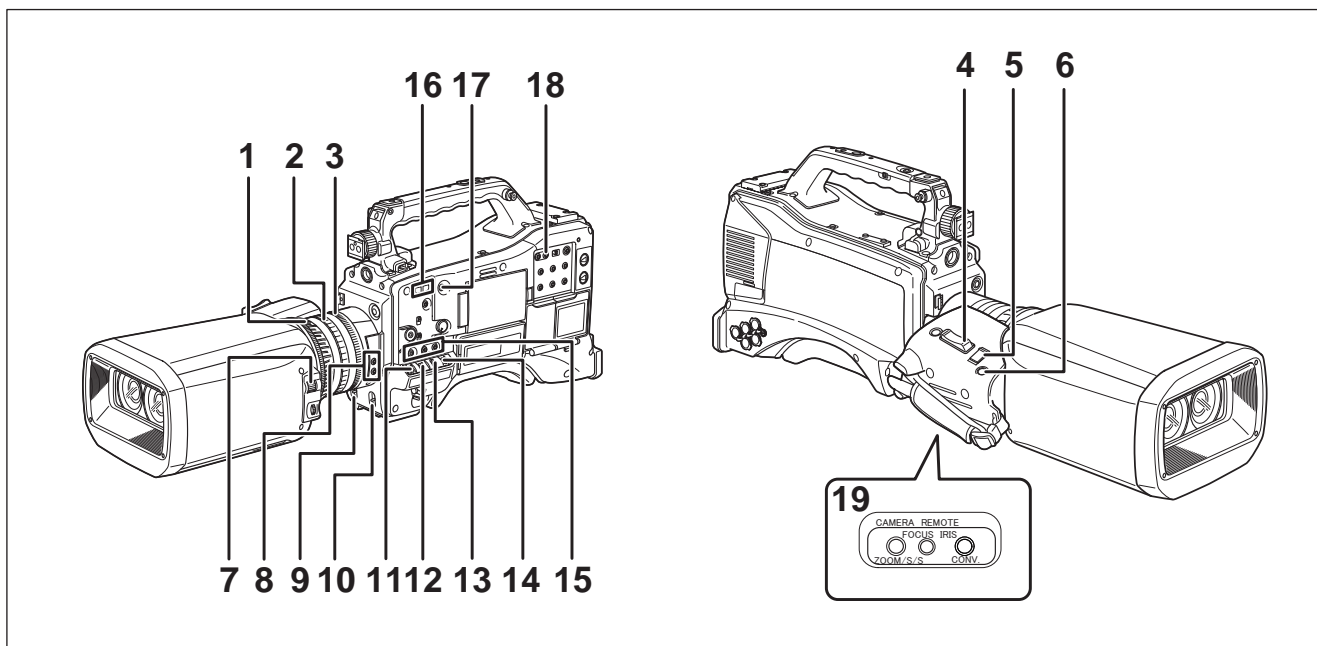
■ Shooting and Recording (camera unit)

1 Focus ring
Use this using to adjust the focus manually.

2 Zoom ring
Use this using to adjust the zoom manually.

3 Iris ring
Use this using to adjust the lens iris manually.

4 ZOOM lever
Use this lever to perform zoom operations.
T:　　Zoom in
W:　　Zoom out
Press the lever lightly to change the zoom slowly, and hard to change it quickly.

5 IRIS selector switch
Use this switch to select the lens iris adjustment mode.
M:　　Manual iris mode
　　　　To adjust the iris, turn the iris ring on the lens.
W:　　Auto iris mode
　　　　The lens iris is adjusted automatically.

6 IRIS (PUSH AUTO) button
Press this button in manual iris mode. The lens iris is adjusted automatically while you hold down the button.

7 CONV. (convergence) dial
Use this dial to adjust the convergence point (depth of the reference place for the 3D image).
For details, refer to [Adjusting the Convergence Point] (page 54).

◆**NOTE**
Lens operations such as iris, zoom, focus, and convergence adjustments cannot be performed during synchronization with the GENLOCK input signal.

8 ND FILTER (filter switching) selector button (∧ ∨)
Use this button to adjust the amount of light entering the MOS sensor during shooting in strong outdoor lighting.

Setting	Description
① CLEAR	Does not use the ND filter.
② 1/4	Reduces the amount of light entering the MOS sensor to 1/4.
③ 1/16	Reduces the amount of light entering the MOS sensor to 1/16.
④ 1/64	Reduces the amount of light entering the MOS sensor to 1/64.

9 SHUTTER switch
Use this switch to turn the electronic shutter on and off.
OFF:　　The electronic shutter is off.
ON:　　The electronic shutter is on.
SEL:　　Changes the speed of the electronic shutter.
This dial switch returns to its original position when released. Each push in the SEL direction changes the shutter speed.
For details, refer to [Setting the Electronic Shutter] (page 48).

10 AUTO W/B (white/black) BAL switch
AWB:　　Automatically adjusts the white balance.
　　　　Set the WHITE BAL switch on the side to A or B and use this switch to adjust the white balance, which takes a few seconds. The adjusted value is stored in memory.
　　　　When the WHITE BAL switch is set to PRST and the AUTO W/B BAL switch is set to AWB to indicate the color temperature, pushing the AUTO W/B BAL switch towards AWB a second time allows you to change the preset color temperature.
ABB:　　Automatically adjusts the black balance.
For details, refer to [Adjusting the White Balance and Black Balance] (page 46).

19

11 FOCUS selector switch

Use this switch to select the focus adjustment mode.

A (AUTO): Auto focus mode

M (MANUAL): Manual focus mode

∞: Focus on infinity

12 GAIN selector switch

This switch adjusts video amplifier gain to suit ambient lighting conditions at the time of shooting.

Use the menu options LOW GAIN, MID GAIN and HIGH GAIN in the SW MODE screen to set the L/M/H position gain values.

The factory settings for L, M and H positions are 0 dB, 6 dB and 12 dB, respectively.

13 OUTPUT/AUTO KNEE selector switch

This switch selects the video signals sent from the camera unit to the memory card recorder unit, viewfinder and video monitor.

CAM. ON:

Video being recorded through the camera is output with the Auto knee circuit activated.

CAM. OFF:

Video being recorded through the camera is output with the Auto knee circuit turned off. The KNEE point is locked to the level set in the menu.

BARS: Color bar signals are output with the AUTO KNEE circuit turned off.

◆ **NOTE**

∎**AUTO KNEE function**

Usually, when you shoot people or scenery against a strongly lit background and adjust the level to the subject, the background will be totally whited-out, with buildings and other objects blurred. Use of the AUTO KNEE function in situations like these will reproduce the background clearly.

The AUTO KNEE function is effective when:

- **The subject is a person positioned in the shade under a clear sky.**
- **The subject is a person in a vehicle or building and you also want to capture the background visible through a window.**
- **The subject is a high-contrast scene.**

14 WHITE BAL (white balance memory selector) switch

Use this switch to select method of white balance adjustment.

PRST: Use PRST when you have no time to adjust the white balance.

- The factory default setting is 3200 K.
- Use a setting menu or push the AUTO W/B BAL switch towards AWB to display the color temperature. While the color temperature is still indicated, push the AUTO W/B switch once again towards AWB to switch between 3200 K and 5600 K.

A, B: Pushing the AUTO W/B BAL towards AWB will automatically adjust the white balance and save the adjusted value in memory A or memory B.

For details, refer to [Adjusting the White Balance] (page 46).

15 USER MAIN, USER1 and USER2 buttons

These buttons can be assigned user-selected functions in a setting menu. Each button, when pressed, performs the assigned function.

For details, refer to [Assigning Functions to USER Buttons] (page 50).

16 SYNCHRO SCAN switches

This function adjusts the synchro scan speed when the SHUTTER switch is set to ON and synchro scan is selected.

Pressing the – switch sets a slower shutter speed and pressing the + switch sets a faster one.

For example, to record a computer screen, make adjustments to minimize horizontal bar noise in the viewfinder.

In VFR (Variable Frame Rate) mode, press the JOG dial button and this switch to change the frame rate.

For details, refer to [2. JOG dial button] in [Menu/Thumbnail Operation Section] (page 24).

17 DISP/MODE CHK button

Press this button to turn off the display on the LCD monitor and in the viewfinder. (The time code indication stays on.)

A second press of the button turns the display back on and holding it down displays shooting conditions and functions assigned to USER buttons.

It also serves to turn off the alarm sound.

18 ZEBRA (zebra pattern) button

Use this button to display a zebra pattern on the LCD monitor and in the viewfinder.

For details, refer to [Zebra Pattern Display] (page 74).

19 CAMERA REMOTE jack

You can connect a remote control unit (optional) to control camera functions.

CONV. (2.5 mm super mini jack):

Controls the convergence point adjustment remotely.

FOCUS IRIS (3.5 mm mini jack):

Controls the focus and lens iris remotely.

ZOOM S/S (2.5 mm super mini jack):

Controls zoom and start/stop of recording remotely

◆ **NOTE**

- **The focus and iris adjustments on the camera are disabled when the FOCUS IRIS remote control unit is connected.**
- **Do not connect any equipment except the remote control unit to the remote control jack. Connecting any equipment other than the remote control unit may cause the image brightness to change and/or images to appear out of focus.**
- **When the AJ-RC10G or AG-EC4G is connected and the IRIS selector switch of the unit is set to A (Auto), iris adjustment on the AJ-RC10G or AG-EC4G has priority.**

20
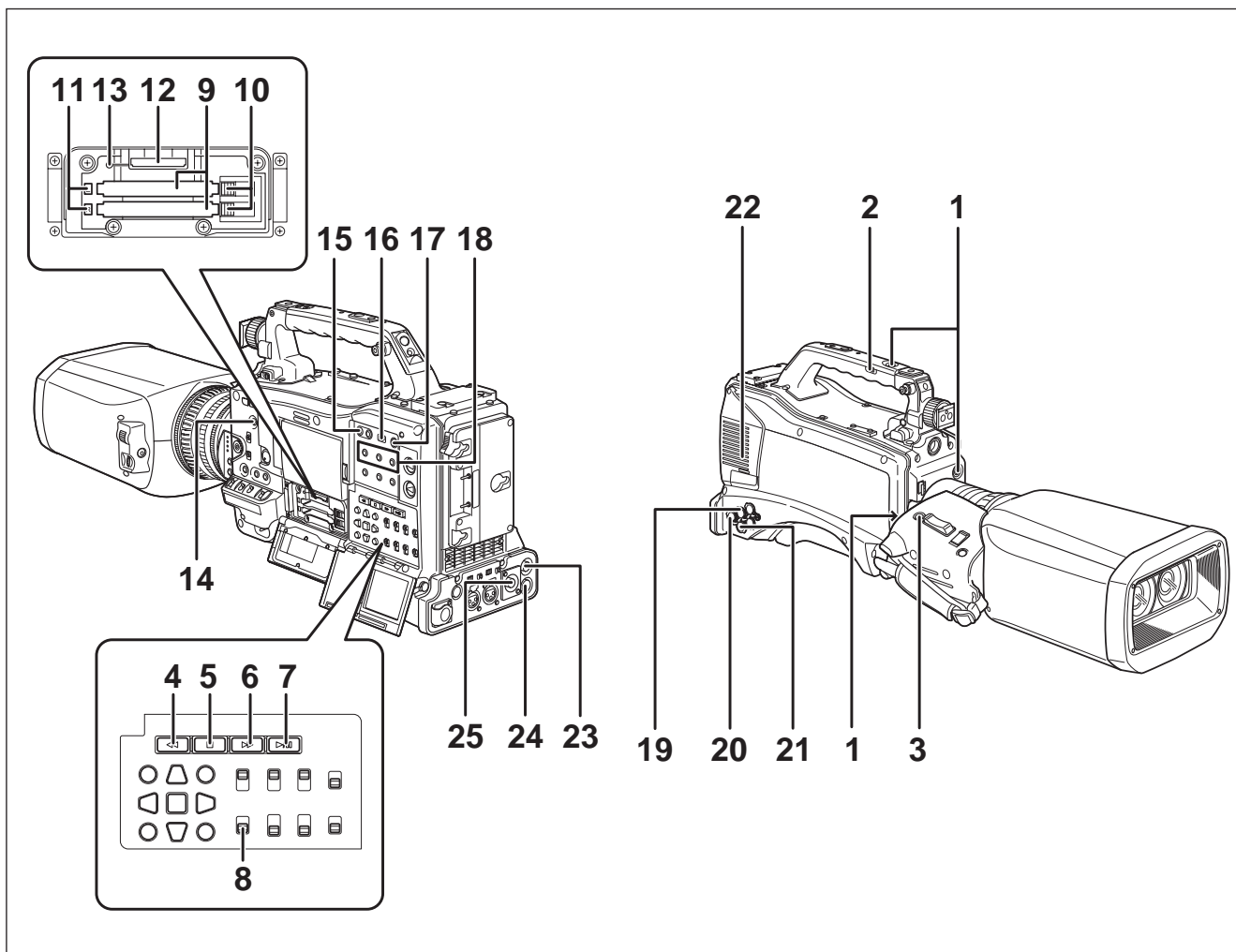
■ Shooting and Recording/Playback Function Section (Recorder Unit)

1 REC button

Press this button to start recording and press once again to stop it.

The REC selector switch can be used to disable the REC button on the handle.

2 REC switch

Switches functions of the REC button on the handle.

ON: Enables the REC button.

OFF: Disables the REC button.

3 RET/REC CHECK button

Press this button to play back the last two seconds of the most recently recorded clip.

◆ **NOTE**

Only the POWER button is enabled during REC CHECK.

4 ◀◀ REW (rewind) button

In stop mode, press this button for fast-reverse playback.

During playback, press this button for fast-reverse playback at about 4x normal speed.

If this button is pressed when playback is paused, the beginning of the clip being played is located in pause mode (cue-up mode).

5 ■ STOP button

Press this button to stop playback.

You can also press this button to stop interval recording.

6 ▶▶ FF (fast forward) button

In stop mode, press this button for fast playback.

During playback, press this button for fast playback at about 4x normal speed.

If this button is pressed when playback is paused, the beginning of the next clip is located in pause mode (cue-up mode).

7 PLAY/PAUSE button

Press this button to view playback on the LCD monitor or in the viewfinder, or on a color video monitor.

Press it during playback to pause playback.

8 OUTPUT CHARACTER switch

Use this switch to control the superimposition of character data onto HD SDI MONITOR OUT to indicate status or setting menus.

ON: Superimposes characters.

OFF: Does not superimpose characters.

9 P2 card slot (L, R)

Insert the P2 card for the left image into card slot L (upper slot), and the one for the right image into card slot R (lower slot).

For details, refer to [Inserting P2 Cards] (page 30).

10 P2 card eject button

Raise this button and press it to remove a P2 card.

21

11 P2 card access LED

This LED indicates the recording and playback status of each card.

For details, refer to [P2 Card Access LED and Status of P2 Cards] (page 31).

12 SD memory card slot

Insert an SD memory card (optional accessory) in this slot. It is used for recording and loading camera setting menus, and uploading meta data.

◆ **NOTE**

■ **SD memory card precautions**

• **Use only SD memory cards that conform to the SD standard or the SDHC standard in this camera.**

• **MultiMediaCards (MMC) cannot be used. (Use of such cards may prevent recording.)**

• **Be sure to use miniSD/microSD card adapters when using miniSD/microSD cards with this camera. (Note that this camera will not operate normally when a miniSD/ microSD adapter is installed without inserting a card. Be sure to insert a card when an adapter is installed.)**

• **Use of Panasonic SD memory cards and miniSD/microSD cards is recommended. Be sure to format such cards in this camera.**

• **This camera supports SD memory cards with capacities between 8 MB to 2 GB, and SDHC memory cards with capacities up to 32 GB.**

• **For the latest information not available in the Operating Instructions, visit the support desk at the following website.**

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

■ **About SD and SDHC memory cards**

• **The SDHC memory card is a new standard, established by the SD Card Association in 2006, for memory cards with capacities of 2 GB or more.**

• **The SD logo is a registered trademark.**

• **MMC (MultiMediaCard) is a registered trademark of Infineon Technologies AG.**

13 BUSY (operation mode display) lamp

This lamp indicates the active status of the SD memory card. It stays illuminated when the card is active.

◆ **NOTE**

Do not remove the card while the lamp is on. The SD memory card could be damaged.

14 FOCUS ASSIST button

Turns magnification of the center portion of the image on and off.

For details, refer to [Focus Assist Function] (page 75).

15 WFM button

Press this button to display waveforms of an image on the LCD monitor.

Each time the button is pressed, the display changes to OFF, WAVE, or VECTOR, cyclically.

For details, refer to [Waveform Monitor Function] (page 75).

◆ **NOTE**

• **The waveform display does not appear in the viewfinder.**

• **The waveform display does not appear when the focus assist (EXPANDED) function is used.**

• **The waveform display cannot be recorded.**

16 3D MODE selector switch

Use this button to select the 3D recording mode.

NEAR: Near distance mode
This mode is used to shoot a target at a short distance.

NORMAL: Normal mode
Normally set to this mode.

EXTRA: Long distance mode
This mode is used to shoot in telephoto mode. The variable range of zooming is widened with this mode.

Refer to [Setting 3D Recording Mode] (page 53).

17 LCD/EVF button

Press this button to select the style of image you wish to appears on the LCD monitor and in the viewfinder.

Each time the button is pressed, the display changes to NORMAL, MIX, R IMAGE, or SIDE by SIDE cyclically.

You can change the selectable images, style with the menu option LCD/EVF in the SW MODE screen.

For details, refer to [Setting 3D Recording Mode] (page 53).

18 3D ASSIST buttons

Press the button to activate the corresponding 3D assist function.

For details, refer to [3D Assist Function] (page 56).

Z WFM: Excessively popped-out or receded areas are indicated by a waveform.

ALERT: Red blocks appear to indicate excessively popped-out areas, yellow blocks to indicate excessively receded areas.

CONV.: Green blocks appear to indicate the convergence point area.

Variable settings for the 3D assist functions are available in the 3D ASSIST screen of the setting menu. For example, the style of image to output to the LCD monitor and in the viewfinder can be selected, the detection range and alert level for excessive pop-out or receding can be set, the display scale can be set, and superimposition of the 3D assist function onto the HD SDI MONITOR OUT output can be turned on/off.

For details, refer to [3D ASSIST Screen] (page 119).

◆ **NOTE**

When the LCD/EVF mode is set to R IMAGE or SIDE by SIDE using the LCD/EVF button, the effect of the 3D assist function is not displayed.

19 GENLOCK IN connector (BNC)

This connector inputs a reference signal when the camera unit is gen-locked, or when the time code is externally locked.

◆ **NOTE**

• **Supply an HD Y signal (1080/59.94i (50i), 1080/23.98 PsF, or 720/59.94P (50P)) as input reference signal.**

• **For the MONITOR OUT (HD SDI/HDMI) output, phase genlock is not guaranteed.**

20 HD SDI OUT 1 (L) connector (BNC)

21 HD SDI OUT 2 (R) connector (BNC)
This connector outputs HD SDI signals.
When the menu option SDI OUT in the OUTPUT SEL screen is set to ON, the HD SDI 1 (L) connector outputs the left-lens (L) image, and the HD SDI 2 (R) connector outputs the right-lens (R) image.
When the menu option SDI OUT in the OUTPUT SEL screen is set to ON (SIDE), the HD SDI 1 (L) and HD SDI 2 (R) connectors output the SIDE by SIDE image.

◆ **NOTE**
For HD SDI signals, use a double-shielded BNC cable 5C-FB or higher.

22 HDMI connector
This connector outputs HDMI signals.
To output signals from this connector, set the menu option SDI OUT in the OUTPUT SEL screen to OFF.
You can set character superimposition for output from HDMI with the menu option HDMI OUT CHAR in the OUTPUT SEL screen.

◆ **NOTE**
• **Use HDMI cables (optional) with double shield or more.**
• **Use of Panasonic HDMI cables is recommended.**
• **The HDMI connector of this product is not compatible with VIERA Link.**
• **When a VIERA-Link device is connected to this product with an HDMI cable, VIERA Link of the connected device may not operate properly.**

23 HD SDI MONITOR OUT connector (BNC)
This connector outputs images for the monitor.
According to the menu option MON OUT SEL in the OUTPUT SEL screen, images independent of HD SDI OUT can be output.
You can set character superimposition for output from HD SDI MONITOR OUTPUT with the menu option MON OUT CHAR in the OUTPUT SEL screen.

◆ **NOTE**
For HD SDI signals, use a double-shielded BNC cable 5C-FB or higher.

24 REMOTE connector
Some functions can be remote controlled when the remote control unit AJ-RC10G (optional accessory) is connected to the camera.
For details, refer to [Connecting the AJ-RC10G Remote Control Unit] (page 121).
Some functions can also be remote controlled when the AG-EC4G extension control unit (optional accessory) is connected.
For details, refer to [Connecting the AG-EC4G Extension Control Unit] (page 122).

25 RETURN IN (HD SDI) connector (BNC)
This connector inputs return video signals (HD SDI signals) to allow checking the video on the LCD monitor and in the viewfinder.

◆ **NOTE**
• **For HD SDI signals, use a double-shielded BNC cable 5C-FB or higher.**
• **The input signal of the RETURN IN connector can be locked externally if the menu option GENLOCK SEL in the OTHER FUNCTIONS screen is set to RETURN IN.**

23

Menu/Thumbnail Operation Section
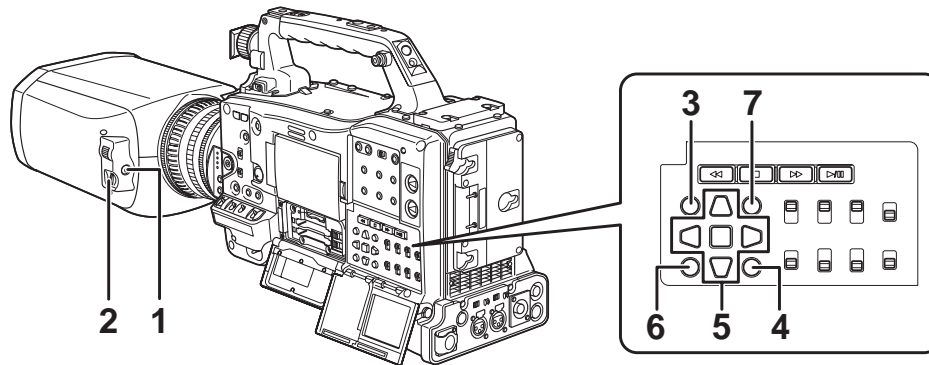
1   MENU button

Hold down the button to open a setting menu screen. A second press of the button returns the previous image. This function is not available in the thumbnail display and during recording.

2   JOG dial button

Use this button to go between setting menus and to select and set items in open setting menus.
In a setting menu, turning the JOG dial button downwards moves the menu cursor downwards and turning it upwards moves the menu cursor upwards. Press the JOG dial button to confirm made settings. In VFR (Variable Frame Rate) mode, press this button and use the SYNCHRO SCAN switch to change frame rates.

3   THUMBNAIL button

Press this button to open the thumbnail screen. Note that this switchover cannot be performed during recording or playback.
This button is also used for iris adjustment in 3D FINE adjustment mode.

4   MENU (thumbnail menu) button

In thumbnail display mode, use this button to access thumbnail menu functions to delete clips, for example.

5   Cursor and SET buttons

Use these buttons to manipulate setting menus, the menu bar and thumbnails.
The four triangular buttons are cursor buttons and the square center button is the SET button.
These buttons are also used for vertical position adjustment (VERTICAL), focus adjustment (FOCUS) and resetting in 3D FINE adjustment mode.

6   EXIT/CANCEL button

Press this button to exit an open thumbnail menu or property window to return to the previous image. Pressing this button while holding down the SHIFT button turns it into a cancel function allowing you to cancel clip selections at one time.
This button is also used for iris adjustment in 3D FINE adjustment mode.

7   SHIFT button

Use this button together with other buttons.
- Hold down the SHIFT button and press the cursor button ($\triangle \triangledown$) in a thumbnail screen to move the pointer to the thumbnail at the beginning or end of a clip.
- Hold down the SHIFT button and press the SET button to select all clips from a previously selected clip to the clip at the cursor location.
- SHIFT button + EXIT/CANCEL button
  This button combination operates like the cancel function.
  For details, refer to [6. EXIT/CANCEL button].
Operations while the SHIFT button is pressed are shown blow each button.
This button is also used for switchover to 3D FINE mode.

◆ **NOTE**

For details on the use of the buttons, refer to the following pages:
- **For menu operation, refer to [Using the Menus] (page 106).**
- **For thumbnail operation, refer to [Selecting Thumbnails] (page 93).**
- **For 3D FINE operation, refer to [Adjustment between Two Lenses (3D FINE Function)] (page 57).**

Time Code Section
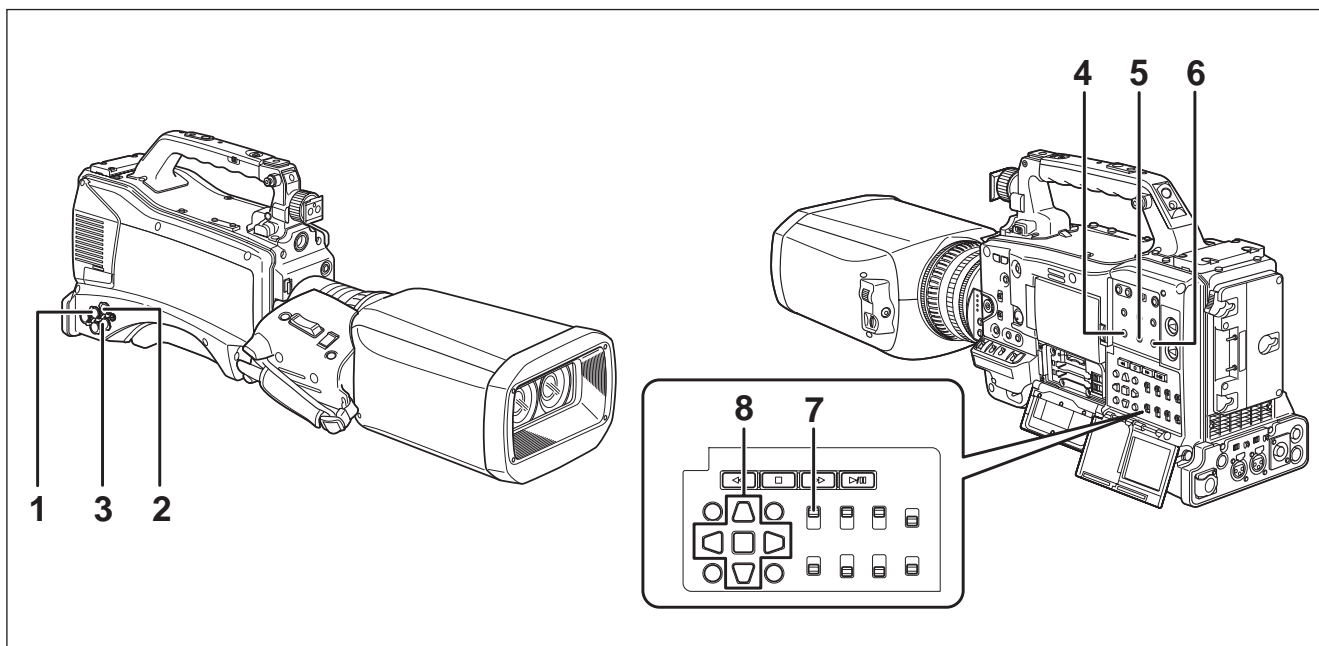
1 GENLOCK IN connector (BNC)
Use this connector to input a reference signal to genlock the camera unit or externally lock the time code.
For details, refer to [Externally Locking the Time Code] (page 65).

2 TC IN connector (BNC)
To externally lock the time code, input a reference time code to this connector.
For details, refer to [Externally Locking the Time Code] (page 65).

3 TC OUT connector (BNC)
Connect this connector to the time code input (TC IN) of the external device to lock the time code of that device to the time code of the AG-3DP1. The signal input to the TC IN connector is output from this connector without delay.

◆ **NOTE**
Keep in mind that the TC OUT phase is not synchronized when the recording format is 720P.

4 HOLD button
Pressing this button instantly freezes the time data indication on the counter. Note that time code generation continues. Pressing the button again restarts the counter.
This function allows you to check the time code or counter value of a recorded scene.

5 COUNTER (counter display selector) button
Each press of the button displays the counter value, time code, user bit and frame rate data on the LCD monitor and in the viewfinder.

6 RESET button
Use this button to reset the counter value on the time code display to 0.
Pressing this button with the TCG switch positioned at SET when the TC PRESET screen and UB PRESET screen are open, resets all set values to 0. Use the Cursor SET button to PRESET.

7 TCG (time code selector) switch
Use this switch to set the running mode of the built-in time code generator.
- **F-RUN:** Select this position to continuously advance the time code independently of P2 card recording status. Use this position to synchronize the time code with the time of day, or to externally lock the time code.
- **SET:** Select this position to set the time code or user bits.
- **R-RUN:** Select this position to advance the time code only during recording. The time code is continuously recorded during normal recording. But deleting clips and setting a 24P frame rate to continue recording of clips that are not 24P clips may break the sequence of time code recording.

◆ **NOTE**
Always use the cursor and SET buttons to set the time code and user bits. The JOG dial button cannot be used for this purpose.

8 Cursor and SET buttons
Use these buttons to set the time code and user bits. The four triangular buttons are cursor buttons and the square center button is the SET button.
For details, refer to [Setting Time Data] (page 59).

25

Warning and Status Display Functions
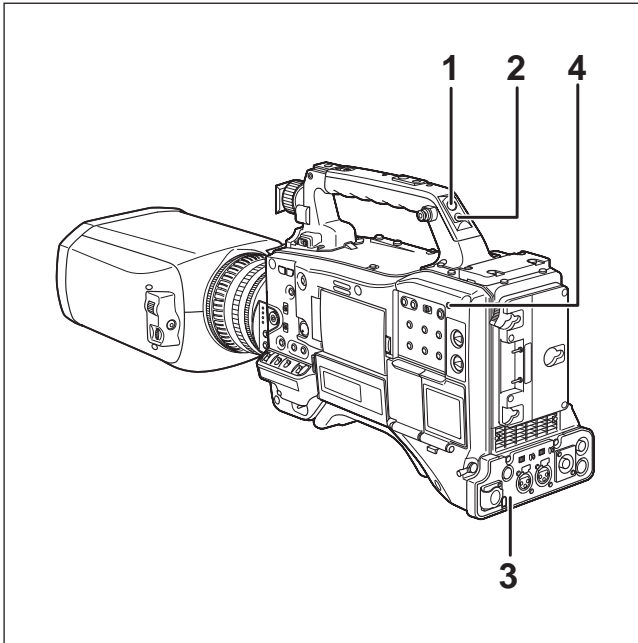
1 Back tally lamp
When the back tally switch is set to ON, this lamp behaves in the same way as the front tally lamp.

2 Back tally switch
Use this switch to control the back and rear tally lamps.
ON: Enables the back and rear tally lamps.
OFF: Disables the back and rear tally lamps.

3 Rear tally lamp
The rear tally lamp behaves in the same way as the back tally lamp.

4 WARNING lamp
This lamp starts blinking or lights when an error is detected in the memory card recorder unit.

LCD Monitor
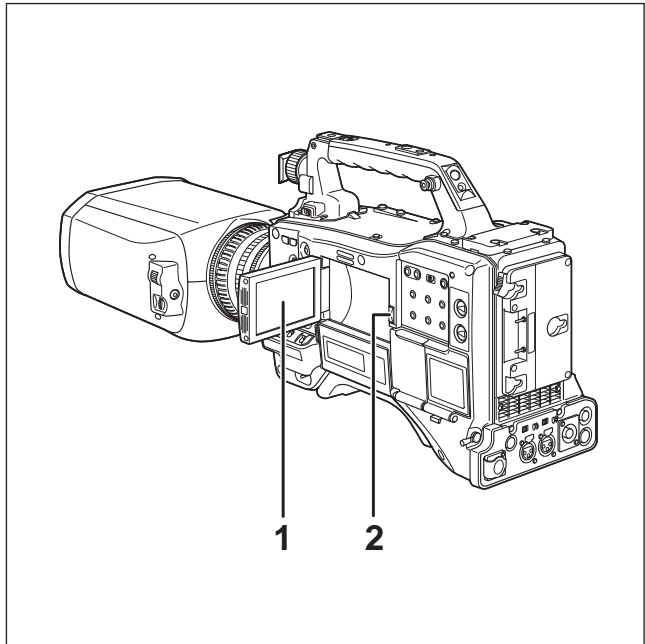
1 LCD monitor
The LCD monitor displays the video in the viewfinder. Alternatively, it can show clips on the P2 card in a thumbnail format.
For details on the setting of the LCD monitor, refer to [Adjusting and Setting the LCD Monitor/Viewfinder] (page 76).
In thumbnail display mode, you can use the thumbnail menu buttons, cursor and SET buttons to manipulate or delete clips, or format P2 cards.
For details, refer to [Manipulating Clips with Thumbnails] (page 91).

2 OPEN button
Use to open the LCD monitor.

Viewfinder

An HD viewfinder can be used with this unit. It is recommended to use the optional AJ-CVF100G (59.94/50Hz switching) or AJ-HVF21KG.
For details on attachment and adjustments of the viewfinder, refer to the operating instructions of the viewfinder.

AJ-CVF100G
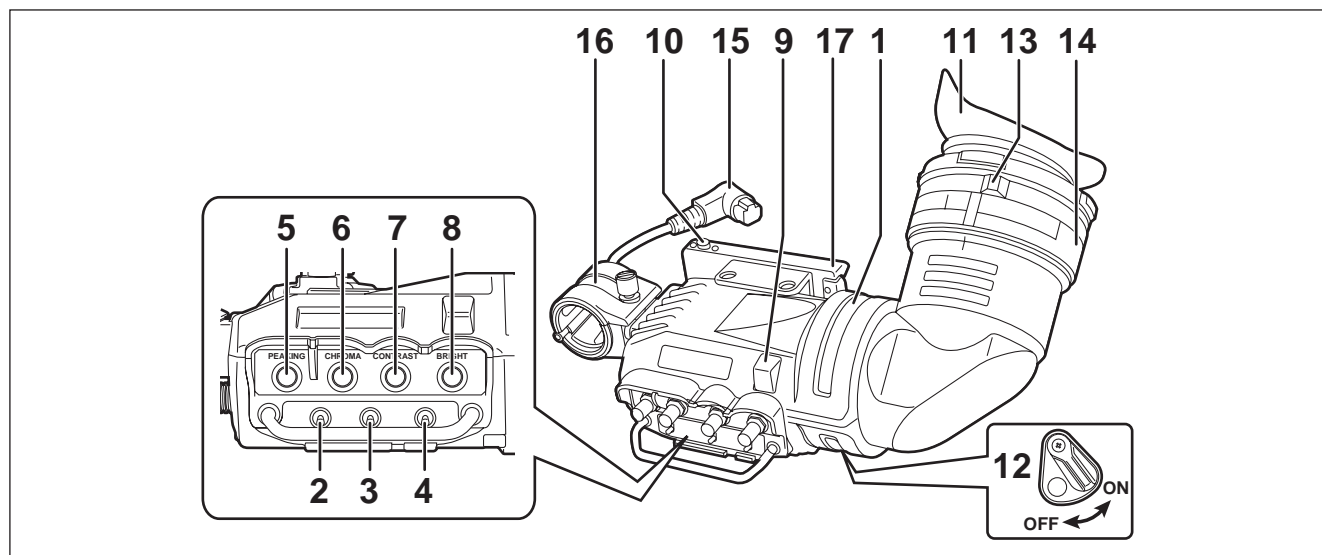
1 Viewfinder (optional)
The viewfinder displays the video image in color or monochrome during recording or playback. It also displays warnings and messages – indicating camera operating status and settings – zebra patterns and markers (safety zone and center markers, etc.).

2 CHROMA switch
Switches the display of images between color and monochrome on the viewfinder.
ON: Displays color images.
OFF: Displays monochrome images.

3 ZEBRA switch
Switches a zebra pattern inside the viewfinder.
ON: Displays a zebra pattern.
OFF: No zebra pattern is displayed.
The details of the display, such as the type of zebra pattern, can be set in the DISPLAY SETUP screen.

4 TALLY switch
Controls the front tally lamp.
HIGH: Makes the front tally lamp brighter.
OFF: Turns the front tally lamp off.
LOW: Makes the front tally lamp dimmer.

5 PEAKING control
Adjusts the outlines of the images in the viewfinder to make focusing easier. The setting of this control has no effect on the output signal of the camera.

6 CHROMA control
Adjusts the chroma of the color for the image in the viewfinder. The setting of this control has no effect on the output signal of the camera.

◆ **NOTE**
In a low temperature environment, the colors in the displayed image may be paler immediately after switching on the power.

7 CONTRAST control
Adjusts the contrast of the screen inside the viewfinder. The setting of this control has no effect on the output signal of the camera.

8 BRIGHT (brightness) control
Adjusts the brightness of the screen inside the viewfinder. The setting of this control has no effect on the output signal of the camera.

9 Front tally lamp
Lights when the camera is shooting if the TALLY switch is set to HIGH or LOW.
Also, the lamp flashes on and off as a warning indication, in the same manner as the REC lamp inside the viewfinder.
The setting of the TALLY switch determines the brightness of the front tally lamp (HIGH or LOW).

10 Viewfinder stopper
This is used to attach/detach the viewfinder.

11 Eyepiece

12 Back tally lamp
Lights when the camera is shooting. Also, the lamp flashes on and off as a warning indication, in the same manner as the REC lamp inside the viewfinder.
The back tally lamp is hidden when the lever is in the OFF position.

13 Diopter adjuster ring
Adjust this control to match the vision of the person using the camera so that the image on the screen in the viewfinder is as clear as possible.

14 Lock ring

15 Connection plug

16 Microphone holder

17 Slide rail

Setting Date and Time of Internal Clock

The CLOCK SETTING value is recorded in the contents (clip), and affects the sequence of playback of the thumbnails. Before carrying out recording, be sure to check and set CLOCK SETTING and TIME ZONE.

■ **This shows you how to adjust the calendar to 5:20 PM on November 16, 2011.**

1 Set the POWER switch to ON.

2 Select TIME ZONE item in OTHER FUNCTIONS, then press the JOG dial button.
  • For details on menu operation, refer to [Using the Menus] (page 106).

3 Use the JOG dial button to set the time difference from Greenwich Mean Time.
  • Check what time zone you are in and set accordingly.

```
        OTHER  FUNCTIONS

USER FILE              >>>
ACCESS LED              ON
ALARM                  LOW
REC TALLY              RED
EVF BAT LED             ON
CLOCK SETTING          >>>
TIME ZONE        ▶    0:00
H PHASE                 0
▼
      PUSH  MENU  TO  RETURN
```
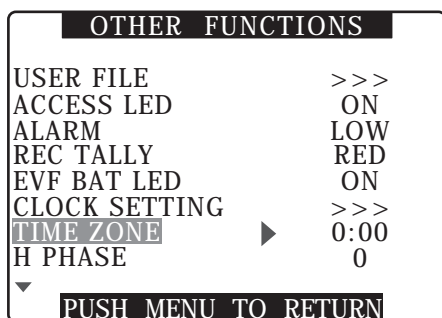
■**Time zone**

Time difference	Area	Time difference	Area
00:00	Greenwich	+01:00	Central Europe
-00:30		+01:30	
-01:00	Azores Islands	+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 Island	+04:30	Kabul
-04:00	Halifax	+05:00	Islamabad
-04:30		+05:30	Bombay
-05:00	New York	+06:00	Dacca
-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	Norfolk Island
-11:00	Midway Island	+12:00	New Zealand
-11:30		+12:45	Chatham Islands
-12:00	Kwajalein	+13:00	
+00:30			

◆ **NOTE**
• **The clock is accurate to within about ±30 seconds a month with the power turned off.**
• **Check and set the time when accurate time is required. After setting the time, change the setting menu TIME ZONE item and the display and the recorded local time will be reset accordingly.**

4 Select CHANGE at the CLOCK SETTING item in OTHER FUNCTIONS, then press the JOG dial button.

• The CLOCK SETTING screen appears.

```
        OTHER  FUNCTIONS

USER FILE              >>>
ACCESS LED              ON
ALARM                   LOW
REC TALLY               RED
EVF BAT LED             ON
CLOCK SETTING         RETURN
TIME ZONE             CHANGE
H PHASE                 0
▼
     PUSH  MENU  TO  RETURN
```
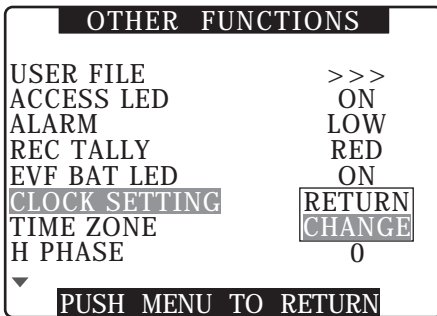
5 Turn the JOG dial button to select YEAR, then press the JOG dial button.

```
        CLOCK  SETTING

 ▶ YEAR               2011
   MONTH              NOV
   DAY                16
   HOUR               13
   MINUTE             07



     PUSH  MENU  TO  RETURN
```
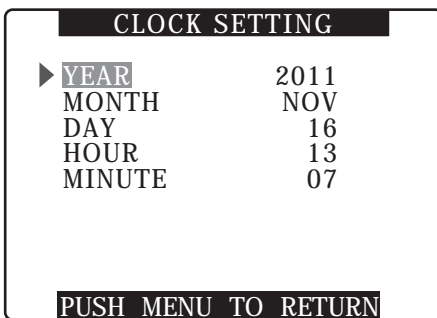
6 Turn the JOG dial button to set YEAR to 2011, then press the JOG dial button.

• A year between 2000 to 2037 can be set.

7 Turn the JOG dial button to select MONTH, then press the JOG dial button.

8 Turn the JOG dial button to set MONTH to NOV, then press the JOG dial button.

9 Set DAY, HOUR and MINUTE in the same way as setting YEAR and MONTH.

• This is a 24-hour clock.

```
        CLOCK  SETTING

   YEAR               2011
   MONTH              NOV
   DAY                16
   HOUR               17
 ▶ MINUTE             20



     PUSH  MENU  TO  RETURN
```

P2 Cards

Inserting P2 Cards

◆ **NOTE**

When using the camera recorder for the first time, be sure to set the time data beforehand.
For details, refer to [Setting Date and Time of Internal Clock] (page 28).

1 Turn on the POWER switch.

2 Open the card slot cover.

Slot cover
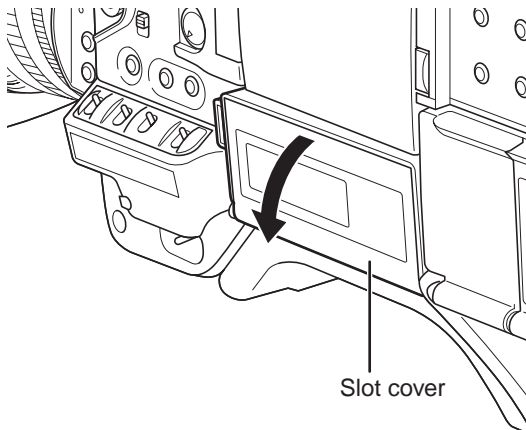
3 Insert P2 cards in the L (left) and R (right) P2 card slots.

• Press in the card until the eject button pops up.

EJECT button

Insert the card with the logo facing up.
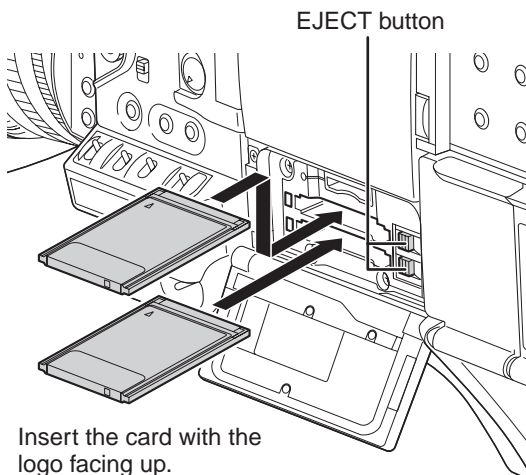
4 Push the eject button that pops up to the right.

• The L and R P2 card access LEDs indicate the status of the corresponding P2 card.

For details, refer to [P2 Card Access LED and Status of P2 Cards] (page 31).

P2 card access LED
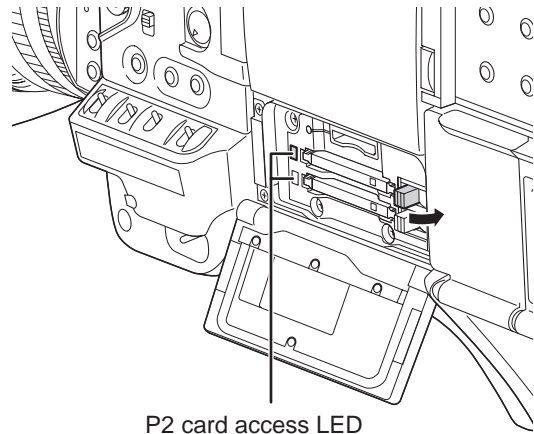
5 Close the card slot cover.

◆ **NOTE**

• **The camera operates only when P2 cards are inserted in both the L and R P2 card slots.**
• **To prevent cards from falling out, dust from entering and reduce the risk of exposure to static electricity, close the card slot cover before moving the camera.**
• **Format two P2 cards simultaneously on this camera.**

Removing P2 Cards

1 Open the card slot cover.

2 Raise the eject button.

3 Then depress the eject button to release the P2 card.
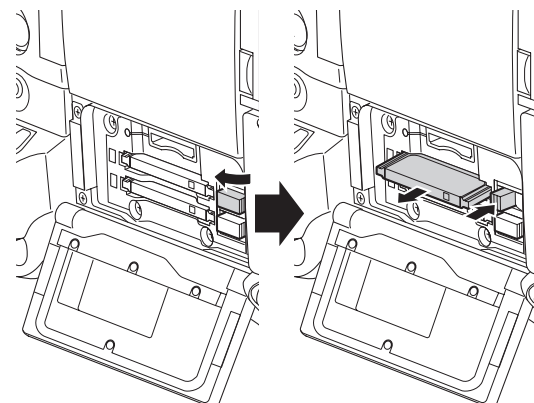
Raise the eject button.   Press the raised eject button to remove a P2 card.

◆ **NOTE**

- **When a P2 card is being accessed or recognised after insertion (P2 card access LED blinks in orange), do not remove the P2 card. Removing a P2 card during access could damage it.**
- **If a P2 card being accessed is removed, the LCD monitor and viewfinder display "TURN POWER OFF" and the camera gives a warning using an alarm and the WARNING lamp. In addition, all P2 card access LEDs blink rapidly in orange. If this is the case, turn the power off.**
  For details, refer to [Warning System] (page 127).
- **Removing a P2 card during access may corrupt clip data. Check the clips and restore them if required.**
  For details, refer to [Restoring Clips] (page 96).
- **If a P2 card being formatted is removed, it may be not be formatted properly. In this case, the LCD monitor and viewfinder display "TURN POWER OFF." If this message appears, turn off the power, then restart the camera to reformat the card.**
- **The P2 card access LED can be set to stay off in the menu option ACCESS LED in the OTHER FUNCTIONS screen. When the camera is used in this way, remove cards when the camera has been powered down or a sufficiently long time after terminating recording, playback and other operating modes.**
- **Removing a P2 card during thumbnail display terminates the thumbnail display.**

To Prevent Accidental Erasure of P2 Card Content

To prevent the content of a P2 card being accidentally erased, position the write-protect switch on the P2 card at [Protect].

Write-protect switch
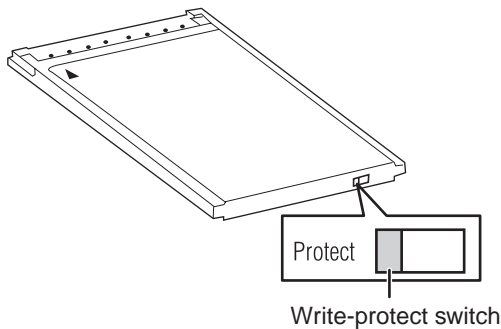
◆ **NOTE**

Write-protect switchover can be performed while the card is being accessed (during recording or playback), but does not take effect until access to the card ceases.

P2 Card Access LED and Status of P2 Cards

P2 card access LED	Status of P2 card		MODE CHECK indication *1
Stays on in orange	Target of recording *2	Both writing and reading enabled, and to be used for recording at present	ACTIVE
Blinks in orange	Being accessed	Writing or reading being performed.	ACCESSING
Quickly blinks in orange	Being recognized	The P2 card is being recognised.	INFO READING
Stays off	Recording Enabled *2	Both writing and reading enabled.	ACTIVE
	Card not supported	The card is not supported by this unit. Replace the card.	NOT SUPPORTED
	Incorrect format	The P2 card is not properly formatted. Reformat the card.	FORMAT ERROR
	Card not inserted	No P2 card is inserted. Card recognition standby.	NO CARD
	Card full	The P2 card has no free space. Only reading is enabled.	FULL
	Write-protected	The write-protect switch on the P2 card is positioned at [Protect]. Only reading is enabled.	PROTECTED

*1 MODE CHECK appears on the LCD monitor and in the viewfinder.
  For details, see [LCD Monitor/Viewfinder Screen Status Displays] (page 67).

*2 Used for recording when recordable P2 cards are inserted in both the L and R card slots.

31

P2 Card Recording Times

P2 cards available with this camera

This camera supports the optional AJ-P2C064AG (64 GB) and AJ-P2E032XG (32 GB) P2 cards, and other 4 GB to 64 GB P2 cards (as of Nov. 2011).

◆ **NOTE**

- **This unit cannot use AJ-P2C002SG (2 GB) cards.**
- **Depending on the type of P2 card used, you may need to update the camera driver.**
  For details, refer to [Updating the Firmware Incorporated into the Unit] (page 131).
- **For the latest information not available in the Operating Instructions, visit the support desk at the following website.**
    http://pro-av.panasonic.net/

P2 card recording times

(When using two 64 GB cards)

Recording format (codec)	Recording time
AVC-I 100	Approx. 60 min.
AVC-I 50	Approx. 120 min.

◆ **NOTE**

- **The above recording time is for normal recording. Recording in native mode will extend recording time depending on system mode.**
  For details, refer to [List of Recording, Playback and Output Formats] (page 45).
- **Use of 32 GB, 16 GB and 8 GB P2 cards will provide 1/2, 1/4 and 1/8, respectively of above recording times.**
- **The indicated capacities include a management area so the total area available for recording is somewhat smaller.**

Splitting clips recorded on P2 cards

This camera will automatically generate additional clips for a continuous recording on an 8 GB or higher capacity P2 card when the recording exceeds the durations given below. Even so, a P2 device will handle such clips as a single clip in thumbnail operations (display, delete, recover, copy, etc.). Such recordings may be handled as separate clips by nonlinear editing software or a PC.

Recording format (excluding Native format)	Continuous recording time
AVC-I 100	Approx. 5 min.
AVC-I 50	Approx. 10 min.

Handling P2 Card Recording

The P2 card is a semiconductor memory card designed for professional video and broadcast equipment.

- Since the AVC-Intra record data as files, it is ideally suited for computer processing. The file structure is in a proprietary format that includes audio and video data recorded in the MXF file format as well as various other essential data forming an interrelated folder structure as shown below.

```
Drive:\
     ├── CONTENTS
     │          ├── AUDIO
     │          ├── CLIP
     │          ├── ICON
     │          ├── PROXY
     │          ├── VIDEO
     │          └── VOICE
     └── LASTCLIP.TXT.*
```
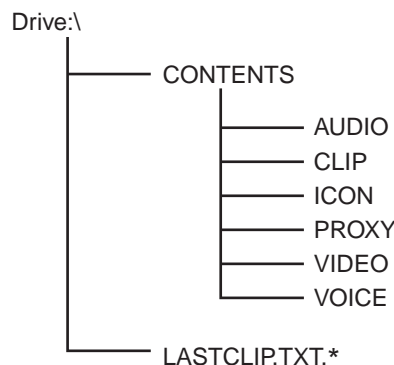
All these folders are required.
* This file contains the last clip data recorded on a P2 device.

◆ **NOTE**

If any of this data is changed or lost, it will not be recognized as P2 data or the P2 card may no longer be possible to use in a P2 device.

- To prevent data loss in transferring P2 card data to a PC or write back PC data on a P2 card, use P2 Viewer, which can be downloaded from the website listed below. You can also visit the support desk at the following website for details on the system requirements of P2 Viewer.

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

- Follow the steps below to use general software such as Microsoft Windows Explorer or Apple Finder to transfer the data to a PC. Be sure to use P2 Viewer to write data back to a P2 card.
  - Treat the CONTENTS folder and the LASTCLIP.TXT file as a unit.
  - Do not modify the data below the CONTENTS folder.
  - In copying, be sure to copy both the CONTENTS folder and the LASTCLIP.TXT file together.
  - When transferring data from multiple P2 cards, create separate folders for each P2 card to prevent overwriting clips with identical names.
  - Do not delete data on a P2 card.
  - Format P2 cards only on a P2 card device.

Basic Procedures

This section describes the basic procedure for shooting and recording.
Before you embark on a shoot, pre-inspect your system to ensure that it works properly.
For directions on inspecting your memory card camera-recorder, see [Inspections Before Shooting] (page 123).

Battery Set-up to P2 card Insertion

1 Insert a charged battery.

2 Turn the POWER switch to ON to check the battery remaining level on the LCD monitor or in the viewfinder.

　• When battery capacity is low, replace it with a fully charged battery.

◆ **NOTE**

When low battery capacity is indicated after replacing a battery with a fully charged battery, check battery installation.
For details, refer to [BATTERY SETUP Screen] (page 117).

3 Insert P2 cards into the L and R P2 card slots and check that the P2 card access LEDs light in orange before closing the slot cover.

Light
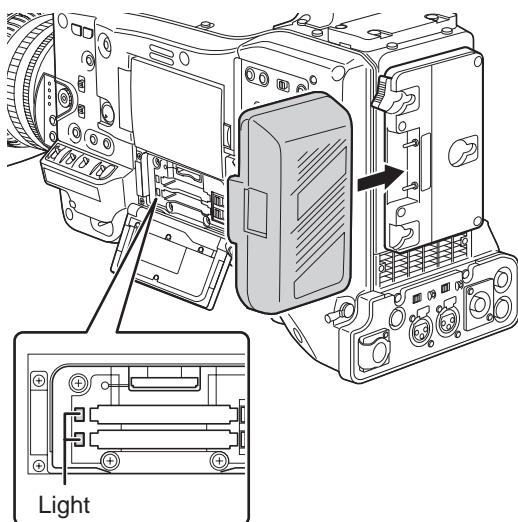
◆ **NOTE**

For secure recording of 3D images, recording cannot be started even if the REC button is operated in the following situations:
• **While the camera is identifying a P2 card after the power is turned on or immediately after the P2 card is inserted (when the P2 card access LED is blinking in orange**
• **When thumbnails are displayed or during playback or transport process, such as PLAY, FF, or REV.**
• **During a recording ending process.**

Setting the switches before shooting and recording

When a battery and P2 cards are installed, set the switches as detailed below, before starting to use your AG-3DP1.
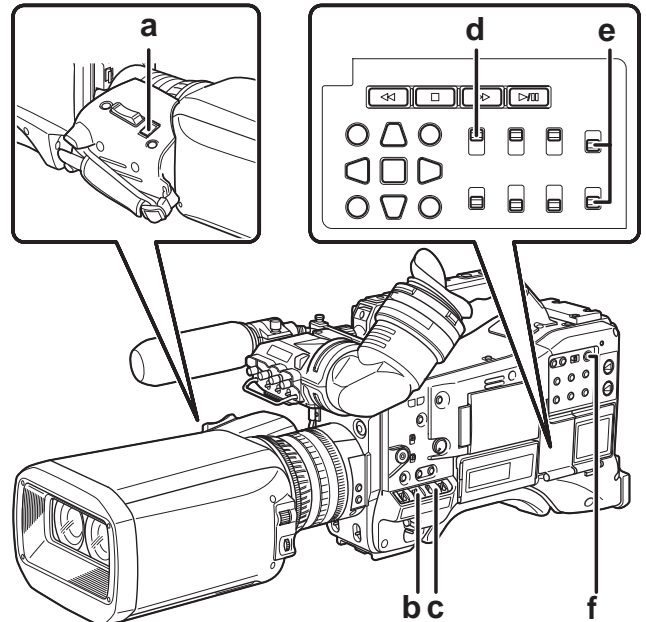
a **IRIS selector switch**
The iris is automatically adjusting if the IRIS selector switch is set to A (AUTO).

b **GAIN switch**
Normally, this should be set to L (0 dB). If conditions are too dark, an appropriate gain level should be set.

c **AUTO KNEE selector switch**
Set to ON or OFF. Selecting BARS turns off this function and outputs a color bar signal.

d **TCG switch**
Set to F-RUN or R-RUN.

e **AUDIO SELECT CH 1/CH 2 switch**
Set to AUTO.

f **LCD/EVF button**
Normally, select MIX mode (left and right images are mixed), by pressing the LCD/EVF button.

Shooting

White/Black Balance Adjustment to Recording Completion

For shooting, follow the steps below.

6, 7
4   **1**
5   **2**
3
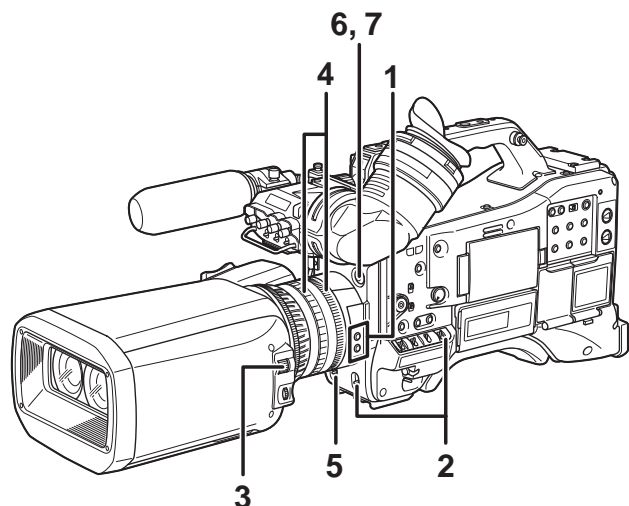
1   Use the ND FILTER ∧ ∨ buttons to select a filter according to ambient light conditions.

2   ■When the white balance is saved:
  • Position the WHITE BAL switch to A or B.
  ■When the white or black balance is not saved and you have no time to adjust the white balance:
  • Position the WHITE BAL switch to PRST.
  • The color temperature can be set to 3200 K or 5600 K.
  For details, refer to [Adjusting the White Balance and Black Balance] (page 46).
  ■If the white balance is adjusted on the spot:
  • Select a filter according to ambient light conditions. Then, position the WHITE BAL switch to A or B and shoot a white test subject so that it appears at the center of the screen. Then, follow the steps below to adjust the white balance.
  1. Turn the AUTO W/B BAL switch toward AWB to adjust the white balance.
  2. Turn the AUTO W/B BAL switch toward ABB to adjust the black balance.
  3. Turn the AUTO W/B BAL switch toward AWB to adjust the white balance again.
  For directions on making adjustments, see [Adjusting the White Balance] (page 46) and [Adjusting the Black Balance] (page 47).

3   Point the camera at your subject and adjust the convergence point, using the CONV. dial.
  For details, refer to [Adjusting the Convergence Point] (page 54).

4   Point the camera at your subject to adjust the focus, and zoom.

5   To use the electronic shutter, set the shutter speed and shutter mode.
  For more information, see [Setting the Electronic Shutter] (page 48).

6   Press the REC button to start recording.

7   To stop recording, press the REC button.

◆ NOTE
Shooting the sun and other very bright subjects may produce a color cast in surrounding areas.

■Operation Buttons
During recording, all operation buttons (REW, FF, PLAY/PAUSE, STOP) are disabled.

Normal Recording

Pressing the REC button starts recording of video and sound on the P2 cards.
• The 3D recording mode is set by factory default. The left-lens (L) image is recorded on the P2 card in card slot L , and the right-lens (R) image on the P2 card in card slot R.
• The video and audio (including additional information) recorded in one session is referred to as a clip.

REC button
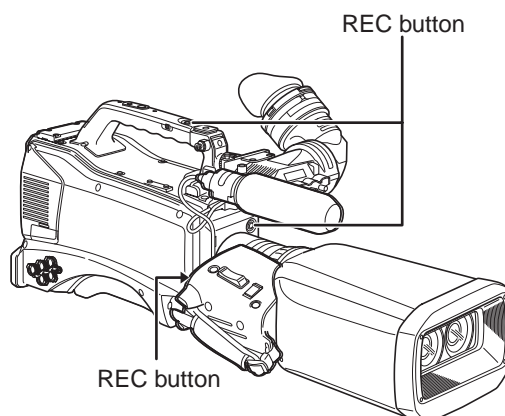
REC button

◆ NOTE
Pressing the REC button will not immediately stop data write operations to a P2 card in the following situations. And the REC button operation is not recognized.
• When terminating a short recording

2D LL Recording

You can record the left-lens (L) image on both the L and R P2 cards.

1 Set the menu option REC MODE in the SYSTEM SETUP screen to 2D LL.

For details on menu operation, refer to [Using the Menus] (page 106).

2 Turn off the power, following the instructions on the LCD monitor, then turn it back on again.

- The camera starts in 2D LL recording mode and "2D LL" is displayed on the upper left of the LCD monitor/viewfinder screen.
- Insert two writable P2 cards into the L and R P2 card slots.
- When the cards are identified, "PAUSE" is displayed on the operation status display.

3 Press the REC button.

- One of the following indicators appear on the operation status display.
  - REC lights during recording.
  - PAUSE lights during recording pause.

◆ **NOTE**
- **Shot marks and clip meta data are recorded on the "L" P2 card only.**
- **Clips recorded in 3D recording mode cannot be checked when 2D LL recording mode is set. Clips recorded in 2D LL recording mode cannot be checked when 3D recording mode is set.**
- **Use one P2 card for either the 3D recording mode or 2D LL mode exclusively. Do not mix the two modes on one card.**
- **The CONV. dial is disabled in 2D LL recording mode although it can be rotated.**
- **The L/R outputs are both left-lens (L) signals, but they are output as 3D video.**

Switching over to the 3D recording mode

To switch over from the 2D LL recording mode to the 3D recording mode, do the following:

1 Set the menu option REC MODE in the SYSTEM SETUP screen to 3D.

For details on menu operation, refer to [Using the Menus] (page 106).

2 Turn off the power, following the instructions on the LCD monitor, then turn it back on again.

- The camera starts in 3D recording mode.

Chapter 3 Recording and Playback

35

Native Recording

Native recording extracts only the active frames according to the recording frame rate. It provides a longer recording time than the normal recording time.
For details on recording time, refer to [List of Recording, Playback and Output Formats] (page 45).
Also in native recording, the output of camera video and playback video is a 59.94 (50) frame rate.

```
Camera capture      [ A  ][ B  ][ C  ][ D  ]
(1080/24PN)
2:3 pull-down    [Ao|Ae|Bo|Be|Bo|Ce|Co|De|Do|De]
Recording        [ A  ][ B  ]   [ C  ][ D  ]
```

```
Camera capture      [ A  ][ B  ][ C  ][ D  ]
(720/24PN)
2:3 pull-down    [A★| A |B★| B |C★| C |D★| D ]
Recording        [ A ]  [ B ]  [ C ]  [ D ]
                 ★ Active frame
```

```
Camera capture      [ A  ][ B  ][ C  ][ D  ]
(720/30PN (25PN))
2:2 pull-down    [A★| A |B★| B |C★| C |D★| D ]
Recording        [ A ]  [ B ]  [ C ]  [ D ]
                 ★ Active frame
```
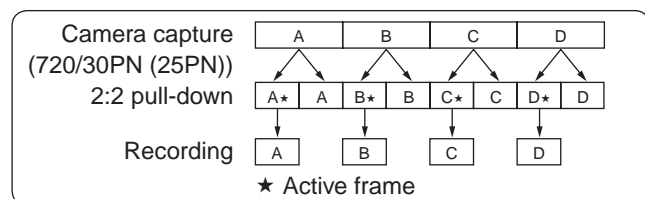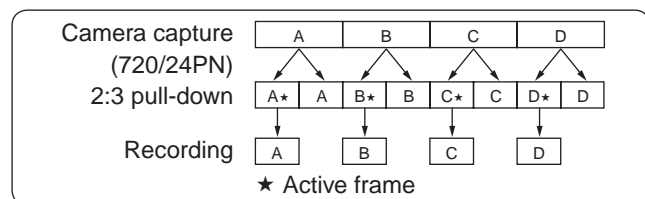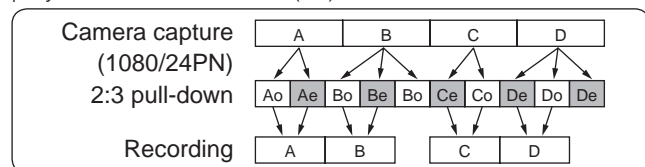
◆ **NOTE**

In 24P, 24PN (native recording) and in 30PN/25PN (native recording) at 720P, the camera starts recording in 5-frame, 4-frame and 2-frame segments, respectively. For this reason, to continue recording clips in a system mode using a different recording segmentation may break the continuity of the time code.

Variable Frame Rate (VFR) Recording

In 720P mode, this camera is capable of frame skipping (undercranking) and high-speed (overcranking) recording. The camera operator can select between native (PN) recording mode and standard (OVER) recording.

Native VFR Recording

1 In the SYSTEM SETUP screen, set the menu option SYSTEM MODE to 720-59.94P (720-50P) and the menu option REC FORMAT to AVC-I 100/24PN, 30PN (25PN).

2 In the SCENE FILE screen, set the menu option VFR to ON and the menu option FRAME RATE to suit shooting purposes.
- The frame rate can be set to a value beteween 12 frames (12P) to 60 frames (60P) when system mode is set to 720-59.94P. and to a value between 12 frames (12P) to 50 frames (50P) when system mode is set to 720-50P.
- The frame rate can be set to a value between 12 frames (12P) and 50 frames (50P) when the system mode is set to 720-50P.

3 Press the REC button.
This starts recording in the VFR mode (native VFR).

This mode can be combined with the AVC-I 100, AVC-I 50, 30PN, and 24PN (25PN) recording formats.
For details, refer to [List of Recording, Playback and Output Formats] (page 45).
For details, refer to [SYSTEM SETUP Screen] (page 111).

◆ **NOTE**
Note the following about native VFR recording.
- Interval recording is not available.
- Sound cannot be recorded. *[1]
- The time code is locked to Rec Run. *[1]
- Thumbnail screens are created 1 frame later than video recorded on a P2 card, but this is not a malfunction.

*[1] In 24PN and 30PN (25PN) recording modes, when the frame rate is 24 and 30 (25) frames per second, respectively, audio can also be recorded. The time code can be set to Free Run (F-RUN).

Standard VFR Recording (pulldown recording)

1 In the SYSTEM SETUP screen, set the menu option SYSTEM MODE to 720-59.94P (720-50P) and the menu option REC FORMAT to AVC-I 100/60P (50P).

2 In the SCENE FILE screen, set the menu option VFR to ON and the menu option FRAME RATE to suit shooting purposes.
- The frame rate can be set to a value beteween 12 frames (12P) to 60 frames (60P) when system mode is set to 720-59.94P.
- The frame rate can be set to a value between 12 frames (12P) and 50 frames (50P) when the system mode is set to 720-50P.

3 Press the REC button.
This starts recording in the VFR mode (OVER 60P (50P)).

This mode can be combined with the AVC-I 100/60P (50P) and AVC-I 50/60P (50P) recording formats.
For details, refer to [List of Recording, Playback and Output Formats] (page 45).
For details, refer to [SYSTEM SETUP screen] (page 111).

◆ **NOTE**
- **Audio playback is disabled when a frame rate converter is used to extract active frames for over and under-cranking.**
- **Note the following about standard VFR recording.**
  - **Interval recording is not available.**
  - **Sound is recorded.**

Using VFR Recording Function

Standard speed for film production (only when SYSTEM MODE is set to 720-59.94P, 1080-23.98PsF)

Screen production normally requires a 24 fps (24 frames per second) frame rate (normal speed) for screening a film. Making the settings described below will provide film-quality playback. The 720P progressive mode and cine-like gamma will make video look like it was shot with a film camera.

Standard settings for film production

SYSTEM MODE settings			Recording frame rate
SYSTEM MODE	Other settings		
720 - 59.94P	REC FORMAT	AVC-I 100/24PN (AVC-I 50/24PN)	24 frames
	VFR	OFF	
1080 - 23.98PsF	REC FORMAT	AVC-I 100/24PN (AVC-I 50/24PN)	

Shooting at standard speed for producing commercials and TV programs

Production aimed at HDTV and SDTV broadcasts for TV audiences must use the frame rate (x1) of 30fps (30 frames/s), 25fps (25 frames/s). The settings below allow you to obtain the kind of playback used for broadcast programs. This permits film-like video recording of commercials and music clips that also provide a frame rate suitable for broadcasting.

Standard settings for producing commercials and dramas

SYETEM MODE settings			Recording frame rate
SYSTEM MODE	Other settings		
720-59.94P	REC FORMAT	AVC-I 100/30PN (AVC-I 50/30PN)	30 frames
	VFR	OFF	
1080-59.94i	REC FORMAT	AVC-I 100/30PN (AVC-I 50/30PN)	
720-50P	REC FORMAT	AVC-I 100/25PN (AVC-I 50/25PN)	25 frames
	VFR	OFF	
1080-50i	REC FORMAT	AVC-I 100/25PN (AVC-I 50/25PN)	

Undercranking effects

This effect produces the quick motion often used for showing clouds drifting across the sky, crowds of people swarming past a solitary standing individual, a kung fu demonstration and other performances. For example, selecting a VFR recording frame rate of 12 fps when shooting at a 24P recording format yields a fast-motion effect of approx. 2x normal speed. The same effect can be obtained at a 30P recording and a 25P recording.

Standard setup for undercranking effects

SYETEM MODE settings			Recording frame rate
SYSTEM MODE	Other settings		
720-59.94P	REC FORMAT	AVC-I 100/24PN (AVC-I 50/24PN)	12 to 22 frames
	VFR	ON	
	FRAME RATE	Set to 22 frames or less	
720-50P	REC FORMAT	AVC-I 100/25PN (AVC-I 50/25PN)	12 to 24 frames
	VFR	ON	
	FRAME RATE	Set to 24 frames or less	

Overcranking effects

Overcranking produces slow-motion playback, which is frequently used in climax scenes, or for dramatic effects like car chases and action scenes. For example, selecting a recording frame rate of 60 fps when shooting a 24P recording format yields a slow-motion effect that is 2.5 times normal speed. Shooting 720P progressive video will produce smooth and high-quality slow-motion. The same effect can be obtained at a 30P recording and a 25P recording.

Standard setup for overcranking effects

SYSTEM MODE setup			Recording frame rate
SYSTEM MODE	Other settings		
720-59.94P	REC FORMAT	AVC-I 100/24PN (AVC-I 50/24PN)	25 to 60 frames
	VFR	ON	
	FRAME RATE	Set to 25 frames or more	
720-50P	REC FORMAT	AVC-I 100/25PN (AVC-I 50/25PN)	26 to 50 frames
	VFR	ON	
	FRAME RATE	Set to 26 frames or more	

Frame rate settings

When SYSTEM MODE is 720P and VFR is ON, the following frame rates can be set with the menu option FRAME RATE in the SCENE FILE screen.

SYSTEM MODE	Recording frame rate
720-59.94P	12, 15, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30, 32, 34, 36, 40, 44, 48, 54, 60
720-50P	12, 15, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 32, 34, 37, 42, 45, 48, 50

Special Recording Modes

During P2 card recording, interval recording can be enabled from the RECORDING SETUP screen.
The interval recording mode is available only with the following settings:

SYSTEM MODE	REC FORMAT	Other conditions
1080-59.94i	AVC-I 100/60i AVC-I 50/60i	
720-59.94P	AVC-I 100/60P AVC-I 50/60P	Turn VFR OFF
1080-50i	AVC-I 100/50i AVC-I 50/50i	
720-50P	AVC-I 100/50P AVC-I 50/50P	Turn VFR OFF

Interval Recording (INTERVAL REC)

This function is used to record 1 frame at the time interval set in the INTERVAL TIME item.
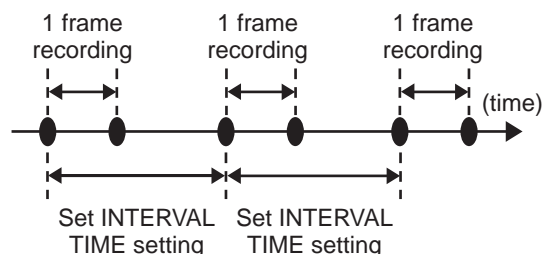
1 Check that the SYSTEM SETUP screen is set up as shown in the left table.

For details on menu operation, refer to [Using the Menus] (page 106).

2 Select INTERVAL in the menu option REC FUNCTION in the RECORDING SETUP screen.

3 Set the time in the menu option INTERVAL TIME in the RECORDING SETUP screen.

4 Press the REC button.

• The camera will repeat 1-frame recording for the time interval set in the INTERVAL TIME option.
• Press the STOP button to stop recording.
• To cancel this function, turn the camera off or select NORMAL in the REC FUNCTION option.
• The following indications appear to the left of the operation status display.
  • During recording: "I-REC" stays lit.
  • During a pause: "I-PAUSE" stays lit.
    When a setting of less than 2 seconds is made in step 3, "I-REC" blinks according to time setting during recording.
  • When stopped: "I-" in "I-PAUSE" blinks.

◆ **NOTE**
• **Sound is not recorded.**
• **Data recorded (until the STOP button is pressed) in this mode is recorded as a single file.**

REC CHECK Function

Pressing the USER button (USER MAIN, USER1 or USER2) or the RET/REC CHECK button to which REC CHECK has been assigned will automatically locate and play back the last two seconds of the most recent clip.
Use this function to check that recording is performed normally. The camera returns to recording standby mode after playback.

• You can use menu options USER MAIN, USER1, USER2, and RET in the SW MODE screen to assign the REC CHECK function to the desired button.

Shot Marker (SHOT MARK) Recording Function

This function can be used to distinguish a clip from other clips by adding a thumbnail to each clip.
This also makes possible to display or play back the marked clips only.

To add shot marks

1 In the SW MODE screen, assign SHOT MARK to a user button (USER MAIN, USER1 or USER2).

For details on menu operation, refer to [Using the Menus] (page 106).

2 Press the USER button to which SHOT MARK has been assigned during recording or when recording is paused.

• SHOT MARK ON is displayed as a shot mark is inserted in the currently recorded clip.
• Pressing this key a second time displays SHOT MARK OFF and the shot mark is deleted.

◆ **NOTE**
• **A shot mark added during a pause after recording is added to the most recently recorded clip.**
• **Shot marks can be added also in the thumbnail display.**
• **The shot mark function is not available during, interval recording. When this function is not available, pressing this button displays SHOT MARK INVALID.**
• **Shot marks can be set or cancelled in playback pause mode but not during playback.**
• **Shot marks are added on the "L" P2 card only.**

Normal and Variable Speed Playback

■Normal speed playback

Press the PLAY/PAUSE button to view playback on the LCD monitor and in the viewfinder in color. Connecting a color video monitor to the HD SDI MONITOR OUT, HD SDI OUT 1(L)/2(R) or HDMI connector will enable playback of color video.
The PLAY/PAUSE button can be used to pause playback.
• During normal playback, 3D display mode is available. (3D recording mode)

■Fast-forward/fast-reverse playback

The FF and REW buttons provide 32× and 4× fast playbacks and fast reverse playbacks. In stop mode, this function will play back video at 32× speed and in playback mode, it will play back video at 4× speed.
• Only 2D display mode is available during fast-forward and fast-reverse playback.

■Clip cue up

When playback is paused, the FF button locates the beginning of the next clip while staying in pause mode.
When playback is paused, the REW button locates the beginning of the current clip while staying in pause mode.

◆ NOTE
• **It may take some time to load clip data if playback is started or a thumbnail screen is opened right after removing or inserting a P2 card or turning the power on. The thumbnail screen displays UPDATING at such times.**
• **To play back a clip in a different SYSTEM MODE, adjust the SYSTEM MODE to the clip to reset the camera before playback.**
• **Playback of the audio channels CH5 to CH8 recorded on another device is not possible.**
• **For information on the output connectors and video output formats depending on the settings, refer to [Selecting Video Output] (page 44).**

Chapter 4 Adjustments and Settings for Recording

Selecting Recording Signals

This camera records HD (1080i, 720P) signals using AVC-Intra codec.
It provides a variety of capture frame rates and recording frame rates (native recording) to suit specific applications.
Select recording and recording signal in the setting menus listed below.

Screen	Setting menu	Setting
SYSTEM SETUP screen	SYSTEM MODE	Selects the signal format from among 1080/59.94i, 1080/23.98PsF, 1080/50i, 720/59.94P, and 720/50P. To change this setting, wait until TURN POWER OFF appears before turning the power off and then turn it back on again.
	REC FORMAT	Selects AVC-I 100 or AVC-I 50 codec. For each of 1080 or 720 system, 60i, 60P, 30PN, 24PN, 50i, 50P and 25PN can be selected.
	REC MODE	Selects 3D or 2D LL recording mode. To change this setting, wait until TURN POWER OFF appears before turning the power off and then turn it back on again.
SCENE FILE screen	VFR	Setting this function to ON in 720P mode starts variable frame rate capture which records at the frame rate set in the FRAME RATE option. For details, refer to [Variable Frame Rate (VFR) Recording] (page 37).
	FRAME RATE	When the VFR option is set to ON, select the frame rate for variable frame rate recording.

◆ NOTE

Changing the menu options SYSTEM MODE and REC FORMAT may distort video and audio, but this is not a malfunction.

List of Recording Formats and Functions

The table below lists the recording formats and recording functions that the camera supports.

Operation mode	REC FUNCTION (menu)	REC FORMAT (menu)	VFR (menu)	SHOT MARK
Interval recording	INTERVAL	AVC-I 100/60i, 60P, 50i, 50P (AVC-I 50/60i, 60P, 50i, 50P) only	Disabled	Disabled
Native VFR	NORMAL	AVC-I 100/24PN, 30PN, 25PN (AVC-I 50/24PN, 30PN, 25PN)	ON	Enabled
Native recording (VFR OFF)			OFF	Enabled
Standard VFR		Other than AVC-I 100/24PN, 30PN, 25PN (AVC-I 50/24PN, 30PN, 25PN)	ON	Enabled
Normal recording (VFR OFF)			OFF	Enabled

43

Selecting Video Output

Use the OUTPUT SEL screen to select the video output.

Menu options in the OUTPUT SEL screen	Setting
SDI OUT	Selects the signal to be output from the HD SDI OUT 1 (L)/2 (R) connectors and HD SDI MONITOR OUT connector. **ON:** The HD SDI OUT 1 (L)/2 (R) connectors output the left-lens (L) image and the right-lens (R) image. The HD SDI MONITOR OUT connector outputs the same image as that selected with the menu option MONTIOR OUT SEL. **ON (SIDE):** The HD SDI OUT 1 (L)/2 (R) connectors normally output the SIDE by SIDE images. During playback, however, they do not output SIDE by SIDE images but instead the left-lens (L) image and right-lens (R) image. The HD SDI MONITOR OUT connector outputs the same image as that selected with the menu option MONTIOR OUT SEL. **OFF:** The HD SDI OUT 1 (L)/2 (R) connectors and the HD SDI MONITOR OUT connector output no images. If a monitor is connected to the HDMI connector, an image compatible with the monitor is output from the HDMI connector.
MON OUT SEL	Selects the image to be output from the HD SDI MONITOR OUT connector and HDMI connector.*[1] During playback, however, the output is fixed to the left-lens (L) image. **NORMAL:** The same image as that displayed on the LCD monitor is output. **L:** The left-lens (L) image is output. **MIX:** The mixed left-lens (L) image and right-lens (R) image is output. **SIDE:** The SIDE by SIDE image is output.

*[1] No image is output from the HD SDI MONITOR OUT connector when the menu option SDI OUT is set to OFF. No image is output from the HDMI connector if the menu option SDI OUT is set to ON or ON (SIDE).

List of Recording, Playback and Output Formats

SYSTEM MODE	REC FORMAT	VFR	FRAME RATE (FRAME)	Recording format	Recording time (64 GB)	Video	Audio	3D	SideBySide	720P	1080	480P576P
						SDI L/R/ MONITOR SDI OUT ON		**HDMI** SDI OUT OFF				
1080 59.94i	AVC-I 100/50	60i		1080/60i	60 min	59.94i	4ch	59.94i Field Packing	SbyS 1080 59.94i	L 1080 59.94i	L 1080 59.94i	L 480 59.94p
		30PN		1080/30PN		29.97PsF						
		—	Disabled	Disabled	1080/24PN*¹		23.98P OVER 59.94i 2:3	—				
1080 23.98 PsF	AVC-I 100/50	24PN	Disabled	Disabled	1080/24PN	80 min	23.98PsF*²	4ch	24P Frame Packing	—*³	L 1080 59.94i	L 1080 59.94i	L 480 59.94p
720 59.94P	AVC-I 100/50	60P	OFF	Disabled	720/60P	60 min	59.94P	4ch	59.94P Frame Packing	—*³	L 720 59.94P	L 1080 59.94i	L 480 59.94P
			ON	12-60			59.94P VFR						
		30PN	OFF	Disabled	720/30PN	120 min	29.97P OVER 59.94P 2:2	4ch					
			ON	30									
				Other than 30	720/30PN VFR		59.94P VFR	Muted					
		24PN	OFF	Disabled	720/24PN	150 min	23.98P OVER 59.94P 2:3	4ch					
			ON	24	720/24PN								
				Other than 24	720/24PN VFR		59.94P VFR	Muted					
1080 50i	AVC-I 100/50	50i	Disabled	Disabled	50i	60 min	50i	4ch	50i Field Packing	SbyS 1080 50i	L 1080 50i	L 1080 50i	L 576 50p
		25PN			25PN		25PsF						
720 50P	AVC-I 100/50	50P	OFF	Disabled	720/50P	60 min	50P	4ch	50P Frame Packing	—*³	L 720 50p	L 1080 50i	L 576 50p
			ON	12-50			50P VFR						
		25PN	OFF	Disabled	720/25PN	120 min	25P OVER 50P 2:2	4ch					
			ON	25	720/25PN								
				Other than 25	720/25PN VFR		50P VFR	Muted					

*¹ When playing back the data recorded in 1080/23.98PsF format with 1080/59.94i

*² The 23.98P OVER 59.94i 2:3 signal is output from MONITOR OUT when SYSTEM MODE is set to 1080/23.98PsF.

*³ The HDMI output depends on the connected equipment, as this format is not specified by HDMI standards.

Adjusting the White Balance and Black Balance

To record high-quality video with the AG-3DP1, the black and white balances must be adjusted according to conditions.

For higher quality, it is recommended that the adjustments should be made in this order AWB (white balance adjustment) → ABB (black balance adjustment) → AWB (white balance adjustment).

◆ NOTE

If white balance and black balance adjustments are made while the video image is distorted due to GENLOCK, the adjustments may not be correct. Wait for the video image to return to normal before performing white balance and black balance adjustments again.

Adjusting the White Balance

Whenever light conditions change, the white balance must be readjusted.

To adjust the white balance, follow the steps below.
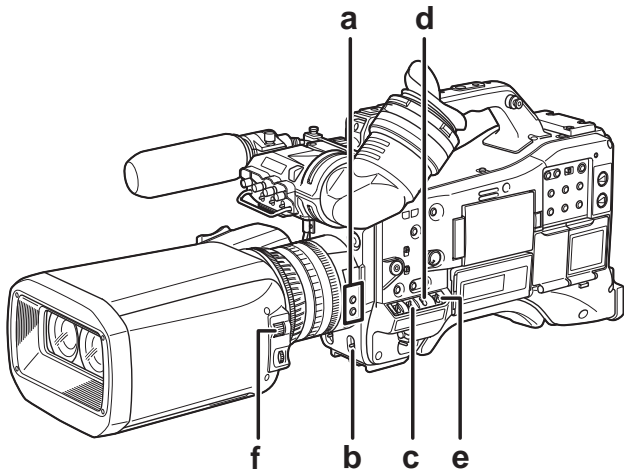
a ND FILTER buttons
These buttons adjust the amount of light entering the MOS sensor.

b AUTO W/B BAL switch
Use for automatic control of white balance.

c GAIN selector switch
Normally set to 0 dB. If this is too dark, adjust gain as necessary.

d OUTPUT selector switch
Set to CAM.

e WHITE BAL switch
Set to A or B.

f CONV. dial
Use to adjust the convergence.

1 Set the GAIN, OUTPUT and WHITE BAL switches.

2 Adjust the ND filter with the ND FILTER buttons according to the lighting conditions.

For examples of the settings with the ND FILTER buttons, refer to [Shooting and Recording/Playback Functions Section] (page 19).

3 Place a white pattern at a point where the lighting conditions match those for the light source of the subject. Then zoom-in on the white pattern so that white color appears in the screen.

• A white object (cloth or wall) may be used instead of a white pattern. The illustration below shows the required size for the white space.

◆ NOTE

• **Do not point the camera at a high-brightness area.**
• **The white object must appear at the center of the screen.**

1/3 or more of the screen in width

1/3 or more of the screen in height
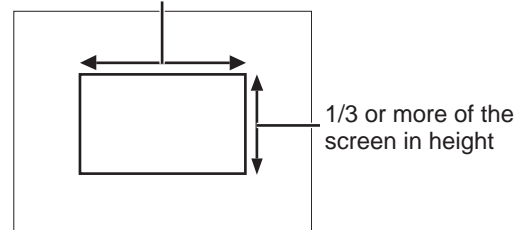
4 Turn the CONV. dial so that the convergence point (reference plane) is set on the white pattern.

5 Adjust the lens iris.

• Use the Y GET function (for details, refer to page 50) and adjust the iris to a approximately 70 % of incoming light.

6 Turn the AUTO W/B BAL switch toward AWB and release it.

• The switch returns to the central position with the white balance automatically adjusted.

7 During an adjustment, the LCD monitor and the viewfinder display the following message:

```
AWB   Ach   ACTIVE
```

8 The adjustment will take effect in a few seconds, and the following message will appear:

• The adjusted value is automatically stored in the selected memory (A or B).

> AWB A END 3.2K

• "C TEMP+7" to "C TEMP-7" will appear when C TEMP of the scene file is set to the value other than 0.

9 If the subject's color temperature is lower than 2300 K or higher than 9900 K the following message appears:

• If the arrow points down (↓) the actual color temperature is lower than the temperature indicated. If the arrow points up (↑) the actual temperature is higher than the temperature indicated.

> AWB A END 2.3K ↓

10 Check the adjustment results for the left and right images, using the LCD monitor or the connected monitor.

• Left and right adjustments may differ depending on the location of a light source or movement of the subject.

When you have no time to adjust the white balance

Position the WHITE BAL switch at PRST.
• Turning the AUTO W/B BAL switch to AWB toggles the color temperature between 3200 K and 5600 K.

When the white balance has not been automatically adjusted

When the white balance has not been successfully adjusted, the LCD monitor/viewfinder displays an error message.

Error message	Description
AWB Ach (or Bch) NG	The color temperature is too high or too low.
LOW LIGHT	There is insufficient light. The convergence point (reference plane) is deviated.
LEVEL OVER	There is too much light.

LCD monitor/viewfinder displays related to white balance

See [LCD Monitor/Viewfinder Screen Status Displays] (page 67).

Adjusting the Black Balance

The black balance must be adjusted when:
• You use your camera the first time.
• Your camera has not been used for some time.
• The ambient temperature has changed substantially.
• The gain switchover value has been changed.
• The menu options SYSTEM MODE and REC FORMAT in the SYSTEM SETUP screen.

Adjust the black balance before shooting to ensure optimum video quality.
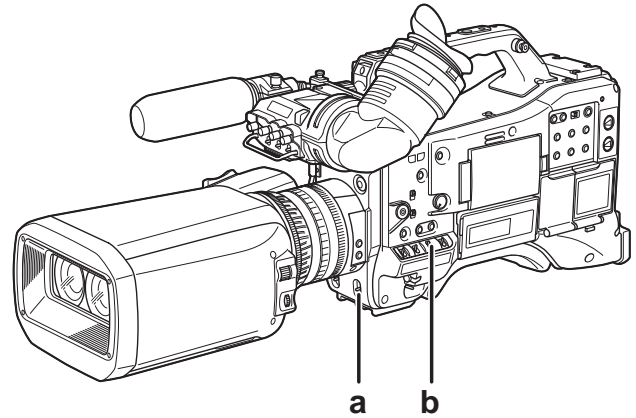
a **AUTO W/B BAL switch**
Use for automatic control of black balance.

b **OUTPUT selector switch**
Set to CAM.

1 Tilt the AUTO W/B BAL switch so that it is positioned at ABB, then release it.

• The switch returns to the central position with the black balance automatically adjusted.

2 During adjustment, the LCD monitor and viewfinder display the following message:

> ABB ACTIVE

3 The adjustment will take effect in a few seconds and the following message will appear:

> ABB END

• The adjusted value is automatically stored in the memory.

◆ **NOTE**
• **Black balance adjustment is not available during recording.**
• **Pressing the REC button during ABB adjustment will not start recording on a P2 card.**

Setting the Electronic Shutter

Setting the Shutter Mode and Speed

1 Press the SHUTTER switch positioned at OFF towards ON.

SHUTTER switch

2 Press the SHUTTER switch towards SEL. Repeat this switchover until the desired mode or speed appears on the LCD monitor and in the viewfinder.

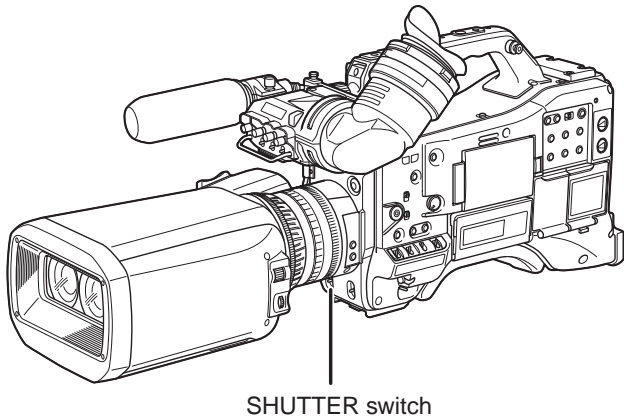- If all modes and speeds are available, the display changes in the following order:
- The bracketed ( ) speeds cannot be selected when VFR is on.

■**When SYSTEM MODE is set to 1080-59.94i or 720-59.94P**

For 60i and 60P recording

S/S → (1/15) → (1/30) → 1/60 → 1/100 → 1/120 → 1/250

For 30P recording

S/S → (1/15) → 1/60 → 1/100 → 1/120 → 1/250

For 24P recording

S/S → (1/12) → 1/60 → 1/100 → 1/120 → 1/250
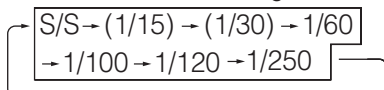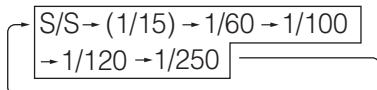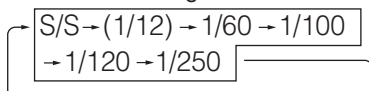
■**When SYSTEM MODE is set to 1080-50i or 720-50P**

For 50i and 50P recording

S/S → (1/12.5) → (1/25) → 1/50 → 1/60 → 1/120 → 1/250

For 25P recording

S/S → (1/12.5) → 1/50 → 1/60 → 1/120 → 1/250
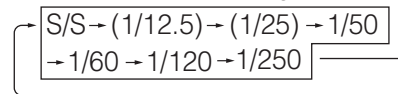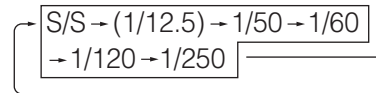
◆ **NOTE**

- **In any electronic shutter mode, a slower shutter speed will reduce camera sensitivity.**
- **In auto iris mode, a faster shutter speed will increase the aperture and lower the depth of field.**
- **Changes in synchro scan and shutter speed settings may cause screen flicker.**
- **Under fluorescent lighting and other discharge lighting systems, horizontal stripes may appear on the screen. Changing the shutter speed may correct this problem.**
- **A subject that is captured when moving quickly across the field of view may appear distorted. This is due to the signal read out format of the image sensor (MOS sensor) and is not a malfunction.**
- **The red, blue and green dots that may appear on the screen at low shutter speeds do not indicate a malfunction.**

Placing the Camera-recorder in SYNCHRO SCAN Mode

1 Press the SHUTTER switch positioned at ON towards SEL, to place the camera-recorder in SYNCHRO SCAN (S/S) mode.

SYNCHRO SCAN switch
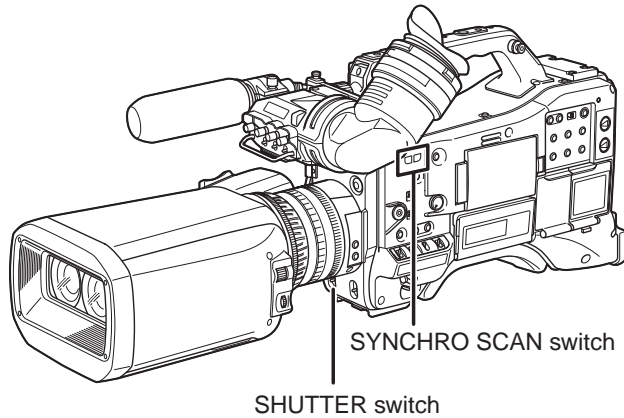
SHUTTER switch

2 In SYNCHRO SCAN mode, use the SYNCHRO SCAN switch to make stepless changes in the range between 1/60.0 s and 1/249.8 s (for 60i mode), or between 1/50.0 and 1/250.0 s (for 50i mode).

• Hold down the SYNCHRO SCAN switch to speed up the rate of shutter speed changes.
If shutter speed changes stop before the desired shutter speed has been reached, press again to continue changing shutter speeds.

Range of variation in each mode

• The shutter speed in SYNCHRO SCAN mode can be displayed in either fractional form (sec) or shutter angle form (deg). To set the display form, use the menu option SYNC SCAN DISP in the DISPLAY SETUP screen.

REC FORMAT	Setting of SYNC SCAN DISP	
	sec	deg
60P/60i	1/60.0 – 1/249.8	90d - 359.5d
30PN	1/30.0 – 1/249.8	45d - 359.5d
24PN	1/24.0 – 1/249.8	45d - 359.5d
50P/50i	1/50.0 – 1/250.0	90d - 359.5d
25PN	1/25.0 – 1/250.0	45d - 359.5d

• The shutter speed may vary before and after SYSTEM MODE switchover.

Chapter 4 Adjustments and Settings for Recording

Assigning Functions to USER Buttons

The USER MAIN, USER1, and USER2 buttons can be assigned user-selected functions.
Use the menu options USER MAIN, USER1, and USER2 to assign functions to respective button. Select these items from the setting menu SW MODE screen.

```
          SW MODE
 LOW GAIN          0dB
 MID GAIN          6dB
 HIGH GAIN        12dB
 USER MAIN    ▶ PUSH AF
 USER1            Y GET
 USER2        SHOT MARK
 RET          REC CHECK
 LCD/EVF         MIX/R

   PUSH  MENU  TO  RETURN
```
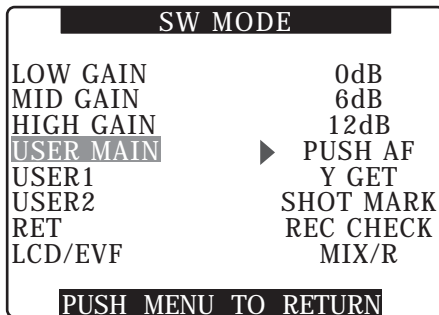
Selectable Functions

• **PUSH AF:**

Assigns temporal auto focusing while holding the PUSH AF button down.

• **Y GET:**

Assigns a function that displays the brightness level at the center of the image.

• **SHOT MARK:**

Assigns the shot marker function.

• **REC CHECK:**

Assigns the REC CHECK function.

• **R CONV:**

Assigns a function that controls the convergence point adjustment from the extension control unit (AG-EC4G) connected to the REMOTE connector. (USER MAIN and USER1 buttons only)

• **3D A.Z WFM:**

Assigns a 3D assist function Z.WFM.

• **3D A.ALERT:**

Assigns a 3D assist function ALERT.

• **3D A.CONV.:**

Assigns a 3D assist function CONV.

◆ **NOTE**

The default settings are listed below.
• **USER MAIN:**   **PUSH AF**
• **USER1:**   **Y GET**
• **USER2:**   **SHOT MARK**

Selecting Audio Input Signals and Adjusting Recording Levels

This camera supports independent four-channel audio recording in any format.
When the AUDIO SELECT CH1/CH2 switch is positioned at AUTO, the recording levels for Audio Channels 1 and 2 are automatically adjusted. To manually adjust the recording levels, position the switch at MAN.
A setting menu allows you set the recording levels for Audio Channels 3 and 4 either to automatic adjustment or manual mode.

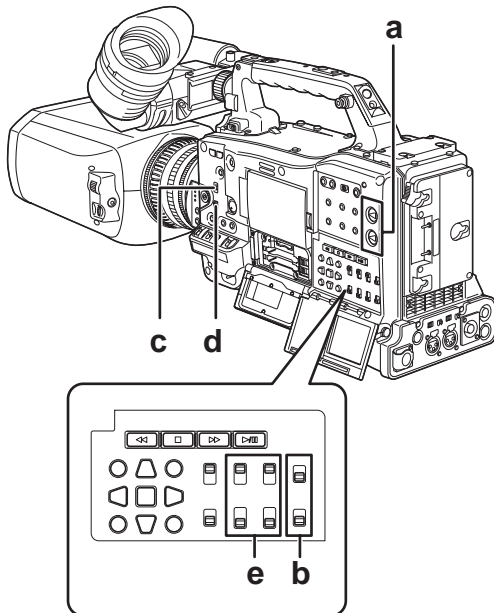## Selecting Audio Input Signals

The input signals to be recorded on Audio Channels 1, 2, 3, and 4 are selected with the AUDIO IN switch.
For more information, see [Audio (input) Function Section] (page 17).

a   **AUDIO LEVEL CH1/CH2 controls**

b   **AUDIO SELECT CH1/CH2 switch**

c   **MONITOR SELECT CH1/3, ST, CH2/4 selector switch**

d   **MONITOR SELECT CH1/2, CH3/4 selector switch**

e   **AUDIO IN CH1/CH2/CH3/CH4 switch**

◆ **NOTE**

The audio signals recorded on the four channels are output as is (SDI).

Use the AUDIO SETUP screen in the setting menu to make detailed audio settings.


```
        AUDIO SETUP
FRONT VR CH1        ▶    OFF
FRONT VR CH2             OFF
MIC LOWCUT CH1          OFF
MIC LOWCUT CH2          OFF
MIC LOWCUT CH3          OFF
MIC LOWCUT CH4          OFF
LIMITER CH1             OFF
LIMITER CH2             OFF
▼
     PUSH  MENU  TO  RETURN
```

Adjusting Recording Levels

To adjust the recording levels for Audio Channels 1 and 2, follow the steps below.

1 Position the MONITOR SELECT CH1/2, CH3/4-selector switch at CH1/2 so that the audio level meter on the display window will provide CH1 and CH2 indications. Ensure that the channel indications displayed in the window are 1 and 2.

2 Position the AUDIO SELECT CH1/CH2 switch at MAN.

3 While checking the audio level meter on the LCD monitor and in the viewfinder, adjust the AUDIO LEVEL CH1/CH2 control.

• Note that if the level exceeds the top bar (0 dB), the word OVER illuminates to show that the input level is excessive. Adjust so that maximum sound levels do not reach the 0 dB bar.

OVER indication

When operating the camera without a sound recordist, it is recommended that the F. AUDIO LEVEL control should be used to adjust the audio level.
In advance, check the level meter on the LCD monitor or the viewfinder screen and use the F. AUDIO LEVEL control to adjust the appropriate audio channel to prevent input of excessive audio signals.

Selecting Function for the F. AUDIO LEVEL Control

Use the menu options FRONT VR CH1 and FRONT VR CH2 in the AUDIO SETUP screen to determine whether or not the F.AUDIO LEVEL control should be enabled. Selecting an input signal in the menu will enable F. AUDIO LEVEL control operations for that input signal.

• When the F.AUDIO LEVEL control is set to level 10, it controls AUDIO LEVEL CH1 and CH2.

```
          AUDIO  SETUP

FRONT  VR  CH1      ▶      OFF
FRONT  VR  CH2             OFF
MIC  LOWCUT  CH1          OFF
MIC  LOWCUT  CH2          OFF
MIC  LOWCUT  CH3          OFF
MIC  LOWCUT  CH4          OFF
LIMITER  CH1             OFF
LIMITER  CH2             OFF
▼
      PUSH   MENU   TO   RETURN
```
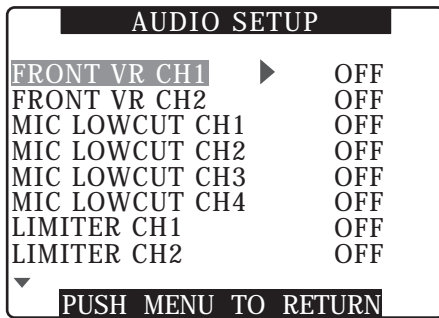
CH3 and CH4 Recording Levels

Conditions and input levels set in the menu options AUTO LEVEL CH3 and the AUTO LEVEL CH4 in the AUDIO SETUP screen change the operation of the audio level of channels 3 and 4 as shown below. These functions cannot be manually adjusted.

Each option can be selected in the AUDIO SETUP screen.

AUTO LEVEL	Input level	
CH3/CH4	LINE	MIC
ON	AGC* ON	AGC ON
OFF	AGC/LIMITER OFF	LIMITER ON

* AGC: Auto Gain Control

Adjustments and Settings for 3D Recording

Switching the LCD Monitor/ Viewfinder Screen

Equipped with two lenses, this camera shoots and records the image from the left lens (L) and that from the right lens (R) separately.

You can select the image to be displayed on the LCD monitor and in the viewfinder with the LCD/EVF button.

The following LCD/EVF modes can be switched over each time you press the LCD/EVF button.

- NORMAL:
  Displays the left-lens (L) image only. This is the normal display mode automatically set when the camera is turned on or during playback.
- MIX:
  Displays a mixed image, with the images from the left lens (L) and the right lens (R) superimposed.
- R IMAGE:
  Displays the right-lens (R) image only. This mode is used for 3D FINE operation.
- SIDE by SIDE:
  Displays the left-lens (L) image and the right-lens (R) image side by side on the same screen.
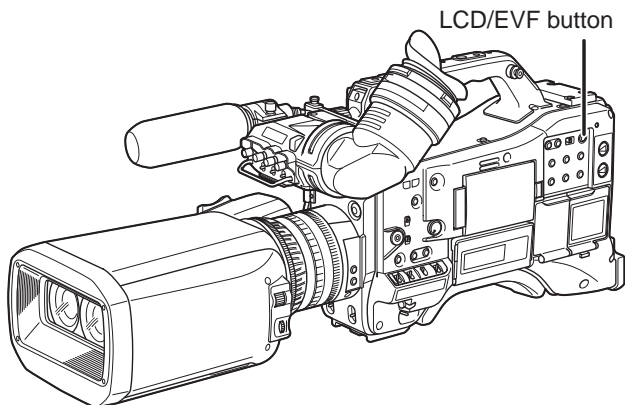
LCD/EVF button

- The selected LCD/EVF mode is displayed on the screen. Refer to [21 LCD/EVF mode display] in [Screen displays] (page 69).
- The images selectable with the LCD/EVF button can be changed with the menu option LCD/EVF in the SW MODE screen.
  MIX: NORMAL and MIX modes selectable
  MIX/R: NORMAL, MIX and R IMAGE modes selectable
  ALL: NORMAL, MIX, R IMAGE and SIDE by SIDE modes selectable

◆ NOTE
The LCD/EVF button is disabled in 2D LL recording mode.

Setting 3D Recording Mode

You can select the 3D recording mode with the 3D MODE selector switch according to the distance of your subject.

- NEAR:
  for shooting a subject at a short distance.
- NORMAL:
  Normally set to this mode (default setting). It allows smooth zooming operation.
- EXTRA:
  for shooting in telephoto mode. The variable range of zooming becomes coarse with this mode.

3D MODE selector switch
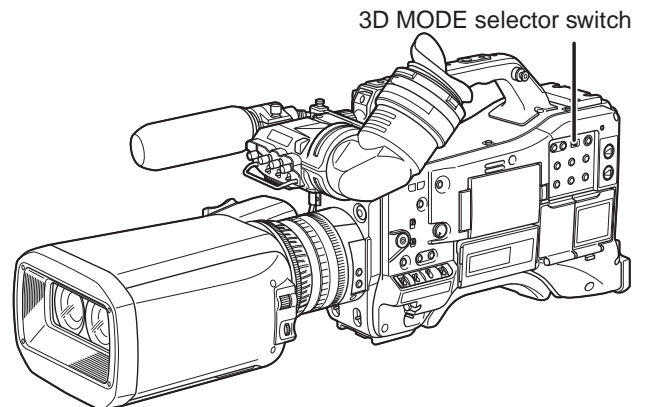
3D MODE selector switch	Convergence point adjustment range*1	Variable range of zooming	Minimum object distance*1
NEAR	1.1 m – 3.4 m (C00 – C69)	Z00 – Z80	0.4 m
NORMAL	1.7 m – ∞ m (C31 – C99)	Z00 – Z80	0.4 m
EXTRA	1.7 m – ∞ m (C31 – C99)	Z00 – Z99	0.9 m

*1 The convergence point adjustment range and the minimum object distance are guides for the distance between the front of the camera and the subject.

◆ NOTE
The 3D MODE selector switch is disabled in 2D LL recording mode. The variable range of zooming is fixed to Z00 to Z99.

53

Adjusting the Convergence Point

The convergence point is a point where the optical axes of the left and right lenses converge. This indicates the reference plane when viewing a 3D image.
When shooting, adjust the convergence point by shooting the subject you wish to set on the reference plane so that the image of the subject from the left lens is completely superimposed onto that from the right lens.
When viewing 3D image, a subject located closer than the convergence point is displayed in front of the screen, and a subject located farther than the convergence point is displayed behind the screen.

1 Press the LCD/EVF button to set to MIX mode.

2 Turn the CONV. dial to adjust the convergence point.

LCD/EVF button

CONV. dial
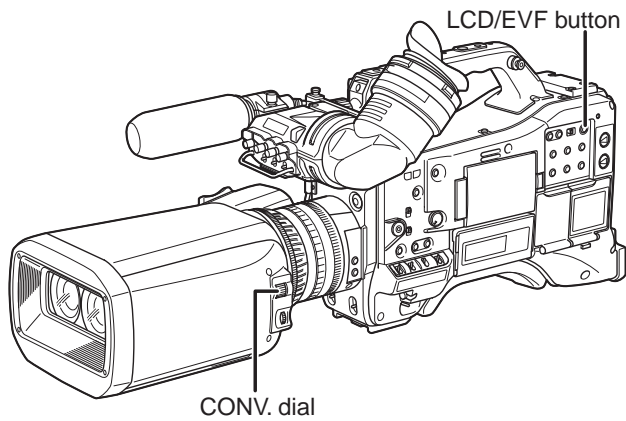
- The convergenct position (distance to the reference plane) is displayed as "C 00" to "C 99" in the center at the lower part of the screen, The larger the number, the greater the distance to the reference plane.
  Refer to [10 Convergence position display] in [Screen displays] (page 69).
- The "Convergence in Green" display of the 3D assist function allows you to check the convergence point area on the screen.
  Refer to [3D Assist Function] (page 56).

◆ **NOTE**

The CONV. dial is disabled in 2D LL recording mode.

What is convergence point adjustment?

■What is parallax?

A human's stereoscopic viewing takes advantage of the brain's ability to process information from the left and right eyes of two images seen from their respective perspectives. The misalignment of the two images is called binocular parallax.

Mainly binocular parallax is used by 3D equipment to create the feeling of stereoscopic images. When shooting, the images from the left and right lenses are misaligned because of the difference in the positions of the lenses as well as in the directions of the optical axes. This misalignment (called parallax) changes according to the distance of the subject being shot (illustration at right).

If parallax is excessive, it is difficult to fuse the two images within the brain. This may produce a double image, create a feeling of strangeness, etc., causing eyestrain.

Limiting the parallax appropriately during shooting is important for comfortable 3D viewing.

■Are there guidelines for appropriate parallax?

There are two guidelines for parallax.

① Parallax: 3 % or less the effective width of the screen

It is usually said that a parallactic angle within 1 degree is preferable for comfortable 3D viewing. The parallactic angle, here, means the difference between the angle of convergence when a viewer watches a point on the screen and the angle when he or she watches an object popped out or recessed from the screen. A large parallactic angle makes it difficult for the viewer to perceive a stereoscopic image, causing eyestrain.

Assuming that people view 3D images from a distance three times the effective height of the screen, a parallactic angle of 1 degree corresponds to misalignment of approximately 3 % the effective width of the screen. This leads to one of the guidelines for parallax, which is to limit horizontal misalignment to within 3 % the effective width of the screen.

② Parallax in depth: 50 mm or less

Parallax in depth is created when an image from the right lens is displayed to the right and an image from the left lens to the left on the screen.

If the value of this parallax exceeds the pupil distance of a viewer, it will cause eyestrain.

In consideration of individual differences of viewers such as age and pupil distance, setting parallax to within 50 mm is preferable.

Parallax in depth is related to screen size. For a 16:9 screen, if the screen size is 77-type or less, limiting parallax to within 3 % the effective width of the screen means that parallax in depth will not exceed 50 mm. If the target screen size is 103-type, limit parallax to 2.2 %. For a 200-type screen, limit parallax to 1.1 %.

■How to operate this camera

The 3D assist function of this camera (page 56) provides a guide of distance ranges from the subject for achieving appropriate parallax. Referring to the guide, change the layout of the subject and check the parallax value (% effective screen width), using a monitor.

Convergence point

Left-lens image

Right-lens image

Parallactig angle in depth

Parallactic angle for pop out
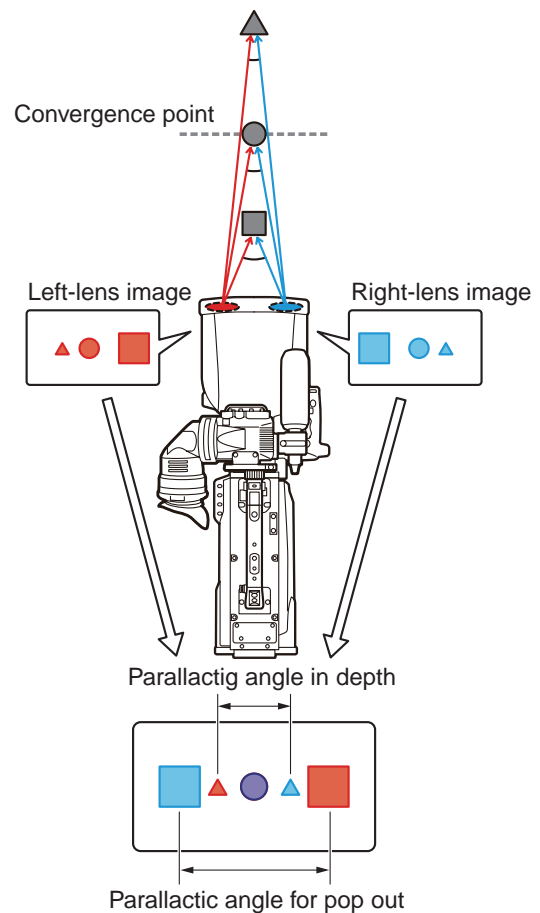
- Extreme parallax between left and right images is demonstrated in the illustration above.

■ Parallax for pop out
Parallax: Approx. 3 % or less (any screen size)
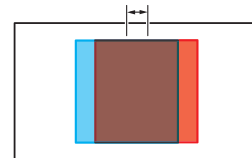
■ Parallax in depth
For a screen of 77-type or less
Parallax: Approx. 3 % or less
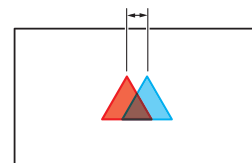
For a screen of 77-type or more
Parallax: 50 mm or less

55
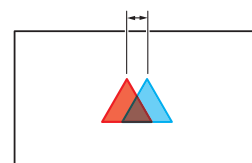
3D Assist Function

In order to shoot 3D images safely and comfortably, this camera is provided with three types of 3D assist function.

• The 3D assist function is enabled when the LCD/EVF mode is set to left-lens (L) image only or mixed left-lens (L) and right-lens (R) image. Press the LCD-EVF button so that the LCD/EVF mode display is none or MIX on the LCD monitor/viewfinder screen.

a **3D ASSIST Z WFM button**
b **3D ASSIST ALERT button**
c **3D ASSIST CONV. button**

”Convergence in Green” display

Press the 3D ASSIST CONV. button.

The message "3 D ASSIST CONV. ON" is displayed on the screen for three seconds.

Green blocks indicate the area in which the subject is on the reference plane for the 3D image (convergence point). You can visually confirm the surface of the screen while shooting, to achieve effective 3D expression.

Green blocks indicate the reference plane area.
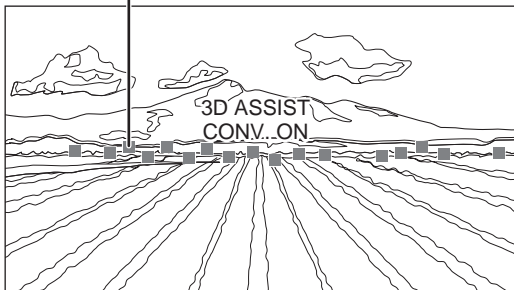
Press the 3D ASSIST CONV. button again to turn off the green blocks.
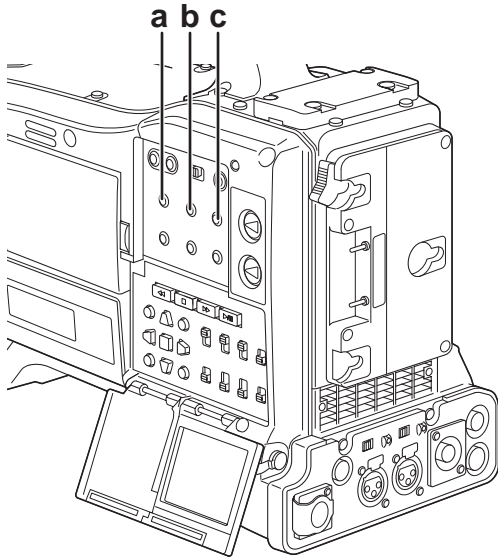
”Z Waveform” display

Press the 3D ASSIST Z WFM button.

The waveform displayed on the screen indicates the amount of pop-out area and receded area.
The ascending waveform shows the receded area, and the descending waveform the pop-out area.
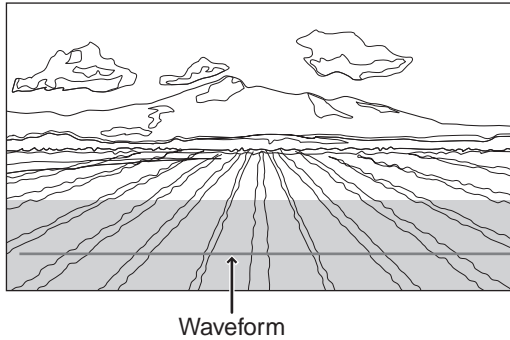
Waveform

Press the 3D ASSIST Z WFM button again to turn off the waveform display.

• You can set the level of pop-out area and receded area in the 3D ASSIST screen to check visually if the 3D image you are shooting produces your intended effect.

”Parallax Alert” display

Press the 3D ASSIST ALERT button.

Red blocks indicate an alert area where the subject will excessively pop out from the screen, and yellow blocks indicate an alert area where the subject will excessively recede in depth from the screen.
This is to help you to shoot natural 3D images.

Yellow blocks indicate excessively receded areas
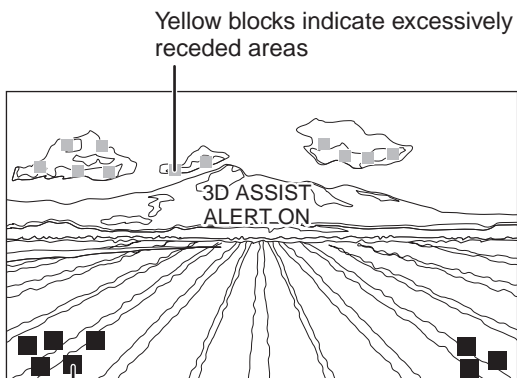
Red blocks indicate excessively pop-out areas

Press the 3D ASSIST ALERT button again to turn off the red and yellow blocks.

• You can set the alert level for pop-out areas and receded areas, respectively, with the menu options NEAR LEVEL and FAR LEVEL in the 3D ASSIST screen.

◆ NOTE

Blocks are not displayed for subjects extremely receded or popped out.

◆**NOTE**

• **The 3D assist function is disabled when the LCD/EVF mode is set to MIX, SIDE or R IMAGE.**

• **The 3D ASSIST buttons are disabled in 2D LL recording mode.**

• **Any 3D recording of a flat image or repetitive pattern may not be reproduced with correct depth information.**

Adjustment between Two Lenses (3D FINE Function)

As the left and right lenses are linked, you normally do not have to adjust them.
If you wish to perform fine adjustments between the two lenses, the 3D FINE function allows you to adjust the vertical position of the images, focus, and iris.
When the SHIFT button is pressed, the functions of the menu/thumbnail operation buttons change for the 3D FINE function.

◆**NOTE**

• **The 3D FINE screen is not displayed during recording. Perform the 3D FINE adjustment before recording.**

• **The appropriate adjustment range varies depending on the zoom position. If you have changed the zoom position, perform readjustment.**

d   c   b   a
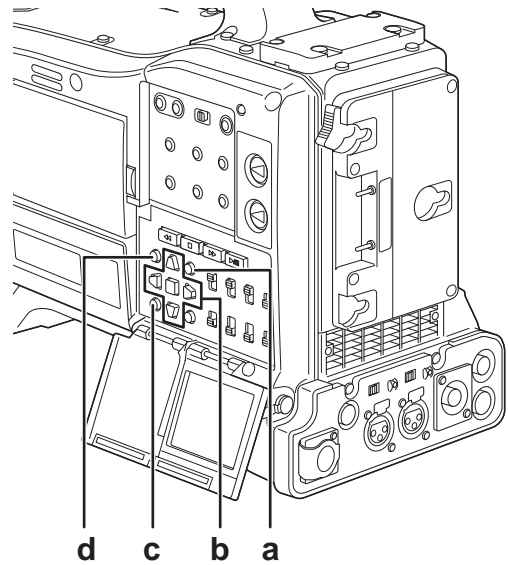
a **SHIFT (3D FINE) button**
b **Cursor and SET (RESET) buttons**
c **EXIT (IRIS) button**
d **THUMBNAIL (IRIS) button**

1 Perform zoom, focus, and/or brightness adjustment.

2 Press the SHIFT (3D FINE) button.

The fine adjustment screen is displayed.

3 Adjust the following fine adjustments as necessary.

■**Vertical position of the images (VERTICAL)**
Press the cursor button ▼ or ▲. The image from the right lens moves downwards by pressing ▼, and upwards by pressing ▲.

◆ **NOTE**

This product is preadjusted at the factory to minimize vertical misalignment.*[1] The specification for vertical misalignment is 1.2 % or less.

*[1] It is indicated in percentage of vertical misalignment between the images from the left and right lenses at the center of the screen according to the effective height of the screen, when measured under the following conditions: the zoom position at the maximum wide angle (Z00), the convergence point in the center (C50), and shooting a subject at a distance of 4.3 m.

■**Focus (FOCUS)**

Press the cursor button ◀ or ▶. The focal length for the right lens is increased if you press ◀, and is reduced if you press ▶.

■**Iris (IRIS)**

Press the EXIT (IRIS) or THUMBNAIL (IRIS) button. The iris of the right lens is opened if you press EXIT (IRIS), and is closed if you press THUMBNAIL (IRIS).

◆ **NOTE**

• **Holding the SET (RESET) button pressed during the 3D FINE adjustment resets all the adjusted values.**
• **The 3D FINE function is disabled in 2D LL recording mode.**
• **The appropriate adjustment area varies depending on the zoom position. Perform the fine adjustments again if the zoom position is changed.**

Setting Time Data

The camera provides time data such as time codes, user bits, time of day (real-time) data, which is recorded on each frame alongside video data. It is also recorded as as data in clip metadata files.

Time data overview

■Time code

Use the TCG switch to select Rec Run or Free Run mode.

- Free Run: The time code advances constantly whether the camera is on or not just like time itself. Recording using a slave-locked time code input to the TC IN connector is also possible.
- Rec Run: The time code advances only during recording. This will enable continuation of time codes in previously recorded clips and when the power is turned off or new P2 cards are inserted to continue recording.

◆ NOTE

The following events will disrupt time code continuity.
- **When clips are deleted**
- **When 24PN or 30PN (25PN) is selected**
- **When a recording is interrupted by a REC WARNING or other abnormality**

User bits

- Two types of user bits are provided internally: LTC and VITC.
- LTC user bits enable the recording of user settings, time, date, time codes and similar values, the frame rate data for camera capture and external input values (via TC IN connector input). They are output from the TC OUT connector or output as LTC embedded in HD SDI.
- VITC user bits record the frame rate data of camera capture. They are output as VITC embedded in HD SDI.
- The user bits in clip metadata record the LTC UB value at the start of recording.

■Date (real time)

- The built-in clock calculates the year, month, day and time from the internal clock to display on video output on the LCD monitor, in the viewfinder, or embedded in MONITOR OUT.
- The internal clock is not only used to calculate the free run time code when the power is off and to set the user bit year, date and time, but also to set file creation dates when clips are recorded that determine the order of thumbnails and playback order.
- It is also used for generating clip metadata and UMID (Unique Material Identifier).
  For details, see [Setting Date and Time of Internal Clock] (page 28).

Recording Time Codes and User Bits

Menu setting			Recording format	Recorded TC		Output TC		Displayed TC	Recorded UB		Output UB		
SYSTEM MODE	REC FORMAT	FRAME RATE		LTC	VITC	TC OUT	HD SDI	TC/tc (24/30 conversion)	LTC UB	VITC UB	TC OUT connector UB*1	LTC UB embedded in HD SDI*1	VITC UB embedded in HD SDI
1080-59.94i	AVC-I 100/60i AVC-I 50/60i	–	100/60i	R-RUN F-RUN*2 DF/NDF 30 frames				TC:30F tc:24F	UB MODE	FRAME RATE	LTC UB		FRAME RATE
	AVC-I 100/30PN AVC-I 50/30PN	–	100/30PN										
	–	–	1080/24PN*6	–		24F(LTC) 30F conversion		Recording 24F Playback TC:24F tc:30F	–	–	LTC UB → OVER 60i output		
1080-23.98PsF	AVC-I 100/24PN AVC-I 50/24PN	–	1080/24PN	R-RUN F-RUN*4 *7 NDF 24 frames				Recording 24F Playback TC:24F tc:30F	UB MODE	FRAME RATE	LTC UB		FRAME RATE
720-59.94P	AVC-I 100/60P AVC-I 50/60P	Over than 24 frames	720/60P	R-RUN F-RUN*2 DF/NDF 30 frames				TC:30F tc:24F	UB MODE	UB MODE	LTC UB		FRAME RATE
		24 frames	720/60P	R-RUN F-RUN*4 NDF locked 30 frames									
	AVC-I 100/30PN AVC-I 50/30PN	30 frames	720/30PN	R-RUN F-RUN*3 NDF locked Every active frame 30 frames									
		Over than 30 frames	720/30PN	R-RUN locked DF/NDF Every active frame 30 frames		Matches recorder TC at start of recording 30 frames/s							
	AVC-I 100/24PN AVC-I 50/24PN	24 frames	720/24PN	R-RUN F-RUN*5 NDF locked Every active frame 24 frames		LTC 30F conversion	LTC	Recording 24F Playback TC:24F tc:30F			LTC UB → OVER 60P output		
		Over than 24 frames	720/24PN	R-RUN locked NDF locked Every active frame 24 frames		Matches recorder TC at start of recording 30 frames/s							
1080-50i	AVC-I 100/50i AVC-I 50/50i	–	1080/50i	R-RUN F-RUN*2 25 frames				TC:25F	UB MODE	FRAME RATE	LTC UB		FRAME RATE
	AVC-I 100/25PN AVC-I 50/25PN	–	1080/30PN										
720-50P	AVC-I 100/50P AVC-I 50/50P	50 frames	720/50PN	R-RUN F-RUN*2 25 frames				TC:25F	UB MODE	UB MODE	LTC UB		FRAME RATE
		Over than 50 frames	720/50PN										
	AVC-I 100/25PN AVC-I 50/25PN	25 frames	720/25PN	R-RUN F-RUN*3 Every active frame 25 frames									
		Over than 25 frames	720/25PN	R-RUN locked Every active frame 25 frames		Matches recorder TC at start of recording 25 frames/s							

*1 When UB MODE is FRM. RATE, playback of native clips is the pulldown frame rate read from VITC UB.
*2 In Free Run mode, it is slaved to the time code input to the TC IN connector.
*3 In Free Run mode, it is slaved to the time code input to the TC IN connector. But not slaved to it during recording.
*4 In Free Run mode, it is slaved when TC input to the TC IN connector is non-drop frame. But not slaved to it during recording.
*5 In Free Run mode, it is slaved to the time code input to the TC IN connector, whose value is converted to 24 frames when it was NDF 30 frames. But not slaved to it during recording.
*6 When playing back the data recorded in 1080/23.98PsF format with 1080/59.94i
*7 The signal converted from 24F (LCT) into 30F is output from MONITOR OUT.

Setting User Bits

Use the setting menu UB MODE on the RECORDING SETUP screen to select the user bits to record in the LCT area.

- USER:
  Records internal user values.
  To set user values, set the TCG switch to SET to open the setting menu UB PRESET screen.
  Set values are retained after the power is turned off.
  See also [Entering the User Bits] (this page).
- TIME:
  Records the time calculated by the internal clock.
- DATE:
  Records the year, month and day time digits from the internal clock.
- EXT:
  Records the user bits input to the TC IN connector.
- TCG:
  Records the time code value.
- FRM. RATE:
  Records the frame rate information of camera capture. A native recorded clip is played back at the same frame rate as the VITC UB regardless of recorded values. Use this setting when a PC or other editing device is to use the user bit frame rate.
  For details, see [Frame rate information recorded in user bits] (page 62).

- To slave lock to the user bits input to the TC IN connector, set to EXT.
- In slave mode, the UB indicator is highlighted.
- A slave relationship, once started, continues even after input from the TC IN connector ends. Note that the following events release user bit slave status.
  - When a UB MODE option is set to something other than EXT.
  - When UB PRESET is performed
  - Turning the power off.
  The internal user value retains the slave values even after slave release.

Entering the User Bits

The user bits allow information, including memos that use up to eight-digit hexadecimal numbers (date and time), to be recorded in the Subcode area.
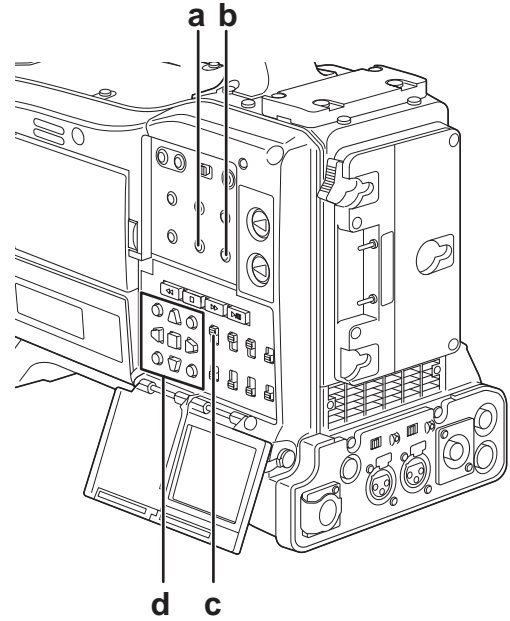
a COUNTER button

b RESET button

c TCG switch

d Cursor and SET buttons

1 Set the COUNTER button to UB.

2 Position the TCG switch at SET.

3 Use the cursor buttons to set the user bits.
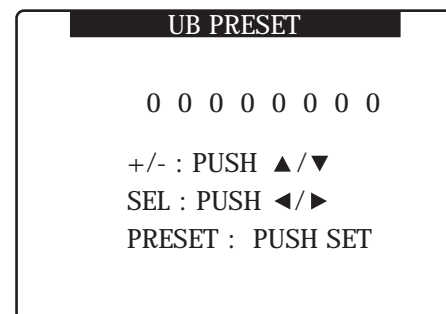
```
        UB PRESET

       0 0 0 0 0 0 0 0

+/- : PUSH ▲ /▼
SEL : PUSH ◄/ ►
PRESET :  PUSH SET
```

▶ button: Shifts the target (highlighted) digit to the right.

◄ button: Shifts the target (highlighted) digit to the left.

▲ button: Increases the highlighted number by one.

▼ button: Decreases the highlighted number by one.

- Pressing the RESET button while setting the user bits will reset any user bit setting to 0.

4 Press the SET button to confirm the user bit value, and position the TCG switch at F-RUN or R-RUN.

◆ **NOTE**

Changing the TCG switch setting without pressing the SET button disables the set value.

5 Open the setting menu RECORDING SETUP screen and set the menu option UB MODE to USER.

Retaining the user bits

The data set for the user bits are automatically saved and retained even if the video camera-recorder is turned off.

Frame rate information recorded in user bits

The frame rate value of video data captured and recorded at a frame rate set in the menu option FRAME RATE or other options in the SYSTEM SETUP screen can be recorded in the user bits and be used in editing equipment (computer editing software).
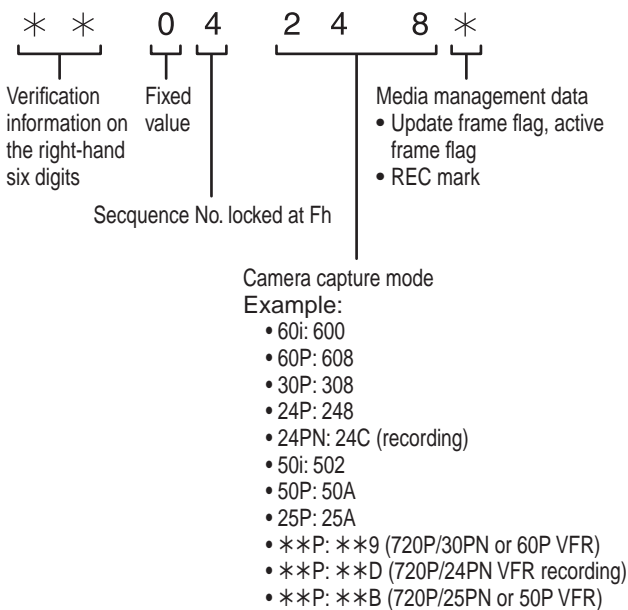This type of data is recorded in VITC UB at all times.
Setting the setting menu UB MODE to FRM.RATE, records the information also to the user bits.
In playback of clips recorded in native mode, the same frame rate information as that obtained in playing back the user bits in the VIDEO AUX area is also output to the user bits in the subcode area.

■Frame rate information

Frame rate, video pull-down and time code user bits are related as described below.

$$* \quad * \quad 0 \quad 4 \quad 2 \quad 4 \quad 8 \quad *$$

Verification information on the right-hand six digits

Fixed value

Secquence No. locked at Fh

Camera capture mode
Example:
- 60i: 600
- 60P: 608
- 30P: 308
- 24P: 248
- 24PN: 24C (recording)
- 50i: 502
- 50P: 50A
- 25P: 25A
- **P: **9 (720P/30PN or 60P VFR)
- **P: **D (720P/24PN VFR recording)
- **P: **B (720P/25PN or 50P VFR)

Media management data
- Update frame flag, active frame flag
- REC mark

1080i mode

Frame rate: 24P over 60i (2:3)

☐ First field of updated frame rate

Time code digit

| 00 | 01 | 02 | 03 | 04 | 05 | 06 | ··· | 23 | 24 | 25 | 26 | 27 | 28 | 29 |

Video

| Ao | Ae | Bo | Be | Bo | Ce | Co | De | Do | De | Ao | Ae | Bo | Be | ··· | Co | De | Do | De | Ao | Ae | Bo | Be | Bo | Ce | Co | De | Do | De |

Sequence No.

| 0 | 1 | 2 | 3 | 4 | 0 | 1 | ··· | 3 | 4 | 0 | 1 | 2 | 3 | 4 |

Updated frame information

| 10 | 10 | 01 | 01 | 00 | 10 | 10 | ··· | 01 | 00 | 10 | 10 | 01 | 01 | 00 |

Frame rate: 30PsF
25PsF

Time code digit

| 00 | 01 | 02 | ··· |

Video

| Ao | Ae | Bo | Be | Co | Ce | ··· |

Updated frame information

| 10 | 10 | 10 | ··· |

720P mode

Frame rate: 24P over 60P (2:3)

☐ Updated frame

Time code digit

| 00 | 01 | 02 | 03 | 04 | 05 | 06 | ··· | 23 | 24 | 25 | 26 | 27 | 28 | 29 |

Video

| A | A | B | B | B | C | C | D | D | D | A | A | B | B | ··· | C | D | D | D | A | A | B | B | B | C | C | D | D | D |

Updated frame information

| 10 | 10 | 01 | 01 | 00 | 10 | 10 | ··· | 01 | 00 | 10 | 10 | 01 | 01 | 00 |

Frame rate: 30P Over 60P (2:2)
25P Over 50P (2:2)

Time code digit

| 00 | 01 | 02 | ··· |

Video

| A | A | B | B | C | C | ··· |

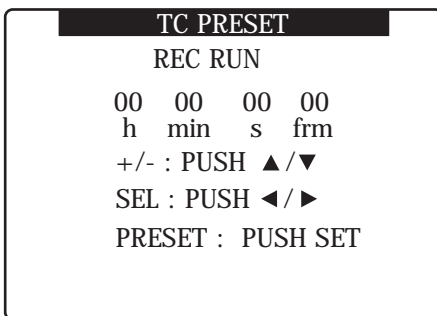Updated frame information

| 10 | 10 | 10 | ··· |

Setting the Time Code

1 Switch the menu option TC MODE on the RECORDING SETUP screen to DF or NDF using the menus. (In 59.94 Hz mode)

For details on menu operation, refer to [Using the Menus] (page 106).

- Select DF to advance time code in drop frame mode and NDF in non-drop frame mode. Note that the unit always operates in NDF mode when 50 Hz is selected in SYSTEM MODE (1080-50i or 720-50P), or 24PN is set when 60 Hz is selected (1080-59/94i or 720-59.94P).

2 Use the COUNTER button to switch to time code display.

3 Position the TCG switch at SET.

4 Use the cursor buttons to set the time code.

- Range of available time code settings:
  In case of 60 Hz
  00:00:00:00 to 23:59:59:29 (other than 24PN)
  00:00:00:00 to 23:59:59:23 (24PN)
  In case of 50 Hz
  00:00:00:00 to 23:59:59:24

```
              TC PRESET
               REC RUN

          00   00   00   00
           h   min   s   frm
         +/- : PUSH  ▲/▼
         SEL : PUSH  ◄/►
         PRESET :  PUSH SET
```

► button: Shifts the target (highlighted) digit to the right.
◄ button: Shifts the target (highlighted) digit to the left.
▲ button: Increases the highlighted number by one.
▼ button: Decreases the highlighted number by one.

- Pressing the RESET button will reset any time code setting to 0.

5 Press the SET button to confirm the time code setting, and use the TCG switch to select a time code.

- F-RUN steps the time code in free run mode, and R-RUN set it in recording run mode.

◆ **NOTE**
- **The time code is adjusted to multiples of four for 24PN and to even numbers for 720/30PN. It is adjusted so that the seconds plus the frames are an even number for 720/25PN. The time code cannot be set during recording.**
- **The set value is not valid if you change the TCG switch position without pressing the SET button.**

Time code function during battery replacement

Even during battery replacement the backup mechanism keeps the time code generator functioning.
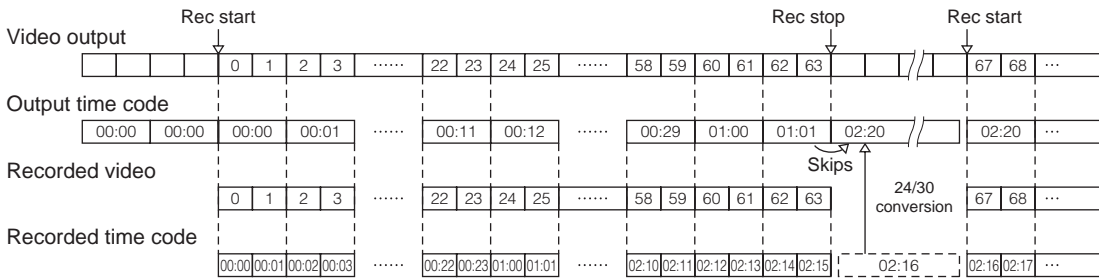
◆ **NOTE**
When the POWER switch has been switched ON → OFF → ON, the backup accuracy of the time code in free run mode is about ±2 frames.
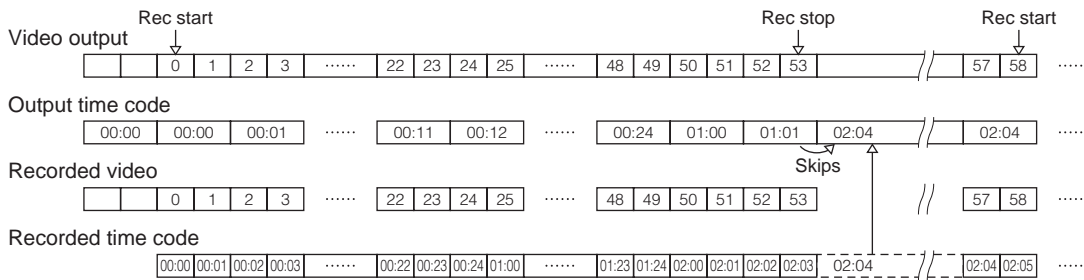
VFR (variable frame rate) time code

- In 24PN mode, recording is performed at 24-frame time code, and output is performed at 30-frame time code to match the 2:3 pull-down scheme used for video output.
- At a frame rate (capture frame rate) of 24P in 24PN mode, the speed of recording and the output time code matches actual time, but not at any speed other than 24P. (Example: at 60P recording progresses at 60/24 speed)
- Then the camera operates in Rec Run mode and the time code output at start of recording matches the recording time code.
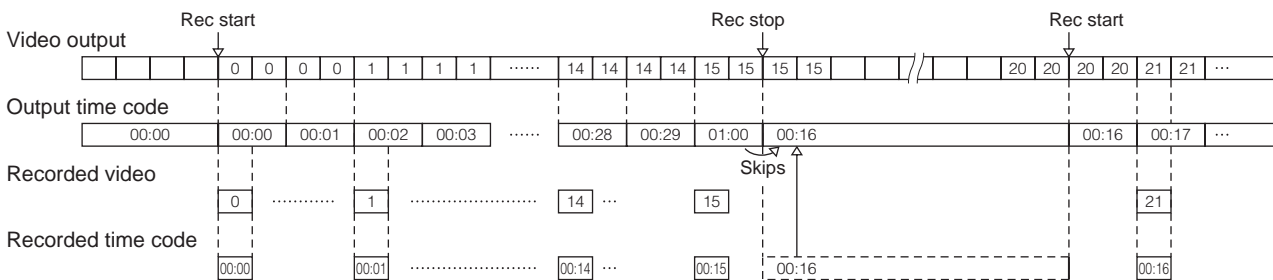- This is true also for frame rates other than 30P capture in 30PN mode and 25P capture in 25PN mode.

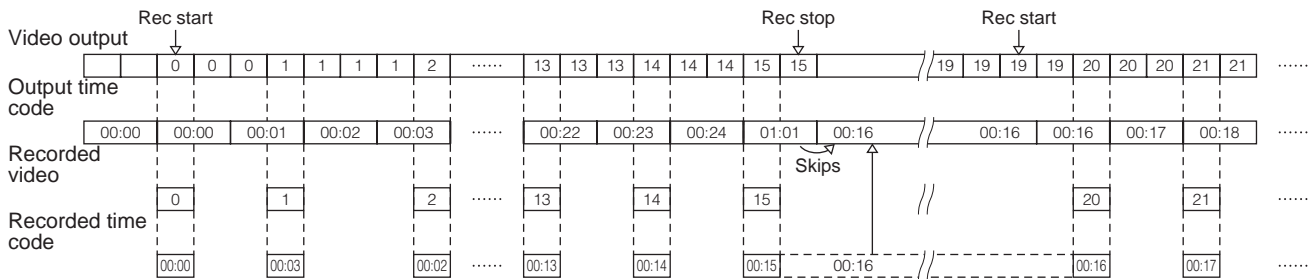### 24PN recording at 60P capture

	Rec start											Rec stop		Rec start		

Video output: 0 1 2 3 …… 22 23 24 25 …… 58 59 60 61 62 63 // 67 68 …

Output time code: 00:00 00:00 00:00 00:01 …… 00:11 00:12 …… 00:29 01:00 01:01 02:20 // 02:20 …
(Skips)

Recorded video: 0 1 2 3 …… 22 23 24 25 …… 58 59 60 61 62 63 (24/30 conversion) 67 68 …

Recorded time code: 00:00 00:01 00:02 00:03 …… 00:22 00:23 01:00 01:01 …… 02:10 02:11 02:12 02:13 02:14 02:15 02:16 02:16 02:17 …

25PN recording at 50P capture

Video output: Rec start 0 1 2 3 …… 22 23 24 25 …… 48 49 50 51 52 53 Rec stop // 57 58 …… Rec start

Output time code: 00:00 00:00 00:01 …… 00:11 00:12 …… 00:24 01:00 01:01 02:04 // 02:04 ……
(Skips)

Recorded video: 0 1 2 3 …… 22 23 24 25 …… 48 49 50 51 52 53 // 57 58 ……

Recorded time code: 00:00 00:01 00:02 00:03 …… 00:22 00:23 00:24 01:00 …… 01:23 01:24 02:00 02:01 02:02 02:03 02:04 // 02:04 02:05 ……

30PN recording at 15P capture

Video output: Rec start 0 0 0 0 1 1 1 1 …… 14 14 14 14 15 15 15 15 Rec stop // 20 20 20 20 21 21 … Rec start

Output time code: 00:00 00:00 00:01 00:02 00:03 …… 00:28 00:29 01:00 00:16 // 00:16 00:17 …
(Skips)

Recorded video: 0 ……… 1 ……………… 14 … 15 // 21

Recorded time code: 00:00 00:01 …………… 00:14 … 00:15 00:16 00:16

25PN recording at 15P capture

Video output: Rec start 0 0 0 1 1 1 1 2 …… 13 13 13 14 14 14 15 15 Rec stop // 19 19 19 19 20 20 20 21 21 …… Rec start

Output time code: 00:00 00:00 00:01 00:02 00:03 …… 00:22 00:23 00:24 01:01 00:16 // 00:16 00:16 00:17 00:18 ……
(Skips)

Recorded video: 0 1 2 …… 13 14 15 // 20 21 ……

Recorded time code: 00:00 00:03 00:02 …… 00:13 00:14 00:15 00:16 // 00:16 00:17 ……

Externally Locking the Time Code

The time code generator built into your camera may be locked to an external generator. It is also possible to lock an external time code generator to the internal generator.

Connections for externally locking the time code (examples)

As illustrated, both the reference video signals and the time code must be input.

■Example 1 : Locking the time code to external signals
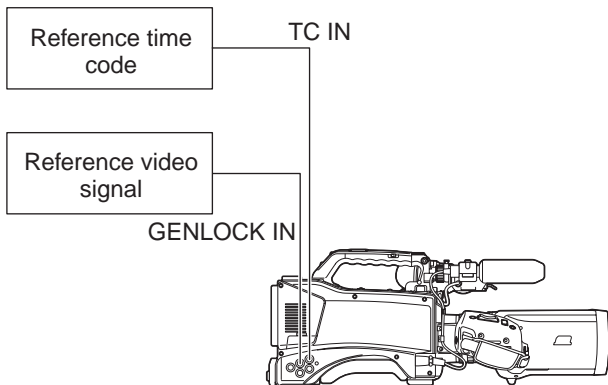
◆ NOTE
- **Use an HD Y reference signal as reference video signal.**
- **During HD-Y signal input in 720P system mode, GENLOCK input for the video signal is applied but the time code is delayed by 1 field.**
- **If the reference GENLOCK input signal becomes irregular, recording cannot be performed normally and the continuity of the time code cannot be guaranteed. When the reference GENLOCK input signal becomes irregular, the unit resets the L/R section of the camera and is restarted. (During this process, the image is disturbed.)**
- **The input signal of the RETURN IN connector can be locked externally if the menu option GENLOCK SEL in the OTHER FUNCTIONS screen is set to RETURN IN.**

■Example 2 : Locking the time code of this unit and external equipment to the time code from an external time code generator
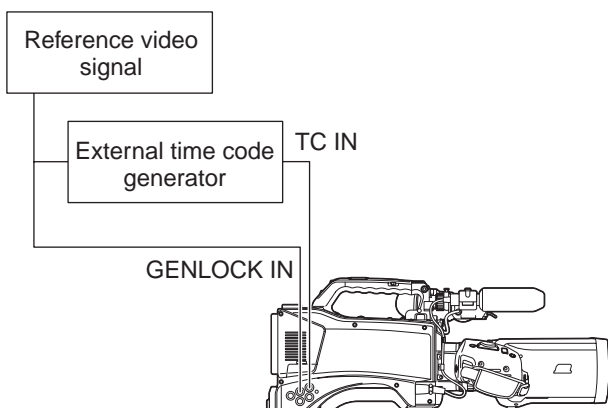
◆ NOTE
When the system mode is 1080/23.98PsF, use the HD signal of 23.98PsF as a reference signal and input a 24-frame time code to the TC IN connector.

To externally lock the time code

Follow the steps below.

1 Turn on the POWER switch.

2 Position the TCG switch at F-RUN.

3 Set the COUNTER button to TC.

4 Supply a phase-relationship reference time code (that conforms to the time code requirements) and reference video signals to the TC IN and GENLOCK IN connectors, respectively.

- Now the built-in time code generator is locked to the reference time code.
- When locked to an external time code generator, the time code is at all times locked to the external time code, which is displayed as a highlighted value on the counter indicator. Do not engage the recording mode during the few seconds it takes for the sync generator to stabilize.
- Once a slave relationship is established, the TC IN and GENLOCK IN connectors stay in slave status.*1
  Note that the following events release slave status.
  - When TC PRESET is performed
  - The power is turned off
  - The time code mode is switched
  - The TCG switch is set to R-RUN
  - When REC FORMAT has been switched
  *1 The slave status locks the time code to the TC IN input and the device will use this time code even if time code input should subsequently cease.

Setting the user bits when the time code is externally locked

To externally lock user bits, set the setting menu UB MODE (RECORDING SETUP screen) to EXT.
Regardless of an F-RUN or R-RUN setting of the TCG switch, the time code is slaved to user bit values input to the TC IN connector.
For details, refer to [Setting Time Data] (page 59) and [Setting User Bits] (page 61).

To unlock the externally locked time code

Discontinue external time code supply, then position the TCG switch at R-RUN.

65

Cautions in switching the power source from battery to external power supply

Connect the DC IN socket with the external power supply before removing the battery, in order to keep the time code generator energized. If the battery is removed first, there is no guarantee that the time code will stay externally locked.

External synchronisation of the camera when the time code is externally locked

When the time code is externally locked, the reference video signals input through the GENLOCK IN connector gen-lock the camera.

◆ **NOTE**

• **To lock other devices externally to the AG-3DP1, as the master device, make sure that the other devices are in the same mode as the AG-3DP1. Note that if some of the connected devices use interlaced scanning while other devices use progressive scanning, there may be breaks in the video and time code.**

• **To externally lock at 24PN (Native Recording), be sure to input a non-dropframe time code. External lock using a drop frame time code is not possible.**

Counter Setting and Display

Pressing the COUNTER button to view the counter displays the counter value on the time code indicator on the LCD monitor and in the viewfinder. The counter value is indicated in "Hour : Minute : Second" format. The counter value is not displayed during playback.

The menu option REC COUNTER in the DISPLAY SETUP screen can be set to display two types of counters.

TOTAL: provides a continuous count until reset by pressing the COUNTER RESET button. The counter value is retained when P2 cards are replaced and when the power is turned off.

CLIP: The counter is reset to 0 at the start of each recording and allows you to keep track of clip recording time while shooting the current clip.
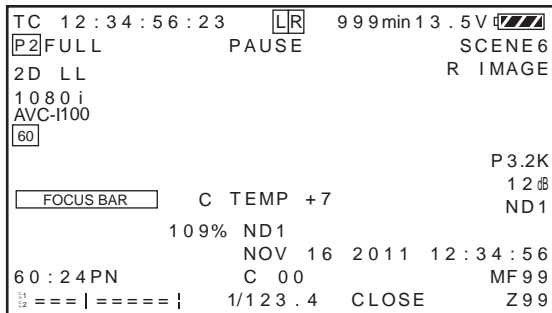
◆ **NOTE**

• **Pressing the RESET button when the counter value is displayed resets the counter to 0.**

• **The counter value indicates values in the range between 0:00:00 and 9:59:59 in 1-second steps.**

LCD Monitor/Viewfinder Screen Status Displays

In addition to video, the LCD monitor and viewfinder show messages indicating camera settings and operating status, center markers, safety zone markers, zebra patterns and other indications.

Status Indication Layout

The illustration below shows the indications (except MODE CHECK) that are displayed on the LCD monitor and in the viewfinder.

```
TC 12:34:56:23   L R    999min13.5V
P2 FULL          PAUSE          SCENE6
2D LL                           R IMAGE
1080i
AVC-I100
60
                                P3.2K
                                 12dB
  FOCUS BAR     C TEMP +7        ND1
       109% ND1
             NOV 16 2011 12:34:56
60:24PN        C 00              MF99
=== | ===== |  1/123.4  CLOSE    Z99
```
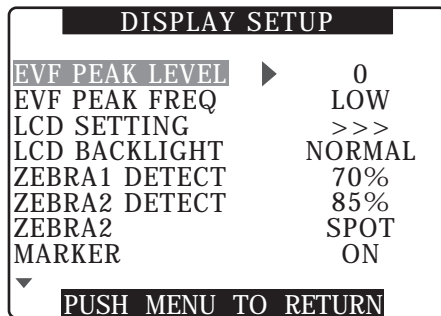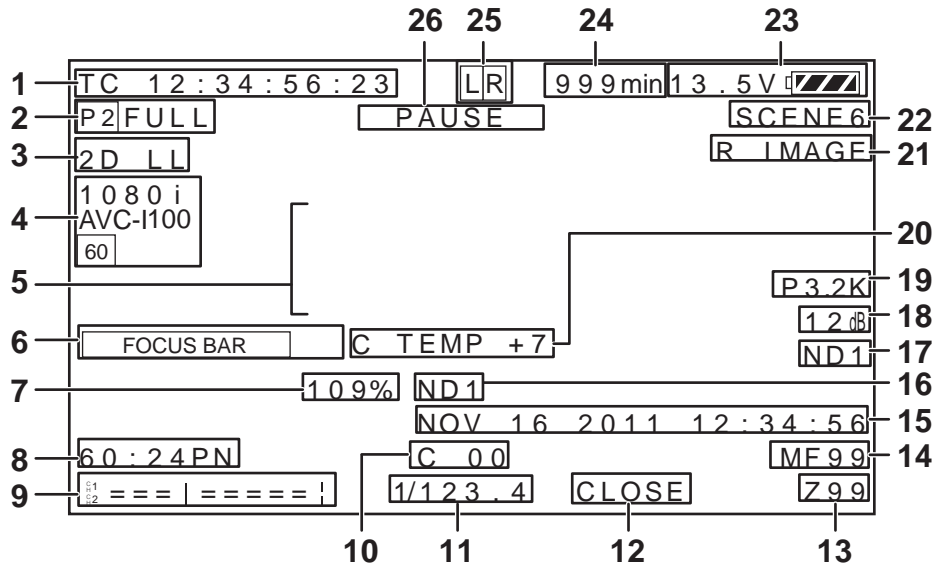
For more information, see the following pages:

Selecting Display Information

To select items, open the DISPLAY SETUP screen and turn on or off each item or type.
Refer to the section [Using the Menus] (page 106).

```
         DISPLAY SETUP

EVF PEAK LEVEL    ▶      0
EVF PEAK FREQ          LOW
LCD SETTING            >>>
LCD BACKLIGHT        NORMAL
ZEBRA1 DETECT         70%
ZEBRA2 DETECT         85%
ZEBRA2               SPOT
MARKER                ON
▼
   PUSH MENU TO RETURN
```

Screen Displays

```
                    26  25      24          23
1 ─ T C  1 2 : 3 4 : 5 6 : 2 3    L R   9 9 9 min 1 3 . 5 V ▮▰▰▰
2 ─ P2 F U L L            P A U S E              S C E N E 6 ─ 22
3 ─ 2 D  L L                                     R  I M A G E ─ 21
    1 0 8 0 i
4 ─ AVC-I100                                              ─ 20
    60
5 ─                                              P 3 2 K ─ 19
                                                 1 2 dB ─ 18
6 ─ FOCUS BAR        C  T E M P  + 7             N D 1  ─ 17
7 ─          1 0 9 %  N D 1                       ─ 16
                      N O V  1 6  2 0 1 1  1 2 : 3 4 : 5 6 ─ 15
8 ─ 6 0 : 2 4 P N    C  0 0                      M F 9 9 ─ 14
9 ─ ≈1 = = = | = = = = = |   1/1 2 3 . 4   C L O S E   Z 9 9 ─ 13
          10       11          12          13
```

1 Time code displays

Each press of the COUNTER button displays (or turns off) the indications listed below.

- **(No indication)**
- **Counter:**

    Counter value (during recording only)
- **TC:** Time code value

    The colon between the seconds and the frames changes to a period (.) in drop frame mode.
- **tc:** Time code value (frame digits are indicated in 24 frames)

    The colon between the seconds and the frames changes to a period (.) in drop frame mode.
- **UB:** User bit values
- **FR:** Frame rate information for recording
  - FR60I: 60i interlace mode (60 fields/s)
  - FR60P: 60P progressive mode (60 frames/s)
  - FR30P: 30P progressive mode (30 frames/s)
  - FR24P✳: 24P progressive mode (24 frames/s)
  - FR50I: 50i interlace mode (50 fields/s)
  - FR50P: 50P progressive mode (50 fields/s)
  - FR25P: 25P progressive mode (25 fields/s)
  - ✳: In FR24P mode, the last digit contains the frame conversion sequence information.

◆ NOTE

When TC, tc and UB are locked to TC IN input, the characters in their icons change to outline characters TC → TC **.**

When the HOLD button is used to temporarily freeze indications, the HOLD indication blinks.

2 Warnings

- ▣ **:** Blinks when no P2 card is inserted or the card is write protected.
- P2 **FULL:**

    Blinks when a P2 card has insufficient space for recording or the number of clips on a P2 card has reached the limit for the number of clips that can be recorded on one P2 card.
- ⊜ **:** Blinks when the battery for the internal clock is depleted.

    For details, refer to [Charging the Internal Battery] (page 126).

3 2D LL display

Indicates that the 2D LL recording mode is set.

4 Recording format and system frequency indication

- **System mode**
  - 1080i
  - 1080
  - 720P
- **Recording format**
  - AVC-I 100: AVC-Intra 100 format
  - AVC-I 50: AVC-Intra 50 format
- **System frequency**
  - 60 : 59.94 Hz
  - 50 : 50 Hz
  - 24 : 23.98 Hz

5 Information display

The following information is displayed depending on the situation.

- Performance of auto white balance and auto black balance
- Warning and error indication
- Information on switch and button operations

For details, refer to [Center Information Display] (page 70).

6 FOCUS BAR display

Indicates the focusing status when the menu option FOCUS BAR in the DISPLAY SETUP screen is set to ON.

7 Y GET brightness display

When the Y GET function is used, the image level at the center of the image is indicated in a range between 0% and 109%

8 Recording/playback frame rate display

In native recording, the capture frame rate and recording and playback frame rates are displayed.
Example: 60:24PN (recording 60P with the camera frame rate set to a variable frame rate of 24PN)
In standard recording only the capture frame rate is indicated in playback.

9 Audio level meter display

HEAD ROOM at -20 dB

```
                -20dB                0dB
CH1 – – – – – – – + – – – – – – – – – ⊣
CH2 – – – – – – – + – – – – – – – – – ⊣
```

HEAD ROOM at -18 dB

```
                -18dB                0dB
CH1 – – – – – – – – + – – – – – – – – ⊣
CH2 – – – – – – – – + – – – – – – – – ⊣
```
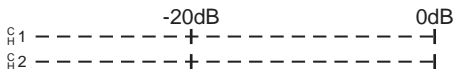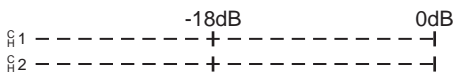
10 Convergence position display

Indicates the convergence position (distance of the reference plane for a 3D image) with C00 to C99. The higher the number, the greater the distance.

- Use this display as a rough gauide.

11 Shutter speed

The shutter speed is displayed here.
In synchro scan mode, the display (time (minutes) display or shutter angle icon display) made in the menu option SYNC SCAN DISP in the DISPLAY SETUP screen is used.
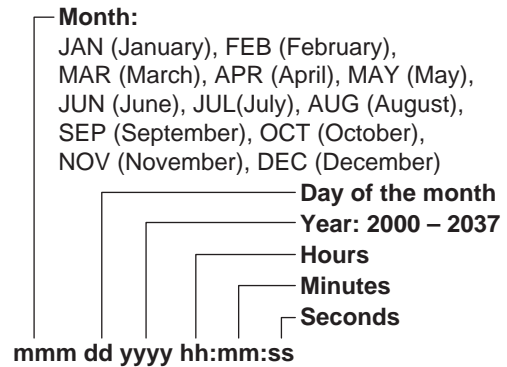
12 Iris display

Displays F values.

13 Zoom position display

Zoom positions are indicated in a range from Z00 (maximum wide angle) to Z99 (maximum zoom).

14 Focus position display

Indicates the focus position in the range of 00 to 99.
In addition to a numerical value (cal), AF appears in the auto focus mode, and MF in the manual focus mode. MF95 appears when focus is infinity (∞).
The higher the number, the greater the focal distance.

15 Calendar

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)
Day of the month
Year: 2000 – 2037
Hours
Minutes
Seconds

mmm dd yyyy hh:mm:ss

16 Recommended ND filter display

This indicates the most suitable ND filter to use under current shooting conditions.

17 ND filter display

This indicates the selected ND filter.

18 Gain display

Indicates the gain value set using the video amplifier.

19 WHITE BAL switch position indication

Indicates the currently selected switch position and also white balance operation when AWB is preset.

20 C TEMP (color temperature) display

The color temperature value is displayed in the range of –7 to +7 after the auto white balance adjustment.

21 LCD/EVF mode display

Indicates the image displayed on the LCD monitor and in the viewfinder.

- No display: Left-lens (L) image
  This mode is set automatically when the power is turned on.
- MIX: Mixed image of the left-lens (L) image and right-lens (R) image
- SIDE: Side by side display of the left-lens (L) image and right-lens (R) image
- R IMAGE: Right-lens (R) image

22 Scene file name display

Indicates the name of currently selected SCENE FILE (F1 to F6). No indication appears when a scene file name is not assigned.

23 Remaining battery charge

As the remaining battery charge drops, the display changes as follows: ▯▨▨▨ → ▯▨▨ → ▯▨ → ▯ → ▯ .
When the battery is completely discharged, ▯ (▯) blinks.
(When the AC adaptor is being used, a display other than ▯▨▨▨ may appear: this is not a sign of malfunctioning.)

Batteries that indicate battery level in % (percent)

Such batteries indicate remaining battery level as follows.

- **B✳✳%:** 10 %~99 %
  Indicates the remaining battery level in %.
- **MAX:** Indicates that the battery is fully charged.
- **EMP:** Indicates that the remaining battery level is less than 10 %.

Batteries that do not indicate capacity in % (percent)

Such batteries indicate the battery level in voltages.

- **13.5 V:** Indication of current battery voltage.

24 Media remaining memory display

Indicates a remaining 3D recording time based on the remaining time on the P2 cards inserted in card slots L and R.

- Indicates remaining time in 1-minute increments from 0 to 999 minutes. 999 minutes and longer time periods are also indicated as 999 minutes.
- The display blinks when 2 minutes or less time is left.
- The display does not appear while calculating the remaining time.

25 Media information display

Indicates the slots that contain P2 cards and general information on the media.

- ⎣L⎤ ⎣R⎤ **light green:**

  P2 card ready for recording
- ⎣L⎤ ⎣R⎤ **light green in reverse:**

  P2 card selected for recording
- ⎣L⎤ ⎣R⎤ **flash rapidly in white:**

  The card is being recognized
- ⎣ - ⎤ **:** No card inserted
- ⎣P⎤ **:** Write-protected
- ⎣F⎤ **:** Full
- ⎣X⎤ **:** Cannot recognize
- ⎣E⎤ **:** P2 card in an invalid format (formatting will take care of this problem)

26 Operation status display

- **REC:** Recording
- **PAUSE:**

  Recording standby
- **▌▌ :** Playback pause
- **▶ :** Play
- **▶▶ (◀◀) :**

  Fast-forward/fast-forward playback (fast-reverse/fast-reverse playback)
- **4X ▶▶ (4X ◀◀) :**

  4x speed search (4x speed reverse search)
- **CLIP ▌▌▶ (CLIP ◀▌▌) :**

  Clip forward (clip reverse), cue up of single clips

During DISPLAY OFF, only the REC and special recording displays are shown at the top right.

Special recording display

The indication "I-" appears when the interval recording is set to ON.

Center Information Display

The following information displays are provided.

P2 card recording and playback data indications

- BOS

  Beginning of stream. No more data is available in the rearward playback direction.
- CANNOT PLAY

  Appears when playback is disabled.
  - CARD ERR (L) (R) (L/R):

    This indicates trouble with the P2 card(s) inserted in the card slot(s) shown has (have). trouble.
  - UPDATING: Reading card data
- CANNOT REC

  Appears when recording cannot be started by pressing the REC button.
- EOS

  End of stream. No more data is available in the forward playback direction.
- SHOT MARK ON (OFF) (INVALID)

  SHOT MARK appears when the user button or the lens RET button to which it has been assigned is pressed.
- SYNC POSI FAILED

  Appears when the synchronization of the clip position has failed.

Errors and warnings

Errors and warnings appear when something goes wrong with the camera or a P2 card malfunctions. If the problem cannot be solved by turning off the camera and turning it back on, try replacing the card and if that does not help, it may be necessary to consult your supplier.

- DIR ENTRY NG CARD L (R) (L/R)

  This message indicates that the directory on the card has become corrupted and that normal recording cannot be guaranteed if operation continues. Make a quick backup of card data and reformat the card.
- FAN STOPPED

  FAN (1, 1/2, 1/3, 2, 2/3, 3, 1/2/3)

  This indicates an error with the fan. The fan is under suspension.
- FORMAT ERR !

  This indicates a P2 card that does not meet the P2 card standard
- HIGH TEMPERATURE

  A high-temperature error is detected.
- INCOMPATIBLE CARD

  This message indicates that the inserted card does not meet required standards and cannot be used.
- LOW BATTERY

  This message indicates that the battery is depleted.

- **REC WARNING**

  This is displayed during a recording error. Do the recording over. If this does not solve the problem, consult your supplier.
  - **CARD ERR L (R) (L/R):**

    This indicates trouble with the P2 card(s) inserted into the card slot(s).
    - Turn the power off if the warning continues.
    - If the warning persists after rerecording, replace the card with another card.
  - **IRREGULAR FRM SIG:**

    The reference signal, such as the GENLOCK input, is distorted.
  - **L/R DURATION NG:**

    The duration of the recorded clip is different between the L and R P2 cards.
  - **OVER MAX# CLIPS:** The limit for the number of clips that can be recorded to one P2 card has been reached.
  - **PULL DOWN ERROR:** Video pull-down sequence error in a mode such as 24P (25P)
  - **REC RAM OVERFLOW:** Overflow of recording memory
  - **ERROR:** Other causes

- **RUN DOWN CARD L (R) (L/R)**

  This message indicates that a P2 card has been overwritten the maximum number of times and that normal recording cannot be guaranteed if operation continues.

  It is best to replace such P2 cards with a new card.

- **SYSTEM ERROR**

  This message indicates that a system error has occurred. This type of error can often be corrected by turning off the power and turning it back on again.
  - **CAM MICON ERROR:** The microprocessor in the camera is not responding.
  - **P2 CONTROL ERROR:** A P2 control error has occurred.
  - **P2 MICON ERROR:** The P2 microprocessor does not respond
  - **P2 MICON LINK ERROR:** A connection error between P2 microprocessors has occurred.

- **THUMBNAIL OPEN**

  This message is displayed in the viewfinder during thumbnail operations.

- **TURN POWER OFF**

  This message indicates that an abnormal event has occurred, for example, that a card was removed during access or that a system mode change was made. Turn the power off and then turn it back on again.

- **WARNING**

  These messages are displayed when an error related to the camera block is detected.
  - **FOCUS NG L(R)(L/R):** Focus error
  - **ZOOM NG L(R)(L/R):** Zoom error
  - **IRIS NG L(R)(L/R):** Iris error
  - **ND FILTER NG L(R)(L/R):** ND filter error
  - **CONV. NG L(R)(L/R):** Convergence error
  - **SUB LENS NG L(R)(L/R):** Sub-lens error

- **VERSION MISMATCH PLEASE UPDATE**

  This message is displayed if a version mismatch has occurred.
  Perform card updating.

- **WIRELESS RF**

  This message indicates that reception from the wireless receiver is poor.

Camera status display

- **ABB**

  ABB indicator
- **AUTO KNEE (ON/OFF)**

  Displayed when changing the AUTO KNEE switch position.
- **AWB**

  AWB indicator
- **AWB P3.2K/AWB P5.6K**

  Displays the color temperature assigned to PRST when the WHITE BAL switch is set to PRST. Also displayed when AWB is performed in the PRST position.
- **GAIN ✳✳dB**

  Displayed when GAIN is switched.
- **SHUTTER ✳✳✳✳ (OFF)**

  Displayed when the shutter speed is changed.

3D status display

- **3D ASSIST**
  - **ALERT(ON/OFF):** Status indication of the 3D ASSIST ALERT function
  - **CONV.(ON/OFF):** Status indication of the 3D ASSIST CONV. function
- **3D ASSIST ACTIVE**

  Displayed when the ZEBRA button is pressed while the 3D assist function is active.
- **3D MODE**
  - **NEAR:** Displayed when the 3D MODE selector switch position is changed to NEAR
  - **NORMAL:** Displayed when the 3D MODE selector switch position is changed to NORMAL.
  - **EXTRA ZOOM:** Displayed when the 3D MODE selector switch position is changed to EXTRA.

Checking and Displaying Shooting Status

- Hold down the DISP/MODE CHK button in recording standby or during recording to display the settings of each shooting function, the list of functions assigned to USER buttons and all other information. Release the button to return to the regular screen.
- Press the DISP/MODE CHK button during recording standby or recording clears all displays. Press again to return to the regular display.
- These settings are maintained when the unit is turned off and also when switching media and operating mode.
- The following items can be displayed on the LCD monitor and in the viewfinder by pressing the DISP/MODE CHK button or by configuring the menu option OTHER DISPLAY in the DISPLAY SETUP screen.

DISP/MODE CHK button
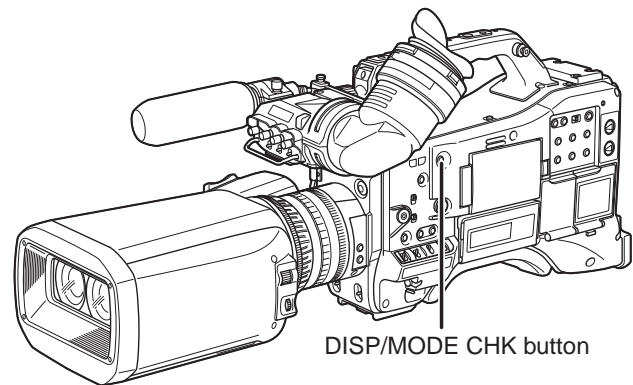
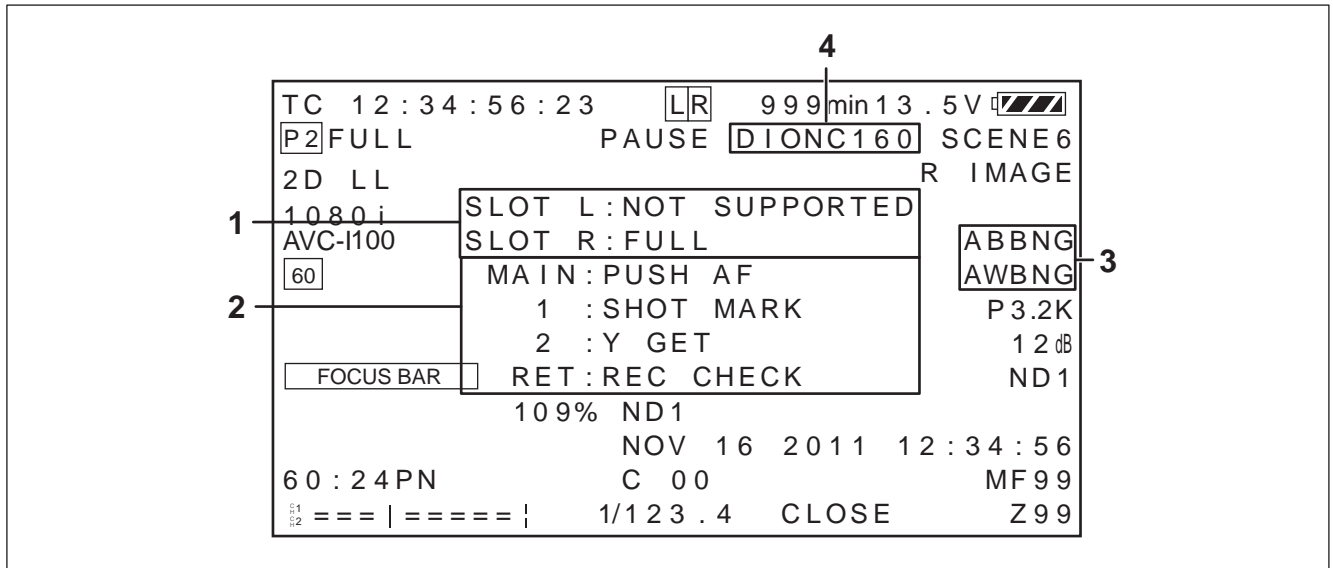| No	Displays	Displays that MODE CHECK brings up: ✓	Displays that DISPLAY OFF clears: ✓	Displays opened or hidden by settings in the OTHER DISPLAY option −: Not affected		Other menus that clear displays −: Not affected
				ON	OFF	
1	Time code	✓	Is not cleared	−	−	COUNTER Button
2	Warnings	✓	Is not cleared *1	−	−	CARD/BATT *1
3	2D LL	✓	✓	Opened	Cleared	Displayed when REC MODE is 2D LL mode
4	Recording format and system frequency indication	✓	✓	Opened	Cleared	−
5	Information	Is not displayed	Is not cleared	−	−	−
6	FOCUS BAR	Is not displayed	Is not cleared *2	−	−	FOCUS BAR
7	Y GET brightness	✓	Is not cleared	−	−	−
8	Recording/playback frame rate	✓	✓	Opened	Cleared	−
9	Audio level meter	✓	✓	−	−	LEVEL METER
10	Convergence position	✓	✓	−	−	CONVERGENCE
11	Shutter speed	✓	✓	Opened (Displayed only with SHUTTER ON)	Cleared	−
12	Iris	✓	✓	Opened	Cleared	−
13	Zoom position	✓	✓	−	−	ZOOM&FOCUS
14	Focus position	✓	✓	−	−	ZOOM&FOCUS
15	Calendar	✓	✓	−	−	DATE/TIME
16	Recommended ND filter	✓	✓	Opened	Cleared	Displayed only when there is a recommended position
17	ND filter	✓	✓	Opened	Cleared	−
18	Gain	✓	✓	Opened	Cleared	−
19	WHITE BAL switch position	✓	✓	Opened	Cleared	−
20	C TEMP (color temperature)	✓	Is not cleared	−	−	Displayed only after AWB adjustment
21	LCD/EVF mode	✓	✓	Opened	Cleared	−
22	Scene file name	✓	✓	Opened	Cleared	−
23	Remaining battery charge	✓	✓ Goes on when battery charge drops	−	−	CARD/BATT
24	Media remaining memory	✓	✓ Goes on when battery charge drops	−	−	CARD/BATT
25	Media information	✓	✓	−	−	CARD/BATT
26	Operation status	✓	✓ Appears at top right only during recording and in special recording modes	Opened	Cleared (Appears at top right only during recording and in special recording modes)	−

*1 Only the warning that a P2 card has not been inserted is not displayed.
*2 This is displayed at the lower left of the screen in DISPLAY OFF mode.

MODE CHECK Indication

MODE CHECK provides an almost complete set of camera information.
Items 1 to 4 below are provided only by MODE CHECK.

```
                                  4
┌─────────────────────────────────────────────────────────┐
│  TC  12:34:56:23    L R    999 min 13.5V �( ▨▨▨ )         │
│  P2 FULL          PAUSE  DIONC160   SCENE6                │
│  2D LL                              R  IMAGE              │
│  1080 i    ┌─────────────────────────────┐               │
│  AVC-I100  │ SLOT L:NOT SUPPORTED         │   A B B N G  │
│            │ SLOT R:FULL                  │   A W B N G  │
│  60        │  MAIN:PUSH AF                │   P 3.2K     │
│            │     1 :SHOT MARK             │   12 dB      │
│            │     2 :Y GET                 │   ND1        │
│  FOCUS BAR │   RET:REC CHECK              │              │
│            └─────────────────────────────┘               │
│               109% ND1                                    │
│                    NOV 16 2011 12:34:56                   │
│  60:24PN            C 00                      MF99         │
│  === | =====     1/123.4  CLOSE              Z99          │
└─────────────────────────────────────────────────────────┘
```

- **1** P2 card slot status display
- **2** Information on user button and lens RET button assignment
- **3** (AWB, ABB error display)
- **4** Battery type

1 P2 card slot status display
Displays status for P2 card slots L and R.
- **• ACTIVE:**
  Indicates cards that are ready for write operation (includes cards selected for recording)
- **• ACCESSING:**
  Indicates a card that is currently read or being written to
- **• INFO READING:**
  Card in the recognition phase
- **• FULL:** No more space available on the P2 card, or the number of clips recorded on the P2 card reached the limit.
- **• PROTECTED:**
  The P2 card is write-protected.
- **• NOT SUPPORTED:**
  The P2 card cannot be used or recognized.
- **• FORMAT ERROR:**
  The P2 card is not properly formatted.
- **• NO CARD:**
  No card has been inserted.

2 Information on user button and lens RET button assignment
Information to check what functions are assigned to user buttons and the lens RET button are provided in the following sections.
For details, refer to [Assigning Functions to USER Buttons] (page 50).
For details, refer to [RET] (page 113).

3 AWB, ABB error display
A mode check indicates when AWB and ABB fail to operate normally.

4 Battery type
This indicates the battery type selected for detection of remaining battery charge.

Center Marker Display

A center marker is displayed when the menu option MARKER in the DISPLAY SETUP screen is set to ON.
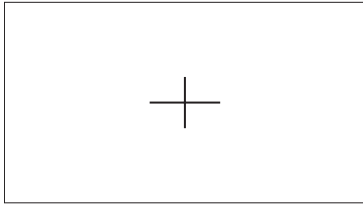
◆ **NOTE**

The center marker display appears only on the LCD monitor and in the viewfinder. It is not superimposed on signals output via the HD SDI MONITOR OUT and HDMI connectors.

Safety Zone Markers

A safety zone marker is displayed when the menu option SAFETY ZONE is selected in the DISPLAY SETUP screen.
• OFF: Not displayed
• 90%: indicates the display area on a normal household TV
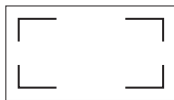
• 13:9: Indicates the display area available at a 13:9 aspect ratio.

• 14:9: Indicates the display area available at a 14:9 aspect ratio.

◆ **NOTE**

Safety zone markers appear only on the LCD monitor and in the viewfinder. They are not superimposed on signals output via the HD SDI MONITOR OUT and HDMI connectors.

Zebra Pattern Display

The AG-3DP1 can display two zebra patterns.
The zebra pattern set in the menu appears on the LCD monitor and in the viewfinder when the ZEBRA button is pressed or if the ZEBRA switch on the viewfinder is set to ON.
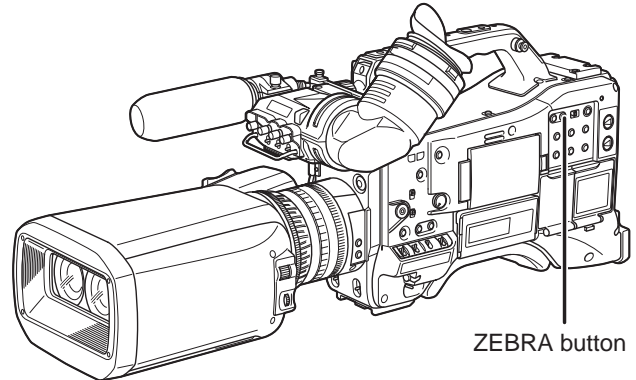
ZEBRA button

Use the DISPLAY SETUP screen to set the level of zebra pattern display.

Item	Setting	Description
ZEBRA1 DETECT	50%…70%…109%	Sets the level of the right-leaning zebra pattern 1.
ZEBRA2 DETECT	50%…85%…109%	Sets the level of the left-leaning zebra pattern 2.
ZEBRA2	ON, SPOT, OFF	Selects the ZEBRA2 type.

Underlined values indicate factory defaults.
SPOT: A video level between ZEBRA1 and ZEBRA2 displays a zebra pattern.

ZEBRA 2

Image level

ON   OFF   SPOT

109%

ZEBRA 2 DETECT

ZEBRA 1 DETECT

0%
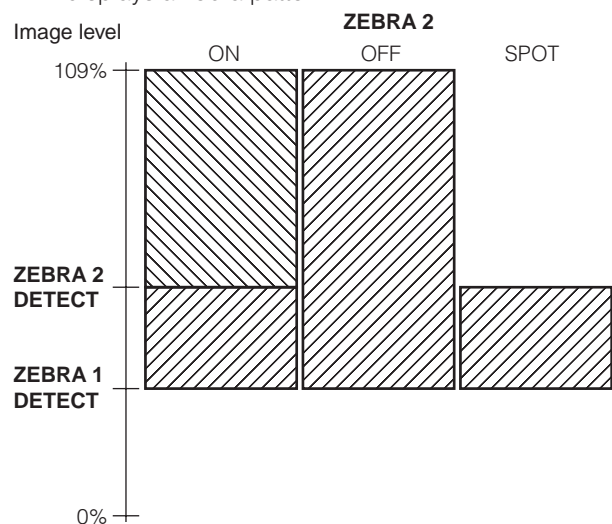
◆ **NOTE**

The zebra pattern cannot be displayed when the 3D assist function is operating.

Focus Assist Function

The AG-3DP1 is equipped with a focus assist function to facilitate focusing using the expanded display on the LCD monitor and the focus bar display on the LCD monitor/ viewfinder screen.

Expanded display (EXPANDED)

Pressing the FOCUS ASSIST button magnifies the image at the center of the LCD monitor to facilitate focusing. The image is magnified nearly 2x when SYSTEM MODE is 1080i, or nearly 1.5x when SYSTEM MODDE is 720P.

- The expanded display function is enabled only when LCD/EVF mode is set to left-lens (L) image.
- The status indication and the zebra pattern disappear and LCD EXPANDED appears at the top of the screen during magnification.

FOCUS ASSIST button
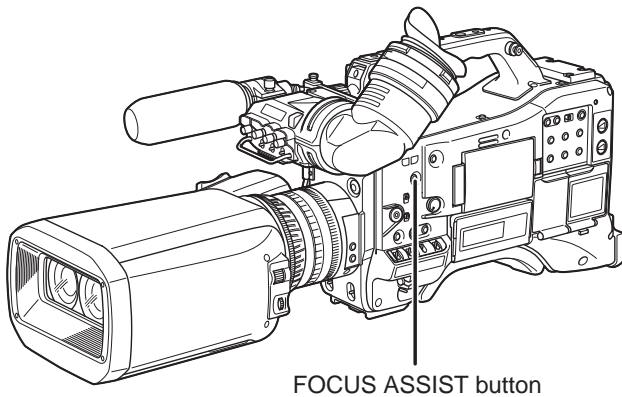
◆ NOTE

This function magnifies only the image on the LCD monitor. It does not magnify the image in the viewfinder or the image of signals output via the HD SDI MONITOR OUT and HDMI connectors.

Focus bar display (FOCUS BAR)

Set the menu option FOCUS BAR to ON in the DISPLAY SETUP screen to display the focus bar. The length of the focus bar indicates whether the image is in focus.

Out of focus

The bar extends to the right when the image is in focus.
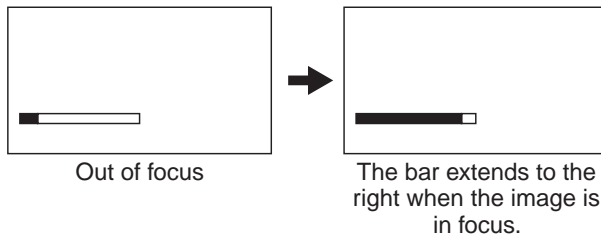
◆ NOTE

The focus bar is displayed only on the LCD monitor and in the viewfinder. It is not displayed for the signals output via the HD SDI MONITOR OUT and HDMI connectors.

Waveform Monitor Function

Press the WFM button to display a waveform for an image on the LCD monitor. Another press of the WFM button changes the waveform to the vector display, and one more press returns it to the normal display.
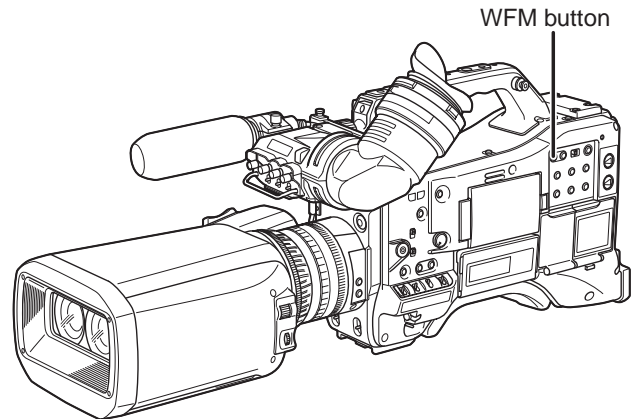
WFM button

- The waveform display does not appear in the viewfinder.
- The waveform display does not appear when the focus assist (EXPANDED) function is used.
- The waveform display cannot be recorded.

Adjusting and Setting the LCD Monitor/Viewfinder

Using the LCD monitor

1 Turn on the POWER switch of the AG-3DP1.

2 Slide the OPEN button in the arrow ① direction to open the LCD monitor.
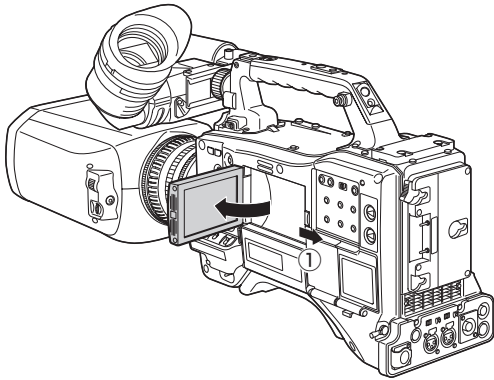
◆ **NOTE**
The LCD monitor opens to an angle of 90 degrees. Attempts to open it further will damage the monitor.

3 Adjust the angle of the LCD monitor for most convenient viewing.

• The monitor can turn up to 180 degrees towards the lens and up to 90 degrees towards you.

◆ **NOTE**
To prevent camera-recorder failure, do not use force when adjusting the monitor (when open).
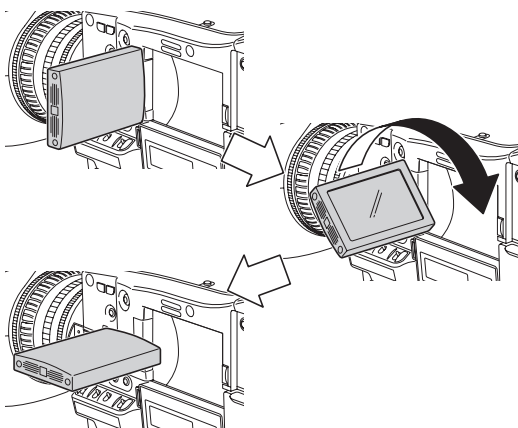
4 Use the subscreen in the menu option LCD SETTING in the DISPLAY SETUP screen to adjust screen color level, brightness and contrast.

For details on menu operation, refer to [Using the Menus] (page 106).
• At LCD SETTING of the DISPLAY SETUP screen, select CHANGE.

```
          DISPLAY SETUP

EVF PEAK LEVEL            0
EVF PEAK FREQ          LOW
LCD SETTING         RETURN
LCD BACKLIGHT       CHANGE
ZWBRA1 DETECT          70%
ZWBRA2 DETECT          85%
ZWBRA2                SPOT
MARKER                  ON
▼
     PUSH  MENU  TO  RETURN
```

5 Use the JOG dial button to select an item.

```
          LCD SETTING

  LCD  COLOR  LEVEL
[−] ----------+---------- [+]

   LCD  BRIGHTNESS
[−] ----------+---------- [+]

   LCD  CONTRAST
[−] ----------+---------- [+]

   PUSH  MENU  TO  RETURN
```

6 Press the JOG dial button, and turn the JOG dial button to adjust the selected item.

```
          LCD SETTING

   LCD  COLOR  LEVEL
[−] ----------+---------- [+]

   LCD  BRIGHTNESS
▶[−] ----------+---------- [+]

   LCD  CONTRAST
[−] ----------+---------- [+]

   PUSH  MENU  TO  RETURN
```

◆ **NOTE**

- **Pressing the RESET button when a value that can be adjusted is selected in the setting menu LCD SETTING will return the setting to its factory default.**
- **When closing the LCD monitor make sure that it is shut tight.**
- **In an environment with sudden temperature changes, condensation may form on the liquid crystal surface of the monitor. If this happens, wipe off the moisture with a soft, dry cloth.**
- **When a cloth is used to wipe dew or dirt off the LCD monitor, discoloration may appear on the screen. This is not a malfunction. The discoloration disappears in a few minutes.**
- **When the camera-recorder is very cold, the video image in the LCD monitor will appear slightly darker immediately after the power is turned on. Once the interior of the camera-recorder warms up, the LCD monitor delivers normal brightness.**
- **The image on the LCD monitor may remain if the battery or the power plug of an external DC power supply is removed when the camera is on. This is normal and not a malfunction. This image will disappear if the camera is left idle.**
- **Image lag may increase at low temperatures, but this is not a malfunction.**

Adjusting Left and Right Viewfinder Positions

1 Loosen the viewfinder left-right positioning ring.

2 Slide the viewfinder left and right to find a position that facilitates viewing.
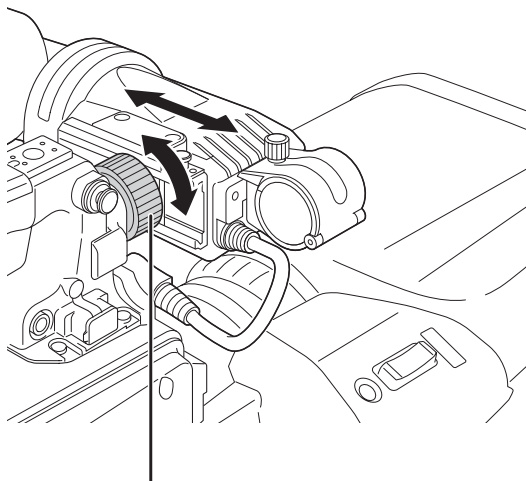
Viewfinder left-right positioning ring

3 Tighten the viewfinder left-right positioning ring.

Diopter Adjustment

1 Set the POWER switch of the camera to ON.

- Look at the image in the viewfinder.

2 Turn the diopter adjusting ring until you get the sharpest possible image in the viewfinder.

Diopter adjusting ring
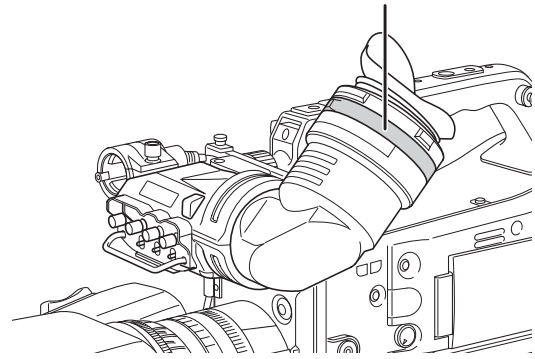
Emphasizing Image Outlines

Emphasizing outlines of images in the viewfinder and on the LCD monitor makes it easier to focus.
This function does not affect video output from the camera or video recorded by the camera.

1 Adjust EVF PEAK LEVEL and EVF PEAK FREQ in the DISPLAY SETUP screen.

```
         DISPLAY SETUP

EVF PEAK LEVEL          0
EVF PEAK FREQ    ▶     LOW
LCD SETTING           >>>
LCD BACKLIGHT       NORMAL
ZEBRA1 DETECT        100%
ZEBRA2 DETECT         85%
ZEBRA2               SPOT
MARKER                ON
▼
     PUSH  MENU  TO  RETURN
```

77

Handling Setup Data

Configuration of Setup Data Files

This camera makes it possible to save up to six scene files (1 to 6) in internal memory.
Use of an SD memory card makes it possible to save four sets of scene files (1 to 6) on an SD card for later retrieval.
The setting menu values can be stored as a user file in the camera and up to four files can be stored on the SD memory card.
The setting data files are configured as shown below.
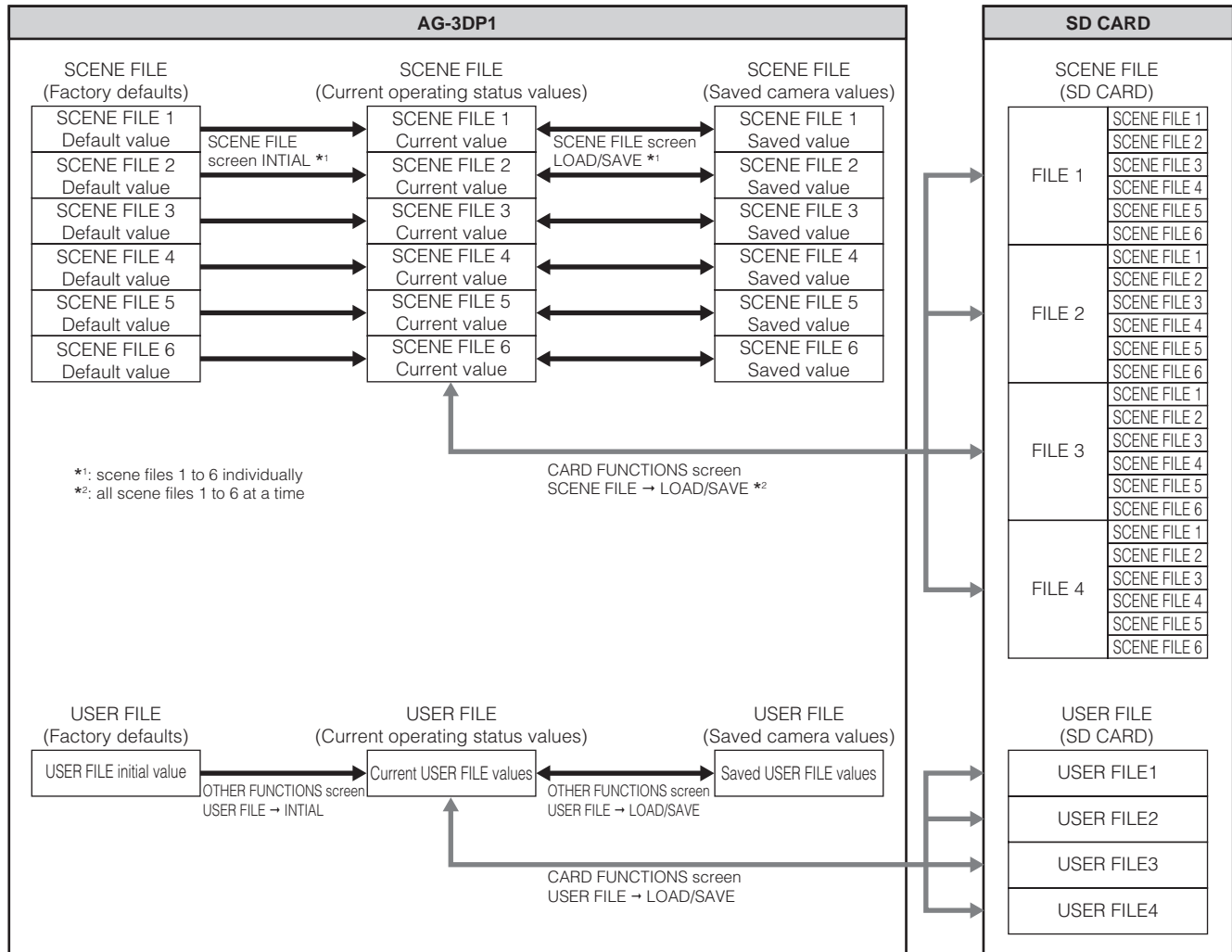
◆ NOTE

Running the menu option MENU INIT in the OTHER FUNCTIONS screen returns all current operating status values and saved camera values in the 1 to 6 scene files as well as in the user file to their factory defaults. This function does not return the TIME ZONE setting to its factory default.

Setting Data Using an SD memory card

By saving up to four files of setup menu settings on an SD or SDHC memory card (optional accessory), you can create a setup card that will allow you to quickly configure camera settings before recording.

Handling SD Memory Cards

An SD memory card may be inserted or removed, either before or after the power is turned on.

To insert an SD memory card

Open the slot cover, insert the SD memory card (optional accessory) in the slot with the label side of the card facing upwards and close the slot cover.
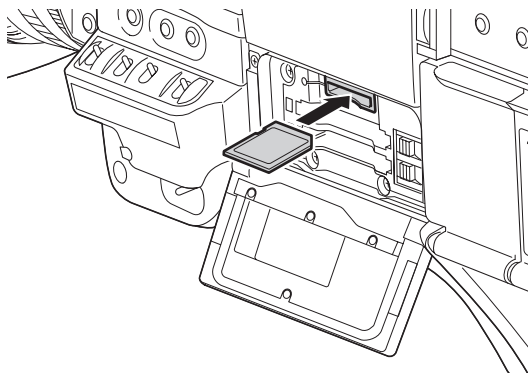
◆ **NOTE**

• **An SD memory card must be inserted with the right side facing the slot. If the card cannot be inserted, it may the wrong side up or back-to-front. Do not force it into the slot. Check the card before reinserting it.**
• **Use only SD memory cards that conform to the SD standard or the SDHC standard in this camera.**
Be sure to read [SD memory card precautions] (page 22) regarding SD memory handling.

To remove the SD memory card

Open the slot cover and make sure that the BUSY lamp is not on before pushing the SD memory card further into the slot and releasing it. This will cause the SD memory card to pop out of the slot. Remove the SD memory card and close the slot cover.

SD memory cards must not be used or stored in an environment where they may be

• Exposed to high temperatures/humidities;
• Exposed to water droplets; or
• Electrically charged.
For storage, the SD memory card must be kept inserted into the camera with the lid closed.

Formatting, Writing and Reading an SD Memory Card

Open the CARD FUNCTIONS screen from the setting menu to format SD memory cards, write setting data to SD memory cards and to read data stored on an SD memory card.
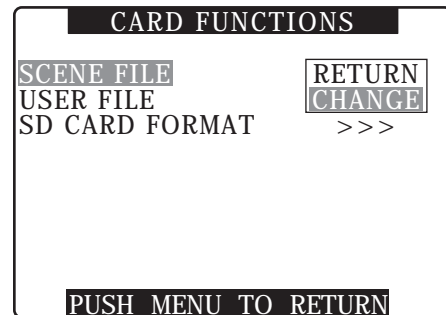
Use of SD memory cards in a non-SD/SDHC format formatted on a device other than this camera will display a FORMAT ERROR message at the top right of the screen. Reformat such SD cards in the camera before use.
See [To format an SD memory card] (this page).

To format an SD Memory Card

◆ **NOTE**
SD memory cards may be formatted via the thumbnail screen.
For more information, see [Formatting SD Memory Cards] (page 100).

1 Select SD CARD FORMAT item in CARD FUNCTIONS, then press the JOG dial button.

For details on menu operation, refer to [Using the Menus] (page 106).

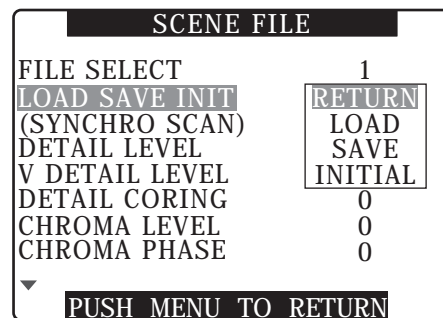**2** Select EXCUTE, then press the JOG dial button.
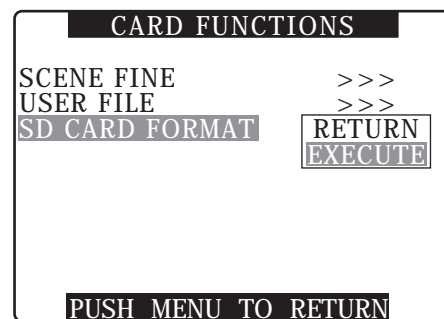
3
Select YES in the confirmation screen and press the JOG dial button.

- "SD CARD FORMAT OK" appears and the SD memory card is formatted.

◆ **NOTE**

Check that no important data remains on a card before formatting since data erased by formatting cannot be recovered.

The card will not be formatted if the following message appears when the JOG dial button is pressed:

Error message	Remedy
SD CARD FORMAT NG NO CARD (No SD memory card inserted.)	Insert an SD memory card.
SD CARD FORMAT NG ERROR (SD memory card cannot be formatted.)	The card may be defective. Replace the card.
SD CARD FORMAT NG WRITE PROTECT (SD memory card is write-protected.)	Remove the card and cancel the protect.
SD CARD FORMAT NG CANNOT ACCESS (SD memory card not accessible).	The SD memory card is not accessible. When the current access operation ends, reformat the card.

How to Use Scene File Data

The camera stores up to six settings for specific shooting situations as scene files.
When shooting, you can retrieve the desired file instantly.

Selecting a scene file

1
Select the menu option FILE SELECT in the SCENE FILE screen then press the JOG dial button.

For details on menu operation, refer to [Using the Menus] (page 106).

```
          SCENE FILE
FILE SELECT            1
LOAD/SAVE/INIT        >>>
(SYNCHRO SCAN)        1/60.0
DETAIL LEVEL          0
V DETAIL LEVEL        0
DETAIL CORING         0
CHROMA LEVEL          0
CHROMA PHASE          0
▼
     PUSH  MENU  TO  RETURN
```
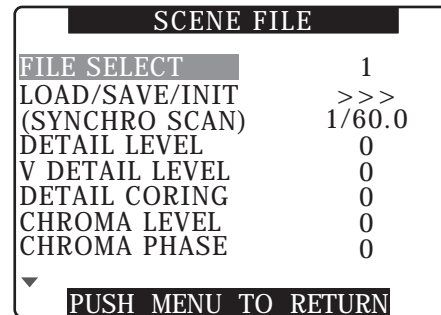
2
Turn the JOG dial button to select the file number.

```
          SCENE FILE
FILE SELECT        >    1
LOAD/SAVE/INIT          2
(SYNCHRO SCAN)          3
DETAIL LEVEL            4
V DETAIL LEVEL          5
DETAIL CORING          6
CHROMA LEVEL           0
CHROMA PHASE           0
▼
     PUSH  MENU  TO  RETURN
```
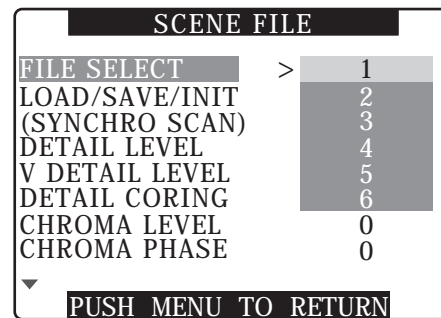
◆ **NOTE**

Changes to scene files do not affect SYSTEM MODE settings. Use the SYSTEM SETUP screen to make such changes.

Changing scene file settings

■ Example 1: Change the name of the scene file.

1 Select the scene file to be changed.

2 Select the menu option NAME EDIT in the SCENE FILE screen, then press the JOG dial button.

For details on menu operation, refer to [Using the Menus] (page 106).

```
         SCENE FILE
  ▲
MATRIX                    NORM1
NAME EDIT                RETURN
                        CHANGE




        PUSH  MENU  TO  RETURN
```

3 Select CHANGE and press the JOG dial button.
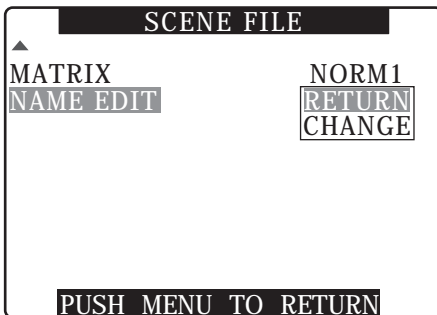
```
         SCENE FILE
  ▲
MATRIX                    NORM1
NAME EDIT                RETURN
                        CHANGE




        PUSH  MENU  TO  RETURN
```
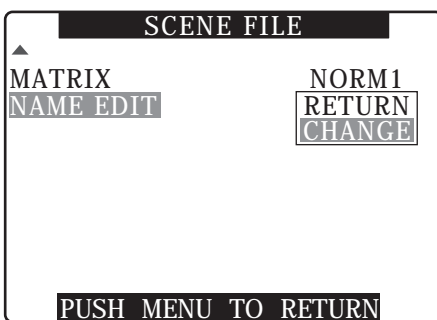
4 When the screen shown below appears, use the JOG dial button to enter a 6-character file name.

- Turning the JOG dial button changes the character display in the following order: space (□) → alphabet (A to Z) → numerics (0 to 9) → symbols (; : < = > ? @ [\ ] ^_-./).
- If the RESET button is pressed when the filename has been set, the characters are cleared.

```
         NAME EDIT

       FILE SELECT 3
         S P A R K




        PUSH  MENU  TO  RETURN
```
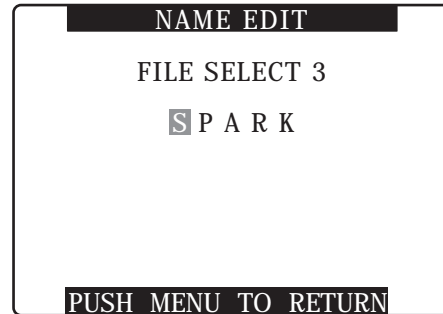
- After you finish setting the filename, press the MENU button. This completes the NAME EDIT change. A change that has been confirmed is retained after a power down and is not affected by dial position. Items set for the scene file are also retained.

■ Example 2 : Save the FILE 1 scene data to the camera.

1 Select the menu option LOAD/SAVE/INIT in the SCENE FILE screen, then press the JOG dial button.

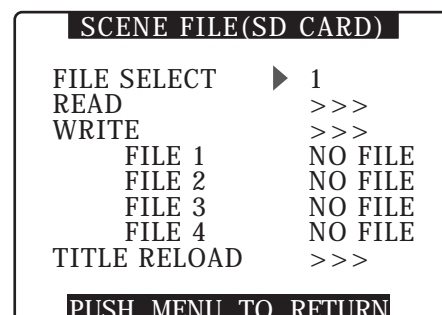For details on menu operation, refer to [Using the Menus] (page 106).

```
         SCENE FILE

FILE SELECT              1
LOAD SAVE INIT         RETURN
(SYNCHRO SCAN)          LOAD
DETAIL LEVEL            SAVE
V DETAIL LEVEL         INITIAL
DETAIL CORING            0
CHROMA LEVEL             0
CHROMA PHASE            0
  ▼
        PUSH  MENU  TO  RETURN
```

81

2 Select SAVE and press the JOG dial button.

```
        SCENE FILE
FILE SELECT            1
LOAD SAVE INIT       RETURN
(SYNCHRO SCAN)        LOAD
DETAIL LEVEL          SAVE
V DETAIL LEVEL        INITIAL
DETAIL CORING         0
CHROMA LEVEL          0
CHROMA PHASE          0
▼
     PUSH  MENU  TO  RETURN
```
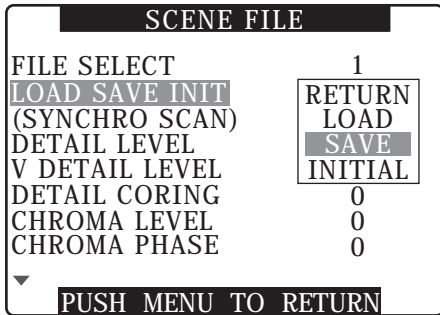
3 Select YES and press the JOG dial button.

• To return to the menu level above, press the MENU button.

```
        SCENE FILE

  SAVE ?

     YES  ⟶  PUSH SET

     NO
```
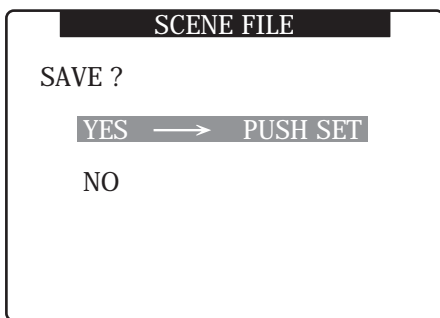
• "PROCESSING" appears and the following message is shown when all settings have been completed.

```
        SAVE
     COMPLETED !
```

• After changing the scene file settings, to return to the settings to the previously saved values, select LOAD in step 2 and perform the operation described in step 3.
• To return the scene file settings to their factory defaults, select INITIAL in step 2 and perform the operation described in step 3.
• To save and read user file settings or return them to their factory defaults, open the setting menu OTHER FUNCTIONS screen and run USER FILE in the same way as when handling scene files.

Saving Scene Files and Other Settings on SD Memory Cards

You can save up to four scene file settings or other settings as files on an SD memory card, and you can also load them from the card.
• Current scene file settings are automatically saved in the camera and written to an SD memory card. When data has been read from an SD memory card, the current settings are rewritten at the same time as the data saved inside the unit.
• The data in all the scene files 1 to 6, is rewritten. Be sure to read [Handling SD Memory Cards] (page 79) regarding SD memory handling.

The following procedure shows how to save scene files.

1 Set the unit's POWER switch to ON.

2 Select the menu option SCENE FILE in the CARD FUNCTIONS screen, then press the JOG dial button.

For details on menu operation, refer to [Using the Menus] (page 106).

3 Select CHANGE and press the JOG dial button.

• Select the menu option USER FILE for other settings.

```
     CARD FUNCTIONS

SCENE FILE           RETURN
USER FILE            CHANGE
SD CARD FORMAT        >>>

     PUSH  MENU  TO  RETURN
```
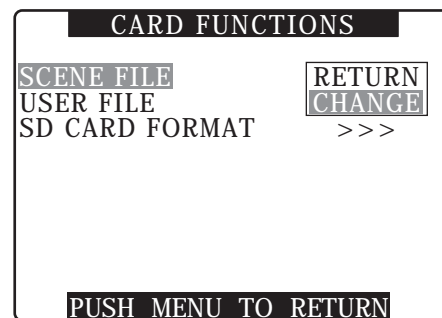
4 Select the file number (1 to 4) using the JOG dial button.

• Press the JOG dial button again to confirm the setting.

```
   SCENE FILE(SD CARD)

FILE SELECT     ▶  1
READ               >>>
WRITE              >>>
    FILE 1        NO FILE
    FILE 2        NO FILE
    FILE 3        NO FILE
    FILE 4        NO FILE
TITLE RELOAD       >>>

     PUSH  MENU  TO  RETURN
```

5 Select WRITE and press the JOG dial button, then select EXECUTE and press the JOG dial button.

```
┌─────────────────────────────────┐
│    SCENE FILE(SD CARD)           │
│                                  │
│  FILE SELECT      1              │
│  READ             >>>            │
│  WRITE            RETURN         │
│     FILE 1        EXECUTE        │
│     FILE 2        NO FILE        │
│     FILE 3        NO FILE        │
│     FILE 4        NO FILE        │
│  TITLE RELOAD     >>>            │
│                                  │
│  PUSH  MENU  TO  RETURN          │
└─────────────────────────────────┘
```
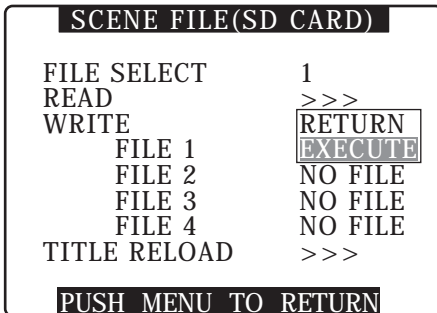
6 Turn the JOG dial button to move to YES and press the JOG dial button.

• In the following example, TITLE 1 is the filename.
• When writing is completed, WRITE OK appears.

```
┌─────────────────────────────────┐
│    SCENE FILE(SD CARD)           │
│                                  │
│  WRITE FILE 1                    │
│     YES ––→ PUSH SET             │
│     NO                           │
│  TITLE EDIT                      │
│     T I T L E 1                  │
│                                  │
│                                  │
│  PUSH  MENU  TO  RETURN          │
└─────────────────────────────────┘
```

To load a file

Perform steps 1 to 4. Select READ in step 5, select EXECUTE and press the JOG dial button. READ OK appears when loading completes.
Like scene files, process user files by using the menu option USER FILE in the CARD FUNCTION screen.

Reloading Files From an SD Memory Card

Perform steps 1 to 3, move to TITLE RELOAD so that YES is displayed in step 5, and press the JOG dial button. The file is reloaded.

To title a file

1 Perform steps 1 to 5.

2 Use the JOG dial button to select characters, then press the JOG dial button to move to the next character.

• You can input any of the following characters: Space, A to Z, 0 to 9, : ; < = > ? @ [\ ] ^_-./
• You can erase all characters using the RESET button.

3 When all entries have been made, move the cursor to the right of the entered title.

4 Select YES and press the JOG dial button.

```
┌─────────────────────────────────┐
│    SCENE FILE(SD CARD)           │
│                                  │
│  WRITE FILE 1                    │
│     YES ––→ PUSH SET             │
│     NO                           │
│  TITLE EDIT                      │
│     T I T L E 1                  │
│                                  │
│                                  │
│  PUSH  MENU  TO  RETURN          │
└─────────────────────────────────┘
```
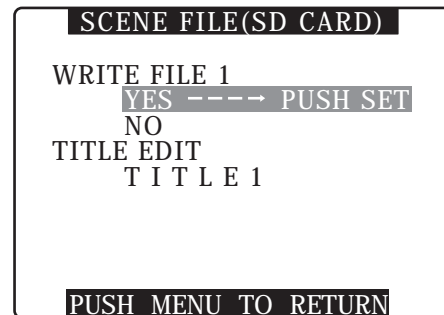
• WRITE OK appears when the title is written.

◆ **NOTE**
• **If WRITE NG FORMAT ERROR appears, format the SD memory card.**
• **If WRITE NG WRITE PROTECT appears, change the lock tab position to enable writing.**
• **If WRITE NG CANNOT ACCESS appears, quit all other operations (such as playback) before proceeding.**
• **If WRITE NG ERROR appears, the SD memory card may be defective. Replace it.**

83

Chapter 5 Preparation

Power Supply

A battery or an external DC power supply can be used as the power supply for the camera-recorder.

Using a Battery

The following is a list of batteries that have been tested and verified to work with the camera.
■Anton/Bauer batteries
HYTRON140
DIONIC90, DIONIC160
■IDX batteries
"ENDURA" E-10 / E-10S
■PAG batteries
PAGL95

◆ **NOTE**
• **Although other batteries may be used by changing the menu setting, it is recommended that you use batteries that have been tested and verified to work with camera.**
• **Charge the battery with the battery charger before using it. (Please refer to the battery charger's instruction manual for information about charging.)**

Mounting the Battery and Setting the Battery Type

Using an Anton/Bauer Battery

1   Mount an Anton/Bauer battery.

Anton/Bauer Battery
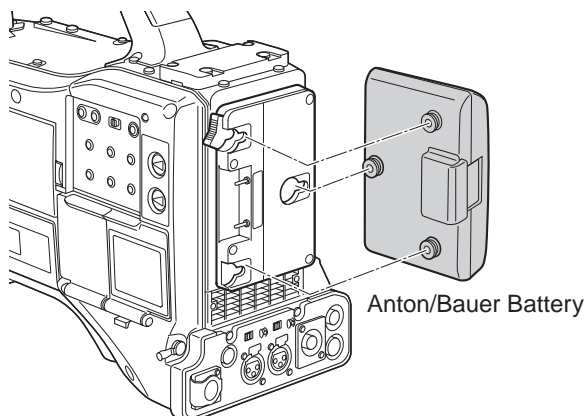
◆ **NOTE**
The Anton/Bauer battery holder includes both a power supply output connector for lighting and a lighting control switch, which are convenient when attaching a light. Please contact Anton/Bauer for information about the lighting system.

2   Insert the battery and slide it in the direction of the arrow.
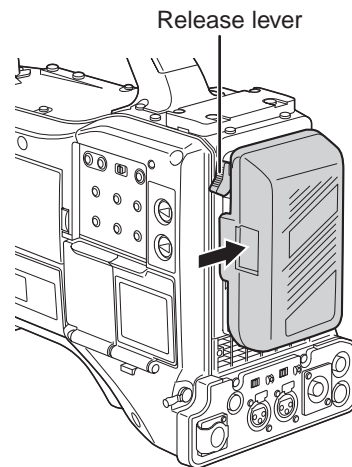
Release lever

◆ **NOTE**
■**Removing the battery**
Completely push down and hold the release lever on the battery holder. Then, slide the battery in the opposite direction to the arrow while holding the lever down.

3   Set the battery type.
• Select the battery type listed under BATTERY SELECT. Select the menu option BATTERY SELECT from the setting menu BATTERY SETUP screen.

◆ **NOTE**
If you wish to turn on a light using the Camera Studio System (AG-BS300, AG-CA300G), attach the battery plate to the AG-CA300G and mount the battery on it for the supply power for the light via the battery plate. If power is supplied via the Light connector of this unit, the unit may not operate, because of overcurrent protection of AG-BS300/AG-CA300G activated by excess current generated when the light is turned on.

When using a V-mount type battery

1 Mount the V-mount adapter plate.

Insert the plate and slide it as shown below.
- To remove the plate, slide the release lever downwards.

Release lever
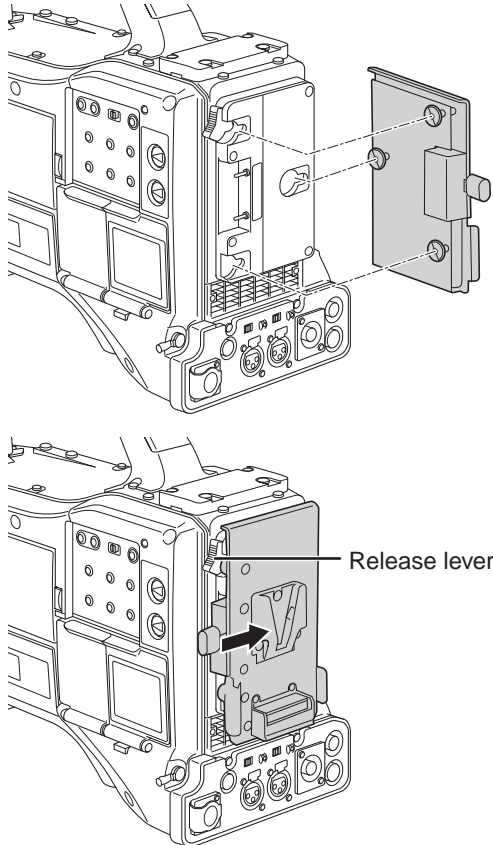
2 Set the battery type.
- Select the battery type listed under BATTERY SELECT. Select the menu option BATTERY SELECT from the setting menu BATTERY SETUP screen.
- When using a battery not listed under BATTERY SELECT, select TYPE A or TYPE B and set each item according to the battery characteristics.
For details, refer to [BATTERY SETUP Screen] (page 117).

◆ NOTE
- **For information about the V-mount adapter plate, please contact the store where you purchased the camera-recorder.**
- **With the V-mount adapter plate installed, % (percent) values cannot be displayed when using batteries that show the remaining battery capacity.**

Use of the External DC Power Supply

1 Connect the external DC power supply to the DC IN socket on the unit.

DC cable

DC IN socket

External DC power supply
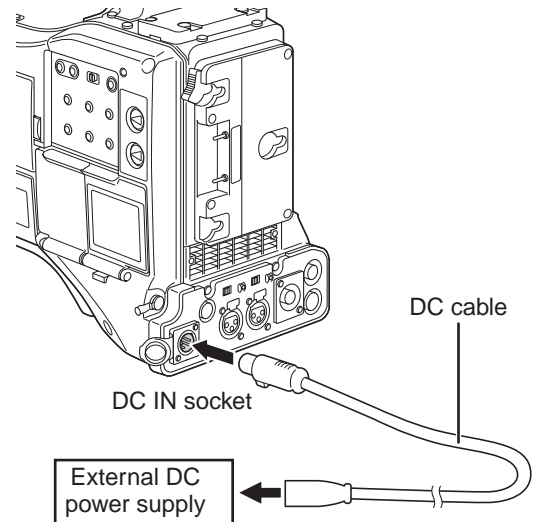
2 Turn "ON" the power switch of the external DC power supply. (If the power switch is available on the external DC power supply)

3 Turn the camera-recorder power switch ON.

85

■Use of external DC power supply
Make sure that the output voltage of the external DC power supply meets the rated voltage of the camera before making a connection.
The output current of the external DC power supply should be large enough to provide the connected camera with its total amperage needs with a reasonable margin.
Use the following formula to calculate the total amperage of the camera.

total power consumption ÷ voltage

When the power is turned on, a rush current occurs. If the power supply is insufficient during this time, the camera may be damaged. Therefore, we recommend using an external DC power supply that provides at least twice the total power consumed by the camera and all the devices connected to the unit that power on when the camera powers on (example: viewfinder). The DC cable should be a two-core 18 AWG (or larger) shielded cable (nominal cross-sectional area: 0.824 mm^2).

When using an external power supply other than the AC adaptor, check the DC IN socket pin information to ensure correct polarity. If a +12 V power supply is accidentally connected to the GND terminal, this could cause a fire or personal injury.

DC IN socket
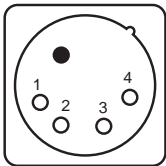
Pin No.	Signal
1	GND
2, 3	NC
4	+12 V
CASE	Frame GND

◆ **NOTE**
• **When both the battery and the external DC power supply are connected, power is supplied from the external DC power supply. The battery can be removed or mounted while using an external DC power supply.**
• **When using an external DC power supply, make sure you turn on the external DC power supply before turning on the camera-recorder's power switch. If this sequence is reversed, the camera-recorder may malfunction due to slow rising of the external DC power supply voltage.**
• **The light circuit does not operate when power is supplied via the DC IN socket. The light circuit can only operate when power is supplied through the Anton/Bauer battery holder.**

Preparing for Audio Input

Take the following steps to prepare the camera for connecting audio input devices.

When Using the Front Microphone

The AG-MC900G stereo microphone kit (optional) can be mounted on the microphone holder of the viewfinder.

1 Open the microphone holder.
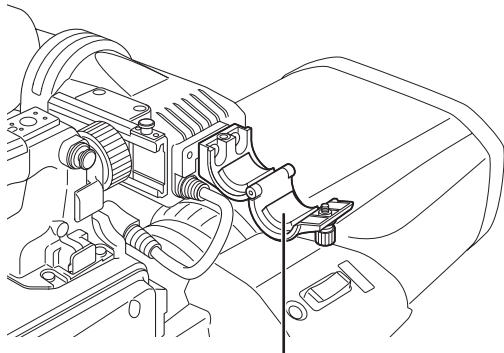
Microphone holder

2 Mount the microphone and tighten the clamping screw.
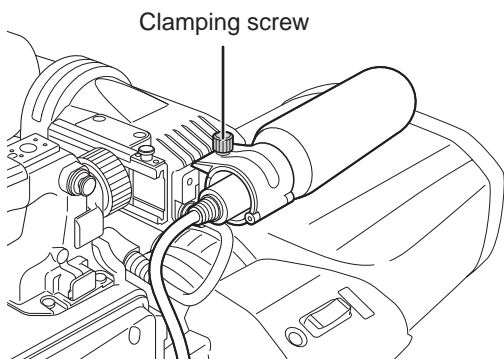
Clamping screw

3 Connect the microphone cable to the MIC IN jack on the camera.
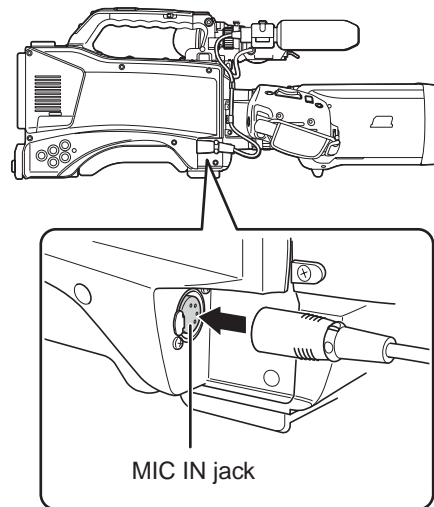
MIC IN jack

4 Set the AUDIO IN switch to FRONT depending on the audio channel to be recorded.
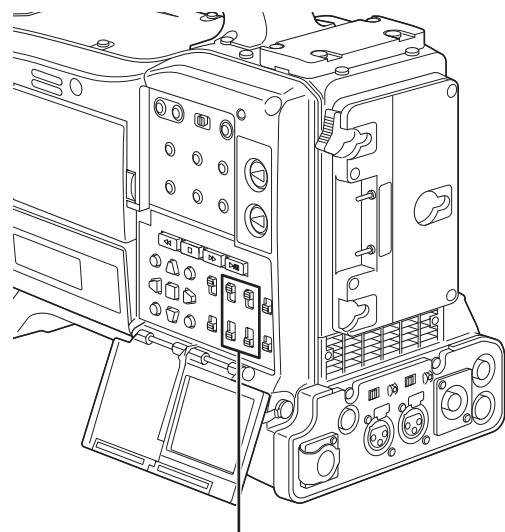
AUDIO IN switch

◆ **NOTE**

When using the front microphone, you may replace the microphone holder with the supplied one to reduce noise during zooming.

87

Using a Wireless Receiver

When using the Unislot Wireless Receiver

1 Remove the lid, install the wireless receiver and screw it down.
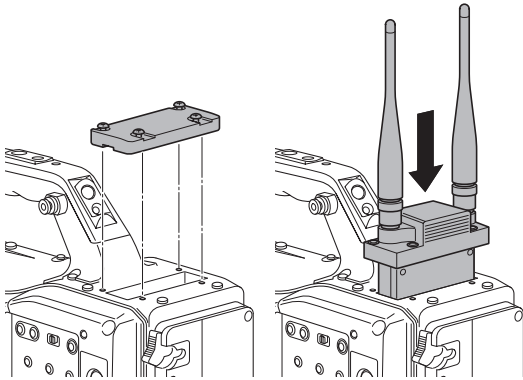
2 Set the AUDIO IN switch to W.L. for the audio channels that will be recorded.
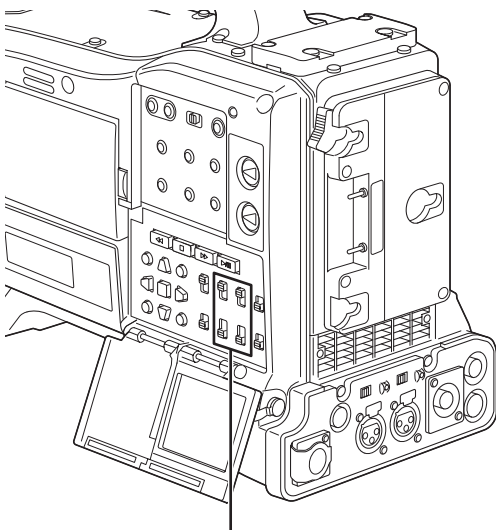
AUDIO IN Switch

• Set the menu option WIRELESS TYPE in the AUDIO SETUP screen to DUAL for a 2-channel wireless receiver.

When Using Audio Devices

1 Connect the audio device to the AUDIO IN jack with the XLR cable.

2 Set the AUDIO IN switch to REAR for the channel to which the XLR cable is connected.

3 Set the LINE/MIC selector switch on the rear panel to LINE.

LINE/MIC selector switch
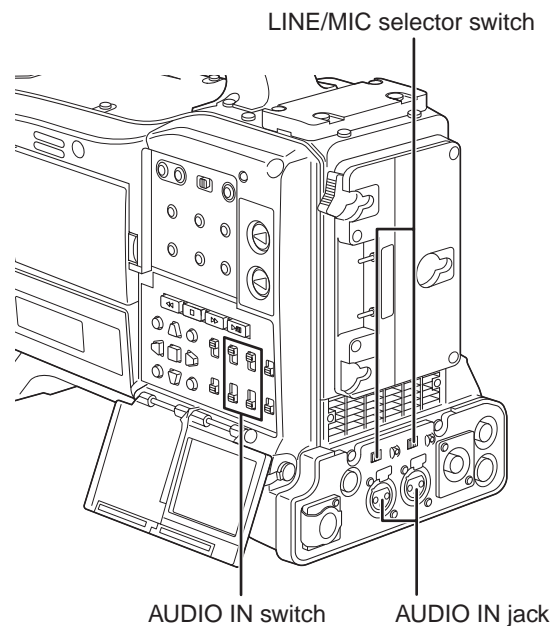
AUDIO IN switch   AUDIO IN jack

88

Attaching/Adjusting Accessories

Mounting the Camera on a Tripod

Use an optional (SHAN-TM700) tripod adapter to place the camera on a tripod.

1   Attach the tripod adapter to the tripod.

Tripod adapter
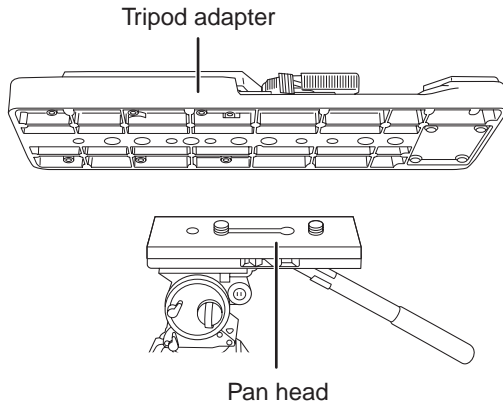
Pan head

◆ **NOTE**

Use the holes in the tripod adapter that will make it possible to position the camera over the tripod adapter's center of gravity.
Also, make sure that the diameter of the selected hole matches the diameter of the pan head screw.

2   Attach the camera to the tripod adapter.

- Slide the camera forward along the grooves until you hear a "click".
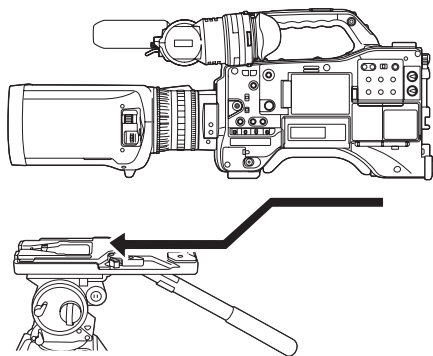
Removing the Camera from the Tripod Adapter

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

Red Lever   Black Lever
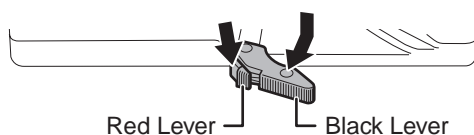
◆ **NOTE**

If the tripod adapter's 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. Please note that the camera cannot be mounted if the pin remains in the center.

Attaching the Shoulder Strap

Attach the shoulder strap to the shoulder strap bracket. To detach the shoulder strap, first open the hooks, then detach the strap.

Shoulder Strap

Press to open the hook.
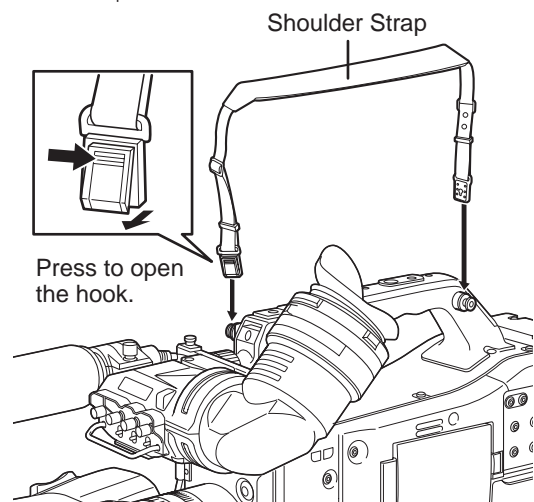
◆ **NOTE**

Make sure that the shoulder strap is securely attached.

Adjusting the Grip Belt

The length of the grip belt can be adjusted.
Once detach the tape, adjust the grip position then fix it with the tape again.
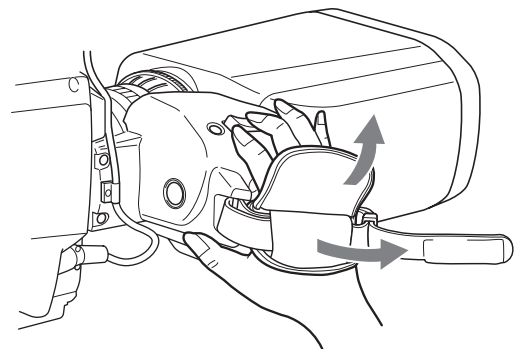
◆ **NOTE**

Be sure that the grip belt is secured.

DC OUT Connector and External REC Start/Stop Switch Connection

The DC OUT connector on the camera can output a 1.5 A current.

Connecting an external switch to this connector enables REC Start and Stop control.

An LED can be connected and used as a tally lamp, which is convenient when the camera is mounted on a crane during recording.

DC OUT connector

(Connection example)

Cable connector
HR10A-7P-4P(73)
Hirose Electric Co.
(For details on the connector, refer to page 138.)

LED

Resist-
ance

REC
Start/Stop

Pin assignment

1   GND

2   TALLY OUT
The AG-3DP1 has open collector output.
TALLY ON:
> Low impedance
TALLY OFF:
> High impedance

3   REC Start/Stop switch
This pin is connected in parallel with the REC button.

4   +12 V

◆ **NOTE**

Be sure to check polarity before connecting an external device as incorrect connection could lead to damage.

90

Chapter 6 Manipulating Clips with Thumbnails

A clip is a data group that includes the images and sounds created from one shooting session, together with additional information such as meta data.

The following manipulations can be performed using the cursor and SET buttons, while checking the images displayed on the LCD monitor:

• Playback, delete, or restore the clip.
• Add or delete a shot mark on the clip thumbnail.
• Format P2 cards and SD memory cards.
• Uploading and editing clip metadata from the SD memory card
• Saving the log data

Thumbnail Operations

Thumbnail Manipulations Overview

Thumbnail screens are configured as follows:

THUMBNAIL

- ALL CLIP
- SAME FORMAT CLIPS
- SELECTED CLIPS
- MARKED CLIPS
- SETUP
  - INDICATOR
  - DATA DISPLAY
  - DATE FORMAT
  - THUMBNAIL SIZE
  - PLAYBACK RESUME
  - THUMBNAIL INIT
  - EXIT
- EXIT

OPERATION

- DELETE
- FORMAT
- REPAIR CLIP
- LOG DATA
- EXIT

PROPERTY

- CLIP PROPERTY
- CARD STATUS
- DEVICES
- PROPERTY SETUP
- EXIT

META DATA

- LOAD
- RECORD
- USER CLIP NAME
- INITIALIZE
- PROPERTY
- EXIT
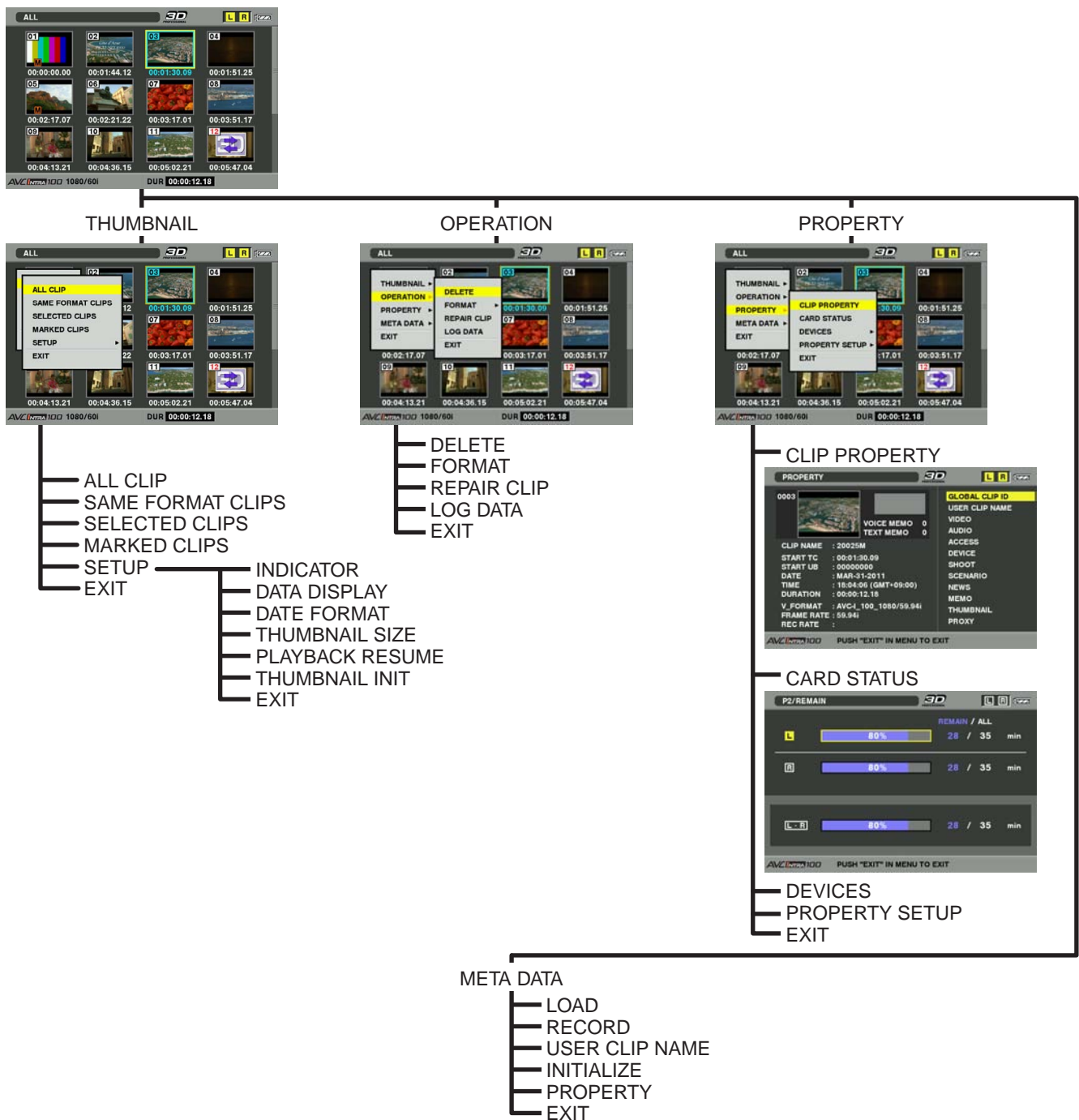
Thumbnail Screen

Press the THUMBNAIL button to display the thumbnail screen on the LCD monitor. Pressing the THUMBNAIL button again returns the display to the regular display. When switching is done from the regular screen display to the thumbnail screen display, all the clips will be displayed on the thumbnail screen.
Pressing the THUMBNAIL MENU button allows you to navigate the thumbnail menu.

◆ NOTE
When the TCG switch is set to "SET" to set the time code and user bits or when the camera menu is open, the THUMBNAIL button does not work.
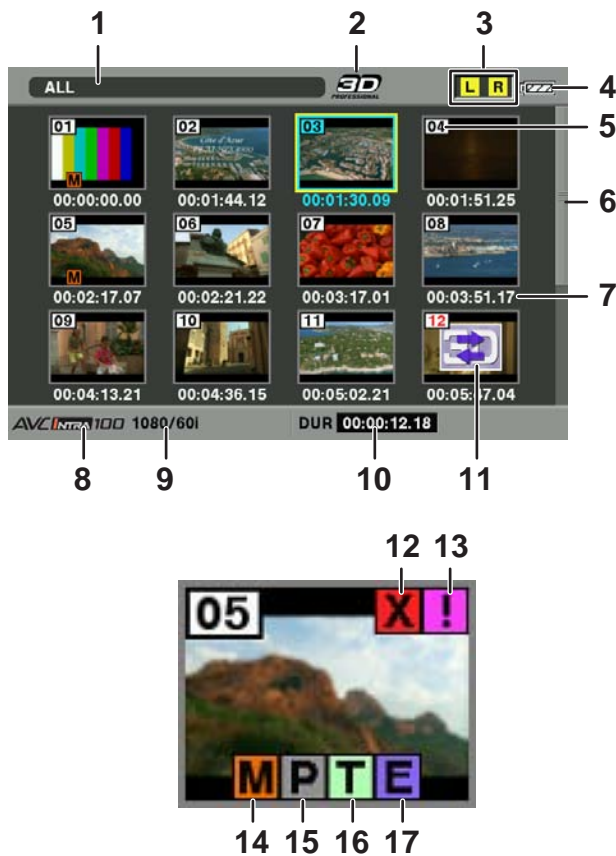
1 Display Mode
Displays thumbnail types and other information screens.
ALL: Display all clips.
SAME FORMAT:
The clips in the same format as the system format are shown. To check the format, consult system mode and REC FORMAT indicated on the STATUS screen of the LCD monitor/viewfinder.
For details, see [LCD Monitor/Viewfinder Screen Status Displays] (page 67).
SELECT: The clips selected with the SET button are shown.
MARKER:
Display clips with shot marks.

UPDATING..:
Indicated when the unit is updating the screen or reading data. When the screen is being updated, the rotating icon is indicated.
For details, refer to [Switching the Thumbnail Display] (page 94).

2 3D logo (or 2D LL logo)
Indicates whether the displayed thumbnails are those of 3D recording or of 2D LL recording.

3 Slot information
The status of the card slots L (left) and R (right) is indicated. The letter of the card slot that contains a P2 card is indicated in yellow.

◆ NOTE
When the following P2 card is inserted, the slot letter is displayed in a magenta frame.
● RUN DOWN CARD
(A P2 card on which the maximum number of overwrites has been exceeded.)
● DIR ENTRY NG CARD
(A P2 card on which the directory structure is not supported.)

4 Remaining battery indicator
Indicates the remaining battery capacity.

5 Clip Number
The numbers set by the camera for all the clips recognized correctly by the P2 card. These numbers are allocated in chronological order, by shooting dates and times.
If clips cannot be played because of different recording formats, they are displayed in red.

6 Thumbnail scroll bar
Indicates the approximate location of the current thumbnail among all thumbnails.

7 Time Display
You can set this to display the time code at the start of clip recording, the user bits at the start of clip recording, the shooting time, the shooting date, the shooting date and time, clip name or USER CLIP NAME.
For details, refer to [Setting the Thumbnail Display Mode] (page 101).

8 Recording mode
The recording mode for the clip on which the pointer is located is indicated.

9 System mode
The format for the clip on which the pointer is located is indicated.

10 Duration
The duration of the clip on which the pointer is located is indicated.

11 3D clip/2D LL clip abnormal status indicator
Clip L is inserted into card slot R, or clip R is inserted into card slot L. Insert the P2 cards correctly.
Clip L or R is not inserted. Insert a P2 card that contains the missing clip.

Clip L or R recorded in 2D LL mode is not inserted. Insert a P2 card that contains the missing clip.

12 **X** **Defective Clip Indicator and**
? **Unknown Clip indicator**

This marker is displayed for defective clips, which may result from a variety of causes, e.g., powering-down during recording.

Clip with yellow defective clip indicators can be restored in some cases. Please refer to [Restoring Clips] (page 96) for more information.

A clip displayed with a red defective clip indicator cannot be restored and must be deleted. If the clip cannot be deleted, format the P2 card.

? is displayed for clips such as those which differ in format from the P2 standard.

13 **!** **Incomplete Clip Indicator**

Indicates that although a clip is recorded across multiple P2 cards, one of these cards is not inserted into a P2 card slot.

14 **M** **Shot Mark Indicator**

This marker is displayed for a clip with a shot mark attached. For details, refer to [Shot Marker (SHOT MARK) Recording Function] (page 41).

15 **P** **Indicator for clips with proxy**

This marker is displayed for clips with proxy attached.

16 **T** **Text Memo Indicator**

This marker is displayed for a clip with a text memo attached.

17 **E** **Edit Copied Clip Indicator**

In models which support edit copying, such as the AJ-HPM110, this marker is displayed on clips which have undergone edit copying. For more information about edit copying, see the instruction manual for a model that supports edit copying.

Selecting Thumbnails

Multiple thumbnails can be randomly selected in the thumbnail screen.

1 Use the cursor buttons to move the pointer (yellow frame) to the desired clip and press the SET button.

• The frame around the selected thumbnail changes to a blue frame. Press the SET button again to deselect the clip.

2 Additional clips can be selected by repeating step 1.

It is possible to display only the selected thumbnails in the thumbnail screen for playback. Please refer to [Switching the Thumbnail Display] (page 94) for more information.

◆ **NOTE**

• **To move the pointer to the first or last clip, hold down the SHIFT button and press the up and down cursor (▲/▼) buttons.**
• **To select a sequence of clips, select the first clip and move the pointer to another clip. Then hold down the SHIFT button and press the SET button. This will select all clips from the clip selected first to the clip at the pointer and all clips in between.**
• **To cancel selected clips, hold down the SHIFT button while pressing the EXIT button.**
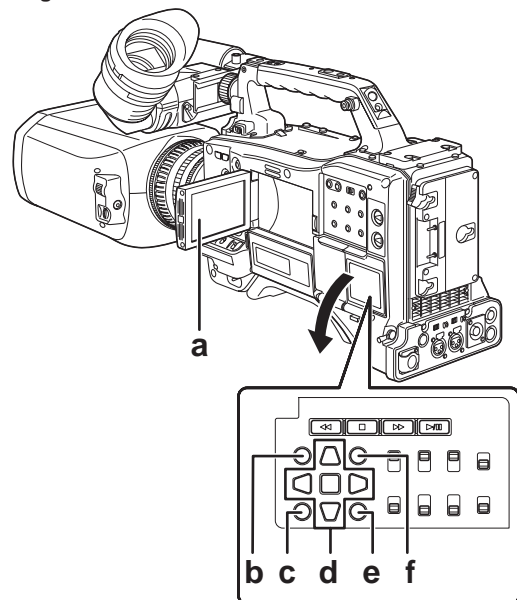
a **LCD monitor**
b **THUMBNAIL button**
c **EXIT button**
d **▲ ► ▼ ◄ cursor buttons**
  ■ **SET button**
e **MENU (thumbnail menu) button**
f **SHIFT button**

93

Playing back Clips

1 Press the THUMBNAIL button.

- The thumbnail screen appears on the LCD monitor.

2 Use the cursor buttons to move the pointer over the desired clip.

3 Press the PLAY/PAUSE button.

- The clip at pointer position is played back on the LCD monitor.
- After the clip at the cursor location has been played, subsequent clips are played back in order. When the last clip has been played, the thumbnail screen appears.

◆ **NOTE**

- **When playing back clips, it is not necessary to "select" the clips (blue frames around the thumbnails).**
- **Clips with clip numbers displayed in red cannot be played.**
- **During normal playback, or variable speed playback (i.e. 4x speed playback) except during pause, the left-lens (L) image is output from the left and right channels.**

- During playback, pressing the REW button starts 4X speed reverse playback, and the FF button starts 4X speed fast playback. Press the PLAY/PAUSE button to return to normal playback.
- During clip playback, pressing the PLAY/PAUSE button will temporarily stop (pause) the process.
  During a pause, pressing the REW button moves the pause position to the beginning of the clip. Pressing the REW button again moves the pause position to the beginning of the previous clip.
  During a pause, pressing the FF button moves the pause position to the beginning of the next clip.
- Pressing the STOP button during clip playback stops the playback and returns the display to the thumbnail screen.

◆ **NOTE**

- **When playback is stopped, the position of the pointer moves to the clip that was being played back, regardless of where playback started.**
- **When the PLAY/PAUSE button is pressed again, playback will start from the beginning of the clip on which the pointer is positioned. To begin playback from the last stop position, set PLAYBACK RESUME to on. Refer to [Setting the Thumbnail Display Mode] (page 101) for further details.**

Switching the Thumbnail Display

The display can be switched so that only those clips matching the specified conditions are displayed in the thumbnail screen.

1 Press the THUMBNAIL button.

- The thumbnail screen appears on the LCD monitor.

2 Press the MENU button.

- The thumbnail menu opens.
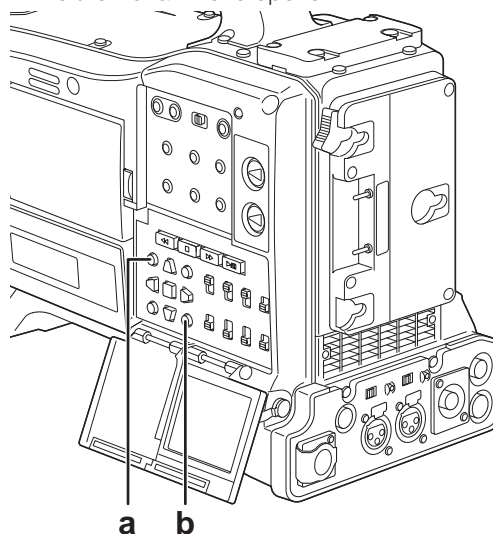
a   THUMBNAIL button

b   MENU button

3 Select THUMBNAIL from the thumbnail menu.

• Switch the thumbnail display by selecting one of the following items:

ALL CLIP:
　Displays all the clips according to the selected REC MODE.
　3D mode: Clips recorded in 3D recording mode
　2D LL mode: Clips recorded in 2D LL recording mode.

SAME FORMAT CLIPS:
　Displays clips of the current system format.

SELECTED CLIPS:
　Display randomly selected clips.
　The thumbnails are displayed in the specified order.

MARKED CLIPS:
　Display clips with shot marks attached.

SETUP: Please refer to [Setting the Thumbnail Display Mode] (page 101) for information about this item.

EXIT: Close the sub-menu.

Shot Mark

A shot mark can be added to a clip thumbnail to distinguish this clip from other clips.

1 Press the THUMBNAIL button.

• The thumbnail screen appears on the LCD monitor.

2 Use the cursor buttons to move the pointer over the clip to which you want to attach a shot mark.

3 Press the USER button to which the shot mark function has been assigned.

• This adds a shot mark to the thumbnail of the clip at the pointer position. The shot mark is added in the clip in card slot L only.

• To delete a shot mark, place the pointer on the clip a second time and press the USER button to which the shot mark function has been assigned.
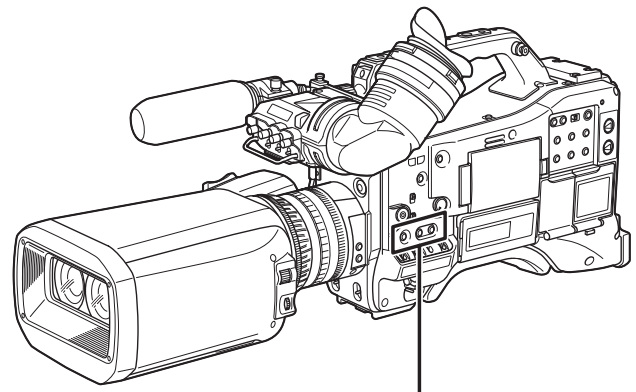
USER MAIN, USER1 and USER2 buttons

◆**NOTE**
• **A shot mark can be attached during recording.**
• **Adding shot marks after recording stops, attaches the shot mark to the most recently recorded clip.**
Please refer to [Shot Marker (SHOT MARK) Recording Function] (page 41) for more information.

Deleting Clips

1 Press the THUMBNAIL button.

• The thumbnail screen appears on the LCD monitor.

2 Use the cursor buttons to move the pointer to the clip to be deleted and press the SET button to select the clip.

3 Press the MENU button and select OPERATION → DELETE from the thumbnail menu.

4 The following screen appears. Use the cursor buttons and the SET button to select YES.

• The clip is deleted. All selected clips (in blue frames) are deleted by this operation.

◆ **NOTE**

To interrupt deleting, press the SHIFT and EXIT buttons or the SET button to cancel the operation.
Partially deleted clips cannot be restored by canceling.

Restoring Clips

Restores clips that are defective as a result of sudden powering-down during recording, or removal of the P2 card being accessed.

◆ **NOTE**

Only those clips with yellow defective clip indicators can be restored. Delete the clips with red defective clip indicators. If the clip cannot be deleted, format the P2 card.
During restoration of the clips, however, the defective-clip indicator may change from yellow to red, resulting in inability to restore the clips.

1 Press the THUMBNAIL button.

• The thumbnail screen appears on the LCD monitor.

2 Use the cursor buttons to move the pointer over the clip you wish to restore then press the SET button to select that clip.

• Defective clips are indicated by defective clip indicators.

3 Press the MENU button, and select OPERATION → REPAIR CLIP from the thumbnail menu.

• When a confirmation screen asks you to confirm that you want to repair the clip, use a cursor button and the SET button to select YES if you want to restore the clip.

Setting of Clip Meta Data

Information such as the name of the person who shot the video, the name of the reporter, or the shooting location, can be read from the SD memory card, and can be recorded as Clip Meta Data.

• The camera does not support recording of text memo data

Reading the SD memory card that contains the Clip Meta Data (metadata upload file)

**1** Insert the SD memory card that contains the Clip Meta Data (metadata upload file).

2 Press the THUMBNAIL button.

• The thumbnail screen appears on the LCD monitor.

◆ **NOTE**

Press the THUMBNAIL button while pressing DISP/MODE CHK button when a thumbnail is displayed to move to step 4.

3 Press the MENU button and Select META DATA → LOAD from the thumbnail menu, and press the SET button.
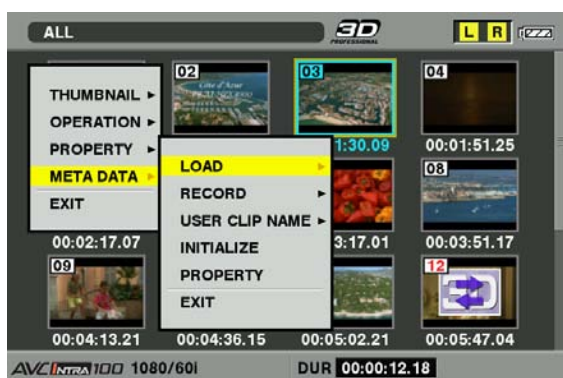
4 Meta Data names of metadata upload files stored on the SD memory card are displayed. Select the desired files using the cursor buttons, and choose YES.

• Uploading starts.
• Uploaded metadata is retained even if the power is turned off.
• For more information on confirmation of uploaded data, see [Checking and modifying read metadata] (page 98).

◆ **NOTE**

Press the cursor button (▶) when the Meta Data name is displayed to change the display to the file name. Press the cursor button (◀) to return to display of the Meta Data name.

Clip Meta Data items

Clip Meta Data includes the following items: Underlined items can be set by reading the metadata upload file on the SD memory card. Other items are set automatically during shooting. Using the latest update version of P2 Viewer, metadata upload files can be written to SD memory cards using a PC. Download the latest update version of P2 Viewer from the support desk at the following website, and install it on your PC.

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

Regarding SD memory cards to be used, see [SD memory card precautions] (page 22).

◆ **NOTE**

Files edited using software other than P2 Viewer are displayed as "UNKNOWN DATA!", and may not be read.

GLOBAL CLIP ID:
Displays the global clip ID, which indicates the shooting status of the clip.

USER CLIP NAME:
Displays the clip name specified by the user.*[1]

VIDEO: Displays [FRAME RATE] (frame rate of the clip), [PULL DOWN], and [ASPECT RATIO].

AUDIO: [SAMPLING RATE] (sampling frequency of recorded sound) and [BITS PER SAMPLE] (digitized bit[s] of recorded sound).

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 *[2]:
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).

*[1] The USER CLIP NAME recording method is selectable. For details, refer to [Selecting the USER CLIP NAME recording method] (page 99).

*[2] During recording, the camera does not automatically set altitude, latitude and longitude of the shoot. Such data can be set in the property of a recorded clip.

MEMO: Displays [NO.] (the number of the text memo), [OFFSET] (location of the frame with added text memo in relation to the beginning of the clip), [PERSON] (person who recorded the text memo added to the clip), and [TEXT] (contents 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 the information for a proxy, such as its format, when a proxy is attached.

◆ **NOTE**

This unit only displays printable ASCII characters.

Checking and modifying read metadata

The unit allows you to check details of metadata read from SD memory cards.

1 Press the THUMBNAIL button.

• The thumbnail screen appears on the LCD monitor.

2 Press the MENU button to select META DATA → PROPERTY from the thumbnail menu.

• Then the screen shown below appears.
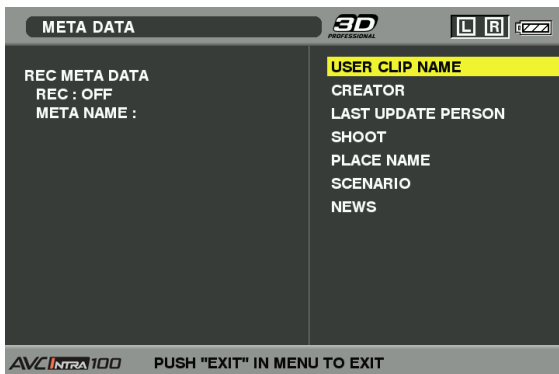
3 Use the cursor buttons to move the pointer to the item to confirm and press the SET button.

• Use this function to check loaded metadata settings.
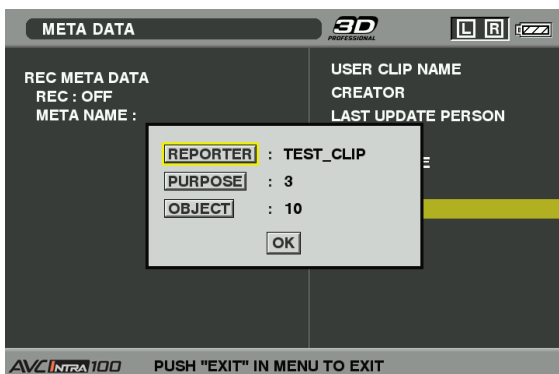
4 While viewing metadata settings, use the cursor buttons to move the pointer to the desired option. Then, press the SET button.

• A soft keyboard screen is displayed, allowing you to modify the setting.
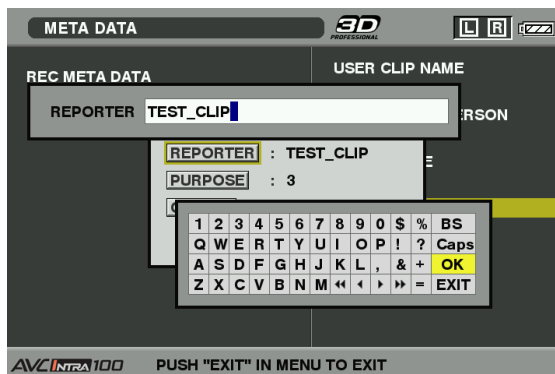
To set whether or not the uploaded metadata is recorded

Set "ON"/"OFF" in META DATA → RECORD from the thumbnail menu. The factory setting is "OFF".

• The metadata is added to the clip on the card in card slot L only.

Selecting the USER CLIP NAME recording method

Select META DATA → USER CLIP NAME from the thumbnail menu to select the recording method. Two options are available: TYPE1 and TYPE2.

● TYPE1(Factory defaults)

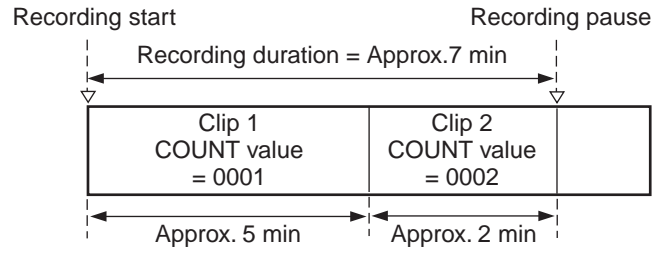|	USER CLIP NAME to be recorded
If clip metadata has been read in	Uploaded data
If no clip metadata has been read in or if the setting for recording clip metadata has been turned off	Same as GLOBAL CLIP ID (UMID data)

● TYPE2

	USER CLIP NAME to be recorded
If clip metadata has been read in	Uploaded data + COUNT value*1
If no clip metadata has been read in or if the setting for recording clip metadata has been turned off	Same as CLIP ID NAME

*1 The COUNT value is indicated as a four-digit number. The COUNT value is incremented each time a new clip is captured if clip metadata has been read in and TYPE2 has been selected as the recording method.
The COUNT value can be reset using the following procedure.
Select META DATA → PROPERTY from the thumbnail menu, then select USER CLIP NAME to display the menu shown below. Select "COUNT RESET" with the cursor and press the SET button to reset the COUNT value to 1.

```
META DATA                3D        L R ▱
                      PROFESSIONAL

REC META DATA         USER CLIP NAME
REC : OFF             CREATOR
META NAME :           LAST UPDATE PERSON

         LOAD DATA : TEST_CLIP

         COUNT     : 0001

         REC DATA  : <GLOBAL CLIP ID>

         OK      COUNT RESET


AVC INTRA 100   PUSH "EXIT" IN MENU TO EXIT
```
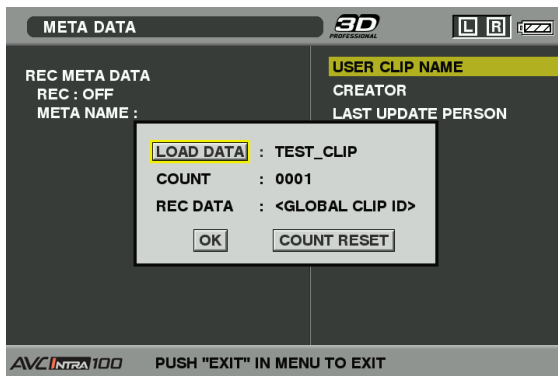
◆ NOTE

When an 8 GB or larger capacity P2 is used and the recording session exceeds the prescribed duration (AVC-Intra100: about 5 minutes; AVC-Intra50: about 10 minutes), the recording will automatically be split into separate clips. At this time, each clip will be provided with its own COUNT value.

Example of AVC-I 100

Recording start   Recording pause

Recording duration = Approx.7 min

Clip 1 COUNT value = 0001	Clip 2 COUNT value = 0002	
Approx. 5 min	Approx. 2 min	

If the clip thumbnails are displayed as shown in the example above or their properties are indicated using a P2 device, the thumbnail and COUNT value of clip 1 will be displayed.

Clearing uploaded metadata

Select META DATA → INITIALIZE from the thumbnail menu, and press the SET button. Select YES when the confirmation screen is displayed.

Chapter 6 Manipulating Clips with Thumbnails

Formatting a P2 Card

1 Press the THUMBNAIL button.

- The thumbnail screen appears on the LCD monitor.

2 Press the MENU button and select OPERATION → FORMAT from the thumbnail menu.

- When the screen shown below appears, select ALL P2 and press the SET button.
- Select EXIT if formatting is not required.
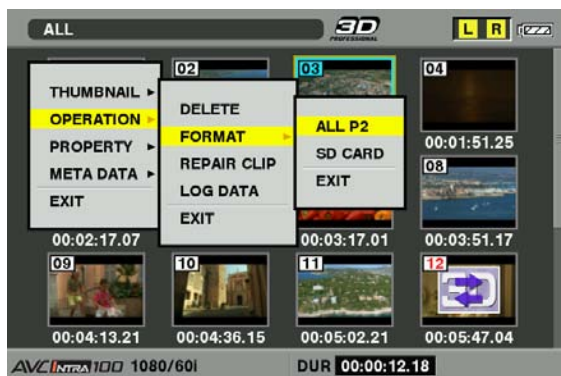
3 The following screen appears. Use the cursor buttons and the SET button to select YES.
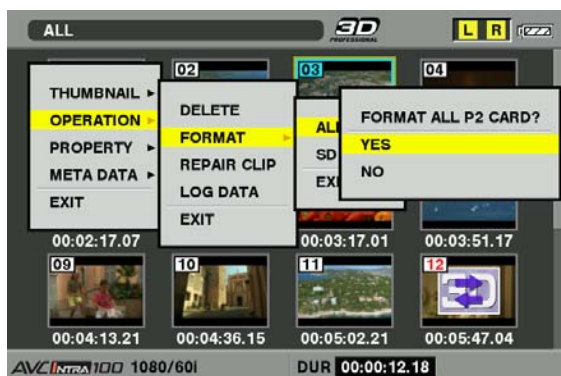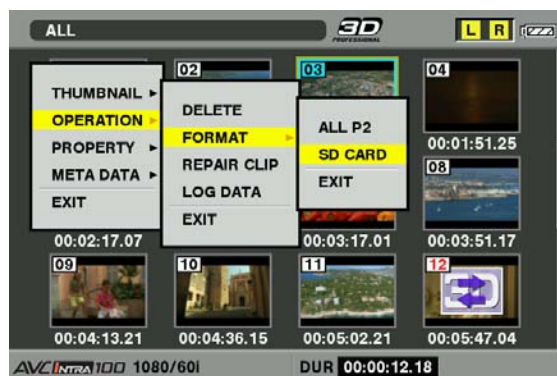

- The two P2 cards inserted in card slots L and R are formatted simultaneously

◆ **NOTE**

- **Check that no important data remains on a card before formatting since data erased by formatting cannot be recovered.**
- **If there are clips that are not displayed on the thumbnail screen when formatting, a warning "FORMAT ALL P2 CARD? (INCLUDING CLIP OF OTHER REC MODE)" is displayed.**

Formatting SD Memory Cards

SD memory cards can also be formatted from the thumbnail screen. With an SD memory card inserted into the unit, perform the following operation:

1 Press the THUMBNAIL button.

- The thumbnail screen appears on the LCD monitor.

2 Press the MENU button and select OPERATION → FORMAT from the thumbnail menu.

- Select "SD CARD" and press the SET button when the screen shown below appears.
- Select "EXIT" if formatting is not required.

3 When the following screen appears, use the cursor buttons and the SET button to select YES.

- The SD memory card is formatted.

◆ **NOTE**

- **You can also use the menu option SD CARD FORMAT in the CARD FUNCTIONS screen to format SD memory cards.** For details, refer to [Formatting, Writing and Reading an SD Memory Card] (page 79).
- **Check that no important data remains on a card before formatting since data erased by formatting cannot be recovered.**

Setting the Thumbnail Display Mode

The thumbnail display mode can be customized to suit your preferences.

1 Press the THUMBNAIL button.

- The thumbnail screen appears on the LCD monitor.

2 Press the MENU button and select THUMBNAIL → SETUP from the thumbnail menu.

- The following screen appears.

INDICATOR:
Select which indicators you want to show on thumbnails and which you want to hide.

- **ALL HIDE:**
  - **ON:** No indicators are displayed.
  - **OFF:** Indication/No indication will be set depending on the following menu. The factory settings are as follows.

- **MARKER:**
  Switches the shot mark marker between indication and no indication (ON/OFF). The factory setting is ON (indication).

- **TEXT MEMO:**
  Switches the text memo marker between indication and no indication (ON/OFF). The factory setting is ON (indication).

- **PROXY:**
  Switches the proxy marker between indication and no indication (ON/OFF). The factory setting is ON (indication).

DATA DISPLAY:
The time display field of the clip offers a choice of Time Code (TC), User Bits (UB), Shooting Time (TIME), Shooting Date (DATE), Shooting Date and Time (DATE/TIME), Clip Name (CLIP NAME) or USER CLIP NAME. The factory setting is Time Code.

DATE FORMAT:
You can specify the display order for the shooting date as either Year/Month/Day (Y-M-D), Month/Day/Year (M-D-Y) or Day/Month/Year (D-M-Y). The factory default setting is Month/Day/Year. (The factory default setting is Day/Month/Year when the area setting is PAL.)
This setting is reflected in the recording date shown in the clip property and the shooting date shown when DATE is selected under the item DATA DISPLAY.

THUMBNAIL SIZE:
For the size of thumbnails displayed on one screen, either LARGE (3 X 2 thumbnails displayed) or NORMAL (4 X 3 thumbnails displayed) can be selected. The factory default value is NORMAL.

PLAYBACK RESUME:
Selecting a position to restart playback after stopping playback on the thumbnails screen using the STOP button.
- **ON:** Playback starts from the stop position.
- **OFF:** Playback starts from the beginning of the clip indicated by the pointer.

Note that if the pointer is moved after stopping playback, the playback will restart from the beginning of the clip indicated by the pointer regardless of this setting.

THUMBNAIL INIT:
Returns the above thumbnail display settings to their factory default values. Move the cursor to this option, and press the SET button. Select YES in the confirmation screen that appears.
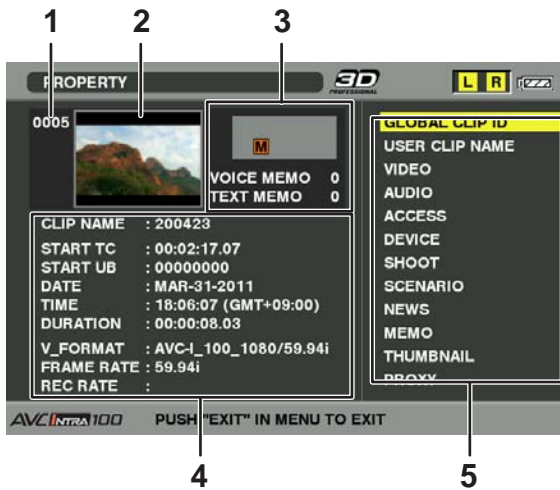
EXIT:
Returns to the previous menu.

Properties

Properties display clip properties and P2 card status.
It is possible to edit and rewrite recorded clip metadata
while clip properties are displayed.

Clip Property

From the thumbnail menu, select PROPERTY → CLIP
PROPERTY. The following screen appears.

1 **Clip Number**

2 **Thumbnail**

3 **Clip Information**
Indicates the indicators added to the clip or the number
of text/voice memos attached to the clip. The 🔒 mark
appears if the clip is recorded on a write-protected P2
card.

4 **Clip Information**
Displays detailed information about the clip.

CLIP NAME:
Display clip names.

START TC:
The time code value at the start of the recording.

START UB:
The user bit value at the start of the recording.

DATE:
The date of the recording.

TIME:
The time at the start of the recording.

DURATION:
The time length of the clip.

V_FORMAT:
The recording format for the clip.

FRAME RATE:
The frame rate for the playback.

REC RATE:
The recording frame rate is displayed. (Only
displayed for clips recorded using native recording
with the VFR function.)

5 **Clip Meta Data**
Displays more detailed data about the clip. Use the
cursor buttons to move the pointer, and press the
SET button to check the detailed content. For more
information on displayed metadata, see [Setting of Clip
Meta Data] (page 97).

Modification of recorded clip metadata

1 Display the window for detailed clip metadata
that you intend to modify in the clip properties
window.

2 Place the cursor on the item to be modified
using the cursor button.
• The metadata that can be modified are shown like
[USER CLIP NAME] in the following figure.

3 Press the SET button.
• The input window (soft keyboard) for modifying
metadata is displayed.
• Use the keyboard to modify the metadata.

Use the keyboard operations described in
[Checking and modifying read metadata] (page 98).

4 Press OK on the keyboard.
• The modified metadata are written on the clip, and
the metadata window is restored.

◆ **NOTE**
- **LOCATION (recording location data) data for a SHOOT cannot be deleted independently. Thus by setting ALTITUDE to empty will also delete the LONGITUDE and LATITUDE settings.**
- **The metadata for a clip with the ⚠ incomplete clip indicator cannot be modified.**
- **The clip meta data for a clip cannot be modified if the source of clip is inserted in a wrong orientation in P2 card slot L and R or if the source of a 3D or 2D LL clip is not inserted in either slot L or R.**

P2 Card Status Display

■ P2 Card Status Display Settings

Select PROPERTY → CARD STATUS from the thumbnail menu to set the desired indication mode (remaining free space or used memory capacity) for the P2 card status display.

1 Press the THUMBNAIL button.
- The thumbnail screen appears on the LCD monitor.

2 Press the MENU button and select PROPERTY → PROPERTY SETUP → P2 CARD CAP from the thumbnail menu.
- The following screen appears. Select the P2 card status display settings from the P2 CARD CAP menu option.
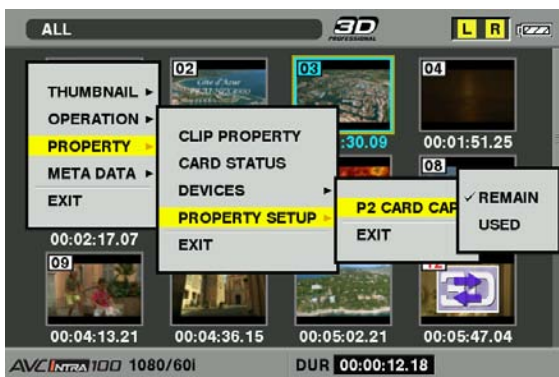
REMAIN:
Show remaining free space on the P2 card as the P2 card status display. (Factory setting)

USED:
Show used memory capacity on the P2 card as the P2 card status display.

■ Contents of P2 Card Status Display Settings

From the thumbnail menu, select PROPERTY → CARD STATUS. The following screen appears.

When "REMAIN" is selected:
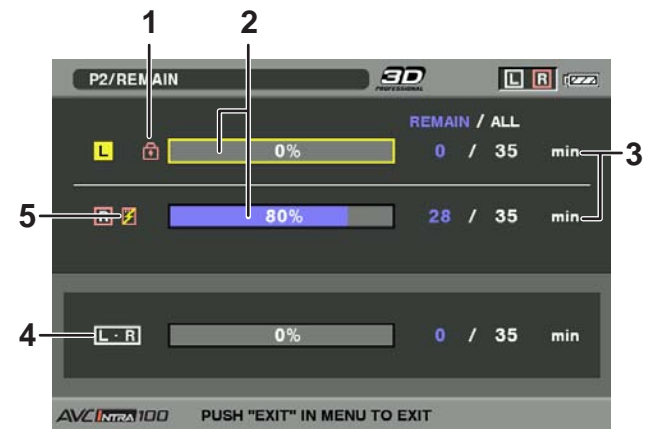
1 Write-protect mark
The 🔒 mark appears if the P2 card is write-protected.

2 L/R P2 card status (remaining free space)
The remaining memory capacity of the P2 card is indicated by a bar graph and percentage. The bar graph indicator moves to the left as the remaining free space decreases. The following indications may appear, depending on the card status:

FORMAT ERROR!:
An unformatted P2 card is inserted.

NOT SUPPORTED!:
An unsupported card is inserted in the camera.

NO CARD!:
No P2 cards are inserted.
Use the cursor button to place the cursor on the P2 card for data you want to access and press the SET button to display detailed information about the P2 card to check individual information such as the serial number and the user ID.

3 L/R P2 card remaining capacity/total capacity
Displays the P2 card remaining capacity and total capacity in minutes. The digits representing less than minutes are rounded down.
Note that the indicated capacity will vary according to the frame rate in native recording with VFR operation. The remaining capacity becomes 0 with a P2 card on which the number of recorded clips reached the limit or with a write-protected P2 card.

4 Remaining 3D/2D LL recording capacity
Displays the remaining capacity for recording, calculated from the remaining free space of the P2 cards inserted in card slots L and R.

5 Warning symbol
Inserting the following type of P2 cards will display the (⚠) symbol.

103

RUN DOWN CARD:

The maximum number of overwrites on the P2 card has been exceeded.

DIR ENTRY NG CARD:

The directory structure on the P2 card is not supported.

- For details on P2 card status indications, refer to [2. L/R P2 card status (remaining free space)].
- If the number of recorded clips reaches the limit (1000) on the P2 card status indicator, "OVER MAX NUMBER CLIPS" is displayed in the WARNING field.

When "USED" is selected:
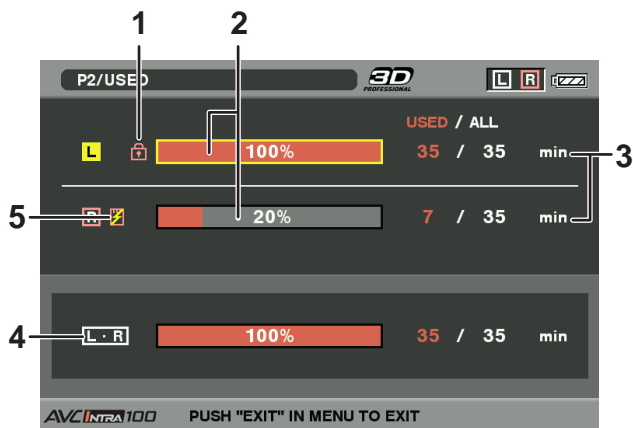
1 Write-protect mark

The 🔒 mark appears if the P2 card is write-protected.

2 L/R P2 card status (used memory capacity)

The used memory capacity of the P2 card is indicated by a bar graph and a percentage figure. The bar graph indicator moves to the right as the used memory capacity increases.

The following indications may appear, depending on the card status:

FORMAT ERROR!:

An unformatted P2 card is inserted.

NOT SUPPORTED!:

An unsupported card is inserted in the camera.

NO CARD!:

P2 cards are not inserted.

Use the cursor button to place the cursor on the P2 card for data you want to access and press the SET button to display detailed information about the P2 card to check individual information such as the serial number and the user ID.

3 L/R P2 card used memory capacity/total capacity

Displays the used memory capacity on a P2 card and the total capacity in minutes. The digits representing less than minutes are rounded down. The used memory capacity of a write-protected P2 card is displayed as 100 %.

Note that the indicated capacity will vary according to the frame rate in native recording with VFR operation.

4 Used 3D/2D LL recording capacity

Displays the used memory capacity for recording, calculated from the used memory capacity of the P2 cards inserted into card slots L and R.

5 Warning symbol

Inserting the following type of P2 cards will display the (🖉) symbol.

RUN DOWN CARD:

The maximum number of overwrites on the P2 card has been exceeded.

DIR ENTRY NG CARD:

The directory structure on the P2 card is not supported.

- For details on P2 card status indications, refer to [2. L/R P2 card status (used memory capacity)]
- If the number of recorded clips reaches the limit (1000) on the P2 card status indicator, "OVER MAX NUMBER CLIPS" is displayed in the WARNING field.

SD memory card Status Display

The status display enables a confirmation of the SD memory card formatted condition, available memory capacity etc. From the thumbnail menu, select PROPERTY → DEVICES → SD CARD.

If the format is compatible with SD standards, the message

SD STANDARD : SUPPORTED

If the format is not compatible with SD standards, the message

SD STANDARD : NOT SUPPORTED

is displayed. If this is the case, writing or reading will not be successful. Format the card with the unit. For more information on formatting SD memory cards, see [Formatting SD Memory Cards] (page 100).

104

Saving the Log Data

Equipment log data can also be stored in an SD memory card from the thumbnail screen. With an SD memory card inserted in the unit, perform the following operation:

1 Press the THUMBNAIL button.
- The thumbnail screen appears on the LCD monitor.

2 Press the MENU button and select OPERATION → LOG DATA from the thumbnail menu.

3 When the following screen appears, use the cursor buttons and the SET button to select YES.
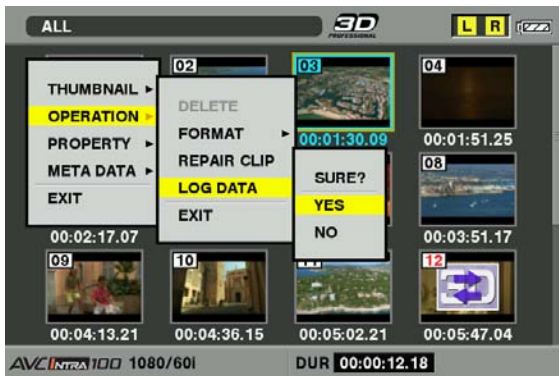
4 Press the SET button.
- Log data are saved in the SD memory card.

105

Chapter 7 Menu Operations

LCD Monitor/Viewfinder Menus

Using the Menus

Use the setup menus to change the settings to suit the scenes you are shooting or what you are recording.
To operate the menu, you can use the MENU button and JOG dial button on the lens unit, or the MENU, cursor, and SET buttons on the side of the unit.

• If the thumbnail menu is displayed, press the THUMBNAIL button to clear the display.
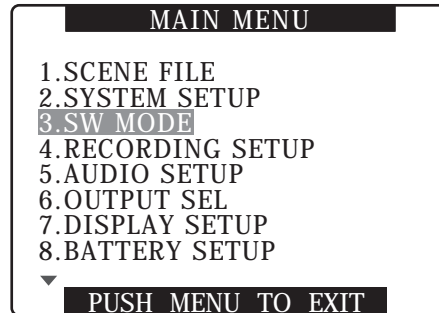• The menu items indicated in the blue characters cannot be used.
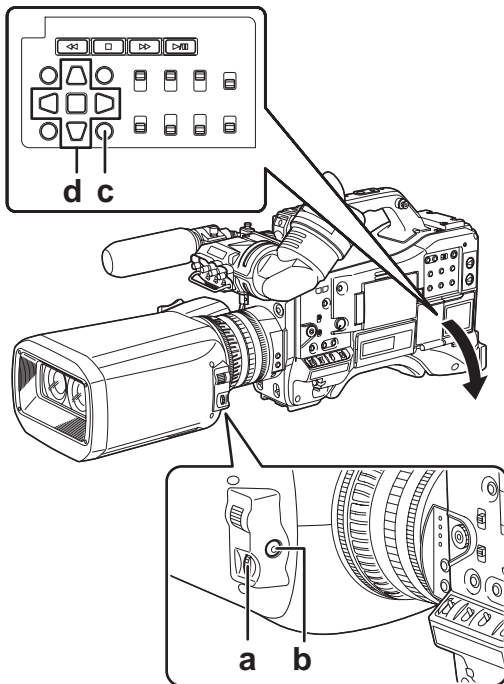
a **JOG dial button**

b **MENU button**

c **MENU button**

d **Cursor and SET buttons**

1 Press the MENU button to end any mode other than recording.

• Hold down the MENU button for about 1 second.
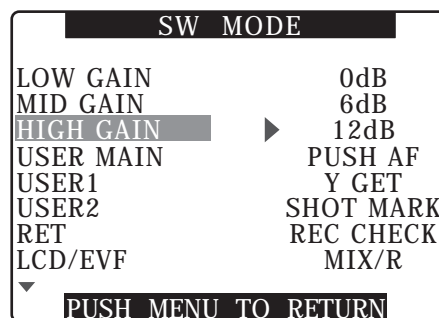• The function screen appears on the LCD monitor and in the viewfinder.

```
           MAIN MENU

    1.SCENE FILE
    2.SYSTEM SETUP
    3.SW MODE
    4.RECORDING SETUP
    5.AUDIO SETUP
    6.OUTPUT SEL
    7.DISPLAY SETUP
    8.BATTERY SETUP
    ▼
        PUSH  MENU  TO  EXIT
```
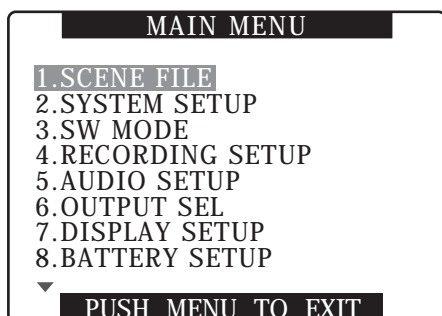
2 Use the JOG dial button or the cursor buttons (▲▼) to highlight the function you wish to change.

```
           MAIN MENU

    1.SCENE FILE
    2.SYSTEM SETUP
    3.SW MODE
    4.RECORDING SETUP
    5.AUDIO SETUP
    6.OUTPUT SEL
    7.DISPLAY SETUP
    8.BATTERY SETUP
    ▼
        PUSH  MENU  TO  EXIT
```

3 Press the JOG dial button or the SET button to display the items.

```
           SW  MODE

    LOW GAIN        ▶      0dB
    MID GAIN              6dB
    HIGH GAIN            12dB
    USER MAIN        PUSH AF
    USER1              Y GET
    USER2         SHOT MARK
    RET           REC CHECK
    LCD/EVF            MIX/R
    ▼
       PUSH  MENU  TO  RETURN
```
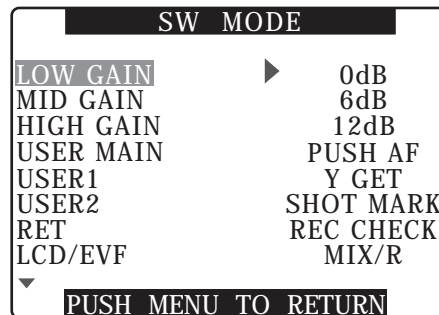
4 UUse the JOG dial button or the cursor buttons (▲▼) to highlight the item you wish to change.

```
           SW  MODE

    LOW GAIN              0dB
    MID GAIN              6dB
    HIGH GAIN       ▶    12dB
    USER MAIN        PUSH AF
    USER1              Y GET
    USER2         SHOT MARK
    RET           REC CHECK
    LCD/EVF            MIX/R
    ▼
       PUSH  MENU  TO  RETURN
```

5 Press the JOG dial button or the SET button to change the setting value.

```
          SW   MODE
LOW GAIN              0dB
MID GAIN              3dB
HIGH GAIN            6dB
USER MAIN          P  9dB  F
USER1               12dB
USER2             SHOT MARK
RET               REC CHECK
LCD/EVF             MIX/R
▼
      PUSH  MENU  TO  RETURN
```
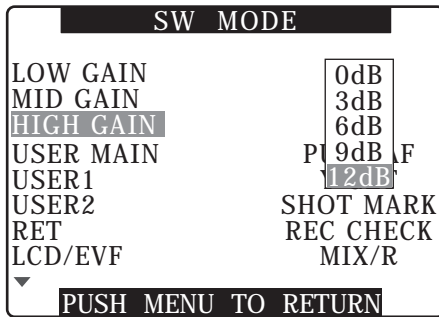
6 To change other settings, repeat steps 4 and 5.
  • When you finish, press the MENU button to return to the function screen.

7 To change other functions, repeat steps 2 to 5.
  • To exit the function screen and return to the normal screen, press the MENU button again.

◆ **NOTE**
■**Direct close function**
When the MENU button is pressed and held down after making a menu setting, the setting menu screen closes without first returning to the previous setting menu.
■**To quickly change settings (MASTER PED and H PHASE only)**
• **Fast UP**
  Hold down the JOG dial button while turning it upwards and maintain this position. Or, hold the cursor button (▲) pressed.
• **Fast DOWN**
  Hold down the JOG dial button while turning it downwards and maintain this position. Or, hold the cursor button (▼) pressed.

Initializing the Menu Settings

The menu settings contain both the user file settings and the scene file settings. You can initialize them separately.

To initialize scene files (i.e. all the settings other than the scene file settings)

Select INITIAL in USER FILE of the OTHER FUNCTIONS screen. The current menu settings of user file will return to the factory settings.
• The TIME ZONE setting does not return to its factory default.

To initialize the scene file

Select INITIAL in LOAD/SAVE/INIT of the SCENE FILE screen. The settings for the scene file selected in FILE SELECT of the SCENE FILE screen will return to the factory settings.
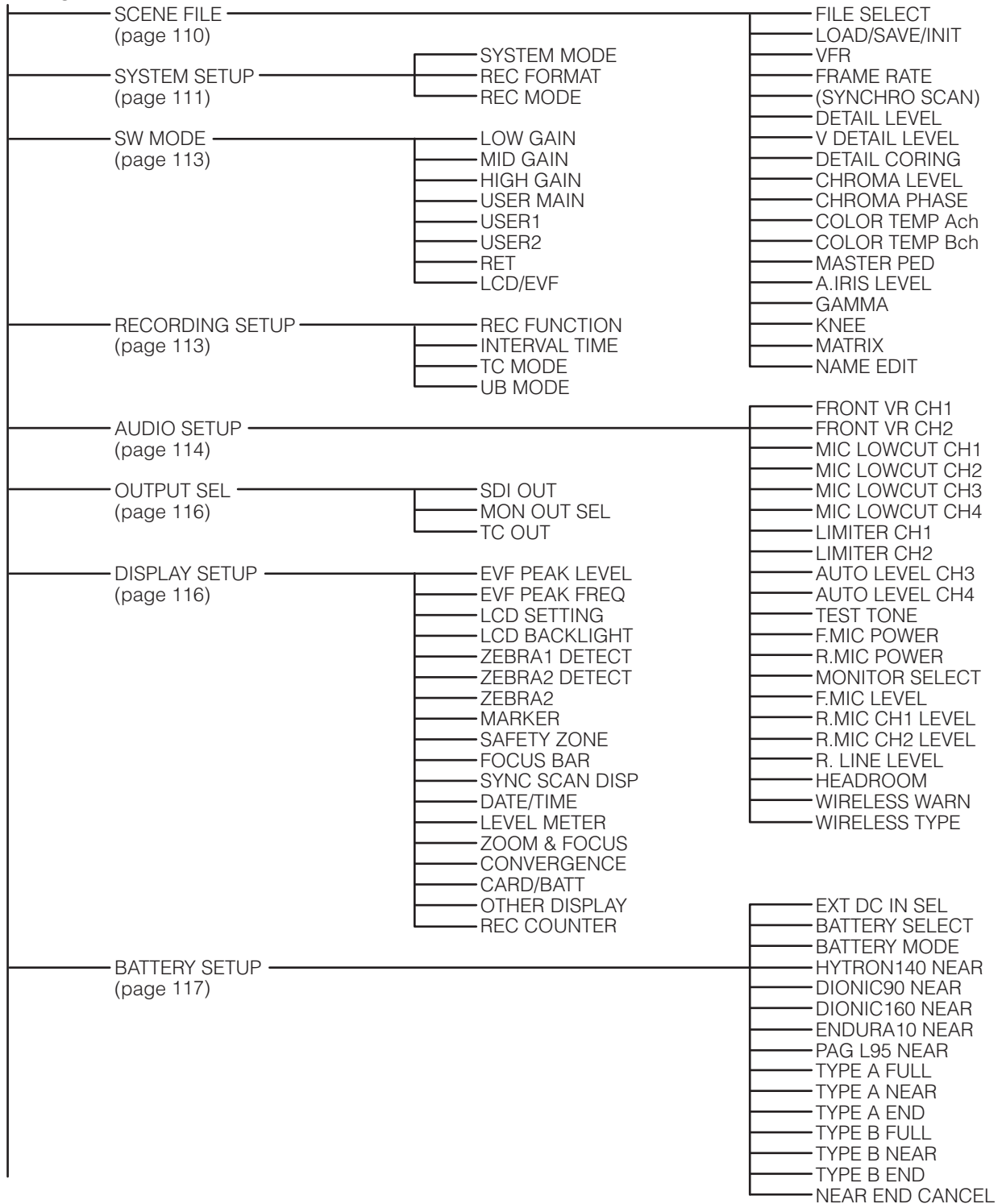• This does not affect any other scene files.

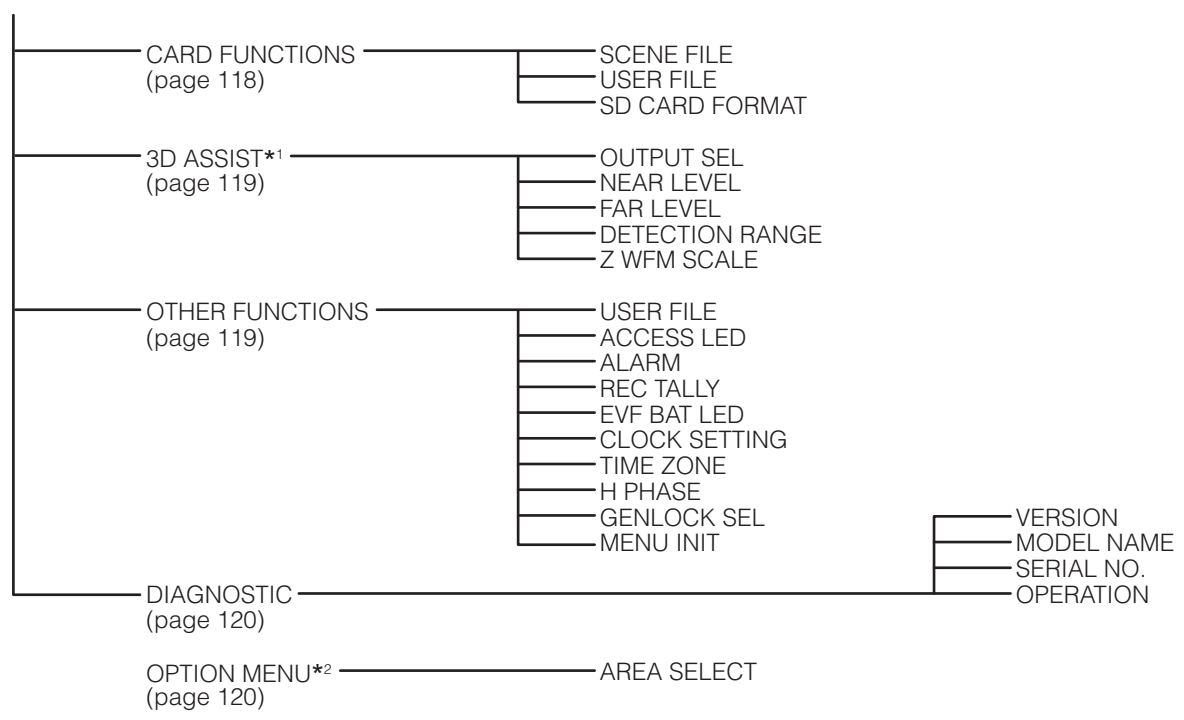### Initializing user files and scene files simultaneously

You can return the user files and the six scene files to their factory defaults by selecting YES in the menu option MENU INIT in the OTHER FUNCTIONS screen.
• The TIME ZONE setting does not return to its factory default.

107

Setup Menu Structure

MAIN MENU

- SCENE FILE (page 110)
  - FILE SELECT
  - LOAD/SAVE/INIT
- SYSTEM SETUP (page 111)
  - SYSTEM MODE
  - REC FORMAT
    - VFR
    - FRAME RATE
    - (SYNCHRO SCAN)
  - REC MODE
- SW MODE (page 113)
  - LOW GAIN
    - DETAIL LEVEL
    - V DETAIL LEVEL
  - MID GAIN
    - DETAIL CORING
  - HIGH GAIN
    - CHROMA LEVEL
  - USER MAIN
    - CHROMA PHASE
  - USER1
    - COLOR TEMP Ach
  - USER2
    - COLOR TEMP Bch
  - RET
    - MASTER PED
  - LCD/EVF
    - A.IRIS LEVEL
    - GAMMA
- RECORDING SETUP (page 113)
  - REC FUNCTION
    - KNEE
  - INTERVAL TIME
    - MATRIX
  - TC MODE
    - NAME EDIT
  - UB MODE
- AUDIO SETUP (page 114)
  - FRONT VR CH1
  - FRONT VR CH2
  - MIC LOWCUT CH1
  - MIC LOWCUT CH2
- OUTPUT SEL (page 116)
  - SDI OUT
    - MIC LOWCUT CH3
  - MON OUT SEL
    - MIC LOWCUT CH4
  - TC OUT
    - LIMITER CH1
    - LIMITER CH2
- DISPLAY SETUP (page 116)
  - EVF PEAK LEVEL
    - AUTO LEVEL CH3
  - EVF PEAK FREQ
    - AUTO LEVEL CH4
  - LCD SETTING
    - TEST TONE
  - LCD BACKLIGHT
    - F.MIC POWER
  - ZEBRA1 DETECT
    - R.MIC POWER
  - ZEBRA2 DETECT
    - MONITOR SELECT
  - ZEBRA2
    - F.MIC LEVEL
  - MARKER
    - R.MIC CH1 LEVEL
  - SAFETY ZONE
    - R.MIC CH2 LEVEL
  - FOCUS BAR
    - R. LINE LEVEL
  - SYNC SCAN DISP
    - HEADROOM
  - DATE/TIME
    - WIRELESS WARN
  - LEVEL METER
    - WIRELESS TYPE
  - ZOOM & FOCUS
  - CONVERGENCE
  - CARD/BATT
  - OTHER DISPLAY
  - REC COUNTER
- BATTERY SETUP (page 117)
  - EXT DC IN SEL
  - BATTERY SELECT
  - BATTERY MODE
  - HYTRON140 NEAR
  - DIONIC90 NEAR
  - DIONIC160 NEAR
  - ENDURA10 NEAR
  - PAG L95 NEAR
  - TYPE A FULL
  - TYPE A NEAR
  - TYPE A END
  - TYPE B FULL
  - TYPE B NEAR
  - TYPE B END
  - NEAR END CANCEL

108

```
├─── CARD FUNCTIONS ────────────┬─── SCENE FILE
│    (page 118)                  ├─── USER FILE
│                                └─── SD CARD FORMAT
│
├─── 3D ASSIST*¹ ───────────────┬─── OUTPUT SEL
│    (page 119)                  ├─── NEAR LEVEL
│                                ├─── FAR LEVEL
│                                ├─── DETECTION RANGE
│                                └─── Z WFM SCALE
│
├─── OTHER FUNCTIONS ───────────┬─── USER FILE
│    (page 119)                  ├─── ACCESS LED
│                                ├─── ALARM
│                                ├─── REC TALLY
│                                ├─── EVF BAT LED
│                                ├─── CLOCK SETTING
│                                ├─── TIME ZONE
│                                ├─── H PHASE
│                                ├─── GENLOCK SEL        ┌─── VERSION
│                                └─── MENU INIT          ├─── MODEL NAME
│                                                        ├─── SERIAL NO.
└─── DIAGNOSTIC ─────────────────────────────────────────┴─── OPERATION
     (page 120)

     OPTION MENU*² ──────────────────── AREA SELECT
     (page 120)
```

*¹ The 3D ASSIST screen is not displayed when 2D LL recording mode is set.
*² To open the OPTION MENU, hold down the DISP/MODE CHK button and press the MENU button.

Setup Menu List

SCENE FILE Screen

Item	Setting	Notes
FILE SELECT	Select the file you wish to use for shooting among six scene files.Select number 1 to 6 that corresponds to FILE1 to FILE6, respectively.	• The factory default settings are the same for 1 to 6.
LOAD/SAVE/INIT	Loads, saves, and initializes the settings of the scene file selected in FILE SELECT. **LOAD:** Loads data stored in camera memory. **SAVE:** Saves current values in camera memory. **INITIAL:** Returns settings to their factory defaults.	• This setting does not affect scene files that are not the currently selected one.
VFR	Enables or disables variable frame rate (VFR) mode at 720P. **ON:** VFR operation **OFF:** VFR off	• Available only in 720P system mode. (This message does not appear in modes other than 720P.)
FRAME RATE	Adjusts the frame rate and exposure time at 720P when VFR is on. • When 59.94 Hz is selected 12, 15, 18, 20, 21, 22, 24, 25, 26, 27, 28, 30, 32, 34, 36, 40, 44, 48, 54, 60 FRAME • When 50 Hz is selected 12, 15, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 30, 32, 34, 37, 42, 45, 48, 50 FRAME	• Available only in 720P system mode and when VFR is set to ON. (This message does not appear in modes other than 720P.) • A change to 24 fps may cause the screen to flicker momentarily.
(SYNCHRO SCAN)	Displays synchro scan shutter speeds to enable the operator to synchronize the camera to computer monitors. • This function only displays the shutter speeds. Use the SYNCHRO SCAN switch to set a shutter speed. • Set values (displayed values) are assigned to the current scene file and manipulated using the LOAD, SAVE and INIT functions. For details, refer to [Placing the Camera-recorder in SYNCHRO SCAN Mode] (page 49). • When 59.94 Hz is selected **1/60.0** • When 50 Hz is selected **1/50.0**	• Displayed in blue when not set to synchro scan mode and when the SYNCHRO SCAN switch settings are not available.
DETAIL LEVEL	Adjusts the level of image outline correction (in horizontal and vertical directions). **–7 ... 0 ... +7**	
V DETAIL LEVEL	Adjusts the level of correction in vertical direction. **–7 ... 0 ... +7**	
DETAIL CORING	Adjusts the level of noise reduction of the detail signal. **–7 ... +5 ... +7** • Adjust towards – for a clearer image. Noise increases slightly. • Adjust towards + for less noise.	
CHROMA LEVEL	Adjusts the chroma level. **–7 ... 0 ... +7**	
CHROMA PHASE	Makes fine adjustments to the chroma phase. **–7 ... 0 ... +7**	
COLOR TEMP Ach	Makes fine adjustments to the color temperature (after Ach white balance adjustment). **–7 ... 0 ... +7**	
COLOR TEMP Bch	Makes fine adjustments to the color temperature (after Bch white balance adjustment). **–7 ... 0 ... +7**	

____ indicates the factory setting

Item	Setting	Notes
MASTER PED	Adjusts the black master pedestal that serves as the video reference. **–100 ... +15 ... +100**	• Hold down the JOG dial button and turn it downwards or upwards and maintain this position to quickly change values. • When a remote control unit (AJ-RC10G) or extension control unit (AG-EC4G) is connected, use the M-PED control on the remote control unit or extension control unit to adjust.
A. IRIS LEVEL	Sets the AUTO IRIS target value. **–10 ... 0 ... +10**	
GAMMA	Selects the gamma curve. **HD NORM:** Gamma setting for HD recording. **LOW:** Applies a gently rising gamma curve to low-brightness areas for a balanced look. **HIGH:** Applies a steep gamma curve to low brightness areas to expand the tonality of dark areas for video with greater brightness. Contrast softens as a result. **B.PRESS:** Produces sharper contrast than LOW. **CINE-LIKE D:** Applies a gamma curve to produce video with a cine-like feel. **CINE-LIKE V:** Applies a gamma curve to produce high-contrast video with a cine-like feel. • A lens aperture set lower than normal video level (approx. 1/2) is recommended when using cine-like gamma to enjoy the full benefit of the function.	
KNEE	Sets the compression level (knee point) of the high brightness video signals received through the MOS sensor to avoid overexposure. **HIGH:** High setting (compression starts at approx. 100 %) **MID:** Medium setting (compression starts at approx. 90 %) **LOW:** Low setting (compression starts at approx. 80 %)	
MATRIX	Selects the MATRIX table to reproduce color during shooting. **NORM1:** Ensures proper color rendition when shooting out in the open or under halogen lighting. **NORM2:** Produces more vivid colors than NORM1. **CINE-LIKE:** Produces a tone similar to movie film.	
NAME EDIT	Edits the name of the selected scene file.	• No names are set for FILE1 to FILE 6 with the factory default settings.

SYSTEM SETUP Screen

Item	Setting	Notes
SYSTEM MODE	Specifies the signal format used by this camera. **1080-59.94i, 1080-23.98PsF, 720-59.94P, 1080-50i, 720-50P** • When a setting is changed, the message "TURN POWER OFF" appears. Then turn the power off and turn it back on again.	• The factory default setting is 1080-50i when the area setting is PAL.

___ indicates the factory setting

111

Item	Setting	Notes
REC FORMAT	Selects the recording codec as well as shooting and recording modes. **• When SYSTEM MODE is 1080-59.94i:** An AVC-I 100 or AVC-I 50 codec is used for shooting and recording. Recording and shooting can be performed at 60i or 30PN (native recording) with each codec. **AVC-I 100/60i** **AVC-I 100/30PN** **AVC-I 50/60i** **AVC-I 50/30PN** **• When SYSTEM MODE is 1080-23.98PsF:** AVC-I 100 or AVC-I 50 codec is used for shooting and recording. Recording and shooting can be performed at 24PN (native recording). **AVC-I 100/24PN** **AVC-I 50/24PN** **• When SYSTEM MODE is 1080-50i:** AVC-I 100 or AVC-I 50 codec is used for shooting and recording. Recording and shooting can be performed at 50i or 25PN (native recording) with each codec. **AVC-I 100/50i** **AVC-I 100/25PN** **AVC-I 50/50i** **AVC-I 50/25PN** **• When SYSTEM MODE is 720-59.94P:** An AVC-I 100 or AVC-I 50 codec is used for shooting and recording. Recording and shooting can be performed at 60P, 30PN (native recording) or 24PN (native recording) with each codec. **AVC-I 100/60P** **AVC-I 100/30PN** **AVC-I 100/24PN** **AVC-I 50/60P** **AVC-I 50/30PN** **AVC-I 50/24PN** **• When SYSTEM MODE is 720-50P:** An AVC-I 100 or AVC-I 50 codec is used for shooting and recording. Recording and shooting can be performed at 50P or 25PN (native recording) with each codec. **AVC-I 100/50P** **AVC-I 100/25PN** **AVC-I 50/50P** **AVC-I 50/25PN**	
REC MODE	Sets the recording mode of this unit. **3D:** Recording 3D images. **2D LL:** Recording the left-lens (L) image on two P2 cards inserted in P2 card slots L and R simultaneously. • When the setting is changed, the message "TURN POWER OFF" appears. Then turn the power off and back on again.	• The following functions are disabled when REC MODE is set to 2D LL. - LCD/EVF button - 3D MODE selector switch - CONV. (convergence) dial - 3D ASSIST buttons - 3D FINE function • Clip meta data and shot marks are added to the clip in the P2 card in card slot L.

____ indicates the factory setting

SW MODE Screen

Item	Setting	Notes
LOW GAIN	Sets the gain value assigned to the L position of the GAIN switch. **0dB**, **3dB**, **6dB**, **9dB**, **12dB**	
MID GAIN	Sets the gain value assigned to the M position of the GAIN switch. **0dB**, **3dB**, <u>**6dB**</u>, **9dB**, **12dB**	
HIGH GAIN	Sets the gain value assigned to the H position of the GAIN switch. **0dB**, **3dB**, **6dB**, **9dB**, <u>**12dB**</u>	
USER MAIN	Sets the function assigned to the USER MAIN button. <u>**PUSH AF,**</u> **Y-GET, SHOT MARK, REC CHECK, R CONV, 3D A.Z WFM, 3D A.ALERT, 3D A.CONV.** For details, refer to [Assigning Functions to USER Buttons] (page 50).	
USER1	Sets a function assigned to the USER1 button. The functions that can be assigned to this button are the same as for the USER MAIN button. <u>**Y-GET**</u> For details, refer to [Assigning Functions to USER Buttons] (page 50).	
USER2	Sets a function assigned to the USER2 button. **PUSH AF,** **Y-GET,** <u>**SHOT MARK,**</u> **REC CHECK, 3D A.Z WFM, 3D A.ALERT, 3D A.CONV.** For details, refer to [Assigning Functions to USER Buttons] (page 50).	
RET	Sets the function assigned to the RET button on the lens. <u>**REC CHECK,**</u> **RETURN**	
LCD/EVF	Sets the images on the LCD monitor and in the viewfinder that you can select by pressing the LCD/EVF button. **MIX:** Normal image (left-lens image) or MIX image <u>**MIX/R:**</u> Normal image, MIX image or right-lens image **ALL:** Normal image, MIX image, right-lens image or Side by Side image • The normal image (left-lens image) is displayed immediately after the unit is turned on or when normal playback is performed.	

RECORDING SETUP Screen

Item	Setting	Notes
REC FUNCTION	Sets special recording modes. <u>**NORMAL:**</u> The special recording modes are not used. **INTERVAL:** Sets interval recording. • This function is always set to NORMAL when the power is turned on.	• This item is not available when native recording is selected in REC FORMAT.
INTERVAL TIME	Sets the time interval of interval recording. <u>**2frm,**</u> **4frm, 8frm, 16frm, 1s, 2s, 5s, 10s, 30s, 1min, 5min, 10min** For details, refer to [Interval Recording (INTERVAL REC)] (page 40).	• Available only when REC FUNCTION is set to INTERVAL.

____ indicates the factory setting

Item	Setting	Notes
TC MODE	Sets count correction when using the internal time code generator. **DF:** Drop frame time code **NDF:** Non drop frame time code For details, refer to [Setting the Time Code] (page 63).	• This item is not available when SYSTEM MODE is set to 50 Hz. It cannot be set and the item is displayed in blue when SYSTEM MODE is set to 23.98 Hz and REC FORMAT is 24PN. In both cases, the count correction is fixed to NDF.
UB MODE	Sets the data recorded in the camera user bits. **USER, TIME, DATE, EXT, TCG, <u>FRM.RATE</u>** For details, refer to [Setting User Bits] (page 61).	

AUDIO SETUP Screen

Item	Setting	Notes
FRONT VR CH1	Enables/disables the F. AUDIO LEVEL control of CH1 input. **FRONT:** Enables the F. AUDIO LEVEL control of microphone input to CH1. **W.L.:** Enables the F. AUDIO LEVEL control of audio from a wireless receiver input to CH1. **REAR:** Enables the F. AUDIO LEVEL control of rear input that is input to CH1. **ALL:** Enables the F. AUDIO LEVEL control when front, wireless, rear and other inputs are input to CH1. **<u>OFF</u>:** Disables the F. AUDIO LEVEL control of CH1.	• When the AUDIO SELECT CH1 switch is set to AUTO and auto adjustment mode is active, the the F. AUDIO LEVEL control is disabled regardless of these settings.
FRONT VR CH2	Enables/disables the F. AUDIO LEVEL control of CH2 input. Same setting as FRONT VR CH1. **<u>OFF</u>**	• When the AUDIO SELECT CH2 switch is set to AUTO and auto adjustment mode is active, the F. AUDIO LEVEL control is disabled regardless of these settings.
MIC LOWCUT CH1*[1]	Sets the CH1 microphone low-cut filter. **FRONT:** Operates for the front microphone input. **W.L.:** Operates for wireless receiver input. **REAR:** Operates for the rear microphone input. **<u>OFF</u>:** Turns off the filter for all inputs.	
MIC LOWCUT CH2*[1]	Sets the CH2 microphone low-cut filter. Same setting as MIC LOWCUT CH1. **<u>OFF</u>**	
MIC LOWCUT CH3*[1]	Sets the CH3 microphone low-cut filter. Same setting as MIC LOWCUT CH1. **<u>OFF</u>**	
MIC LOWCUT CH4*[1]	Sets the CH4 microphone low-cut filter. Same setting as MIC LOWCUT CH1. **<u>OFF</u>**	
LIMITER CH1	Sets the CH1 limiter. **ON, <u>OFF</u>**	• When the AUDIO SELECT CH1 switch is set to AUTO and auto adjustment mode is active, the limiter is disabled regardless of these settings.
LIMITER CH2	Sets the CH2 limiter. **ON, <u>OFF</u>**	• When the AUDIO SELECT CH2 switch is set to AUTO and auto adjustment mode is active, the limiter is disabled regardless of these settings.

*[1] The frequency characteristics for a microphone low-cut filter is 200 Hz – 10 kHz.

___ indicates the factory setting

Item	Setting	Notes
AUTO LEVEL CH3	Selects the method for setting CH3 level. **ON:** Engages the auto adjustment mode. The limiter is not available. **OFF:** Locks the level. The limiter operates on all inputs except the line input of the rear.	
AUTO LEVEL CH4	Selects the method for setting CH4 level. Same setting as AUTO LEVEL CH3. **ON**	
TEST TONE	Selects the test signal. **NORMAL:** Outputs test tones to channels 1, 2, 3 and 4 when the OUTPUT/AUTO KNEE selector switch is set to BARS and the AUDIO IN switch CH1 is set to FRONT. **ALWAYS:** Outputs test tones to channels 1, 2, 3 and 4 at all times when the OUTPUT/AUTO KNEE selector switch is set to BARS. **CHSEL:** Outputs test tones to channels selected by setting the AUDIO IN switch CH1 or CH2 to FRONT and the OUTPUT/AUTO KNEE selector switch is set to BARS. (Test tones are not output to CH3 and CH4.) **OFF:** Does not output a test tone.	
F.MIC POWER	Turns on and off the phantom power supply for the front microphone. **ON, OFF**	
R.MIC POWER	Turns on and off the phantom power supply for the rear microphone. **ON:** Turns on the phantom power supply to the microphone when the rear MIC/LINE selector switch is set to MIC and the +48V ON/OFF switch is set to ON. **OFF:** Does not supply phantom power to the microphone even when the rear MIC/LINE selector switch is set to MIC and the +48V ON/OFF switch is set to ON.	
MONITOR SELECT	Switches the output signal to earphones and speaker when the MONITOR SELECT switch is set to ST. **STEREO, MIX**	
F.MIC LEVEL	Selects the input level for the front microphone. **–40dB, –50dB**	
R.MIC CH1 LEVEL	Selects the input level for the rear microphone connected to CH1. **–50dB, –60dB**	
R.MIC CH2 LEVEL	Selects the input level for the rear microphone connected to CH2. **–50dB, –60dB**	
R.LINE LEVEL	Selects the input level for the rear line input. **+4dB, 0dB, -3dB**	
HEADROOM	Sets the headroom (standard level). **18dB, 20dB**	• The factory default setting is 18dB when the area setting is PAL.
WIRELESS WARN	Sets whether a warning should be output when wireless receiver reception is poor. **ON, OFF**	
WIRELESS TYPE	Selects wireless receiver type. **SINGLE:** 1-channel receiver **DUAL:** 2-channel receiver • When DUAL is selected for a 1-channel wireless receiver, CH2 and CH4 will stay mute.	

____ indicates the factory setting

115

OUTPUT SEL Screen

Item	Setting	Notes
SDI OUT	Selects the signal to be output from the HD SDI OUT 1 (L)/2 (R) connectors and HD SDI MONITOR OUT connector. **ON:** The HD SDI OUT 1 (L)/2 (R) connectors output the left-lens (L) image and the right-lens (R) image. The HD SDI MONITOR OUT connector outputs the same image as that selected with the menu option MONTIOR OUT SEL. **ON (SIDE):** The HD SDI OUT 1 (L)/2 (R) connectors output the SIDE by SIDE image. The HD SDI MONITOR OUT connector outputs the same image as that selected with the menu option MONTIOR OUT SEL. **OFF:** The HD SDI OUT 1 (L)/2 (R) connectors and the HD SDI MONITOR OUT connector output no signals. If a monitor is connected to the HDMI connector, an image compatible with the monitor is output from the HDMI connector.	• No signals are output from the HDMI connector when this item is set to ON or ON (SIDE).
MON OUT SEL	Selects the image to be output from the HD SDI MONITOR OUT connector and HDMI connector. **NORMAL:** The same image as that displayed on the LCD monitor is output. **L:** The left-lens (L) image is output. **MIX:** The mixed left-lens (L) image and right-lens (R) image is output. **SIDE:** The SIDE by SIDE image is output.	• When SDI OUT is set to OFF, no image is output from the HD SDI MONITOR OUT connector, regardless of this item setting. When you wish to output the effect of the 3D assist function, set SDI OUT to a setting other than OFF and this item to NORMAL. (The signal of the 3D assist function is not output from the HDMI connector.)
TC OUT	Sets the time code type output from the TC OUT connector. **TCG:** Outputs the time code generator value of the camera at all times. **TCG/TCR:** Outputs time code generator value during camera recording and outputs the played back time code during video playback.	

DISPLAY SETUP Screen

Item	Setting	Notes
EVF PEAK LEVEL	Adjusts the peaking level of the LCD monitor and viewfinder. **-7 ... 0 ... +7**	
EVF PEAK FREQ	Adjusts the peaking frequency of the LCD monitor and viewfinder. **HIGH, LOW**	
LCD SETTING	Makes it possible to set video color level, brightness and contrast displayed in the LCD monitor in a subscreen. (Subscreen) LCD COLOR LEVEL LCD BRIGHTNESS LCD CONTRAST	
LCD BACKLIGHT	Adjusts LCD monitor backlight brightness. **HIGH, NORMAL, LOW**	

____ indicates the factory setting

Item	Setting	Notes
ZEBRA1 DETECT	Sets the level of the right-leaning zebra pattern 1. **50% ... <u>70%</u> ... 109%**	
ZEBRA2 DETECT	Sets the level of the left-leaning zebra pattern 2. **50% ... <u>85%</u> ... 109%**	
ZEBRA2	Selects ZEBRA2 type. (For details, refer to page 74.) **ON, <u>SPOT</u>, OFF**	
MARKER	Turns the center marker displayed on the LCD monitor and in the viewfinder on and off. (For details, refer to page 74.) **<u>ON</u>, OFF**	
SAFETY ZONE	Sets the safety zone displayed on the LCD monitor and in the viewfinder. (For details, refer to page 74.) **<u>90%</u>, 13:9, 14:9, OFF**	
FOCUS BAR	The length of the focus bar indicates accuracy of focusing. **ON:** Displays the focus bar. **<u>OFF</u>:** Does not display the focus bar.	• The indication disappears when the LCD monitor screen is switched to the R (right lens) image, MIX image, or Side-by-Side image. The display will reappear when the L (left) image is restored. • The indication disappears when a menu is displayed.
SYNC SCAN DISP	Selects synchro scan shutter display. **<u>sec</u>:** Indicates shutter speed in fractions. **deg:** Provides a shutter angle indication.	• Brightness may change when settings are modified.
DATE/TIME	Sets the date and time display. **TIME:** Hours, minutes and second display **DATE:** Year, month and day display **TIME&DATE:** Hours, minutes, seconds and year, month and day display **<u>OFF</u>:** Not displayed	
LEVEL METER	Sets the Audio Level Meter display. **<u>ON</u>, OFF**	
ZOOM & FOCUS	Sets the display of the lens zoom value and focus value. **ON, <u>OFF</u>**	
CONVERGENCE	Sets the display of the position of the reference place for 3D recording (relative value). **ON, <u>OFF</u>**	
CARD/BATT	Sets the remaining P2 card capacity and battery charge. **<u>ON</u>, OFF**	
OTHER DISPLAY	Sets display of other data. **<u>ON</u>:** Displays all data. **OFF:** Not displayed	
REC COUNTER	Selects counter operation during recording. **<u>TOTAL</u>:** Provides a continuous count until reset by pressing the COUNTER RESET button. **CLIP:** Clears the count value at start of recording and counts time of recording.	

BATTERY SETUP Screen

Item	Setting	Notes
EXT DC IN SEL	Selects external DC power supply type. **<u>AC ADAPTOR</u>:** AC adaptor **BATTERY:** Battery	

____ indicates the factory setting

Item	Setting	Notes
BATTERY SELECT	Sets the battery type. **HYTRON140, <u>DIONIC90</u>, DIONIC160, ENDURA10, PAG L95, TYPE A, TYPE B**	
BATTERY MODE	Sets near end. <u>**AUTO:**</u> Automatically selects one of the battery types selected in BATTERY SELECT. **MANUAL:** Manually sets the near end voltage.	
HYTRON140 NEAR	Sets the near end voltage for HYTRON140. (Adjustable in 0.1 V units.) **11.0 V ... <u>13.5 V</u> ... 15.0 V**	
DIONIC90 NEAR	Sets the near end voltage for DIONIC90. (Adjustable in 0.1 V units.) **11.0 V ... <u>13.4 V</u> ... 15.0 V**	
DIONIC160 NEAR	Sets the near end voltage for DIONIC160. (Adjustable in 0.1 V units.) **11.0 V ... <u>13.6 V</u> ... 15.0 V**	
ENDURA10 NEAR	Sets the near end voltage for ENDURA10. (Adjustable in 0.1 V units.) **11.0 V ... <u>13.4 V</u> ... 15.0 V**	
PAG L95 NEAR	Sets the near end voltage for PAG L95. (Adjustable in 0.1 V units.) **11.0 V ... <u>13.6 V</u> ... 15.0 V**	
TYPE A FULL	Sets the full voltage for TYPE A. (Adjustable in 0.1 V units.) **12.0 V ... <u>15.3 V</u> ... 17.0 V**	
TYPE A NEAR	Sets the near end voltage for TYPE A. (Adjustable in 0.1 V units.) **11.0 V ... <u>13.6 V</u> ... 15.0 V**	
TYPE A END	Sets the end voltage for TYPE A. (Adjustable in 0.1 V units.) **11.0 V ... <u>13.2 V</u> ... 15.0 V**	
TYPE B FULL	Sets the full voltage for TYPE B. (Adjustable in 0.1 V units.) **12.0 V ... <u>15.5 V</u> ... 17.0 V**	
TYPE B NEAR	Sets the near end voltage for TYPE B. (Adjustable in 0.1 V units.) **11.0 V ... <u>13.5 V</u> ... 15.0 V**	
TYPE B END	Sets the end voltage for TYPE B. (Adjustable in 0.1 V units.) **11.0 V ... <u>13.1 V</u> ... 15.0 V**	

NEAR END CANCEL	Sets to cancel battery near end warning.
	<u>**ON**</u>**, OFF**
	• When set to ON, pressing the DISP/MODE CHK
	  button stops the flashing of WARNING and tally
	  lamps.	

CARD FUNCTIONS Screen

Item	Setting	Notes
SCENE FILE	Reads/writes scene files from/onto the SD memory card. **FILE SELECT:** Selects scene files (1 to 4). **READ:** Reads the selected scene file (1 – 4) settings stored on the SD memory card. **WRITE:** Saves the current scene file (1 – 4) settings to the SD memory card. **TITLE RELOAD:** Reloads title list.	

____ indicates the factory setting

Item	Setting	Notes
USER FILE	Reads/writes user files (files other than SCENE FILES) from/onto the SD memory card. **FILE SELECT:** Selects user files (1 – 4). **READ:** Reads the user file (1 – 4) settings stored on the SD memory card. **WRITE:** Saves the current user file (1 – 4) settings to the SD memory card. **TITLE RELOAD:** Reloads title list.	
SD CARD FORMAT	Formats SD memory cards.	

3D ASSIST Screen

Item	Setting	Notes
OUTPUT SEL	Sets where to output the effect of 3D assist function controlled by the 3D ASSIST buttons (Z WFM/ALERT/CONV.). **LCD:** The effect of the 3D assist function is output to the LCD monitor only. **LCD/EVF:** The effect of the 3D assist function is output to the LCD monitor and viewfinder.	
NEAR LEVEL	Selects the alert level for a short distance in the 3D assist function. 0.5%, 1%, 1.5%, <u>2%</u>, 2.5%, 3%, 3.5%, 4%	• Use this item to set a guide for safety shooting, preventing forward divergence.
FAR LEVEL	Selects the alert level for a long distance in the 3D assist function. 0.5%, 1%, 1.5%, <u>2%</u>, 2.5%, 3%, 3.5%, 4%	• Use this item to set a guide for safety shooting, preventing backward divergence.
DETECTION RANGE	Selects the detection range of the 3D assist function. **<u>NARROW:</u>** 6.56 % (1080) **WIDE:** 13.12 % (1080)	• Use this item to prevent excessive separation due to backward divergence.
Z WFM SCALE	Selects the display mode of the 3D assist function. **<u>NORMAL:</u>** Displays all the detection area. **2 x :** Displays a clip in half the detection area.	

OTHER FUNCTIONS Screen

Item	Setting	Notes
USER FILE	Saves user files to camera memory, loads them into camera memory or initializes them. (For details, refer to page 78, 107.) **LOAD, SAVE, INITIAL**	• This does not affect options in the SCENE FILE screen. • The TIME ZONE setting is not initialized.
ACCESS LED	Determines whether or not the P2 card access LED should light. **<u>ON,</u> OFF**	
ALARM	Sets the alarm sound output when an alarm occurs. **<u>HIGH,</u> LOW, OFF**	
REC TALLY	Selects the recording status indicator of the camera. **<u>RED:</u>** Red tally lamp lights. **GREEN:** Green tally lamp lights. **OFF:** The tally lamp does not light.	
EVF BAT LED	Selects whether the BAT lamp inside the viewfinder is to light or not when the remaining battery capacity is below NEAR END. **<u>ON,</u> OFF**	
CLOCK SETTING	Sets the internal calendar (date) For details, see [Setting Date and Time of Internal Clock] (page 28).	

____ indicates the factory setting

Item	Setting	Notes
TIME ZONE	Sets the time difference relative to Greenwich Mean Time (GMT). **–12:00 ... 0:00 ... +13:00** For details, see [Setting Date and Time of Internal Clock] (page 28).	• This setting cannot be initialized by performing the MENU INIT option and the INITIAL option in USER FILE.
H PHASE	Adjusts the horizontal phase when phase is locked to the signal input to the GENLOCK IN connector. **–512 ... 0 ... +511**	• Hold down the JOG dial button and turn it downwards or upwards and maintain this position to quickly change values.
GENLOCK SEL	Selects the GENLOCK input. **GENLOCK IN:** Signal input to the GENLOCK IN connector (HD Tri-level sync) **RETURN IN:** Signal input to the RETURN IN connector (HD SDI)	
MENU INIT	Restores all setting menu values including all scene files 1 – 6 and the user file to their factory defaults.	• The TIME ZONE setting does not return to its factory default.

DIAGNOSTIC Screen

Item	Setting	Notes
VERSION	Indicates the version of the firmware used in this camera. A subscreen provides details on which firmware versions are used. (Subscreen) **CAM SOFT:** Software of the camera microprocessor **SYSCON SOFT:** Software of the system control microprocessor **P2CS BL2-1:** Boot program 1 of the P2 control microprocessor **P2CS BL2-2:** Boot program 2 of the P2 control microprocessor **P2CS KR:** Kernel of the P2 control microprocessor **P2CS AP:** Application software of the P2 control microprocessor **VUP:** Software of the system that totally updates the firmware of this product **VUP FS:** File system for updating this product **CAM FPGA:** Configuration ROM of the camera FPGA **CAMIO FPGA:** Configuration ROM of the camera IO FPGA **AVIO FPGA:** Configuration ROM of the AVIO FPGA **PQCONT FPGA:** Configuration ROM of the PQ control FPGA	
MODEL NAME	Indicates the model name of this camera.	
SERIAL NO.	Indicates serial number of this camera. (xxxxxxxxxx)	
OPERATION	Indicates the time of the camera has been on. (xxxx h)	

OPTION MENU Screen

Open this menu by holding down the DISP/MODE CHK button and when shooting status appears press the front MENU button.

Item	Setting	Notes
AREA SELECT	Selects the TV system for the area where you use the camera. **NTSC:** Selects the NTSC area. **PAL:** Selects the PAL area.	

____ indicates the factory setting

Chapter 8 Connecting to External Devices

Connecting the AJ-RC10G Remote Control Unit

Some functions can be remote controlled when the remote
control unit AJ-RC10G (optional accessory) is connected to
the camera.
When the AJ-RC10G is connected, the camera
automatically enters remote control mode after the power
switches of both the camera and the AJ-RC10G are turned
ON.
The remote control mode is released when AJ-RC10G is
removed or the power for the AJ-RC10G is turned OFF.

■ Switch/button operations in remote control mode

The following switches and buttons on the camera do not
work in remote control mode.
• SHUTTER switch
• MENU button
• JOG dial button
• GAIN selector switch
• OUTPUT/AUTO KNEE selector switch
• WHITE BAL switch
• USER MAIN button
• USER 1 button
• USER 2 button
• OUTPUT CHARACTER switch

REMOTE connector   AJ-RC10G
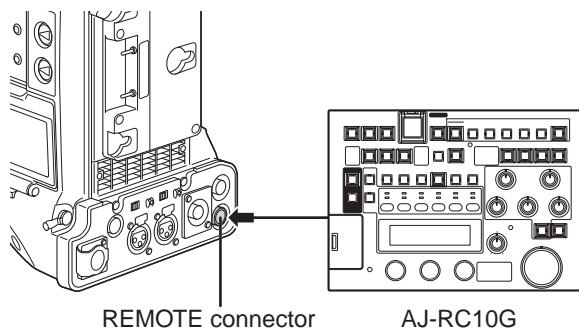
◆ NOTE

• **Be sure to turn the POWER switches on the camera and
  the AJ-RC10G off before connecting or disconnecting the
  controller cable.**
• **Use only designated cables or designed option cables to
  connect the AJ-RC10G. Use of other cables could result in
  equipment damage.**
    Refer to the Operating Guide of the AJ-RC10G included in the
    supplied CD-ROM.
    For details on the current provided by the REMOTE connector,
    refer to page 138.
• **Data for the operations performed by the AJ-RC10G are
  generally stored in the camera.**
• **Setting the RC-DATA-SAVE menu on the AJ-RC10G to OFF
  resets the following values to the values before connecting
  the AJ-RC10G.**
    - Synchro scan value
    - Master Pedestal value
    - GAIN values (R/B)
    - Pedestal values (R/G/B)
    - GAIN value (at LOW position)

Connecting the AG-EC4G Extension Control Unit

Some functions can be remote controlled when the AG-EC4G extension control unit (optional accessory) is connected to the camera.
When the AG-EC4G is connected, the camera automatically enters remote control mode after the power switches of both the camera and the AG-EC4G are turned ON.
The remote control mode is released when AG-EC4G is removed or the power for the AG-EC4G is turned OFF.

■ Switch/button operations in remote control mode

The following switches and buttons on the camera do not work in remote control mode.
• SHUTTER switch
• MENU button
• JOG dial button
• GAIN selector switch
• OUTPUT/AUTO KNEE selector switch
• WHITE BAL switch
• USER MAIN button
• USER 1 button
• USER 2 button
• OUTPUT CHARACTER switch

REMOTE connector
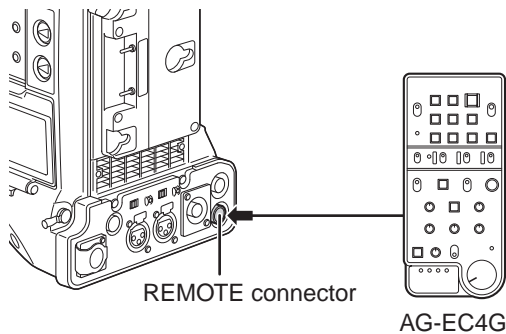
AG-EC4G

◆ NOTE
• **Be sure to turn the POWER switches on the camera and the AG-EC4G off before connecting or disconnecting the controller cable.**
• **Use only designated cables or designated option cables to connect the AG-EC4G. Use of other cables could result in equipment damage.**
   For details on the current provided by the REMOTE connector, refer to page 138.
• **Data for the operations performed by the AG-EC4G are generally stored in the camera.**
• **Setting the DATA SAVE switch on the AG-EC4G to OFF resets the following values to the values before connecting the AG-EC4G.**
   - Synchro scan value
   - Master Pedestal value
   - GAIN values (R/B)
   - Pedestal values (R/G/B)
   - GAIN value (at LOW position)

Adjusting the Convergence Point

The convergence point can be adjusted, using the buttons on the AG-EC4G.
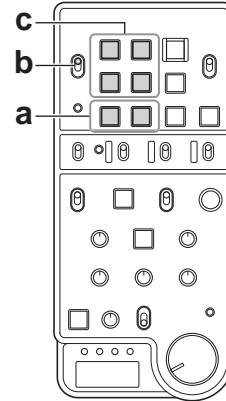
a   USER buttons (USER MAIN/USER1)

b   RECORDER switch

c   ◀◀REW, ▶▶FF, ■STOP and ▶PLAY buttons

1   In the SW MODE screen, assign R CONV to the USER MAIN or USER1 button.

2   Press the USER button to which R CONV has been assigned on the AG-EC4G.

3   Set the RECORDER switch to ENABLE.

4   Adjust the convergence, using the ■STOP and ▶PLAY buttons for coarse adjustment and the ◀◀REW and ▶▶FF buttons for fine adjustment.
   ■STOP, ◀◀REW: to adjust the convergence point nearer
   ▶PLAY, ▶▶FF: to adjust the convergence point farther

◆ NOTE
The USER2 button on the AG-EC4G operates as the THUMBNAIL button for the camera.

122
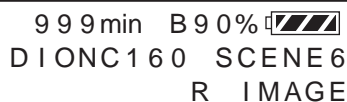
Chapter 9 Maintenance and Inspections

Inspections Before Shooting

Make sure you check that the system is operating normally before embarking on a shoot. We recommend using a colour video monitor to check the image.

Preparing for Inspections

1 Mount a charged battery.

2 Turn the POWER switch to ON to check the battery remaining level on the LCD monitor or in the viewfinder.

• When battery capacity is low, replace it with a fully charged battery.

```
 9 9 9 min   B 9 0 %
D I O N C 1 6 0   S C E N E 6
            R   I M A G E
```

3 Insert P2 cards into card slots L and R and close the slot cover.

• Confirm that both P2 card access LEDs L and R light in orange.
• Recording cannot start if either P2 card has no free space for recording or is write-protected.

P2 card access LEDs
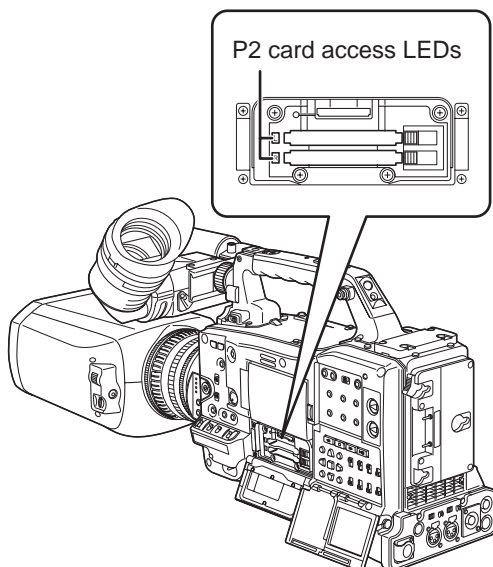
Inspecting the Camera Unit

Inspection for Zoom, Iris and Gain

1 Set the zoom to electric zoom mode and check the zoom operation.

• Check that the image changes to telephoto and wide angle.

2 Set the zoom to manual zoom mode and check the zoom operation.

• Turn the manual zoom lever to check that the image changes to telephoto and wide angle.

3 Set the iris to automatic adjustment mode and aim the lens at objects with different degrees of brightness, to check that the automatic iris adjustment operates normally.

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

5 Return the iris to automatic adjustment mode and change the GAIN switch setting to L, M, and H, to check the following items:

• The iris is adjusted for objects with the same brightness according to the switch setting.
• The gain value displayed on the viewfinder screen changes according to the switch setting.

Inspection for 3D Recording

1 Press the LCD/EVF button to set the LCD/EVF mode to MIX or SIDE by SIDE.

2 Press the SHIFT button to display the 3D FINE adjustment screen.

3 Check the vertical position, focus, and lens iris of the left-lens image and right-lens image, on the LCD monitor and in the viewfinder.

• If the adjustments are not the same for the left-lens image and the right-lens image, readjust them using the 3D FINE function.
For details, refer to [Adjustment between Two Lenses (3D FINE function)] (page 57).

Inspecting the Memory Recording Functions

Make sure you successively carry out the inspections from [Inspecting the P2 Card Recording] to [Inspecting the Earphone and Speaker].

Inspecting the P2 Card Recording

1 Check on the LCD monitor or in the viewfinder that the remaining P2 card recording capacity for both P2 cards is sufficient.

For details, refer to [Screen Displays] (page 68).

2 Press the camera's REC button to check the following items:

- The P2 card access LEDs blink in orange.
- The REC indication on the screen lights.
- System warnings do not appear on the screen.

3 Press the camera's REC button again.

- Check that the P2 card access LEDs light in orange, and that the REC indication on the screen is cleared.

4 Using the REC button on the handle, repeat Steps 2 to 3 to check the same operation.

5 Using the REC button on the lens unit, repeat Steps 2 to 3 to check the same operation.

6 Press the THUMBNAIL button to switch the thumbnail screen to play back currently recorded clip from thumbnail.

- Check that playback is operating normally.

Inspecting the Audio Level Automatic Adjustment

1 Set the AUDIO SELECT CH1 and CH2 switches to AUTO.

2 Set the AUDIO IN switch to FRONT.

3 Aim the microphone connected to the MIC jack at an appropriate sound source. Then, check that the level displays for both CH1 and CH2 change according to the sound level.

Inspecting the Audio Level Manual Adjustment

1 Set the AUDIO IN switch to FRONT.

2 Set the AUDIO SELECT CH1 and CH2 switches to MAN.

3 Turn the AUDIO LEVEL CH1 and CH2 controls.

- Check that the level display increases when the controls are turned to the right.

Inspecting the Earphone and Speaker

1 Turn the MONITOR control to check that the speaker volume changes.

2 Connect an earphone to the PHONES jack.

- Check that the speaker is turned off and the microphone sound can be heard from the earphone.

3 Turn the MONITOR control to check that the earphone volume changes.

Inspection for Using an External Microphone

1 Connect an external microphone to the AUDIO IN CH1/CH2 connectors.

2 Set the AUDIO IN switch to REAR.

3 Set the LINE/MIC selector switches on the rear panel to MIC, and set the +48V ON/OFF switch depending on the power supply type of the external microphone.

• **OFF:** For a microphone with internal power supply.
• **+48V:** For a microphone with external power supply.

4 Aim the microphone at the sound source and check that the sound level indication on the LCD monitor or in the viewfinder varies with changes in sound intensity.

• The channels can also be checked separately by connecting a single microphone to each channel.

Inspection of the clock, time code, and user bits

1 Set the user bits as required.
Please refer to [Setting User Bits] (page 61) for the setting procedures.

2 Set the time code.
Please refer to [Setting the Time Code] (page 63) for the setting procedures.

3 Set the TCG switch to R-RUN.
• Press the COUNTER button to display the time code on the LCD monitor or in the viewfinder.

4 Press the REC button.
• Check that the counter display number changes as recording progresses.

5 Press the REC button again.
• Check that recording stops and the counter display number stops changing.

6 Set the TCG switch to F-RUN.
• Check that the counter display number changes regardless of recording status.

7 Hold down the DISP/MODE CHK button to check the date and time on the LCD monitor or in the viewfinder.
• Adjust the date and time setting if the DATE, TIME and time zone is not correctly displayed.
For details, see [Setting Date and Time of Internal Clock] (page 28).

◆ **NOTE**

Note that date and time data set for DATE, TIME, and time zone is recorded in clips, and affects the playback sequence, etc. at the time of thumbnail manipulations.

Chapter 9 Maintenance and Inspections

125

Maintenance

Cleaning Inside the Viewfinder

- Do not use solvent such as thinner to remove dirt.
- To clean the lens, use a commercially available lens cleaner.
- Never wipe the mirror. If dust adheres on the mirror, use a commercially available blower brush.

◆ **NOTE**

When outdoors, never carry or set up the camera with the eyepiece facing up to prevent sunlight, which could damage the camera, from entering.

Charging the Internal Battery

The internal battery preserves the date and time settings. If the camera is left unused for half a year or longer, the internal battery may become depleted and the ⊜ (battery icon) may appear on the LCD monitor and in the viewfinder. Should this happen, connect an external DC power supply or battery, and leave the camera turned off for about four hours to fully charge the internal battery. Then reset the time and date.
Replace the internal battery if ⊜ appears after charging. Consult your distributor.

Warning System

Warning Description Tables

If a problem is detected immediately after the power is turned on, or during operation, this will be indicated by the WARNING lamp, lamps on the LCD monitor and a warning tone.
Warnings have priorities. If multiple errors occur simultaneously, the WARNING lamp, warning display on the screen, and alarm tone are displayed in order of priority shown in the table below.

Priority	Warning type	LCD indication	Tally lamp	WARNING lamp	Alarm tone*[1]	Warning description and recording/playback operation	Countermeasures
1	System error	SYSTEM ERROR cause indication*[2] blinks red.	Blinks 4 times per second	Blinks 4 times per second	Continuous tone	Reference signal or communication error. Operation stops.	Check the cause indication *[2] and consult your distributor.
2	Incorrect P2 card removal	TURN POWER OFF Blinks red	Blinks 4 times per second	Blinks 4 times per second	Continuous tone	A P2 card was removed during access and card data was corrupted. Both P2 card access LEDs blink in orange. Recording/ playback cannot start.	Turn off the power. Repair the P2 card if the clips on the card are corrupted.
3	The battery is exhauseted	LOW BATTERY blinks red, and the battery level bar blinks with the empty status. (This indication appears even if CARD/ BATT is set to OFF in the DISPLAY SETUP screen.)	Blinks 1 time per second	Lights	Continuous tone	The battery is exhausted. Recording and playback stop. The camera stops automatically when the voltage drops.	Replace the battery.
4	Version mismatch	VERSION MISMATCH PLEASE UPDATE Blinks white	Blinks 4 times per second	Blinks 4 times per second	No	Version misatch has occurred. Only SD CARD FORMAT and UPDATE are available with the thumbnail menu.	Perform CARD UPDATE.
5	High Temperature error detectionl	HIGH TEMPERATURE Blinks red	Off	Off	No	High temperature error is detected. Operation continues, but abnormal recording/playback may occur.	Stop operation immediately and consult your distributor.
6	Fan stop	FAN STOPPED cause indication*[3] blinks red	Off	Off	No	The fan is in failure and has stopped. Although operation continues with the fan stopped, it may raise the temperature inside the unit, causing abnormal recording/ playback.	Check the cause indication*[3] and consult your distributor.

*[1] When the alarm sounds, audio is not output to the camera speakers or earphones. The DISP/MODE CHK button cancels only the alarm tone when pressed during an alarm.

*[2] P2 SYSTEM ERROR cause indication
- P2 MICON ERROR: The P2 microprocessor does not respond.
- P2 CONTROL ERROR: A P2 recording control error has occurred.
- CAM MICON ERROR: The camera microprocessor does not respond.
- P2 MICON LINK ERROR: A connection error between P2 microprocessors has occurred.

*[3] FAN STOPPED cause indication
- FAN****: FAN error position (1, 1/2, 1/3, 2, 2/3, 3, 1/2/3)

Priority	Warning type	LCD indication	Tally lamp	WARNING lamp	Alarm tone	Warning description and recording/playback operation	Countermeasures
7	Error of camera section	WARNING cause indication*[4] blinks red	Off	Off	No	An error in the camera section is detected. Operation continues, but abnormal shooting may occur.	Check the cause indication*[4] and consult your distributor.
8	P2 card fully recorded	P2 FULL Blinks red	Blinks 4 times per second after completion of recording.	Lights after completing recording	Continuous tone after completing recording	No more space on P2 cards left for recording.Stop recording.*[5]	Delete clips that are no longer needed or insert a new card.
9	Playback sync error	SYNC POSI FAILED Blinks white	Off	Off	No	The synchronization of clip position has failed. It may occur when the reference signal is unstable during 3D clip playback	Check the number and type of the clip. Or press the STOP button to stop playback, check the connection and/or the input signal, then restart playback.
10	Recording error	REC WARNING Cause indication *[6] Blinks red	Blinks 4 times per second	Blinks 4 times per second	Intermittent tone 4 times per second	A recording error has occurred. The error may terminate recording. *[7]	Turn the power off and then back on again and check recording and playback. Replace any P2 card that does not enable normal recording.

*[4] Camera WARINNG cause indication
  • FOCUS NG∗: Focus error (∗: L, R or L/R)
  • ZOOM NG∗: Zoom error (∗: L, R or L/R)
  • IRIS NG∗: Iris error (∗: L, R or L/R)
  • ND FILTER NG∗: ND filter error (∗: L, R or L/R)
  • CONV. NG∗: Convergence error (∗: L, R or L/R)
  • SUB LENS NG∗: Sub-lens error (∗: L, R or L/R)

*[5] Perform either of the following procedures to cancel this warning.
  • Press a playback control button.
  • Press the THUMBNAIL button.
  • Remove the P2 card and insert another card.

*[6] REC WARNING cause indication
  • CARD ERROR∗: P2CARD error (∗ indicates the slot of the card with the error.) Stops recording.
  • REC RAM OVERFLOW: Overflow of recording RAM. Stops recording.
  • PULL DOWN ERROR: 24P, 30P (25P) video pulldown error. Recording continues.
  • OVER MAX# CLIPS: Recording is interrupted as the limit for the number of clips that can be recorded to one P2 card has been reached.
  • IRREGULAR FRM SIG: The reference signal, such as the GENLOCK input, is distorted.
  • L/R DURATION NG: The duration of the recorded clip is different between the L and R P2 cards.

*[7] Perform either of the following procedures to cancel this warning.
  • Press the REC button.
  • Press a playback control button.
  • Press the THUMBNAIL button.
  • Remove all cards.

Priority	Warning type	LCD indication	Tally lamp	WARNING lamp	Alarm tone	Warning description and recording/playback operation	Countermeasures
11	Drop in reception quality of wireless receiver transmission	WIRELESS RF *8 Blinks red	Blinks 4 times per second (Recording only)	Blinks 4 times per second	No	Indicates poor reception from the wireless receiver. Recording continues but wireless microphone cannot be received.	Check microphone power supply and receiver reception status.
12	Battery nearly empty	The last bar in the battery level indication blinks (This indication appears even if CARD/BATT is set to OFF in the DISPLAY SETUP screen.)	Blinks 1 time per second	Blinks 1 time per second	No	The battery is near depletion. Operation continues.*9	Replace the battery as necessary.
13	P2 card nearly fully recorded	The P2 card level indicator blinks.	Blinks 1 time per second during recording.	Blinks 1 time per second during recording.	No	Less than 2 minutes is left on the P2 cards (level indicator shows 1 minute or less). This warning appears only during recording.	Replace the P2 cards as necessary.

*8 The warning can be disabled by setting the WIRELESS WARN option on the AUDIO SETUP screen to OFF.
*9 When NEAR END CANCEL is set to ON, you can press the DISP/MODE CHK button to cancel the alarm.

Chapter 9 Maintenance and Inspections

Warning and Error Display for Thumbnail Operation

Item	Message	Description	Measure
Thumbnails	CANNOT ACCESS!	Data cannot be accessed because it is corrupted or for other reasons.	Restore media and clips to normal state before access.
	CANNOT DELETE !	P2 card contains contents version mismatches or bad clips.	Match devices and contents versions, and repair bad clips.
	CANNOT FORMAT!	Formatting cannot be made due to some P2 card problem.	Check the P2 card.
	CANNOT REPAIR!	Data cannot be repaired since content that cannot be repaired is selected.	Check selected content.
	CANNOT REPAIR IN SELECTION!	Some of the selected clip could not be repaired.	—
	CARD FULL!	The P2 or SD card is full.	Insert media with sufficient capacity.
	INVALID VALUE!	Entered data was invalid.	Enter data in a valid range.
	LACK OF CAPACITY!	The recording capacity on the P2 card is insufficient.	Insert a card with sufficient recording capacity.
	MISSING CLIP!	You tried to add a shot mark to a clip that had been recorded across multiple cards, using another 3D device.	Any clip recorded across multiple cards is not supported.
	NO CARD!	No P2 or SD card is inserted.	Insert compatible media.
	NO FILE!	The designated file is not found.	Check the file.
	NO SD CARD!	No SD card is inserted.	Insert an SD card.
	TOO MANY CLIPS!	Too many clips are selected.	Reduce the number of selected clips.
	UNKNOWN CONTENTS FORMAT!	P2 card contains contents version mismatches or corrupted content.	• Match devices and contents versions. • If corrupted clips exist (including corrupted clips that are located on the copy destination), repair the corrupted clips or delete them.
	UNKNOWN DATA!	The metadata character code is invalid.	Use UTF-8 for the metadata character code. Use the viewer to enter correct characters.
	USER CLIP NAME MODIFIED!	Characters in the clip name had to be deleted in adding the counter value.	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 exceeds 100 bytes.
	WRITE PROTECTED!	The P2 or SD card is write protected.	Insert write-enabled media.
Soft keyboard	CANNOT SET! INVALID VALUE!	The entered value is incorrect.	Change the value.

Updating the Firmware Incorporated into the Unit

Check firmware version of the camera in the DIAGNOSTIC screen. Then access the site listed in the NOTE below to check the most recent firmware information and download any firmware you require.

◆ **NOTE**

• **The update is completed by loading the downloaded file onto the unit via an SD memory card. For details on updating, visit the support desk at the following website.**

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

• **Be sure to use a compatible SD memory card. The unit is compatible with SD memory cards based on the SD and SDHC standards. Also, be sure to format the memory card using the unit before use.**

Chapter 9 Maintenance and Inspections

131

Chapter 10 Index

Chapter 10 Index

Chapter 10 Index

134

Chapter 11 Specifications

Dimensions and specifications

Dimensions

654.5 mm (25-3/4 inches)

270.5 mm (10-5/8 inches)

335 mm (13-3/16 inches)

125 mm (4-15/16 inches)

149mm (5-7/8 inches)

92 mm (3-5/8 inches)

667.5 mm (26-1/4 inches)

137 mm (5-3/8 inches)

235 mm (9-1/4 inches)

196 mm (7-11/16 inches)

93.5 mm (3-11/16 inches)
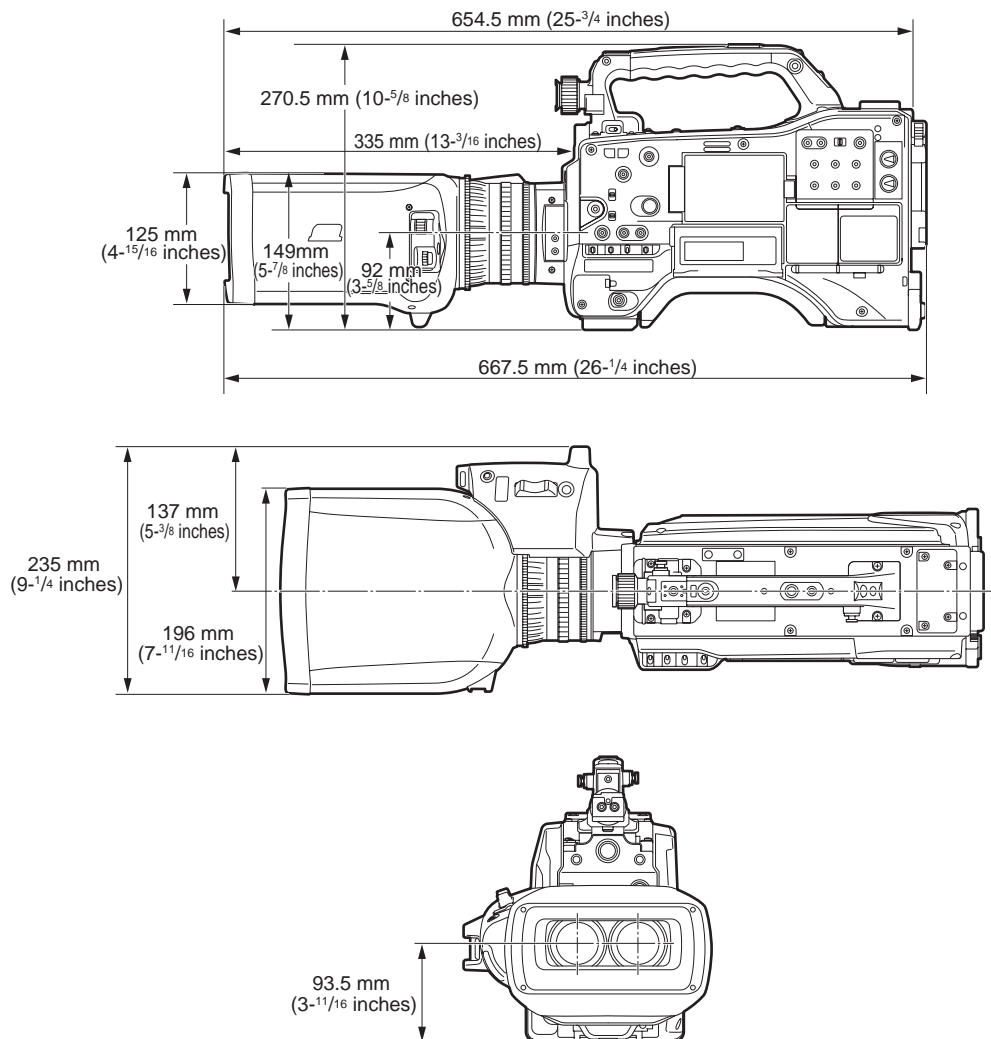
Specifications

General

Power supply:	DC 12 V (11 V to 17 V)
Power consumption:	38 W (Camera only)

□ indicates safety information.

Ambient operating temperature/humidity:	0 °C to 40 °C (32 °F to 104 °F) / 10 % to 80 % (relative humidity)
Storage temperature:	−20 °C to 60 °C (−4 °F to 140 °F)
Weight:	Approx. 6.1 kg (13.4 lb) (camera unit only) Approx 7.9 kg (17.4 lb) (including an AJ-HVF21KG, a DIONIC battery, two P2 cards, and an AJ-MC900G microphone)
Dimensions: (Camera only)	235 mm (width) × 270.5 mm (height) × 667.5 mm (depth) (excluding protrusions) 9-1/4 inches (width) × 10-5/8 inches (height) × 26-1/4 inches (depth) (excluding protrusions)

Camera Unit

Pickup devices:	1/3-type progressive, 2.2-megapixel, 3MOS sensor × 2
Lens:	Optical 17.0x, F1.6 (Wide) to F3.4 (Tele) Focus distance: f 4.6 mm to 79 mm (35 mm equivalent: 35.0 mm to 601.9 mm)
Color separation optical system:	Prism system
Distance betweent he optical axes:	Approx. 58 mm (2-5/16 inches)
Reference plane adjustment range:	Approx. 1.1 m (43-5/16 inches) to ∞
ND filter:	4 positions (CLEAR, 1/4ND, 1/16ND, 1/64ND)
Gain settings:	0, +3, +6, +9, +12 dB
Shutter speed:	• 60i/60p mode: 1/60 (OFF), 1/100, 1/120, 1/250 sec. • 30p mode: 1/30 (OFF), 1/60, 1/100, 1/120, 1/250 sec. • 24p mode: 1/24 (OFF), 1/60, 1/100, 1/120, 1/250 sec. • 50i/50p mode: 1/50 (OFF), 1/60, 1/120, 1/250 sec. • 25p mode: 1/25 (OFF), 1/50, 1/60, 1/120, 1/250 sec.
Shutter speed (Synchro scan):	• 60i/60p mode: 1/60.0 to 1/249.8 • 30p mode: 1/30.0 to 1/249.8 • 24p mode: 1/24.0 to 1/249.8 • 50i/50p mode: 1/50.0 to 1/250.0 • 25p mode: 1/25.0 to 1/250.0
Shutter speed (slow):	• 60i/60p mode: 1/15, 1/30 • 30p mode: 1/15 • 24p mode: 1/12 • 50i/50p mode: 1/12.5, 1/25 • 25p mode: 1/12.5
Frame rates:	• 59.94 Hz mode: variable 12/15/18/20/21/22/24/25/26/27/28/30/32/34/36/40/44/48/54/60 fps (frames per second) • 50 Hz mode: variable 12/15/18/20/21/22/23/24/25/26/27/28/30/32/34/37/42/45/48/50 fps (frames per second)

Memory card recorder Unit

Recording media:	P2 card
Recording Formats:	AVC-Intra 100/AVC-Intra 50
Recording/Playback Time:	AVC-Intra 100: 64 GB: approx. 60 min., with two P2 cards (L/R)
	AVC-Intra 50: 64 GB: approx. 120 min., with two P2 cards (L/R)
	The times listed above can be continuously recorded as one clip. The number of recording clips will reduce the above figures somewhat.

Recorded video signals:	• 59.94 Hz mode
	   1080/59.94i, 1080/29.97pN, 1080/23.98pN, 720/59.94p, 720/29.97pN, 720/23.98pN
	 • 50 Hz mode
	   1080/50i, 1080/25pN, 720/50p, 720/25pN

Digital video Unit

Sampling Frequency:	AVC-Intra 100: Y: 74.1758 MHz, P_B/P_R: 37.0879 MHz
	AVC-Intra 50: Y: 13.5 MHz, P_B/P_R: 6.75 MHz
Quantizing:	10 bit
Video Compression Format:	MPEG-4 AVC/H.264 Intra Profile

Digital audio Unit

Audio Recording Signal:	48 kHz/16 bit, 4CH
Head room:	20 dB/18 dB Menu selectable

Video Input/Output Unit

GENLOCK IN:	BNC × 1, 1.0 V [p-p], 75 Ω
HD SDI OUT:	BNC × 2 (L/R), 0.8 V [p-p], 75 Ω
HD SDI MONITOR OUT:	BNC × 1, 0.8 V [p-p], 75 Ω
HDMI OUT:	A type × 1 • Simultaneous output with HD SDI OUT is not possible.
HD SDI RETURN IN:	BNC × 1, 0.8V [p-p], 75 Ω

Audio Input/Output Unit

MIC IN:	XLR, 5-pin +48 V (available) available menu selections: –40 dBu/–50 dBu
AUDIO IN:	XLR × 2, 3-pin (CH1, CH2) LINE/MIC/+48 V (selectable) LINE: available menu selections: +4 dBu/0 dBu/–3 dBu MIC: available menu selections: –50 dBu/–60 dBu
WIRELESS:	25-pin, D-SUB, –40 dBu
Earphone:	ø3.5 mm stereo mini jack × 2
Internal speaker:	28 mm diameter × 1

Other Input/Output Unit

|	
TC IN:	BNC × 1, 0.5 V [p-p] to 8 V [p-p], 10 kΩ
TC OUT:	BNC × 1, low impedance, 2.0 V ± 0.5 V [p-p]
DC IN:	XLR × 1, 4 pins, DC 12 V (DC 11.0 V to 17.0 V)
DC OUT:	4 pins, DC 12 V (DC 11.0 V to 17.0 V), Maximum rated current: 1.5 A
REMOTE:	10 pins
CAMERA REMOTE:	ZOOM S/S: Super mini jack (2.5 mm diameter) × 1 FOCUS IRIS: Super mini jack (3.5 mm diameter) × 1 CONVERGENCE: Super mini jack (2.5 mm diameter) × 1

LCD Monitor Unit

LCD monitor:	82 mm (3.2 inch) color LCD monitor with approx. 921,000 dots (16:9)

Chapter 11 Specifications

Connector Signal Description

DC IN	
1	GND
2	NC
3	NC
4	+12 V

Panasonic Part No. K1AA104H0038
Manufacturer Part No. HA16RX-4P (SW1) (76)
(Hirose Electric Co.)
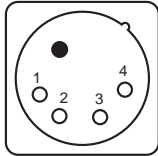
◆ NOTE

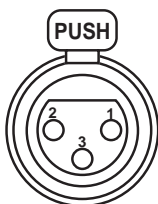**Be sure to use correct polarity when using external power supplies.**

FRONT MIC IN	
1	GND
2	L CH IN (H)
3	L CH IN (C)
4	R CH IN (H)
5	R CH IN (C)

Panasonic Part No. K1AB105B0002
Manufacturer Part No. NC5FBH (NEUTRIK)
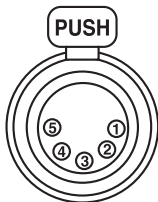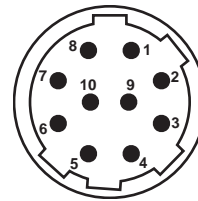
AUDIO IN CH1, CH2	
1	GND
2	AUDIO IN (H)
3	AUDIO IN (C)

Panasonic Part No. K1AY103A0001
Manufacturer Part 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 Part No. K1AY110JA001
Manufacturer Part No. HR10A-10R-10SC (71)
(Hirose Electric Co.)

DC OUT	
1	GND
2	R TALLY (open collector)
3	REC SW
4	UNREG +12 V (Max 1.5 A)

Panasonic Part No. K1AY104J0001
Manufacturer Part No. HR10A-7R-4SC (73)
(Hirose Electric Co.)
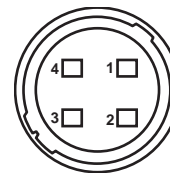
| Wireless receiver interface		
1	CH-1 SHIELD	GND
2	CH-1 HOT	Audio input from a wireless receiver: CH1 HOT
3	CH-1 COLD	Audio input from a wireless receiver: CH1 COLD
4	GND	GND
5	UNREG +12 V	Power supply for a wireless receiver
6	RX ON	Remote power output to a wireless receiver
7	RF WARN	RF warning input from a wireless 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 a wireless receiver: CH2 HOT
16	CH-2 COLD	Audio input from a wireless receiver: CH2 COLD
17	+5.6 V	Power supply for a wireless receiver
18	VIDEO OUT	Not used
19	VIDEO RET	Not used
20	VIDEO EN	Not used
21	RM1 (RM CLK)	Not used
22	RM2 (RM DATA)	Not used
23	RM3 (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.)
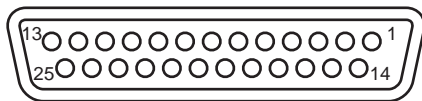
Dear customer,

Thank you for choosing Panasonic!

Please take time to fill in the information on the right. Be sure to **retain this manual** as your convenient camera information source.

Date of Purchase

Dealer Purchased From

Dealer Address

Dealer Phone No.

Model No.

Serial No.

Information for Users on Collection and Disposal of Old Equipment and used Batteries

These symbols on the products, packaging, and/or accompanying documents mean that used electrical and electronic products and batteries should 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 and the Directives 2002/96/EC and 2006/66/EC.

EU

By disposing of these products and batteries correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.

For more information about collection and recycling of old products and batteries, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.

Penalties may be applicable for incorrect disposal of this waste, in accordance with national legislation.

EU

For business users in the European Union
If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

Information on Disposal in other Countries outside the European Union
These symbols are only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.

Cd

Note for the battery symbol (bottom two symbol examples):
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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