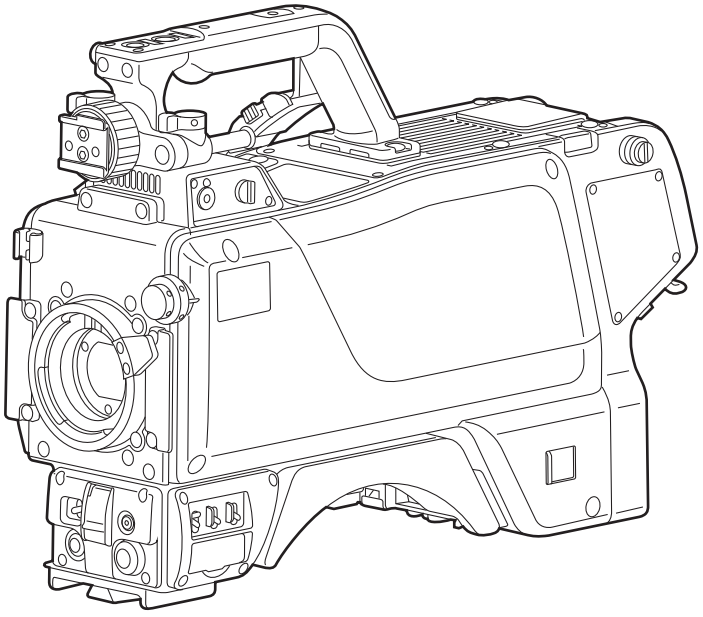
Panasonic®

Operating Instructions

Multi-Format Camera

Model No. AK-HC3500P



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

VQTB0273-1

For your safety

CAUTION
RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER TO SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (service) instructions in the literature accompanying the appliance.

For CANADA

This class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

WARNING:

- **TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.**
- **TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD, KEEP THIS EQUIPMENT AWAY FROM ALL LIQUIDS. USE AND STORE ONLY IN LOCATIONS WHICH ARE NOT EXPOSED TO THE RISK OF DRIPPING OR SPLASHING LIQUIDS, AND DO NOT PLACE ANY LIQUID CONTAINERS ON TOP OF THE EQUIPMENT.**

CAUTION:

TO REDUCE THE RISK OF FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

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

FCC Note:
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.

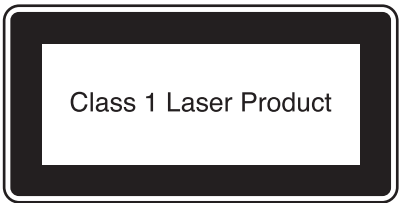
Warning:
To assure continued FCC emission limit compliance, the user must use only shielded interface cables when connecting to external units. Also, any unauthorized changes or modifications to this equipment could void the user's authority to operate it.

CAUTION:

Invisible Laser radiation is emitted from the Optical fiber connector when this product is turned on.
Don't look into directly into the Optical fiber connector of this product.

CAUTION:

This product uses a semiconductor laser system and is a laser class 1 product complies with Radiation Performance Standards, 21CFR SUBCHAPTER J.
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.
Don't make any modifications.
Don't repair by yourself.
Refer servicing to qualified personnel.



▭ indicates safety information.

For your safety

IMPORTANT SAFETY INSTRUCTIONS

Read these operating instructions carefully before using the unit. Follow the safety instructions on the unit and the applicable safety instructions listed below. Keep these operating instructions handy for future reference.

1) Read these instructions.

2) Keep these instructions.

3) Heed all warnings.

4) Follow all instructions.

5) Do not use this apparatus near water.

6) Clean only with dry cloth.

7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10) Protect the power cord form being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11) Only use attachments/accessories specified by the manufacturer.

12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13) Unplug this apparatus during lightning storms or when unused for long periods of time.

14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

Contents

Overview

This unit is a new-generation multi-format HD camera that supports the 1080i format.
It uses a new-generation 2/3-inch 2.2-megapixel IT-CCD [1920 (H) × 1080 (V)] imaging device. This newly developed CCD employs leading-edge processes and embodies a fresh look taken at the on-chip lens and CCD structure to improve the sensitivity, smear and dynamic range by a significant margin over previous CCDs. Furthermore, Panasonic's horizontal single-line readout CCD and high-precision signal processing combine to achieve pixel shifting and a dramatic reduction in moire within the band.
Another salient feature is the newly developed digital signal processor LSI chip which is mounted in the camera head and supports 14-bit A/D conversion: This chip processes the gamma, knee, detail, matrix and other process signals, delivers the kind of multi-functionality, high quality and high stability that digital technology alone can provide, and improves the operating ease.
The 14-bit A/D converter is instrumental in creating a stable wide dynamic circuit with a high signal-to-noise ratio from the dark area all the way to the highlights. Using the dynamic range stretch (DRS) function which adjusts the gamma correction optimally in real time, both the dark areas and light areas can now be reproduced with startling clarity.

The camera head with its new design features an overall smaller size and lower profile that neatly taken into consideration the performance of buildup operations, and the fact that it is now possible to connect it with the buildup unit without the need to hook up any cables has resulted in a significant improvement in both operability and applicability.
The amount of heat generated by the camera has also been slashed as a result of adopting a low-power-consumption design for the new circuits and a heat-dissipation design for the new chassis.
When this Multi-Format Camera is connected to a CCU (AK-HCU931, optional accessory), not only can HD signals be input and output but SD signals (D1, VBS) can be output and RET/PROMPT signals can be input as well.
The iris, pedestal, gain and other camera adjustments can be carried out by remote control using a unit such as the ROP (AK-HRP931) or MSU (AK-MSU935) available as optional accessories.

Accessories

Operating Instructions 1
Camera No. plate (1 to 12) ..... 1 set
Camera hangers* 2
Screws* (M3 × 8 mm) 4
Mount cap 1

*** These accessory parts are used when mounting the buildup unit (AK-HBU3500). Keep them in a safe place to ensure that you will not lose or misplace them.**

Features

Newly developed 1080I, 2.2 million-pixel CCDs incorporated
- Standard sensitivity of F10 and high sensitivity on a par with SD.
- Smear has been cut to approx. 130 dB and the number of white marks has been drastically reduced by process improvements.
- H-CCD drive is accomplished at a frequency of 74 MHz to attain a high response and high resolution.

Digital signal processing LSI with high picture quality featured in the camera unit
- After the process circuits, the signals undergo 14-bit, 74 MHz high-picture-quality digital processing, yielding a high reliability, more functions and enhanced operating ease as a result.

Multi-functional enhancer
- In addition to the many functions such as skin DTL, there is a choice of 30 boost frequencies.

Designed to achieve low noise levels of below NC15
- Power consumption can be reduced since the fan mode can be switched according to the situation in which the camera system is being applied. As a result, the heat-dissipation design has also been optimized.

Fuller complement of control circuits and auto setup (ASU) function
- Users can select the standard mode or simplified mode.

Peripheral components
- Ease of operation can be further improved by configuring a system where the Multi-Format Camera is used in combination with the remote operation panel (ROP) and master setup unit (MSU).

Data trunk function
- Two RS-422 and two RS-232C circuits are provided as a standard feature.
  They obviate the need for the cables used with virtual control, pan-tilt head and lens control, etc.

Precautions for use

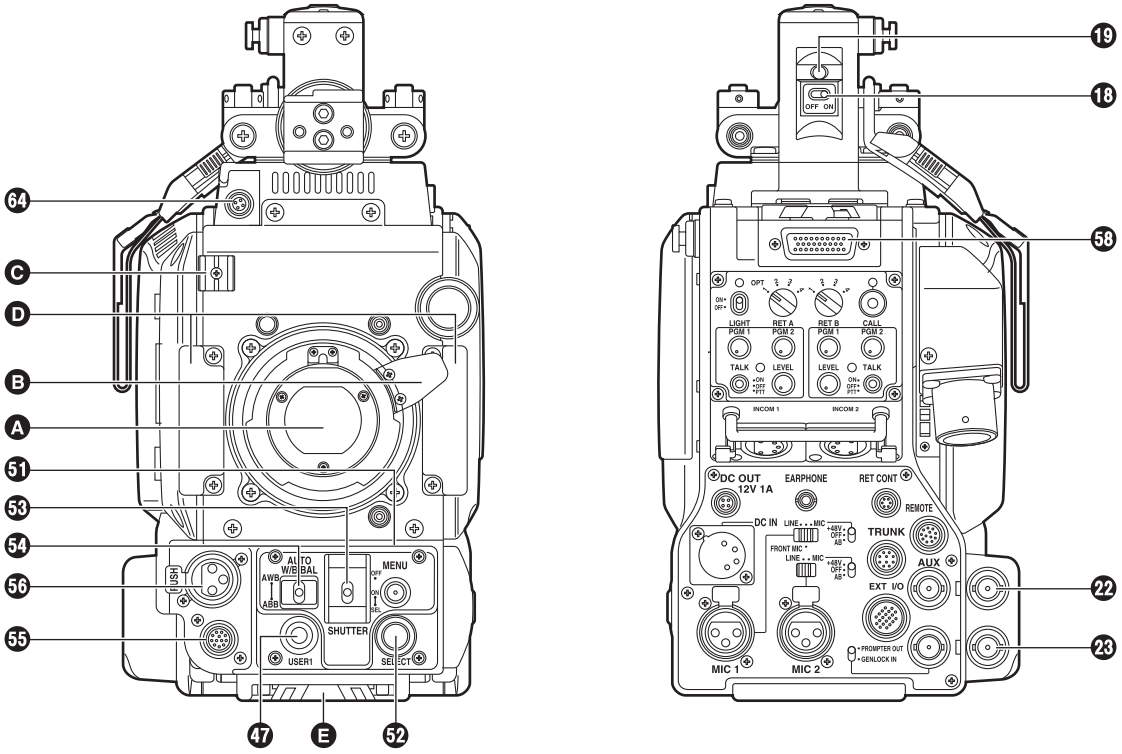
DON'TS

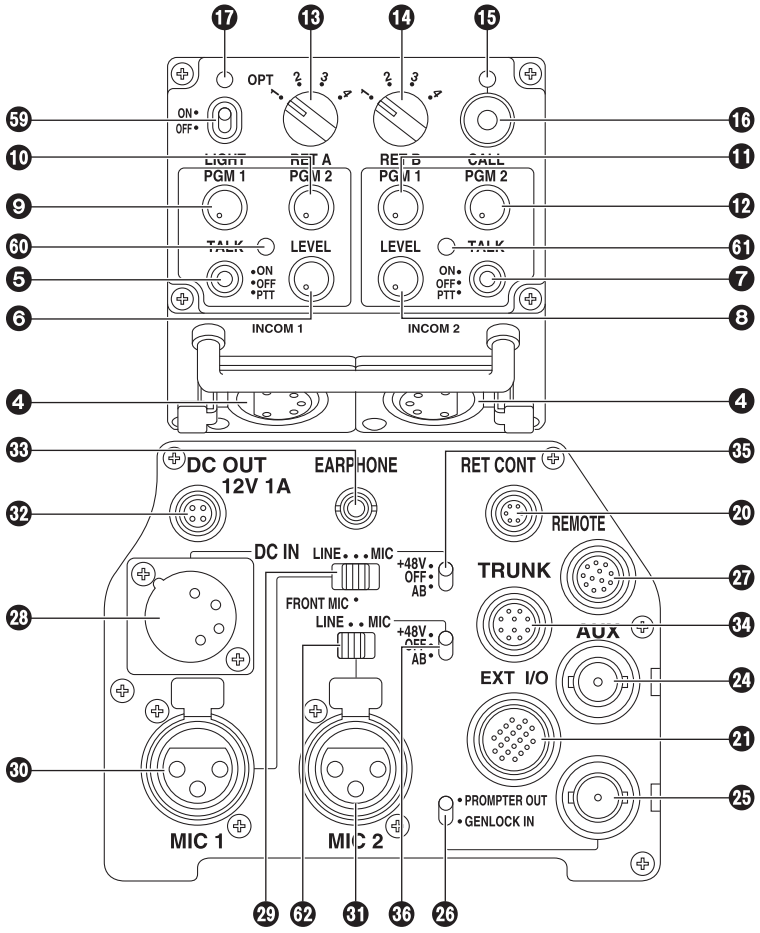
- Do not attempt to disassemble the camera or other units. In order to prevent electric shock, do not remove screws or covers. There are no user-serviceable parts inside.
- Do not abuse the camera. Avoid striking, shaking, etc. The camera contains sensitive components which could be damaged by improper handling or storage.
- Do not let the lens remain uncapped when the camera is not use. If the lens is not installed, do not leave the lens mount hole uncovered.
- Do not touch the surface of the lens or prism.
- Do not use strong of abrasive detergents when cleaning the camera body.
- Do not aim the camera toward the sun, no matter whether it is turned on or not.
  Taking images of sunlight and other such conditions for prolonged periods of time may damage the CCD.
- Do not operate the camera outdoors during a lightning storm.
- Do not use the camera in an extreme environment where high temperatures or high humidity exist.
- Do not leave the camera turned on when not in use.
  Do not unnecessarily turn the camera power on and off repeatedly.
  Do not block the ventilation slots.
- Do not cover the port otherwise block ventilation during operation. Internal heat buildup can cause a fire.

DO'S

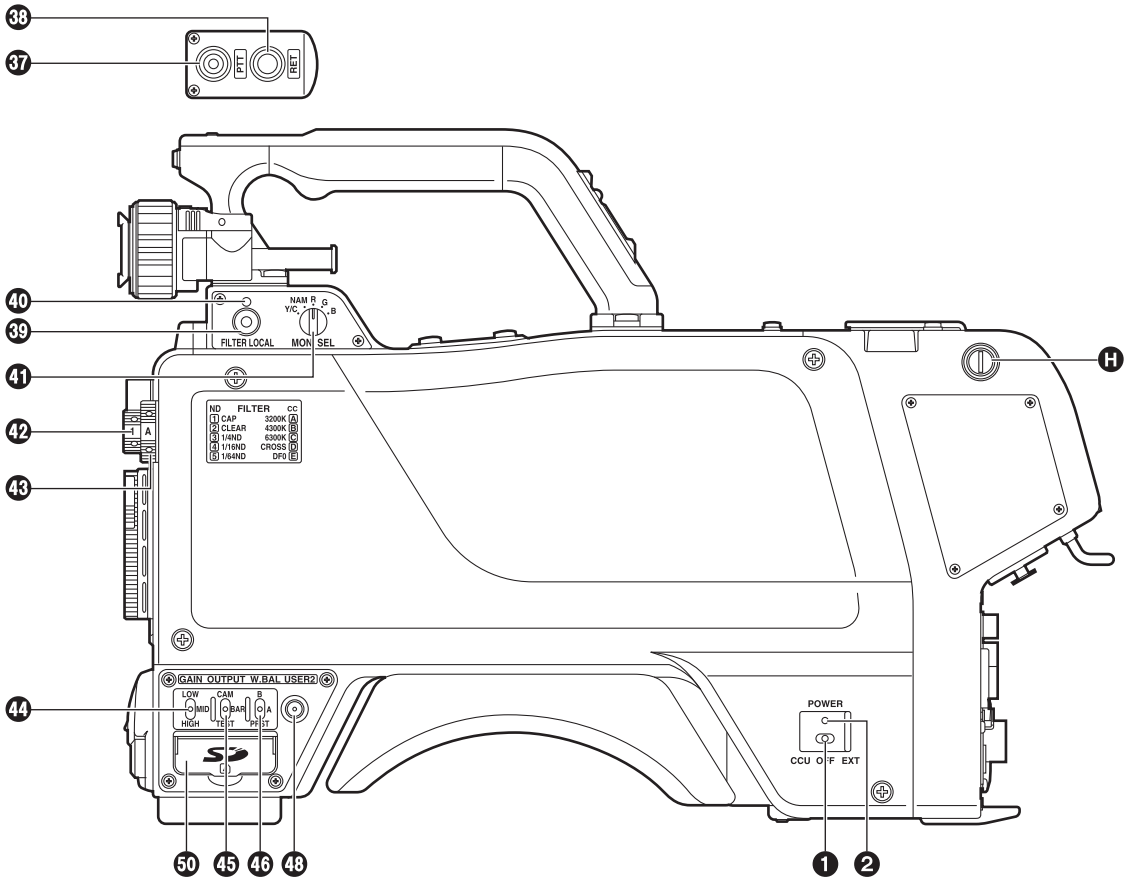
- Refer any servicing to qualified service personnel.
- Handle the camera with care.
- Protect the precision made lens by placing the lens cap over when the camera is not in use. If the lens is not installed, protect the surface of the prism by placing the body cap into the lens mount hole.
- Use a mild blower or lens cleaning tissue designed for coated lenses, to clean the surface of the lens or prism in the event that it should become dirty.
- Use a dry cloth to clean the camera if it is dirty. In case the dirt is hard to remove, use mild detergent and wipe gently.
- Use caution when operating the camera in the vicinity of spot lights or bright lights, as well as light reflecting objects and surfaces.
- Take immediate action if ever the camera should become wet. Turn the power off and have the unit checked by an authorized service facility.
- Follow normal safety precaution to avoid personal injury.
- Use the camera in an environment where the temperature is within 14 °F to +113 °F (–10 °C to +45 °C), and the relative humidity is less than 85 % (no condensation).
- Always turn the power off when the camera is not going to be used. Operate the camera only when there is adequate ventilation.
- Cooling fan
  There is internally provided a cooling fan.
  Since the cooling fan is a consumable part, replace it after about 50,000 hours of operation.
  (Be sure to ask the dealer for the replacement.)
- When using the unit in windy or snowy conditions or at the beach or at the waterfront, cover it with the rain cover (optional accessory) or protect it in some other way in order to prevent it from getting wet and stop water from seeping inside.
- Use the camera in places with minimal moisture and dust. Avoid using the camera in places with high concentrations of moisture or dust since these conditions will tend to cause damage to the internal parts.
  In addition, ensure that the connectors which are not in use are covered with their protective caps.
- Peripheral equipment software
  The versions of the software used for the peripheral units (such as the CCU, ROP and MSU) connected to the AK-HC3500 may need to be updated.
  For further details, contact your dealer.

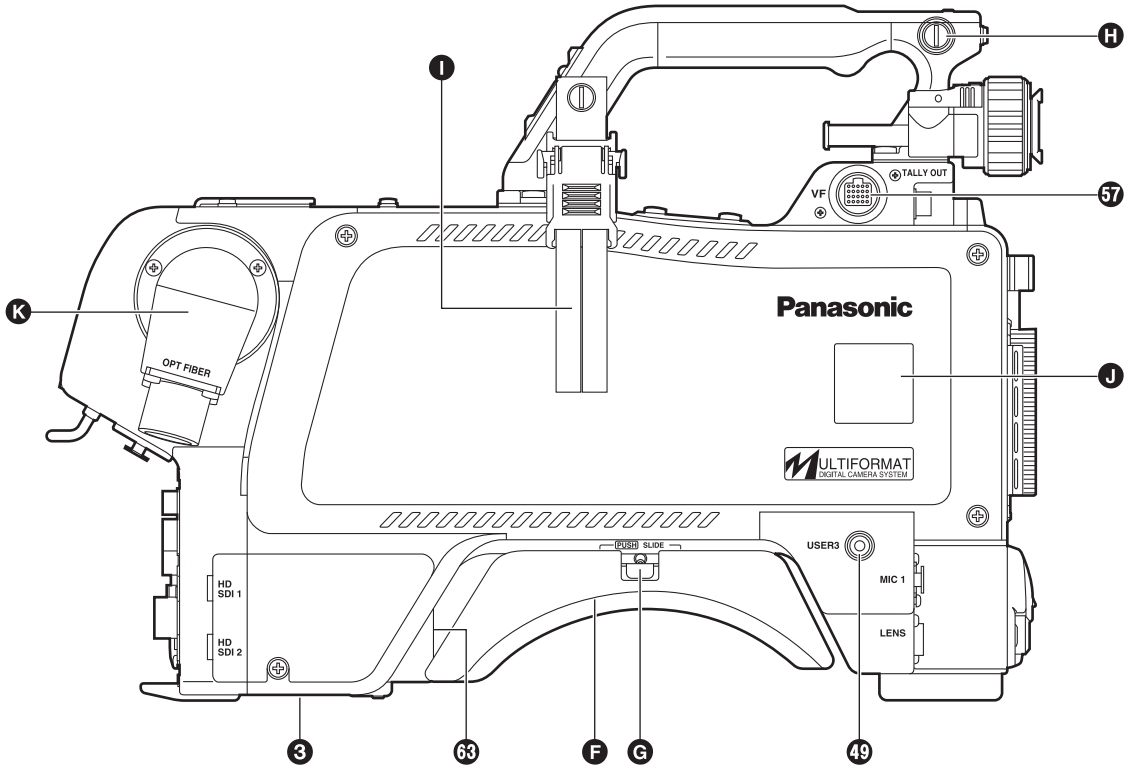
Controls and their functions





Controls and their functions





Controls and their functions

Ⓐ Lens mount (Bayonet type)
This is where the lens is mounted.

Ⓑ Lens clamp lever
The lens is inserted into the lens mount Ⓐ, and this lever is then turned to clamp the lens in place.

Ⓒ Lens cable, mic cable clamps
These are used to clamp the lens cable and mic cable in place.

Ⓓ Camera hangers (supplied)
When the buildup unit (AK-HBU3500) is used, install these hangers to the camera with supplied screws (M3 × 8 mm).
For details, refer to the Operating Instructions for AK-HBU3500.

Ⓔ Tripod mount
Before securing the Multi-Format Camera to a tripod, attach the tripod adapter (SHAN-TM700) which is available as an optional accessory.

Ⓕ Shoulder pad
This is used when the Multi-Format Camera is to be carried on the shoulder.
It can be adjusted to position it more toward the front or more toward the back.

Ⓖ Slide lock release lever
This is held down while it is used to adjust the front/back position of the shoulder pad Ⓕ.
Use it to adjust the position of the shoulder pad so that the camera can be operated more easily while it is being carried on the shoulder.

Ⓗ Shoulder strap fitting
This enables the shoulder belt to be attached.

Ⓘ Optical cable clamp
This enables the optical cable to be clamped.

Ⓙ Camera No. plate holder
This enables the accessory camera No. plate to be attached.

Ⓚ Optical fiber connector (EDW.3K made by LEMO)
This is used to connect with the CCU (camera control unit) using the optical fiber cable. When it is not in use, cover it with its protective cap.

❶ Camera power switch [POWER]
This is used to select the camera power input (power supplied from the CCU or from an external connector) and turn the power ON and OFF.

❷ Power LED
This lights up green when power is supplied to the camera.
When the camera's power switch is set to OFF, this lights up red if the CCU is connected, and it goes off if the CCU is not connected (if the power was turned ON by the CCU).

❸ Power circuit breaker [BREAKER]
This shuts off the power in the event of an overcurrent while the DC 12 V power supply is used.
To reset the circuit breaker, eliminate what caused it to trip, and then press the circuit breaker button.

❹ INCOM connectors 1, 2 [INCOM1, INCOM2]
The INCOM or headset plugs are connected here.

❺ INCOM1 MIC ON/OFF switch [MIC1 TALK]
This is the INCOM1 MIC ON/OFF selector switch.

❻ INCOM1 level control [INCOM1 LEVEL]
This is used to adjust the INCOM1 receiving volume level.

❼ INCOM2 MIC ON/OFF switch [MIC2 TALK]
This is the INCOM2 MIC ON/OFF selector switch.

❽ INCOM2 level control [INCOM2 LEVEL]
This is used to adjust the INCOM2 receiving volume level.

❾ INCOM1 PGM1 level control [INCOM1 PGM1]
This is used to adjust the INCOM1 and PGM1 mixing level.

❿ INCOM1 PGM2 level control [INCOM1 PGM2]
This is used to adjust the INCOM1 and PGM2 mixing level.

⓫ INCOM2 PGM1 level control [INCOM2 PGM1]
This is used to adjust the INCOM2 and PGM1 mixing level.

⓬ INCOM2 PGM2 level control [INCOM2 PGM2]
This is used to adjust the INCOM2 and PGM2 mixing level.

⑬ RET-A selector switch [RET A]
This switch is used to select the return images to be switched by RET-A.
The return images which have been set on the ROP menu are allocated to this switch.

⑭ RET-B selector switch [RET B]
This switch is used to select the return images to be switched by RET-B.
The return images which have been set on the ROP menu are allocated to this switch.

⑮ CALL LED
This lights up green when the CALL switch is pressed from the ROP, MSU or CCU.

⑯ CALL switch [CALL]
This lights the CALL LED on the ROP or MSU and sounds the buzzer (when ON has been selected as the buzzer setting).

⑰ OPT LED
This indicates the camera's optical signal reception status. It normally lights up green. When any problem has occurred, it lights up red.
When a problem has occurred, clean the optical fiber connector.
If the problem is not cleared up, immediately turn off the power, and contact your dealer.

⑱ Back tally LED selector switch
This is used to set the back tally LED to ON or OFF.

⑲ Back tally LED
This lights when the tally signal is supplied.
This lights up red when the R tally signal is supplied, green when the G tally signal is supplied, and red when both the R and G tally signals are supplied.

⑳ RET switching control connector [RET CONT]
The cable of the RET switching box (optional accessory) is connected here for controlling the ON/OFF of RET1, 2, 3 and INCOM1, 2 MIC.

㉑ External I/O [EXT I/O]
This signal interface connector is designed to support future interfacing with external devices.

㉒ Camera HD-SDI output1 connector (BNC) [HD-SDI1]
The camera HD-SDI images are output from this connector.

㉓ Camera HD-SDI output2 connector (BNC) [HD-SDI2]
Camera images, VF images or RET images can be selected on the camera menu to output HD-SDI signals from this connector.

㉔ Optional video connector (BNC) [AUX]
This is an auxiliary input/output connector.
The HD analog Y input or Prompt2 output (when the CCU has a Prompt2 input) can be selected.
When a down-converter (optional accessory) has been installed in the camera, this connector can be used as a VBS or D1 output connector.

㉕ Genlock sync input/PROMPT output connector [PROMPT/GL]
When the GL/PROMPT selector switch is set to GL, the reference signal (tri-level SYNC or B.B.) which is used to genlock the camera is input to this connector; Genlock sync signals are input to this connector when the CCU is not connected. When it is set to Prompt, the Prompt images input from the CCU are output from this connector.

㉖ GL/PROMPT selector switch
This is used to select the genlock input or the input/output (genlock input and PROMPT output) signals of the PROMPT output connector.

㉗ Remote connector [REMOTE]
The remote operation panel (ROP, optional accessory) is connected to this connector.
The [SYSTEM], [FUNC] and [SD DTL] menus of the ROP cannot be controlled.
Neither can the [HEAD POWER], [CHARA], [BAR], [MONO], [SD DTL OFF] and [MONITOR (R/G/B/SEQ/ENC)] switches be controlled.

㉘ External power supply input connector [DC IN]
The input of the external DC power supply is connected to this connector. (DC 10.8 V to 17 V)

㉙ MIC1 selector switch [LINE/FRONT MIC/MIC]
This is used to switch the input signal to LINE, FRONT MIC or rear MIC.

㉚ Rear MIC1 connector [MIC1]
An audio component or microphone is connected to this connector.
The gain setting can be selected on the camera menu.

㉛ Rear MIC2 connector [MIC2]
An audio component or microphone is connected to this connector.
The gain setting can be selected on the camera menu.

㉜ DC output connector [DC OUT]
The R or G tally signal is output from this connector (open collector). A DC 12 V power supply (up to 1.0 A) can also be supplied.
If the current exceeds the rating, the power is turned off forcibly.

㉝ Earphone jack [EARPHONE]
When an earphone (optional accessory) is connected to this jack, the INCOM1 receiving signals can be heard.

㉞ Data trunk connector [TRUNK]
The trunk data [RS-422 × 2 or RS-232C × 2] of the CCU is input to and output from this connector.
The camera menu is used to select the setting.

㉟ MIC1 power selector switch
This is used to select what kind of power is to be supplied to MIC1. (The switch is set to phantom 48 V, AB 12 V or OFF.)

㊱ MIC2 power selector switch
This is used to select what kind of power is to be supplied to MIC2. (The switch is set to phantom 48 V, AB 12 V or OFF.)

㊲ Grip PTT switch [PTT]
This selector switch is used to set the INCOM1 MIC to ON or OFF.
The camera menu is used to select the setting.

㊳ Grip RET switch [RET]
This is used as return image selector switch.
The camera menu is used to select the setting.

㊴ Optical filter selector switch [FILTER LOCAL]
When this switch is pressed and the filter local LED ㊵ lights, the optical filter can be adjusted manually.
When it is pressed again, the optical filter can be controlled by the ROP.

㊵ Filter local LED [LOCAL]
While this LED is lighted, the optical filter can be adjusted manually.

㊶ Monitor output selector switch [MONI SEL]
This is used to select the viewfinder image and the HD SDI2 image (Y, NAM, R, G, B) in the VF OUT status.

㊷ ND filter selector knob
This is used to adjust the optical filter manually when LOCAL has been selected as the filter setting.
1: CAP, 2: Through, 3: 1/4, 4: 1/16, 5: 1/64
Do not turn this knob while the filter local LED ㊵ is off.

㊸ CC filter selector knob
This is used to adjust the optical filter manually when LOCAL has been selected as the filter setting.
A: 3200K, B: 4300K, C: 6300K, D: Cross, E: DF0
Do not turn this knob while the filter local LED ㊵ is off.

㊹ Gain selector switch [GAIN]
This is used to select the gain for the camera images. (LOW, MID, HIGH)
It is not effective when the CCU is connected to the camera.
The gain setting can be selected on the camera menu.

㊺ Camera output selector switch [OUTPUT]
This is used to select the video output (CAM, BAR or TEST).
It is not effective when the CCU is connected to the camera.

㊻ White balance memory selector switch [W.BAL]
This is used to select the white balance memory.
Data can be recorded in A or B.
The factory settings are established when the switch is set to PRST.
It is not effective when the CCU is connected to the camera.

㊼㊽㊾ Assignable switch [USER 1, 2, 3]
The ON/OFF function settings established ahead of time can be allocated to these switches using the camera menu.

㊿ SD memory card connector [SD CARD]
The SD memory card (optional accessory) is inserted here.
For the recording items, refer to the “Table of the adjustment setting ranges”. (See pages 32 to 33.)

SD memory cards whose operation has been authenticated (recommended)
Cards made by Panasonic with a memory size of 2 GB or less (SD-HC memory cards are not supported)

- SD Logo is a trademark.

㊿㊀ Menu switch [MENU]
When this switch is pressed, the camera’s user menu is output; when it is pressed again, the menu screen display is cleared.

㊿㊁ JOG dial button
Turning the JOG dial while the menu screen is displayed moves the cursor to the setting items. The menu settings are established by operating this dial button.
For details on the menu operations, refer to the section on the menu operations.

㊿㊂ Electronic shutter selector switch [SHUTTER]
This is set to ON when the electronic shutter is to be used. When it is set to the SEL position, the shutter speed is switched in the preset range.
It is not effective when the CCU is connected to the camera.

㊿㊃ AWB/ABB start switch [AUTO W/B BAL]
This is used for conducting automatic white balance adjustments (AWB) or automatic black balance adjustments (ABB).
It is not effective when the CCU is connected to the camera.

㊿㊄ Lens connector [LENS]
The lens cable is connected to this connector.

㊿㊅ Front MIC1 connector [MIC1]
A microphone (optional accessory) is connected here.
When using the microphone, set the MIC1 selector switch ㉙ to front MIC. (See page 16.)
The power supply for the microphone can be connected from this connector. What kind power is to be supplied is set using the MIC1 power selector switch.

㊿㊆ VF connector [VF]
The 2″ viewfinder cable is connected to this connector.

㊿㊇ Rear VF connector
This D-sub connector is used for Viewfinder interface.

㊿㊈ Back light switch [LIGHT]
This light switch is used to make it easier to read the characters on the camera’s back panel.
The brightness can be adjusted using the camera menu.

㊿㊉ MIC1 Talk LED [TALK]
This LED lights up green when the INCOM1 MIC is operational.
It blinks when the MIC has been forcibly set to OFF by a remote control operation.

㊿㊀㊀ MIC2 Talk LED [TALK]
This LED lights up green when the INCOM2 MIC is operational.
It blinks when the MIC has been forcibly set to OFF by a remote control operation.

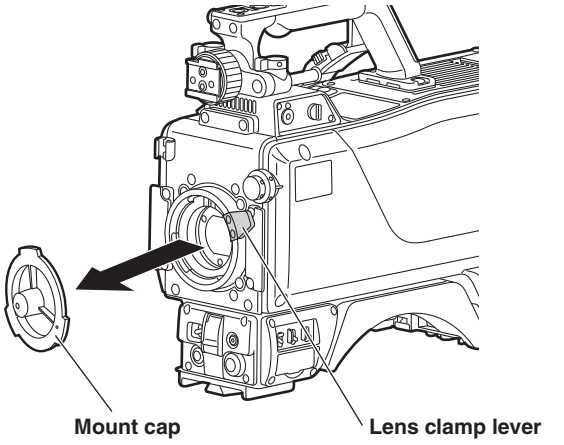
㊿㊀㊁ MIC2 selector switch [LINE/MIC]
This switch is used to select LINE or MIC for the input signals.

㊿㊀㊂ Buildup unit I/F
This signal interface connector is used to connect the Buildup unit.

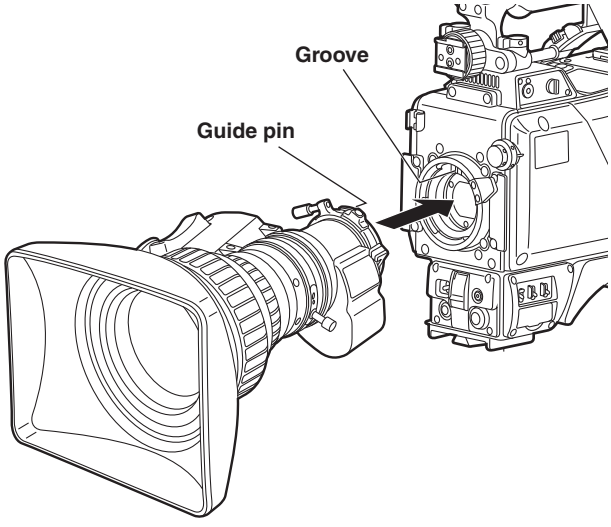
㊿㊀㊃ Tally output connector [TALLY OUT]
The R or G tally signal is output from this connector (open collector). A DC 12 V power supply (up to 1.0 A) can also be supplied.
If the current exceeds the rating, the power is turned off forcibly.

Mounting the lens

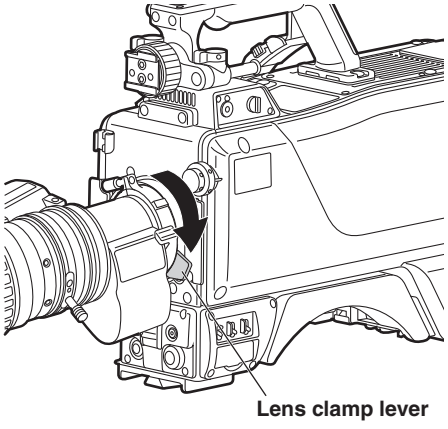
1 Raise the lens clamp lever, and remove the mount cap.



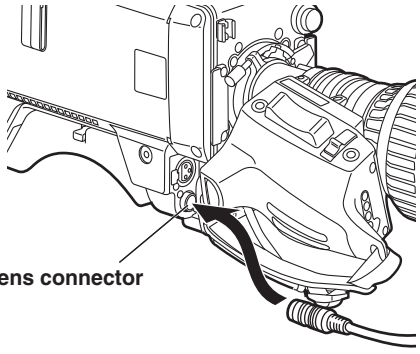
2 Align the guide pin on the lens with the groove at the top center of the lens mount, and mount the lens.



3 Lower the lens clamp lever to clamp the lens in place.



4 Insert the cable into the cable clamp and connect it to the lens connector.



Notes

- For details on handling the lens, refer to the instructions that accompany the lens.
- Depending on the lens mounted, it may be necessary to perform the following lens and camera adjustments.
  1. Flange back adjustment for the lens
  2. Auto iris operation speed adjustment for the lens
  3. White shading adjustment for the lens (performed using the controls on the camera)

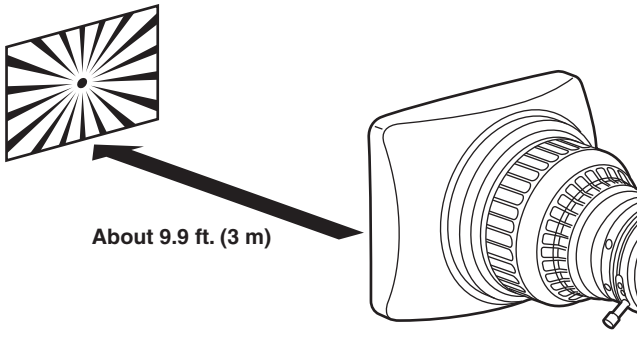
Adjusting the lens flange back

Adjust the flange back (distance from the surface where the lens is mounted to the surface where the images are formed) if the subject fails to be precisely focused at both the telephoto and wide-angle settings when zoom operations are to be performed. Once adjusted, the flange back does not need to be adjusted again unless the lens is replaced.

Adjustment method

Note

For details on the adjustment method and positions of the lens parts, refer also to the instructions that accompany the lens.



1 Mount the lens on the camera. Do not forget to connect the lens cable at this time.

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

3 Set the lighting in such a way that the appropriate video output level is obtained at a distance of about 9.9 ft. (3 m) from the flange back adjustment chart.
If the video level is too high, use a filter or shutter.

4 Loosen the screw that secures the F.f (flange focus) ring.

Note

Depending on the lens concerned, this ring may be marked as the “F.b” (flange back) ring.

5 Set the zoom ring to the telephoto position either by manual or electrical means.

6 Shoot the flange back adjustment chart, and turn the distance ring to adjust the focus.

7 Set the zoom ring to the wide-angle position, and turn the F.f ring to adjust the focus. Take care not to move the distance ring.

8 Repeat steps 5 to 7 until the chart is focused properly at both the telephoto and wide-angle positions.

9 Tighten up the screw that secures the F.f ring.

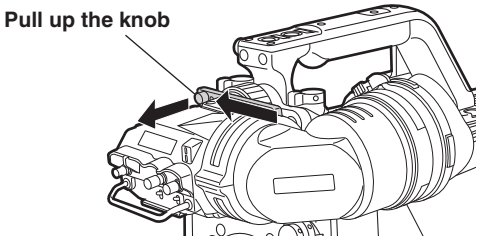
Performing the viewfinder adjustments

(The viewfinder is an optional accessory.)

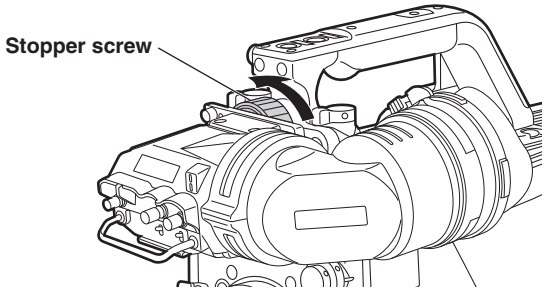
Attaching the viewfinder

1 Check that the camera's POWER switch is at the OFF position.

2 Pull up the knob on the mounting plate and slide the plate to attach the viewfinder.



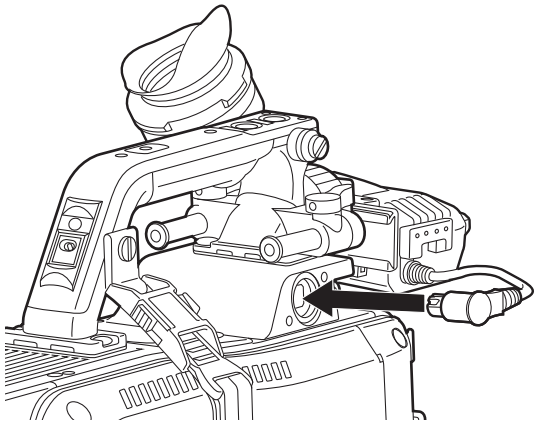
3 Tighten the stopper screw securely.



4 Connect the plug to the VF connector.

Note

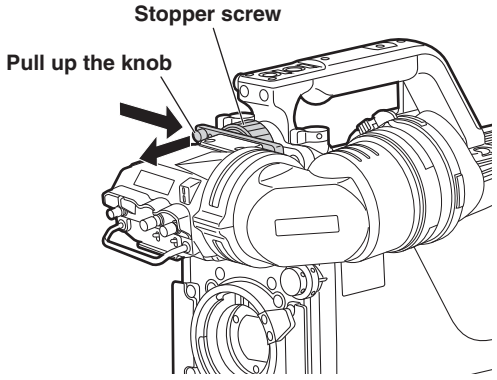
When connecting the plug to the VF connector, ensure that it is fully and securely inserted.



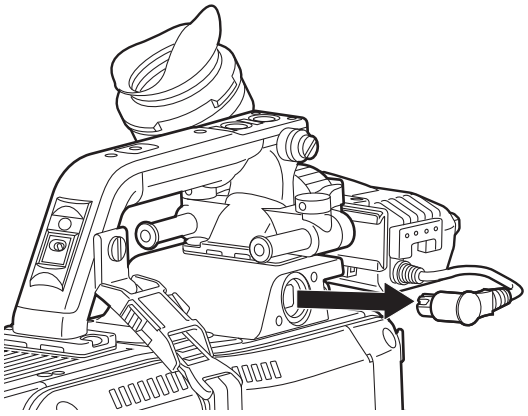
Detaching the viewfinder

1 Check that the camera's POWER switch is at the OFF position.

2 Loosen the stopper screw, pull up the knob on the mounting plate and slide the viewfinder along and off the plate.



3 Disconnect the plug from the VF connector.

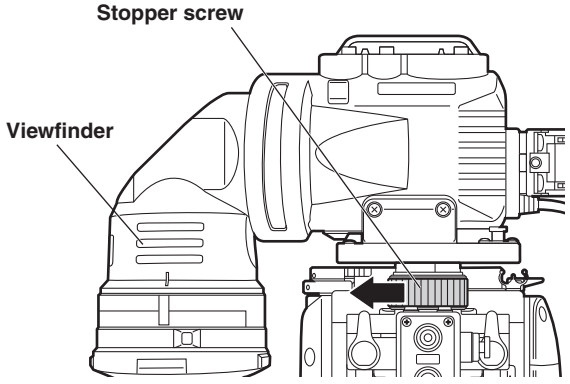


Performing the viewfinder adjustments

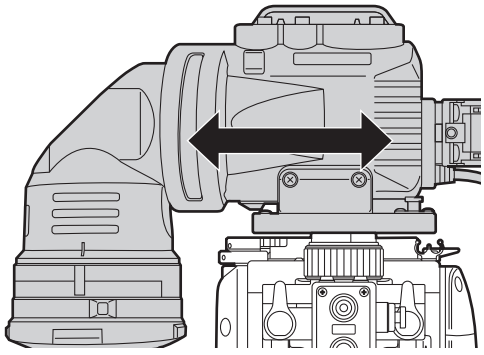
(The viewfinder is an optional accessory.)

Left or right position adjustment

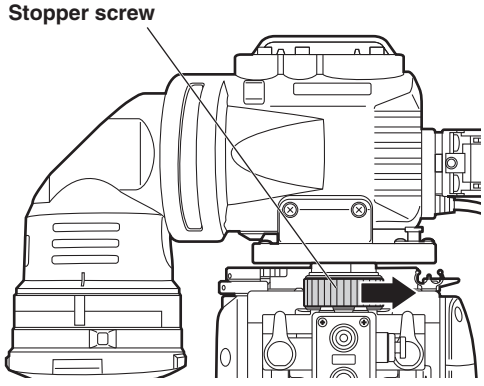
1 Loosen the stopper screw.



2 Move the viewfinder to the left or right to adjust its position.

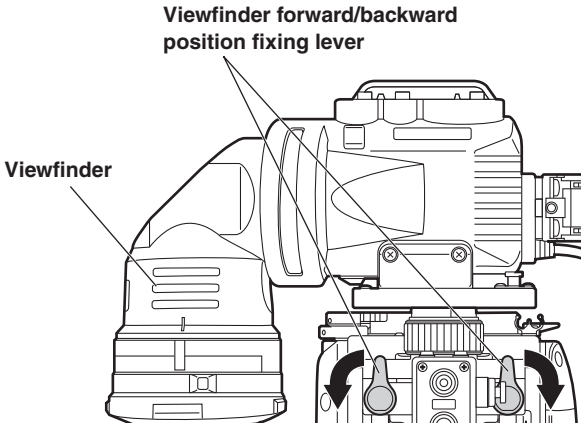


3 Tighten the stopper screw.

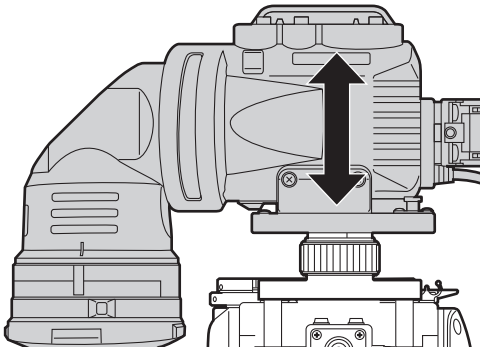


Forward or backward position adjustment

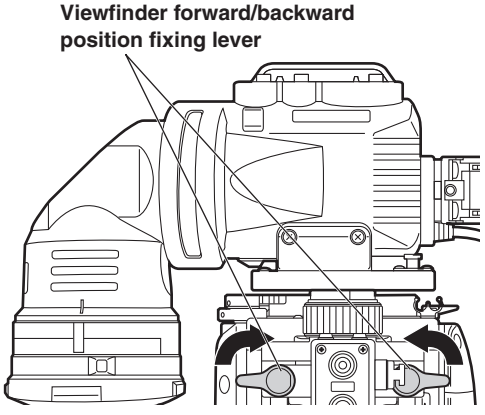
1 Rotate the viewfinder forward/backward position fixing lever towards the outside to release it from the locked position.



2 Move the viewfinder forward or backward to adjust its position.



3 Rotate the viewfinder forward/backward position fixing lever in the opposite direction until it locks.

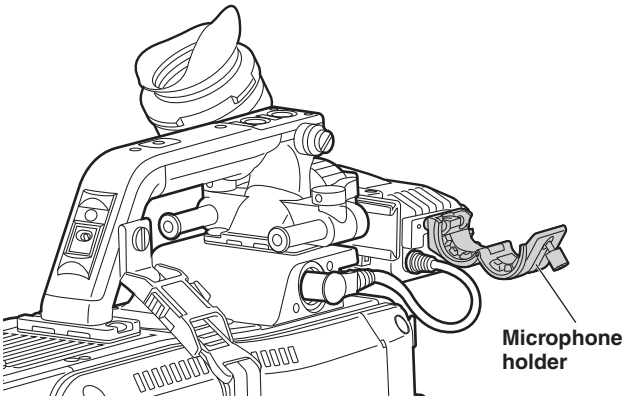


Connecting a microphone

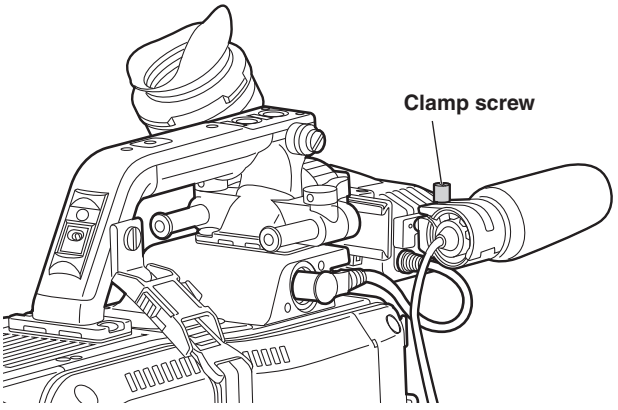
When the microphone is mounted on the viewfinder (optional accessory) for use

A microphone such as the AJ-MC700 microphone kit (optional accessory) can be mounted on the viewfinder.

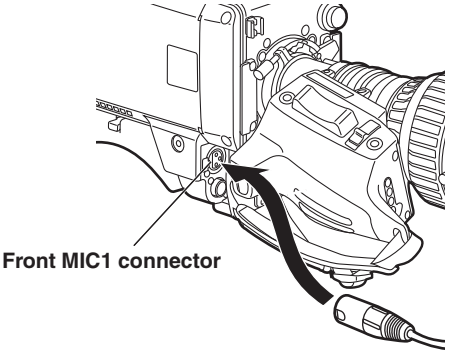
1 Open the microphone holder.



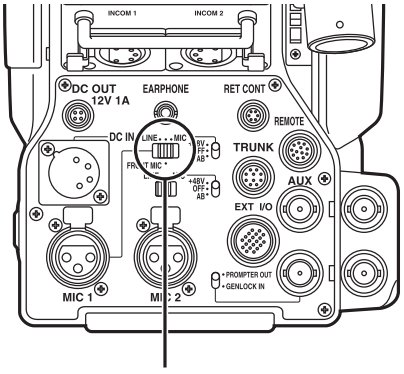
2 Mount the microphone and tighten up the clamp screw.



3 Connect the microphone cable to the front MIC1 connector on the camera.



4 If the audio channel whose signals are to be recorded so requires, set the MIC1 selector switch to FRONT MIC.



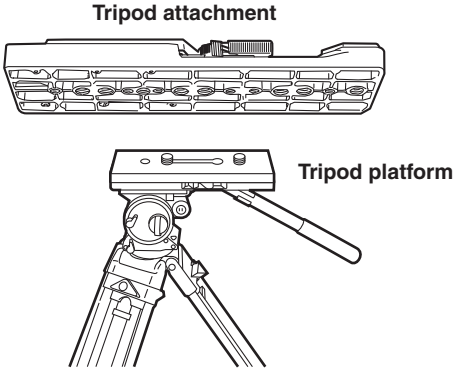
Mounting the camera on a tripod

Use the tripod attachment, available as an optional accessory, to mount the camera on a tripod.

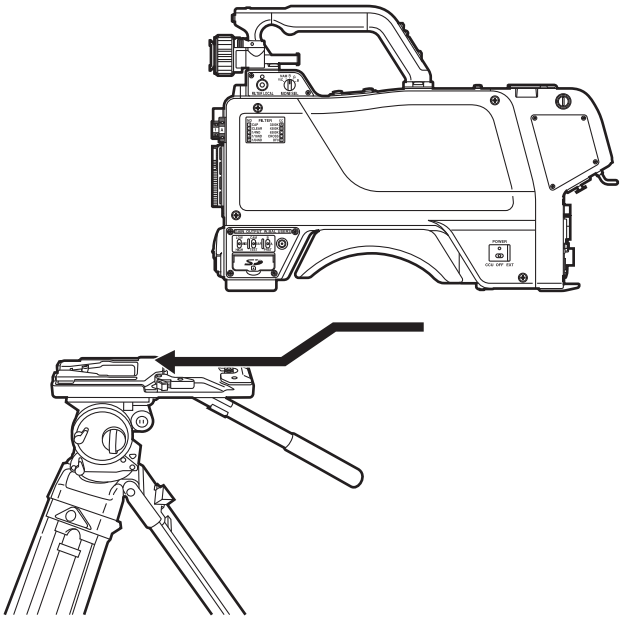
1 Mount the tripod attachment on the tripod.

Note

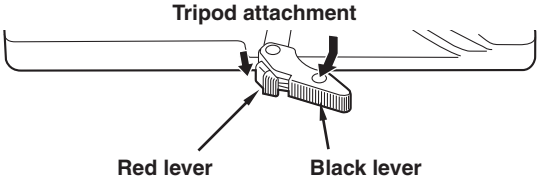
Select the appropriate holes from among the holes on the bottom of tripod attachment depending on where the center of gravity of the camera and tripod attachment falls. If the holes selected are not appropriate, the center of gravity will not be supported, as a result of which the camera may drop off or fall over, which in turn may possibly cause injury.
Check that the diameter of the holes selected for mounting matches the diameter of the screw holes of the tripod platform. If these diameters do not correspond, the tripod attachment will not be secured properly, as a result of which the camera may drop off or fall over, which in turn may possibly cause injury.



2 Mount the camera on the tripod attachment. Slide the camera toward the front along the groove until a click is heard.
Now check that the camera is secured properly.



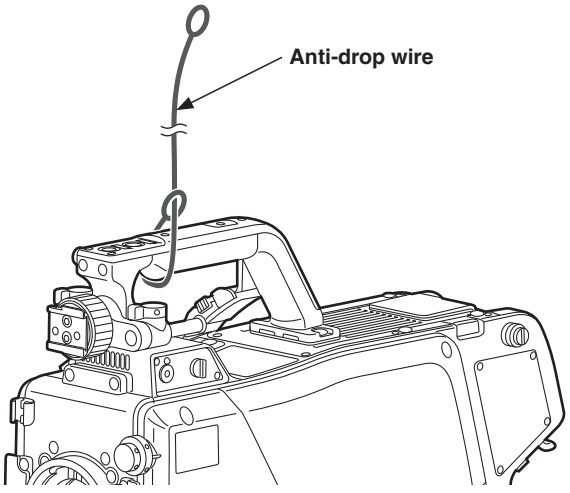
Detaching the camera from the tripod attachment
While pushing the red lever, move the black lever in the direction of the arrow, and slide the camera toward the back.



<Note>
If the pin of the tripod attachment fails to return to its original position after the camera has been detached, push the red lever again and simultaneously move the black lever in the direction of the arrow to return the pin to its original position.
Bear in mind that the camera cannot be mounted if the pin still remains at the center.

Note

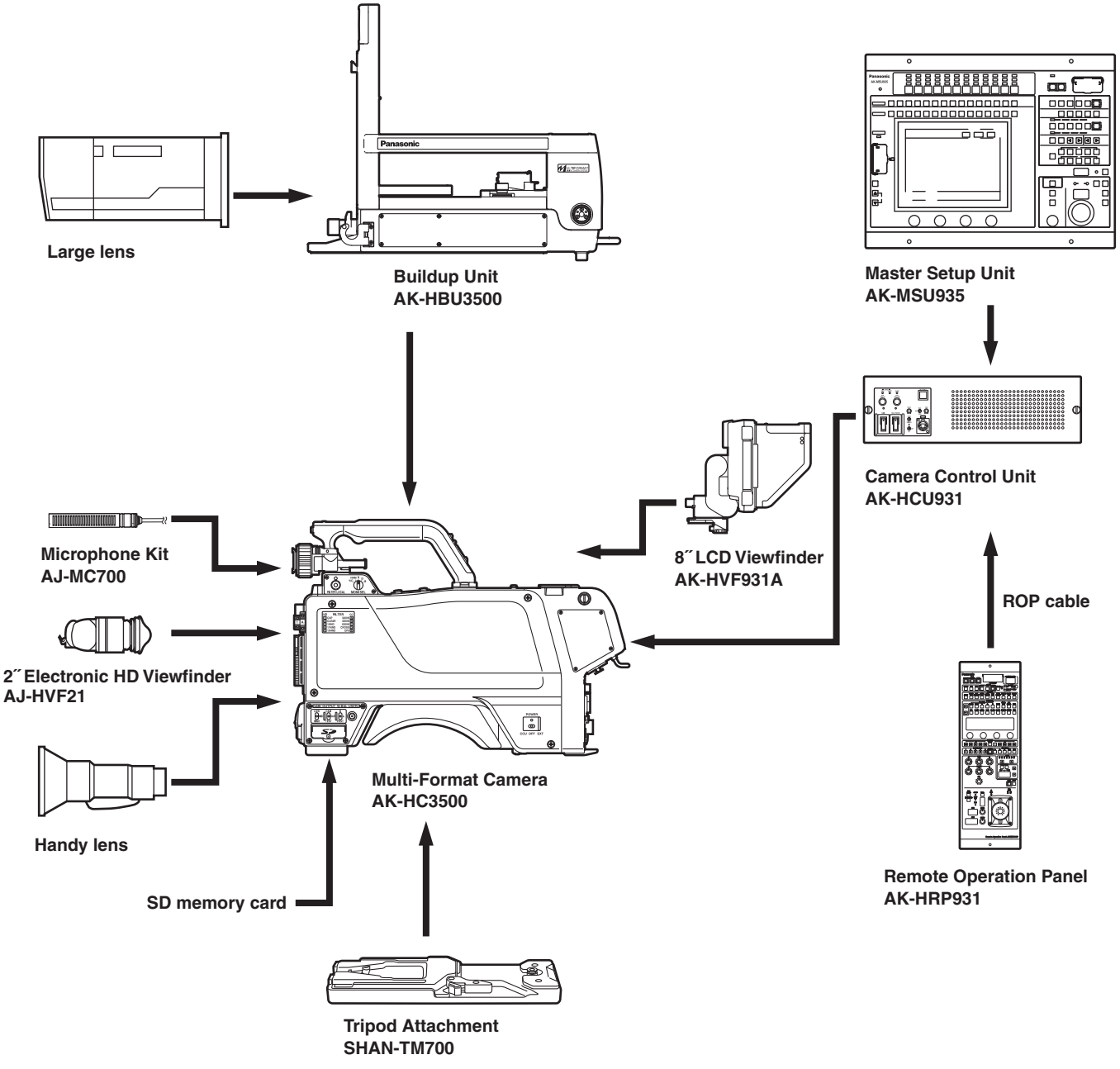
Concerning the steps for ensuring that the camera does not slip or drop out of position
When installing the camera on a crane or at some other position high above the floor or ground, first check that the crane can bear the weight of the entire system including the camera, lens and connecting cables, and then use the specified tools to install the camera securely.
Be absolutely sure to ensure that the camera will not drop from its position by looping an anti-drop wire around its handle and securing the end of the wire at a point above the camera, as shown in the figure below.



Component system configuration

An example of the standard system consisting of the Multi-Format Camera (AK-HC3500) and peripheral components is described below and shown on the following page. The MSU (AK-MSU935) is not required unless a multiple number of cameras are to be controlled.
The basic system configuration includes the lens, Multi-Format Camera, viewfinder, camera control unit (CCU) and remote operation panel (ROP).

System block diagram



Component system configuration

Outline of peripheral components

- **Camera Control Unit (CCU: AK-HCU931)**
  This is the Multi-Format Camera's camera control unit.
  It is connected to the Multi-Format Camera using an optical fiber cable.
  HD/SD video input and output can be supported by inserting the HD/SD output unit.

- **Remote Operation Panel (ROP: AK-HRP931)**
  The ROP is connected to the CCU using the ROP cable, and enables the camera, CCU and lens to be operated by remote control.

- **Master Setup Unit (MSU: AK-MSU935)**
  When a multiple number of cameras and CCUs are used, the MSU can operate up to 12 units either separately or simultaneously by remote control.
  It can be operated together with the ROP.

- **2˝ Electronic HD Viewfinder (2˝VF: AJ-HVF21)**
  This is the viewfinder for the Multi-Format Camera.

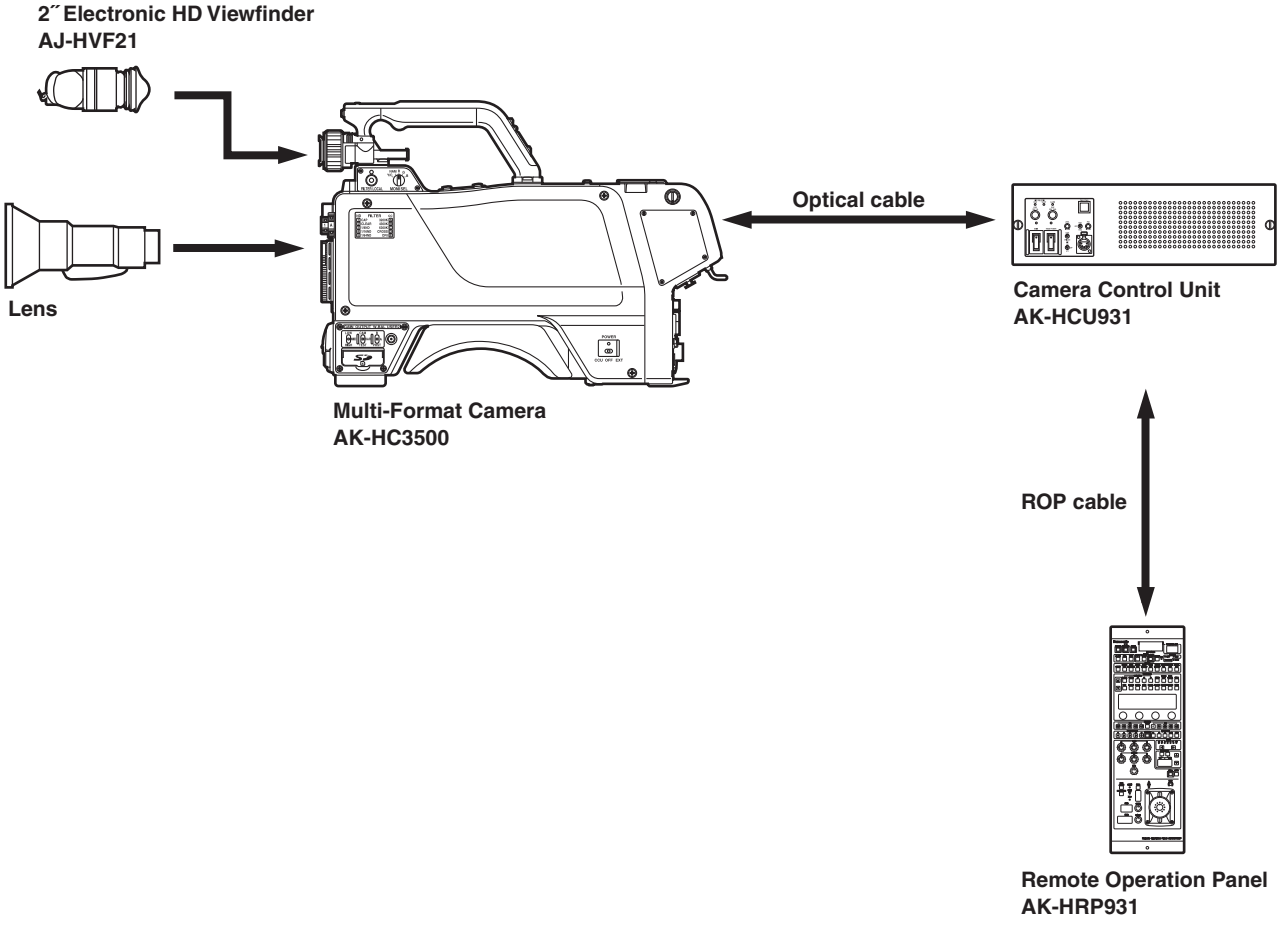
- **8˝ LCD Viewfinder (8˝ LCD VF: AK-HVF931A)**
  This is the LCD viewfinder for the Multi-Format Camera.
  It can be used at the same time as the 2˝ viewfinder.
  It can still be operated when the system is built up.

- **Buildup Unit (AK-HBU3500)**
  A large-sized lens can be mounted on the multi-format camera to enable the same operations as for a large-sized camera can be undertaken.

Component connections

Refer to pages 20 to 22 for the component connections.
After all the components have been connected (the monitor system may be connected afterward), set the CCU's main power switch to the ON position.
Then turn on the camera's power switch.

System connections 1 (with Multi-Format Camera)



① Before proceeding with the connections, set the CCU power switch to the OFF position.

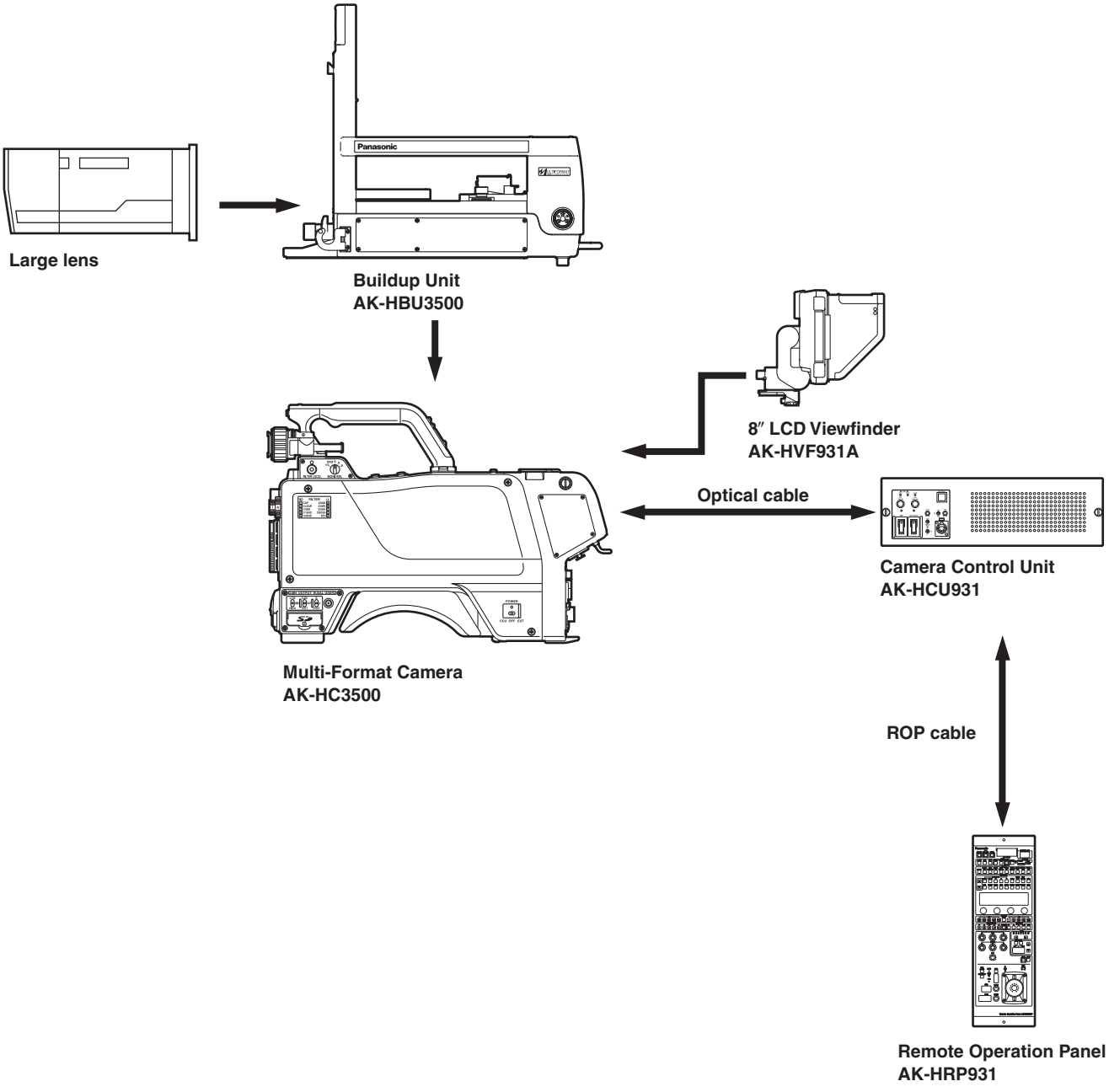
② Connect the optical cable to the Multi-Format Camera and CCU.

③ Connect the ROP cable to the CCU and ROP.

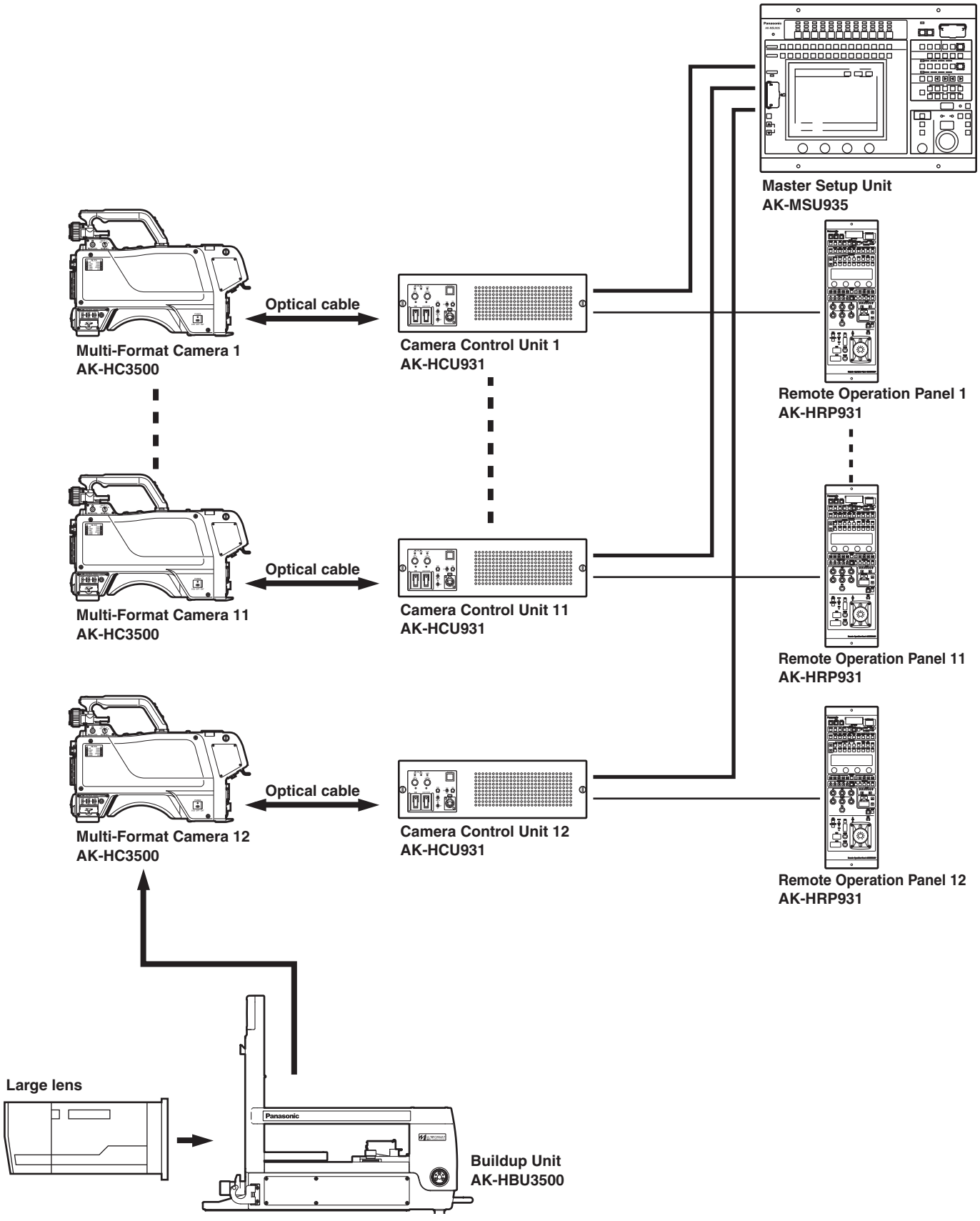
④ When the camera power switch is set to ON after the CCU main power switch has been set to ON, the camera can be controlled using the ROP.

⑤ Upon completion of shooting, set the CCU camera power switch and main power switch to OFF.

System connections 2 (with Buildup Unit)



System connections 3 (with MSU)



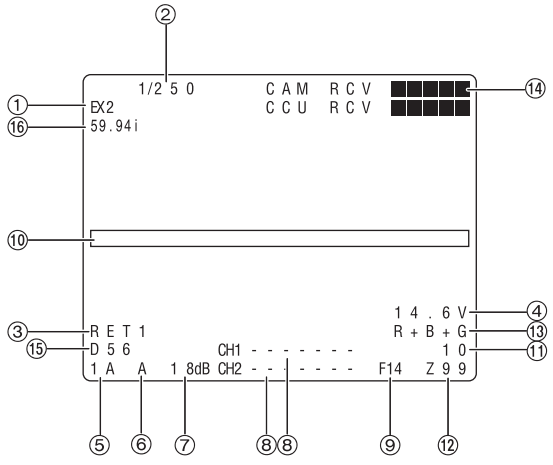
- A multiple number of cameras (up to 12 units) can be controlled in one location using the MSU.
- The cameras can be controlled by both the ROPs and MSU.

Status displays on viewfinder screen

Besides the images, Multi-Format Camera settings and messages indicating operating statuses appear on the viewfinder screen.
The camera menu VF DISPLAY screen and the items which have been set to ON using the switches related to the viewfinder display appear at the top and bottom of the screen.
When a setting has been changed or an adjustment made, a message with details of the setting, the status of the adjustment process or the adjustment result can be displayed for about 3 seconds.

■Display items and where the items appear

① Extender display
② Shutter speed/mode display
③ RET SEL display
④ Voltage display
⑤ Filter display
⑥ White balance memory display
⑦ Gain display
⑧ Audio CH1 and CH2 displays
⑨ Iris f-number display
⑩ Camera warning or message display
⑪ Focus position display
⑫ Zoom position display
⑬ MONI SEL display
⑭ Optical level display
⑮ 5600K display
⑯ Field frequency display



① **Extender display:**
This appears when the lens extender is being used.

② **Shutter speed/mode display:**
This indicates the shutter speed or shutter mode setting.

③ **RET SEL display:**
This indicates the return mode selected by the RET switch.

④ **Voltage display:**
This indicates the voltage of the DC IN currently in use.

⑤ **Filter display:**
This indicates the type of filter selected.

⑥ **White balance memory display:**
This indicates the automatic adjustment memory selected for the white balance.
A: The WHITE BAL switch is set to “A”.
B: The WHITE BAL switch is set to “B”.
P: The WHITE BAL switch is set to “PRST”.

⑦ **Gain display:**
This indicates the video amplifier’s gain setting (in dB) which has been selected by the gain selector switch.

⑧ **Audio CH1 and CH2 displays:**
The audio levels are displayed here (separately for audio CH1 and audio CH2).

⑨ **Iris f-number display:**
The approximate value of the iris setting (f-number) is displayed here.

<Note>
This display appears when a lens which has an f-number output is being used.

⑩ **Camera warning or message display:**
A message indicating the occurrence of an error, the camera settings, the progress made in the adjustments, and the adjustment results appear here for about 3 seconds.

⑪ **Focus position display:**
The focus position is indicated here in the form of a number.

<Note>
This display appears only when a lens which has a focus position output is being used.

⑫ **Zoom position display:**
The zoom position is indicated here in the form of a number.

<Note>
This display appears only when a lens which has a zoom position output is being used.

⑬ **MONI SEL display:**
This indicates the video mode of the monitor output.

⑭ **Optical level display:**
This indicates the light sensing level of the optical fiber cable.

⑮ **5600K display:**
This indicates the setting of the electronic color compensation.

⑯ **Field frequency display:**
This indicates the field frequency at which the camera is operating. Either 50i or 59.94i is displayed.

Checking and setting the calendar

The calendar is checked and set on the [Date/Time] page located on the Maintenance menu.

- **Checking the current settings**
  1. Check the current year/month/day, day of the week and time displayed on [Present].
  2. Select [Adjust], press the jog dial, and when [YES?] is selected and entered, the seconds are reset to “00.”

- **Adjusting the time**
  1. At [12H/24H], select whether the 12-hour or 24-hour system is going to be used.
  2. At [Date], set the year, month, day and day of the week.
  3. At [Time], set the hours, minutes and seconds.
  4. At [Set Exe], when [YES?] is selected and entered, the adjusted year/month/day, day of the week and time are displayed in [Present].
  5. At [Reset], when [YES?] is selected and entered, the following is displayed:

     00/01/01 MON
     00:00:00

Notes

- The calendar function will not operate properly when an irregular year/month/day, day of the week or time is set.
- The manufacturer disclaims all responsibility for any trouble which may be caused by the calendar function.

Camera warning displays

Warning displays appear when errors have occurred in the camera’s auto functions.
Set [Status (AUTO)] to ON at [VF Display2] under [Operation].

- **When AWB is executed:**

①	**AWB LOW LIGHT**	Auto white balance cannot be executed because the light quantity is insufficient. Set the light quantity to the appropriate level.
②	**AWB HIGH LIGHT**	Auto white balance cannot be executed because the light quantity is excessive. Set the light quantity to the appropriate level.
③	**AWB R/Bch NG Out Range**	The white balance convergence for the red or blue channel cannot be achieved. Shoot a uniformly white object on the screen, and execute AWB.

- **When ABB is executed:**

①	**Not Finished**	Auto black balance cannot be completed successfully. The lens iris may not be open or the ND filter may not be set to CAP.
②	**R/B Out Range**	The black balance convergence for the red or blue channel cannot be achieved. Check whether there are any abnormalities in the image.

- **When ASU is executed:**

①	**LENS CTL NG Out Range**	The lens iris cannot be controlled. Review the lens settings.
②	**--- R/Bch NG**	Trouble has occurred in the red or blue channel in the process which is being executed. Using a regular chart, check the correct position vis-à-vis the chart and angle of view, check the color temperature setting of the light source, and check whether any other areas are not amenable to control.

Basic setting menu operations

■ Displaying the menus

User menu

1 Press the MENU switch.
The camera's USER menu screen now appears on the viewfinder or monitor.

```
USER MENU

→Operation
 Painting
 Maintenance
```

2 Turn the JOG dial to select the menu item.

3 After having selected the item, press the JOG dial to access that item's menu.

```
Operation

→VF Setting1   INCOM Set.1
 VF Setting2   INCOM Set.2
 Cursor        MIC Gain
 VF Display1
 VF Display2
 Setting1
 Setting2
 Setting3
 Setting4
 !LED
 7"VF
```

■ Entering the menu data

After accessing the item menus, enter the respective data.

1 Turn the JOG dial to select the menu item to be set.

```
VF Setting1

 Side Modu SW     OFF
 Side Modu LVL     15
→Zone Mark         4:3
 Safety Mark1     16:9
 Safety Area1     93%
 Safety Mark2      4:3
 Safety Area2     93%
 Center Mark      OFF
 Center Mark SEL  3
 Line Width       3
 Marker Level     100%
```

2 When the JOG dial is pressed, the setting of the item indicated by the arrow flashes.

```
VF Setting1

 Side Modu SW     OFF
 Side Modu LVL     15
→Zone Mark         4:3
 Safety Mark1     16:9
 Safety Area1     93%
 Safety Mark2      4:3
 Safety Area2     93%
 Center Mark      OFF
 Center Mark SEL  3
 Line Width       3
 Marker Level     100%
```

3 Turn the JOG dial to change the setting.

```
VF Setting1

 Side Modu SW     OFF
 Side Modu LVL     15
→Zone Mark        13:9
 Safety Mark1     16:9
 Safety Area1     93%
 Safety Mark2      4:3
 Safety Area2     93%
 Center Mark      OFF
 Center Mark SEL  3
 Line Width       3
 Marker Level     100%
```

4 When the JOG dial is pressed, the data is entered.

```
VF Setting1

 Side Modu SW     OFF
 Side Modu LVL     15
→Zone Mark        13:9
 Safety Mark1     16:9
 Safety Area1     93%
 Safety Mark2      4:3
 Safety Area2     93%
 Center Mark      OFF
 Center Mark SEL  3
 Line Width       3
 Marker Level     100%
```

Note

Bear in mind that if, in step 3, the MENU switch is set to OFF while the setting is flashing, the setting prior to the flashing will remain unchanged.

■ Entering the menu data (continued)

When the setting flashes one character at a time, press the JOG dial to move the flashing toward the right.

1 When the JOG dial is pressed, flashing moves toward the right.

```
Setting3

→RET1 ID          ABCDE
 RET2 ID          IJKLM
 RET3 ID          QRSTU
 RET4 ID          YZ012
 Gain SW LOW       0dB
 Gain SW MID       6dB
 Gain SW HIGH     12dB
 ID Character     ABCDEFGHIJ
 RET-C Select     1
 RET-A+RET-B      RET-C
```

```
Setting3

→RET1 ID          ABCDE
 RET2 ID          IJKLM
 RET3 ID          QRSTU
 RET4 ID          YZ012
 Gain SW LOW       0dB
 Gain SW MID       6dB
 Gain SW HIGH     12dB
 ID Character     ABCDEFGHIJ
 RET-C Select     1
 RET-A+RET-B      RET-C
```

2 Turn the JOG dial to change the setting.

```
Setting3

→RET1 ID          AMCDE
 RET2 ID          IJKLM
 RET3 ID          QRSTU
 RET4 ID          YZ012
 Gain SW LOW       0dB
 Gain SW MID       6dB
 Gain SW HIGH     12dB
 ID Character     ABCDEFGHIJ
 RET-C Select     1
 RET-A+RET-B      RET-C
```

3 When the JOG dial is now pressed, the data is entered.

```
Setting3

→RET1 ID          AMCDE
 RET2 ID          IJKLM
 RET3 ID          QRSTU
 RET4 ID          YZ012
 Gain SW LOW       0dB
 Gain SW MID       6dB
 Gain SW HIGH     12dB
 ID Character     ABCDEFGHIJ
 RET-C Select     1
 RET-A+RET-B      RET-C
```

Setting menu configuration

Hierarchical menus

USER MENU

- **Operation**
  - VF Setting1 — Viewfinder settings1
    - Side Modu SW (for setting the peripheral brightness modulation to ON or OFF)
    - Side Modu LVL (for setting the peripheral brightness modulation level)
    - Zone Mark (for setting the zone marker)
    - Safety Mark1 (for setting the safety marker1)
    - Safety Area1 (for setting the safety area1)
    - Safety Mark2 (for setting the safety marker2)
    - Safety Area2 (for setting the safety area2)
    - Center Mark (for setting the center marker)
    - Center Mark SEL (for setting the shape of the center marker)
    - Line Width (for setting the thickness of the markers)
    - Marker Level (for setting the brightness of the markers)
  - VF Setting2 — Viewfinder settings2
    - VF DTL (for adjusting VF DTL)
    - RET Signal
      - HD Peak FREQ (for adjusting the peak frequency of HD RET signal)
      - HD Offset Gain (for adjusting the DTL offset gain of HD RET signal)
      - HD Crisp (for adjusting the DTL crisp level of HD RET signal)
      - D1 Peak FREQ (for adjusting the peak frequency of D1 RET signal)
      - D1 Offset Gain (for adjusting the DTL offset gain of D1 RET signal)
      - D1 Crisp (for adjusting the DTL crisp level of D1 RET signal)
      - VBS Peak FREQ (for adjusting the peak frequency of VBS RET signal)
      - VBS Offset Gain (for adjusting the DTL offset gain of VBS RET signal)
      - VBS Crisp (for adjusting the DTL crisp level of VBS RET signal)
  - Cursor — Cursor settings
    - Cursor (for setting the cursor marker to ON or OFF)
    - Cursor Memory (for selecting the cursor marker memory from ADJ, 1, 2 or 1+2)
      - H Position (for adjusting the H position of the cursor)
      - V Position (for adjusting the V position of the cursor)
      - Width (for adjusting the width of the cursor)
      - Height (for adjusting the height of the cursor)
      - BOX/CROSS (for setting the shape of the cursor)
    - Store (for setting the cursor memory)
      - EXECUTE (for executing Store)
  - VF Display1 — Viewfinder display settings1
    - F Number (for setting the f-number display to ON or OFF)
    - Zoom (for setting the zoom value display to ON or OFF)
    - Focus (for setting the focus value display to ON or OFF)
    - Extender (for setting the lens extender display to ON or OFF)
    - MONI OUT (for setting the monitor output selection display to ON or OFF)
    - Filter (for setting the ND/CC filter display to ON or OFF)
    - M Gain (for setting the gain display to ON or OFF)
    - Shutter (for setting the electronic shutter display to ON or OFF)
    - 5600K (for setting the 5600K effect to ON or OFF)
    - Audio Level (for setting the audio level display to ON or OFF)
  - VF Display2 — Viewfinder display settings2
    - OPT Level (for setting the optical level display to ON or OFF)
    - RET Select (for setting the RET selection display to ON or OFF)
    - Status (for setting the display appearing when functions are selected to ON or OFF)
    - Status(AUTO) (for setting the display appearing when AWB/ABB/ASU are started or finished to ON or OFF)
    - Field Rate (for setting the field rate display to ON or OFF)
    - Voltage (for setting the supply voltage display to ON or OFF)
    - WFM (for setting the WFM display to ON or OFF)
    - White CH (for setting the white balance memory display to ON or OFF)
  - Setting1 — Camera settings1
    - FAN Power (for setting the camera fan to ON or OFF)
    - FAN Mode (for setting the camera fan mode)
    - CALL+R_TALLY (for setting to light R TALLY when CALL is detected)
    - CALL+T_TALLY (for setting to light T TALLY when CALL is detected)
    - PinP Mode (not operate)
    - HD-SDI2 OUT (for selecting the mode of HD-SDI2 connector)
    - HD-SDI2 Power (for setting the power of HD-SDI2 to ON or OFF)
    - AUX I/O (for selecting the mode of AUX connector)
    - TRUNK1 (for setting the serial interface standard of trunk line)
    - TRUNK2 (for setting the serial interface standard of trunk line)
    - 5600K (for setting the electronic color temperature filter)
  - Setting2 — Camera settings2
    - HND GRIP RET (for selecting the grip RET SW function)
    - HND GRIP PTT (for selecting the grip PTT SW function)
    - HND Lens VTR (for selecting the handy lens VTR SW function)
    - HND Lens RET (for selecting the handy lens RET SW function)
    - STD Lens RET1 (for selecting the standard lens RET1 SW function)
    - STD Lens RET2 (for selecting the standard lens RET2 SW function)
    - EXT RET 1 (for selecting the external return control SW1 function)
    - EXT RET 2 (for selecting the external return control SW2 function)
    - EXT RET 3 (for selecting the external return control SW3 function)

Setting menu configuration

Hierarchical menus

USER MENU

- **Operation**
  - Setting3 / Camera settings3
    - RET1 ID (for setting the RET1 designation)
    - RET2 ID (for setting the RET2 designation)
    - RET3 ID (for setting the RET3 designation)
    - RET4 ID (for setting the RET4 designation)
    - Gain SW LOW (for setting the gain selector switch to LOW gain)
    - Gain SW MID (for setting the gain selector switch to MID gain)
    - Gain SW High (for setting the gain selector switch to HIGH gain)
    - ID Character (for setting the camera designation)
  - Setting4 / Camera settings4
    - User SW1 (for selecting the function of User SW1)
    - User SW2 (for selecting the function of User SW2)
    - User SW3 (for selecting the function of User SW3)
    - User B/U (for selecting the function of User SW on the Buildup Unit)
    - Back Light (for setting the back light to ON or OFF)
    - RET Mode (for setting the RET SW operation mode)
    - Lens I/F (for setting the interface of the lens)
    - B/U Lens (for setting the lens type in B/U system)
    - Rear ROP VR (for setting the right of priority for the control knobs of the ROP connected to the camera rear connector)
  - !LED / Camera status display settings
    - Gamma Off (for displaying the status when the gamma is OFF)
    - Shutter (for displaying the status when the electronic shutter is ON)
    - Extender (for displaying the status when the lens extender is ON)
    - MONI OUT (for displaying the status when the monitor output signal is other than Y)
    - FAN Off (for displaying the status when the fan is OFF)
    - Master Gain (for displaying the status when the gain is other than 0 dB)
    - Black Gamma (for displaying the status when the black gamma is ON)
  - 7˝VF / CRT VF settings
    - VF FAN Speed (for controlling the fan speed of the CRT viewfinder)
    - Peak Slice (for setting the “peak slice” function)
    - Peak FREQ (for selecting the peak frequency)
  - INCOM Set.1 / Incom settings1
    - INC1 MIC Type (for selecting the type of intercom1 microphone)
    - INC1 MIC Gain (for setting the gain of intercom1 microphone)
    - INC1 MIC Power (for setting the mic power supply of INCOM1 to ON or OFF)
    - INC1 Side Tone (for setting the side tone of intercom1 to ON or OFF)
    - INC1 PGM MIX (for setting the PGM mix of intercom1 to ON or OFF)
    - INC1 ENG/PROD (for selecting the communication destination of intercom1)
    - INC1 to CCU (for setting the insertion of CCU into the communication destination for intercom1 to ON or OFF)
  - INCOM Set.2 / Incom settings2
    - INC2 MIC Type (for selecting the type of intercom2 microphone)
    - INC2 MIC Gain (for setting the gain of intercom2 microphone)
    - INC2 MIC Power (for setting the mic power supply of INCOM2 to ON or OFF)
    - INC2 Side Tone (for setting the side tone of intercom2 to ON or OFF)
    - INC2 PGM MIX (for setting the PGM mix of intercom2 to ON or OFF)
    - INC2 ENG/PROD (for selecting the communication destination of intercom2)
    - CRANE MIC Gain (for setting the insertion of CCU into the communication destination for intercom2 to ON or OFF)
    - CRANE Side Tone (for setting the side tone of CRANE for the intercom to ON or OFF)
    - CRANE ENG/PROD (for selecting the communication destination of the CRANE intercom)
    - CRANE to CCU (for setting the insertion of CRANE into the communication destination for intercom2 to ON or OFF)
  - MIC Gain / MIC Gain settings
    - MIC1 Gain (for setting the gain of MIC1)
    - MIC1 AMP (for setting the amplitude of MIC1)
    - MIC2 Gain (for setting the gain of MIC2)
    - MIC2 AMP (for setting the amplitude of MIC2)

Setting menu configuration

Hierarchical menus

USER MENU

- **Painting**
  - Setting SW — Image ON/OFF settings
    - Flare (for setting the flare to ON or OFF)
    - Black Gamma (for setting the black gamma to ON or OFF)
    - Gamma (for setting the gamma to ON or OFF)
    - Knee (for setting the KNEE to ON or OFF)
    - White Clip (for setting the white clip to ON or OFF)
    - Matrix (for setting the matrix to ON or OFF)
    - Preset Matrix (for setting the preset matrix)
    - DTL (for setting the DTL to ON or OFF)
    - Skin Tone DTL (for setting the skin tone DTL to ON or OFF)
    - DRS SW (for setting the DRS to ON or OFF)
  - BlackShading — Black shading adjustments
    - Correct (for setting the black shading to ON or OFF)
    - H SAW R/G/B (for adjusting the H SAW)
    - H PARA R/G/B (for adjusting the H PARA)
    - V SAW R/G/B (for adjusting the V SAW)
    - V PARA R/G/B (for adjusting the V PARA)
    - AUTO V.SAW (for setting the auto shading V.SAW to ON or OFF)
  - Black/Gain — Pedestal, flare and gain adjustments
    - PED M (for adjusting the master pedestal)
    - PED R (for adjusting the R pedestal)
    - PED B (for adjusting the B pedestal)
    - Flare (for setting the flare to ON or OFF)
    - Flare G (for adjusting the G flare)
    - Flare R (for adjusting the R flare)
    - Flare B (for adjusting the B flare)
    - Gain G (for adjusting the G gain)
    - Gain R (for adjusting the R gain)
    - Gain B (for adjusting the B gain)
  - White SHD — White shading adjustments
    - Correct (for setting the white shading to ON or OFF)
    - H SAW R/G/B (for adjusting the H SAW)
    - H PARA R/G/B (for adjusting the H PARA)
    - V SAW R/G/B (for adjusting the V SAW)
    - V PARA R/G/B (for adjusting the V PARA)
  - Gamma — Gamma adjustments
    - Gamma (for setting the gamma to ON or OFF)
    - Gamma M (for adjusting the master gamma)
    - Gamma R (for adjusting the R gamma)
    - Gamma B (for adjusting the B gamma)
    - Black Gamma (for setting the black gamma to ON or OFF)
    - Black Gamma M (for adjusting the master black gamma)
    - Black Gamma R (for adjusting the R black gamma)
    - Black Gamma B (for adjusting the B black gamma)
    - DRS SW (for setting the DRS to ON or OFF)
      - Effect Depth (for adjusting the DRS effect)
    - Initial Gain (for setting the gradient of the gamma rise)
  - Knee/W.Clip — Knee and white clip adjustments
    - Knee (for setting the KNEE to ON or OFF)
    - Knee Point M (for adjusting the master KNEE point)
    - Knee Point R (for adjusting the R KNEE point)
    - Knee Point B (for adjusting the B KNEE point)
    - Knee Slope M (for adjusting the master KNEE slope)
    - Knee Slope R (for adjusting the R KNEE slope)
    - Knee Slope B (for adjusting the B KNEE slope)
    - White Clip (for setting the white clip to ON or OFF)
    - White Clip M (for adjusting the master white clip)
    - White Clip R (for adjusting the R white clip)
    - White Clip B (for adjusting the B white clip)
  - Linear Matrix — Linear matrix adjustments
    - Matrix (for setting the matrix to ON or OFF)
      - Linear (for setting the linear matrix to ON or OFF)
      - 12axes (for setting the 12axes matrix to ON or OFF)
    - R-G (for adjusting the R-G level)
    - R-B (for adjusting the R-B level)
    - G-R (for adjusting the G-R level)
    - G-B (for adjusting the G-B level)
    - B-R (for adjusting the B-R level)
    - B-G (for adjusting the B-G level)

Setting menu configuration

Hierarchical menus

USER MENU

- **Painting**
  - Color Correct1 — 12axes matrix adjustments1
    - Matrix (for setting the matrix to ON or OFF)
    - Linear (for setting the linear matrix to ON or OFF)
    - 12axes (for setting the 12axes matrix to ON or OFF)
    - G Satu/Phase (for adjusting the G gain)
    - G_Cy Satu/Phase (for adjusting the G_Cy gain)
    - Cy Satu/Phase (for adjusting the Cy gain)
    - Cy_B Satu/Phase (for adjusting the Cy_B gain)
    - B Satu/Phase (for adjusting the B gain)
    - B_Mg Satu/Phase (for adjusting the B_Mg gain)
  - Color Correct2 — 12axes matrix adjustments2
    - Matrix (for setting the matrix to ON or OFF)
    - Linear (for setting the linear matrix to ON or OFF)
    - 12axes (for setting the 12axes matrix to ON or OFF)
    - Mg Satu/Phase (for adjusting the Mg gain)
    - Mg_R Satu/Phase (for adjusting the Mg_R gain)
    - R Satu/Phase (for adjusting the R gain)
    - R_Ye Satu/Phase (for adjusting the R_Ye gain)
    - Ye Satu/Phase (for adjusting the Ye gain)
    - Ye_G Satu/Phase (for adjusting the Ye_G gain)
  - Detail1 — Detail adjustments1
    - V DTL (for adjusting the V DTL level)
    - H DTL (for adjusting the H DTL level)
    - Crisp (for adjusting the detail crisp level)
    - Peak FREQ (for adjusting the detail peak frequency)
    - Level Dep. (for adjusting the level dependent)
    - Dark DTL (for adjusting the dark detail level)
    - Corner DTL (for adjusting the corner detail level)
    - DTL_Source (for selecting the detail source)
    - DTL_Clip+ (for adjusting the clip on the detail + side)
    - DTL_Clip– (for adjusting the clip on the detail – side)
  - Detail2 — Detail adjustments2
    - DTL_Knee+ (for adjusting the knee compensation on the detail + side)
    - DTL_Knee– (for adjusting the knee compensation on the detail – side)
    - Knee DTL (for adjusting the knee detail gain)
  - Skin Tone Detail1 — Skin tone detail adjustments1
    - Skin Tone DTL (for setting the skin tone detail to ON or OFF)
    - Skin Tone Get (for capturing the skin tone)
    - Cursor (for displaying the cursor which captures the skin tone)
    - H Cursor (for adjusting the horizontal position of the cursor)
    - V Cursor (for adjusting the vertical position of the cursor)
    - ZEBRA (for setting the zebra pattern displayed in the applicable skin tone range to ON or OFF)
    - Effect MEM (for selecting the memory in which the skin tone detail is to be reflected)
  - Skin Tone Detail2 — Skin tone detail adjustments2
    - Skin Tone DTL (for setting the skin tone detail to ON or OFF)
    - MEM Select (for selecting the memory in which the skin tone detail is stored)
    - Skin Tone Crisp (for adjusting the crispness of the skin tone detail)
    - Phase (for adjusting the skin tone detail phase)
    - Width (for adjusting the skin tone detail range)
    - Saturation (for adjusting the skin tone detail saturation)

Setting menu configuration

Hierarchical menus

USER MENU

- **Maintenance**
  - Date/Time — Camera's internal calendar function setting
    - Present (for displaying the present status)
    - Adjust (for setting the adjustment mode to ON or OFF)
    - 12H/24H (for setting the 12H/24H)
    - Date (for setting the DATE)
    - Time (for setting the TIME)
    - Set Exe (for reflecting the adjustment values)
    - Reset (for resetting the statuses which have been set)
  - SD Card — SD card operations with camera
    - Mode (for selecting the operation for the SD card)
    - File No. (for selecting the file number in SD card)
    - EXECUTE (for executing the operation for the SD card)
  - Scene File — Scene file operations
    - Mode (for selecting scene file operation)
    - File No. (for selecting the scene file)
    - EXECUTE (for executing the operation for the scene file)
  - Lens File — Lens file operations
    - Mode (for selecting lens file operation)
    - File No. (for selecting the lens file)
    - File Name (for setting the lens file name)
    - EXECUTE (for executing the operation for the lens file)
  - Lens Edit — Lens file edit
    - Gain (for adjusting the gain in the lens file data)
    - Flare (for adjusting the flare in the lens file data)
    - W H SAW R/G/B (for adjusting the White H SAW in the lens file data)
    - W H PARA R/G/B (for adjusting the White H PARA in the lens file data)
    - W V SAW R/G/B (for adjusting the White V SAW in the lens file data)
    - W V PARA R/G/B (for adjusting the White V PARA in the lens file data)
    - Store? (for storing the lens file)
    - Cancel?
  - Option — Option board
    - The menu displayed differs depending on the type of option board installed.
  - Iris Cont. — Iris control setting
    - Auto Iris (for setting the auto iris mode to ON or OFF)
    - Window Select (for selecting the detected area of auto iris)
    - Iris Level (for adjusting the auto iris level)
    - Peak Ratio (for adjusting the ratio between peak and average during auto iris operations)
    - A.Iris Range (for setting the range of adjusting fine auto iris level with iris volume joystick)
    - A.Iris Speed (for setting the auto iris speed)
    - LensExtComp.SW (for setting the ALC compensation when the lens extender is ON)
    - LensExtComp.LVL (for setting the amount of the ALC compensation when the lens extender is ON)
  - CINE Gamma — Cinema gamma settings
    - Cinema Gamma SW (for setting the cinema gamma to ON or OFF)
    - Cinema Gamma SEL (for adjusting the cinema gamma)
    - Black STR LVL (for adjusting the stretch level of the cinema gamma)
    - Dynamic LVL (for adjusting the dynamic level of the cinema gamma)
    - Knee Point (for adjusting the knee point of the cinema gamma)
    - Knee Slope (for adjusting the knee slope of the cinema gamma)
  - ASU — Auto setup operations
    - Filter (for setting the ND/CC filter mode when auto setup)
    - Setup Mode (for setting the auto setup mode)
    - REF File (for setting the reference file on the auto setup)
    - M-PED Target (for setting the master pedestal on the auto setup)
    - ASU Execute (for executing the auto setup)
  - Tally Guard — Tally guard setting
    - Tally Guard (for setting the mode that prohibits the execution of AWB, ABB and ASU at the tally ON setting)
  - G/L — G/L adjustments
    - H Phase Coarse (for coarsely adjusting the H phase)
    - H Phase Fine (for finely adjusting the H phase)
    - SD-HD Phase CRS (for coarsely adjusting the horizontal phase of the HD signals to the horizontal phase of the SD signals during B.B. genlock)
    - SD-HD Phase Fine (for finely adjusting the horizontal phase of the HD signals to the horizontal phase of the SD signals during B.B. genlock)
    - HD-SD Phase CRS (for coarsely adjusting the horizontal phase of the SD signals to the horizontal phase of the HD signals during HD genlock)
    - HD-SD Phase Fine (for finely adjusting the horizontal phase of the SD signals to the horizontal phase of the HD signals during HD genlock)
    - SD-HD V Phase (for adjusting the relative vertical phase of the SD signals and HD signals)
    - SC Coarse (for coarsely adjusting the SC)
    - SC Fine (for finely adjusting the SC)
    - SC-H Coarse (for coarsely adjusting the SC-H phase)
    - SC-H Fine (for finely adjusting the SC-H phase)
  - Shutter — Shutter setting
    - Shutter (for setting the shutter mode to ON or OFF)
    - SYNCHRO (for setting the synchro shutter to ON or OFF)
    - Mode (for selecting the mode of the shutter)
    - Speed (for setting the speed of shutter to ON or OFF)
  - ROM Version — ROM Version display
    - CAM (for displaying the ROM version)
    - B/U (for displaying the ROM version)
  - PLD Version — PLD Version display
    - TG (for displaying the PLD version)
    - SHD (for displaying the PLD version)
    - MEM (for displaying the PLD version)
    - RET VF (for displaying the PLD version)
    - AUX (for displaying the PLD version)
    - CAMSYS (for displaying the PLD version)
    - OPTION (for displaying the PLD version)
  - Format — System format settings
    - Present (for displaying the present system format)
    - Format (for setting the system format)

Table of adjustment setting ranges

Operation

Menu	Item	Adjustment setting range	Initial value	Items recorded on SD memory cards
VF Setting1	Side Modu SW	OFF, ON	OFF	✔ No switching from the SD memory card to the camera settings possible while the buildup unit is connected.
	Side Modu LVL	0 to 31	31	✔ No switching from the SD memory card to the camera settings possible while the buildup unit is connected.
	Zone Mark	OFF, 4:3, 13:9, 14:9, 15:9, 16:9	OFF	✔ No switching from the SD memory card to the camera settings possible while the buildup unit is connected.
	Safety Mark1	16:9, 15:9, 14:9, 13:9, 4:3, OFF	OFF	✔
	Safety Area1	80 %, 90 %, 93 %, 100 %	93 %	✔
	Safety Mark2	16:9, 15:9, 14:9, 13:9, 4:3, OFF	OFF	✔
	Safety Area2	80 %, 90 %, 93 %, 100 %	80 %	✔
	Center Mark	OFF, ON	OFF	✔
	Center Mark SEL	1 to 4	1	✔
	Line Width	1 to 3	2	✔
	Marker Level	100 %, 75 %, 50 %	100 %	✔
VF Setting2	VF DTL	0 to 23	10	✔
	HD Peak FREQ	12.4M, 12.5M, 12.7M, 12.9M, 13.0M, 13.3M, 13.6M, 13.9M, 14.2M, 14.6M, 15.0M, 15.5M, 16.1M, 16.7M, 17.3M, 18.0M, 18.6M, 18.8M, 19.0M, 19.2M, 19.5M, 19.9M, 20.3M, 20.9M, 21.5M, 22.4M, 23.6M, 25.4M, 28.6M, 37.1M	12.4M	✔
	HD Offset Gain	0 to 5	0	✔
	HD Crisp	0 to 63	0	✔
	D1 Peak FREQ	2.0M, 2.3M, 2.7M, 3.4M, 4.5M, 6.8M, 13M	6.8M	✔
	D1 Offset Gain	0 to 5	0	✔
	D1 Crisp	0 to 63	0	✔
	VBS Peak FREQ	2.0M, 2.3M, 2.7M, 3.4M, 4.5M, 6.8M, 13M	6.8M	✔
	VBS Offset Gain	0 to 5	0	✔
	VBS Crisp	0 to 63	0	✔
Cursor	Cursor	OFF, ON	OFF	✔
	Cursor Memory	ADJ, 1, 2, 1+2	ADJ	✔
	H Position	0 to 255	127	
	V Position	0 to 255	127	
	Width	0 to 255	127	
	Height	0 to 255	127	
	BOX/CROSS	BOX, CROSS	BOX	
	Store Memory	MEM1, MEM2	MEM1	
	EXECUTE	NO?, YES?	NO?	
VF Display1	F Number	OFF, ON	OFF	✔
	Zoom	OFF, ON	OFF	✔
	Focus	OFF, ON	OFF	✔
	Extender	OFF, ON	OFF	✔
	MONI OUT	OFF, ON	OFF	✔
	Filter	OFF, ON	OFF	✔
	M Gain	OFF, ON	OFF	✔
	Shutter	OFF, ON	OFF	✔
	5600K	OFF, ON	OFF	✔
	Audio Level	OFF, ON	OFF	✔
VF Display2	OPT Level	OFF, ON	OFF	✔
	RET Select	OFF, ON	OFF	✔
	Status	OFF, ON	OFF	✔
	Status(AUTO)	OFF, ON	OFF	✔
	Field Rate	OFF, ON	OFF	✔
	Voltage	OFF, ON	OFF	✔
	WFM (*1)	OFF, ON	OFF	✔
	White CH	OFF, ON	OFF	✔
Setting1	FAN Power	OFF, ON, AUTO	ON	
	FAN Mode	LOW, NORM	NORM	
	CALL+R_TALLY	OFF, ON	OFF	✔
	CALL+T_TALLY	OFF, ON	OFF	✔
	PinP Mode	—	—	

***1: Waveforms are displayed as a single line at the center of the screen. They appear at the bottom right when the aspect ratio is set to 16:9, but when an aspect ratio of 4:3 is set on the viewfinder or when the side panel mode is selected by the down-converter, the waveform display will be cut off in part.**

Table of adjustment setting ranges

Menu	Item	Adjustment setting range	Initial value	Items recorded on SD memory cards
Setting1	HD-SDI2 OUT	MAIN, VF, RET	VF	
	HD-SDI2 Power	ACTIVE, SAVE	ACTIVE	
	AUX I/O	RET Y IN, PMT2 OUT, VBS OUT, D1 OUT	RET Y IN	
	TRUNK1	RS422, RS232C	RS422	
	TRUNK2	RS422, RS232C	RS422	
	5600K	OFF, ON	OFF	
Setting2	HND GRIP RET	A, B, PTT	A	✔
	HND GRIP PTT	PTT, A, B	PTT	✔
	HND Lens VTR	VTR, A, B, PTT	B	✔
	HND Lens RET	A, B	A	✔
	STD Lens RET1	A, B	A	✔
	STD Lens RET2	A, B	B	✔
	EXT RET 1	A, B	A	✔
	EXT RET 2	A, B	B	✔
	EXT RET 3	A, B	B	✔
Setting3	RET1 ID	Enables a name (5 characters) to be set.	RET1	✔
	RET2 ID	Enables a name (5 characters) to be set.	RET2	✔
	RET3 ID	Enables a name (5 characters) to be set.	RET3	✔
	RET4 ID	Enables a name (5 characters) to be set.	RET4	✔
	Gain SW LOW	–6 dB to 36 dB (in 3 dB increments)	0 dB	✔
	Gain SW MID	–6 dB to 36 dB (in 3 dB increments)	6 dB	✔
	Gain SW HIGH	–6 dB to 36 dB (in 3 dB increments)	12 dB	✔
	ID Character	Enables a name (10 characters) to be set.	—	✔
Setting4	User SW1	A, B, PTT, DISP, MARK OFF (*2)	A	✔
	User SW2	A, B, PTT, DISP, MARK OFF	PTT	✔
	User SW3	A, B, PTT, DISP, MARK OFF	PTT	✔
	User B/U	A, B, PTT, DISP, MARK OFF, LENS EXT	PTT	✔
	Back Light	1 to 70	20	✔
	RET Mode	NORM, TOGGLE, SEQ.	NORM	✔
	Lens I/F	Analog, Serial	Analog	✔
	B/U Lens	PORTABLE, BOX	BOX	✔
	Rear ROP VR	CAM, CCU	CAM	
!LED	Gamma Off	OFF, ON	OFF	✔
	Shutter	OFF, ON	OFF	✔
	Extender	OFF, ON	OFF	✔
	MONI OUT	OFF, ON	OFF	✔
	FAN Off	OFF, ON	OFF	✔
	Master Gain	OFF, ON	OFF	✔
	Black Gamma	OFF, ON	OFF	✔
7"VF	VF FAN Speed	NORM, LOW	NORM	✔
	Peak Slice	OFF, LOW, MID, HIGH	OFF	✔
	Peak FREQ	8 MHz, 15 MHz	8 MHz	✔
INCOM Set.1	INC1 MIC Type	DYN, ECM, CBN	DYN	
	INC1 MIC Gain	–12 dB to +12 dB (in 3 dB increments)	0 dB	
	INC1 MIC Power	OFF, ON	OFF	
	INC1 Side Tone	OFF, –36 dB to 0 dB (in 3 dB increments)	OFF	
	INC1 PGM MIX	OFF, ON	ON	
	INC1 ENG/PROD	ENG, PROD	ENG	
	INC1 to CCU	OFF, ON	ON	
INCOM Set.2	INC2 MIC Type	DYN, ECM, CBN	DYN	
	INC2 MIC Gain	–12 dB to +12 dB (in 3 dB increments)	0 dB	
	INC2 MIC Power	OFF, ON	OFF	
	INC2 Side Tone	OFF, –36 dB to 0 dB (in 3 dB increments)	OFF	
	INC2 PGM MIX	OFF, ON	ON	
	INC2 ENG/PROD	ENG, PROD	ENG	
	CRANE MIC Gain	–12 dB to +12 dB (in 3 dB increments)	0 dB	
	CRANE Side Tone	OFF, –36 dB to 0 dB (in 3 dB increments)	OFF	
	CRANE ENG/PROD	ENG, PROD	ENG	
	CRANE to CCU	OFF, ON	ON	
MIC Gain	MIC1 Gain	20 dB, 40 dB, 60 dB	20 dB	
	MIC1 AMP	–20 dB to 20 dB (in 1 dB increments)	0 dB	
	MIC2 Gain	20 dB, 40 dB, 60 dB	20 dB	
	MIC2 AMP	–20 dB to 20 dB (in 1 dB increments)	0 dB	

***2: DISP: At the DISP setting, the character display is forcibly set to OFF while the user switch is pressed.**
MARK OFF: At the MARK OFF setting, ZONE, SAFETY, CURSOR, CENTER and WFM are forcibly set to OFF while the user switch is pressed.

Table of adjustment setting ranges

Painting

Menu	Item	Adjustment setting range	Initial value
Setting SW	Flare	OFF, ON	ON
	Black Gamma	OFF, ON	OFF
	Gamma	OFF, ON	ON
	Knee	OFF, ON	OFF
	White Clip	OFF, ON	OFF
	Matrix	OFF, ON	OFF
	Preset Matrix	NORM, EBU, NTSC	NORM
	DTL	OFF, ON	ON
	Skin Tone DTL	OFF, ON	OFF
	DRS SW (*3)	OFF, ON	OFF
BlackShading	Correct	OFF, ON	ON
	H SAW R/G/B	–100 to +100	0
	H PARA R/G/B	–100 to +100	0
	V SAW R/G/B	–100 to +100	0
	V PARA R/G/B	–100 to +100	0
	AUTO V.SAW	—	—
Black/Gain	PED M	–99 to +99	0
	PED R	–800 to +800	0
	PED B	–800 to +800	0
	Flare	OFF, ON	ON
	Flare R	–100 to +100	0
	Flare G	–100 to +100	0
	Flare B	–100 to +100	0
	Gain R	–800 to +800	0
	Gain G	–800 to +800	0
	Gain B	–800 to +800	0
White SHD	Correct	OFF, ON	ON
	H SAW R/G/B	–100 to +100	0
	H PARA R/G/B	–100 to +100	0
	V SAW R/G/B	–100 to +100	0
	V PARA R/G/B	–100 to +100	0
Gamma	Gamma	OFF, ON	ON
	Gamma M	0.600 to 0.300	0.450
	Gamma R	–75 to +75	0
	Gamma B	–75 to +75	0
	Black Gamma	OFF, ON	OFF
	Black Gamma M	–32 to +32	0
	Black Gamma R	–20 to +20	0
	Black Gamma B	–20 to +20	0
	DRS SW	OFF, ON	OFF
	Effect Depth	1 to 5	5
	Initial Gain	4.0, 4.5, 5.0	4.5
Knee/W.Clip	Knee	OFF, ON	OFF
	Knee Point M	110 % to 80 %	95 %
	Knee Point R	–20 to +20	0
	Knee Point B	–20 to +20	0
	Knee Slope M	0 to 199	100
	Knee Slope R	–31 to +31	0
	Knee Slope B	–31 to +31	0
	White Clip	OFF, ON	OFF
	White Clip M	109 % to 80 %	109 %
	White Clip R	–15 % to +15 %	0
	White Clip B	–15 % to +15 %	0

***3: The image will be disturbed for an instant when the DRS function setting is changed.**

Table of adjustment setting ranges

Menu	Item	Adjustment setting range	Initial value
Linear Matrix	Matrix	OFF, ON	OFF
	Linear	OFF, A, B	A
	12axes	OFF, A, B	A
	R-G	–31 to +31	0
	R-B	–31 to +31	0
	G-R	–31 to +31	0
	G-B	–31 to +31	0
	B-R	–31 to +31	0
	B-G	–31 to +31	0
Color Correct1	Matrix	OFF, ON	OFF
	Linear	OFF, A, B	A
	12axes	OFF, A, B	A
	G Satu	–128 to +127	0
	G Phase	–128 to +127	0
	G_Cy Satu	–128 to +127	0
	G_Cy Phase	–128 to +127	0
	Cy Satu	–128 to +127	0
	Cy Phase	–128 to +127	0
	Cy_B Satu	–128 to +127	0
	Cy_B Phase	–128 to +127	0
	B Satu	–128 to +127	0
	B Phase	–128 to +127	0
	B_Mg Satu	–128 to +127	0
	B_Mg Phase	–128 to +127	0
Color Correct2	Matrix	OFF, ON	OFF
	Linear	OFF, A, B	A
	12axes	OFF, A, B	A
	Mg Satu	–128 to +127	0
	Mg Phase	–128 to +127	0
	Mg_R Satu	–128 to +127	0
	Mg_R Phase	–128 to +127	0
	R Satu	–128 to +127	0
	R Phase	–128 to +127	0
	R_Ye Satu	–128 to +127	0
	R_Ye Phase	–128 to +127	0
	Ye Satu	–128 to +127	0
	Ye Phase	–128 to +127	0
	Ye_G Satu	–128 to +127	0
	Ye_G Phase	–128 to +127	0
Detail1	V DTL	0 to 63	22
	H DTL	0 to 63	22
	Crisp	0 to 63	10
	Peak FREQ	12.4 MHz to 37.1 MHz	23.6 MHz
	Level Dep.	0 % to 30 %	0 %
	Dark DTL	0 to 7	0
	Corner DTL	0 to 31	0
	DTL_Source	2G+B+R, R, B, R+B, G, R+G, G+B, R+G+B	R+G
	DTL_Clip+	0 to 63	0
	DTL_Clip–	0 to 63	0
Detail2	DTL_Knee+	0 to 15	0
	DTL_Knee–	0 to 15	0
	Knee DTL	0 to 39	0

Table of adjustment setting ranges

Menu	Item	Adjustment setting range	Initial value
Skin Tone Detail1	Skin Tone DTL	OFF, ON	OFF
	Skin Tone Get	EXECUTE (execution items)	EXECUTE
	Skin Tone Get	CANCEL (execution items)	CANCEL
	MEM Select	A, B	A
	Cursor	OFF, ON	OFF
	H Cursor	1 to 1920	960
	V Cursor	1 to 540	270
	ZEBRA	OFF, A, B, A+B	OFF
	Effect MEM	A, B, A+B	A+B
Skin Tone Detail2	Skin Tone DTL	OFF, ON	OFF
	MEM A	—	—
	Skin Tone Crisp	–63 to 0 to +63	0
	Phase	0 to 359	0
	Width	0 to 255	0
	Saturation	0 to 255	0
	MEM B	—	—
	Skin Tone Crisp	–63 to 0 to +63	0
	Phase	0 to 359	0
	Width	0 to 255	0
	Saturation	0 to 255	0

Table of adjustment setting ranges

Maintenance

Menu	Item	Adjustment setting range	Initial value
Date / Time (*4)	Present	(Display item)	(Current date/time)
	Adjust	NO?, YES?	NO?
	12H, 24H	24H, 12H	12H
	Date YY	Year	(Current year)
	Date MM	Month	(Current month)
	Date DD	Day	(Current day)
	Date aaa	Day of week	(Current day of week)
	Time HH	Hours	(Current hours)
	Time NN	Minutes	(Current minutes)
	Time SS	Seconds	(Current seconds)
	Set Exe	NO?, YES?	NO?
	Reset	NO?, YES?	NO?
SD Card	Mode	FORMAT, LOAD, STORE	LOAD
	File No.	1 to 8	1
	EXECUTE	NO?, YES?	NO?
Scene File	Mode	LOAD, STORE	LOAD
	File No	OFF, 1 to 8 (when LOAD is selected) 1 to 8 (when STORE is selected)	1
	EXECUTE	NO?, YES?	NO?
Lens File	Mode	LOAD, STORE	LOAD
	File No	OFF, 01 to 16 (when LOAD is selected) 01 to 16 (when STORE is selected)	01
	File Name	Enables a name (8 characters) to be set.	(Filename)
	EXECUTE	NO?, YES?	NO?
Lens Edit	Gain R	–100 to +100	0
	Gain G	–100 to +100	0
	Gain B	–100 to +100	0
	Flare R	–100 to +100	0
	Flare G	–100 to +100	0
	Flare B	–100 to +100	0
	W H SAW R/G/B	–100 to +100	0
	W H PARA R/G/B	–100 to +100	0
	W V SAW R/G/B	–100 to +100	0
	W V PARA R/G/B	–100 to +100	0
	Store?	NO?, YES?	NO?
	Cancel?	NO?, YES?	NO?
Option (*5)	—	—	—
Iris Cont.	Auto Iris	OFF, ON	OFF
	Window Select	1 to 8 (*6)	1
	Iris Level	0 to 100	50
	Peak Ratio	0 to 100	60
	A.Iris Range	NORMAL, (3/4), (2/4), (1/4)	NORMAL
	A.Iris Speed	1 to 25	15
	LensExtComp.SW	NORMAL, ON	NORMAL
	LensExtComp.LVL	–40 to +40	0

***4: If the date and time have not been set properly, the time may not be updated properly. The clock has an error which may cause it to gain or lose up to one minute per month.**

***5: The menu displayed differs depending on the type of option board installed.**

***6: The types of windows which can be selected are as shown in the figure below.**

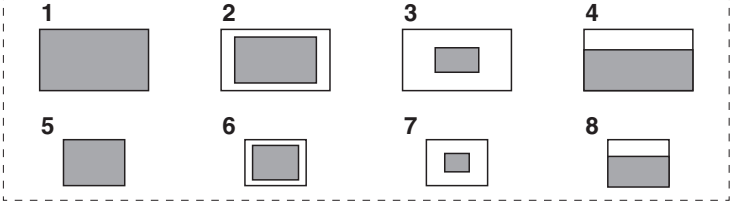


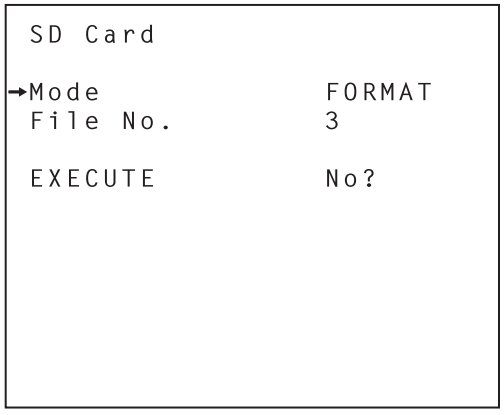
Table of adjustment setting ranges

Menu	Item	Adjustment setting range	Initial value
CINE Gamma	Cinema Gamma SW	OFF, ON	OFF
	Cinema Gamma SEL	VIDEO_REC, FILM_REC	VIDEO_REC
	Black STR LVL	0 to +30	+30
	Dynamic LVL	200 %, 300 %, 400 %, 500 %	200 %
	Knee Point	+30 to +90	+30
	Knee Slope	150 %, 200 %, 250 %, 300 %, 350 %, 400 %, 450 %, 500 %, 550 %, 600 %	150 %
ASU	Filter	REF, CURRENT	REF
	Setup Mode	FULL (standard), EASY (simplified)	FULL
	REF File	Factory, User1, User2, User3	Factory
	M-PED Target	0.0 % to 7.5 %	5.0 %
	ASU Execute	(execution items)	READY?
Tally Guard	Tally Guard	OFF, ON	OFF
G / L	H Phase Coarse	–60 to +60 (during HD signal genlock) –120 to +120 (during SD signal genlock)	0
	H Phase Fine	–45 to +45	0
	SD-HD Phase CRS	–4 to +4	0
	SD-HD Phase Fine	–99 to +99	0
	HD-SD Phase CRS	–8 to +8	0
	HD-SD Phase Fine	–99 to +99	0
	SD-HD V Phase	HD, SD	SD
	SC Coarse	0 to 7	0
	SC Fine	–255 to +255	0
	SC-H Coarse	0 to 7	0
	SC-H Fine	–255 to +255	0
Shutter	Shutter	OFF, ON	OFF
	SYNCHRO	OFF, ON	OFF
	Mode	Fixed at SHUTTER	SHUTTER
	Speed	When SHUTTER is ON, SYNCHRO is OFF 100/125/250/500/1000/2000 When SHUTTER is ON, SYNCHRO is ON 60.9 Hz to 99.8 Hz When SHUTTER is OFF, SYNCHRO is ON 60.9 Hz to 99.8 Hz When SHUTTER is OFF, SYNCHRO is OFF 100/125/250/500/1000/2000	When SHUTTER is ON, SYNCHRO is OFF: 100 When SHUTTER is ON, SYNCHRO is ON: 60.9 When SHUTTER is OFF, SYNCHRO is ON: 60.9 When SHUTTER is OFF, SYNCHRO is OFF: 100
ROM Version	CAM	(Display item)	(Current value)
	B, U (*7)	(Display item)	(Current value)
PLD Version	TG	(Display item)	(Current value)
	SHD	(Display item)	(Current value)
	MEM	(Display item)	(Current value)
	RET VF	(Display item)	(Current value)
	AUX	(Display item)	(Current value)
	CAMSYS	(Display item)	(Current value)
	OPTION	(Display item)	(Current value)
Format	Present	(Display item)	(Current value)
	Format	50 i, 59.94 i	59.94 i

***7: This is displayed when the buildup unit is connected.**

SD memory card operations

These operations are performed on the SD Card page on the Maintenance menu.
The VF display settings and camera function settings on the Operation menu can be recorded on the SD memory card.
For details on what items are stored in the memory of the SD memory card, refer to “Table of the adjustment setting ranges.”



Mode: SD memory card operation mode setting

Select the SD memory card operation here.

Setting range: FORMAT, LOAD, STORE

FILE No.: File selection

Select the number of the file to be loaded or stored here.

Setting range: 1 to 8

- The files on the SD memory card have filenames which range from “3500cm01.dat” for File No.1 to “3500cm08.dat” for File No.8.
- The SD memory card may not work properly if files have been edited using a personal computer or other device.

EXECUTE

The item set in “Mode” is executed here.
When the arrow cursor (→) is moved to EXECUTE and the JOG dial button is pressed, “No?” appears.
When the dial button is turned, “Yes?” appears.
When the dial button is pressed while “Yes?” is displayed, the selected operation is executed.
Conversely, when it is pressed while “No?” is displayed, the selected operation is canceled.

AK-HC3500 connector pin assignment

CN# in the Instructions

K OPT FIBER EDW.3K.93C.TLC (LEMO)

Pin#	Signal
01	OPT-TX (Mark Band = IN)
02	OPT-RX (Mark Band = OUT)
1	STBYINCOM-T
2	STBYINCOM-R
3	AC220V(C)
4	AC220V(H)

4 INCOM XLR5-31F77 Female (ITT Cannon)

Pin#	Signal
1	TALK_GND
2	TALK
3	RECEIVE_GND
4	RECEIVE
5	PGM

20 RET CONT HR10A-7R-6SC (Hirose)

Pin#	Signal
1	INCOM1_MIC_ON
2	INCOM2_MIC_ON
3	AGND
4	RET_CNT3
5	RET_CNT1
6	RET_CNT2

21 EXT I/O HR10A-13R-20SC (Hirose)

Pin#	Signal
1	BU_CRN_DATA_H
2	BU_CRN_DATA_C
3	BU_CRN_CONT_H
4	BU_CRN_CONT_C
5	DGND
6	CRN_INC_R
7	CRN_INC_R_GND
8	CRN_INC_T
9	CRN_INC_T_GND
10	CRN_PGM1_LVL
11	CRN_PGM2_LVL
12	
13	
14	G_TALLY_VF
15	R_TALLY_VF
16	T_TALLY_VF
17	CRANE_ACT
18	EXT+12V
19	
20	UNREG_GND

22 23 HD SDI BNC(75)J-H.FLJ-BPA(40) (Hirose)

Pin#	Signal
1	SDI_OUT
2	SDI_OUT_GND

24 AUX BNC(75)J-PL72J-BPA (Hirose)

Pin#	Signal
1	AUX
2	AUX_GND

25 PROMPT/GL BCJ-R/1 (Canare)

Pin#	Signal
1	PROMPT/GL_IN
2	PROMPT_GND/GL_IN_GND

27 REMOTE HA10A-10R-10SC (Hirose)

Pin#	Signal
1	CAM_DATA(H)
2	CAM_DATA(C)
3	CAM_CONT(H)
4	CAM_CONT(C)
5	
6	
7	
8	
9	RCOP+12V
10	UNREG_GND

28 DC IN HA16RA-4P (Hirose)

Pin#	Signal
1	EXT_GND
2	
3	
4	EXT+12V

CN# in the Instructions

30 MIC1 HA16PRM-3SB(05) (Hirose)

Pin#	Signal
1	MIC1_GND
2	MIC1(H)
3	MIC1(C)

31 MIC2 HA16PRM-3SB(05) (Hirose)

Pin#	Signal
1	MIC2_GND
2	MIC2(H)
3	MIC2(C)

32 DC OUT HR10A-7R-4SC (Hirose)

Pin#	Signal
1	UNREG_GND
2	R_TALLY_OUT (contact output)
3	G_TALLY_OUT (contact output)
4	SCRIPT+12V

33 EARPHONE HSJ0927-0160209 (Hoshiden)

Pin#	Signal
1	PHONE_GND
2	PHONE_OUT
3	

34 TRUNK HR10A-10R-12SC (Hirose)

Pin#	Signal
1	CMD-OUT0(H)
2	CMD-OUT0(C)
3	CMD-IN0(H)
4	CMD-IN0(C)
5	CMD-OUT1(H)
6	CMD-OUT1(C)
7	CMD-IN(H)
8	CMD-IN1(C)
9	
10	DGND
11	
12	

55 LENS HR10A-10R-12SC (Hirose)

Pin#	Signal
1	LENS_RETSW
2	LENS_VTRSW
3	AGND
4	ENF_SERVO
5	IRIS_CONT
6	LENS+12V
7	IRIS_POSI
8	H_IRIS_A-R
9	EXTENDER
10	ZOOM_POSI
11	FOCUS_POS/L_RXD
12	S_IRIS_A-R/L_TXD

56 FRONT MIC HA16PRM-3S(05) (Hirose)

Pin#	Signal
1	FRONT_MIC_GND
2	FRONT_MIC(H)
3	FRONT_MIC(C)

57 VF HR12-14RA-20SC (Hirose)

Pin#	Signal
1	VF+12V
2	VF+12V
3	UNREG_GND
4	VF-PBOUT_GND
5	VF-PBOUT_GND
6	VF-YOUT
7	VF-YOUT_GND
8	VF_CLK
9	VF_WR
10	VF_DATA
11	UNREG_GND
12	ZEBRA_SW
13	PEAKING
14	TA_BOX_ACT
15	VF-PROUT
16	VF-PBOUT
17	VF_SW3
18	FRONT_VR
19	TA_TALLY
20	F_GND

CN# in the Instructions

58 REAR VF CN D02-29S-N-F0 (JAE)

Pin#	Signal
1	VF-YOUT
2	VF-PBOUT
3	VF-PROUT
4	
5	I2C_DATA
6	R_TALLY
7	TA_TALLY
8	
9	LCD+12V
10	12V
11	VF-YOUT_GND
12	VF-PBOUT_GND
13	VF-PROUT_GND
14	AGND
15	DGND
16	
17	UNREG_GND
18	
19	F_GND
20	LCD_ACT
21	
22	
23	PEAKING_CONT
24	I2C_CLK
25	G_TALLY
26	VF_P_REQ
27	
28	
29	

63 Buildup unit I/F QR/P8-20S-C(01) (Hirose)

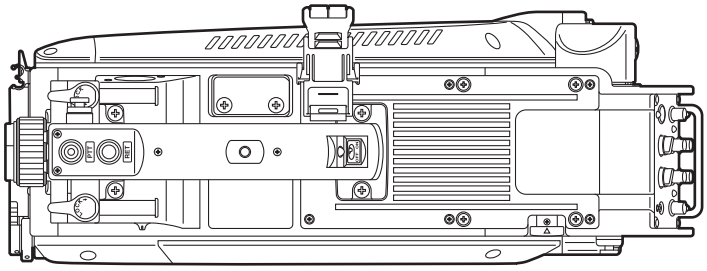
Pin#	Signal
1	VF_YOUT3
2	VF_YOUT3_GND
3	VF_PBOUT3
4	VF_PBOUT3_GND
5	VF_PROUT3
6	VF_PROUT3_GND
7	BU_CRN_DATA_H
8	BU_CRN_DATA_C
9	BU_CRN_CONT_H
10	BU_CRN_CONT_C
11	OPT_AC(H)
12	LNS_ID_CO
13	LNS_IP–B
14	I2C_DATA
15	I2C_CLK
16	LNS_FOCUS_POS
17	LNS_L_TXD
18	BU_ACT
19	DGND
20	OPT_AC(C)

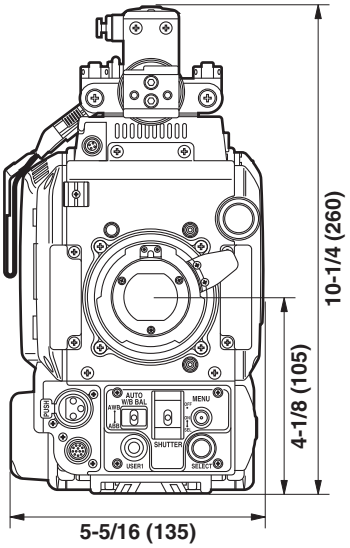
64 TALLY OUT HR10A-7R-4SC (Hirose)

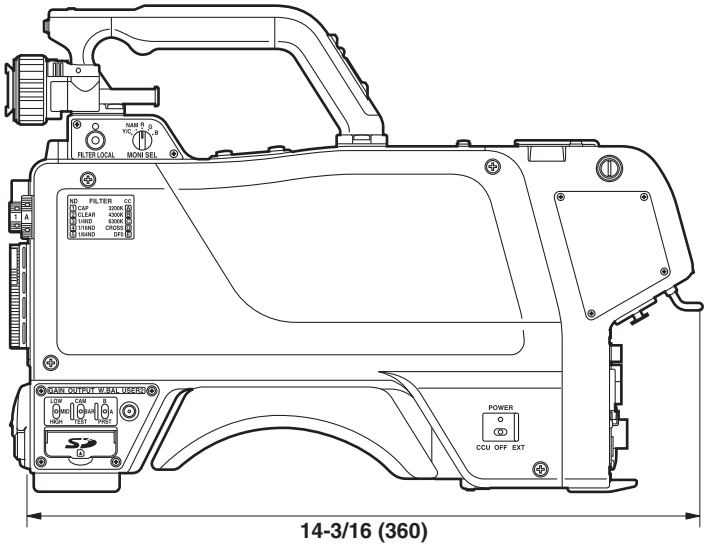
Pin#	Signal
1	UNREG_GND
2	R_TALLY_OUT (contact output)
3	G_TALLY_OUT (contact output)
4	SCRIPT+12V

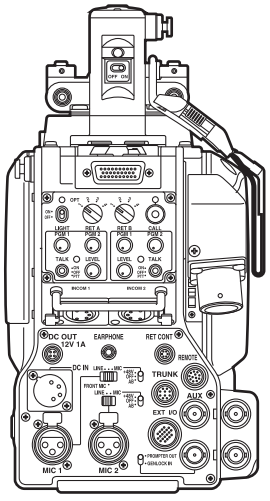
External dimension drawings

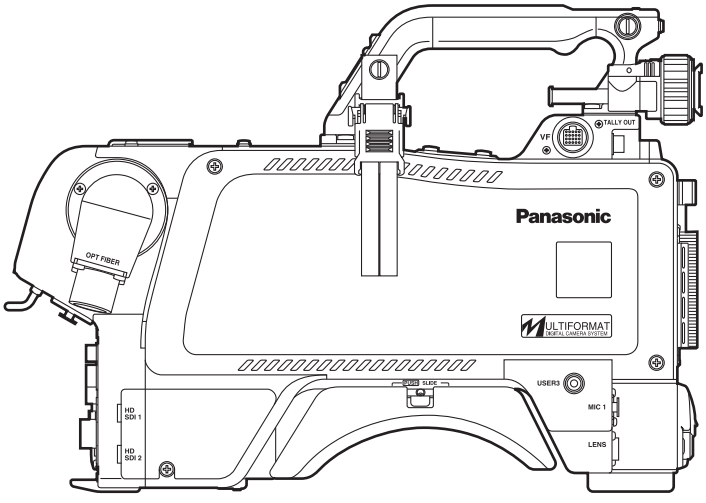
Unit: inch (mm)











Specifications

Power supply:	DC 12 V (when external power is supplied) AC 150 V - 240 V (when CCU is connected)
Power consumption:	28 W (during external power supply operation, camera only) 34 W (when CCU is connected)

⚠ indicates safety information.

Ambient temperature range:
14 °F to 113 °F (–10 °C to +45 °C)
[Preheating required at temperatures below 32 °F (0 °C)]

Storage temperature range:
–4 °F to 140 °F (–20 °C to +60 °C)

Operating ambient humidity:
Less than 85 %

Weight: Approx. 10.36 lbs. (4.7 kg)

Dimensions: (W × H × D)
5-5/16″ × 10-1/4″ × 14-3/16″
(135 × 260 × 360 mm)
[excluding protrusions]

Basic items

1) Pickup device: 2/3″ 2.2 million pixel IT-CCD × 3
2) System: GBR pickup system
3) Color separation optical system:
f/1.4 prism
4) Optical filters: CC: 3200K, 4300K, 6300K, Cross, Diffusion
ND: CAP, Through, 1/4, 1/16, 1/64
5) Lens mount: Bayonet type
6) Output standard: SMPTE 292M
7) Sensitivity: f/10.0, 2000 lux, 3200K, white reflectance 89.9 %
(Vertical frequency: 59.94 Hz)
8) Horizontal modulation:
More than 50 % (27.5 MHz)
9) S/N ratio: 60 dB typ. (Y: 30 MHz)
10) Horizontal frequency:
33.716 kHz, 1125-line frame
(Vertical frequency: 59.94 Hz)
28.125 kHz, 1125-line frame
(Vertical frequency: 50 Hz)
11) Vertical frequency:
59.94 Hz or 50 Hz, interlace

Input/output signals

1) MIC input: –60 dBu to +4 dBu
(XLR 3-pin female × 2)
Gain selected by camera menu
2) INCOM: Input: –60 dBu to –10 dBu
Output: 100 mW max.
(XLR, 5-pin female × 2)
(Mixing is controlled separately for PGM1 and PGM2.)
3) HD-SDI1/HD-SDI2 output:
HD signal = 0.8 Vp-p, 75 ohms (BNC)
The HD-SDI2 signal output can be added to the regular images using the camera menu item setting and switched to the VF or RET image output.
4) Prompt output: VBS signal = 1 Vp-p, 75 ohms (BNC)
G/L input: Tri-level SYNC or black burst (BNC)
Selected using a switch.
5) AUX BNC
• HD RET input: HD analog signal = 1 Vp-p, 75 ohms (BNC)
• Prompt2 output: VBS signal = 1 Vp-p, 75 ohms (BNC)
(When the CCU has a Prompt2 input)
• Down converter output (supported as an option):
VBS or D1 signal = 1 Vp-p or 0.8 Vp-p, 75 ohms (BNC)
Input or output can be selected using the camera menu item setting.
6) DC OUT: 12 V, MAX. 1A

Control

1) Power selection: CCU, OFF, EXT
2) USER 1, 2, 3: Functions specified by menu items can be allocated to the switch.
3) RET A/B selection:
For selecting the return signal
4) Monitor selection: Y/C, NAM, R, G, B
5) RET, PTT SW: RET, PTT
6) Gain selection: LOW, MID, HIGH
7) Output selection: CAM, BAR, TEST
8) White balance mode:
A, B, preset
9) Shutter speed selection:
1/100, 1/125, 1/250, 1/500, 1/1000, 1/2000
10) AWB, ABB settings
11) Menu selection
12) CALL SW
13) INCOM: MIC ON/OFF, receiving level or PGM level
14) MIC setting: MIC power, MIC gain, MIC1 selection
15) Optical filter setting:
REM, LOCAL selection and LOCAL setting
16) Back light SW (rear panel):
ON/OFF

*** When the CCU is connected, the selection functions for 6) to 10) are not effective.**
Control is exercised from the ROP or MSU.

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Memo

Panasonic®

PANASONIC BROADCAST & TELEVISION SYSTEMS COMPANY
UNIT COMPANY OF PANASONIC CORPORATION OF NORTH AMERICA

Executive Office:
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Broadcast PARTS INFORMATION & ORDERING:
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Emergency after hour parts orders (800) 334-4881

TECHNICAL SUPPORT:
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