

HD Color Camera

Operating Instructions

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

HXC-D70

Exmor
FULL HD 3CMOS


MEMORY STICK™

Owner's Record

The model and serial numbers are located at the top. Record these numbers in the spaces provided below. Refer to them whenever you call upon your Sony dealer regarding this product.

Model No. _____ Serial No. _____

WARNING

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

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

For the customers in the U.S.A.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

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

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.

For the customers in Canada

This Class A digital apparatus complies with Canadian ICES-003.

For the customers in Europe

This product with the CE marking complies with the EMC Directive issued by the Commission of the European Community.

Compliance with this directive implies conformity to the following European standards:

- EN55103-1: Electromagnetic Interference(Emission)
- EN55103-2: Electromagnetic Susceptibility(Immunity)

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

For the customers in Europe

The manufacturer of this product is Sony Corporation, 1-7-1 Konan, Minato-ku, Tokyo, Japan.

The Authorized Representative for EMC and product safety is Sony Deutschland GmbH, Hedelfinger Strasse 61, 70327 Stuttgart, Germany. For any service or guarantee matters please refer to the addresses given in separate service or guarantee documents.

For the State of California, USA only

Perchlorate Material - special handling may apply, See www.dtsc.ca.gov/hazardouswaste/perchlorate
Perchlorate Material : Lithium battery contains perchlorate.

For the customers in Taiwan only



廢電池請回收

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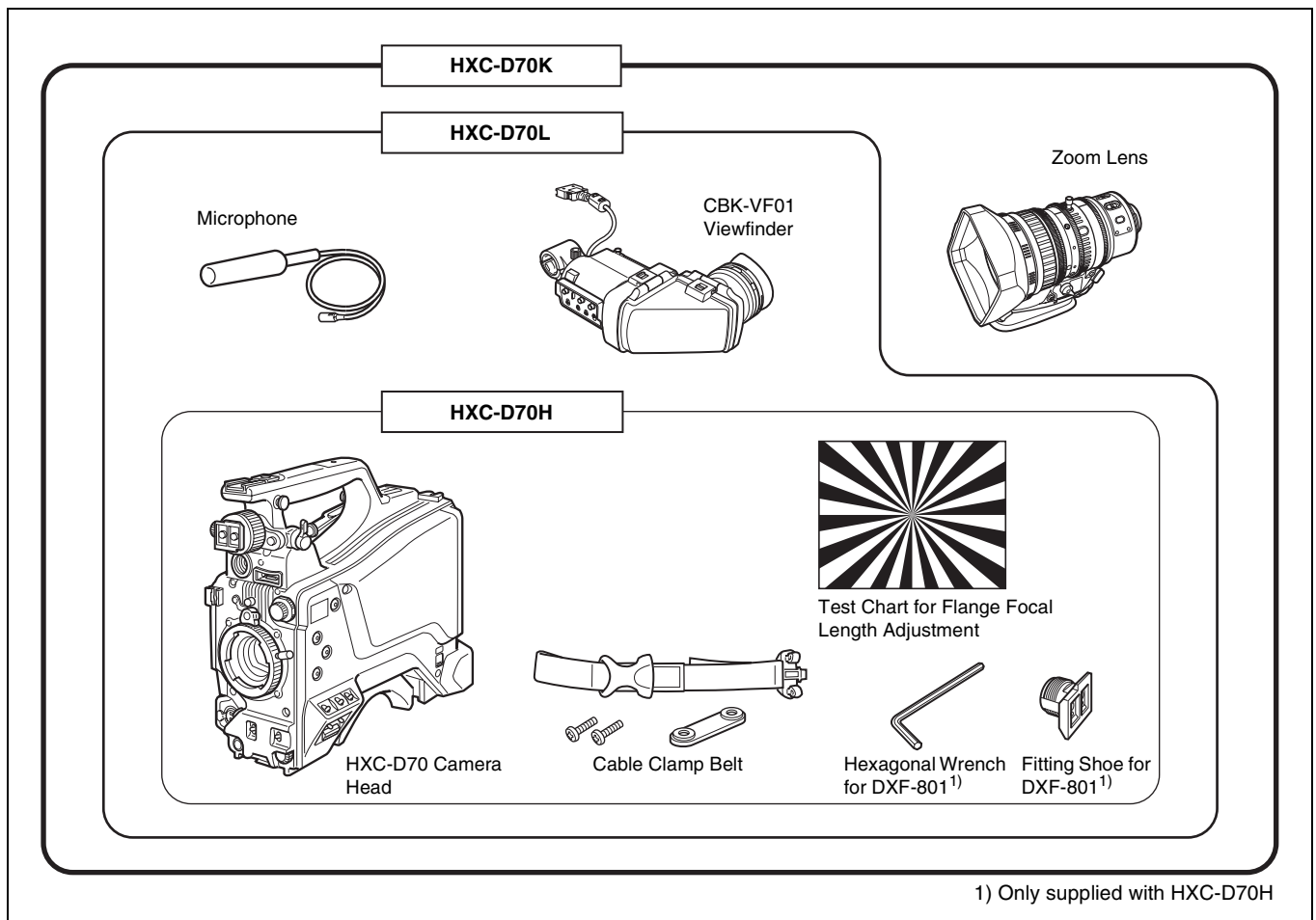
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Product Configurations

The HXC-D70 comprises the components as shown in the figure below.
The operation of the basic camera unit is the same in all cases.



Features

High picture quality and high performance

The HXC-D70 is an HD color video camera equipped with three-chip 2/3-type “Exmor” CMOS image sensors. The approximately 2.07 million effective pixels image sensor technology for full HD resolution (1920 × 1080) and newly developed digital processing circuit enable the capture of very high-quality images, with a sensitivity of F12 (59.94i) / F13 (50i) and an SN ratio of 56 dB (w/o Noise Suppression (NS) mode).

High-resolution pictures can be transmitted between the camera and camera control Unit (CCU) using Sony-developed digital transmission technology via multi-core cable.

Multiple formats

The camera supports 1080/59.94i, 720/59.94P, 1080/50i, and 720/50P formats. With its wide-range down-converter, the camera also enables output of high-quality SD signals (525i/625i) from the camera and the connected CCU.

Using the HXCU-D70 and CCU-D50/D50P camera control units (CCU)

The camera is compatible with the HXCU-D70 for HD/SD signal output, and CCU-D50/D50P for SD signal output. With HXCU-D70, HD/SD simultaneous output can be provided from both the camera and CCU.

Newly designed integrated unit

The camera comes with stylish and sophisticated appearance. It provides easy-to-use design for setting up a system with multi-core cables or for shooting with batteries on your shoulder. The CCZ-A connector on the camera enables you to connect it to the CCU using a single Sony multi-core cable. The interface follows the original design with more user-friendly features.

Various picture adjustment functions

Selection of multiple gamma tables

Seven types of standard and 4 types of hypergamma tables are featured. The hypergamma values enable cinema-like image creations with wide dynamic range, which are different from those achieved with conventional video gamma.

Knee saturation

Change in hue and decrease in saturation that occur in highlighted areas can be compensated. This enables reproduction of natural skin tones under strong lighting.

Low key saturation

Saturation in low-key zones can be compensated.

Skin-tone detail

This function allows control (emphasis or suppression) of the detail level for just a certain hue or saturation area in the image, such as skin tones.

Auto focus

The 2/3-type auto focus lens (supplied with HXC-D70K) ensures high-quality shooting in all situations from wide angle to telephoto. Using the HXC-D70 HD Color Camera enables auto-focusing, which is especially useful for technically demanding HD shooting.

Position-adjustable shoulder pad

The position of the shoulder pad can be adjusted for stable shooting according to the build of the camera operator, the type of lens in use, or the shooting style. A low-repulsion shoulder pad (position fixed) is available as an option. (Part No.: A-8286-346-A)

Assignable switches

The camera has buttons on the side panel to which various functions can be assigned. You can activate your desired function, such as electronic color-temperature conversion and digital extender, instantly when shooting by assigning it to one of these buttons in advance.

Auto lens aberration compensation

The Auto Lens Aberration Compensation (ALAC) function automatically reduces chromatic aberration of magnification when a lens that supports auto aberration compensation is attached.

For details on lenses supporting auto aberration compensation, contact your Sony dealer or a Sony service representative.

Focus assist functions

The VF (viewfinder) detail and focus assist indicator functions facilitate focusing.

VF detail

Various functions are provided for the VF detail signal, which can be added only on images on the viewfinder screen, in order to facilitate focusing, as follows:

Coloring the VF detail signal

Adding flicker to the VF detail signal by applying modulation

Thickening the VF detail signal

Automatically compensating for the VF detail level according to zoom position

Focus assist indicator

The focusing level indicator in the viewfinder provides a guide for focusing. The best focus setting can be easily determined by observing the level indicator as a guide.

User selectable VF interfaces

Two selectable interfaces - analog VF (20-pin, round) and digital VF (26-pin, rectangular) - allow for a versatile choice of viewfinders. Sony's newly developed 5-type color LCD viewfinders (DXF-C50WA) or existing CRT viewfinders, such as DXF-51 and DXF-20W, can be attached to the analog interface. Additionally, a digital interface is available for the 3.5-type color LCD VF CBK-VF01 (supplied with HXC-D70K/HXC-D70L).

“Memory Stick Duo” operation

The camera is equipped with a “Memory Stick Duo” slot, which enables setup data storage and software upgrading using a “Memory Stick Duo.”

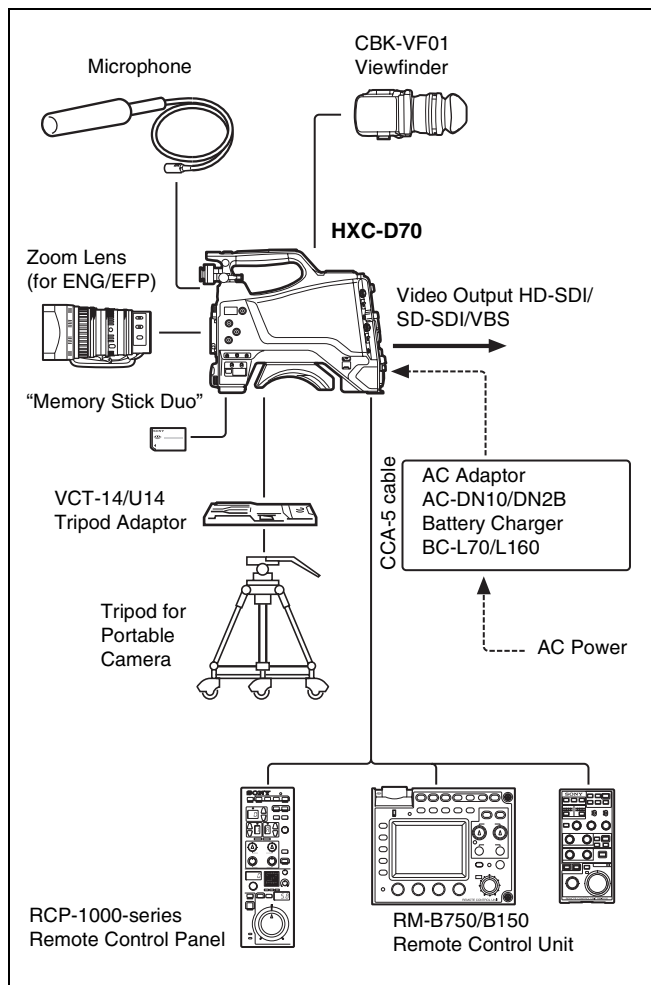
System Configuration

Peripherals and related devices for the camera are shown in figures.

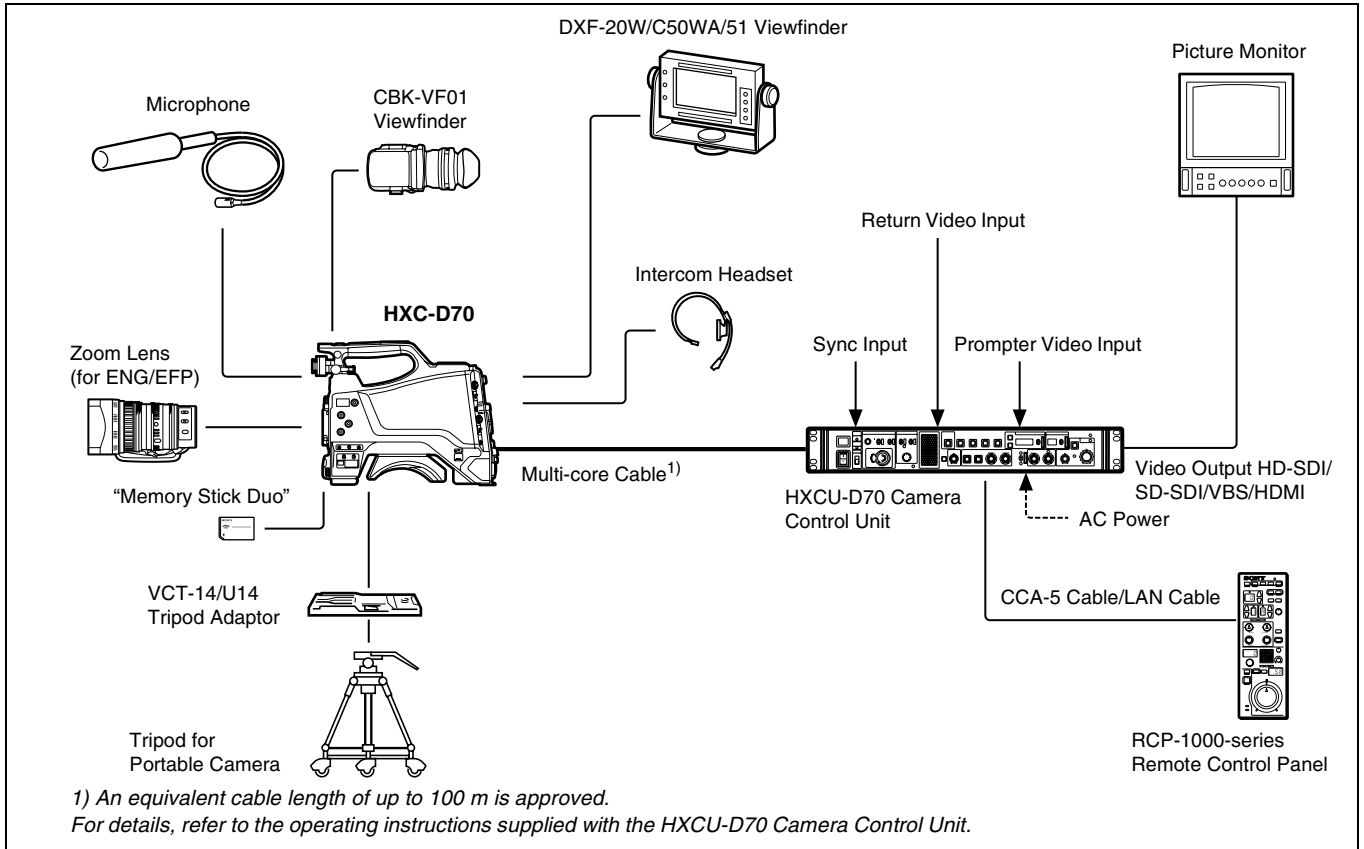
Note

Production of some of the peripherals and related devices shown in the figures has been discontinued. For advice on choosing devices, please contact your Sony dealer or a Sony service representative.

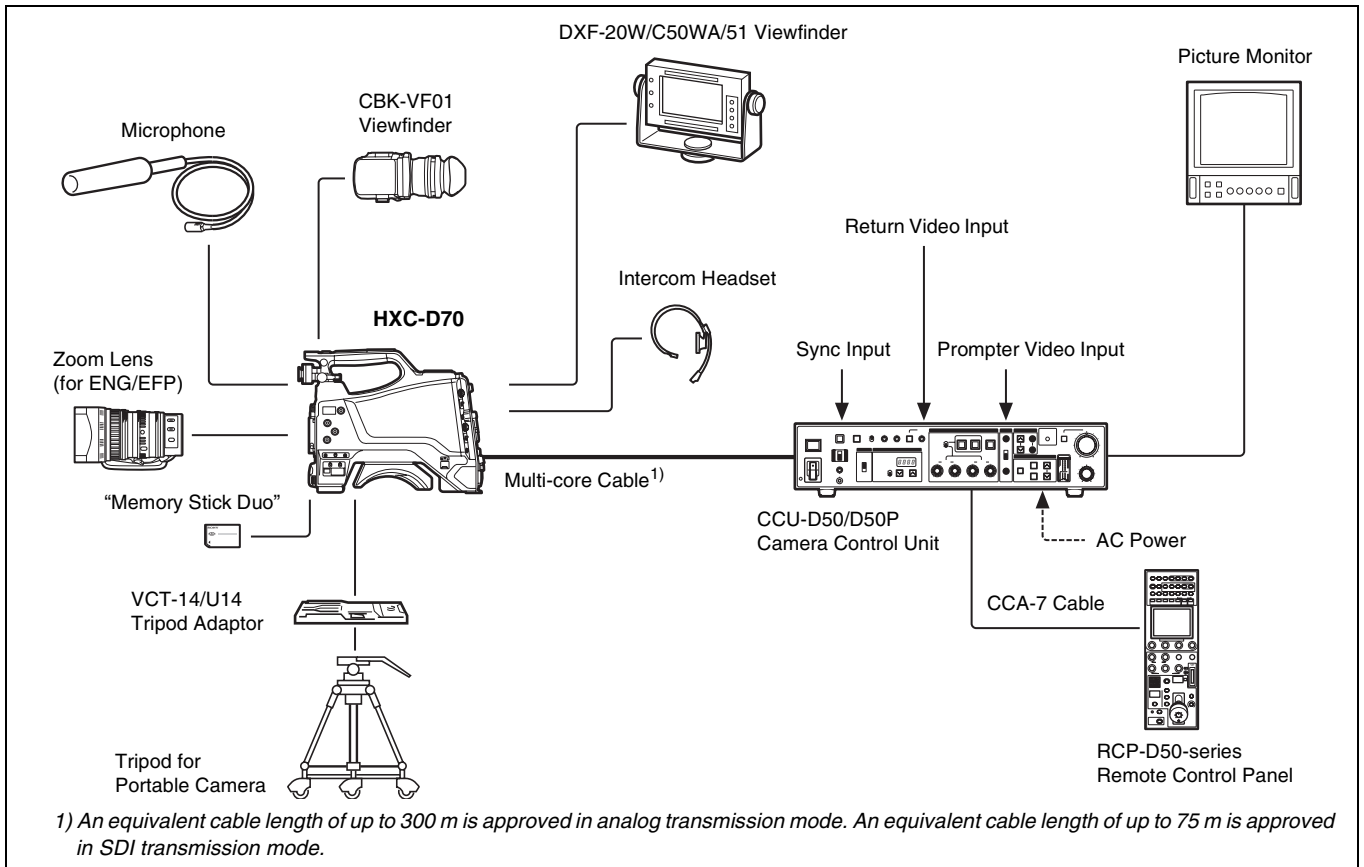
Standalone operation example



System operation example (with the HXCU-D70 Camera Control Unit)



System operation example (with the CCU-D50/D50P Camera Control Unit)

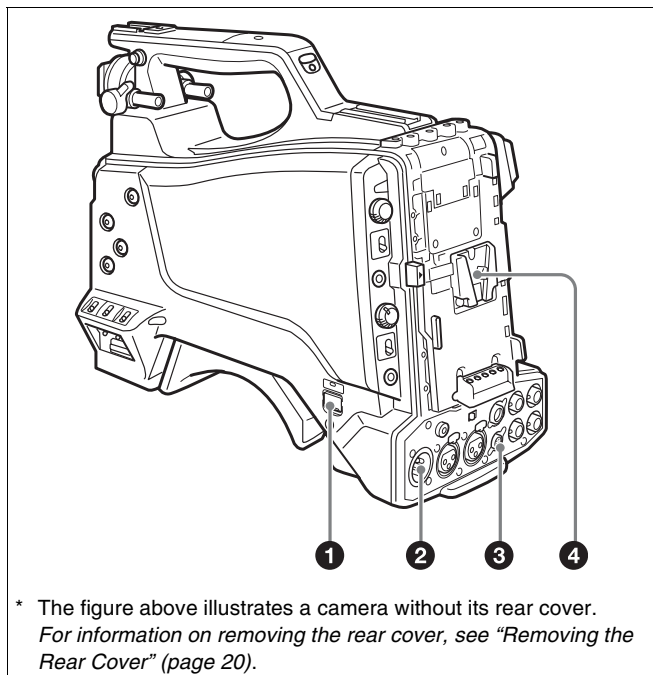


Locations and Functions of Parts and Controls

Note

For your safety, and to ensure proper operation of the camera, Sony recommends the use of the following battery packs: BP-GL95A, BP-GL65A, BP-L60S, and BP-L80S.

Power Supply



1 Power switch

Turn the power supply on and off. The indicator lights up in green when the power is on.

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

To operate the camera from an external DC power supply, connect an optional DC power cord to this connector and then connect the cord to the DC output connector of the BC-L70, BC-L160, or another battery charger.

For information on pin assignment, see "DC IN" in "Pin assignment" on page 79.

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

To supply power to a script light or equivalent (maximum 1.5 A).

For information on pin assignment, see "DC OUT" in "Pin assignment" on page 79.

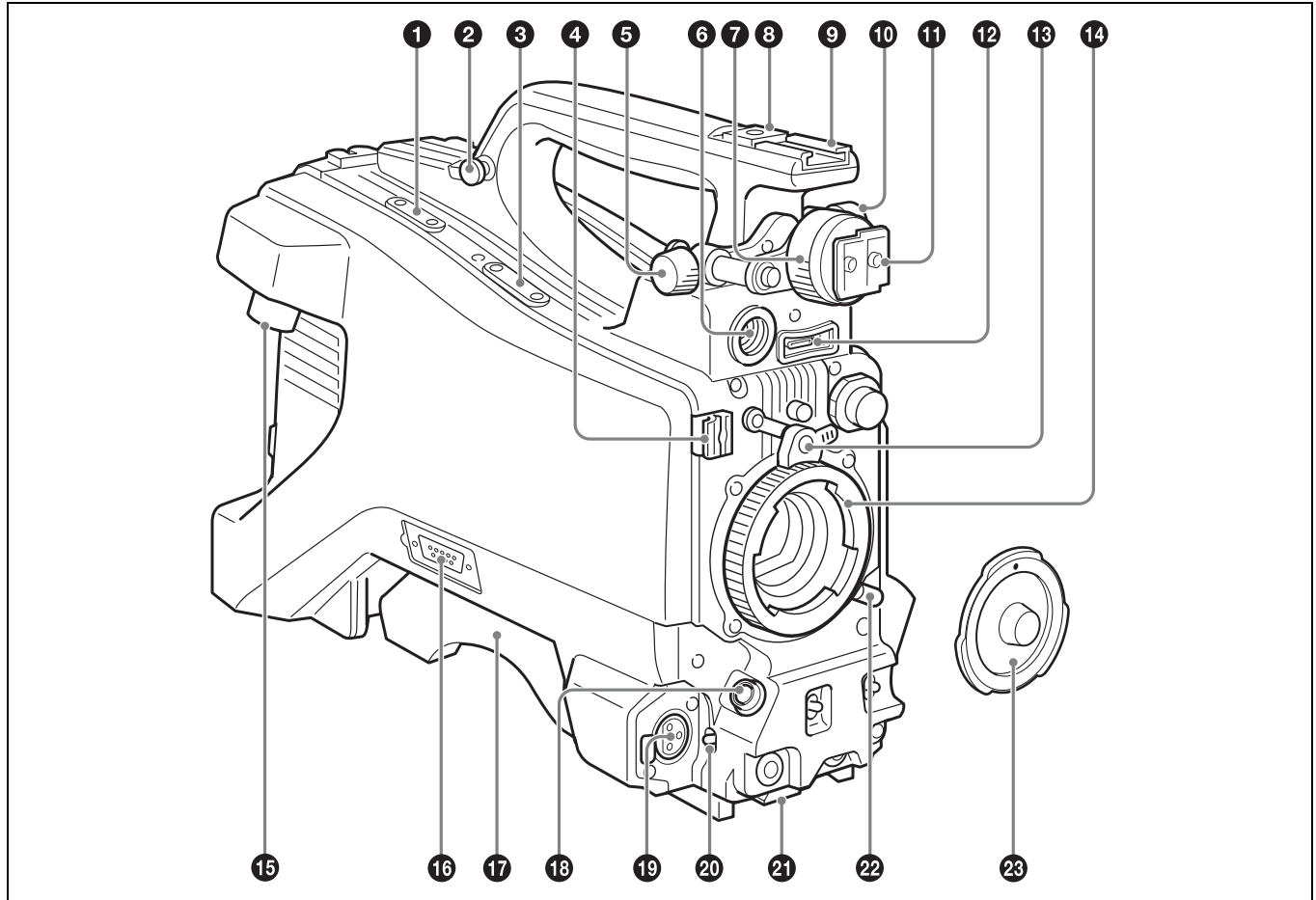
4 Battery attachment shoe

Attach a BP-GL95A/GL65A/L80S/L60S Battery Pack. Alternatively, you can attach an AC-DN2B/DN10 AC Adaptor to operate the camera on AC power supply.

For details, see "Standalone Operation" (page 20).

For details, see "Attaching a UHF Portable Tuner (for a UHF Wireless Microphone System)" (page 33).

Accessory Attachments



1 Cable clamp attachment

Attach the supplied cable clamp.

2 Shoulder strap fitting

Attach an optional shoulder strap (A-6772-374-C) (see page 34).

3 Fitting for optional microphone holder

Fit an optional CAC-12 microphone holder (see page 31).

4 Lens cable clamp

Clamp a lens cable.

5 Viewfinder front-to-back positioning lock knob

Loosen this knob to adjust the front-to-back position of the viewfinder (see page 22).

6 VF (viewfinder) connector (20-pin, round)

Connect a cable supplied with an optional viewfinder (DXF-51, DXF-C50WA or DXF-20W).

7 Viewfinder left-to-right positioning ring

Loosen this ring to adjust the left-to-right position of the viewfinder (see page 22).

8 1/4-inch-screw-type accessory shoe

9 Slide-type accessory shoe

10 Viewfinder front-to-back positioning lever

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

11 Viewfinder fitting shoe

Attach a viewfinder.

For information on attaching the DXF-801 viewfinder, see "Attaching the DXF-801 viewfinder" (page 25).

12 VF (viewfinder) connector (26-pin, rectangular)

Connect the viewfinder provided with HXC-D70K and HXC-D70L.

13 Lens mount securing rubber

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

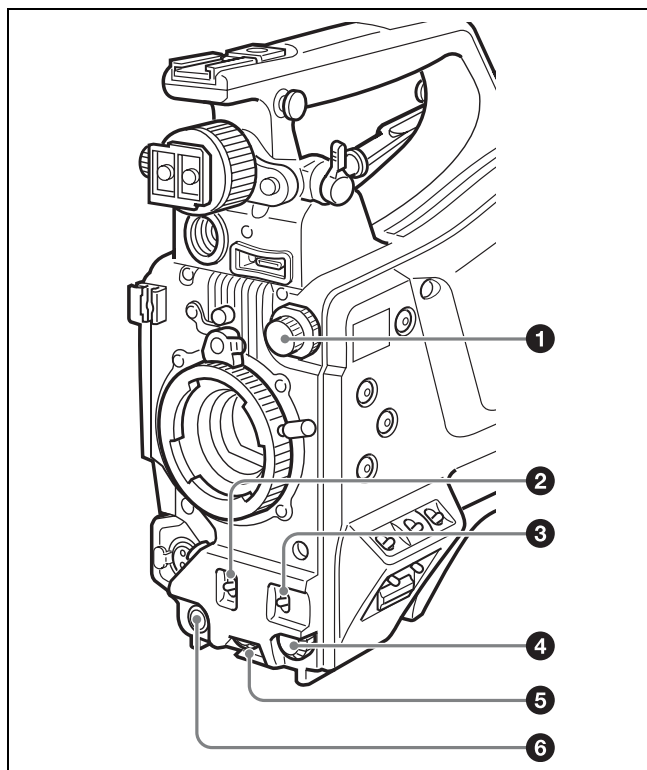
14 Lens mount (special bayonet mount)

Attach a lens.

Consult your Sony dealer or a Sony service representative for information about available lenses.

Operating and Connectors Section

Front



1 FILTER (filter select) knob

Switch between four built-in ND filters. The selected filter setting appears in the viewfinder for about three seconds.

FILTER knob setting	ND filter
1	Clear
2	$\frac{1}{4}$ ND (attenuates light to approximately $\frac{1}{4}$)
3	$\frac{1}{16}$ ND (attenuates light to approximately $\frac{1}{16}$)
4	$\frac{1}{64}$ ND (attenuates light to approximately $\frac{1}{64}$)

You can change a MAINTENANCE menu setting so that different white balance settings can be stored for different FILTER knob positions. This allows you to automatically obtain optimum white balance for the current shooting conditions in linkage with the filter selection.

For details, see “Adjusting the White Balance” (page 37).

2 SHUTTER selector

Set to ON to use the electronic shutter. Push to SEL to switch the shutter speed or shutter mode setting. When this selector is used, the shutter speed settings appear in the viewfinder for about three seconds.

Unavailable when the camera is connected to the CCU.

15 Camera control unit (CCU) connector (multi-core interface)

Set up a system with the HXCU-D70 or CCU-D50/D50P camera control unit using multi-core cables.

16 TRUNK connector (D-sub 9-pin)

Use for trunk signal communication between the camera and HXCU-D70 Camera Control Unit.

For information on pin assignment, see “TRUNK” in “Pin assignment” on page 79.

17 Shoulder pad

Raise the shoulder pad fixing lever to adjust the position in the front-to-rear direction. Adjust the position for maximum convenience when operating the camera on your shoulder (see page 35).

18 LENS connector (12-pin)

Connect a lens cable to this connector.

Note

When connecting/disconnecting the lens cable to/from this connector, power off the camera first.

19 AUDIO 1 IN (audio input 1) connector (XLR type, 3-pin, female)

Audio input connector to which you can connect audio equipment or a microphone.

Audio signals input to this connector will be output from the AUDIO OUTPUT CH1 connector when the camera is used with the HXCU-D70. Audio signals input to this connector will be output from the MIC OUT connector when the camera is used with the CCU-D50/D50P. You can change the output configuration in MAINTENANCE > AUDIO in the setup menu (see page 65).

For information on pin assignment, see “AUDIO 1/2 IN” in “Pin assignment” on page 80.

20 Audio input select switch

Select the audio level input to the AUDIO 1 IN connector using the select switch.

+48V: To supply phantom power +48 V to condenser microphones

MIC: When a microphone is connected

LINE: When a line-level (0 dBu) signal source is connected

Select +48V when using the microphone supplied with HXC-D70K/D70L.

21 Tripod mount

When using the camera on a tripod, attach the tripod adaptor (optional) (see page 33).

22 Lens locking lever

After inserting the lens in the lens mount, rotate the lens mount ring with this lever to lock the lens in position.

After locking the lens, be sure to use the lens mount securing rubber to prevent the lens from becoming detached.

23 Lens mount cap

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

3 WHT/BLK (automatic white/black balance adjustment) switch

Activate the automatic white/black balance adjustment functions.

WHT: Adjust the white balance automatically. If the WHITE BAL switch (see page 13) is set to A or B, the white balance setting is stored in the corresponding memory. If the WHITE BAL switch is set to PRST, the automatic white balance adjustment function does not operate.

BLK: Adjust the black set and black balance automatically. You can use the WHT/BLK switch even when the ATW (Auto Tracing White Balance) function is operating. If you push the switch to the WHT side once more during the automatic white balance adjustment, the adjustment is cancelled and the white balance setting returns to the original setting.

If you push the switch to the BLK side once more during the automatic black balance adjustment, the adjustment is cancelled and the black balance setting returns to the original setting.

Unavailable when the camera is connected to the CCU.

4 Menu control knob (rotary encoder)

Use to select settings from menus displayed in the viewfinder (by rotating it) and to confirm settings (by pushing it). This knob functions the same as that on the rear panel.

5 INTERCOM LEVEL control

- When the HXCU-D70 is connected, use this control to adjust the intercom/earphone volume level. The intercom volume level can also be adjusted using the INTERCOM control on the rear panel of the camera.
- When the camera is either used on its own without connecting a CCU or connected to the CCU-D50/D50P, use this control to set the input gain for a microphone connected to the AUDIO 1 IN and AUDIO 2 IN connectors. You can assign this control to other connectors in OPERATION > VR ASSIGN in the setup menu (see page 57).

6 RET (return video) button

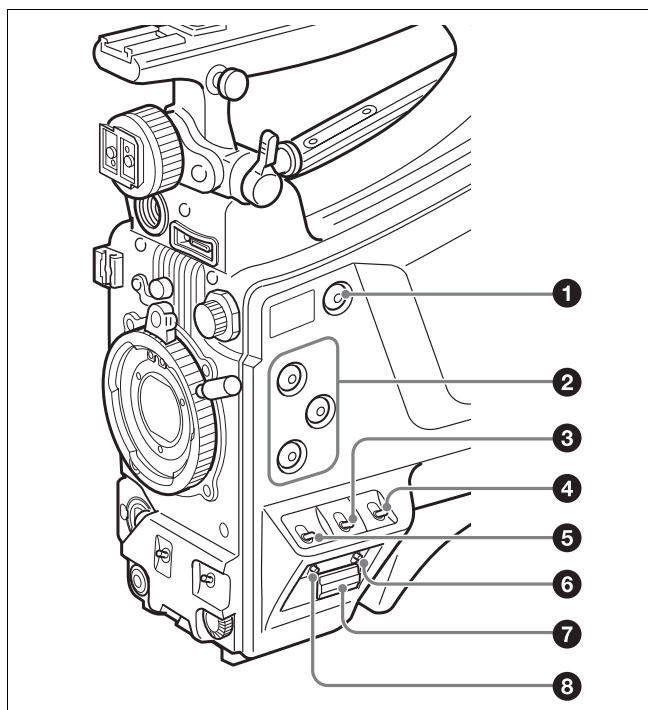
The return video signal from the CCU is monitored in the viewfinder while this button is held pressed. While either DXF-51 or DXF-20W viewfinder is used and the return video signal is monitored in it, no information other than video signal appears on the screen.

You can assign the desired function to this button in OPERATION > SWITCH ASSIGN2 > FRONT RET2 in the setup menu (see page 57).

Note

The display screen may be disturbed when input video signal is switched.

Right side



1 COLOR TEMP. (color temperature) button

Press to light the button and change the color temperature for shooting (factory default setting). You can use this as an assignable switch (see page 57).

2 ASSIGN. (assignable) 1/2/3 buttons

You can assign the desired functions to these switches in OPERATION > SWITCH ASSIGN1 > ASSIGNABLE 1/2/3 in the setup menu (see page 57). OFF is assigned to the ASSIGN. 1/2/3 switches as the factory default setting.

3 OUTPUT (output signal select)/AUTO KNEE switch

Switch the video signal output from the camera module, between the following two.

BARS: Output the color bar signal.

CAM: Output the video signal being shot. When this is selected, you can switch AUTO KNEE¹⁾ on and off.

1) **AUTO KNEE:** Against a very bright background with the iris opening adjusted to the subject, objects in the background will be lost in the glare. The AUTO KNEE function will suppress the high intensity and restore much of the lost detail and is particularly effective in the following cases.

- Shooting people in the shade on a sunny day
- Shooting a subject indoors, against a background through a window
- Any high contrast scene

Unavailable when the camera is connected to the CCU.

4 WHITE BAL (white balance memory select) switch

Control adjustment of the white balance.

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

A or B: Recall the white balance adjustment settings already stored in A or B. Push the WHT/BLK switch (see page 12) on the WHT side, to automatically adjust the white balance, and save the adjustment settings in memory A or memory B.

When this switch is adjusted, the new setting appears in the viewfinder for about three seconds.

Unavailable when the camera is connected to the CCU.

5 GAIN selector

Switch the gain of the video amplifier to match the lighting conditions during shooting. The gains corresponding to the L, M, and H settings can be selected in OPERATION > SWITCH ASSIGN 1 > GAIN L/H/M in the setup menu (see page 57). (The factory settings are L=0 dB, M=6 dB, and H=12 dB.)

When this switch is adjusted, the new settings appear in the viewfinder for about three seconds.

Unavailable when the camera is connected to the CCU.

6 DISPLAY/MENU switch

Select the display in the viewfinder.

DISPLAY: To display various textual information and markers, such as messages showing the camera settings and operating status, the center marker, and the safety zone marker, in addition to camera images.

OFF: Not to display textual information and markers.

MENU: To display menus for camera settings, in addition to camera images.

The switch functions the same as the DISPLAY/MENU switch on the rear operation panel.

7 “Memory Stick Duo” slot and access lamp

Take the cover off and insert a “Memory Stick Duo” into the slot. The access lamp lights in green.

The lamp is lit in red while writing/reading data to/from the “Memory Stick Duo.”

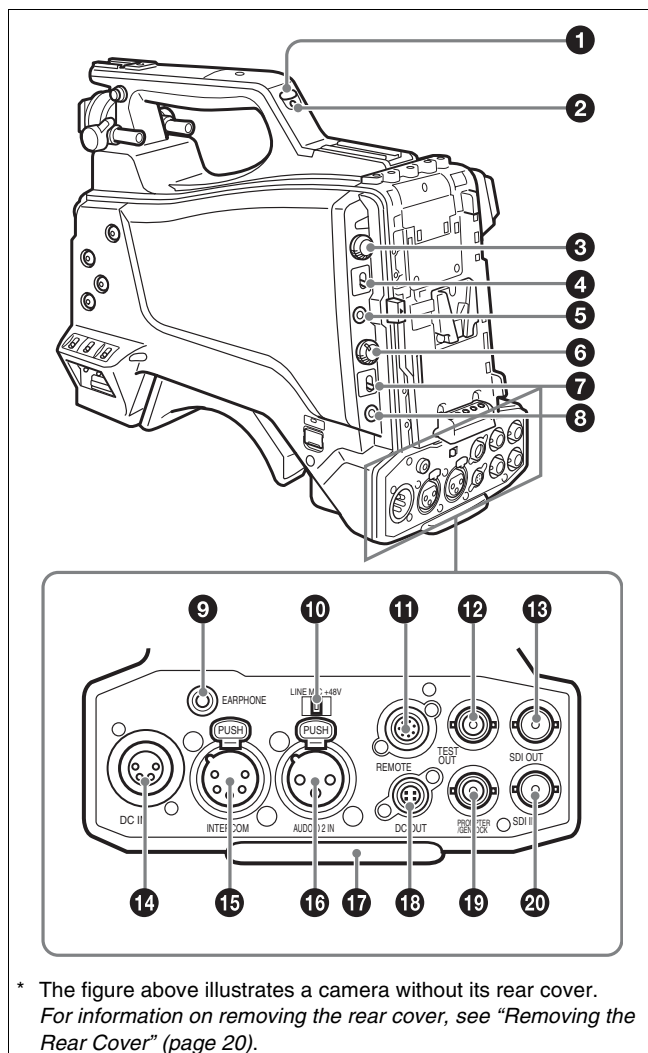
Notes

- Only a “Memory Stick” of Duo size can be used with the camera.
- When the access lamp is lit in red, do not remove the “Memory Stick Duo” or turn off the camera.
- The cover cannot be closed while a “Memory Stick Duo” is inserted into the slot.

8 STATUS/CANCEL switch

STATUS: To display status information of this camera in the viewfinder when no menu is displayed with the DISPLAY/MENU switch set to DISPLAY.

CANCEL: To cancel changed settings or return the display to the previous menu when a menu is displayed in the viewfinder.

Rear

* The figure above illustrates a camera without its rear cover. For information on removing the rear cover, see “Removing the Rear Cover” (page 20).

1 TALLY (back tally) indicators (red/green)

ON: The tally lamp lights when a tally signal is input to the connected CCU or a call signal is generated in response to pressing of a CALL button.

OFF: The tally lamp is prevented from lighting.

2 TALLY switch

Set to ON to activate the TALLY indicator function.

3 Menu control knob (rotary encoder)

This knob functions the same as that on the front panel (see page 12).

4 DISPLAY/MENU switch

This switch functions the same as that on the right panel (see page 13).

5 CALL button

When you press this button, the red tally lamps on the front panel of the CCU and the connected external control device (RCP/RM, etc.) will light.

6 INTERCOM control

- When a HXCU-D70 is connected, use this control to adjust the intercom volume level. The intercom volume level can also be adjusted using the INTERCOM LEVEL control on the front panel (see page 12).
- When the camera is either used on its own without connecting a CCU or connected to the CCU-D50/D50P, use this control to adjust the intercom volume level. You can assign this control to other connectors in OPERATION > VR ASSIGN in the setup menu (see page 57).

7 INTERCOM ON/OFF switch

Turn the intercom microphone output on or off. Set it to ON to communicate with a CCU or external control device.

8 RET (return video) button

The RETURN1 signal is monitored in the viewfinder.

9 EARPHONE jack (stereo, minijack)

Monitor the audio output from the intercom or audio signals input to the AUDIO 1/2 IN connectors. You can select an audio output to monitor in OPERATION > EARPHONE in the setup menu (see page 58).

The earphone volume level can be adjusted using the INTERCOM LEVEL control on the front panel and OPERATION > EARPHONE in the setup menu (see page 58).

10 AUDIO 2 IN input select switch

Select the audio level input to the AUDIO 2 IN connector using the select switch.

+48V: To supply phantom power +48 V to condenser microphones

MIC: When a microphone is connected

LINE: When a line-level (0 dBu) signal source is connected

11 REMOTE connector (8-pin)

Connect a remote control unit, which makes it possible to control the camera remotely.

Note

Before connecting/disconnecting the remote control unit to/from the camera, be sure to turn off the camera power switch.

For information on pin assignment, see "REMOTE" in "Pin assignment" on page 79.

12 TEST OUT connector (BNC type)

Outputs an analog signal. This connector outputs one of the following signals selected on the menu: VBS, HD-SYNC, SD-SYNC, or the same Y signal that is output from the VF connector (20-pin, round).

Note

When the test out connector outputs a Y signal the same as that from the VF connector (20-pin, round), output signal format from this connector varies depending on which of the following viewfinders are connected.

No viewfinder: SD component (Y) signal

DXF-C50WA viewfinder: HD component (Y) signal

Viewfinders other than DXF-C50WA: SD component (Y) signal

13 SDI OUT connector (BNC type)

Outputs an HD-SDI or SD-SDI signal. You can select the output signal format in the MAINTENANCE menu.

14 DC IN (DC power supply input) connector (XLR 4-pin, female)

Refer to "DC IN connector" in "Power Supply" on page 9.

15 INTERCOM connector (XLR 5-pin)

Connect an XLR 5-pin headset for input and output of intercom audio signals.

For information on pin assignment, see "INTERCOM" in "Pin assignment" on page 79.

16 AUDIO 2 IN (audio input 2) connector (XLR type, 3-pin, female)

Audio input connector to which you can connect audio equipment or a microphone.

Audio signals input to this connector will be output from the AUDIO OUTPUT CH2 connector when the camera is used with the HXCU-D70. Audio signals input to this connector will be output from the MIC OUT connector when the camera is used with the CCU-D50/D50P. You can change the settings in MAINTENANCE > AUDIO in the setup menu (see page 65).

For information on pin assignment, see "AUDIO 1/2 IN" in "Pin assignment" on page 80.

17 Tail guard

This is provided for protecting the cables connected to the connectors on the rear panel.

18 DC OUT (DC power supply output) connector (4-pin, female)

Refer to "DC OUT connector" in "Power Supply" on page 9.

19 PROMPTER/GENLOCK (prompter signal output/external sync signal input) connector (BNC type)

- When a CCU is connected, this connector outputs a VBS prompter signal.
- When the camera is used on its own without connecting a CCU, use this connector for input of an external sync signal (BB or 3-level sync). If a VBS signal is input, you can check the input image by pressing the RET button.

20 SDI IN connector (BNC type)

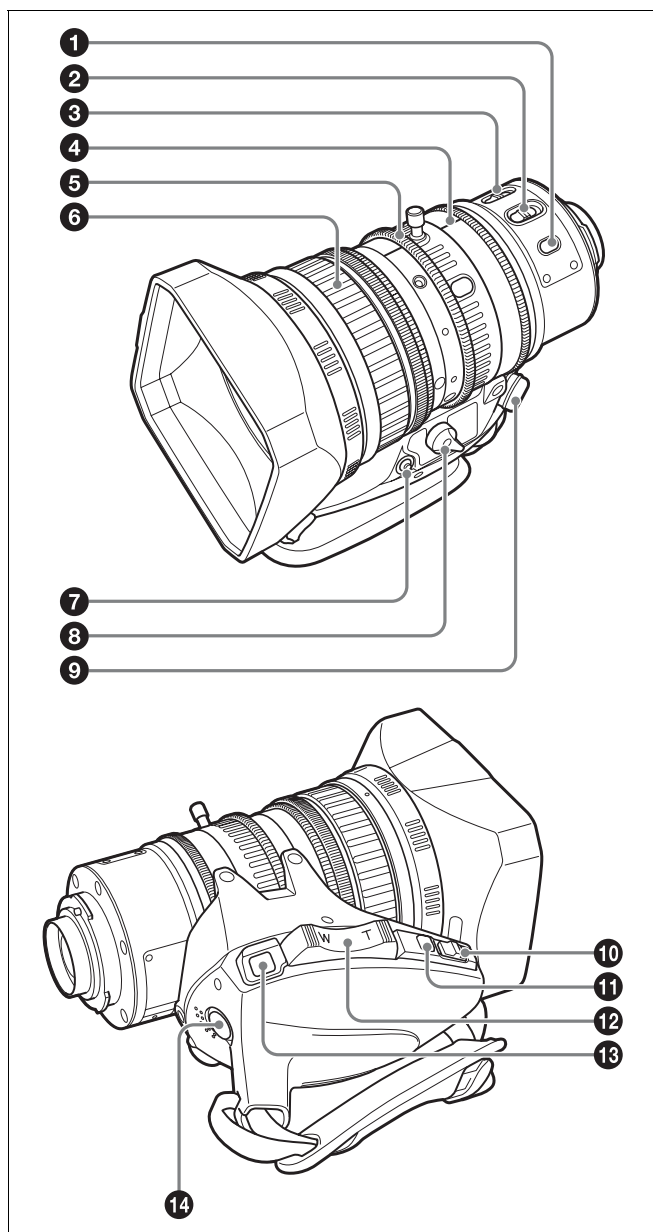
Displays HD-SDI signal input from the SDI IN connector when the RET button is pressed in standalone status.

You can select the signal to be displayed in the viewfinder in MAINTENANCE > EXT RETURN in the setup menu (see page 68).

Notes

- HD-SDI signals in specified format can only be input to the SDI IN connector. You can select the desired format in MAINTENANCE > OUTPUT FORMAT in the setup menu (see page 66).
- Signals input to the SDI IN connector can be displayed in the following viewfinders:
 - CBK-VF01 (supplied with HXC-D70K/D70L)
 - DXF-C50WA
- Signals input to the SDI IN connector cannot be displayed in the viewfinder when SD-SDI is selected in MAINTENANCE > SDI OUT in the setup menu (see page 66).

Auto Focus Lens (Supplied with HXC-D70K)



1 PUSH AF (auto focus) button

When the focus adjustment is in the manual mode, by pressing this button you can use the auto focus for an instantaneous adjustment to the subject. When the button is pressed, the auto focus operates until the image is in focus, then disengages. Even when the FOCUS switch is set to A (auto), by pressing this button, you can restart the auto focus.

2 FOCUS (focus adjustment mode) switch

A (auto): The auto focus function is constantly active. Even with the switch in the A position, you can manually adjust the focus by operating the focus ring.

M (manual): The manual mode allows focusing adjustment with the focus ring.

In manual mode, auto focus adjustment is also possible, by pressing the PUSH AF button.

3 MACRO switch

When this switch is in the ON position, the macro mode is enabled, allowing focusing over the whole range (5 cm^{-1} to ∞) including the macro range (from 5 cm^{-1} to 90 cm from the front of the lens).

This operation is independent of whether the focus adjustment mode is auto or manual.

In the macro range, the auto focusing speed is lower.

1) At the wide-angle setting

4 Iris ring

For manual iris adjustment, set the IRIS switch to the M (manual) position, then turn this ring.

5 Zoom ring

For manual zoom adjustment, set the ZOOM switch to the MANUAL position, then turn this ring.

6 Focus ring

Turn this ring to adjust the focus.

This ring can be turned endlessly in both directions. The faster you turn, the faster the focusing mechanism operates, to minimize the amount of turning required for focusing.

When you slide the focus ring back (toward the camera), the focus mode becomes Full MF mode (see page 40).

7 Flange focal length adjustment button

Press this to adjust the flange focal length (the distance from the lens mounting flange plane to the focusing plane) (see page 30).

8 Zoom control connector (8-pin)

Connecting an optional zoom servo controller allows remote control of zooming.

9 ZOOM switch

SERVO: Motorized zoom. Operate the zoom with the power zoom lever.

MANU. (manual): Manual zoom. Operate the zoom with the zoom ring.

10 PUSH AUTO button

When the IRIS switch is in the M position for manual adjustment, press this button for an instantaneous auto adjustment.

The iris is automatically adjusted while the button is held down.

11 IRIS switch

A (auto): The iris is adjusted automatically.

M (manual): Adjust the iris with the iris ring.

12 Power zoom lever

This is enabled when the ZOOM switch is in the SERVO position. Press the W end for wide-angle and the T end for telephoto.

Press the lever harder for a faster zoom action.

Notes on auto focus

- In the following cases, it may be difficult to focus on the subject. If this does happen, use manual focusing.
 - If the subject has no contrast
 - If the subject is moving rapidly

- When shooting point light sources, under street lighting or at night
- When there are very bright objects close to the subject
- When shooting through a glass window
- If there are a number of objects within the screen at close and far range, the focus may not be on the intended subject. In this case, with the subject on which you want to focus in the center of the screen, press the PUSH AF button.
- After focusing with the PUSH AF button, if you operate the zoom or adjust the iris, the depth of field may become shallower, losing crisp focus. In such cases, press the PUSH AF button once more.
- If you focus at wide-angle then zoom to telephoto, the subject may no longer be in focus.

Note on zoom speed

Depending on the shooting distance, the zoom speed may fall as the lens approaches the telephoto end.

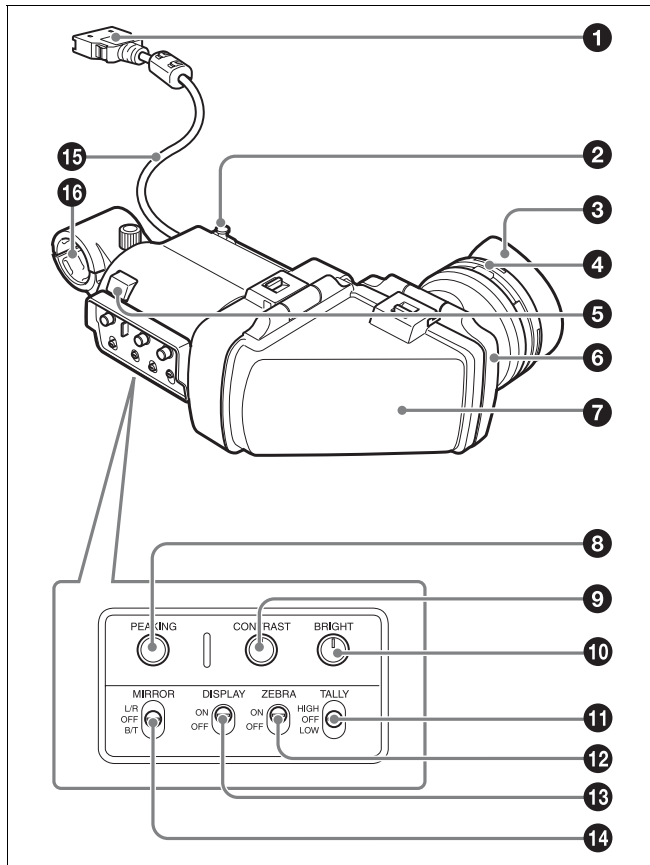
13 RET (return video) button

The RETURN1 signal is monitored in the viewfinder.

14 VTR button

You can assign the desired function to this button in OPERATION > SWITCH ASSIGN2 > LENS VTR S/S in the setup menu (see page 57).

Viewfinder (supplied with HXC-D70K/D70L)



1 Plug

Connect to the VF connector (rectangular) on the camera.

2 Stopper

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

3 Eyecup

4 Diopter adjustment ring

Allows for optimal focus adjustment.

5 Tally indicator

When an abnormality occurs, the tally indicator flashes to indicate a warning.

6 Eyepiece

You can raise this up when required by the situation.

7 Viewfinder barrel

You can raise this up or rotate when required by the situation.

8 PEAKING control

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

9 CONTRAST control

Adjust the contrast of the screen. This control has no effect on the output signals of the camera.

10 BRIGHT control

Adjust the brightness of the screen. This control has no effect on the output signals of the camera.

11 TALLY switch

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

HIGH: The tally indicator brightness is set to high.

OFF: The tally indicator is disabled.

LOW: The tally indicator brightness is set to low.

12 ZEBRA (zebra pattern) switch

Control the zebra pattern display in the viewfinder as follows.

ON: Display a zebra pattern.

OFF: Do not display a zebra pattern.

13 DISPLAY switch

Turn the display of text information on and off.

ON: Display text information.

OFF: Do not display text information.

14 MIRROR switch

The image display on the monitor screen becomes reversed horizontally or vertically when the viewfinder barrel is raised up or rotated. Use this switch to control the image display in such situation.

L/R: Reverse the image horizontally.

OFF: Do not reverse the image.

B/T: Reverse the image vertically.

15 Viewfinder cable

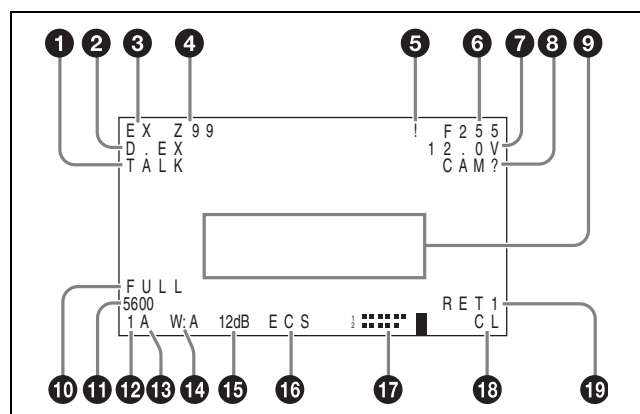
16 Microphone holder

Viewfinder Screen Display

Besides the video image, the viewfinder can display characters and messages showing the camera settings and operation status, as well as items such as a center marker or safety-zone marker.

When the DISPLAY/MENU switch is set to DISPLAY

Items set to ON using the menu or related switches will be displayed.



1 TALK indication

Displayed when the intercom microphone is set to ON.

2 D.EX indication

Displayed when the digital extender function is set to ON.

3 EX (lens extender) indication

Displayed when a lens extender is in use.

4 Zoom position indication

Indicates the approximate position of the zoom lens variator between wide angle (0) and telephoto (99 [infinity]).

5 ! indication

By using the '!' IND function, the '!' indication appears in the viewfinder when non-standard or abnormal conditions are found.

For details, see *OPERATION* > '!' IND in the setup menu (page 55).

6 Focus position indication

Shows the focus position of a zoom lens as a numeric value (0 to 255 [infinity]).

7 Voltage indication

Indicates the power voltage supplied to the camera.

8 DIAG indication

Indicates self-diagnostic information.

9 Message

10 AF (auto focus) indication

Displays the auto focus status.

FULL: Full MF (full manual focus) mode

MF *: Manual focus assist mode

AF: Auto focus mode

11 5600K mode indication

Displayed when the internal electrical filter (5600K) is set to ON.

12 Filter indication

Displays the type of ND filter currently selected with a number (1, 2, 3, or 4).

13 ECC indication

Displays the type of electrical CC filter (A to D) currently selected.

14 White balance memory indication

Shows the currently selected white balance automatic adjustment memory. This is not displayed when a CCU is connected.

W:A: The WHITE BAL switch is set to A.

W:B: The WHITE BAL switch is set to B.

W:P: The WHITE BAL switch is set to PRST.

15 Gain value indication

Shows the video gain value (dB) set with the GAIN selector.

16 Shutter/ECS indication

Displays the shutter/ECS status. Nothing is displayed if the electronic shutter is set to OFF.

17 Audio level meters

Indicates the audio levels input to the AUDIO 1 IN and AUDIO 2 IN connectors.

18 F-value indication

Indicates the lens F (iris opening) value.

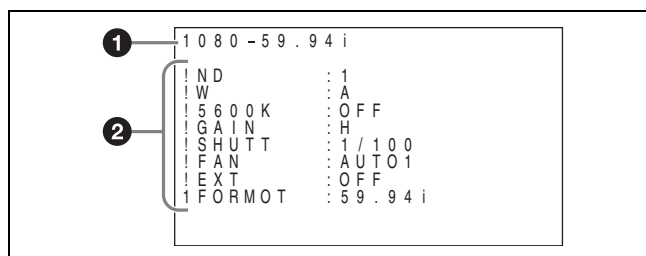
19 Return video indication

Displayed while the RET button is pressed.

When the STATUS/CANCEL switch is pressed toward STATUS

The status display appears when you press the STATUS/CANCEL switch toward STATUS after pressing the DISPLAY/MENU switch toward DISPLAY or when you push on the menu control knob on the rear panel.

Video formats and the adjusted items (not default) are indicated in the status display.



1 Format indication

The current video format is displayed.

② '!' indication area

This area is used to display abnormal statuses, using the '!' IND function. Display options can be set, using the menu.

For details, see *OPERATION > '!' IND in the setup menu (page 55)*.

CALL/TALLY indication in digital viewfinders

Digital viewfinders have no tally lamps. CALL/TALLY indication is displayed as follows.

In digital viewfinders such as CBK-VF01

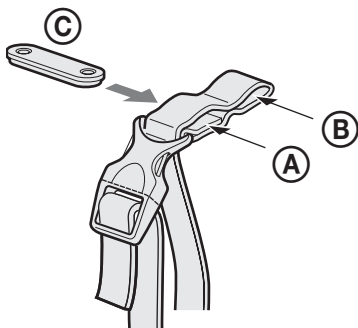


Connecting a Camera Control Unit (CCU)

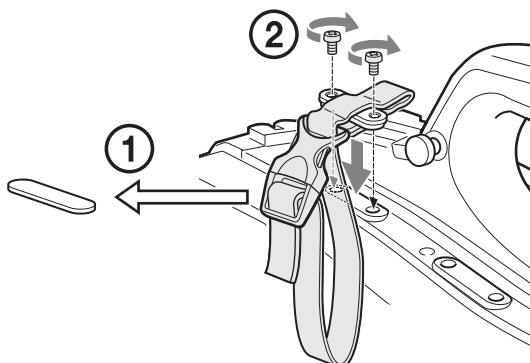
When operating the camera in a system with a CCU, connect between the CCU connector of the camera and the CAMERA connector of the CCU, using a multi-core cable. When required, secure the cable, using the supplied cable clamp belt.

To use the cable clamp belt

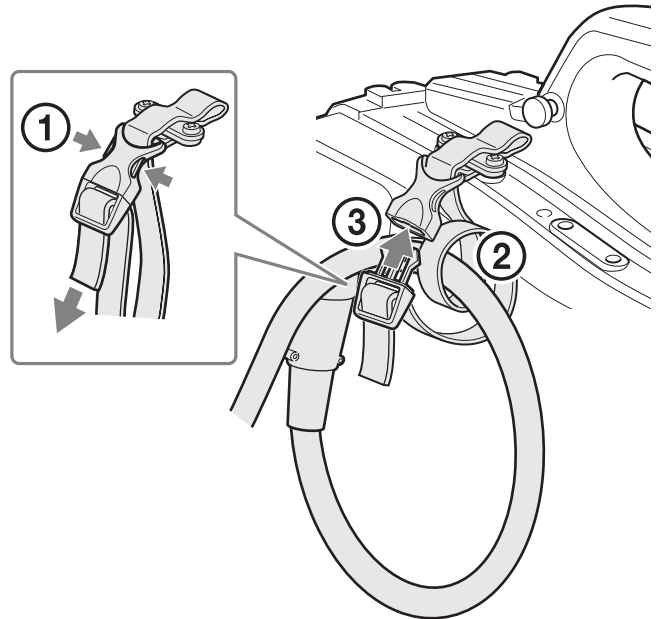
- 1 Insert the belt bracket (C) into hole (A) or (B) of the cable clamp belt.



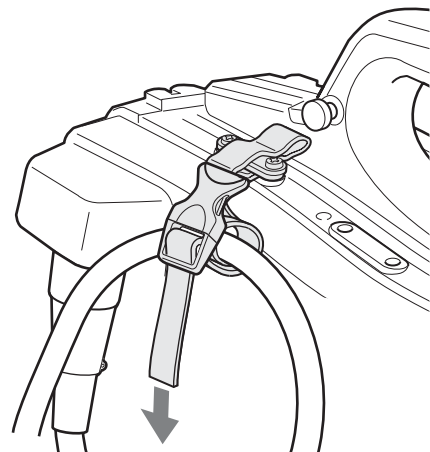
- 2 ① Remove the screw-hole cover on the top rear of the camera and ② secure the cable clamp belt to the camera, using the two supplied screws (+B3×10).



- 3 ① Release the buckle, ② bundle the cable with the belt, ③ then lock the buckle again.



- 4 Adjust the length by pulling down the end of the belt.



Standalone Operation

When the camera is used on its own without connecting a CCU, use a battery pack or AC power to operate it. Be sure to remove the rear cover before using a battery pack or AC power.

For safety, use only a Sony battery pack or AC adaptor listed below.

- BP-GL95A/GL65A/L60S/L80S Lithium-ion Battery Pack
- AC power using the AC-DN2B/DN10 AC Adaptor

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

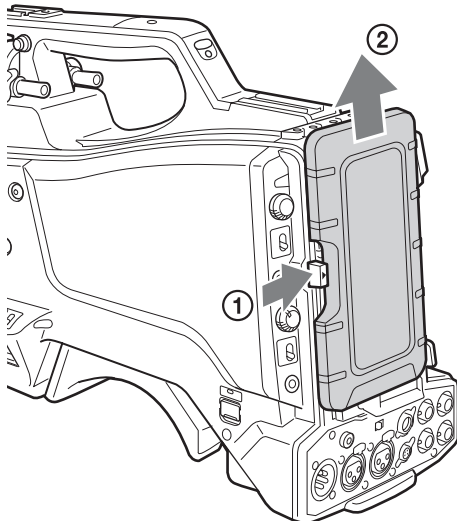
When you dispose of the battery, you must obey the law in the relative area or country.

Removing the Rear Cover

Remove the rear cover before using AC power or attaching a battery pack to operate the camera on its own.

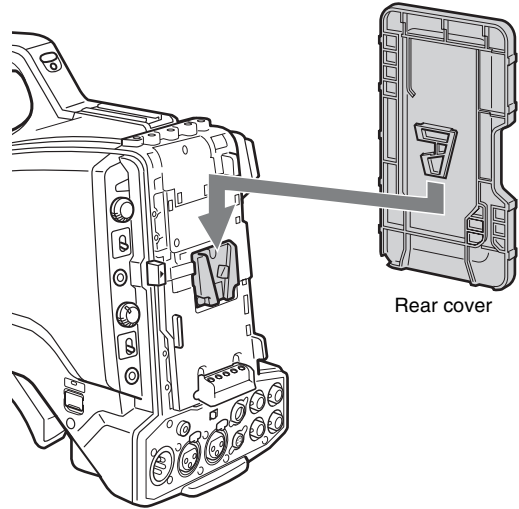
To remove the rear cover

① Holding the release button on the camera in, ② pull the rear cover up.



To attach the rear cover

You can attach the rear cover by following the detaching procedure in reverse order. Be sure to engage the guide on the backside of the rear cover with the battery mount on the camera.



Rear cover

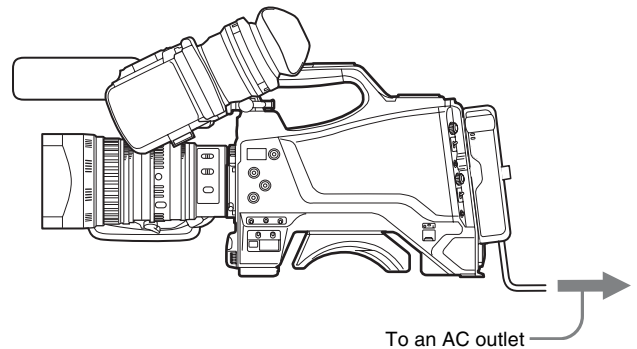
Using AC Power (via the DC IN connector)

Connect an optional DC power cord to the DC IN connector on the camera, and then connect the cord to the DC output connector of the AC-DN10/DN2B AC adaptor or BC-L70/L160 battery charger.

Using AC Power (with AC adaptor)

Mount an AC-DN2B/DN10 on the camera, then connect to the AC power supply.

The AC-DN2B/DN10 can supply up to 100 W of power.



To an AC outlet

Using a Battery Pack

When a BP-GL95A/GL65A/L60S/L80S Battery Pack is used, the camera will operate for the time shown below.

Model name	Operating time
BP-GL95A	Approx. 230 minutes
BP-GL65A	Approx. 150 minutes
BP-L60S	Approx. 150 minutes
BP-L80S	Approx. 190 minutes

Note

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

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

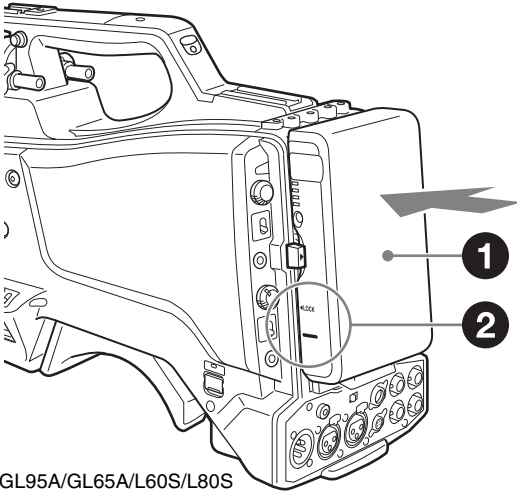
For details on the battery charging procedure, refer to the battery charger operation manual.

Note on using the battery pack

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

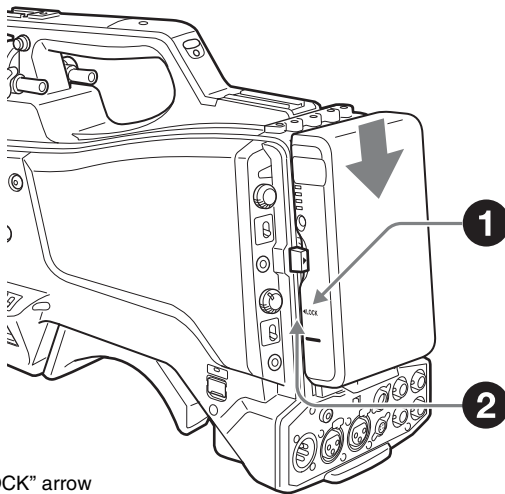
To attach the battery pack

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



- 1 BP-GL95A/GL65A/L60S/L80S
- 2 Align these lines.

- 2** Slide the battery pack down until its “LOCK” arrow points at the matching line on the camera.



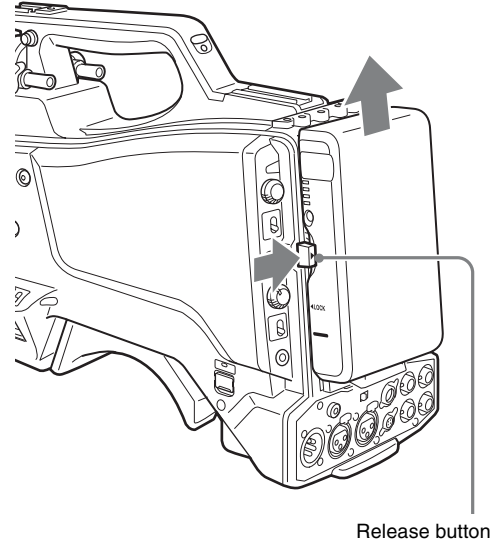
- 1 “LOCK” arrow
- 2 Matching line on the camera

Note

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

To detach the battery pack

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



Note

Make sure to power the camera off before replacing the battery pack.

Attaching the Viewfinder

CAUTION

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

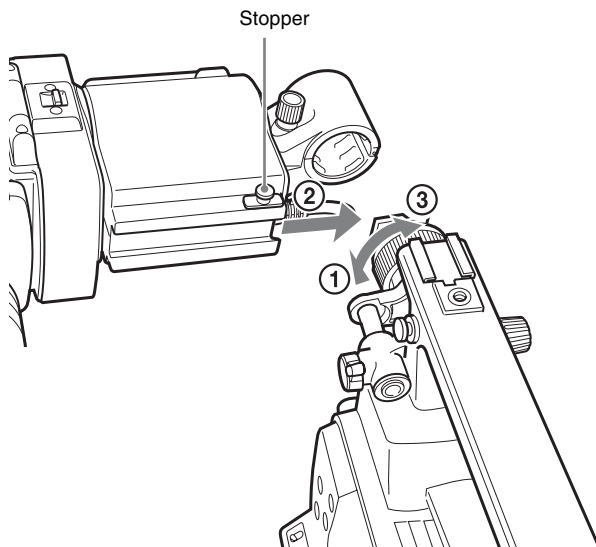
Attaching the Supplied Viewfinder

Notes

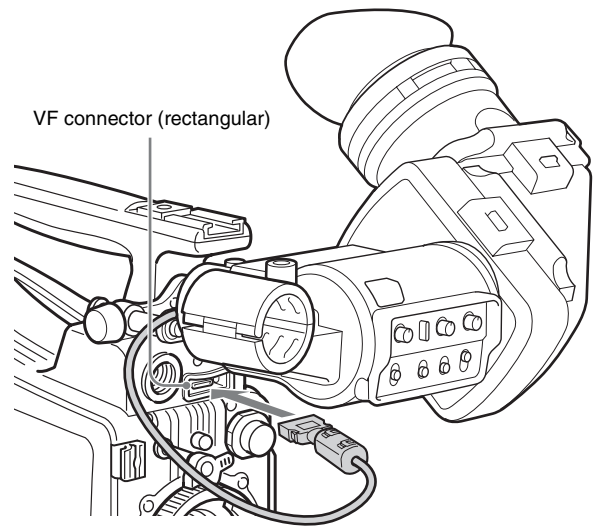
When attaching the viewfinder, make notes of the following points.

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

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



- 2 Remove the cover of the viewfinder connector and couple it to the VF connector (rectangular).

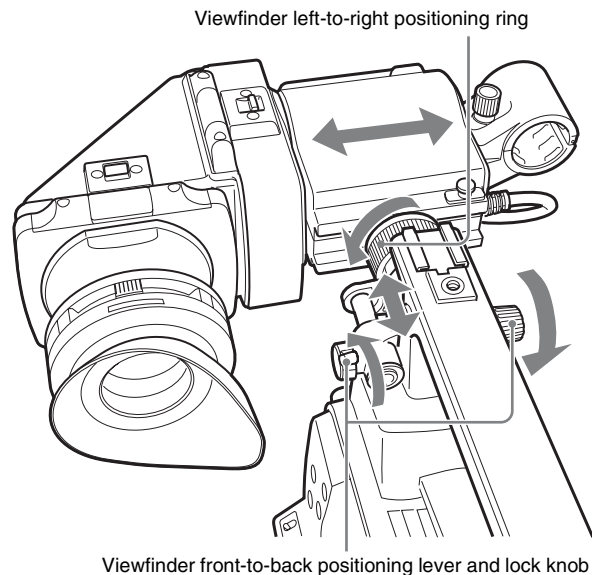


Detaching the viewfinder

You can detach the viewfinder by following the attaching procedure in reverse order, but there is an additional action to take: when detaching the viewfinder from the fitting shoe, pull up the stopper (see page 22).

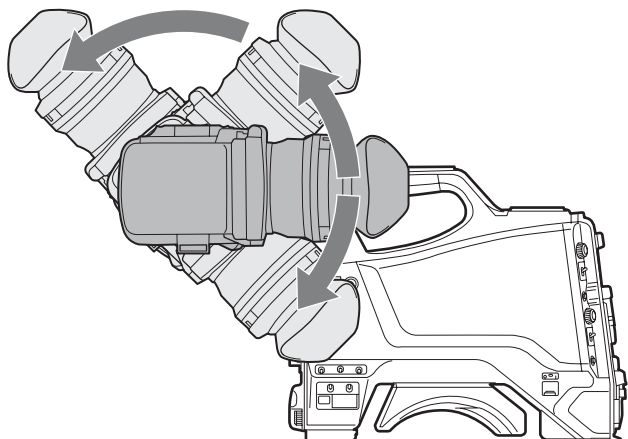
Adjusting the Viewfinder Position

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



Adjusting the Viewfinder Angle

You can adjust the angle of the viewfinder.



To reverse the display (image/text indication) vertically

The viewfinder can be rotated as much as 180 degrees toward the direction facing the subject.

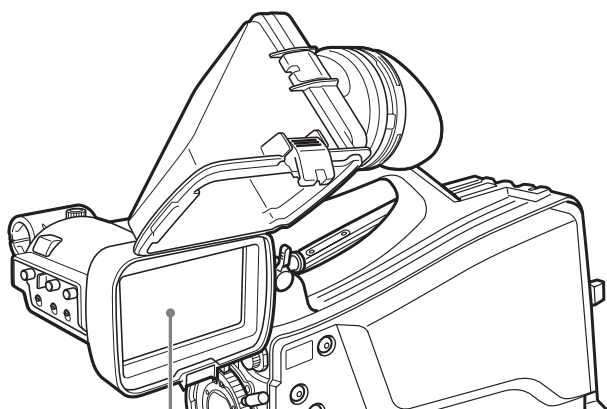
When you do this, the picture and other information displayed in the viewfinder appear upside down.

To restore the normal display, set the MIRROR switch on the rear panel of the viewfinder to B/T.

Lifting Up the Viewfinder Barrel and Eyepiece

You can view the LCD screen inside the viewfinder or its mirrored image by lifting up the viewfinder barrel or the eyepiece.

This section describes how to lift up the viewfinder barrel and detach it. The eyepiece can also be lifted up and detached in the same way.

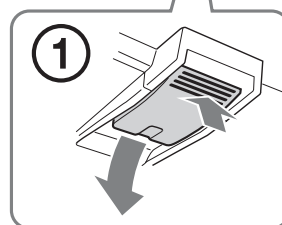
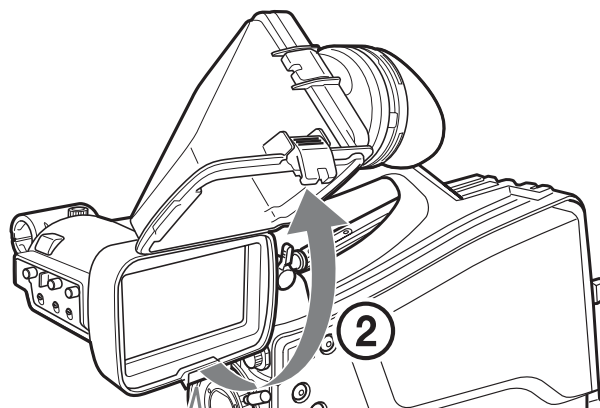


LCD screen

To raise up the viewfinder barrel

① Push the clip on the bottom to release and ② flip up the viewfinder barrel.

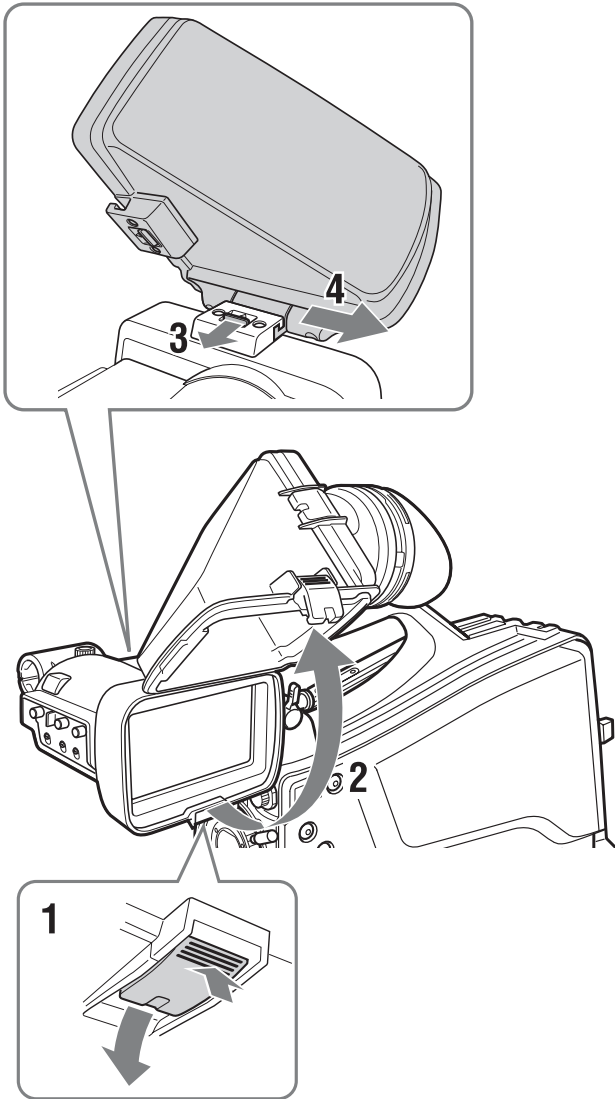
It locks at the 120-degree position.



Normally use it in the locked position.

Although you can open it farther from the lock position, once return it to the closed position to lock it at the 120-degree position again.

To detach the viewfinder barrel



- 1** Push the clip on the bottom to release.
- 2** Flip up the viewfinder barrel.
- 3** Slide the knob on the top to the opposite side of the viewfinder barrel.
- 4** Detach the viewfinder barrel by horizontally sliding it.

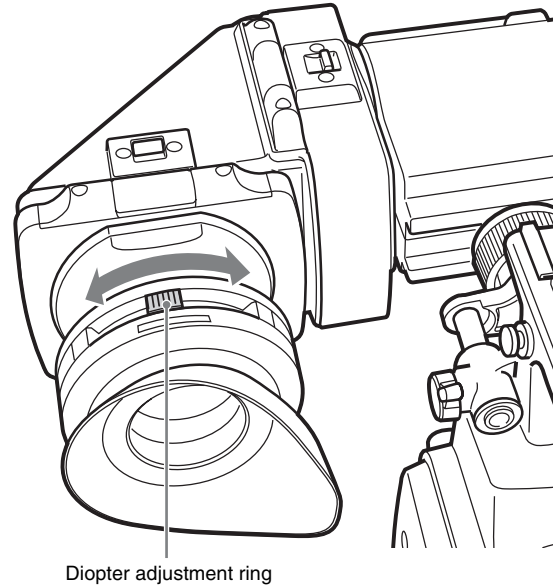
To reverse the display (image/text indication) horizontally

By setting the MIRROR switch on the rear panel of the viewfinder to L/R, you can reverse the picture and other information displayed in the viewfinder horizontally.

Adjusting the Viewfinder Focus and Screen

To adjust the viewfinder focus

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



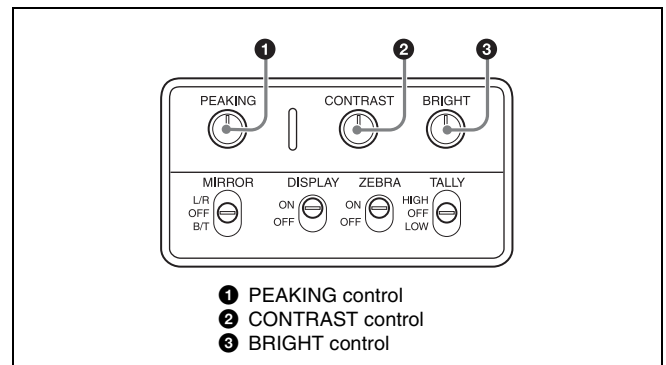
To adjust the viewfinder screen

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

Peaking: Adjust using the PEAKING control

Contrast: Adjust using the CONTRAST control

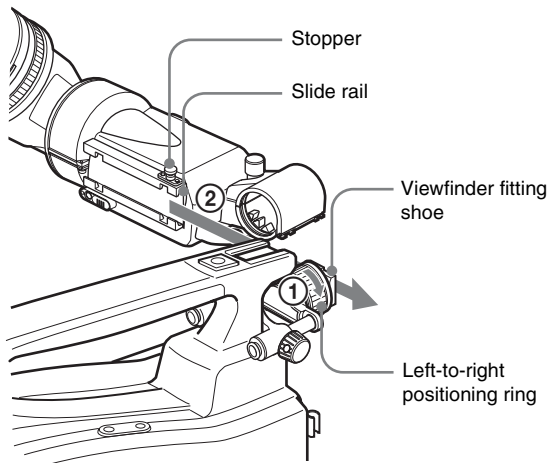
Bright: Adjust using the BRIGHT control



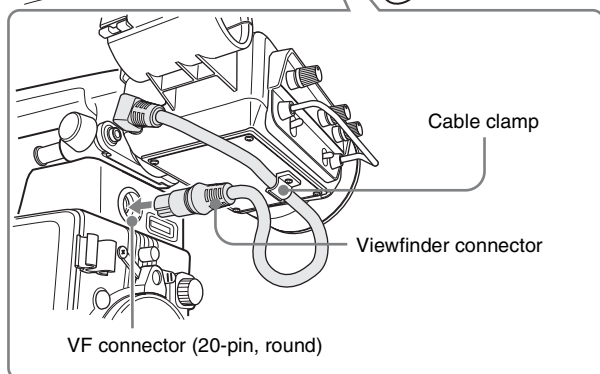
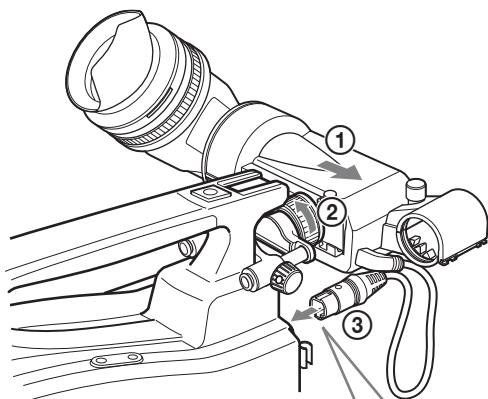
Attaching an Optional Viewfinder

Attaching the DXF-20W viewfinder

- 1** ① Loosen the left-to-right positioning ring of the camera, and ② engage the slide rail on the backside of the viewfinder with the viewfinder fitting shoe.



- 2** ① Slide the viewfinder in the direction shown by the arrow to the required mounting position, ② tighten the left-to-right positioning ring of the camera, and ③ plug the viewfinder connector into the VF connector (20-pin, round) of the camera, and clip the cable into the cable clamp.



Notes

- Be sure to power off the camera before plugging the viewfinder connector into the VF connector on the camera. If the connector is plugged in while the power is on, the viewfinder may not operate correctly.
- Make sure that the viewfinder connector is pushed fully into the VF connector (20-pin, round) on the camera. If the connector is not firmly connected, the image may break up, or the tally light may not operate properly.

To detach the DXF-20W viewfinder

To detach the viewfinder from the camera, conduct the attachment procedure in reverse. When removing the viewfinder from the camera, pull up the stopper.

Attaching the DXF-801 viewfinder

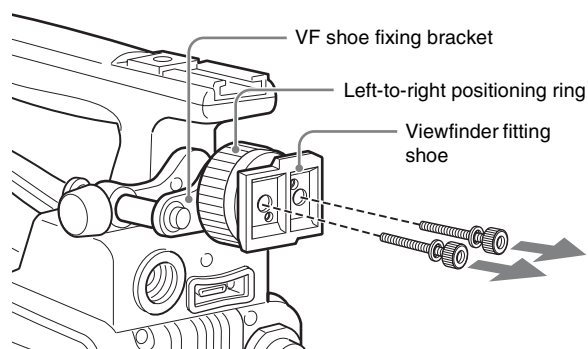
Replace the viewfinder fitting shoe, following the steps below before attaching the DXF-801 viewfinder.

Note

The following accessories are not supplied with the HXC-D70K/D70L. (A 3.5-type color LCD viewfinder is supplied with the HXC-D70K/D70L.)

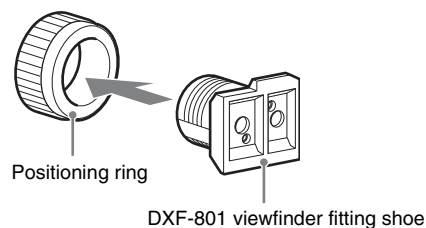
- Viewfinder fitting shoe (service part number: 3-776-885-03)
- Hexagonal wrench (size: 2.5 mm) (service part number: 7-700-736-04, 7-721-130-53)

- 1** With the supplied hexagonal wrench (size: 2.5 mm), remove the bolts and spring washers, and detach the viewfinder fitting shoe from the VF shoe fixing bracket.

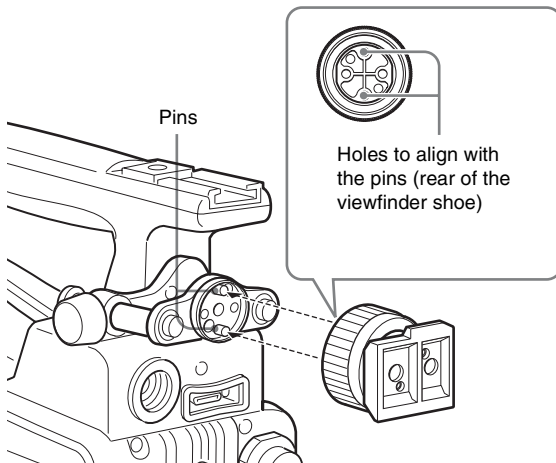


- 2** Loosen the viewfinder left-to-right positioning ring and detach it from the viewfinder fitting shoe.

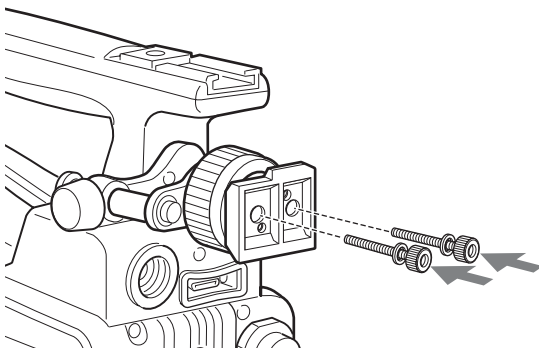
- 3** Attach the ring to the supplied viewfinder fitting shoe and tighten the ring.



- 4 Attach the provided viewfinder shoe to the camera.**
Align the holes in the rear of the viewfinder fitting shoe with the two pins on the VF shoe fixing bracket. Be sure the cutout in the viewfinder fitting shoe facing upward.

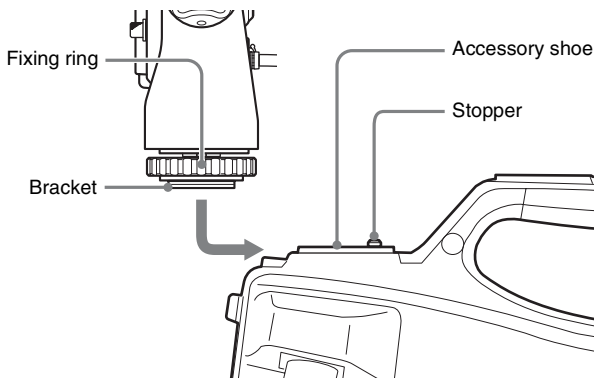


- 5 With the spring washers and bolts removed in step 1, fasten the viewfinder fitting shoe to the VF shoe fixing bracket.**

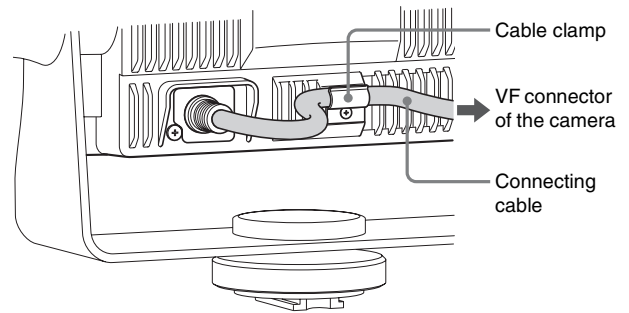


Attaching the DXF-C50WA/51 viewfinder

- Slide the bracket fully into the accessory shoe of the camera until the end stops.
- Tighten the fixing ring to secure the viewfinder.



- 3 Couple the connector to the VF connector (20-pin, round) of the camera, and clip the connecting cable into the cable clamp as shown in the following figure.**



To detach the DXF-C50WA/51 viewfinder

Loosen the fixing ring and pull the viewfinder out of the accessory shoe in the opposite direction.

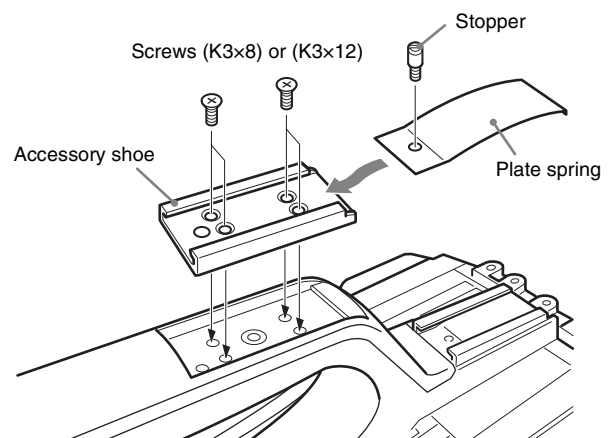
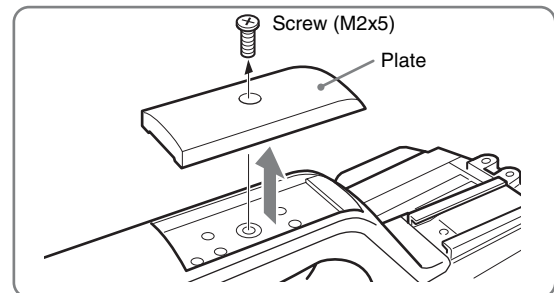
Attaching a 5-type color LCD viewfinder

A 5-type color LCD viewfinder can be panned over an angle of 30° to the right and 30° to the left. To rotate the viewfinder (for panning) up to 90° in the left and right directions, attach the optional accessory shoe kit (service part number: A-8274-968-B), or the accessory shoe supplied with the camera to the camera head grip taking the following steps.

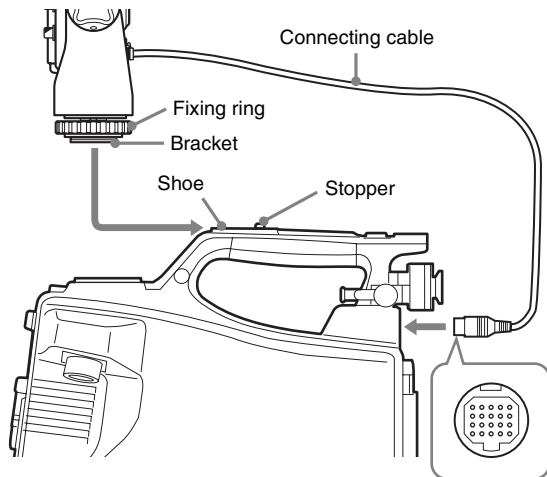
Detaching the accessory shoe

- Pull up the stopper and remove the plate spring.
- Detach the accessory shoe after loosening the four screws (K3x8).

Attaching the accessory shoe



- 1 Detach the plate after loosening the screw (M2×5).
- 2 Attach the accessory shoe using either the four screws used for the camera (K3×8) or the four screws supplied with the shoe kit (K3×12).
- 3 Slide the plate spring in the direction shown by the arrow and secure the spring using the stopper.
- 4 Slide the bracket fully into the accessory shoe until the end stop, and tighten the fixing ring to secure the viewfinder.
- 5 Couple the connecting cable to the VF connector (20-pin, round) of the camera.

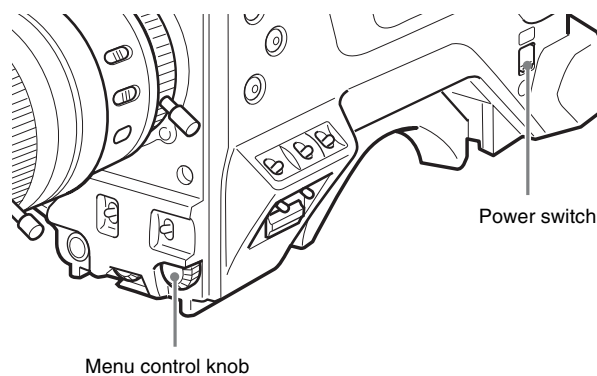


Setting the Area of Use

When using the camera for the first time

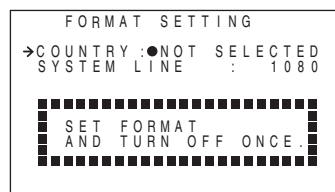
The area of use is not factory preset. Before using the camera, you need to set this item. (You cannot use the camera without setting this item.)

To set the area of use



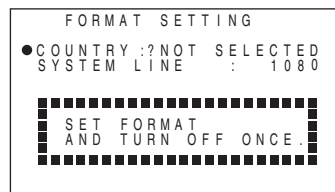
- 1 Set the power switch to the ON.

The screen for setting the area of use appears in the viewfinder.



- 2 Press the menu control knob.

The settings for selectable areas of use are displayed.



- 3** Turn the menu control knob to select the desired area of use.

Setting	Area of use
NTSC AREA	NTSC (for areas other than Japan) ^{a)}
NTSC(J) AREA	NTSC (Japan) ^{b)}
PAL AREA	PAL ^{c)}

- a) The composite signal output from this camera is an NTSC signal with a black setup (7.5 IRE). The system frequency is 59.94i.
- b) The composite signal output from this camera is an NTSC signal with no black setup. The system frequency is 59.94i.
- c) The composite signal output from this camera is a PAL signal. The system frequency is 50i.

- 4** Adjust the **SYSTEM LINE** (picture resolution) settings

Setting	Resolution (Horizontal x Vertical)
1080	1080 lines (1920 x 1080)
720	720 lines (1280 x 720)

- 5** Set the power switch to **OFF** and set it to **ON** again. The camera is now ready for use.

To adjust the area settings

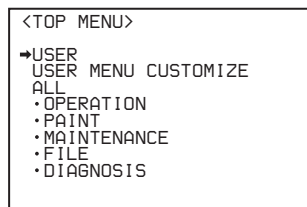
The settings can be adjusted in **MAINTENANCE > OUTPUT FORMAT > COUNTRY** in the setup menu (see page 66).

Setting the Date/Time of the Internal Clock

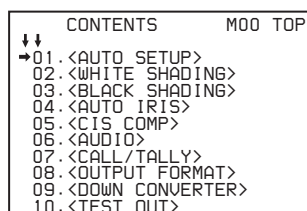
When using the camera for the first time, set the built-in clock to local time, using **MAINTENANCE > DATE** in the setup menu (page 67) displayed in the viewfinder.

For details on menu operations, see “Basic Menu Operations” (page 48).

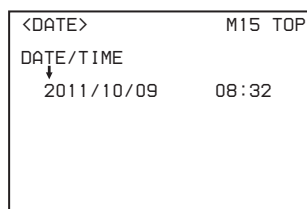
- 1** Turn on the camera.
- 2** While holding the menu control knob pressed, set the **DISPLAY/MENU** switch to **MENU**. The camera enters menu mode, and “TOP” is displayed at the upper-right corner of the screen.
- 3** Rotate the menu control knob to set the pointer (➡) to “TOP” and push on the menu control knob. The TOP MENU screen is displayed.



- 4** Rotate the menu control knob to position the pointer to **MAINTENANCE** and push on the menu control knob. The CONTENTS page of the MAINTENANCE menu is displayed.



- 5** Turn the menu control knob to scroll the page and position the pointer to **<DATE>** then push on the menu control knob. The <DATE> page is displayed.



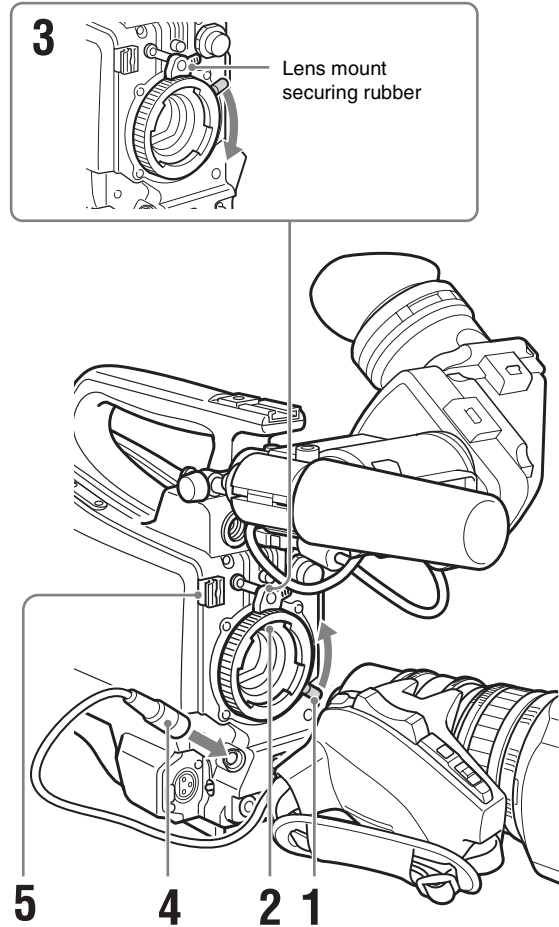
- 6** Turn the menu control knob and set the date and time. Push on the menu control knob to shift to the next digit.

- 7 When the date/time setting is completed, set the DISPLAY/MENU switch to OFF to exit menu mode.

Mounting and Adjusting the Lens

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

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



- 1 Push the lens locking lever up and remove the lens mount cap from the lens mount.
- 2 Align the center pin on the lens with the center slot in the lens mount, and insert the lens into the mount.
- 3 Holding the lens in place, push the lens locking lever down to lock the lens.

Caution

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

- 4 Connect the lens cable to the LENS connector.

5 Secure the lens cable with the cable clamps.

If you have attached an aberration correction lens

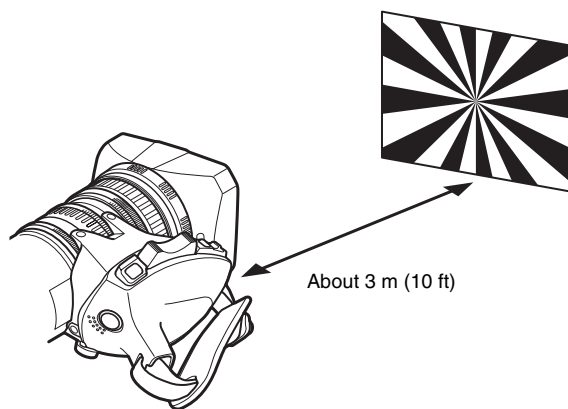
The aberration correction function is activated automatically. Starting the camera with an aberration correction lens may require more time than normally because of data loading at start-up.

The lens supplied with the HXC-D70K is an aberration correction lens. Contact your Sony dealer or a Sony service representative for information about other aberration correction lenses.

Adjusting the Flange Focal Length

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

When carrying out the adjustment, use the supplied flange focal length adjustment chart as the subject.



Notes

- If you use a subject with insufficient contrast, or move the camera or subject during adjustment, this will cause an adjustment error.
- Place the subject (the flange focal length adjustment chart) so that it appears at the center of the screen at the telephoto end. Arrange so that no nearby object (no object closer to the camera than the chart) enters the screen at the wide-angle end.

Carrying out the adjustment

When using the auto focus lens

With the lens supplied with the HXC-D70K, zoom and focus operations automatically adjust the flange focal length.

- 1 Open the iris, position the supplied flange focal length adjustment chart approximately three meters (10 ft) away from the camera, and arrange the lighting to obtain a satisfactory video output.
- 2 Set the ZOOM switch to SERVO (power zoom mode).

- 3 Activate the AUTO FLANGE BACK function using MAINTENANCE > OTHERS 1 > AUTO FLANGE BACK in the setup menu (see page 68).

- 4 Make sure the message "AFB OK" appears after the setting.

When using a non-auto focus lens

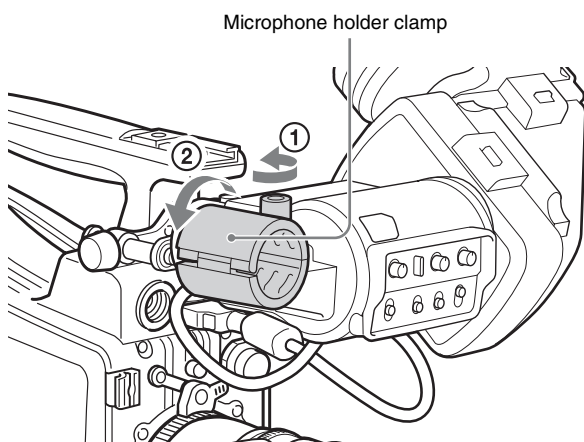
- 1 Set the iris to manual.
- 2 Open the iris, position the supplied flange focal length adjustment chart approximately three meters (10 ft) away from the camera, and arrange the lighting to obtain a satisfactory video output.
- 3 Loosen the fixing screws on the F.f or F.B ring (flange focal length adjustment ring).
- 4 Use manual or power zoom to set the lens to telephoto.
- 5 Point the camera at the chart by turning the focus ring and focus on it.
- 6 Set the zoom ring to wide angle.
- 7 Turn the F.f or F.B ring until the chart is in focus, being careful not to disturb the focus ring.
- 8 Repeat steps 4 to 7 until the chart stays in focus all the way from wide angle to telephoto.
- 9 Tighten the F.f or F.B ring fixing screws.

Preparing the Audio Input System

Connecting a Microphone to the AUDIO 1 IN Connector

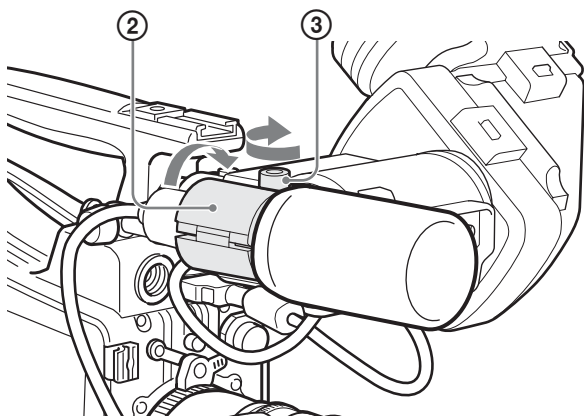
Attach a microphone (supplied with HXC-D70K/D70L) to the microphone holder of the supplied viewfinder.

- 1 Loosen the screw and open the microphone holder clamp.



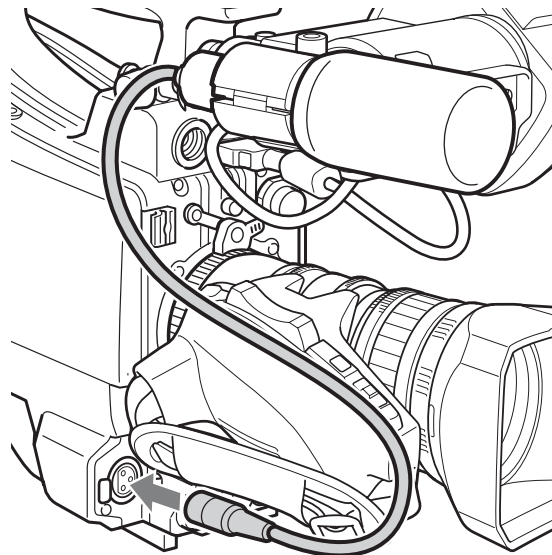
- 2 Place the microphone in the microphone holder.

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



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

- 3 Plug the microphone cable into the AUDIO 1 IN connector.



- 4 Secure the microphone cable with the cable clamp.

- 5 Set the AUDIO 1 IN input select switch as follows. Set the input select switch as indicated below, depending on the power supply type of the microphone.

Microphone not requiring a phantom power supply from the camera: MIC

Microphone requiring a phantom power supply from the camera: +48V

- 6 Switch the input level to match the sensitivity of the microphone used.

When the camera is used on its own, switch the input level by changing the setting of either MAINTENANCE > AUDIO (factory default setting is -60 dB) or OPERATION > VR ASSIGN in the setup menu. For details, see *page 65* or *page 57*.

Notes

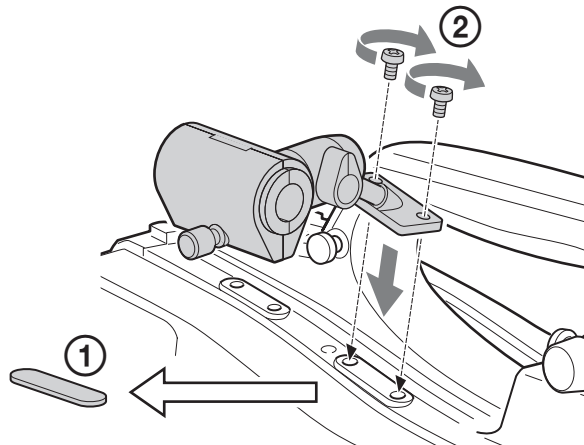
- If the input level on the camera is not at an appropriate setting for the microphone sensitivity, loud sounds may be distorted, and the signal-to-noise ratio may be affected.
- In order for the AUDIO 1 IN and AUDIO 2 IN connectors on the camera to be able to provide a phantom 48 V power supply, female XLR connectors (3-pin) are fitted. If the microphone cable has a female connector, use an adaptor.

Connecting a Microphone to the AUDIO 2 IN Connector

You can connect a monaural microphone to the AUDIO 2 IN connector, using an optional CAC-12 microphone holder. The following is the procedure for attaching an electret condenser microphone such as the ECM-674/678.

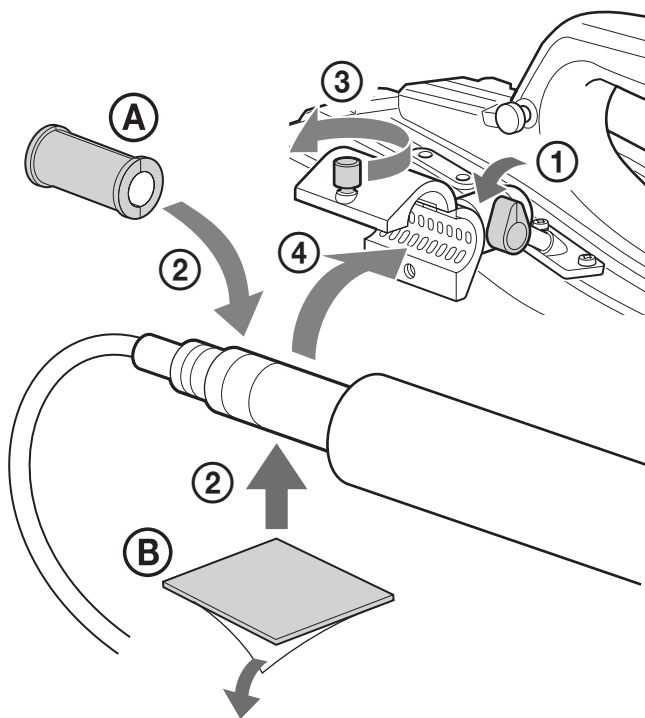
- 1 Attach the CAC-12 microphone holder.

- ① Remove the screw-hole cover on the top front of the camera.
- ② Secure the CAC-12 to the camera, using the two supplied screws (+B4×8).



2 Attach the electret condenser microphone.

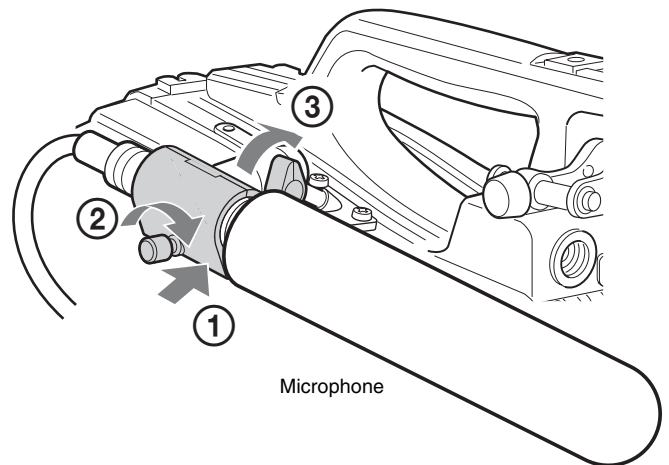
- ① Loosen the ball joint lock lever.
- ② Attach the microphone spacer **A** (molded type, supplied) to the microphone, or wind the microphone spacer **B** (sheet type, supplied) around the microphone after peeling off the protective sheets on both sides of the spacer.
- ③ Loosen the screw and open the microphone holder clamp.
- ④ Place the microphone in the holder so that “UP” is at the top.



3 Secure the microphone.

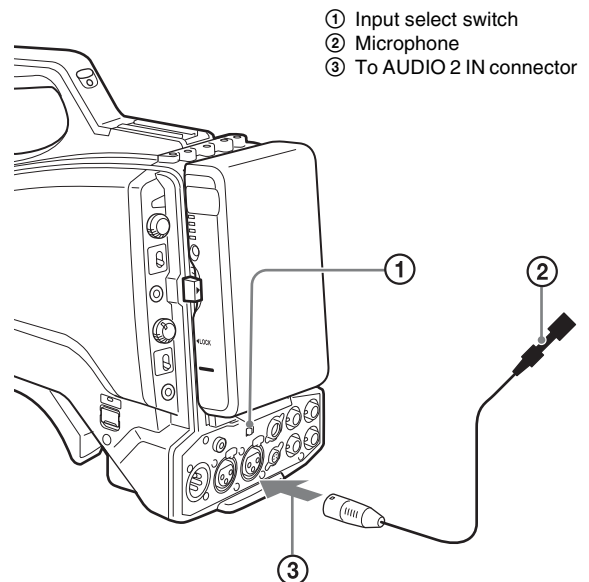
- ① Close the microphone holder.

- ② Tighten the screw.
- ③ Position so that the microphone does not interfere with the viewfinder and tighten the ball joint lock lever.



4 Connect the microphone cable to the AUDIO 2 IN connector.

5 Follow step 5 and 6 in “Connecting a Microphone to the AUDIO 1 IN Connector” (see page 31).



Notes

- If the input level on the camera is not at an appropriate setting for the microphone sensitivity, loud sounds may be distorted, and the signal-to-noise ratio may be affected.
- In order for the AUDIO 1 IN and AUDIO 2 IN connectors on the camera to be able to provide a phantom 48 V power supply, female XLR connectors (3-pin) are fitted. If the microphone cable has a female connector, use an adaptor.
- When you detach a CAC-12 Microphone Holder once you have attached to the camera, be careful not to lose the two screws fixing the CAC-12 (in step 1). After detaching the CAC-12, be sure to put the two screws back into their original places.

Attaching a UHF Portable Tuner (for a UHF Wireless Microphone System)

To use a Sony UHF wireless microphone system, power the camera off and then fit one of the following UHF portable tuners.

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

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

Notes

- The optional BTA-801¹⁾ Portable Tuner Mount Adapter and WRR Mount Bracket (service part number: A-8278-057-B) are required to attach a UHF portable tuner.
- The DWA-01D Digital Wireless Adaptor is required to attach a digital wireless receiver.

1) Required when WRR-855 is used.

For details, contact your Sony dealer or a Sony service representative.

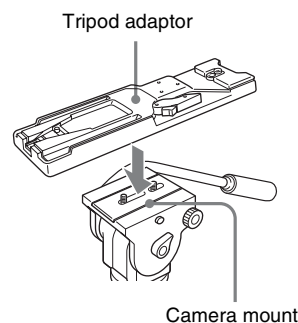
Mounting the Camera to a Tripod

Mount the camera to a tripod, using an optional VCT-U14 tripod adaptor.

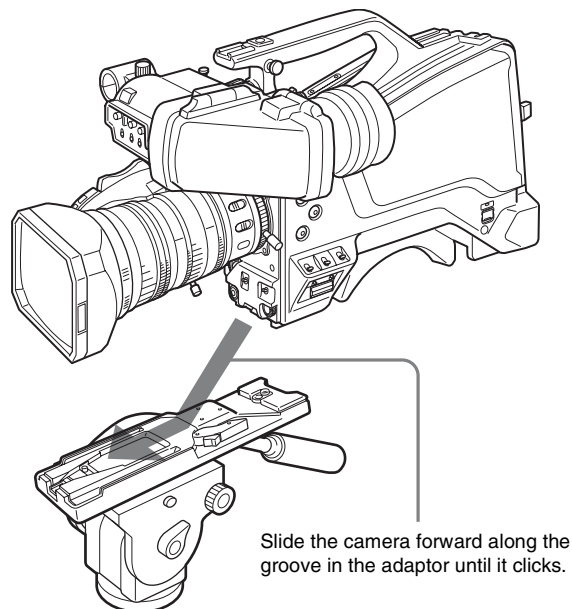
Notes

- If camera instability still affects shooting when using a tripod with the VCT-U14 tripod adaptor, use the VCT-14 tripod adaptor for professional use.
- Select an appropriate hole from among those at the bottom of the tripod adaptor considering the balance of the weight of the camera and the tripod adaptor. If an inappropriate hole is selected, the camera may fall over resulting in injury.
- Check that the size of the selected hole matches that of the screw of the tripod. If they do not match, the tripod adaptor cannot be attached to the tripod securely.

1 Attach the optional VCT-14/U14 tripod adaptor to the tripod.

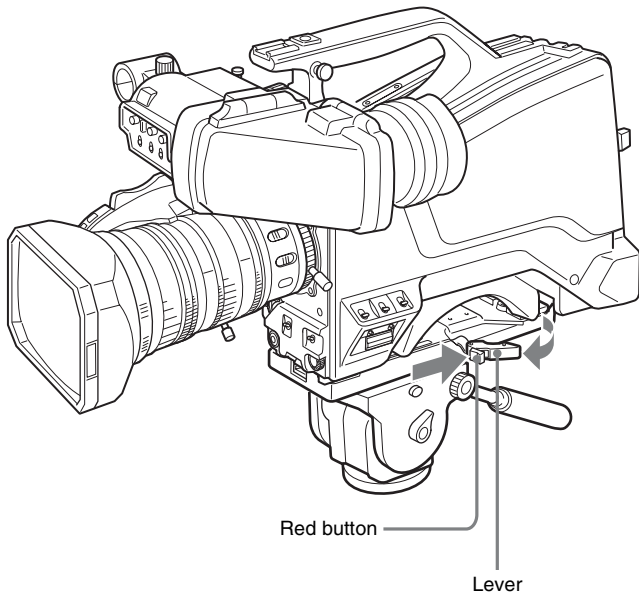


2 Mount the camera on the tripod adaptor.



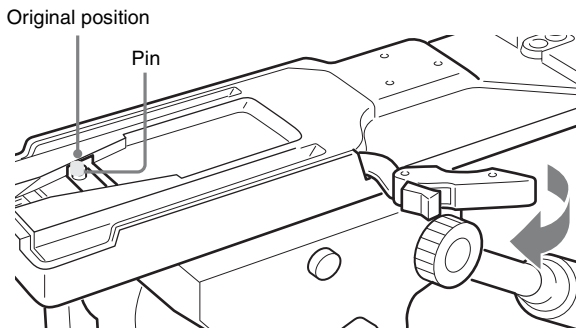
To remove the camera from the tripod adaptor

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



If the pin of the tripod adaptor does not return to its original position

After removing the camera, if the pin of the tripod adaptor does not return to its original position, hold down the red button and move the lever in the direction of the arrow to return the pin to its original position. It is not possible to mount a camera with the pin not seated.

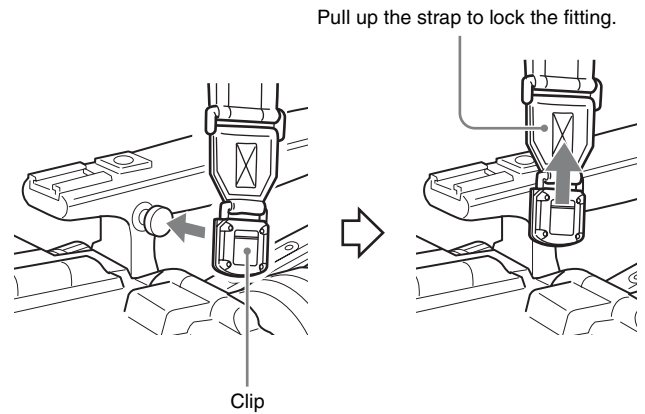


Using the Shoulder Strap (Optional)

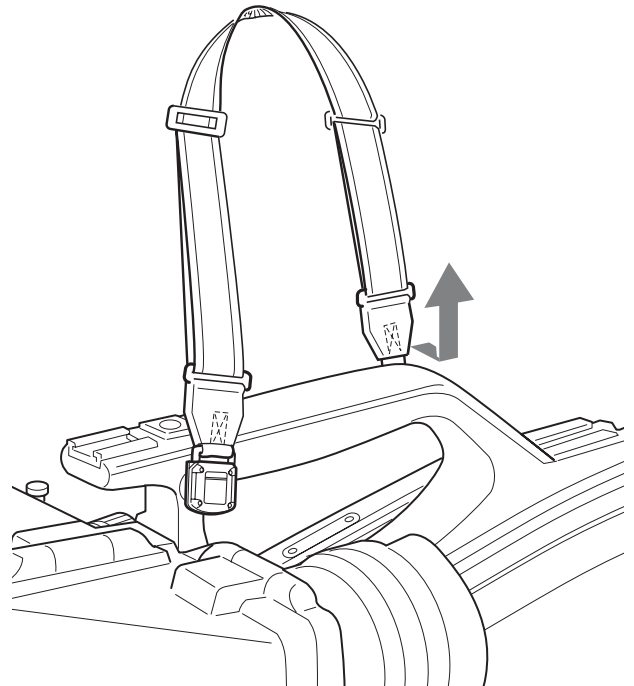
The optional shoulder strap (service part number: A-6772-374-C) can be attached to the camera.

To attach the shoulder strap

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

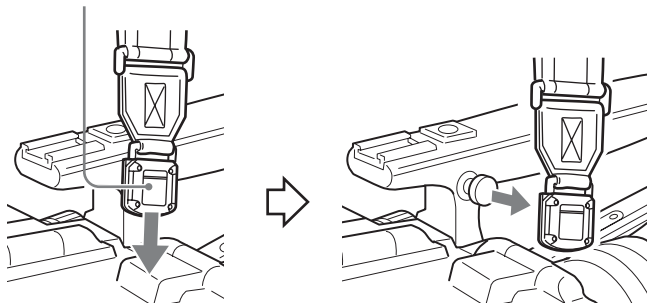


2 Fit the other clip to the shoulder strap fitting on the other side of the grip in the same way as in step 1.



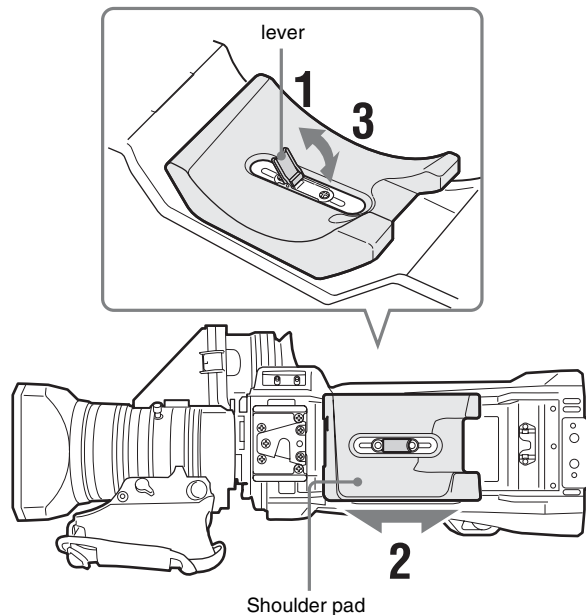
To remove the shoulder strap

Press here and pull in the direction shown by the arrow to release.



Adjusting the Shoulder Pad Position

You can slide the shoulder pad back and forth within a 40 mm range. This adjustment helps you get the best balance for shooting with the camera on your shoulder.



- 1** Raise the lever in the center of the shoulder pad to unlock the shoulder pad.
- 2** Slide the shoulder pad backward or forward until it is in the most convenient position.
- 3** Bring down the lever to lock the shoulder pad in the selected position.

Basic Procedure for Shooting

Note

When the HXCU-D70, CCU-D50/D50P Camera Control Unit or an external control device, such as an RCP-series Remote Control Panel, is connected, the white balance, black balance and shutter adjustments are controlled from the external device, and the controls on the camera are disabled.

For operations on the external control device, refer to the operating instructions or operation manual for the device.

- 1 Turn the camera on.**
- 2 Set the FILTER knob and COLOR TEMP. button appropriately for the lighting conditions.**

FILTER knob settings

FILTER knob	Lighting conditions
1 (Clear)	Indoor shooting
2 (1/4 ND)	Outdoor (cloudy or rainy) or indoor shooting when you wish to reduce the depth of field ¹⁾
3 (1/16 ND)	Outdoor shooting in daytime
4 (1/64ND)	Outdoor shooting when you wish to reduce the depth of field, or especially under bright outdoor ambient light

1) Depth of field: This is the range over which the subject is sharply in focus.

From the viewpoint of the characteristics of lenses, shooting with the iris set in the range of F4 to F8 is generally recommended for good quality pictures. Set the filter select knob to bring the iris setting into that range. However, this may not apply when special composition is desired.

5600K setting

The 5600K ON/OFF function has been assigned to the COLOR TEMP. button at the factory.

5600K	Example of lighting conditions
OFF	Indoor shooting under lighting with lower color temperature, such as a halogen or tungsten lamp
ON	Outdoor shooting in daytime, or indoor shooting under lighting with higher color temperature

- 3 Check the settings of the camera.**
 - Settings of switches/control knobs
 - Settings in the OPERATION menu (page 54) and the PAINT menu (page 59)
 - Electronic shutter setting (page 38)
 - Settings for the output signals from the camera (page 42)
 - Flange focal length setting (page 30)
- 4 Adjust the eyepiece focus as well as the contrast and brightness of the viewfinder image.**

For viewfinder settings, refer to the operation manual for the viewfinder.
- 5 If required, switch on the center marker and/or safety zone and zebra pattern in the viewfinder image, using OPERATION > VF MARKER (page 55) and OPERATION > ZEBRA (page 56) in the setup menu.**
- 6 Check the sound system settings.**
 - Microphone connections
 - Settings of the audio input select switch
- 7 Adjust the white balance and black balance (page 37).**
- 8 Turn the focusing ring so that the subject is sharply in focus.**

Adjustments and Settings

Changing the Video Format

- 1 Select **MAINTENANCE > OUTPUT FORMAT** in the setup menu (see page 66).
- 2 Turn the menu control knob to select the item to change, and press the knob.
- 3 Turn the menu control knob to change the setting, and press the knob.

Adjusting the Black Balance and the White Balance

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

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

Black balance adjustment

The black balance will require adjustment in the following cases.

- When the camera is used for the first time
- When the camera has not been used for a long time
- When the camera is used under conditions in which the surrounding temperature has changed greatly
- When the GAIN selector (L/M/H) values have been changed by using **OPERATION > SWITCH ASSIGN1 > GAIN** switch in the setup menu (see page 57).

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

White balance adjustment

Always readjust the white balance when the lighting conditions change.

Adjusting the Black Balance

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

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

- 1 Set the **OUTPUT/AUTO KNEE** switch to **CAM**.
- 2 Push the **WHT/BLK** switch to **BLK** and release the switch.

The message “Executing...” appears during execution, and changes to “OK” when the adjustment finishes. Adjustment values are saved to memory automatically.

Notes

- During the black balance adjustment, the iris is automatically closed.
- During the black balance adjustment, the gain selection circuit is automatically activated so you may see flickering in the viewfinder, but this is not a fault.

If automatic black balance adjustment cannot be made

If the black balance adjustment cannot be completed normally, an error message will appear for about three seconds in the viewfinder.

If any error message is displayed, retry the black balance adjustment.

If the error message occurs again, consult your Sony dealer or a Sony service representative.

Note

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

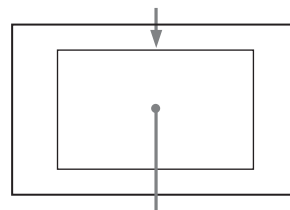
Adjusting the White Balance

- 1 **Set the switches and selectors as shown below.**
 - GAIN selector: L (set to a gain value that is as small as possible)
 - OUTPUT/AUTO KNEE switch: CAM
 - WHITE BAL switch: A or B
- 2 **Set the FILTER knob to suit the lighting conditions as follows.**
- 3 **Place a white test card under the same lighting conditions as for the subject to be shot and zoom up to it.**

Alternatively, any white object such as a cloth or a wall can be used.

The absolute minimum white area is as follows.

Rectangle centered on the screen. The lengths of the sides are 70% of the length and width of the screen.



The white object must be within the rectangle and have an area of at least 10% of the screen.

Note

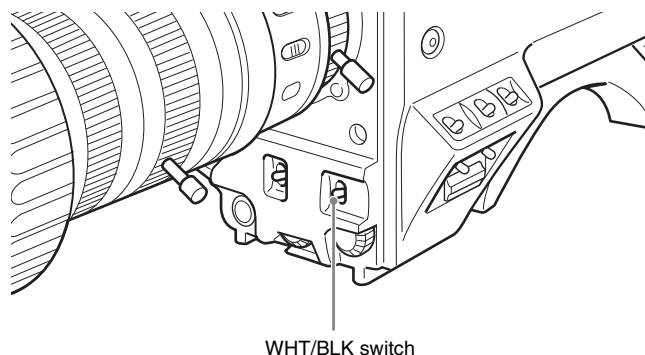
Make sure there are not bright spots in the rectangle.

4 Adjust the lens iris.

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

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

5 Push the WHT/BLK switch to WHT and then release the switch.



The message “AWB: EXECUTING..” appears during execution, and changes to “AWB: OK” when the adjustment finishes.

The adjustment values are saved automatically in the memory selected in step 1 (A or B).

Note

If the camera has a zoom lens with an automatic iris, the iris may hunt ¹⁾ during the adjustment. To prevent this, adjust the iris gain knob (indicated as IG, IS, or S) on the lens.

For details, refer to the lens operation manual.

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

If the automatic white balance adjustment cannot be made

If the white balance adjustment cannot be completed normally, an error message will appear for about three seconds in the viewfinder.

If any error message is displayed, retry the white balance adjustment.

If the error message occurs again, consult your Sony dealer or a Sony service representative.

If you have no time to adjust the white balance

Set the WHITE BAL switch to PRST.

This makes it possible to automatically set the white balance to 5600K (factory default value) by pressing the COLOR TEMP. button.

The color temperature to which the white balance is set when the COLOR TEMP. button is pressed can be selected from among 3200K, 4300K, 5600K, and 6300K in MAINTENANCE > WHITE FILTER > ELECTRICAL CC <A>//<C>/<D> in the setup menu (see page 67).

To switch between electrical CC filters with an assignable switch

You can assign the function that switches between electrical CC filters to an assignable switch. This allows you to switch between color temperatures (3200K/4300K/5600K/6300K) that have been assigned to up to four positions (A to D) with each press of the assignable switch.

1 Select MAINTENANCE > WHITE FILTER in the setup menu (see page 67).

2 Select the position to which to assign a CC filter by selecting one of [ELECTRICAL CC <A>] to [ELECTRICAL CC <D>], and then turn the menu control knob to select the desired color temperature. As you turn the menu control knob, the color temperature changes as follows: 3200K ↔ 4300K ↔ 5600K ↔ 6300K.

To set no color temperature

Select “-----” with ELECTRICAL CC <C> or <D> selected. When the assignable switch is pressed, the setting for that position is not displayed. For example, if “-----” is set for one position, then switching between the remaining three positions is carried out.

3 Repeat step 2 as required.

4 Assign the electrical CC filter switching function (ELECTRICAL CC) to an assignable switch. For details, see OPERATION > SWITCH ASSIGN1 in the setup menu (page 57).

White balance memory

There are two white balance memories: A and B. When you execute automatic white balance adjustment, the adjusted white balance value and the setting of the filter select knob will be stored in either memory A or B, selected with the WHITE BAL switch.

The white balance values stored in memory will be preserved even when power is turned off. When power is turned on again, the white balance in memory corresponding to the current WHITE BAL switch setting is retrieved.

Setting the Electronic Shutter

Note

When a CCU or an external control device, such as an RCP/RM, is connected, the electronic shutter is controlled from the external control device or CCU, and the switch on the camera is disabled.

Shutter Modes

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

Standard mode

Select this mode for shooting fast-moving subjects with little blurring.

Speed mode

System frequency	Shutter speed (unit: seconds)
59.94i	$\frac{1}{100}$, $\frac{1}{125}$, $\frac{1}{250}$, $\frac{1}{500}$, $\frac{1}{1000}$, $\frac{1}{2000}$
59.94P	
50i	$\frac{1}{60}$, $\frac{1}{125}$, $\frac{1}{250}$, $\frac{1}{500}$, $\frac{1}{1000}$, $\frac{1}{2000}$
50P	

ECS (Extended Clear Scan) mode

Select this mode for obtaining images with no horizontal bands of noise when shooting subjects such as monitor screens. Range of shutter speeds that can be set varies as shown in the following tables.

System lines: 1080

System frequency	Shutter speed (unit: seconds)
59.94i	60.00 to 4300
50i	50.00 to 4700

System lines: 720

System frequency	Shutter speed (unit: seconds)
59.94P	60.02 to 4600
50P	50.03 to 4600

Selecting the Shutter Mode and Shutter Speed

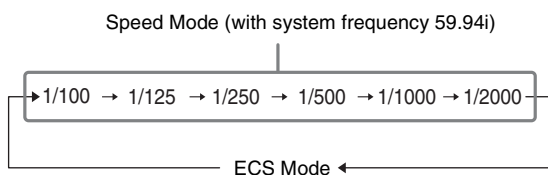
Notes

- When the automatic iris is used, the iris opens wider as the shutter speed increases, thus reducing the depth of field.
- The selectable shutter speeds vary depending on the current system frequency.

To set the shutter mode and standard-mode shutter speed

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

- 1 Push the SHUTTER selector from ON to SEL.**
The current shutter setting indication appears in the viewfinder for about three seconds.
Example: Shutter: 1/250
- 2 Before the shutter setting indication disappears, push the SHUTTER selector down to SEL again and repeat this until the desired mode or speed appears.**
When all modes and speeds are displayed, the display changes in the following order.



To set the shutter speed in ECS mode

- 1 Set the shutter mode to ECS (see page 39).**
- 2 Turn the menu control knob to select the desired frequency or number of frames.**

Changing the Reference Value for Automatic Iris Adjustment

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

- 0.25 to 1 (increasing by increments of 0.25): About 0.25 to 1 stop further open
 - -0.25 to -1 (decreasing by increments of 0.25): About 0.25 to 1 stop further close
- Also you can set the area where light detection occurs.

To change the reference value

- 1 Set MAINTENANCE > AUTO IRIS > AUTO IRIS in the setup menu to ON (see page 64).**
- 2 Change the reference value in MAINTENANCE > AUTO IRIS > OVERRIDE in the setup menu.**

Note

Be sure to confirm that the current shutter mode is not ECS.

An indicator of the current reference value is shown at the iris position indication (see page 17) in the viewfinder.

To make the iris more open

Turn the menu control knob clockwise as seen from the front of the camera.
Select one of 0.25, 0.5, 0.75, or 1.

To stop down the iris

Turn the menu control knob counterclockwise as seen from the front of the camera.
Select one of -0.25, -0.5, -0.75, or -1.

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

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

Zooming

The lens supplied with the HXC-D70K allows you to shoot with manual and servo zooming.

Switching between Zoom Modes

Set the ZOOM switch to SERVO (servo zoom) or MANUAL (manual zoom).

Using Manual Zoom

With the ZOOM switch set to MANUAL, turn the zoom ring.

Using Servo Zoom

With the ZOOM switch set to SERVO, operate the power zoom lever. The current lens zoom position appears in the viewfinder, over the range 0 (wide-angle) to 99 (telephoto) (see page 17).

Push to the W (wide) side when you want wide-angle, and push to the T (telephoto) side when you want telephoto. The zoom speed increases when you push the lever deeply, and decreases when you push less deeply.

Adjusting the Focus

The lens supplied with the HXC-D70K allows you to adjust the focus in the following three ways.

Full MF (full manual focus) mode

This mode supports focusing with the focus ring only. Without changing your grip, you can focus all the way from ∞ to the shortest shooting distance.

MF (manual focus) mode

In this mode, auto focus is enabled temporarily when you press the PUSH AF button. You can also use the MF * function (see page 40).

AF (auto focus) mode

In this mode, auto focus is always enabled. The focus ring and the PUSH AF button are also enabled.

Note

The lens is designed with an extra margin at the infinity position (∞), to compensate for focus drifting due to variations in temperature. When shooting a subject at infinity in MF or Full MF mode, check the picture in the viewfinder as you focus.

Adjusting in Full MF Mode

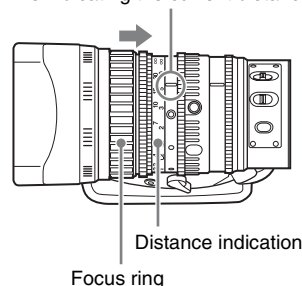
When you slide the focus ring back (toward the camera), the focus mode becomes Full MF mode, in which all focus adjustments are manual.

Note

When you slide the focus ring back, the focus instantly moves to the mark position.

Focus by turning the focus ring while viewing the viewfinder. The distance indications on the ring are valid in Full MF mode. The distances where the picture is in focus correspond to absolute positions of the focus ring.

White line indicating the current distance



Peaking

You can turn the PEAKING knob on the viewfinder to use the peaking function. Edges are emphasized in the monitor picture, which facilitates manual focusing. The recorded video signals are not affected.

Adjusting in MF Mode

When you slide the focus ring forward (toward the lens hood), and set the FOCUS switch to M (manual), the focus mode becomes MF mode, in which focus adjustments are manual but auto focus is available only when necessary.

Using the focus ring

Focus by turning the focus ring while viewing the viewfinder. The distance indications on the ring are invalid in MF mode.

One-push auto focus

Press the PUSH AF button. Auto focus is enabled temporarily (one-push auto focus). One-push auto focus ends when the subject is brought into focus.

MF * function

When the MF * function is on, auto focus starts when you stop adjusting with the focus ring, enabling fine adjustments with the subject at the center of the screen. Auto focusing by the MF * function ends when the fine adjustments end.

Adjusting in AF Mode

When you slide the focus ring forward, and set the FOCUS switch to A (auto), the focus mode becomes AF mode, in which auto focus is always active. The distance indications on the ring are invalid in AF mode.

Focusing in AF mode

In AF mode, the camera monitors the video for changes, and starts auto focus whenever it detects a change. Auto focusing ends when the subject is in focus, but the auto focus function remains on standby. In AF mode, you can also start auto focusing by pressing the PUSH AF button or by turning the focus ring.

Using Macro Mode

When the focus mode is MF or AF, you can set the MACRO switch to the ON side to enable macro mode. Macro mode allows you to focus over the range that includes the macro area. Macro mode is disabled in Full MF mode.

Setting the Focus Assist Function

Using the OPERATION menu, the assist functions for easier focusing in the viewfinder can be activated.

Adding a VF detail signal

Adding a VF detail signal to sharp edges in the image in the viewfinder makes it easier to check the focusing condition by observing changes in the detail signal or in the color converted from the detail signal (color detail).

The focus setting where the detail signal becomes strongest is the best focus setting.

- 1** Set the DISPLAY/MENU switch to MENU while holding the menu control knob pressed.
- 2** Select OPERATION > VF DETAIL in the setup menu (see page 56).
- 3** Rotate the menu control knob to align the pointer to the item to be set and push on the knob.

To use the VF detail signal

Set VF DETAIL to ON to activate the VF detail function to add the detail signal to sharp edges in the image. You can adjust the signal level (strength) in the range of 0 to 100% (default 25%).

You can adjust the characteristics of the detail signal with the menu items below:

CRISP: Adjust to eliminate fine portions of the detail signal.

FREQUENCY: Change the detection band of sharp edges.

FAT MODE: Turn the function ON/OFF to thicken the detail signal.

AREA: To limit the area where to display the detail signal.

ZOOM LINK: Set the VF detail level at the full WIDE position. (The VF detail level changes according to the zoom position.)

To use the color detail

Set COLOR DETAIL to ON to convert the VF detail signal to a specified color. This makes it easier to check the signal on an LCD screen, including the viewfinder screen. The display color can be selected at the column next to ON.

You can adjust the coloring with the menu items below:

PEAK COLOR: Turn the function ON/OFF to change the color where the detail signal is strongest.

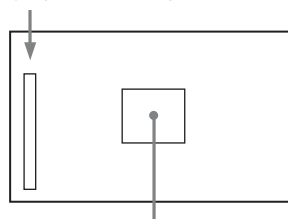
CHROMA LEVEL: To reduce the chroma components of the video signal (only for video signals in the viewfinder).

- 4** Rotate the menu control knob to display the desired setting and push on the knob.
- 5** Set the DISPLAY/MENU switch to OFF to exit menu mode.

Displaying the focus assist indicators

The focus assist indicator function extracts the irregularities of a subject and converts the integrated values to a level indicator, which shows the focus condition.

Level indicator (Its position and operations can be adjusted.)



Area marker to display the detection area of the focus (Its size and position can be adjusted.)

The focus setting where the indicator shows the maximum level is the best focus setting. (The range of the indicator substantially changes depending on picture elements or shooting environments. Adjust it with GAIN and OFFSET as required.)

- 1** Set the DISPLAY/MENU switch to MENU while holding the menu control knob pressed.
- 2** Select OPERATION > FOCUS ASSIST in the setup menu (see page 56).
- 3** Rotate the menu control knob to align the pointer to the item to be set and push on the knob.

To use the level indicator

Setting INDICATOR to ON displays the level indicator in the viewfinder.

You can set the display format with the menu items below.

MODE: Set the type and position of the indicator.

LEVEL: Set the density and the response speed of the indicator.

GAIN: Set the sensitivity of the indicator.¹⁾

OFFSET: Set the offset of the focus detection value.²⁾

1) Normally, the sensitivity of the indicator is automatically set to the optimum value in conjunction with the AREA MARKER SIZE set value. Use this setting when an optimum sensitivity value cannot be obtained, depending on the shooting environment.

2) Normally, the optimum offset is automatically set in conjunction with the AREA MARKER SIZE and MASTER GAIN set values. Use this setting when the optimum offset cannot be obtained, depending on the shooting environment.

To use the area marker

Setting AREA MARKER to ON displays the detection area of the focus as a marker in the viewfinder.

You can set the size and position of the detection area with the menu items below.

SIZE: The size of the detection area can be changed. (If the area size is too large, both the subject and the background are included in the area, making the indicator display easily deviate from the subject.)

POSITION: Roughly set the position of the detection area.

POSITION H: Finely adjust the position of the detection area in the horizontal directions.

POSITION V: Finely adjust the position of the detection area in the vertical directions.

- 4** Rotate the menu control knob to display the desired setting and push on the knob.

5 Set the DISPLAY/MENU switch to OFF to exit menu mode.

Notes

- The level indicator and the effect area marker cannot be displayed simultaneously, whichever you set to ON later is preferentially displayed.
- The area marker and the aspect safety marker cannot be displayed simultaneously, whichever you set to ON later is preferentially displayed.
- When displaying the focus assist indicators, check that the flange focal length has been precisely adjusted.

See “Adjusting the Flange Focal Length” (page 30) for the flange focal length.

Setting the Camera Outputs

You can specify video signals directly output from the camera, with menu operations.

Note

The MAIN (camera picture), RET (return video), or VF (the same picture as that displayed in the viewfinder) setting is common to SD-SDI and VBS. Different signals cannot be output.

The menu pages used for the output settings have been registered to the USER menu at the factory.

- <POWER SAVE> (U10)
- <OUTPUT FORMAT> (U15)
- <TEST OUT> (U16)
- <DOWN CONVERTER> (U17)

Set the menu items on the above menu pages to the settings shown in the following tables.

For details on menu operations and the USER menu, see “Basic Menu Operations” (page 48).

Outputting the signal being shot (camera picture)

The same textual information as that displayed in the viewfinder can be added to the output signal by setting CHARACTER to ON on the <SDI OUT> or <TEST OUT> page.

To output as HD-SDI

Menu page	Item	Setting
<POWER SAVE>	SDI OUT	ACTIVE
<SDI OUT>	OUTPUT	MAIN

To output as SD-SDI

Menu page	Item	Setting
<POWER SAVE>	SDI OUT	ACTIVE
	DOWN CONVERTER	ACTIVE
<DOWN CONVERTER>	OUTPUT SIGNAL	MAIN
<SDI OUT>	OUTPUT	SD-SDI

To output as VBS

Menu page	Item	Setting
<POWER SAVE>	DOWN CONVERTER	ACTIVE

Menu page	Item	Setting
<DOWN CONVERTER>	OUTPUT SIGNAL	MAIN
<TEST OUT>	OUTPUT	VBS

Constantly outputting a return video

- When a CCU is connected, one of the signals being supplied to the CCU can be output from the camera.
- The last selected return signal is output.

To output as HD-SDI

Menu page	Item	Setting
<POWER SAVE>	SDI OUT	ACTIVE
<SDI OUT>	OUTPUT	RET

Outputting the same image as that in the viewfinder

With HD-SDI, you can obtain a signal that includes the same information as that being displayed in the viewfinder according to the settings for VF MARKER, CHARACTER, VF DETAIL, ZEBRA, etc. The ON/OFF or other settings for adding information are common to those for the viewfinder. The output is synchronized with switching among Y, R, G, and B or switching to a return signal.

To output as HD-SDI

Menu page	Item	Setting
<POWER SAVE>	SDI OUT	ACTIVE
<SDI OUT>	OUTPUT	VF

To output as TEST OUT

Menu page	Item	Setting
<POWER SAVE>	DOWN CONVERTER	ACTIVE
<TEST OUT>	OUTPUT	VF

Note

VF signal format (a Y signal only) output from the TEST OUT connector varies depending on which of the following viewfinders are connected to the VF connector (20-pin, round).

No viewfinder: SD component (Y) signal

DXF-C50WA viewfinder: HD component (Y) signal

Viewfinders other than DXF-C50WA: SD component (Y) signal

Outputting a prompter signal

The VBS signal supplied to the PROMPTER connector of the CCU is output from the PROMPTER/GENLOCK connector of the camera.

Adjusting the Audio Level

When the camera is used with the HXCU-D70

The input levels from audio sources connected to the AUDIO 1 IN and AUDIO 2 IN connectors can be adjusted using a remote control panel connected to the CCU or the CONFIGURATION menu on the CCU.

When the audio input select switch is set to MIC, the level can be adjusted between 20 dB and 60 dB in steps of 10 dB.

When the audio input select switch is set to LINE, the level cannot be adjusted.

When the camera is used in standalone status or used with the CCU-D50/D50P

The input level from audio sources connected to the AUDIO 1 IN and AUDIO 2 IN connectors can be adjusted using the INTERCOM LEVEL control on the front panel.

When the audio input select switch is set to MIC, the level can be adjusted between 20 dB and 60 dB in steps of 10 dB, using the INTERCOM LEVEL control.

When the audio input select switch is set to LINE, the level cannot be adjusted.

You can change the VR functions using OPERATION > VR ASSIGN in the setup menu (see page 57). Set the gain to avoid clipping the audio signal by monitoring the audio level meters and waveforms.

Using the flash band compensation function

Flash band artifacts are detected and compensated by using the flash band compensation function.

Set MAINTENANCE > CIS COMP > FLASH BAND COMP (page 65) in the setup menu to on.

- The flash band compensation function is available when the shutter function is deactivated.
- The flash band compensation function will be forcibly switched from on to off while the shutter function is activated. The function turns on automatically after the shutter function becomes deactivated.

Notes

- While the flash band compensation function is set to on, video output from the camera is delayed by 1 field.
- Depending on the shooting conditions, flash band artifacts may not be detected and compensated properly. The function may not be performed depending on the following conditions:
 - Subject of shooting
 - Ambient lighting
 - Camera-subject distance/angle
 - Flash-subject distance/angle
 - Flash intensity
 - Light-emitting time
 - Multiple-flash for a shooting
 - Timing to flash for a shooting
- The flash band compensation function is activated when the brightness of the lower half of the image differs considerably from the upper half. Since the function may be inadvertently activated under certain shooting conditions, in which the brightness between the upper and lower half of the image differs markedly, be sure to use the function only for shooting footage exposed to flash light.

To reduce flash band artifacts

If flash band artifacts are detected using this function, the unit compensates them as follows.

No compensation is performed when a flash extends to the entire screen (the brightness is not divided between the top and bottom of the image).

When the flash band effects appears in two frames

Stitches together the split-field flash frames, regenerating a single frame in which a flash extends entirely.

Notes

- The compensation is performed by reducing the brightness of flashes.
- Horizontal lines (low brightness line of pixels) may appear on the screen as a result of regeneration of the frame.
- When a moving subject is shot, images in the upper and lower parts of the screen may appear discontinuously or the subject may appear to be stationary for a moment.
- The flash band effect remains uncorrected when a flash extends from the lower lines of pixels.

Using the digital extender function

With this function, the central area of the screen is magnified twice.

1 Sets MAINTENANCE > POWER SAVE > D.EXTENDER (page 67) in the setup menu to ENABLE.

2 Select DIGITAL EXTENDER in OPERATION > SWITCH ASSIGN1 > ASSIGNABLE1/2/3 (in either of three) in the setup menu (page 57).

3 Press the ASSIGNABLE button you assigned the function to in step 2.

The central area of the screen is magnified twice.

Pressing the button again returns to the standard display mode.

Notes

- While MAINTENANCE > POWER SAVE > D.EXTENDER (page 67) in the setup menu is set to ENABLE, video output from the camera is delayed by 1 field.
- If both the flash band compensation function and digital extender function are used at the same time, video output from the camera is delayed by 2 fields.

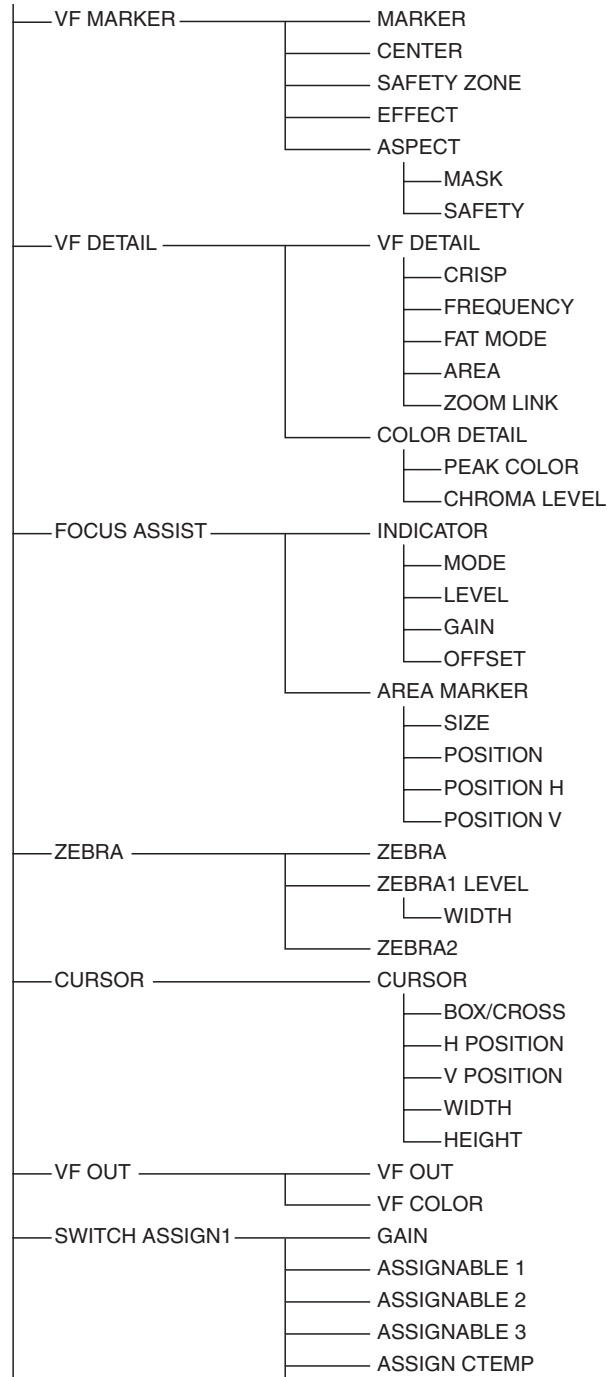
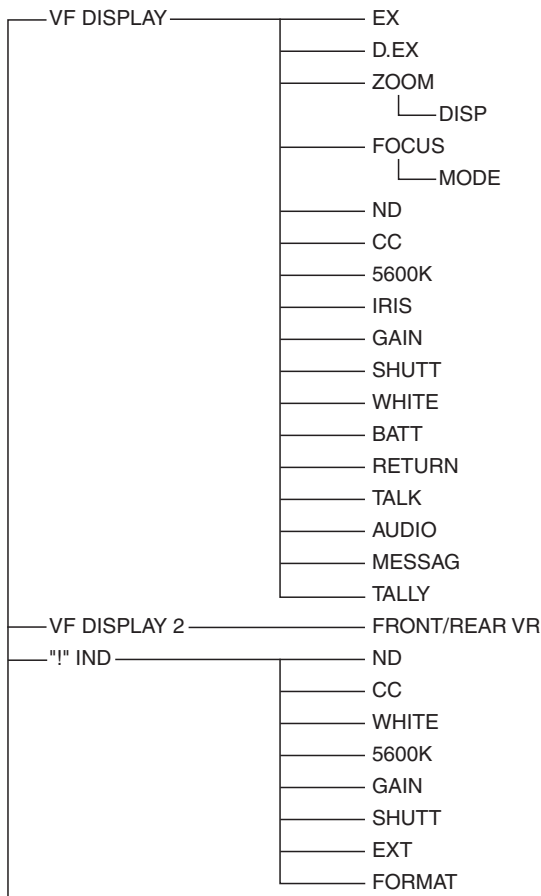
Setup Menu Organization and Levels

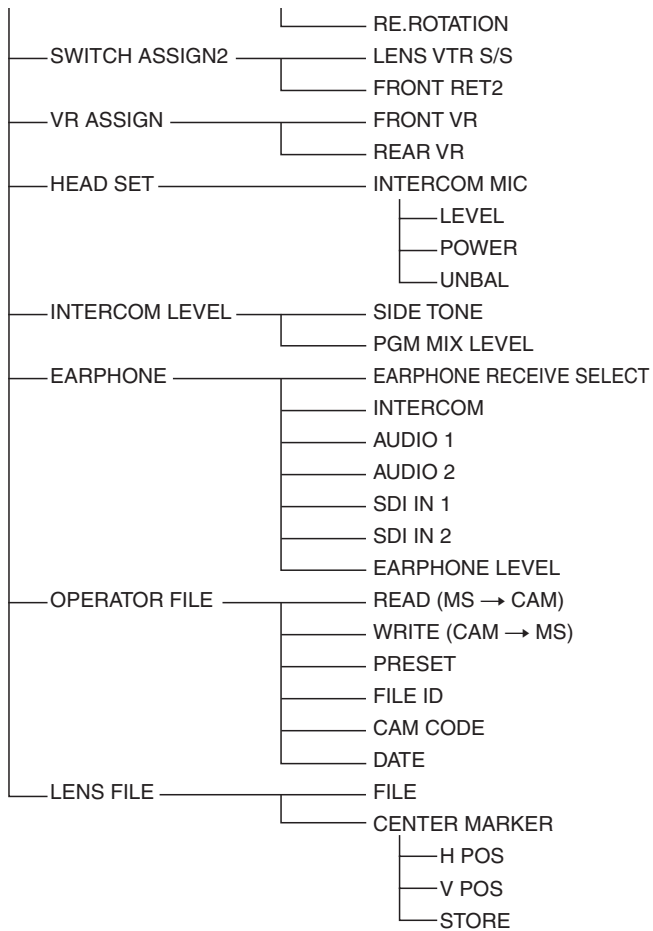
On this camera, settings are made in the setup menu, which appears in the viewfinder.

Setup Menu Organization

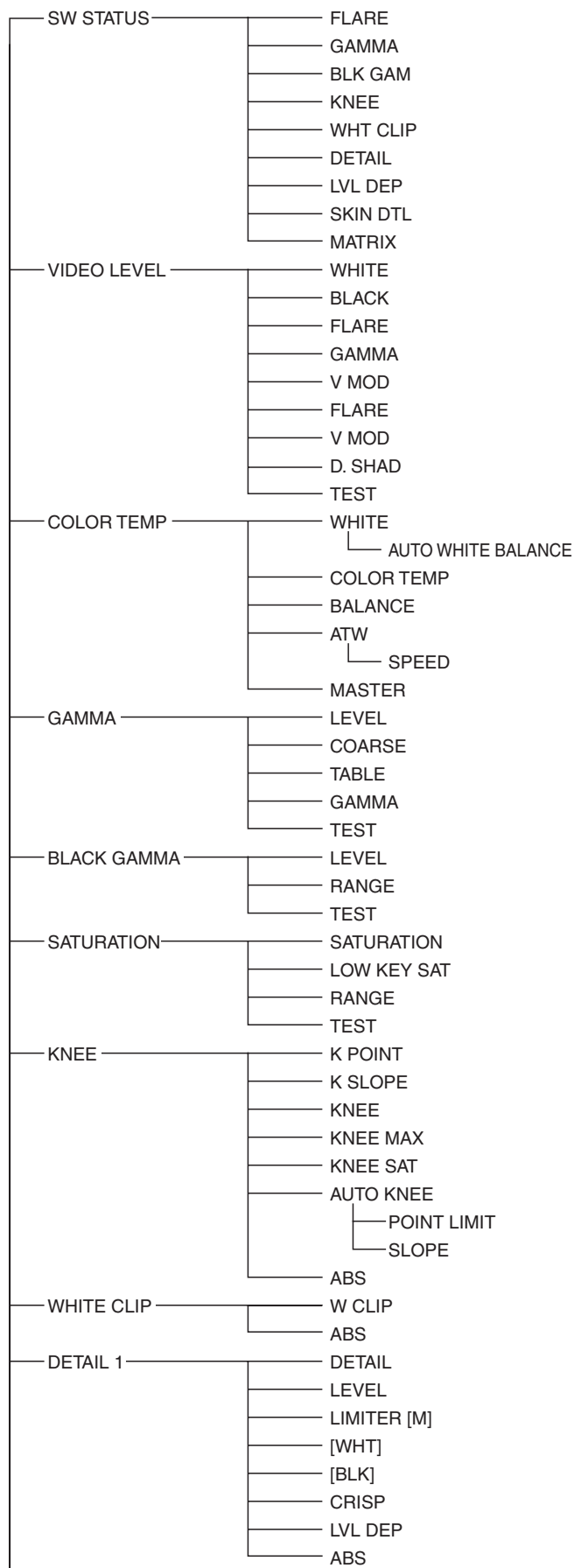
The setup menu consists of the following menus.

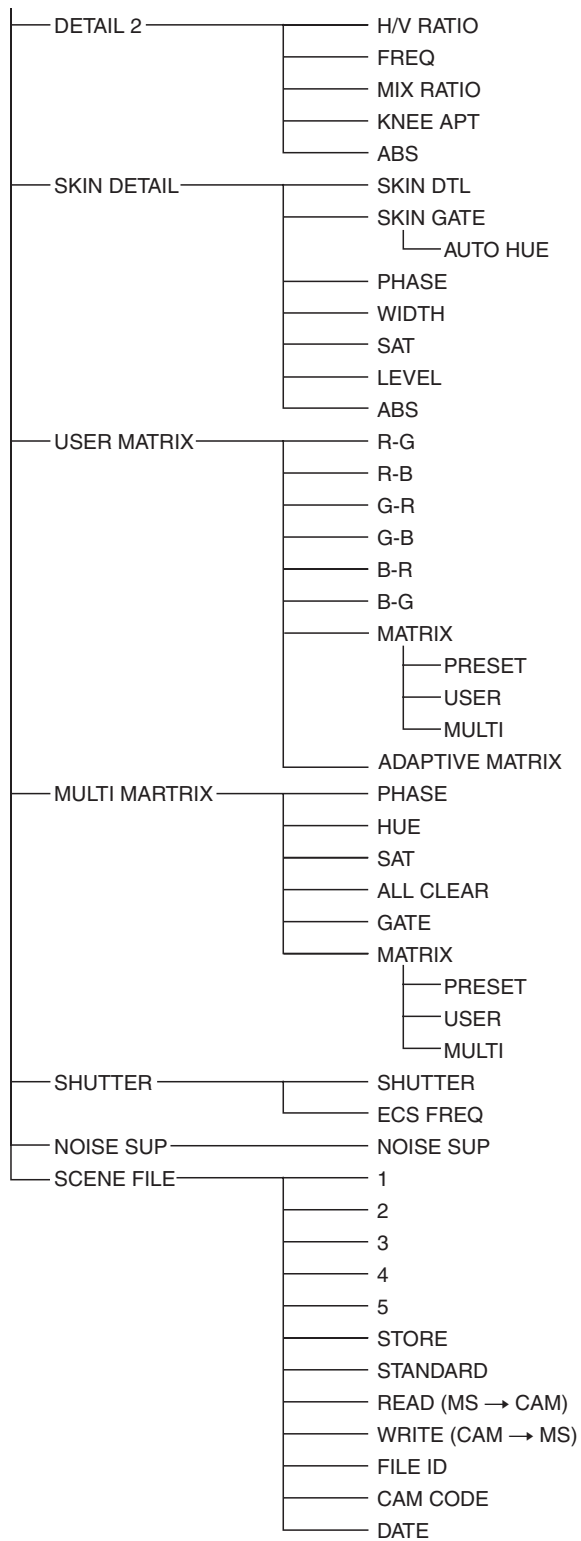
OPERATION menu



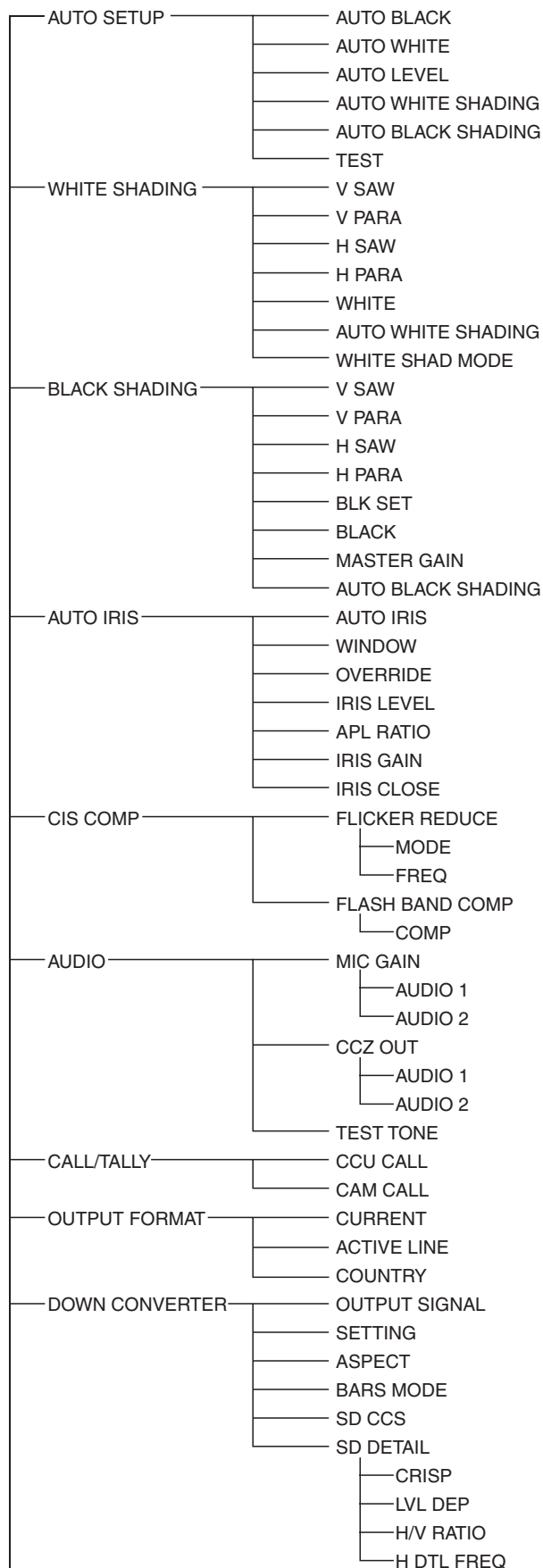


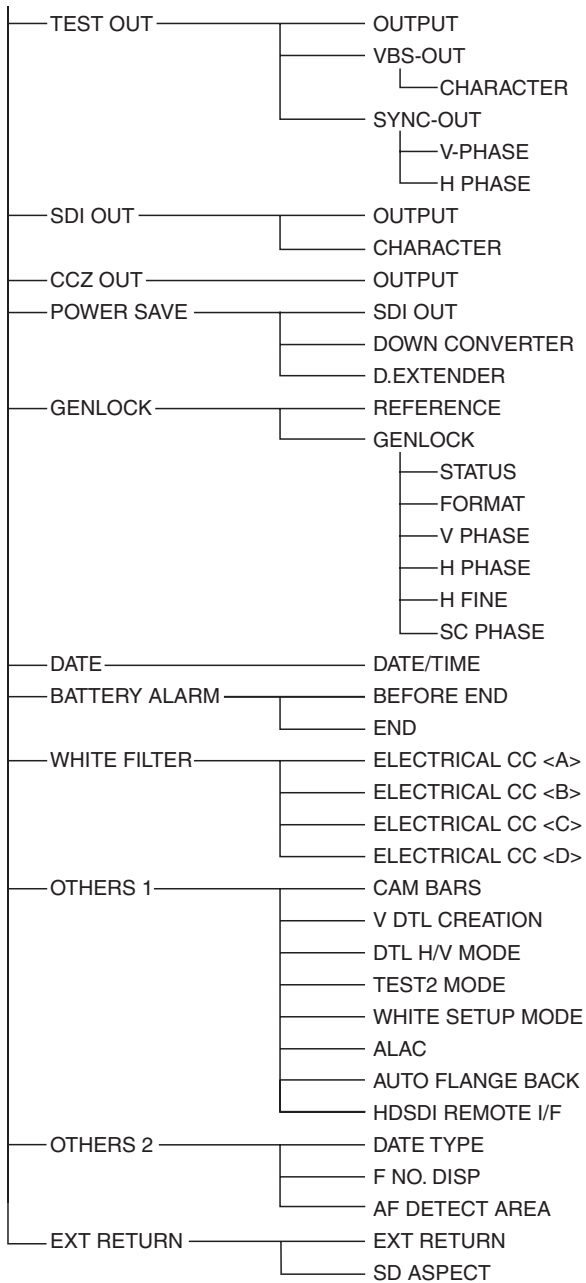
PAINT menu



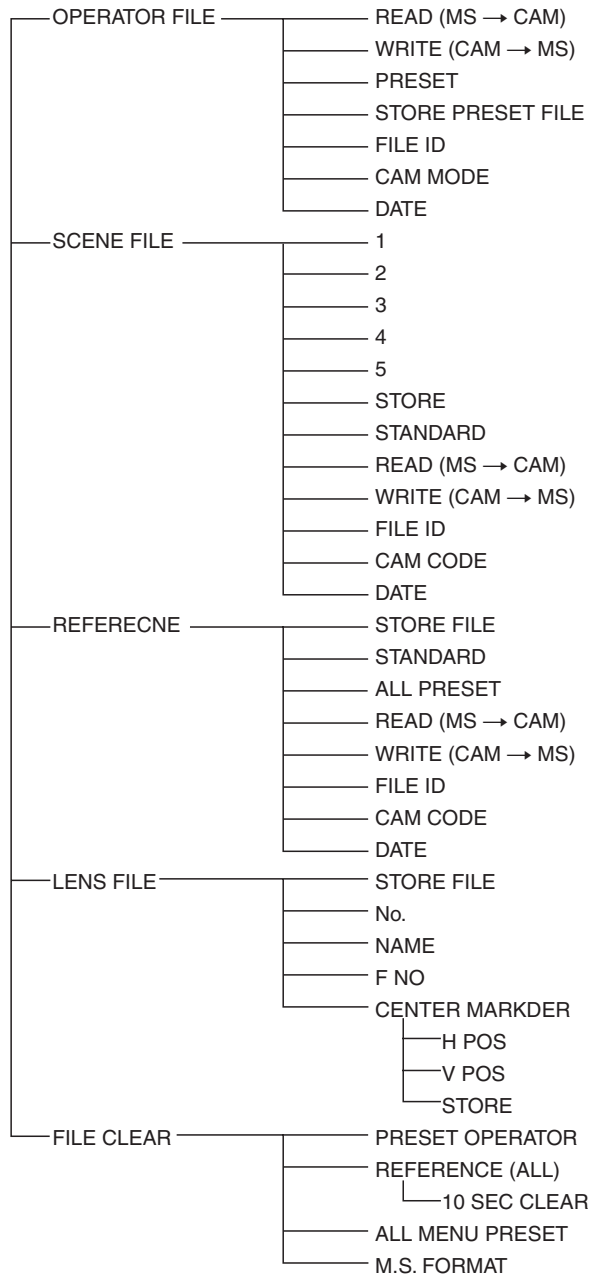


MAINTENANCE menu

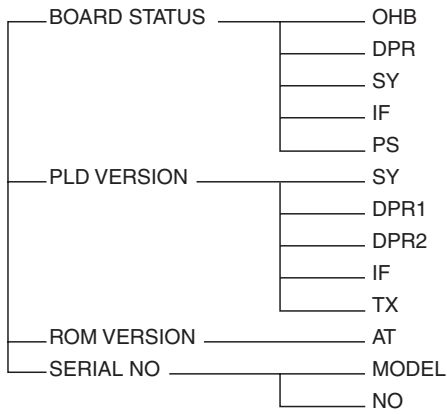




FILE menu



DIAGNOSIS menu



Basic Menu Operations

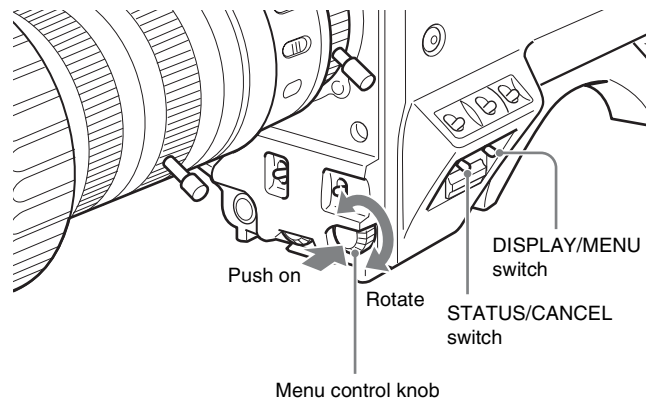
The menus displayed in the viewfinder enable various settings of the camera.

The following controls are used to operate the menus.

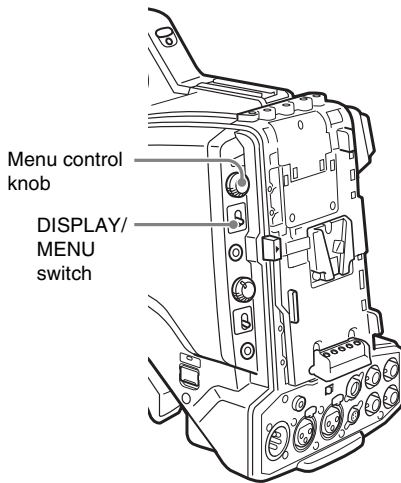
To enter menu mode, you can use the DISPLAY/MENU switch either on the right side or the rear panel of the unit.

The menu control knob at the low on the front panel and that on the rear panel function the same. Rotate the knob to select menu items or values and push on it to register (enter) the selection.

Right side



Rear operation panel



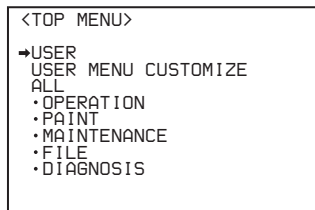
Displaying Menu Pages

To display a menu page

Set the DISPLAY/MENU switch to MENU. The menu page last accessed will be displayed. If it is the first time, the CONTENTS page of the USER menu will be displayed.

To display the TOP MENU screen

If you set the DISPLAY/MENU switch to MENU while holding the menu control knob pressed, "TOP" is displayed at the upper right corner of the screen. Turn the menu control knob to move the pointer (➡) on the display to "TOP" and push on the knob. The TOP MENU screen is displayed, listing the available menus.



Menu	Purpose
USER	This menu can include menu pages selected from among the OPERATION, PAINT, MAINTENANCE, FILE, and DIAGNOSIS menus, for convenience. Changing, adding, and deleting pages can be performed with the USER MENU CUSTOMIZE menu.
USER MENU CUSTOMIZE	This menu allows you to edit the USER menu. <i>For details on the USER menu, see "Editing the USER Menu" (page 51).</i>
ALL	This menu permits you to control all items of the OPERATION menu, PAINT menu, MAINTENANCE menu, FILE menu, and DIAGNOSIS menu as a single menu.
OPERATION	This menu contains items for camera operators to operate the camera. It mainly permits viewfinder, intercom, and switch settings.

Menu	Purpose
PAINT	This menu contains items for making detailed image adjustments while using a waveform monitor to monitor the waveforms output from the camera. Support of a video engineer is usually required to use this menu. Although you can also use an external control device to set the items on this menu, the menu is effective when using the camera by itself outdoors.
MAINTENANCE	This menu contains items for performing camera maintenance operations, such as changing the system or setting infrequently used "paint" items.
FILE	This menu is for performing file operations, such as writing or clearing the reference file.
DIAGNOSIS	This menu enables you to confirm the self-diagnostic information.

To disable the "TOP" indication

Turn the power off then on again, or set the DISPLAY/MENU switch to MENU while holding the STATUS/ CANCEL switch pressed toward CANCEL. This disables the TOP selection.

Setting the Menu

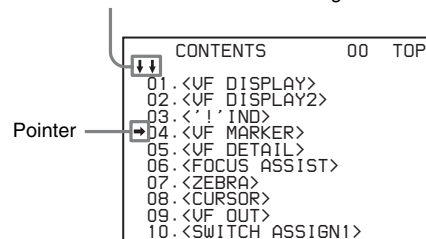
To select a menu on the TOP MENU screen

Rotate the menu control knob to align the pointer with the desired menu indication then push on the knob. The CONTENTS page (page No. 00) or the last accessed page of the selected menu is displayed.

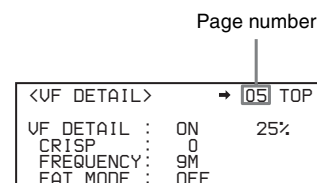
To select a page from a CONTENTS page

Rotate the menu control knob to align the pointer with the desired page indication then push on the menu control knob.

If the screen can be scrolled, arrows will indicate the direction for scrolling.



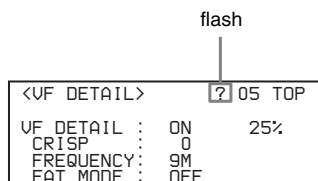
The selected page is displayed.



To change the displayed page

- 1 **Check that the pointer is located at the left of the page number then push on the menu control knob.**

The pointer will change to a flashing question mark.

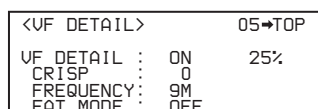


- 2 **Rotate the menu control knob to flip through the pages, and push on the knob when the desired page is displayed.**

The question mark will change back to the pointer, and operations with the displayed page are enabled.

To return to the TOP MENU screen

Align the pointer with "TOP" at the top right of the menu page then push on the menu control knob.



To set the Menu Items

If a question mark is flashing at the left of the page number, push on the menu control knob to change it to the pointer. Operation on the displayed page is enabled.

- 1 **Align the pointer with the desired item, then push on the menu control knob.**

The pointer will change to a flashing question mark.

- 2 **Rotate the menu control knob to change the setting value.**

When the knob is rotated quickly, the values will change quickly; when rotated slowly, the values will change slowly.

To reset a changed value

If you press the STATUS/ CANCEL switch toward CANCEL before pushing on the menu control knob, the setting will be returned to its previous value.

To interrupt settings

Set the DISPLAY/MENU switch to OFF to turn off the menu screen display. The setting operation can be restarted by setting the DISPLAY/MENU switch back to MENU.

- 3 **Push on the menu control knob.**

The question mark will change back to the pointer, and the new setting will be registered.

- 4 **To change other setting items on the same menu page, repeat steps 1 through 3.**

To specify a character string

When you press the menu control knob with the pointer pointing to an item for which a character string, such as a file ID, is to be specified, a cursor and the list of selectable characters are displayed.

The displayed cursor can be moved by rotating the menu control knob.

- 1 **Set the cursor to the position where you wish enter a character, then push on the menu control knob.**

Another cursor appears on the character list.

- 2 **Set the cursor to the character to be entered and push on the menu control knob.**

Repeat steps 1 and 2.

- By selecting INS on the line below the character list, you can enter a space at the cursor position.
- Selecting DEL deletes the character at the cursor position.
- You can return to step 1 without changing the character by selecting RET.
- If you enter the permitted maximum number of characters (up to the stop mark at the right end of the line), the cursor moves to ESC on the line below the character list.

- 3 **Select END and push on the menu control knob.**

The new string you have set is registered.

To restore the previous string

Select ESC and push on the menu control knob.

To return a menu item to its standard value

Select the menu item to be returned to its standard value then hold the menu control knob pressed for 3 seconds while the pointer is displayed.

If "10 SEC CLEAR" has been set to ON in FILE > FILE CLEAR in the setup menu (see page 71), you can return the setting in the reference file for the item being selected to the factory-set value by holding the menu control knob pressed for another 10 seconds.

To end menu operations

Set the DISPLAY/MENU switch to OFF.

Editing the USER Menu

You can select desired pages and items from the OPERATION, PAINT, MAINTENANCE, FILE, and DIAGNOSIS menus and register them to the USER menu. If you specify pages or items frequently used for the USER menu, you can easily call and use them.

The following pages are included on the factory-set USER menu:

Menu page title	USER menu No.	Source menu / page No.
<VF OUT>	U01	OPERATION 09
<VF DETAIL>	U02	OPERATION 05
<FOCUS ASSIST>	U03	OPERATION 06
<VF DISPLAY>	U04	OPERATION 01
<'I' IND>	U05	OPERATION 03
<VF MARKER>	U06	OPERATION 04
<CURSOR>	U08	OPERATION 08
<ZEBRA>	U07	OPERATION 07
<SWITCH ASSIGN1>	U09	OPERATION 10
<POWER SAVE>	U10	MAINTENANCE M13
<LENS FILE>	U11	OPERATION 17
<HEAD SET>	U12	OPERATION 13
<INTERCOM LEVEL>	U13	OPERATION 14
<AUDIO>	U14	MAINTENANCE M06
<OUTPUT FORMAT>	U15	MAINTENANCE M08
<TEST OUT>	U16	MAINTENANCE M10
<DOWN CONVERTER>	U17	MAINTENANCE M09
<ROM VERSION>	U18	DIAGNOSIS D03

For the items on each page, see "OPERATION Menu" (page 54), "MAINTENANCE Menu" (page 63), or "DIAGNOSIS Menu" (page 71).

The USER MENU CUSTOMIZE menu allows you to configure the USER menu as follows:

- Creating a new page with items selected from multiple menu pages
- Adding (registering) a menu page (new page you create or existing menu page) to the USER menu
- Deleting (unregistering) a page from the USER menu
- Changing the order of pages of the USER menu

Editing by items

While the EDIT page contains factory-preset items, the USER 1 EDIT to USER 19 EDIT pages are all blank in their initial state. You can register up to 10 items, including blank lines, on each of these pages.

To add items to a page

1 Select USER MENU CUSTOMIZE on the TOP MENU screen (page 49).

If this is the first time the USER MENU CUSTOMIZE menu has been displayed, the CONTENTS page of the menu appears.

CONTENTS		E00 TOP
↓	01.EDIT PAGE	
	02.USER 1 EDIT	
→	03.USER 2 EDIT	
	04.USER 3 EDIT	
	05.USER 4 EDIT	
	06.USER 5 EDIT	
	07.USER 6 EDIT	
	08.USER 7 EDIT	
	09.USER 8 EDIT	
	10.USER 9 EDIT	

If the USER MENU CUSTOMIZE menu has been used before, the page last accessed appears.

2 If the CONTENTS page is displayed, turn the menu control knob to move the pointer to any of USER 1 EDIT to USER 19 EDIT then push on the menu control knob to display the page.

If a different page is displayed, turn the menu control knob until the desired page appears then push on the menu control knob to select the page.

Example: When you select the USER 2 EDIT page

USER 2 EDIT		E03 TOP
→		

3 Move the pointer to the item to be added (this operation is unnecessary if no item exists on the page, as shown in the figure for the previous step) then push on the menu control knob.

The EDIT FUNCTION screen appears.

EDIT FUNCTION		ESC
→	INSERT	
	MOVE	
	DELETE	
	BLANK	

4 Move the pointer to INSERT and push on the menu control knob.

The page with the last item added appears.

<SW STATUS>		P01 ESC
FLARE	: → ON	
GAMMA	: ON	
BLK GAM	: OFF	
KNEE	: ON	
WHT CLIP	: ON	
DETAIL	: ON	
LVL DEP	: ON	
SKIN DTL	: OFF	
MATRIX	: OFF	

5 Add the items.

- Turn the menu control knob until the page that has the desired items appears, then push on the menu control knob.
- Turn the menu control knob to move the pointer to the desired item, then push on the menu control knob

The USER 2 EDIT page appears again, displaying the newly added item.

6 Add the remaining items by repeating steps 3 to 5.

You can add up to 10 items on one page.

To change the order of items on a page

1 Move the pointer to the item to be moved then push on the menu control knob.

The EDIT FUNCTION screen appears.

2 Select MOVE then push on the menu control knob.

The previously displayed page appears again.

3 Move the pointer to the position where you wish to move the item then push on the menu control knob.

ITEM MOVE		ESC
↓ ↓		
→	VF OUT : COLOR	
	VF DETAIL : OFF	
	MARKER : ON	
	CURSOR : OFF	
	ZEBRA SW : OFF	
	ASSIGNABLE1 : 1	
	●	ASSIGNABLE1 : OFF

The item selected in step 1 moves to the position that you selected in step 3.

In the above example, ASSIGNABLE1 is moved to the top, and the other items are moved down one line.

To delete items from a page

1 Move the pointer to the item to be deleted then push on the menu control knob.

The EDIT FUNCTION screen appears.

2 Select DELETE and push on the menu control knob.

The previously displayed page appears again, and the message "DELETE OK? YES→NO" appears.

3 To delete, turn the menu control knob to move the pointer to YES and push on the menu control knob.

To insert a blank line

1 Move the pointer to the item above which you wish to insert a blank line.

The EDIT FUNCTION screen appears.

2 Select BLANK then push on the menu control knob.

The previously displayed page appears again, and a blank line is inserted above the specified item.

Note

You cannot insert a blank line on a page where 10 items have already been registered.

Editing by pages

You can add a page to the USER menu, delete a page from the USER menu, or replace pages, using the EDIT PAGE of the USER MENU CUSTOMIZE menu.

To add a page

1 Select USER MENU CUSTOMIZE on the TOP MENU screen.

If this is the first time the USER MENU CUSTOMIZE menu has been displayed, the CONTENTS page of the menu appears. If the menu has been used before, the page last accessed appears.

2 If the CONTENTS page is displayed, turn the menu control knob to move the pointer to EDIT PAGE then push on the menu control knob to display the EDIT PAGE screen.

If a different page is displayed, turn the menu control knob until the EDIT PAGE screen appears then push on the menu control knob to select the page.

EDIT PAGE		E01 TOP
↓ ↓		
	01.<VF OUT>	
→	02.<VF DETAIL>	
	03.<FOCUS ASSIST>	
	04.<VF DISPLAY>	
	05.<' I ' IND>	
	06.<VF MARKER>	
	07.<CURSOR>	
	08.<ZEBRA>	
	09.<SWITCH ASSIGN1>	
	10.<SWITCH ASSIGN2>	

3 Move the pointer to the position where you wish to add the page then push on the menu control knob.

The EDIT FUNCTION screen appears.

4 Select INSERT then push on the menu control knob.

The selection screen appears.

CONTENTS		ESC
↓ ↓		
→	01.USER 1	
	02.USER 2	
	03.USER 3	
	04.USER 4	
	05.USER 5	
	06.USER 6	
	07.USER 7	
	08.USER 8	
	09.USER 9	
	10.USER 10	

5 Move the pointer to the desired page then push on the menu control knob.

This adds the number and name of the selected page above the item selected in step 3.

To cancel addition of a page

Before pushing the menu control knob in step 5, turn the menu control knob to move the pointer to ESC at the top right of the screen then push on the menu control knob. The EDIT PAGE screen appears again.

To delete a page

- 1** On the **EDIT PAGE** screen of the **USER MENU CUSTOMIZE** menu, move the pointer to the page to be deleted and push on the menu control knob.
The **EDIT FUNCTION** screen appears.
- 2** Select **DELETE** then push on the menu control knob.
The previously displayed page appears again, and the message “**DELETE OK? YES→NO**” appears.

```

ITEM DELETE          ESC
DELETE OK? YES→NO
01.<VF OUT>
02.<VF DETAIL>
03.<FOCUS ASSIST>
●04.<VF DISPLAY>
05.<'I' IND>
06.<VF MARKER>
07.<CURSOR>
08.<ZEBRA>
09.<SWITCH ASSIGN1>
10.<SWITCH ASSIGN2>

```

- 3** To delete, turn the menu control knob to move the pointer to **YES** then push on the menu control knob.

To change the order of pages

- 1** Display the **EDIT PAGE** screen of the **USER MENU CUSTOMIZE** menu. Turn the menu control knob to move the pointer to the page that you wish to move.
The **EDIT FUNCTION** screen appears.
- 2** Select **MOVE** then push on the menu control knob.
The **EDIT PAGE** screen appears again.
- 3** Move the pointer to the position where you wish to move the page then push on the menu control knob.

```

ITEM MOVE          ESC
↕↕
01.<VF OUT>
02.<VF DETAIL>
03.<FOCUS ASSIST>
→04.<VF DISPLAY>
05.<'I' IND>
06.<VF MARKER>
07.<CURSOR>
08.<ZEBRA>
●09.<SWITCH ASSIGN1>
10.<SWITCH ASSIGN2>

```

The page selected in step **1** is moved to the position selected in step **3**.

In the above example, <SWITCH ASSIGN1> moves to the “04” position, and the <VF DISPLAY> and following pages move down one line.

Menu List

Note

These remarks are common for all the following menu tables.

ON, OFF, 0, ... , in the Settings columns: Default settings

Page No. nn (Unn): For the pages that have been registered on the USER menu at the factory, the USER menu page numbers are indicated in parenthesis.

Execute by ENTER: Execute by pushing on the menu control knob.

OPERATION Menu

OPERATION			
Page title Page No.	Item	Settings	Description
<VF DISPLAY> 01 (U04)	EX	<u>ON</u> , OFF	Displays or hides the EX (lens extender) indication in the viewfinder.
	D.EX	<u>ON</u> , OFF	Displays or hides the D.EX (digital extender) indication in the viewfinder.
	ZOOM	ON, <u>OFF</u>	Displays or hides the zoom position indication in the viewfinder.
	DISP	<u>LEFT</u> , RIGHT	Sets the display position of the zoom position indication.
	FOCUS	ON, <u>OFF</u>	Displays or hides the focus position indication in the viewfinder. (Valid only when a serial lens is used.)
	MODE	<u>ON</u> , OFF	Displays or hides the focus mode in the viewfinder.
	ND	<u>ON</u> , OFF	Displays or hides the ND filter indication in the viewfinder.
	CC	<u>ON</u> , OFF	Displays or hides the CC filter indication in the viewfinder.
	5600K	<u>ON</u> , OFF	Displays or hides the 5600K mode indication in the viewfinder.
	IRIS	<u>ON</u> , OFF	Displays or hides the F-value (iris opening) indication in the viewfinder.
	GAIN	<u>ON</u> , OFF	Displays or hides the gain value indication in the viewfinder.
	SHUTT	<u>ON</u> , OFF	Displays or hides the shutter/ECS indication in the viewfinder.
	WHITE	ON, <u>OFF</u>	Displays or hides the white balance memory indication in the viewfinder.
	BATT	ON, <u>OFF</u>	Displays or hides the battery voltage indication in the viewfinder.
	RETURN	<u>ON</u> , OFF	Displays or hides the return video indication in the viewfinder.
	TALK	<u>ON</u> , OFF	Displays or hides the TALK indication in the viewfinder.
	AUDIO	<u>ON</u> , OFF	Displays or hides the audio level meters in the viewfinder.
	MESSAG	<u>ALL</u> , AT, WRN, OFF	Selects the display format of the message. ALL: Displays all messages. AT: Displays auto setup information and higher. WRN: Displays warning messages and higher.
	TALLY	<u>x1</u> , x2	Sets the display format of the tally indicator in the viewfinder. (Available when a DXF-series viewfinder is attached.)
<VF DISPLAY2> 02	FRONT/REAR VR	<u>ON</u> , OFF	Displays or hides the FRONT/REAR VR control settings.

OPERATION				
Page title Page No.	Item	Settings	Description	
<'! IND> 03 (U05)	ND	[IND] <u>ON</u> , OFF [NORMAL] <u>1</u> , 2, 3, 4 (combination allowed)	[IND]: Activates/deactivates the '! indication (page 17). [NORMAL]: Specifies the conditions under which the '! indication is not to be displayed even if [IND] is ON. (By specifying the standard or normal conditions here, non-standard or abnormal conditions can be found with the '! indication in the viewfinder.)	
	CC	[IND] <u>ON</u> , OFF [NORMAL] <u>A</u> , B, C, D (combination allowed)		
	WHITE	[IND] <u>ON</u> , OFF, - - - [NORMAL] P, <u>A</u> , <u>B</u> (combination allowed)	- - - : with CCU connected	
	5600K	[IND] <u>ON</u> , OFF, - - - [NORMAL] ON, <u>OFF</u>		
	GAIN	[IND] <u>ON</u> , OFF, - - - [NORMAL] H, M, <u>L</u> (combination allowed)		
	SHUTT	[IND] <u>ON</u> , OFF, - - - [NORMAL] ON, <u>OFF</u>		
	EXT	[IND] <u>ON</u> , OFF		
	FORMAT	[IND] <u>ON</u> , OFF [NORMAL] 59.94I, 50I, 59.94P, 50P		
<VF MARKER> 04 (U06)	MARKER	<u>ON</u> , OFF <u>WHITE</u> , BLACK, DOT	Displays or hides the marker in the viewfinder. Selects the marker type.	
	CENTER	ON, <u>OFF</u>	Displays or hides the center marker in the viewfinder.	
		<u>1</u> , 2, 3, 4	Selects the center marker type. 1: Entire cross 2: Entire cross with a hole 3: Center 4: Center with a hole	
		SAFETY ZONE	ON, <u>OFF</u> 80.0, <u>90.0</u> , 92.5, 95.0%	Displays or hides the safety zone in the viewfinder. Selects the safety zone size.
		EFFECT	ON, <u>OFF</u> , (FOCUS)	Displays or hides the effective pixel area in the viewfinder. (FOCUS): Displayed when INDICATOR in FOCUS ASSIST is set to ON.
	ASPECT	ON, <u>OFF</u>	Displays or hides the aspect marker in the viewfinder.	
		16:9, 15:9, 14:9, 13:9, <u>4:3</u> , (4:3)	Selects the aspect ratio. (4:3): Displayed when 4:3 is selected from VF SCAN on the <VF OUT> page.	
	MASK	ON, <u>OFF</u> , (ON)	Masks the area outside the selected aspect ratio. (ON): Displayed when 4:3 is selected from VF SCAN on the <VF OUT> page.	
		0 to 15 <u>12</u>	When MASK is set to on, sets the level to darken outside the aspect area.	
	SAFETY	ON, <u>OFF</u> , (AREA)	For the safety marker in aspect mode. (AREA): Displayed when AREA MARKER of <FOCUS ASSIST> is ON.	
80.0, <u>90.0</u> , 92.5, 95.0%		Sets the safety marker size.		

OPERATION			
Page title Page No.	Item	Settings	Description
<VF DETAIL> 05 (U02)	VF DETAIL	<u>ON</u> , OFF 0 to 100% <u>25%</u>	Adds detail signals to the edges of the subject.
	CRISP	-99 to 99 <u>0</u>	Removes faint detail signals
	FREQUENCY	<u>9M</u> , 14M, 18M	Changes the detection range for the edge.
	FAT MODE	ON, <u>OFF</u>	Strengthens the added detail signals.
	AREA	<u>100%</u> , 70%, 60%, 50%, 40%	Selects the area displaying the detail signals.
	ZOOM LINK	0%, 25%, 50%, 75%, <u>100%</u>	Sets the VF detail level at the full WIDE position. (Changes the VF detail level according to the zoom position.)
	COLOR DETAIL	ON, <u>OFF</u> <u>BLUE</u> , RED, YELLOW	Displays the detail signals in colors.
	PEAK COLOR	ON, <u>OFF</u>	Displays the strongest detail signal in colors.
	CHROMA LEVEL	100%, 50%, <u>25%</u> , 0%	Lowers the chroma level. (Available only for video signals used in viewfinders)
	<FOCUS ASSIST> 06 (U03)	INDICATOR	ON, <u>OFF</u> , (EFFECT)
MODE		<u>BOX</u> , B&W, COL <u>BTM</u> , LEFT, TOP, RIGHT	Sets the indicator position and format.
LEVEL		1 to 5 <u>3</u> <u>QUICK</u> , SMOOTH	Sets the brightness and response speed of the indicator.
GAIN		0 to 99 <u>50</u>	Sets the gain of the indicator.
OFFSET		0 to 99 <u>50</u>	Automatically sets the offset value according to the AREA MARKER SIZE and MASTER GAIN settings.
AREA MARKER		ON, <u>OFF</u> , (ASPECT)	Displays or hides the detection area of the focus as a marker in the viewfinder. (ASPECT): Displayed when ASPECT SAFETY of <VF MARKER> is ON.
SIZE		SMALL, <u>MIDDLE</u> , LARGE	Changes the detection range. (If larger range than needed is selected, both the subject and background are detected. This may prevent the indicator to function properly.)
POSITION		LEFT, <u>CENTER</u> , RIGHT	Roughly sets the position of the detection area.
POSITION H		0 to 99 <u>50</u>	Finely adjusts the position of the detection area in the horizontal directions.
POSITION V		0 to 99 <u>50</u>	Finely adjusts the position of the detection area in the vertical directions.
<ZEBRA> 07 (U07)	ZEBRA	ON, <u>OFF</u> <u>1</u> , 2, 1&2	Displays or hides the zebra pattern in the viewfinder. Sets the zebra pattern format (either of zebra1, zebra2 or zebra1&2)
	ZEBRA1 LEVEL	50 to 109% <u>70</u>	Sets the zebra1 level.
	WIDTH	0 to 30% <u>10</u>	Sets the range of the video level of zebra1.
	ZEBRA2	50 to 109% <u>100</u>	Sets the zebra2 level.
<CURSOR> 08 (U08)	CURSOR	ON, <u>OFF</u> <u>WHITE</u> , BLACK, DOT	Displays or hides the cursor in the viewfinder. Sets the color of the cursor.
	BOX/CROSS	<u>BOX</u> , CROSS	Sets the display format of the cursor.
	H POSITION	0 to 99 <u>50</u>	Sets the horizontal position of the cursor.
	V POSITION	0 to 99 <u>50</u>	Sets the vertical position of the cursor.
	WIDTH	0 to 99 <u>50</u>	Sets the width of the cursor.
	HEIGHT	0 to 99 <u>50</u>	Sets the height of the cursor.
	<VF OUT> 09 (U01)	VF OUT	<u>COLOR</u> , Y, R, G, B
	VF COLOR	-99 to 99 <u>0</u>	Adjusts the color density of the output signal to the viewfinder. (Available when the CBK-VF01 viewfinder is attached.)

OPERATION			
Page title Page No.	Item	Settings	Description
<SWITCH ASSIGN1> 10 (U09)	GAIN	[L]: -3, 0 , 3, 6, 9, 12, 18, 24, 30, 36, 42dB	Sets the gain value when the GAIN selector is set to L.
		[M]: -3, 0, 3, 6 , 9, 12, 18, 24, 30, 36, 42dB	Sets the gain value when the GAIN selector is set to M.
		[H]: -3, 0, 3, 6, 9, 12 , 18, 24, 30, 36, 42dB	Sets the gain value when the GAIN selector is set to H.
	ASSIGNABLE 1	OFF , RETURN1 SW, RETURN2 SW, INTERCOM, VF DETAIL, MARKER, CURSOR, ZEBRA, ELECTRICAL CC, 5600K, ATW, DIGITAL EXTENDER, MF *	Assigns functions to the ASSIGNABLE 1 button.
	ASSIGNABLE 2		Assigns functions to the ASSIGNABLE 2 button.
	ASSIGNABLE 3		Assigns functions to the ASSIGNABLE 3 button.
	ASSIGN CTEMP RE.ROTATION	5600K , ELECTRICAL CC STD , RVS	Assigns functions to the COLOR TEMP. button. Specifies operation mode of the menu control knob on the front. STD : Clockwise rotation moves the pointer (➡) down or increases values on the menu screen. RVS : Counterclockwise rotation moves the pointer (➡) down or increases values on the menu screen.
<SWITCH ASSIGN2> 11	LENS VTR S/S	OFF, VTR S/S, RETURN1 SW, RETURN2 SW , INTERCOM	Assigns a function to the VTR button on the mounted lens.
	FRONT RET2	OFF, VTR S/S, RETURN1 SW, RETURN2 SW , INTERCOM	Assigns a function to the RET button on the camera.
<VR ASSIGN> 12	FRONT VR	AUDIO1, AUDIO2, AUDIO1+2 , INTERCOM, EARPHONE, OFF, (INTERCOM)	Assigns a function to the INTERCOM LEVEL control on the front panel. (INTERCOM) : Not available when HXCU-D70 is connected.
	REAR VR	AUDIO1, AUDIO2, AUDIO1+2, INTERCOM , EARPHONE, OFF, (INTERCOM)	Assigns a function to the INTERCOM control on the rear panel. (INTERCOM) : Not available when HXCU-D70 is connected.
<HEAD SET> 13 (U12)	INTERCOM MIC LEVEL	DYNAMIC , CARBON, MANUAL	Selects the microphone type.
		-60, -40, -20 dB, (-60 dB)	Selects the audio level. Settings in (): With DYNAMIC or CARBON (cannot be changed)
		-6, 0 , +6 dB	Finely adjusts the audio level.
	POWER	ON, OFF, (ON), (OFF)	Sets the power supply for a microphone to on or off. Settings in (): With DYNAMIC or CARBON (cannot be changed)
	UNBAL	ON , OFF, (ON), (OFF)	Sets the microphone input format. Settings in (): With CARBON (cannot be changed)
<INTERCOM LEVEL> 14 (U13)	SIDE TONE	50 to 99 50	Adjusts the side tone level.
	PGM MIX LEVEL	0 to 99, - - 0	Adjusts the PGM level. - - : When a CCU is not connected or CCU-D50/D50P is connected (cannot be changed)

OPERATION			
Page title Page No.	Item	Settings	Description
<EARPHONE> 15	EARPHONE RECEIVE SELECT	SEPARATE , MIX	Sets the earphone output format. SEPARATE : Outputs different audio signals from the left and right channels. MIX : Outputs an audio signal from the left and right channels.
	INTERCOM	-- -, LEFT, RIGHT, BOTH	Sets the intercom audio output channel.
	AUDIO1	-- -, LEFT, RIGHT, BOTH	Sets the AUDIO1 output channel.
	AUDIO2	-- -, LEFT, RIGHT, BOTH	Sets the AUDIO2 output channel.
	SDI IN 1	-- -, LEFT, RIGHT, BOTH	Sets the SDI IN 1 output channel.
	SDI IN 2	-- -, LEFT, RIGHT, BOTH	Sets the SDI IN 2 output channel.
	EARPHONE LEVEL	0 to 99 80 (99)	Sets the earphone output level.
			Settings in (): Displayed when EARPHONE is selected in VR ASSIGN.
<OPERATOR FILE> 16 <i>See FILE menu F01.</i>	READ (MS→CAM)		Reads an operator file from a "Memory Stick Duo." (Execute by ENTER.)
	WRITE (CAM→MS)		Writes the current settings in the operator file to a "Memory Stick Duo." (Execute by ENTER.)
	PRESET		Loads the preset data. (Execute by ENTER.)
	FILE ID		Enters an operator file name, using up to 16 characters, to be written to a "Memory Stick Duo." <i>See "To specify a character string" on page 50.</i>
	CAM CODE		Displays the camera code. (Display only)
	DATE		Displays the date. (Display only)
<LENS FILE> 17 (U11)	FILE	1 to 17	Displays the selected file number. 1 to 16 : When using a non-serial lens 17 : When using a serial lens
		Lens file name	Displays the model name of the mounted lens. (Changeable only when using a non-serial lens)
		F1.0 to F1.5 to F3.4	Displays the F value of the mounted lens. (Changeable only when using a non-serial lens)
	CENTER MARKER		Sets and stores the center marker position.
	H POS	-20 to 20 0	Sets and stores the horizontal position of the center marker in the lens file. Increasing the value moves it to the right.
	V POS	-20 to 20 0	Sets and stores the vertical position of the center marker in the lens file. Increasing the value moves it downwards.
	STORE		Sets and stores the center marker position. (Execute by ENTER.)

PAINT Menu

PAINT	Item	Settings	Description
<SW STATUS> P01	FLARE	<u>ON</u> , OFF	Sets the flare compensation function to on or off.
	GAMMA	<u>ON</u> , OFF	Sets the gamma compensation function to on or off.
	BLK GAM	ON, <u>OFF</u>	Sets the black gamma compensation function to on or off.
	KNEE	<u>ON</u> , OFF	Sets the knee compensation function to on or off.
	WHT CLIP	<u>ON</u> , OFF	Sets the white clip compensation function to on or off.
	DETAIL	<u>ON</u> , OFF	Sets the detail compensation function to on or off.
	LVL DEP	<u>ON</u> , OFF	Sets the level depend function to on or off.
	SKIN DTL	ON, <u>OFF</u>	Sets the skin detail compensation function to on or off.
	MATRIX	ON, <u>OFF</u>	Sets the linear matrix and user matrix compensation function to on or off.
<VIDEO LEVEL> P02	WHITE	R/G/B: -99 to 99 <u>0</u>	Sets the gain value for white balance.
	BLACK	R/G/B/M: -99 to 99 <u>0</u>	Sets the black level value.
	FLARE	R/G/B/M: -99 to 99 <u>0</u>	Sets the flare compensation level.
	GAMMA	R/G/B/M: -99 to 99 <u>0</u>	Sets the gamma level.
	V MOD	R/G/B/M: -99 to 99 <u>0</u>	Sets the V modulation level.
	FLARE	<u>ON</u> , OFF	Sets the flare compensation function to on or off.
	V MOD	<u>ON</u> , OFF	Sets the V modulation shading compensation function to on or off.
	D. SHAD	ON, <u>OFF</u>	Sets the dynamic shading function to on or off. (Selectable only when a lens supporting dynamic shading is used.)
TEST	<u>OFF</u> , SAW, 3STEP, 10STEP	Selects the output format of the test signal.	
<COLOR TEMP> P03	WHITE	R/G/B: -99 to 99 <u>0</u>	Adjusts the white balance gain.
	AUTO WHITE BALANCE		Performs the auto white balance adjustment. (Execute by ENTER.)
	COLOR TEMP	0K to 65535K <u>3200K</u>	Sets the color temperature.
	BALANCE	R/G/B/M: -99 to 99 <u>0</u>	Sets the white balance.
	ATW	ON, <u>OFF</u>	Sets the ATW (Auto Tracing White Balance) function to on or off.
	SPEED	1 to 5 <u>4</u>	Selects the tracing speed of the ATW. (1: high, 5: low)
	MASTER	-3.0dB to 12.0dB, <u>0.0dB</u>	Adjusts the master white gain.

PAINT			
Page title Page No.	Item	Settings	Description
<GAMMA> P04	LEVEL	R/G/B/M: -99 to 99 <u>0</u>	Sets the gamma level.
	COARSE	0.35 to <u>0.45</u> to 0.90 (0.05 steps)	Sets the gamma compensation value in steps of 0.05.
	TABLE	STANDARD , HYPER	Selects either the standard gamma or hypergamma.
		With STANDARD selected: 1, <u>2</u> , 3, 4, 5, 6, 7 1: equivalent to a camera 2: 4.5-times gain 3: 3.5-times gain 4: equivalent to SMPTE-240M 5: equivalent to ITU-R709 6: 5.0-times gain 7: 5.0-times gain - 709	Selects the gamma table used for gamma compensation.
		With HYPER selected: 1, 2, 3, <u>4</u> 1: 325% to 100% 2: 460% to 100% 3: 325% to 109% 4: 460% to 109%	
		(When you change the TABLE setting, noise may be generated. This is not malfunction.)	
	GAMMA	ON , OFF	Sets the gamma compensation function to on or off.
	TEST	OFF , SAW, 3STEP, 10STEP	Selects the test signal displayed on the monitor screen.
<BLACK GAMMA> P05	LEVEL	R/G/B/M: -99 to 99 <u>0</u>	Sets the black gamma level (master level only).
	RANGE	LOW, L.MID, H.MID, HIGH	Selects the active range of black gamma compensation.
		ON, OFF	Sets the black gamma compensation function to on or off.
	TEST	OFF , SAW, 3STEP, 10STEP	Selects the test signal displayed on the monitor screen.
<SATURATION> P06	SATURATION	-99 to 99 <u>0</u>	Sets the saturation level.
		ON, OFF	Sets the saturation function to on or off.
	LOW KEY SAT	-99 to 99 <u>0</u>	Sets the low key saturation level.
	RANGE	LOW, L.MID, H.MID, HIGH	Selects the saturation range in which the low key saturation function is activated.
		ON, OFF	Sets the low key saturation function to on or off.
	TEST	OFF , SAW, 3STEP, 10STEP	Selects the test signal displayed on the monitor screen.
<KNEE> P07	K POINT	R/G/B/M: -99 to 99 <u>0</u>	Sets the knee point.
	K SLOPE	R/G/B/M: -99 to 99 <u>0</u>	Sets the knee slope.
	KNEE	ON , OFF	Sets the knee compensation function to on or off.
	KNEE MAX	ON, OFF	Sets the knee max to on or off.
	KNEE SAT	-99 to 99 <u>0</u>	Sets the knee saturation level.
		ON, OFF	Sets the knee saturation function to on or off.
	AUTO KNEE	OFF , AUTO	Sets the auto knee function to on or off.
	POINT LIMIT	-99 to 99 <u>0</u>	Sets the auto knee limiter.
	SLOPE	-99 to 99 <u>0</u>	Sets the auto knee slope.
	ABS		Displays the inverted values as absolute values.
<WHITE CLIP> P08	W CLIP	-99 to 99 <u>0</u>	Sets the white clip level.
		ON , OFF	Sets the white clip adjustment function to on or off.
	ABS		Displays the inverted values as absolute values.

PAINT				
Page title Page No.	Item	Settings	Description	
<DETAIL 1> P09	DETAIL	<u>ON</u> , OFF	Sets the detail adjustment (contour correction) function to on or off.	
	LEVEL	-99 to 99 <u>0</u>	Sets the detail level.	
	LIMITER [M]	-99 to 99 <u>0</u>	Sets the master level for the detail limiter.	
	[WHT]	-99 to 99 <u>0</u>	Sets the white detail limiter.	
	[BLK]	-99 to 99 <u>0</u>	Sets the black detail limiter.	
	CRISP	-99 to 99 <u>0</u>	Sets the crispening level.	
	LVL DEP	-99 to 99 <u>0</u>	Sets the level depend level.	
		<u>ON</u> , OFF	Sets the level depend adjustment function to on or off.	
	ABS		Displays the inverted values as absolute values.	
	<DETAIL 2> P10	H/V RATIO	-99 to 99 <u>0</u>	Sets the horizontal and vertical ratio of contour correction.
FREQ		-99 to 99 <u>0</u>	Sets the center frequency of contour correction.	
MIX RATIO		-99 to 99 <u>0</u>	Sets the mix ratio of the gamma and contour correction signals.	
KNEE APT		-99 to 99 <u>0</u>	Sets the knee aperture level.	
		<u>ON</u> , <u>OFF</u>	Sets the knee aperture function to on or off.	
ABS			Displays the inverted values as absolute values.	
<SKIN DETAIL> P11	SKIN DTL	ON, <u>OFF</u>	Sets the skin detail compensation function to on or off.	
	SKIN GATE	ON, <u>OFF</u> , (MAT)	Displays or hides the area in which the skin-tone detail function is activated. (MAT) : Displayed when GATE of <MULTI MATRIX> is ON.	
	AUTO HUE		Execute by ENTER.	
	PHASE	0 to 359 <u>0</u>	Adjusts the phase of the color signal controlled by the skin-tone detail function.	
	WIDTH	0 to 90 <u>29</u>	Adjusts the width of the color signal controlled by the skin-tone detail function.	
	SAT	-99 to 99 <u>-89</u>	Sets the color saturation level (color intensity) controlled by the skin-tone detail function.	
	LEVEL	-99 to 99 <u>0</u>	Sets the skin-tone detail level.	
	ABS		Displays the inverted values as absolute values.	
	<USER MATRIX> P12	R-G	-99 to 99 <u>0</u>	Sets the user matrix for R-G.
		R-B	-99 to 99 <u>0</u>	Sets the user matrix for R-B.
G-R		-99 to 99 <u>0</u>	Sets the user matrix for G-R.	
G-B		-99 to 99 <u>0</u>	Sets the user matrix for G-B.	
B-R		-99 to 99 <u>0</u>	Sets the user matrix for B-R.	
B-G		-99 to 99 <u>0</u>	Sets the user matrix for B-G.	
MATRIX		<u>ON</u> , OFF	Sets the matrix function to on or off. All the matrix functions can be activated or deactivated at the same time, according to the individual settings.	
PRESET		<u>ON</u> , <u>OFF</u> SMPTE-240M, ITU-709 , SMPTE-WIDE, NTSC, EBU, ITU-601, - -	Sets the preset matrix function to on or off. Selects the preset matrix. - - : When MATRIX is set to OFF (cannot be changed)	
USER		ON, <u>OFF</u> , - -	Sets the user matrix function to on or off. The user matrix settings are available when ON is selected. - - : When MATRIX is set to OFF (cannot be changed)	
MULTI		ON, <u>OFF</u> , - -	Sets the multi matrix function to on or off. - - : When MATRIX is set to OFF (cannot be changed)	
ADAPTIVE MATRIX	<u>ON</u> , OFF	Sets the adaptive matrix function to on or off.		

PAINT			
Page title Page No.	Item	Settings	Description
<MULTI MATRIX> P13	PHASE	0 , 23, 45, 68, 90, 113, 135, 158, 180, 203, 225, 248, 270, 293, 315, 338	Selects an axis (angle) for which the multimatrix adjustment to be made.
	HUE	-99 to 99 0	Independently sets the hue compensation for 16 axes.
	SAT	-99 to 99 0	Independently sets the saturation compensation for 16 axes.
	ALL CLEAR	Execute by ENTER.	The HUE and SAT values for all PHASE settings are cleared.
	GATE	ON, OFF , (SKN)	Adds the gate signal to the image specified in the PHASE settings. (SKN) : Displayed when SKIN GATE in SKIN DETAIL is ON.
	MATRIX	ON, OFF	Sets the matrix function to on or off. All the matrix functions can be activated or deactivated at the same time, according to the individual settings.
	PRESET	ON, OFF	Sets the preset matrix function to on or off.
		SMPTE-240M, ITU-709 , SMPTE-WIDE, NTSC, EBU, ITU-601, - -	Selects the preset matrix. - - : When MATRIX is set to OFF (cannot be changed)
	USER	ON, OFF , - -	Sets the user matrix function to on or off. - - : When MATRIX is set to OFF (cannot be changed)
	MULTI	ON, OFF , - -	Sets the multi matrix function to on or off. The PHASE, HUE and SAT settings are available when ON is selected. - - : When MATRIX is set to OFF (cannot be changed)
<SHUTTER> P14	SHUTTER	ON, OFF 59.94I , 59.94P : 1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000 (sec) 50I , 50P : 1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000 (sec)	Sets the shutter speed.
	ECS FREQ	59.94I : 60.00 to 4300 Hz 59.94P : 59.96 to 4600 Hz 50I : 50.00 to 4700 Hz 50P : 50.03 to 4600 Hz	Sets the ECS frequency.
<NOISE SUP> P15	NOISE SUP	ON, OFF	Sets the noise suppressor function to on or off.

PAINT			
Page title Page No.	Item	Settings	Description
<SCENE FILE> P16 <i>See FILE menu F02.</i>	1		File number and file ID
	2		Stores and reads scene files (paint data).
	3		
	4		
	5		
	STORE		Stores scene files in the camera's internal memory.
	STANDARD		Execute by ENTER.
	READ (MS→CAM)		Reads a scene file from a "Memory Stick Duo." (Execute by ENTER.)
	WRITE (CAM→MS)		Writes the current settings in the scene file to a "Memory Stick Duo." (Execute by ENTER.)
	FILE ID		Enters a scene file name, using up to 16 characters, to be written to a "Memory Stick Duo." <i>See "To specify a character string" on page 50.</i>
CAM CODE		Displays the camera code. (Display only)	
DATE		Displays the date. (Display only)	

MAINTENANCE Menu

MAINTENANCE			
Page title Page No.	Item	Settings	Description
<AUTO SETUP> M01	AUTO BLACK		Sets the auto black function. (Execute by ENTER.)
	AUTO WHITE		Sets the auto white function. (Execute by ENTER.)
	AUTO LEVEL		Sets the video signal level to the standard level. (Execute by ENTER.) Adjusts the auto black and auto white functions when RCP-D50 is connected.
	AUTO WHITE SHADING		Activates the auto white shading compensation function. (Execute by ENTER.)
	AUTO BLACK SHADING		Activates the auto black shading compensation function. (Execute by ENTER.)
	TEST		<u>OFF</u> , SAW, 3STEP, 10STEP
<WHITE SHADING> M02	V SAW	R/G/B: -99 to 99 <u>0</u>	Sets the SAW white shading compensation value in the vertical direction.
	V PARA	R/G/B: -99 to 99 <u>0</u>	Sets the parabola white shading compensation value in the vertical direction.
	H SAW	R/G/B: -99 to 99 <u>0</u>	Sets the SAW white shading compensation value in the horizontal direction.
	H PARA	R/G/B: -99 to 99 <u>0</u>	Sets the parabola white shading compensation value in the horizontal direction.
	WHITE	R/G/B: -99 to 99 <u>0</u>	Sets the color temperature compensation values by changing the sensitivities for R, G and B.
	AUTO WHITE SHADING		Performs the auto white shading compensation. (Execute by ENTER.)
	WHITE SHAD MODE	RGB, <u>RB</u>	Selects the signal on which the auto white shading compensation function is performed.

MAINTENANCE			
Page title Page No.	Item	Settings	Description
<BLACK SHADING> M03	V SAW	R/G/B: -99 to 99 <u>0</u>	Sets the SAW black shading compensation value in the vertical direction.
	V PARA	R/G/B: -99 to 99 <u>0</u>	Sets the parabola black shading compensation value in the vertical direction.
	H SAW	R/G/B: -99 to 99 <u>0</u>	Sets the SAW black shading compensation value in the horizontal direction.
	H PARA	R/G/B: -99 to 99 <u>0</u>	Sets the parabola black shading compensation value in the horizontal direction.
	BLK SET	R/G/B: -99 to 99 <u>0</u>	Individually sets the compensation values for R, G and B.
	BLACK	R/G/B/M: -99 to 99 <u>0</u>	Individually sets the black levels for R, G and B. Sets the black level by controlling all the settings for R, G and B.
	MASTER GAIN	-3, <u>0</u> , 3, 6, 9, 12dB	Sets the master gain value.
	AUTO BLACK SHADING		Performs the auto black shading compensation. (Execute by ENTER.)
<AUTO IRIS> M04	AUTO IRIS	ON, OFF	Activates the auto iris function.
	WINDOW	<u>1</u> , 2, 3, 4, 5, 6	Selects the auto iris window:
			The shaded parts indicate the area where light detection occurs.
	OVERVERRIDE	-99 to 99 <u>--</u>	<p>Sets the override to temporarily change the reference value for brightness of the automatic iris level in the range of ± 2 steps.</p> <p>-99: Two steps to fully closed iris</p> <p>99: Two steps to fully open iris</p> <p>--: OFF</p> <p>The setting returns to "--" when the power is turned off.</p>
	IRIS LEVEL	-99 to 99 <u>0</u>	Sets the auto iris level.
	APL RATIO	-99 to 99 <u>65</u>	Adjusts the auto iris APL ratio (ratio of the peak auto iris level and average auto iris level).
	IRIS GAIN	-99 to 99 <u>0</u>	Sets the auto iris response speed.
	IRIS CLOSE	ON, OFF	Closes the lens aperture.

MAINTENANCE			
Page title Page No.	Item	Settings	Description
<CIS COMP> M05	FLICKER REDUCE		Settings related to the flicker compensation function.
	MODE	<u>AUTO</u> , ON, OFF	Enables or disables flicker reduction. AUTO : Enabled when flicker is detected. ON : Always enabled. OFF : Disabled
	FREQ	60 Hz, <u>50 Hz</u>	Set to the frequency of the lighting fixture that is causing the flicker. (The factory default setting is 50 Hz when the area setting is PAL area, 60 Hz when it is other than PAL area.)
	FLASH BAND COMP		Settings related to the flash band compensation.
	COMP	ON, <u>OFF</u> , (OFF)	Sets the flash band compensation function to on or off. (OFF) : Displayed when the shutter function is activated. – ON can be selected only when the shutter function is deactivated. – The COMP setting is automatically switched from ON to (OFF) when the shutter function becomes activated. The setting returns to ON when the shutter function becomes deactivated.
<AUDIO> M06 (U14)	MIC GAIN		
	AUDIO1	20dB, 30dB, 40dB, 50dB, <u>60dB</u>	Sets the input gain of the AUDIO 1 IN connector for an external microphone. Settings in (): When HXCU-D70 is connected (cannot be changed)
	AUDIO2	20dB, 30dB, 40dB, 50dB, <u>60dB</u>	Sets the input gain of the AUDIO 2 IN connector for an external microphone. Settings in (): When HXCU-D70 is connected (cannot be changed)
	CCZ OUT		Adjusts the microphone output settings when the CCU-D50/D50P is connected.
	AUDIO 1	<u>ON</u> , OFF	Outputs the audio signal input from the AUDIO 1 IN connector to the CCU. Settings in (): When HXCU-D70 is connected (cannot be changed)
	AUDIO 2	<u>ON</u> , OFF	Outputs the audio signal input from the AUDIO 2 IN connector to the CCU. Settings in (): When HXCU-D70 is connected (cannot be changed)
	TEST TONE	ON, <u>OFF</u>	Sets the test tone function to on or off. Returns to OFF every time the power is turned on.
<CALL/TALLY> M07	CCU CALL	- - -, <u>ON</u> , OFF	Displays the CALL signal from the CCU. - - -: When a CCU is not connected
	CAM CALL	- - -, ON, <u>OFF</u>	Displays the CALL signal from the camera. - - -: When a CCU is not connected

MAINTENANCE			
Page title Page No.	Item	Settings	Description
<OUTPUT FORMAT> M08 (U15)	CURRENT		Displays the current format.
	ACTIVE LINE	[1080] 59.94i, 50i [720] 59.94P, 50P (When you change the ACTIVE LINE setting, once turn the camera off. The camera will operate in the selected mode when next turned on.)	Set this item when turning the unit on for the first time. Selectable formats vary depending on the area of use.
	COUNTRY	NTSC AREA, NTSC(J) AREA, PAL AREA	Sets the area of use. <i>For details, see "Setting the Area of Use" (page 27).</i> A restart is required after setting.
<DOWN CONVERTER> M09 (U17)	OUTPUT SIGNAL SETTING	(MAIN) CAM, <u>CCU</u>	(Display only) When a CCU is connected: Either CAM (settings made with the camera) or CCU (settings taken from the linked CCU) can be selected. When a CCU is connected, the values for the following items displayed in parenthesis cannot be changed with the camera. When a CCU is not connected: This item is not displayed.
	ASPECT	<u>SQ</u> , EC	Sets the aspect mode for down-converting. SQ: Squeeze (16:9) EC: Edge crop (4:3)
	BARS MODE	<u>DISABLE</u> , SMPTE, FULL (75%), FULL (100%)	Selects the color bar for SD signal. Outputs a down-converted HD BARS signal when DISABLE is selected.
	SD CCS	<u>ON</u> , OFF	Sets the cross color suppression function to on or off.
		-99 to 99 <u>0</u>	Sets the cross color suppression level.
	SD DETAIL	<u>ON</u> , OFF	Sets the detail adjustment function for down-converted output to on or off.
		-99 to 99 <u>0</u>	Sets the SD detail signal level.
	CRISP	-99 to 99 <u>0</u>	Sets the crispening level.
	LVL DEP	-99 to 99 <u>0</u>	Sets the level depend level.
	H/V RATIO	-99 to 99 <u>0</u>	Sets the horizontal and vertical ratio for the detail signal to be added.
	H DTL FREQ	-99 to 99 <u>0</u>	Sets the detection center frequency of the H detail signal.
<TEST OUT> M10 (U16)	OUTPUT	SD-SYNC, VF, HD-SYNC, <u>VBS</u>	Sets the signal to be output from the TEST OUT connector.
	VBS-OUT		Available when VBS is selected in TEST OUT > OUTPUT in the setup menu.
	CHARACTER	ON, <u>OFF</u>	Adds the character signals.
	SYNC-OUT		Available when SD-SYNC or HD-SYNC is selected in TEST OUT > OUTPUT in the setup menu.
	V-PHASE	-1024 to 1023 <u>0</u>	Adjusts the vertical phase for SYNC-OUT.
H-PHASE	-1700 to 1700 <u>0</u>	Adjusts the horizontal phase for SYNC-OUT.	
<SDI OUT> M11	OUTPUT	<u>MAIN</u> , VF, RET, SD-SDI	Selects the output signal from the SDI OUT connector. Available when ACTIVE is selected in MAINTENANCE > POWER SAVE > SDI OUT in the setup menu.
	CHARACTER	ON, <u>OFF</u>	Displayed when OUTPUT is set to SD-SDI.

MAINTENANCE			
Page title Page No.	Item	Settings	Description
<CCZ OUT> M12	OUTPUT	<u>YCrCb</u> , YC, RGB, - - -	Sets the signal to be output from the CCZ-A connector when the camera is used on its own. Settings in (): When CCU-D50/D50P is connected - - -: When a CCU other than CCU-D50/D50P is connected
<POWER SAVE> M13 (U10)	SDI OUT	<u>PWR SAVE</u> , ACTIVE	Sets the power save mode for the SDI OUT connector.
	DOWN CONVERTER	PWR SAVE, <u>ACTIVE</u> , (ACTIVE)	Sets the power save mode for the down-converted output. (ACTIVE) : When CCU-D50/D50P is connected (cannot be changed)
	D.EXTENDER	ENABLE, <u>DISABLE</u>	Sets the power save mode while the digital extender function is not used. ENABLE : When the digital extender function is used. DISABLE : When the digital extender function is not used.
<GENLOCK> M14 Items other than REFERENCE are not displayed when a CCU is connected. They are displayed when CCU-D50/D50P is connected.	REFERENCE	CCU, INTERNAL, GENLOCK	Condition of synchronisation (Display only)
	GENLOCK	<u>DISABLE</u> , ENABLE	Activates or deactivates the genlock function.
	STATUS		Indicates the signal format input to the GENLOCK connector. (Display only)
	FORMAT		
	V PHASE	-1024 to 1023 <u>0</u>	Adjusts the vertical phase for GENLOCK.
	H PHASE	-1700 to 1700 <u>0</u>	Adjusts the horizontal phase for GENLOCK.
	H FINE	-99 to 99 <u>0</u>	Finely adjusts the horizontal phase for GENLOCK (Available only for SD output).
	SC PHASE	0 to 359 <u>0</u>	Adjusts the subcarrier phase (Available only for VBS output).
<DATE> M15	DATE/TIME	yyyy/mm/dd hh:mm	Display format varies depending on the DAY TYPE settings on the <OTHERS 2> page.
<BATTERY ALARM> M16	BEFORE END	<u>11.5 V</u> to 17.0 V	Sets the threshold for displaying the message "Battery Near End."
	END	<u>11.0 V</u> to 11.5 V	Sets the threshold for displaying the message "Battery End."
<WHITE FILTER> M17	ELECTRICAL CC <A>	<u>3200K</u> , 4300K, 5600K, 6300K	Switches between the built-in electrical CC filters.
	ELECTRICAL CC 	3200K, <u>4300K</u> , 5600K, 6300K	
	ELECTRICAL CC <C>	3200K, 4300K, <u>5600K</u> , 6300K, - - - -	The 5600K mode indication lights up when 5600K is selected.
	ELECTRICAL CC <D>	3200K, 4300K, 5600K, <u>6300K</u> , - - - -	

MAINTENANCE			
Page title Page No.	Item	Settings	Description
<OTHERS 1> M18	CAM BARS	ON, OFF	Displays or hides the color bar signal.
	V DTL CREATION	NAM, G, R+G, Y	Selects the source signal of V DTL.
	DTL H/V MODE	H/V , V Only	Selects the operating mode of the H/V RATIO function in DETAIL 2. H/V : H and V increase and decrease in inverse proportion. V Only : V DTL only enabled.
	TEST2 MODE	3STEP , 10STEP	Selects the TEST2 signal.
	WHITE SETUP MODE	AWB, A.LVL	Selects the white balance setting when the auto setup function is performed or all the settings are cleared. AWB : Returns to the previous setting. A.LVL : Returns to the setting stored in the reference file.
	ALAC	AUTO , OFF	Activates the ALAC (Auto Lens Aberration Compensation) function. With AUTO selected, the status is displayed at the right. (ACTIVE) : Compensation in progress (WAIT) : Waiting for completion of lens initialization (STOP) : Compensation is turned off for a non-applicable lens
	AUTO FLANGE BACK		Activates the auto flange back function. (Execute by ENTER.)
	HDSDI REMOTE I/F	OFF , R-TLY	Selects whether to activate the recording-control function for an external device connected to the SDI OUT connector. Available when MAIN is selected in MAINTENANCE > SDI OUT > OUTPUT in the setup menu.
<OTHERS 2> M19	DATE TYPE	1 Y/Mn/D, 2 Mn/D, 3 D/M/Y, 4 D/M, 5 M/D/Y , 6 M/D	Selects the date display format. Y : Year Mn : Month (numeric) M : Month (character string) D : Day
	F NO. DISP	CONTROL , RETURN	Selects the iris indication on the panel when AUTO IRIS is off. CONTROL : To display the value from the camera RETURN : To display the value returned from the lens (When AUTO IRIS is on, the value returned from the lens is always displayed.)
	AF DETECT AREA	CENTER , VARIABLE	Sets the auto-focus detection area. CENTER : Fixed auto-focus detection area at the center VARIABLE : Adjustable auto-focus detection area
<EXT RETURN> M20	EXT RETURN	VBS , SDI	Selects the input signal format displayed in the viewfinder when the RET button is pressed. SDI is not available when a CCU is connected.
	SD ASPECT	EC, SQ	EC : Select this when the aspect ratio of the VBS input signal is 4:3. SQ : Select this when the aspect ratio of the VBS input signal is 16:9.

FILE Menu

Five types of files can be used for easy adjustments of the camera; Operator, Reference, Scene, OHB, and Lens. You can store the items set with the OPERATION menu and customized USER menu in the Operator file.

For the specific items included in these files, refer to the Maintenance Manual.

FILE	Item	Settings	Description
<OPERATOR FILE> F01	READ (MS→CAM)		Reads an operator file from a "Memory Stick Duo." (Execute by ENTER.)
	WRITE (CAM→MS)		Writes the current settings in the operator file to a "Memory Stick Duo." (Execute by ENTER.)
	PRESET		Loads the preset data. (Execute by ENTER.)
	STORE PRESET FILE		Stores the settings (preset data) on the OPERATION menu in the camera's internal memory. (Execute by ENTER.)
	FILE ID		Enters an operator file name, using up to 16 characters, to be written to a "Memory Stick Duo." <i>See "To specify a character string" on page 50.</i>
	CAM CODE		Displays the camera code. (Display only)
	DATE		Displays the date. (Display only)
	1		File number and file ID
	2		Stores and reads scene files (paint data).
	3		
<SCENE FILE> F02	4		
	5		
	STORE		Stores scene files in the camera's internal memory.
	STANDARD		Execute by ENTER.
	READ (MS→CAM)		Reads scene files from a "Memory Stick Duo." (Execute by ENTER.)
	WRITE (CAM→MS)		Writes the current settings in the scene file to a "Memory Stick Duo." (Execute by ENTER.)
	FILE ID		Enters a scene file name, using up to 16 characters, to be written to a "Memory Stick Duo." <i>See "To specify a character string" on page 50.</i>
	CAM CODE		Displays the camera code. (Display only)
	DATE		Displays the date. (Display only)

FILE			
Page title	Item	Settings	Description
<REFERENCE> F03	STORE FILE		Stores the current settings in the reference file to the camera's internal memory. (Execute by ENTER.)
	STANDARD		Reads the standard values in the reference file from the internal memory. (Execute by ENTER.)
	ALL PRESET		Returns the camera settings to the factory preset. (Execute by ENTER.)
	Note		
	The area settings are cleared when this function is executed. Restart the unit after completing the area settings.		
	READ (MS→CAM)		Loads a reference file from a "Memory Stick Duo." (Execute by ENTER.)
	WRITE (CAM→MS)		Writes the current settings in the reference file to a "Memory Stick Duo." (Execute by ENTER.)
	FILE ID		Enters a reference file name, using up to 16 characters, to be written to a "Memory Stick Duo." <i>See "To specify a character string" on page 50.</i>
	CAM CODE		Displays the camera code. (Display only)
	DATE		Displays the date. (Display only)
<LENS FILE> F04	STORE FILE		Stores the current settings in the lens file to the camera's internal memory. (Execute by ENTER.)
	No.	<u>1</u> to 17	1 to 16: When using a non-serial lens 17: When using a serial lens
	NAME	Lens file name	(Changeable only when using a non-serial lens.)
	F NO	F1.0 to F3.4 F1.7	(Changeable only when using a non-serial lens.)
	CENTER MARKER		Sets and store the center marker position.
	H POS	-20 to 20 <u>0</u>	Adjusts the marker position in the horizontal direction. (Increasing the value moves it to the right.)
	V POS	-20 to 20 <u>0</u>	Adjusts the marker position in the vertical direction. (Increasing the value moves it downwards.)
	STORE		Stores the center marker position. (Execute by ENTER.)

FILE			
Page title Page No.	Item	Settings	Description
<FILE CLEAR> F05	PRESET OPERATOR		Returns the operator file to the factory preset. (Execute by ENTER.)
	REFERENCE (ALL)		Returns the reference file to the factory preset. (Execute by ENTER.)
	10 SEC CLEAR	ON, OFF	Clears a specific item in the reference file by holding the menu control knob pressed for 10 seconds. <i>See "To return a menu item to its standard value" (page 50).</i>
	ALL MENU RESET		Returns all the settings to the factory preset.
	M.S. FORMAT		Initializes a "Memory Stick Duo." (Execute by ENTER.)
			<p>Note</p> <p>Clears all the data stored in a "Memory Stick Duo."</p>

DIAGNOSIS Menu

This menu is only for viewing and no setting is made using this menu.

DIAGNOSIS			
Page title Page No.	Item	Settings	Description
<BOARD STATUS> D01	OHB	OK, NG	Displays the OHB Block status.
	DPR	OK, NG	Displays the DPR board status.
	SY	OK, NG	Displays the SY board status.
	IF	OK, NG	Displays the IF board status.
	PS	OK, NG	Displays the PS board status.
<PLD VERSION> D02	SY		Displays the PLD version for SY board.
	DPR1		Displays the PLD1 version for DPR board.
	DPR2		Displays the PLD2 version for DPR board.
	IF		Displays the PLD version for IF board.
	TX		Displays the TX-PLD version for DPR board.
<ROM VERSION> D03 (U18)	AT		Display the ROM (software) version.
<SERIAL NO> D04	MODEL	MODEL NAME	Displays the model name.
	NO	SERIAL NO	Displays the serial number.

Testing the camera

Check the functions of the camera before setting out for a shooting session, preferably by recording and playing back video and audio signals.

Maintenance

Cleaning the Viewfinder

Use a dust blower to clean the lens, the LCD screen, and mirror inside the viewfinder barrel.

Note

Never use organic solvents such as thinners.

Note about the Battery Terminal

The battery terminal of this unit (the connector for battery packs and AC adaptors) is a consumable part. Power may not be supplied to the unit properly if the pins of the battery terminal are bent or deformed by shock or vibrations, or if they become corroded due to prolonged outdoor use. Periodic inspections are recommended to keep the unit working properly and to prolong its usable lifetime. Contact your Sony dealer or a Sony service representative for more information about inspections.

Error Messages

If a problem occurs during operation, a warning message is displayed.

Note

To display a message, set the DISPLAY/MENU switch to DISPLAY or MENU.

Message	Meaning
TEMP WARNING	The internal temperature is extraordinarily high.
FAN STOP	The built-in fan is not rotating properly.
SET SYSTEM CLOCK	The time/date of the internal clock have not been set.
OHB BLOCK NG!	A problem is detected in the optical block.
MSU RPN BUSY	RPN compensation was attempted using the camera menu while being operated from an external device. Consult Sony service personnel.
VF RPN BUSY	RPN compensation was attempted from an external device while being operated using the camera menu. Consult Sony service personnel.
NO MEMORY STICK	A "Memory Stick Duo" operation was attempted with no "Memory Stick Duo" in the slot.
MEMORY STICK ERROR	An error occurred during access to a "Memory Stick Duo."
FORMAT ERROR!	A "Memory Stick Duo" operation was attempted with an unformatted "Memory Stick Duo."
MEMORY STICK LOCKED	File writing was attempted with a write-protected "Memory Stick Duo."
FILE ERROR	An error occurred while reading a file from a "Memory Stick Duo."
OTHER MODEL'S FILE	You attempted to read a file of other models having no compatibility.
FILE NOT FOUND	The file you attempted to read does not exist in the "Memory Stick Duo."

Appendix

Important Notes on Operation

Use and storage

Do not subject the camera to severe shocks

- The internal mechanism may be damaged or the body warped.
- If an accessory mounted on the accessory shoe is subjected to severe shock, the accessory shoe may be damaged. In such a case, stop using it and contact your Sony dealer or a Sony service representative.

Do not cover the camera while operating

Putting a cloth, for example, over the camera can cause excessive internal heat build-up.

After use

Always turn off the power switch.

Before storing the camera for a long period

Remove the battery pack.

Shipping

If sending the camera by truck, ship, air or other transportation service, pack it in the shipping carton of the camera.

Care of the camera

Remove dust and dirt from the surfaces of the lenses or optical filters using a blower.

If the body of the camera is dirty, clean it with a soft, dry cloth. In extreme cases, use a cloth steeped in a little neutral detergent, then wipe dry. Do not use organic solvents such as alcohol or thinners, as these may cause discoloration or other damage to the finish of the camera.

In the event of operating problems

If you should experience problems with the camera, contact your Sony dealer or a Sony service representative.

Use and storage locations

Store in a level, ventilated place. Avoid using or storing the camera in the following places.

- In excessive heat or cold (operating temperature range: 0°C to 40°C (32°F to 104°F)). Remember that in summer in warm climates the temperature inside a car with the windows closed can easily exceed 50°C (122°F).
- In damp or dusty locations
- Locations where the camera may be exposed to rain
- Locations subject to violent vibration
- Near strong magnetic fields
- Close to radio or TV transmitters producing strong electromagnetic fields.
- In direct sunlight or close to heaters for extended periods

To prevent electromagnetic interference from portable communications devices

The use of portable telephones and other communications devices near this camera can result in malfunctions and interference with audio and video signals.

It is recommended that the portable communications devices near this camera be powered off.

Note on laser beams

Laser beams may damage the CMOS image sensors.

If you shoot a scene that includes a laser beam, be careful not to let the laser beam be directed into the lens of the camera.

Fitting the zoom lens

It is important to fit the lens correctly, as otherwise damage may result. *Be sure to refer to the section "Mounting and Adjusting the Lens" (page 29).*

Viewfinder

Do not leave the camera with the eyepiece pointing directly at the sun.

The eyepiece lens can concentrate the sun's rays and melt the interior of the viewfinder.

About the LCD panels

LCD panels are manufactured with extremely high-precision technology that yields effective pixel rates of 99.99% or higher. However, very rarely, one or more pixels may be permanently dark or permanently lit in white, red, blue, or green.

This phenomenon is not a malfunction. Such pixels have no effect on the recorded data, and the camera may be used with confidence even if they are present.

Phenomena specific to CMOS image sensors

The following phenomena that may appear in images are specific to CMOS (Complementary Metal Oxide Semiconductor) image sensors. They do not indicate malfunctions.

White flecks

Although the CMOS image sensors are produced with high-precision technologies, fine white flecks may be generated on the screen in rare cases, caused by cosmic rays, etc. This is related to the principle of CMOS image sensors and is not a malfunction.

The white flecks especially tend to be seen in the following cases:

- when operating at a high environmental temperature
- when you have raised the master gain (sensitivity)

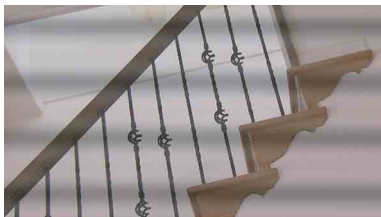
The problem may be alleviated by executing automatic black balance adjustment.

Aliasing

When fine patterns, stripes, or lines are shot, they may appear jagged or flicker.

Flicker

If recording is made under lighting produced by discharge tubes, such as fluorescent, sodium, or mercury-vapor lamps, the screen may flicker, colors may vary, or horizontal stripes may appear distorted.



In such cases, set the flicker-reduction function to auto mode (see page 65).

If the frame rate selected for recording is close to the power-supply frequency, flicker may not be reduced sufficiently even if you activate the Flicker-Reduction function. In such cases, use the electronic shutter.

Focal plane

Owing to the characteristics of the pickup elements (CMOS image sensors) for reading video signals, subjects that quickly move across the screen may appear slightly skewed.

Flash band

The luminance at the top and bottom of the screen may change when shooting a flashlight beam or a light source that quickly flashes.

Using a “Memory Stick Duo”

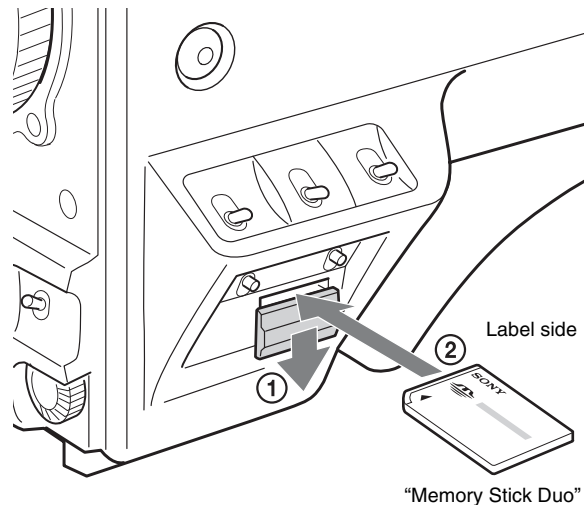
You can use “Memory Stick Duo” media with the camera. When a “Memory Stick Duo” is inserted in the camera, the file data can be stored on the “Memory Stick Duo,” which enables you to share data among devices. The camera operations have been checked using “Memory Stick Duo” media up to 8GB.

Note

Only a “Memory Stick” of Duo size can be used with the camera.

Inserting a “Memory Stick Duo”

① Push the cover down, and ② insert a “Memory Stick Duo” with the label side facing up into the slot until it clicks and the access lamp lights in red. When the “Memory Stick Duo” is properly set, the lamp lights in green.



Note

Be sure to insert a “Memory Stick Duo” in the right direction. If it does not fit into the slot properly or if there is some resistance when you insert it, the “Memory Stick Duo” may be turned around or upside-down. Do not force the “Memory Stick Duo” into the slot. Confirm the direction of the notch and arrow on the “Memory Stick Duo” before inserting the “Memory Stick Duo,” and then try inserting it again.

Removing a “Memory Stick Duo”

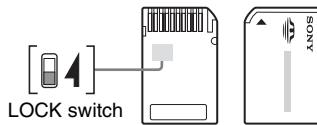
Confirm that the access lamp is not lit in red, then lightly push in the “Memory Stick Duo” to release the lock.

Note

If the access lamp is lit in red, data is being read from or written to the “Memory Stick Duo.” At this time, do not shake the product or subject it to shock. Do not turn off the power to the product or remove the “Memory Stick Duo.” Doing so may damage the data.

Protecting saved data

To prevent accidental erasure of important setup data, use the LOCK switch on the “Memory Stick Duo.” Slide the switch upward to the write protect position. This ensures that you cannot inadvertently overwrite data on the “Memory Stick Duo.”



Note

When using “Memory Stick Duo” media that does not have a LOCK switch, be careful not to inadvertently overwrite or erase your data.

Precautions

- Do not attach anything other than the supplied label to the “Memory Stick Duo” labeling position.
- Attach the label so that it does not stick out beyond the labeling position.
- Carry and store the “Memory Stick Duo” in its case.
- Do not touch the connector of the “Memory Stick Duo” with anything, including your finger or metallic objects.
- Do not strike, bend, or drop the “Memory Stick Duo.”
- Do not disassemble or modify the “Memory Stick Duo.”
- Do not allow the “Memory Stick Duo” to get wet.
- Do not use or store the “Memory Stick Duo” in a location that is:
 - Extremely hot, such as in a car parked in the sun
 - Under direct sunlight
 - Very humid or subject to corrosive substances
- To prevent data loss, make backups of data frequently. In no event will Sony be liable for any loss of data.
- Unauthorized recording may be contrary to the provisions of copyright law. When you use a “Memory Stick Duo” that has been pre-recorded, be sure that the material has been recorded in accordance with copyright and other applicable laws.

- “Memory Stick” and  are trademarks of Sony Corporation.
- “Memory Stick Duo” and **MEMORY STICK DUO** are trademarks of Sony Corporation.

Exchanging the Battery of the Internal Clock

The camera’s internal clock is powered by a lithium battery. If the message “BackUp Battery End” appears in the viewfinder, this battery must be exchanged. Contact your Sony dealer or a Sony service representative.

Specifications

General	
Power requirements	12 V DC (10.5 V to 17.0 V)
Power consumption	Approx. 1.92 A Main unit (camera) + LCD viewfinder + auto focus lens + microphone
Operating temperature	-10°C to +45°C (14°F to 113°F)
Storage temperature	-20°C to +60°C (-4°F to 140°F)
Recording formats	1920 × 1080/59.94i, 50i 1280 × 720/59.94P, 50P
Mass	Main body only: 3.4 kg (7 lb 7.9 oz)
Dimensions	See page 78.
Supplied accessories	See page 77.
Camera Block	
Camera Block	$\frac{2}{3}$ -type, CMOS image sensor Effective picture elements: 1920 (H) × 1080 (V)
Format	3-chip RGB
Optical system	F1.4 prism system
ND filters	1: Clear 2: $\frac{1}{4}$ ND 3: $\frac{1}{16}$ ND 4: $\frac{1}{64}$ ND
Sensitivity	F12 (System frequency: 59.94i) F13 (System frequency: 50i) (2000lx, 89.9% reflection)
Video S/N	56 dB (Noise Suppress Off) 59 dB (Noise Suppress On)
Horizontal resolution	1000TV lines or more
Gain	-3, 0, 3, 6, 9, 12 dB
Shutter speed	59.94i/P, 50i/P: $\frac{1}{60}$ to $\frac{1}{2000}$ sec.
Display (Viewfinder (supplied))	
Screen size	8.8 cm diagonal (3.5-inch)
Aspect ratio	16:9
Picture elements	640 (H) × 3 × 480 (V) Sequence delta

Inputs/Outputs	
CCU	CCZ connector (1)
AUDIO 1 IN/AUDIO 2 IN	XLR type, 3-pin, female (1 each) MIC IN: -60 dBu (Up to -20 dBu can be set by using menu or HXCU-D70), balanced LINE IN: 0 dBu, balanced
INTERCOM	XLR type, 5-pin, female (1)
EARPHONE	Stereo minijack (1)
DC IN	XLR type, 4-pin (1), 10.5 to 17.0 V DC
DC OUT	4-pin (1), 10.5 to 17.0 V DC, maximum rated current: 1.5 A (The numerical value may vary, depending on usage conditions.)
SDI IN	BNC type (1)
SDI OUT	BNC type (1)
TEST OUT	BNC type (1)
PROMPTER/GENLOCK	BNC type (1), 1.0 Vp-p, 75 Ω
LENS	12-pin (1), supplying power to the lens, 10.5 to 17.0 V DC, maximum rated current: 1.0 A
TRUNK	D-sub 9-pin, female (1), RS-232C 1 system
VF	26-pin rectangular (1), 20-pin round (1)
REMOTE	8-pin (1)
Lens Block (HXC-D70K only)	
Focal length	8 mm ($\frac{1}{32}$ inches) to 128 mm (5 $\frac{1}{8}$ inches) (equivalent to 31.5 mm (1 $\frac{1}{4}$ inches) to 503 mm (19 $\frac{7}{8}$ inches) on 35 mm (1 $\frac{7}{16}$ inches) lens)
Zoom	Servo/Manual selectable
Zoom ratio	16×
Maximum relative aperture	1:1.9
Iris	Auto/Manual selectable F1.9 to F16 and C (close)
Focus	Auto/Manual selectable Ranges: 800 mm (31 $\frac{1}{2}$ inches) to ∞ (Macro OFF) 50 mm (2 inches) to ∞ (Macro ON, Wide)
Filter thread	M82 mm, pitch 0.75 mm
Macro	ON/OFF switchable
Supplied Accessories	
Viewfinder (HXC-D70K/D70L only) (1)	
Microphone (HXC-D70K/D70L only) (1)	
Windscreen (HXC-D70K/D70L only) (1)	
Lens mount cap (1)	
Flange back adjustment chart (1)	
Auto focus lens (HXC-D70K only) (1)	
Cable clamp belt (1)	
Hexagonal wrench (supplied with HXC-D70H) (1)	
Fitting Shoe for DXF-801 viewfinder (supplied with HXC-D70H) (1)	
Operating Instructions Japanese version (1) English version (1)	
CD-ROM (1)	
Warranty (1)	

Recommended Additional Equipment**Camera Control Unit**

Camera control unit HXCU-D70, CCU-D50/D50P

Equipment for remote control

Remote control unit RM-B150/B750

Remote control panel RCP-1000/1001/1500/1501/1530/D50/D51

Lens, Viewfinder and Related EquipmentLens $\frac{2}{3}$ -type bayonet mount lenses only

Viewfinder DXF-20W/51/C50WA, CBK-VF01

Power supply and related equipment

AC adaptor AC-DN10/DN2B

Battery pack BP-GL95A/GL65A/L80S/L60S

Battery charger BC-L160/L500/L70

Audio equipment

Microphone ECM-678/674/673/680S

Microphone holder CAC-12 compatible

UHF synthesized tuner unit WRR-855S

UHF synthesized diversity tuner WRR-860A/861/862

Digital Wireless Receiver DWR-S01D

Other peripheral devices

Tripod adaptor VCT-14/U14

Shoulder strap Part No.: A-6772-374-C

Low-repulsion shoulder pad Part No.: A-8286-346-A

Accessory shoe kit Part No.: A-8274-968-B

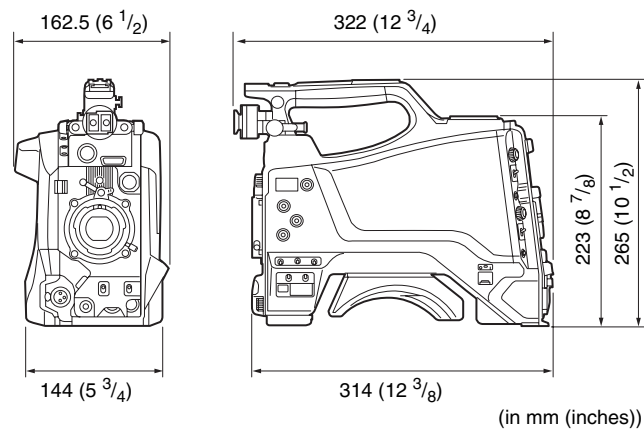
WRR mount bracket Part No.: A-8278-057-B

"Memory Stick Duo"

Equipment for maintenance and easier handling

Soft carrying case LC-DS300SFT

Maintenance manual

Dimensions

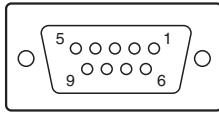
Design and specifications are subject to change without notice.

Note

Always verify that the unit is operating properly before use. SONY WILL NOT BE LIABLE FOR DAMAGES OF ANY KIND INCLUDING, BUT NOT LIMITED TO, COMPENSATION OR REIMBURSEMENT ON ACCOUNT OF THE LOSS OF PRESENT OR PROSPECTIVE PROFITS DUE TO FAILURE OF THIS UNIT, EITHER DURING THE WARRANTY PERIOD OR AFTER EXPIRATION OF THE WARRANTY, OR FOR ANY OTHER REASON WHATSOEVER.

Pin assignment

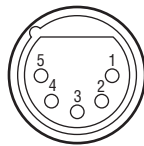
TRUNK



- EXT VIEW -

No.	Signal	Specifications
1	NC	
2	RX IN	TRUNK Data in
3	TX OUT	TRUNK Data out
4	NC	
5	GND	
6	NC	
7	NC	
8	NC	
9	NC	

INTERCOM



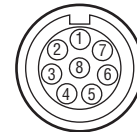
- EXT VIEW -

No.	Signal	Specifications
1	INTERCOM MIC IN (Y) (GND)*	CARBON (-20 dBu, UNBALANCE)
2	INTERCOM MIC IN (X)	DYNAMIC (-60 dBu, BALANCE/ UNBALANCE) MANUAL
3	GND	GND
4	INTERCOM LEFT OUT	8 dBu (VR Max., 250 Ω Load)
5	INTERCOM RIGHT OUT	8 dBu (VR Max., 250 Ω Load)

(0 dBu=0.775 Vrms)

*when the signal is unbalanced

REMOTE



- EXT VIEW -

No.	Signal	Specifications
1	TX OUT (x) for RCP	SERIAL DATA OUT
2	TX OUT (Y) for RCP	
3	RX IN (x) for RCP	SERIAL DATA IN
4	RX IN (Y) for RCP	
5	TX-GND	GND for TX
6	UNREG-OUT	+10.5 to +17 V dc, 200 mA (max.)
7	UNREG-GND	GND for UNREG OUT
8	RCP-PIX OUT	75 Ω, 1.0 Vp-p (SD Video)
	CHASSIS GND	CHASSIS GND

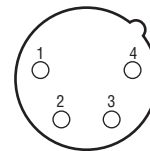
DC OUT



- EXT VIEW -

No.	Signal	Specifications
1	UNREG-GND	GND for UNREG OUT
2	NC	No connection
3	NC	No connection
4	UNREG-OUT	+10.5 to +17 V dc, 1.5 A (max.)

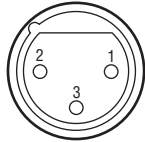
DC IN



- EXT VIEW -

No.	Signal	Specifications
1	EXT DC (C)	GND for DC (+)
2	NC	No connection
3	NC	No connection
4	EXT DC (H)	+10.5 to +17 V dc

AUDIO 1/2 IN



- EXT VIEW -

No.	Signal	Specifications
1	AUDIO 1/2 (G)	-60/-50/-40/-30/-20 dBu, LINE (0
2	AUDIO 1/2 IN (X)	dBu), Selectable, Balanced
3	AUDIO 1/2 IN (Y)	



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