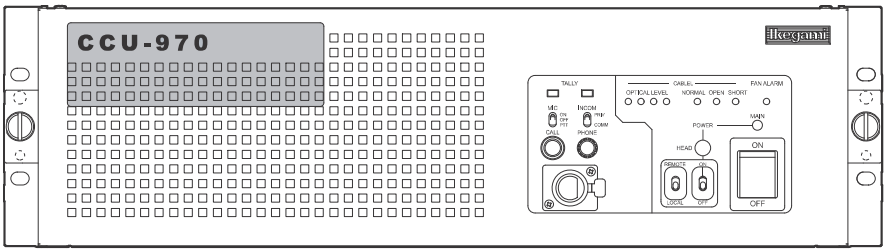


Products conforming to RoHS directive

CCU-970

Camera Control Unit

OPERATION MANUAL

Ikegami

CE

Products conforming to RoHS directive

CCU-970

Camera Control Unit

OPERATION MANUAL

1112 1st Edition (U) (E)

Ikegami

English

Instructions for Disposal of Electric and Electronic Equipment in Private Household

Disposal of used Electric and Electronic Equipment
(Applicable in the European Union and other European countries with separate collection systems)

This symbol on the product, or in the related documents in the package, indicates that this product shall not be treated as normal household waste. Instead, it should be taken to a proper applicable collection point or depot for the recycling of electric and electronic equipment.

By ensuring this product is disposed of correctly, you will help prevent possible negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. The recycling of materials will help to conserve natural resources.
For more detailed information about recycling of this product, please contact your local city authority, your household waste disposal service or the place where you purchased the product.

Deutsch

Vorschriften für die Entsorgung von elektrischen und elektronischen Geräten in Privathaushalten

Entsorgung von gebrauchten elektrischen und elektronischen Geräten
(In der Europäischen Union und anderen europäischen Ländern mit separaten Sammelsystemen anwendbar.)

Das auf dem Produkt angebrachte Symbol, bzw. die Symbole in den in der Packung beiliegenden Dokumenten, weisen darauf hin, dass dieses Produkt nicht als normaler Haushaltsmüll behandelt werden darf. Es muss deshalb an einer dafür vorgesehenen Sammelstelle abgeliefert werden, in der das Recycling von elektrischen und elektronischen Geräten durchgeführt wird.

Durch die ordnungsgemäße Entsorgung dieses Produkts tragen Sie dazu bei, dass unsere Umwelt und unsere Gesundheit nicht durch unsachgemäße Entsorgung negativ beeinflusst wird. Mit dem Recycling von Materialien tragen wir zur Bewahrung der natürlichen Ressourcen bei.
Für nähere Informationen hinsichtlich des Recyclings für dieses Produkt sprechen Sie bitte mit Ihrer zuständigen Behörde, Ihrer Hausmüll-Entsorgungsstelle oder dem Geschäft, wo Sie das Produkt gekauft haben.

Français

Consignes de mise au rebut des appareils électriques et électroniques dans les foyers privés

Mise au rebut des appareils électriques et électroniques
(Applicable dans l'Union Européenne et autres pays d'Europe ayant un système de récupération séparé)

Ce symbole apposé sur le produit ou dans les documents liés se trouvant dans l'emballage indique que ce produit ne doit pas être traité comme un déchet ménager normal. Il doit être porté à un point de récupération correct ou à un dépôt pour le recyclage des appareils électriques et électroniques.

En vous assurant que ce produit est correctement mis au rebut, vous aiderez à empêcher les conséquences possibles pouvant affecter l'environnement et la santé humaine, pouvant être causées par une mauvaise manipulation des déchets de ce produit. Le recyclage des matériaux favorise la conservation des ressources naturelles.
Pour des informations plus détaillées concernant le recyclage de ce produit, veuillez contacter les autorités locales, votre service de mise au rebut des déchets ménagers ou le lieu d'achat de votre produit.

Español

Instrucciones para eliminar equipos eléctricos y electrónicos de una casa privada

Eliminación de equipos eléctricos y electrónicos usados
(Normas aplicables en la Unión Europea y en otros países europeos con diferentes sistemas de recogida)

Este símbolo en el producto, o en los documentos relacionados, indica que este producto no deberá ser tratado como un residuo doméstico normal. En cambio, deberá ser llevado a un punto o lugar donde los equipos eléctricos y electrónicos sean recogidos para ser reciclados.

Asegurándose de que este producto sea eliminado correctamente, usted ayudará a impedir las posibles consecuencias negativas sobre el medio ambiente y la salud humana que podrían ser causadas por el manejo inapropiado de este producto como residuo doméstico. El reciclado de los materiales ayudará a conservar los recursos naturales.
Para conocer una información más detallada acerca del reciclado de este producto, póngase en contacto con las autoridades de su localidad, con su servicio de recogida de residuos domésticos o con el comercio donde adquirió el producto.

PRODUCTS CONFORMING TO RoHS DIRECTIVE

Following products described in this manual are products conforming to RoHS directive.
• CCU-970 Camera Control Unit

Products conforming to RoHS directive include products that do not contain specified hazardous substances such as lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) in electrical and electronic equipment excluding following exemption applications based on the EU directive (Directive2002/95/EC).

* About RoHS Directive
The RoHS directive stands for "the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment" and is one of environmental directives in Europe. This directive restricts the use of specified hazardous substances in electrical and electronic equipment.

● Applications exempted from RoHS directive compliance

Followings applications are permitted as exemptions from RoHS directive compliance.

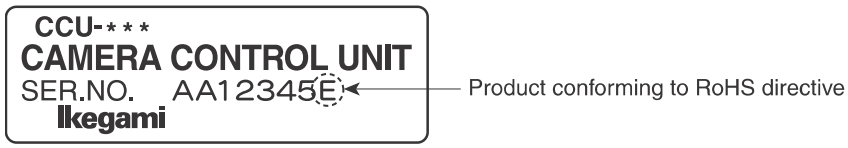
1. Mercury in compact fluorescent lamps not exceeding 5mg per lamp
2. Mercury in straight fluorescent lamps for general purposes not exceeding:
   - halophosphate 10mg
   - triphosphate with a normal lifetime 5mg
   - triphosphate with a long lifetime 8mg
3. Mercury in straight fluorescent lamps for special purposes
4. Mercury in other lamps not specifically mentioned in this Annex
5. Lead in the glass of cathode ray tubes, electronic components and fluorescent tubes
6. Lead as an alloying element in steel containing up to 0.35% lead by weight, aluminum containing up to 0.4% lead by weight and as a copper alloy containing up to 4% lead by weight
7. Lead in following items
   - Lead in high melting temperature type solders (i.e. tin-lead solder alloys containing more than 85% lead)
   - Lead in solders for servers, storage and storage array systems
   - Lead in solders for network infrastructure equipment for switching, signaling, transmission as well as network management for telecommunication
   - Lead in electronic ceramic parts (e.g. piezoelectronic devices)
8. Cadmium plating except for applications banned under Directive 91/338/EEC amending Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations
9. Hexavalent chromium as an anti-corrosion of the carbon steel cooling system in absorption refrigerators
10. Lead used in compliant pin connector systems
11. Lead as a coating material for the thermal conduction module C-ring
12. Lead and cadmium in optical and filter glass
13. Lead in solders consisting of more than two elements for the connection between the pins and the package of microprocessors with a lead content of more than 80% and less than 85% by weight
14. Lead in solders to complete a viable electrical connection between semiconductor die and carrier within integrated circuit Flip Chip packages
15. Decabrominated diphenyl ether (Deca-BDE) in polymeric applications

MAINTENANCE OF PRODUCTS CONFORMING TO RoHS DIRECTIVE

Work with care about followings for maintenance of products conforming to RoHS directive.

1. Identification

- For products conforming to RoHS directive, the letter "E" is appended at the end of the serial number on the label. For models that the letter cannot be appended to the serial number, the letter "E" will be described in a distinguishable position on the label. A description example on a main label is shown below.



Label

- Print-circuit board of the products conforming to RoHS directive is manufactured by following methods.
  [1] Blue resist ink is used for the print-circuit board. (The color of conventional print-circuit board is green.)
  [2] Either one of the following marks is indicated by a serigraph or label.

Phase 3A

Phase 3

2. Soldering

Since the melting point of lead-free solder used for the products conforming to RoHS directive is 20 to 45 degrees Celsius higher than that of conventional solder with lead (Sn-Pb eutectic solder), a high temperature needs to be set to a soldering iron. Taking allowable temperature limit of the parts and stable work into consideration, use a soldering iron with excellent thermal recovery characteristics.

- Recommended solder composition is "Sn/3.0Ag/0.5Cu" or equivalent.
- Separate the soldering iron exclusively for RoHS products and the soldering iron for conventional use.
- Set the temperature of the soldering bit to 350 to 370 degrees Celsius.
  The temperature may need to be adjusted according to the size of the copper foil land on the print-circuit board and the tip width of the soldering bit.
- Finish by a lead-free solder looks dull or whitish compared to conventional solder with lead.
- If the customer mixed the lead-solder with the main body wiring or the circuit board, it becomes guarantee off the subject. Ikegami doesn't guarantee to do the repair work. Because the solder polluted with lead cannot be removed.

3. Parts

Be sure to use parts conforming to RoHS directive.

INFORMATION TO THE USER

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.
Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

SAFETY PRECAUTIONS

This manual describes the precautions using various pictorial symbols for you to use the product safely. Please read these precautions thoroughly before use. The symbols and meanings are as follows:

The following hazard alert symbols are used to indicate the level of impact on the body or property when you do not follow the precautions.

⚠ ***WARNING***	Indicates that mishandling of the product by ignoring this label may lead to a danger resulting in a serious injury or death.
⚠ ***CAUTION***	Indicates that mishandling of the product by ignoring this label may lead to a danger resulting in an injury or property damage.

The following symbols are used to indicate the expected injury or hazards when you do not follow the precautions.

	Indicates general cautions on such matters as safe work, procedure, and installation location. Mishandling may not directly lead to death, injury, or property damage.
	Indicates that mishandling may cause an electric shock.
	Indicates that mishandling may cause a fire.
	Indicates that mishandling may cause injury.

The following symbol is used to indicate other precautions to prevent damage or hazard from occurring:

	Indicates prohibited action.

■ *Handling Precautions*

⚠ WARNING

Regarding the Product

Do not disassemble or modify the product which is not described in this manual. Doing so may cause fire, electric shock, or injury.

Regarding the Power

When you disconnect the cable, be sure to hold the plug and pull. Failure to do so may cause a fire or electric shock due to a damaged cable.

To inspect or operate on the inside of the equipment, turn off the power and wait for one or two minutes before starting work. High voltage is present in some modules and connectors of this product.

⚠ CAUTION

Regarding the Product

Avoid use or storage in the following conditions:
- Extremely high/low temperature
- In direct sunlight for a long time, or near a heater
- High humidity or dusty
- Exposed to water or other liquid
- Strong vibration or shock
- Strong magnetic field or radio waves
- lightning
- In rain without the rain cover

Be sure to hold the plug and pull when you disconnect the cable.
Condensation that cause malfunction may occur in the equipment.

Avoid moving the equipment suddenly from an extremely cold place to a warm place.
Condensation may occur in the Charged Couple Device (CCD) or other parts.

Do not drop or insert a metal object such as a pin or a foreign object into the equipment.

Do not spread or spill water or other liquid on the equipment.

Do not subject the equipment to a strong shock or vibration.
Doing so may cause damage or malfunction of the equipment.
Excessive sound pressure from the headset may cause a hearing loss.

Regarding the Modules

Pay attention to the following points when handling the modules:
- Do not let the parts of the modules or the printed wiring pattern to touch the metal parts that can be energized.
- Avoid placing or storing the modules in humid places.
- Do not touch the parts of the modules or the printed wiring pattern with dirty or wet hands. Do not touch them with hands unless necessary.

Regarding the Power and the Lithium Battery

Use the product in compliance with the rating of the fuse. Otherwise, a fault can occur.

Do not use an unspecified battery.
Wrong usage of batteries may cause liquid leak, explosion, and heat, and at worst injury or fire.
When changing or discarding a battery, please contact Ikegami's sales and service centers.

■ *Maintenance*

Regarding the product

Before performing maintenance on the product, be sure to turn off the power for safety and for protection against malfunction.

Clean the product using a dry and soft cloth.

If the product is very dirty, wipe with a cloth moistened with water or neutral detergent and wrung out. If neutral detergent is used, wipe again with a cloth dipped in clear water and wrung out.

■ *Regular Maintenance Recommended*

This product includes parts that wear out and have a limited life even in proper use or storage. Therefore, regular maintenance (once every 3 years or 8000 hours use) is recommended to extend the life and safe use of this product for a long time. Please contact Ikegami's sales and service centers or Techno Ikegami Co., Ltd. for the regular maintenance and repair of our products.

DOCUMENTATION FOR THE PURCHASER/USER

1. Declaration of conformity
   The CE mark means that the following products will meet the Directive 2004/108/EC,2006/95/EC and the Standards EN55103-1 E4, E5 EN55103-2 E4, E5 (for EMC), EN60950-1 (for LVD).
   For European customer.
2. Please use it by less than 10m, when you use cable of MIC1 OUT, MIC2 OUT, AUD TRUNK, INTERCOM, and DIGITAL AUDIO.
3. Please wind the core which is attached to the cable, when the coaxial cable is used for the Network connector.
   (Please refer to the fig.1)

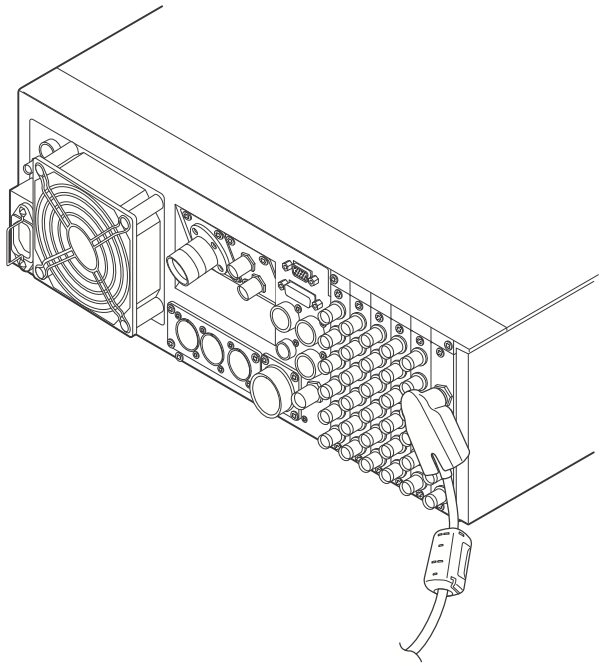


fig.1 (core type: E04SR200935A)

4. We carried out a test in accordance with EN55103-1 Annex B.
   As a result, the value of the inrush current is as follows.

HOW TO READ THE OPERATION MANUAL

This page explains general notes on reading the CCU-970 Operation Manual, and the symbols and notations used in the manual.

■ *Notes on the Manual*

- This manual is written for readers with a basic knowledge of handling a broadcast camera, CCU, or MCP.
- The contents of this manual are subject to change without notice in the future.

■ *Symbols*

The symbols used in this manual are as follows:

CAUTION:	Things you have to be careful during operation. Be sure to read.
Note:	Supplementary information or guidance
Reference:	Sections where related information is available

■ *Notations*

The following notations are used in this manual.

This product, CCU	Indicates CCU-970 Camera Control Unit.
Camera head	Indicates general broadcast cameras.

■ *Illustrations and Displays*

The illustrations and displays in the text are provided for explanation and may be slightly different from the actual equipment or image.

■ *Related Manuals*

Refer to the operation manuals and maintenance manuals accompanying the camera head, CCU, and each control panel to be used.

Structure of Operation Manual

CCU-970 Camera Control Unit Operation Manual is intended to both safely and smoothly operate the CCU-970. The Operation Manual consists of five chapters. By reading it in sequence, you can smoothly perform a series of steps, from connection to operation.

OUTLINE

Explains the features and the specifications of this product.
If you are not familiar with CCU-970, please start with this chapter.

NAME and FUNCTION

Explains the name and function of each part of the CCU-970.

FORMATS and GENLOCK

Explains the signal formats of the CCU-970 and DUAL LINK specification.

EQUIPMENT CONNECTIONS

Explains how to connect the CCU-970 to monitor, camera head, and so on.
Also explains how to connect this product to camera and the peripheral equipment and examples to operate this product.

CCU SETTINGS and ADJUSTMENT

Explains the menu of the CCU-970 and DIP switch settings on the modules inside of the CCU.

TROUBLE SHOOTING and MAINTENANCE

CCU-970 is equipped with the self-diagnostic function. When the alarm lamp lights during the operation of this product, read here to know the problem. This chapter also explains the regular maintenance such as cleaning of connectors and replacement of fuses.

CHANGING INFORMATION

This manual is written for the standard specifications. Your custom specifications and revision information are addressed in "CHANGING INFORMATION." Read by comparing with the main text of the maintenance manual. ("CHANGING INFORMATION" may be sent to you later on.).

CCU-970

CAMERA CONTROL UNIT

OPERATION MANUAL

1

OUTLINE

CCU-970 can build 3G format system with HDK-97A camera (UnicamHD), by the video circuit corresponding to 3Gbps transmission and 3G-SDI format.

A camera cable connects between the CCU and the camera head, and the optical serial digital transmission complies with SMPTE425 (Level-B) (International standard). A transmission distance is up to 3,000m* (for portable camera operation) and 2,000m* (for studio camera operation).

* The maximum cable length varies according to the type of lens and the use of utility power.

1.1 Features of This Product

■ *Transmission between the Camera Head and CCU with 3G-SDI.*

Transmission is possible between the camera head and CCU with 3G-SDI. 1080 progressive scans of the camera head, the high-definition format of 1080i/720p RGB4:4:4, and the 2X speed images of the slow motion format can be output from CCU.
When 3G-SDI format is operated, HD-SDI and DUAL-LINK can also be selected with the CCU output. In addition, the simultaneous output of 3G-SDI and HD-SDI is also possible. (DUAL-LINK only corresponds to 1080p.)

■ *24P Format Conversion Function (option)*

By connecting the HDK-97A or HDK-79EC portable camera, native 24P, 24SF, and 2-3PD format signals can be output.

■ *HD-SDI Q-TV Transmission (option)*

In addition to the conventional composite video, Q-TV (TRUNK) can also transmit HD-SDI.

■ *Use of the HD-SDI trunk circuit from the camera head to CCU (option)*

When operating UnicamHD in 1.5G format, the HD-SDI trunk circuit from the camera head to CCU can be used.

■ *Frame Synchronizer Mounted to RET Signals*

In conventional CCUs, the return video must be in sync with the camera video. This product includes a frame synchronizer that enables synchronization of asynchronous input video for stable return video regardless of synchronous/asynchronous.
* When the frame synchronizer function is enabled, RET input is limited to 2 channels.

■ *Audio Signal Embedded in each SDI Output (Embedded Audio Function)*

Audio signals can be embedded in SDI signals of the main output, PM output, and WFM output. Audio signals can be embedded in HD-SDI signals and SD-SDI signals.

■ *Converter Function*

D/C (down converters) and U/C (up converters) for return video are built in to support the SDTV system.

■ *Remote Control to Support Network*

In addition to traditional control by serial commands, this product supports control through network connection. Building a system to support network realizes a wide range of operating configurations such as panel assignment. This product can be easily added to the system to support network since the cables to be used for the network are coaxial cables.

1.2 Specifications

■ *Rating and Performance*

CCU output format	Camera head format: 1080P/59.94 - HDTV signal output 1080P/59.94 1080I/59.94 - SDTV signal output 480I/59.94		Y Pb Pr 4:2:2 Y Pb Pr 4:2:2 (3G-SDI or DUAL-LINK) or Y Pb Pr 4:2:2
	Camera head format: 1080I/59.94 - HDTV signal output 1080I/59.94 - SDTV signal output 480I /59.94		G B R 4:4:4 G B R 4:4:4 or Y Pb Pr 4:2:2
	Camera head format: 1080P/23.98 2-3 pulldown - HDTV signal output (option) 1080P/23.98 2-3 pulldown 1080P/23.98 1080P/23.98 segment frame - SDTV signal output (option) 480I /59.94 2-3 pulldown		G B R 4:4:4 (option) G B R 4:4:4 or Y Pb Pr 4:2:2 G B R 4:4:4 or Y Pb Pr 4:2:2 G B R 4:4:4 or Y Pb Pr 4:2:2
	Camera head format: 720P/59.94 - HDTV signal output 720P/59.94 - SDTV signal output 480I /59.94		G B R 4:4:4 G B R 4:4:4 or Y Pb Pr 4:2:2
	Camera head format: 1080P/50 - HDTV signal output 1080P/50 1080I/50 - SDTV signal output 580I /50		Y Pb Pr 4:2:2 Y Pb Pr 4:2:2 (3G-SDI or DUAL-LINK) or Y Pb Pr 4:2:2
	Camera head format: 1080I/50 - HDTV signal output 1080I/50 - SDTV signal output 580I /50		G B R 4:4:4 G B R 4:4:4 or Y Pb Pr 4:2:2
	Camera head format: 720P/50 - HDTV signal output 720P/50 - SDTV signal output 580I /50		G B R 4:4:4 G B R 4:4:4 or Y Pb Pr 4:2:2
Frequency characteristics			
HDTV output signal	CCU output of Y, Pb, Pr signals Output Y signal Output of Pb and Pr signals	Less than 60 Hz 60 Hz to 30 MHz 30 MHz or more Less than 60 Hz 60 Hz to 15 MHz 15 MHz or more	Falling characteristic Within ±1.0 dB Falling characteristic Falling characteristic Within ±1.0 dB Falling characteristic
SDTV signal output (when 1080I is down-converted)	CCU output signal Ych	100 kHz standard Less than 60 Hz 60 Hz to 4.5 MHz 4.5 MHz to 5 MHz 5 MHz or more	 Drooping characteristics Within ±0.5 dB Within ±1.0 dB Drooping characteristics
Audio output signal	Less than 100 Hz 100 Hz to 10 kHz 10 kHz or more	Falling characteristic Within ±1.0 dB Falling characteristic	
Performance (when the HDK-97A is connected)			
S/N ratio (CCU output format: 1080I/59.94)	HDTV : -62dB NTSC : -64dB		
Modulation depth	HDTV : Approx. 45% or more (800 TV lines, 27.5 MHz) NTSC : Approx. 90% or more (400 TV lines, 5 MHz)		
Limiting resolution (CCU output format: 1080I)	HDTV : 1000 TV lines NTSC : 540 TV lines (ENC output)		
Limiting resolution (CCU output format: 720P)	HDTV : 700 TV lines NTSC : 480 TV lines (ENC output)		

Power		
	Power voltage	AC 100/110/117/220/234V ±10%
	Power consumption	CCU-970 alone Approx. 110VA HDK-97A (+ FA-97) + 2-inch B/W VF (VF421HD) +CCU-970 400 VA or less HDK-97A (+ FA-97) + SE-H700 + 9-inch COLOR VF (VFL-912) +CCU-970 500 VA or less (Utility power for the camera head is excluded from the above voltage value.)
Environmental conditions		
	Ambient temperature	Operating temperature : 0°C to +45°C Storage temperature : -30°C to +60°C
	Ambient humidity	30% to 90% without condensation
External dimensions		W483×H133×D454
Weight		Approx. 28 kg
Applied Standards		
	EMC standard	FCC15 Subpart B Class A/EN55103-1, EN55103-2
	Safety standard	EN60950-1
	Quality control	ISO 9001 (JIS Z 9901)
Usage Conditions		
	Applicable standard	SMPTE 292M, 296M

* The specification indicates the performance when the HDK-97A series (1080I/59.94 format for the camera head) are connected.

■ *Input Signals*

Item	Rating			
GENLOCK signal (HDTV/SDTV supported)	HDTV : PS	1Vp-p		75Ω bridged connection
	or			
	Tri-sync signal	0.6Vp-p ± 6dB		75Ω bridged connection
	SDTV : VBS	1Vp-p		75Ω bridged connection
	or			
	BBS			75Ω bridged connection
	or			
	BBS+10FIELD ID			75Ω bridged connection
Return signal	3G-SDI/HD-SDI	4 channels*		75Ω single end input
	SD-SDI/VBS (option) selection			
		4 channels (2 channels option)		75Ω single end input
Q-TV signal	VBS	2 channels	1Vp-p	75Ω single end input
	HD-SDI (option)	1 channel		75Ω single end input
Intercom signal (ENG/PROD)	Select from 4-wire/Clearcom/RTS			
	4-wire	2 channels	0dBm	600Ω
	Clearcom	2 channels	-15dBs	200Ω
	RTS	2 channels	0dBm	200Ω
PGM (Program sound)	0dBs standard	2 channels		600Ω /10kΩ
AUDIO TRUNK	0dBs standard	1 channel		600Ω /10kΩ
Tally signal	R TALLY, G TALLY	Select from MAKE/BREAK or POWER supply		

* 2 channels when the frame synchronizer function is enabled.

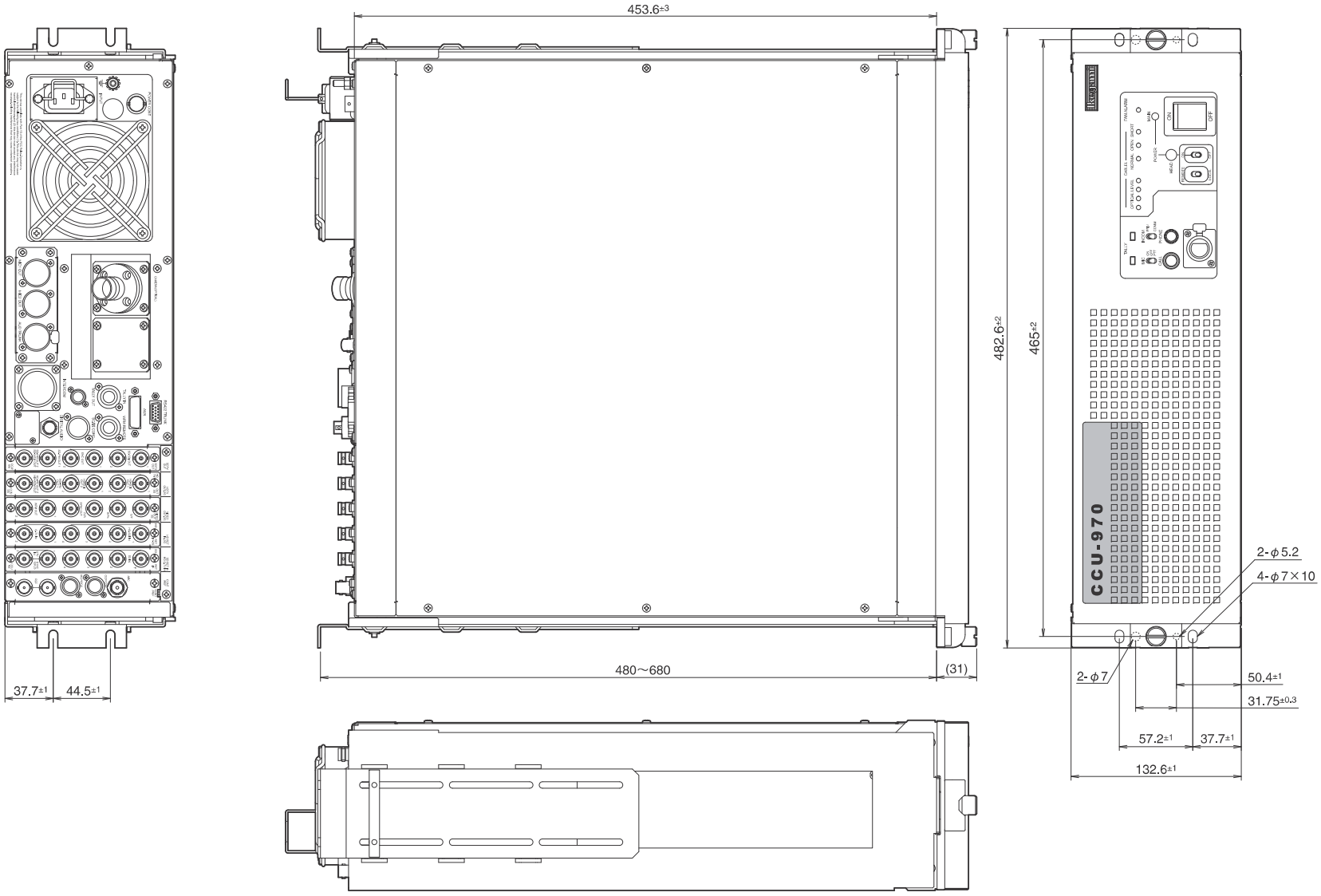
■ *Output Signals*

Item	Rating		
HDTV signal	Select from 3G-SDI/DUAL-LINK/HD-SDI (SMPTE424M, 292M standard)		
		4 channels	75Ω output
SD-SDI signal	SD-SDI (SMPTE259M standard)	2 channels	75Ω output
Synchronization signal	HDTV/SDTV selection HDTV tri-sync signal SDTV	1 channel 0.6Vp-p 2Vp-p	75Ω output
Component signal	Select a pair from HDTV GBR/YPbPr, SDTV GBR/YCbCr		
		1 channel	75Ω output
Composite signal	VBS	2 channels	1Vp-p 75Ω output
Picture monitor (PM) signal	Select from 3G-SDI/DUAL-LINK/HD-SDI		
		2 channels	75Ω output
	Select from SD-SDI/SDTV analog signal (R/G/B/Y/ENC)		
		2 channels	75Ω output
Waveform monitor (WFM) signal	Select from 3G-SDI/DUAL-LINK-A/HD-SDI/SD-SDI		
		1 channel	75Ω output
	Select from DUAL-LINK-B/HD-SDI/SD-SDI/SDTV analog signal (R/G/B/Y/ENC)		
		1 channel	75Ω output
Intercom signal (ENG/PROD)	Select from 4-wire/Clearcom/RTS		
	4-wire	2 channels	600Ω
	Clearcom	2 channels	200Ω
	RTS	2 channels	200Ω
MIC signal	0dBs standard	2 channels	Low impedance
Tally signal	R TALLY, G TALLY		

■ *Camera Cable*

Standard cable	2SM-9.2-37.5
Cable for studio shooting	2SM-16-37.5
Cable configuration	2 single-mode quartz fiber optic cables (HEAD -> CCU, CCU -> HEAD one cable for each) 4 power cables (One cable has 37.5Ω/km.) 2 control cables (One cable has 113Ω/km.)

1.3 External Dimensions Diagram



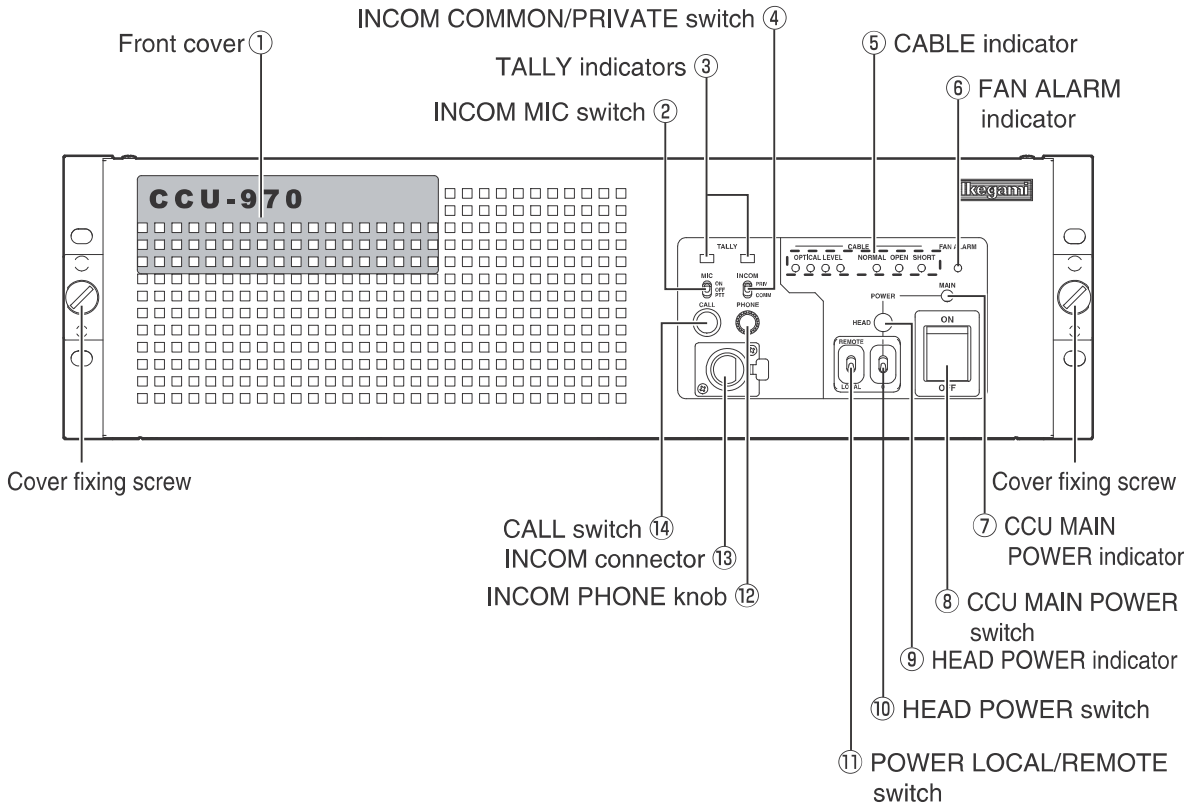
2

NAME and FUNCTION

2.1 CCU-970 Front View

This section explains the names and functions of the parts on the front of the CCU-970.

CCU-970 Front View with the Front Cover On



① Front cover

Protection cover on the front of the CCU.
Remove the cover when you need to operate the switches on the front of the module. It is usually used with the cover on.

How to remove/install the front cover

To remove the front cover, loosen the fixing screws on both ends of the cover and pull the cover straight off. To install the cover, place the cover in the appropriate position and tighten the screws.

② INCOM MIC switch

Selects ON/OFF/PTT for the intercom microphone.

ON : Turns ON the intercom microphone.
OFF : Turns OFF the intercom microphone.
PTT : Turns ON the intercom microphone while this switch is pressed down. (Press To Talk)

③ TALLY indicators

Indicators for R TALLY and G TALLY.

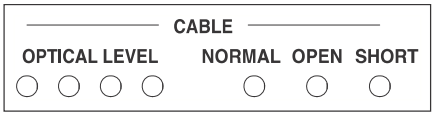
R TALLY : Lights when the R TALLY signal is input to the TALLY IN connector on the rear of the CCU. It also lights while the CALL switch on the camera head or on any control panel (such as OCP, MCP, and RCP) is pressed.
G TALLY : Lights when the G TALLY signal is input to the TALLY IN connector on the rear of the CCU.

④ INCOM COMMON/PRIVATE switch

Selects the intercom conversation mode.

COMM : Conversation among the camera head, CCU, and system is enabled.
PRIV : Conversation between the camera head and CCU is enabled.

⑤ CABLE indicators



OPTICAL LEVEL indicators

Lighting status varies according to the light reception status of the camera to CCU fiber transmission path. The table below shows indicates status.

Lighting Status	Light Reception Status	
Red Yellow Green Green ●○○○	OK	Light reception status is good.
Red Yellow Green Green ●○○●	ATTENTION	The light reception level is low. Although there is no problem with the reception of signals transmitted, cleaning the fiber connector is may be required, unless attenuation is due to very long cable length.
Red Yellow Green Green ●○●●	WARNING	The light reception level is very low. There might be a problem with the reception of signals transmitted. Immediate cleaning the fiber connector is recommended.
Red Yellow Green Green ○●●●	NG	The light cannot be received. There is a problem with the reception of signals transmitted. Cleaning the fiber connector is required; or replace the cable since the camera cable might be broken.

(○ : ON/ ● : OFF)

CABLE indicator

Indicates the status of the camera cable.

NORMAL (green) : Lights when the status is normal.
OPEN (red) : Lights when the camera cable is not connected or there is an "open" in the camera cable.
SHORT (red) : Lights when a short circuit occurs in the camera cable or in the camera connector due to a cause such as water.

⑥ FAN ALARM indicator (red)

Lights when one of the fan motors on the rear of the CCU (1 motor) and inside the CCU (2 motors) has stopped.

⑦ CCU MAIN POWER indicator (green)

Lights when the CCU main power is ON.

⑧ CCU MAIN POWER switch

Switch to turn ON/OFF the CCU main power.

⑨ HEAD POWER indicator

Lights when power is supplied from the CCU to the camera head.

⑩ HEAD POWER switch

Switch to turn ON/OFF the power supply from the CCU to the camera head.

⑪ POWER LOCAL/REMOTE switch

Selects the ON/OFF mode of the CCU main power.

LOCAL : Main power can be turned ON/OFF from the MAIN POWER switch of the CCU.
REMOTE : When the CCU MAIN POWER switch is "ON," CCU main power and the power of the camera head can be turned ON/OFF from the OCP.

* In this case, support status for the power ON/OFF of the camera head and CCU vary according to the OCP to be used. Refer to the instructions accompanying the OCP to be used.

⑫ INCOM PHONE knob

Controls the volume of the intercom receiver.

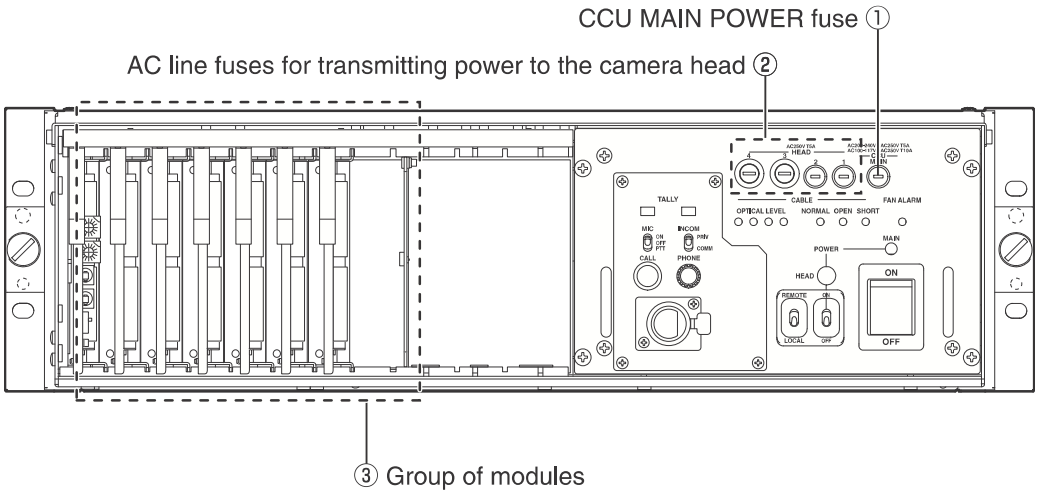
⑬ INCOM connector

Connects the intercom headset. The connector type varies according to the specification.

⑭ CALL switch

Only while this switch is pressed, the R TALLY indicators on the camera head and the control panel light.

CCU-970 Front View with the Front Cover Off



① CCU MAIN POWER fuse

Fuse for the CCU main power.

Fuse to be used

100V-117V AC input voltage: 250V T10A (rating)
220V-240V AC input voltage: 250V T5A (rating)
("T" in the rating indicates a time lag fuse.)

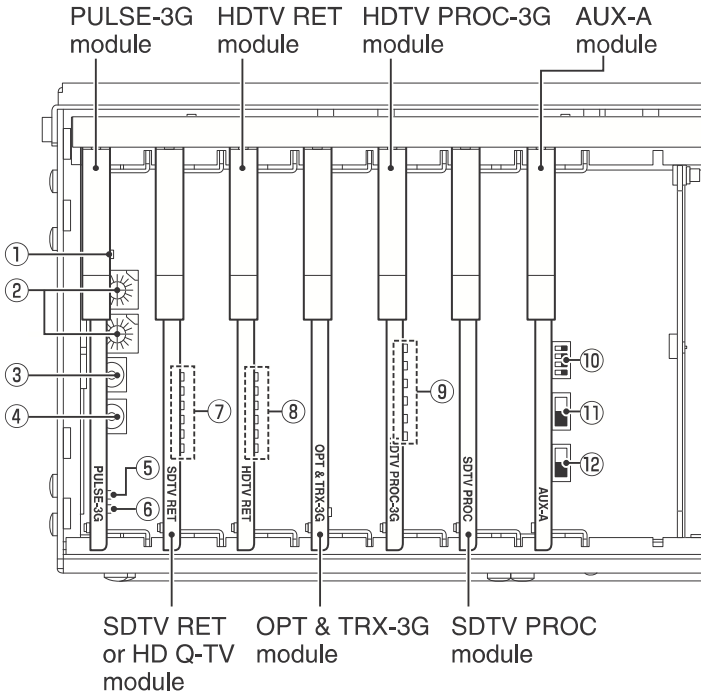
② AC line fuses for transmitting power to the camera head

Fuse for AC power line to transmit the power to the camera head. Fuses are inserted to each line on 4 taps.

Fuse to be used (fuses are all the same.)

250V T5A (rating)
("T" in the rating indicates a time lag fuse.)

③ Group of modules



CAUTION:

The OPT & TRX-3G module is connected to the CCU main body with a fiber optic cable. Do not remove the cable except for the case to replace the module. Using excessive force when removing the cable may cause damage.

■ *PULSE Module*

① GENLOCK indicator

Lights when the CCU operates in GENLOCK mode (external synchronization).

② Network ID set switches

These 2 rotary switches set the network ID. Values on each switch are expressed in hexadecimal. The upper switch is for the higher bit; the lower switch is for the lower bit. Set the network ID from 01h to FFh (1 to 255 in decimal number). For details, refer to the instructions accompanying the HUB to be used.

CAUTION:

Each network ID must be unique in the same network. When the network IDs duplicate, malfunction may occur in not only the equipment with duplicated IDs but also equipment connected to the same network.

③ MENU switch

Switch to display, confirm, and end the menu.

④ SELECT switch

Switch to select the menu.

⑤ HDTV HD test point

Test point for the HDTV horizontal drive signals.

⑥ HDTV FD test point

Test point for the HDTV frame drive signals.

■ *SDTV RET Module*

⑦ DC voltage test points

Test points for DC+5V, +3.3V, +9.5V, +5.5V, -5.5V, and -9.5V from the top.

■ *HDTV RET Module*

⑧ DC voltage test points

Test points for DC+5V, +3.3V, +9.5V, +5.5V, -5.5V, and -9.5V from the top.

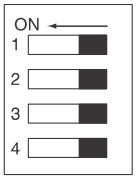
■ *HDTV PROC-3G Module*

⑨ DC voltage detection indicator

Indicator for DC+5V, +3.3V, +9.5V, +5.5V, -5.5V, and -9.5V from the top.

■ *AUX-A Module*

⑩ Setting switches for the intercom system



(Switches viewed from the front of the CCU)

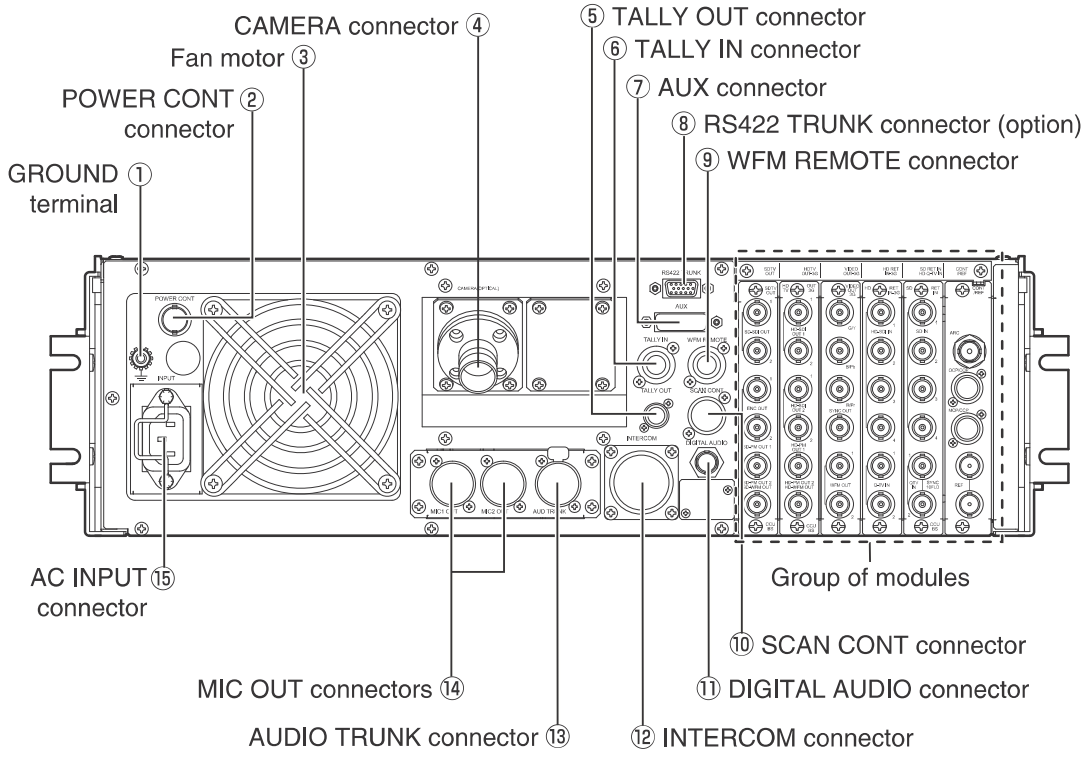
Switch No.	Switch Function Name	ON	OFF
1	ENG RTS/CC	When the ENG line of the system is used for "RTS" or "Clearcom"	When the ENG line of the system is used for "4W"
2	ENG CC ON	When the ENG line of the system is used for "Clearcom"	When the ENG line of the system is used for "RTS"
3	PROD RTS/CC	When the PROD line of the system is used for "RTS" or "Clearcom"	When the PROD line of the system is used for "4W"
4	PROD CC ON	When the PROD line of the system is used for "Clearcom"	When the PROD line of the system is used for "RTS"

⑪ Always place the position of this switch to the lower side.

⑫ Always place the position of this switch to the lower side.

2.2 CCU-970 Rear View

This section explains the names and functions of the parts on the rear of the CCU-970.



① GROUND terminal

Frame ground terminal of the CCU power unit.

② POWER CONT connector

This connector is connected to the P.S CONT connector on the OCP via the POWER CONT cable to control ON/OFF of the CCU main power and the power of the camera head from the OCP. In this case, set the POWER LOCAL/REMOTE switch on the front of the CCU to "REMOTE."
Some OCPs do not have the P.S CONT connector.

③ Fan motor

Fan motor to cool inside of the CCU.

④ CAMERA connector

Connector to connect the camera head via camera cable.

⑤ TALLY OUT connector

Outputs TALLY signals for monitor.

⑥ TALLY IN connector

Inputs TALLY control signals from the external system.
The TALLY mode is selected by the switch on the AUX-A module. Refer to "5.2 Settings Using Switches on the Module," "TALLY Mode Settings" (page 94) for how to select the mode.

Tally Call \ Indicator		Camera		CCU		Control Panel	
		R	G	R	G	R	G
System	R	○		○		○	
	G		○		○		○
Camera Head*				○		○	
CCU*		○				○	
Control Panel*		○		○			

* The indicator lights when the CALL switch on the camera head, CCU, or control panel is pressed. (○ : ON)

⑦ AUX connector

Connector to control external equipment. This connector is used for a special specification (optional).

⑧ RS422 TRUNK connector (option)

Connector for RS-422 communication.

⑨ WFM REMOTE connector

Outputs stair signals for the waveform monitor (WFM). By connecting the WFM for NTSC to this connector, the R, G, and B waveforms can be monitored simultaneously (parade display).

⑩ SCAN CONT connector

Inputs control signals to control the aspect ratio of SDTV output from the external system.

⑪ DIGITAL AUDIO connector

Outputs digital audio signals (75Ω output). The signal conforms to the AES/EBU format.

⑫ INTERCOM connector

Connector to connect to the external intercom system.
"24-pin type" or "BTA S-1005B compliant (19-pin) type" are optionally available for the INTERCOM connector.
* "19-pin type" is optional. (The connector is not RoHS-compliant.)

⑬ AUDIO TRUNK connector

Input connector for the trunk line for audio signals to be transmitted to the camera head.

⑭ MIC OUT connectors

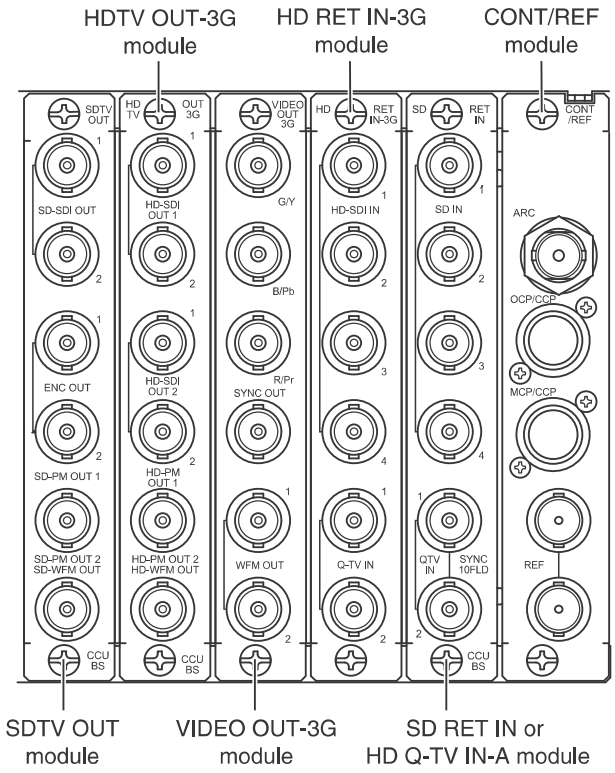
Output the audio signals that are input to the MIC IN connectors on the camera head. (2 channels)

⑮ AC INPUT connector

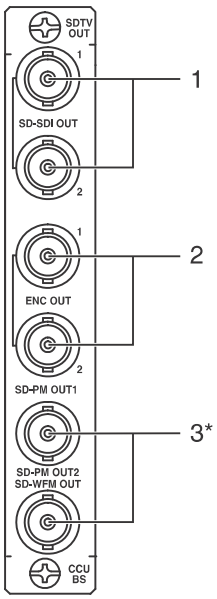
Supplies AC voltage to the CCU.

Modules on the Rear of the CCU-970

Modules on the rear are also the slot type and can be removed/inserted as well as the modules on the front.



■ *SDTV OUT Module*



1. SD-SDI OUT connectors

Output SD-SDI signals (2 channels).

2. ENC OUT connectors

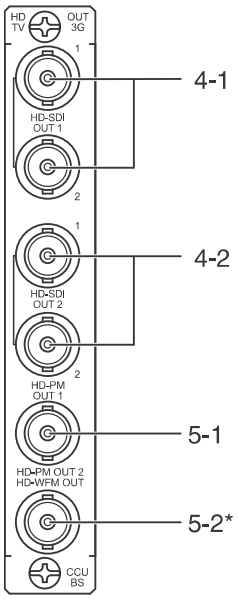
Output ENC signals (2 channels).

3. SD-PM OUT connectors

Output video signals for picture monitor (2 channels).
The SD-SDI signal or SDTV analog signal can be selected as the output signal. Select the signal from "SD PM OUT1" and "SD PM OUT2" of the CCU menu "OUTPUT FORMAT."
(First and second channels can be selected separately.)

* This product does not have the SD-WFM OUT (SDTV video signal output for a waveform monitor) function displayed on the SD-PM OUT2 connector.

■ *HDTV OUT-3G Module*



4-1. HD-SDI OUT 1 connectors

The HD-SDI signal, 3G-SDI signal, and DUAL-LINK (LINK A) signal are outputted. (2 channels)
The output signal can be selected by "HD OUT-1" of "OUTPUT FORMAT" of the CCU menu, when SYSTEM FORMAT is "3G." Both 2 channels are with the same signal.

CAUTION:

This adopts 3G-SDI signal for the output signal, and when only one connector is used, the connector which is not used requires a 75Ω termination.

4-2. HD-SDI OUT 2 connectors

The HD-SDI signal, 3G-SDI signal, and DUAL-LINK (LINK B) signal are outputted. (2 channels)
The output signal can be selected by "HD OUT-2" of "OUTPUT FORMAT" of the CCU menu, when SYSTEM FORMAT is "3G." Both 2 channels are with the same signal.

CAUTION:

This adopts 3G-SDI signal for the output signal, and when only one connector is used, the connector which is not used requires a 75Ω termination.

5-1. HD-PM OUT 1 connector

The HD-SDI signal, 3G-SDI signal, and DUAL-LINK (LINK A) signal for the picture monitor are outputted.
The output signal can be selected by "HD PM OUT-1" of "OUTPUT FORMAT" of the CCU menu, when SYSTEM FORMAT is "3G."

5-2. HD-PM OUT 2 connector

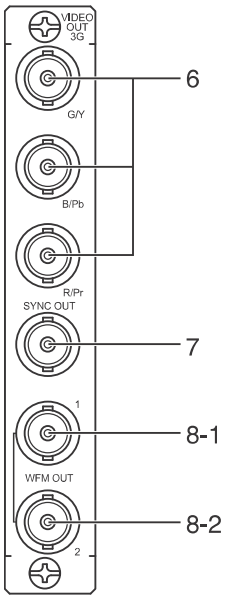
The HD-SDI signal, 3G-SDI signal, and DUAL-LINK (LINK B) signal for the picture monitor are outputted.
The output signal can be selected by "HD PM OUT-2" of "OUTPUT FORMAT" of the CCU menu, when SYSTEM FORMAT is "3G."

Note:

In "HD OUT-1/2" and "HD PM OUT-1/2" of the CCU menu, if "DUAL-LINK" is selected, another side will also become "DUAL-LINK", and it will become the same setting if "3G-SDI" or "HD-SDI" is selected from "DUAL-LINK."

* This product does not have the HD-WFM OUT (HD-SDI video signal output for a waveform monitor) function displayed on the HD-PM OUT2 connector.

■ *VIDEO OUT-3G Module*



6. Component output connectors

About the output signal, HDTV or SDTV, and the GBR signal or Y color-difference signal can be selected by "ANALOG OUT" of "OUTPUT FORMAT" of the CCU menu.
In addition, when SYSTEM FORMAT is "1080P59 (1080P50)," the format of the output signal is "1080I59 (1080I50)".

7. SYNC OUT connector

Outputs signals for external synchronization.
HDTV Tri-Sync signal or SDTV synchronization signal is selected from "SYNC OUT" setting of the CCU menu "OUTPUT FORMAT."

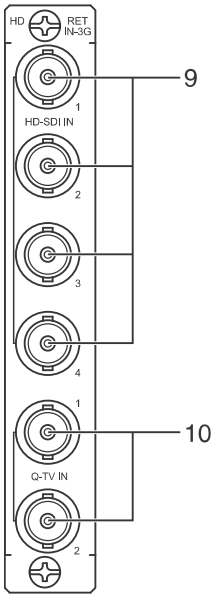
8-1. WFM OUT 1 connector

Output video signal for the waveform monitor.
The output signal can be selected by "WFM OUT-1" of "OUTPUT FORMAT" of the CCU menu. When SYSTEM FORMAT is not "3G," the HD-SDI signal or the SD-SDI signal can be selected. In addition, when SYSTEM FORMAT is "3G," selection 3G-SDI signal or DUAL-LINK (LINK A) signal can be selected. However, when a DUAL-LINK (LINK A) signal is selected, the output signal of WFM OUT 2 connector of the following section becomes DUAL-LINK (LINK B) signal.

8-2. WFM OUT 2 connector

Output video signal for the waveform monitor.
About the output signal, the HD-SDI signal, the SD-SDI signal, and the SDTV analog signal can be selected by "WFM OUT-2" of "OUTPUT FORMAT" of the CCU menu.

■ *HD RET IN-3G Module*



9. HD-SDI RET IN connectors

Input return signals to the camera head (4 channels).
Supports HD-SDI and 3G-SDI signals. Active through connection is not available.

Note:

When "ON" is selected from "FRAME SYNCHRO" of the CCU menu "RET VIDEO FORMAT," 2 channels are used for the input. In this case, the input to the third and fourth channels is disabled.

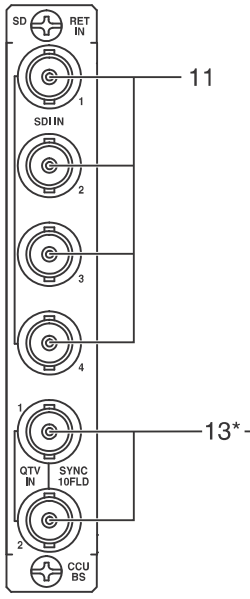
10. QTV IN connectors

Input QTV signals to be transmitted to the camera head (2 channels).
Format is SDTV analog composite signal.

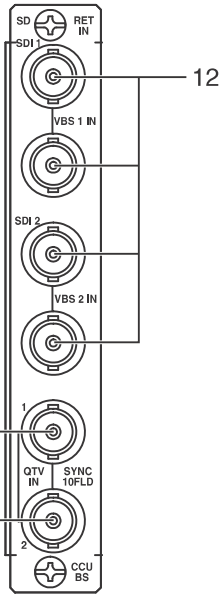
■ *SD RET IN Module*

* The rear panel for the RET4 channel specification is different from that for the RET2 channel specification. (The RET2 channel specification is optional.)

RET4 channel specification



RET2 channel specification



* When the SD RET IN module is installed to this product, the QTV IN (QTV signal input) function is disabled for this connector.

11. SDTV RET IN connectors [RET4 channel specification]

Input return signals to the camera head (4 channels).
Supports SD-SDI signals. Active through connection is not available.

Note:

When "ON" is selected from "FRAME SYNCHRO" of the CCU menu "RET VIDEO FORMAT," 2 channels are used for the input. In this case, the input to the third and fourth channels is disabled.

12. SDTV RET IN connectors [RET2 channel specification]

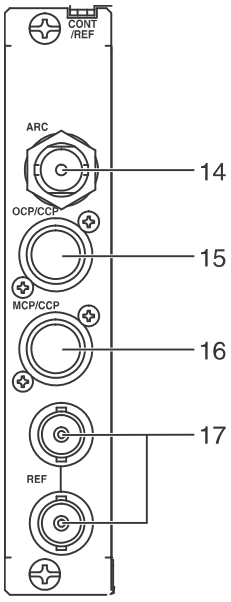
Input return signals to the camera head (2 channels).
Support SD-SDI signals and analog VBS. Bridged connection is available for VBS.

13. SYNC 10FIELD connectors

Bridged connection is available. Input signals necessary for synchronizing the phase of 23.98 signals and 2-3 pulldown signals. Following signals can be input.

- Signals output from the SYNC OUT connector of another CCU-970. However, in this case, select "1080I59." from "SYNC OUT" setting and "ON" from "SYNC 2-3ID ADD" setting of the CCU menu "OUTPUT FORMAT."
- SYNC signals in 1080P23 format (when synchronization signals are supplied from external equipment).

■ *CONT/REF Module*



14. Connector for network commands

Connector for network to connect to the CP HUB (separately sold) via a coaxial cable. For details, refer to the instructions accompanying the CP HUB to be used.

CAUTION:

- Use an F-type conversion plug for connection. In addition, use 75Ω coaxial cable and terminator at each end of the overall path.
- Handle the connector with extreme care since a malfunction may occur when the connector comes into contact with the frame etc.
- Use an F-type conversion plug covered with insulation cover etc.

15. OCP/CCP connector

Connector to connect to the OCP via a CP cable.

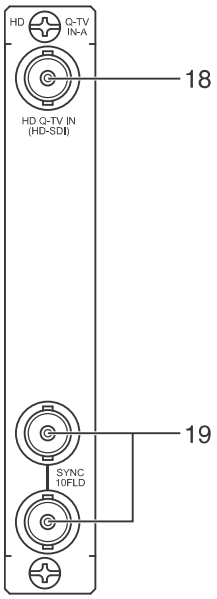
16. MCP/CCP connector

Connector to connect to the MCP or CSU via a CP cable.

17. REF connectors

Input external synchronization signals (HDTV PS/S or SDTV VBS/BBS). Signals to which 10 field ID signals conforming to SMPTE318M are added can be input to the VBS/BBS.
Bridged connection is available.

■ *HD Q-TV IN-A Module*



18. HD-SDI Q-TV IN connector

Input Q-TV signals to the camera head.
Supports HD-SDI signals. Active through connection is not available.

19. SYNC 10FIELD connectors

Bridged connection is available. Input signals necessary for synchronizing the phase of 23.98 signals and 2-3 pulldown signals. Following signals can be input.

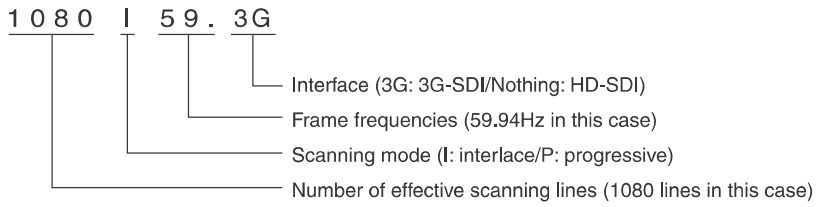
- Signals output from the SYNC OUT connector of another CCU-970. However, in this case, select "1080I59." from "SYNC OUT" setting and "ON" from "SYNC 2-3ID ADD" setting of the CCU menu " OUTPUT FORMAT."
- SYNC signals in 1080P23 format (when synchronization signals are supplied from external equipment).

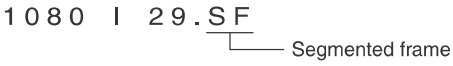
3

FORMATS and GENLOCK

3.1 HDTV Format

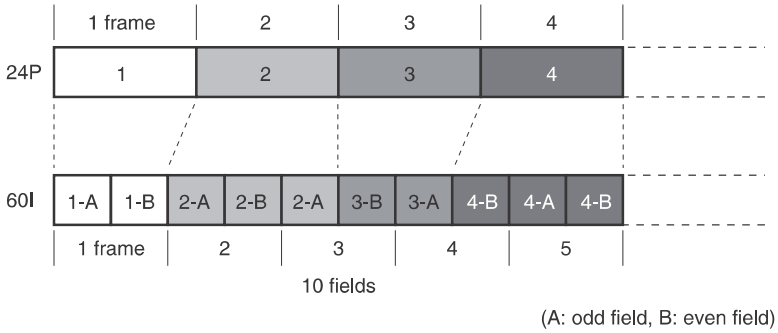
This section explains the HDTV formats displayed on the CCU menu and the self-diagnosis with some examples.





■ *2-3 Pull Down*

2-3 pull down is a method of converting a 24-frame (24P) video into a 60-field (60I) video.



■ *Segmented Frame*

Segmented frame is a method for converting a progressive video separated for 1 line each into an interlaced video.

3.2 GENLOCK System

This section explains input/output connectors and connection examples of the GENLOCK system for this product.

Input Connectors

REF connectors and SYNC 10FLD connectors are explained here.
The phase of output signals can be synchronized with the reference signals input to the REF connectors and SYNC 10FLD connectors.

■ *REF connectors*

Three types of signals below can be input to the REF connectors.
① HDTV PS/S
② SDTV VBS/BBS
③ BBS + 10 FIELD ID

■ *SYNC 10FLD connectors*

When the output format is 1080P/23.98 (2-3 pulldown), 1080P/23.98, or 1080P/23.98 (segment frame), the phase of 23.98P and 2-3 pulldown signals can be synchronized by inputting the following signals.

• When the phase of 2-3 pulldown signal of another CCU-970 is synchronized by using a CCU-970 as master

HDTV tri-sync signals with 10 FIELD ID output from the SYNC OUT connector of another CCU-970

• When the phase of 23.98P and 2-3 pulldown signals is synchronized with the reference signals

Synchronization signals in 23.98P format
(When synchronization signals in 59.94I format are input to the REF connectors of the CCU, the synchronization signals in 23.98/P format must be in phase of the synchronization signals in 59.94I format.)

Output Connectors

SYNC OUT connector and ENC OUT connectors are explained here.

■ *SYNC OUT connector*

SYNC OUT connector outputs synchronization signals. The format to be selected varies depending on the output video signal. (Select a format from the menu.)

HD-SDI OUT1/OUT2 FORMAT	Synchronization Signal Format to be Selected
1080P59.	1080P59./1080 I59./SDTV
1080I59.	1080 I59./SDTV
1080P23.PD	1080 I59./SDTV
1080P23.SF	1080 P23.SF/SDTV
1080P23.	1080 P23./SDTV
720P59.	720P59./SDTV
1080P50.	1080P50./1080 I50./SDTV
1080I50.	1080 I50./SDTV
720P50.	720P50./SDTV

In addition, when a format other than 1080I59. and 720P59. is selected, whether to add 2H pulse every 10 FIELD (this is different form the 10 FIELD ID specified by SMPTE 318M.; however. this is also called "10 FIELD ID" here.) can be selected.

■ *ENC OUT connector*

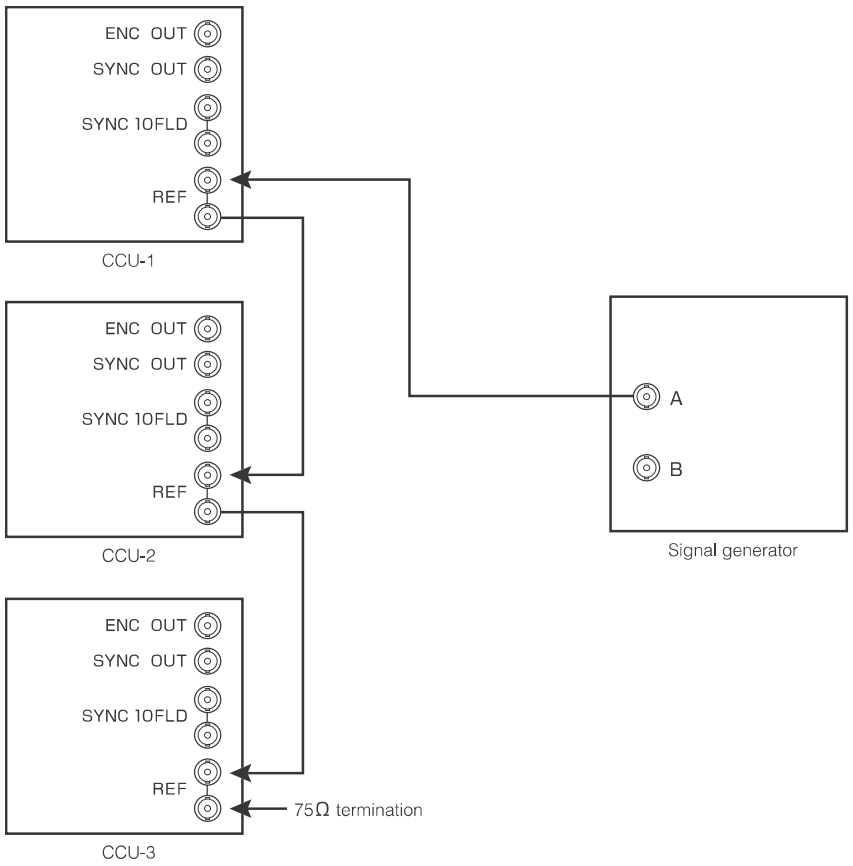
10 FIELD ID can be added to the ENC signal. (The 10 FIELD ID described here indicates the ID specified by SMPTE 318M.)

Note:

When the format of the camera head is 1080P/23.98 (2-3 pulldown), the phase of 2-3 pulldown signal needs to be synchronized even if the 2-3 pulldown signal is not used for the CCU output since the 2-3 pulldown signal is transmit and received between the camera head and the CCU.

■ *Operating configurations*

● When format conversion is not performed



Condition of signals output by the signal generator in this case

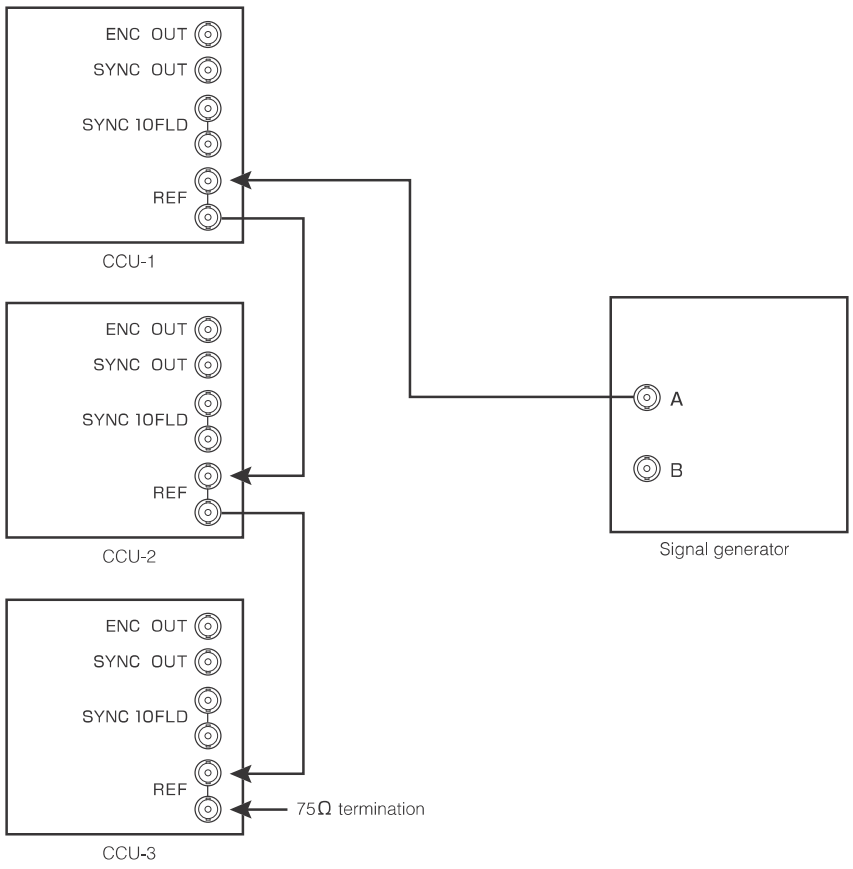
A: HDTV tri-sync signals whose format is the same as the camera head or NTSC BBS

● When format conversion is performed

The following three patterns use 1080P/23.98PD as a format of the camera head.
In addition, 1080P/23.98 is used as the output of the format conversion.

- Pattern 1

The case that NTSC BBS + 10 FIELD ID (SMPTE 318M-compliant) signals can be supplied from the signal generator

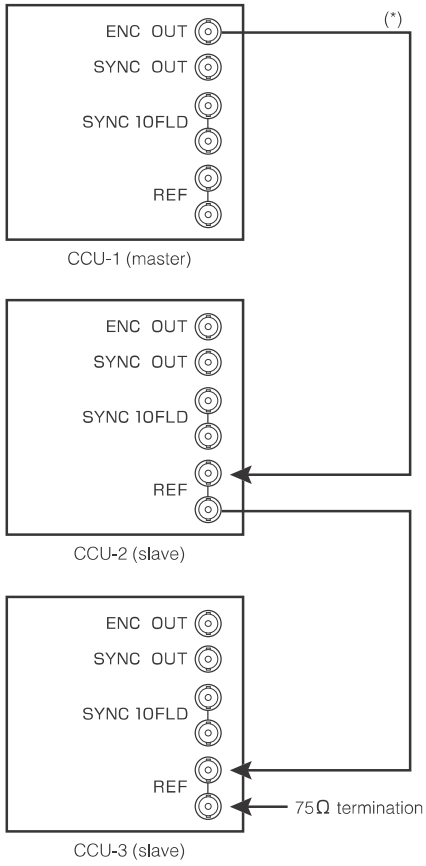


Condition of signals output by the signal generator in this case

A: NTSC BBS + 10 FIELD ID (SMPTE 318M-compliant)

- Pattern 2

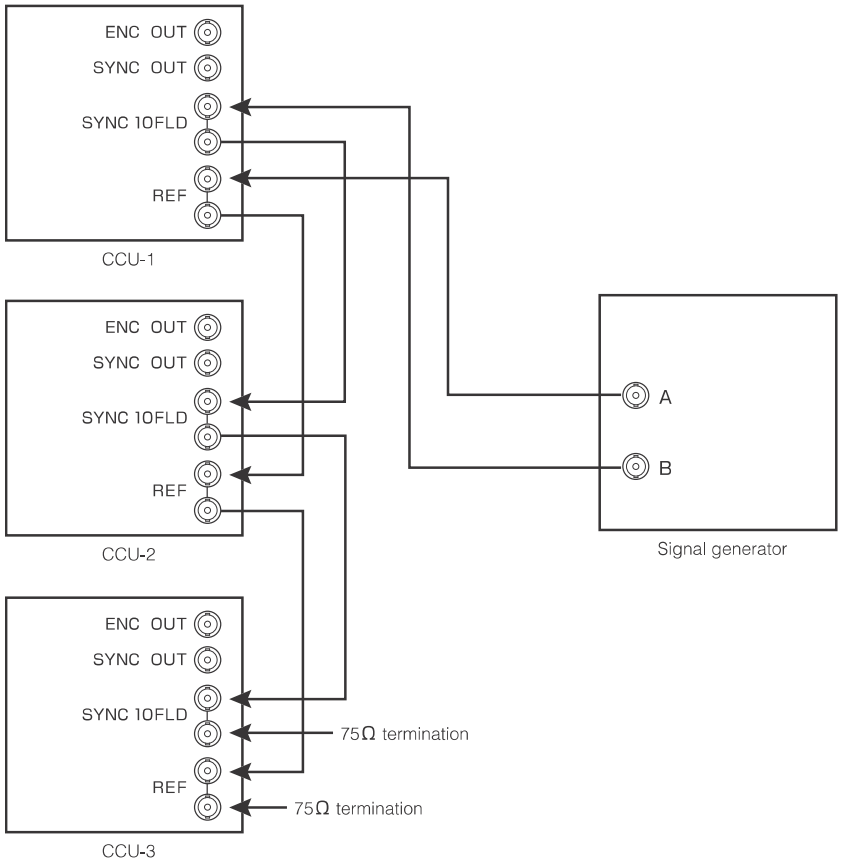
One of CCUs is placed as master when the signal generator is not used.



* In this case, add 10 FIELD ID signals (SMPTE 318M-compliant) to the ENC signal output. (Set the item "10 FIELD ID SIG" of the CCU menu "DOWN CONV CONT (1/3)" to ON.)

- Pattern 3

The case that synchronization signals of two types of formats can be supplied from the signal generator



Condition of signals output by the signal generator in this case

A: HDTV tri-sync signals of 1080I/59.94 format or NTSC BBS
B: HDTV tri-sync signals of 1080P/23.98 format
(However, the 10-field interval for 1080I/59.94 format needs to be synchronized with the 4-frame interval for 1080P/23.98 format.)

EQUIPMENT CONNECTIONS

4

4.1 Preparation

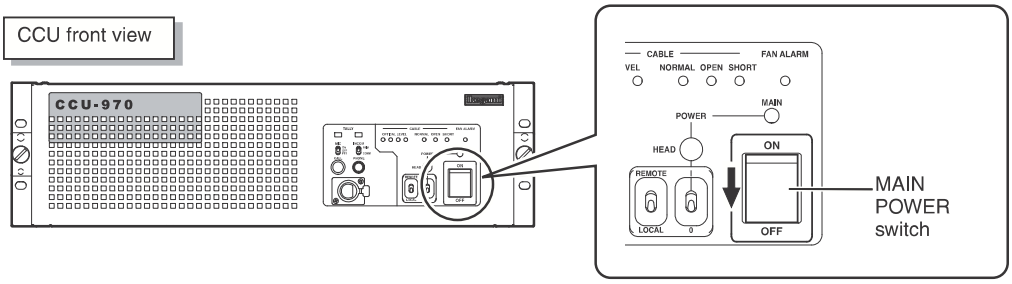
Product Use Environment

Please read THE SAFETY PRECAUTIONS in the beginning of this document and follow the precautions for use.

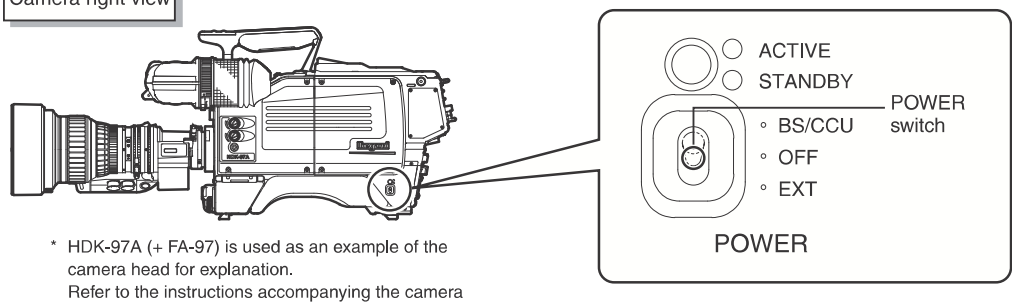
Make Sure the Power Switch is OFF

Please make sure that the power switch is "OFF" before connecting this product and peripheral equipment such as the camera head.

CCU front view



Camera right view



* HDK-97A (+ FA-97) is used as an example of the camera head for explanation.
Refer to the instructions accompanying the camera head to be used for the locations of the POWER switches and switch settings.

4.2 Power Supply

This section explains how to supply power from the CCU-970 to the camera head.

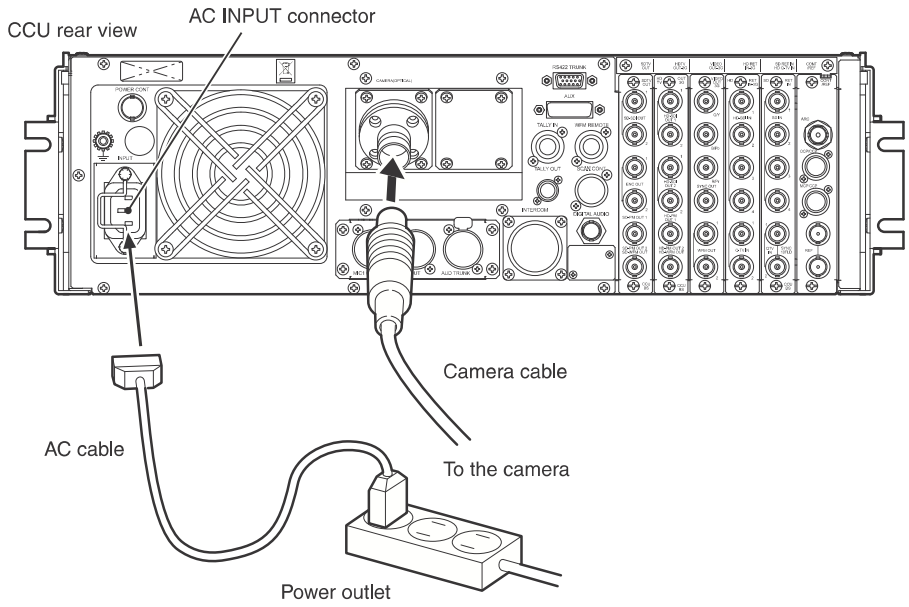
1 Make sure the MAIN POWER switch of the CCU is "OFF."

2 Connect the AC cable to the AC INPUT connector on the rear of the CCU.

3 Insert the AC plug into the power outlet.

4 Connect a camera cable to the CAMERA connector on the rear of the CCU, and connect the other end of the camera cable to the camera head.

Refer to "4.3 CCU and Camera Head Connection" (page 39) for how to connect the camera cable to the camera head.



This completes the connection procedure for supplying power from the CCU-970 to the camera. Two methods of power supply to the camera head are available with this configuration.
a) To control the power ON/OFF from the CCU
b) To control the power ON/OFF from the OCP (remote control)

■ *To Control Power ON/OFF from CCU*

You can control the power ON/OFF of the camera head from the CCU.

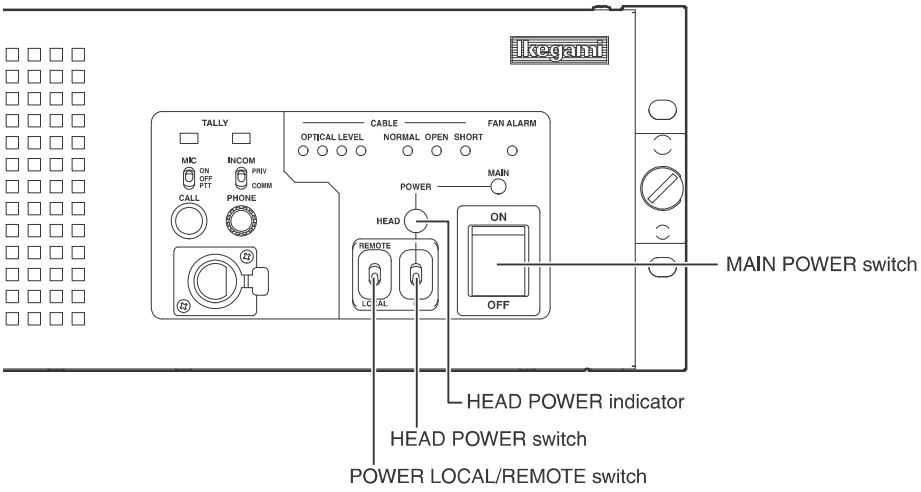
1 Set the MAIN POWER switch on the front of the CCU to "ON," and set the POWER switch of the camera head to "CCU."

This turns on the power of the CCU, but no power is supplied to the camera head yet.

2 Set the POWER LOCAL/REMOTE switch on the front of the CCU to "LOCAL," and set the HEAD POWER switch to "ON."

The power is supplied to the camera head, and the HEAD POWER indicator lights.

CCU front view

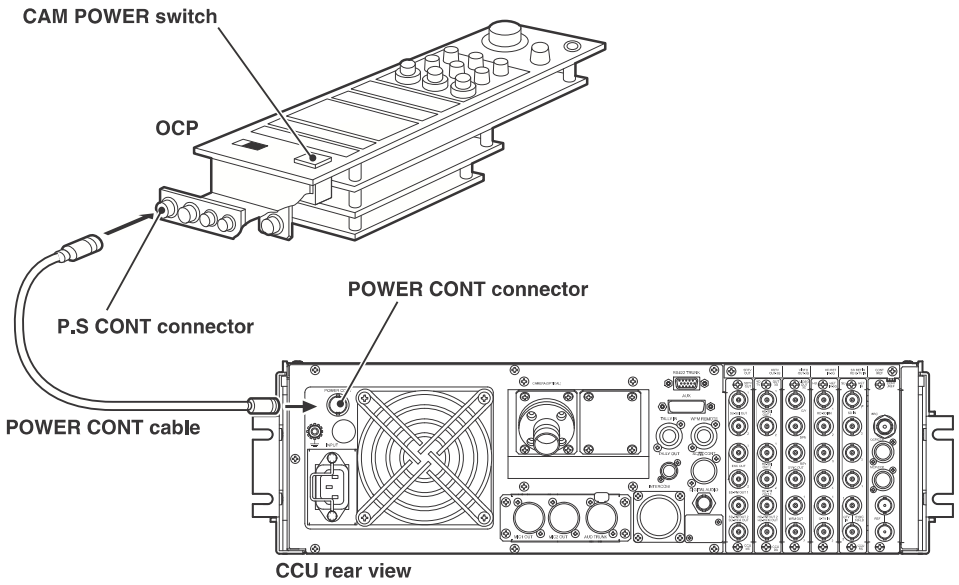


Setting the HEAD POWER switch on the front of the CCU to "ON/OFF" enables control of the power supply to the camera head.

■ *To Control Power ON/OFF from OCP (Remote Control)*

You can control the power ON/OFF of both the camera head and the CCU from the OCP.

1 Connect the POWER CONT connector on the rear of CCU and the P.S CONT connector on the OCP via the POWER CONT cable.



2 Set the MAIN POWER switch on the front of the CCU to "ON."

3 Set the POWER LOCAL/REMOTE switch on the front of the CCU to "REMOTE."

The power of the CCU is turned off.

4 Set the CAM POWER switch on the OCP to "ON."

The power of the CCU is turned on, and the power is simultaneously supplied to the camera head.

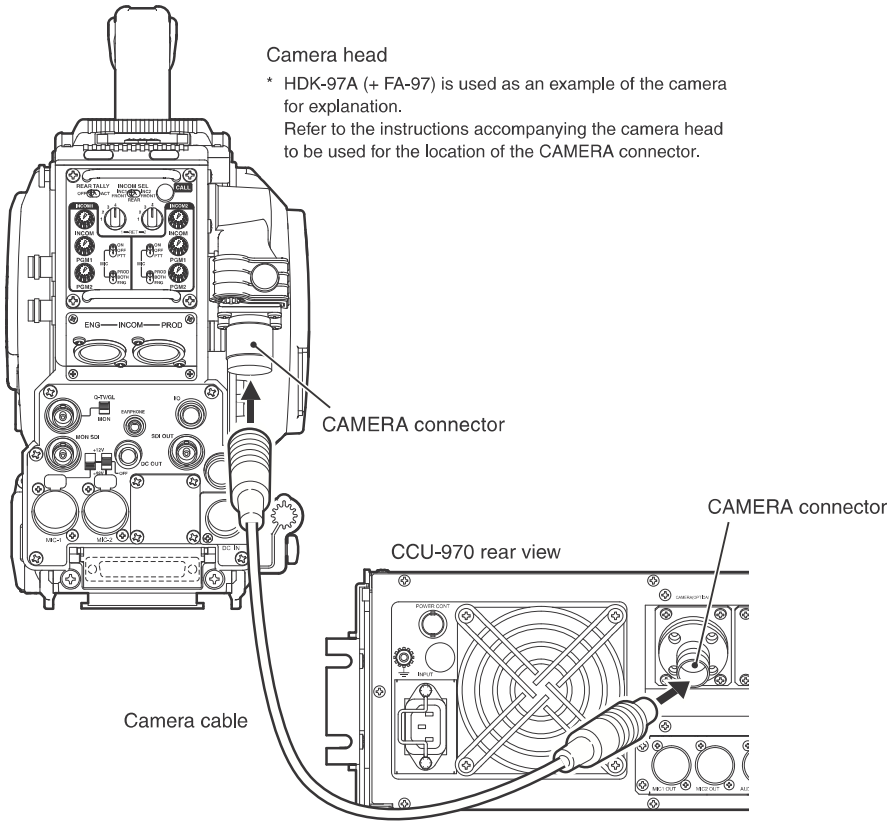
Note:

Some OCP does not have the P.S CONT connector. When an OCP that does not have the P.S CONT connector is used, only ON/OFF of the power supply for the camera head is controlled without controlling the power ON/OFF of the CCU.

4.3 CCU and Camera Head Connection

This section explains how to connect the CCU-970 to the camera.

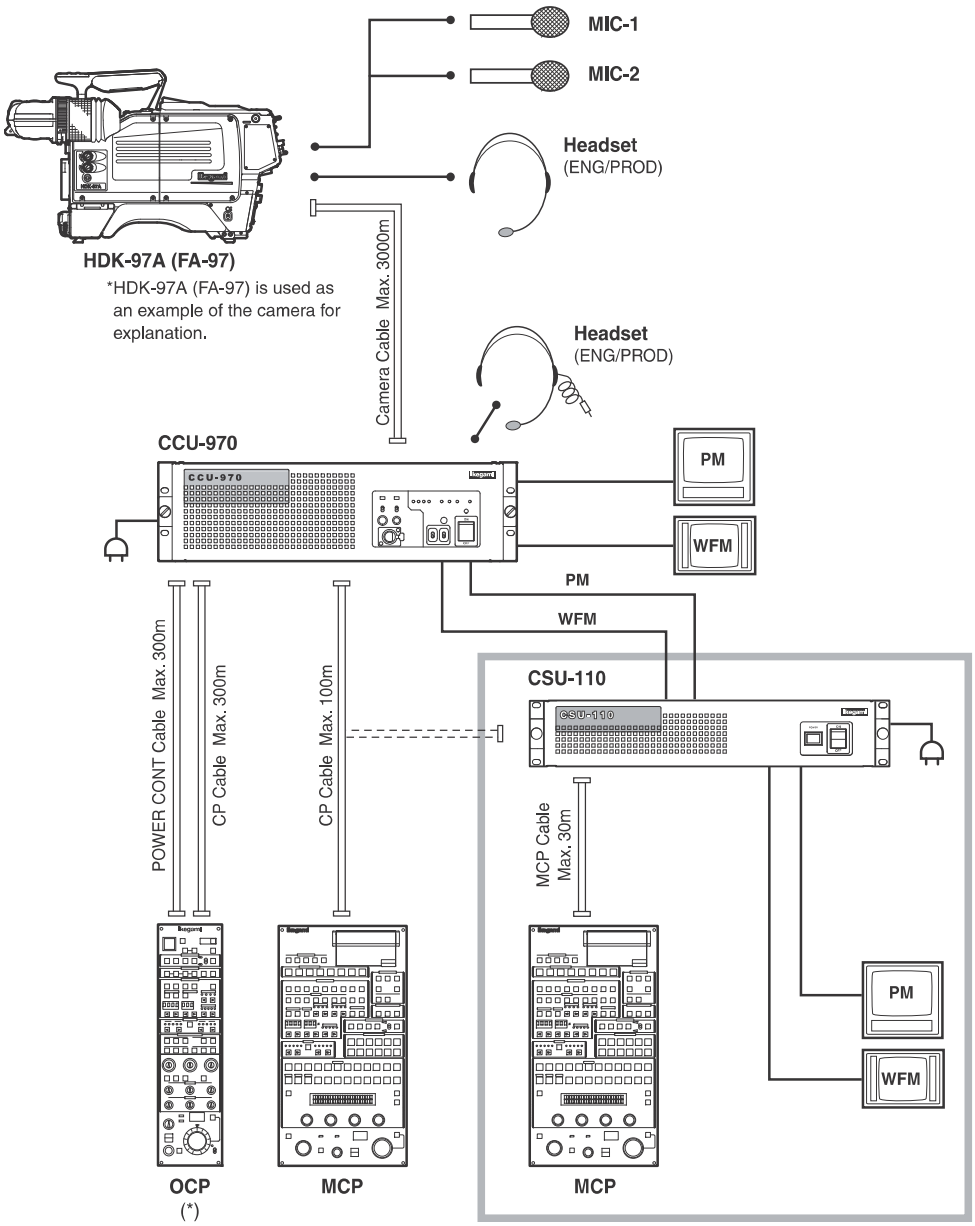
1 Connect the CAMERA connector on the rear of the CCU to the CAMERA connector on the camera head via a camera cable.



CAUTION:

- The camera cable has a plug on one end and a jack on the other end. Make sure the difference before connection.
- Do not forcibly bend the camera cable nor apply excessive force to the camera cable.
- Refer to the instructions accompanying the cable or camera head to be used for how to handle the camera cable.

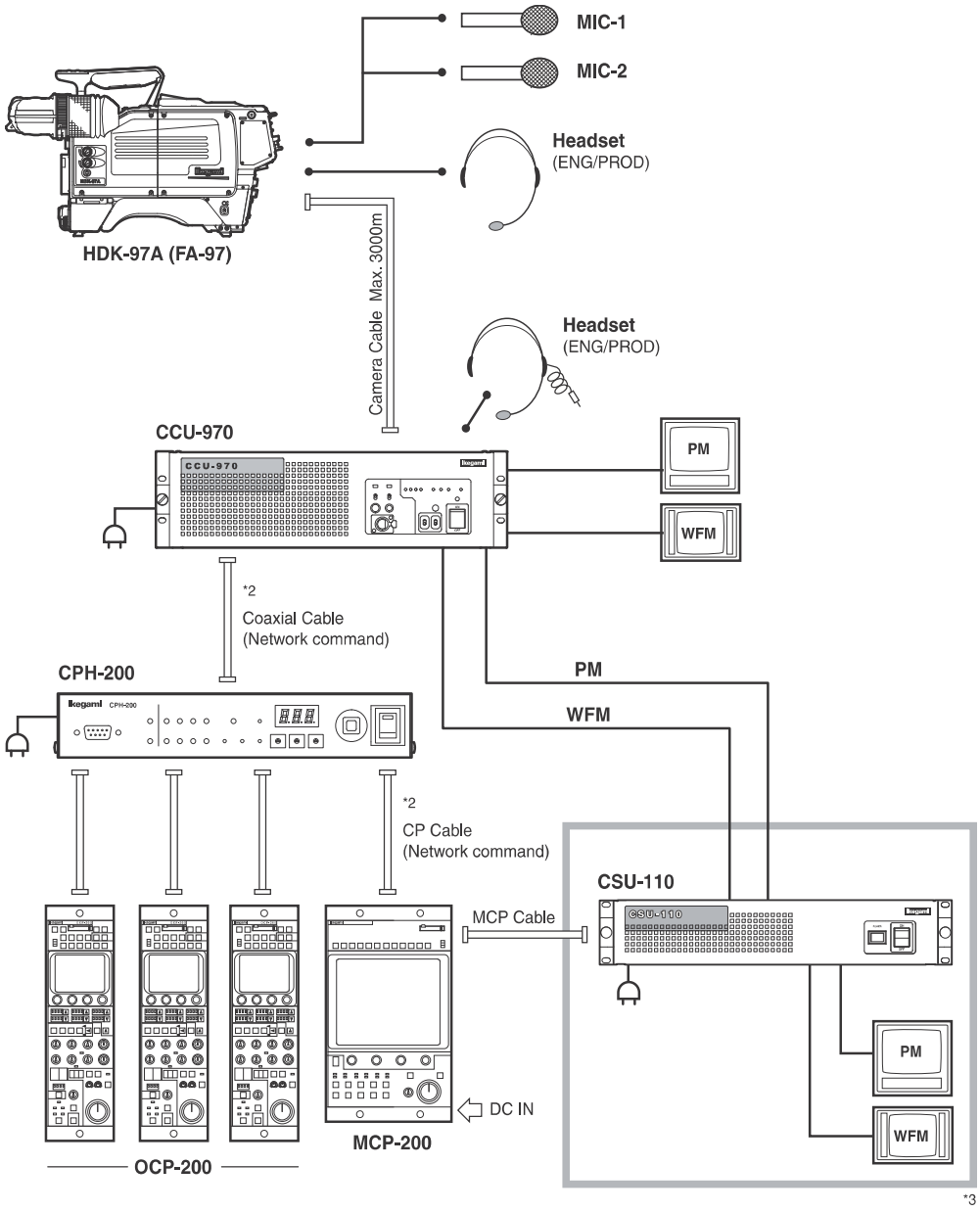
4.4 System Setup Diagram



Multiple Camera Operation

* When the OCP-200 is used, the maximum CP cable length is 80m.

■ *Network Operation*



*1 The CCU-970 can be operated when the network ID of the rotary switch on the PULSE module on the front of the CCU corresponds to the CCU No. set by an OPC or MCP.

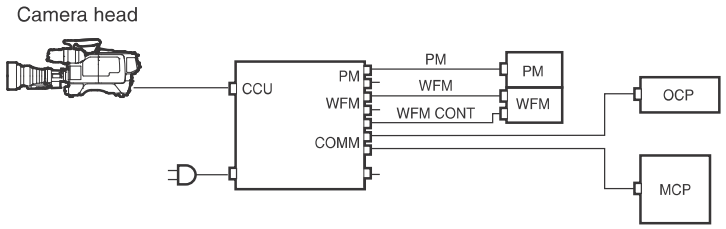
*2 For the maximum and minimum extension length of the cables, refer to "BSH-200/CPH-200 Setup Manual."

*3 For network operation, commands can be selected from an OCP, MCP, or CPH. For video signals, the operating configuration to select the signals from the CSU-110 is also accepted.
However, an external power supply (DC voltage) is required when the MCP-200 is used and the extension length of the cables is long.

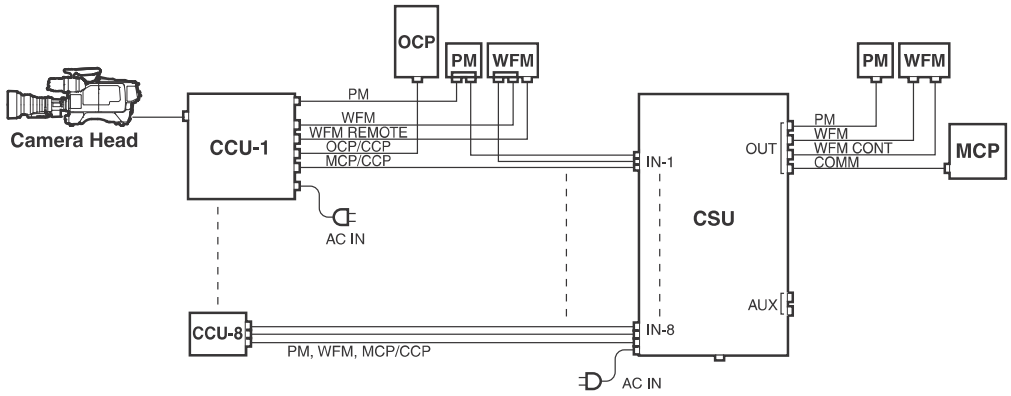
4.5 Operating Systems

You can choose and operate each control panel to be connected to the CCU-970, for your purpose.

■ *Example of Standard Configuration (1 camera head)*

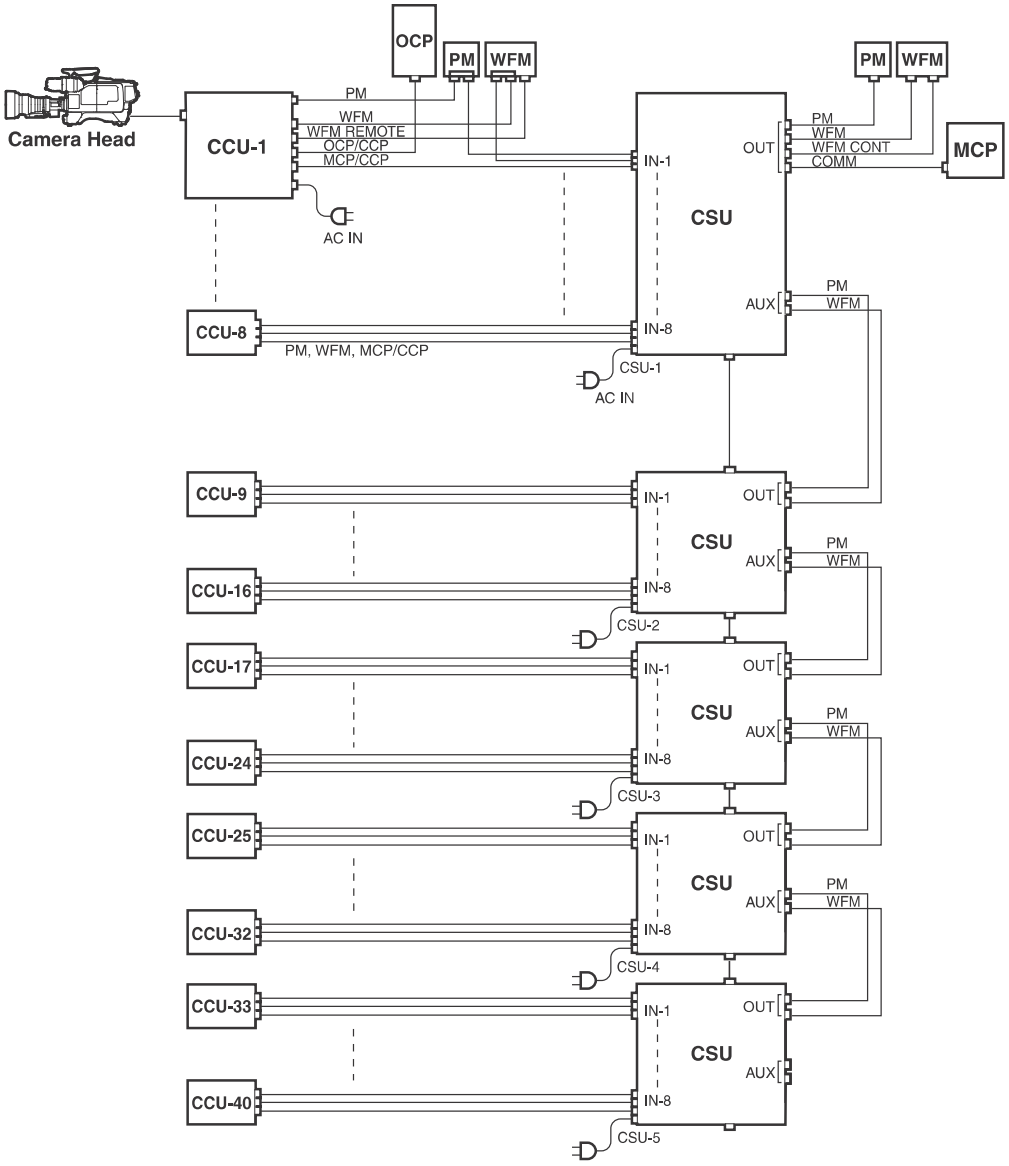


■ *Example of Configuration Up to 8 Camera Heads*



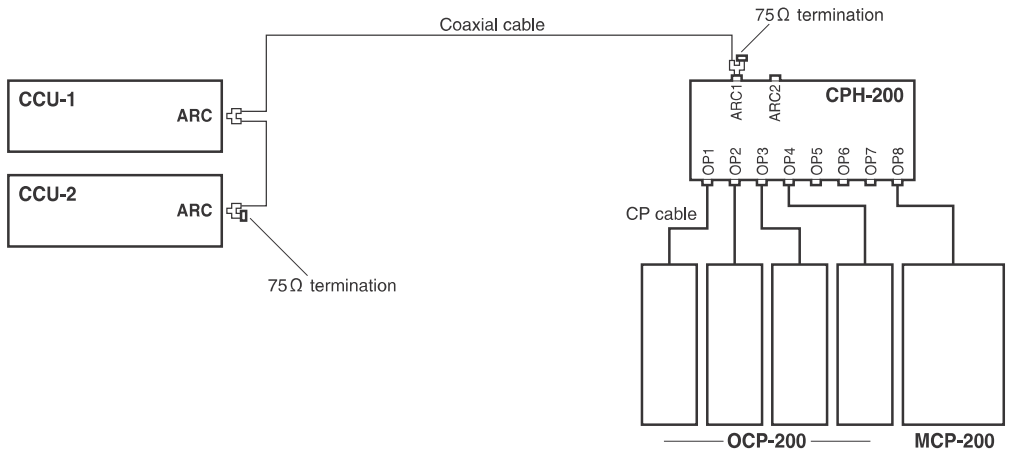
■ *Example of Configuration Up to 40 Camera Heads*

The number of camera head to be selected varies according to the MCP to be used.



■ *Network Connection (Basic bus connection)*

This connection configuration is available only for network-enabled CCU/BS such as the CCU-970.

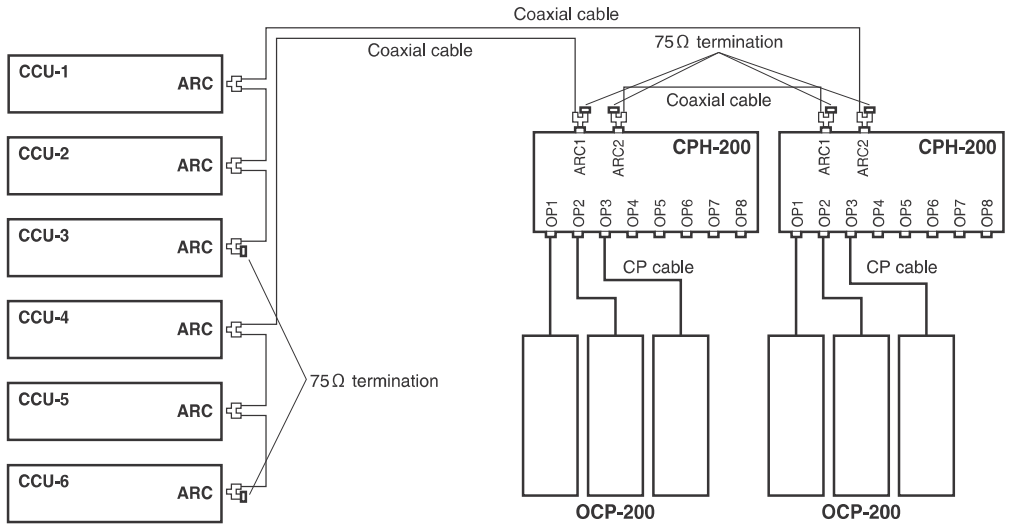


Note:

- The OCP/CCP connector and MCP/CCP connector on the CCU cannot be used with the network connector at the same time in this configuration.
- This product cannot be connected to the BSH-200 (BS HUB).

■ *Network Connection (Expansion bus connection)*

This connection configuration is available only for network-enabled CCU/BS such as the CCU-970.



Note:

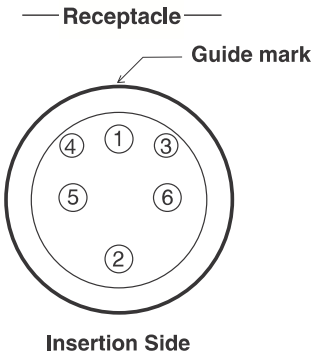
- The OCP/CCP connector and MCP/CCP connector on the CCU cannot be used with the network connector at the same time in this configuration.
- This product cannot be connected to the BSH-200 (BS HUB).

4.6 External Connections

■ *CAMERA Connector*

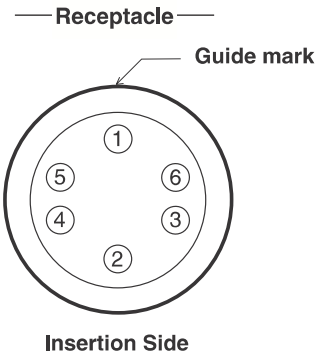
Used to connect the camera head to its CCU.
Two types of CAMERA connector are available.

[3K Series]



Camera head side : FCS015A-FR

[OPS Series]

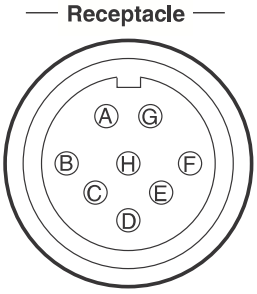


Camera head side : OPS-PR

Pin No.	Name	Function	I/O	External Interface
①	OPT H - C	Optical signal Camera -> CCU	IN	
②	OPT C - H	Optical signal CCU -> Camera	OUT	
③	MTL C - H	Control signal CCU -> Camera	OUT	
④	MTL H - C	Control signal Camera -> CCU	IN	
⑤	AC (H)	AC voltage (H) supplied from CCU to the camera head	OUT	
⑥	AC (C)	AC voltage (C) supplied from CCU to the camera head	OUT	

■ *POWER CONT Connector*

Used to control ON and OFF of the power of the camera head and the CCU from the OCP.

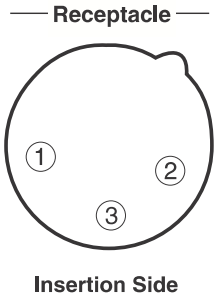


Camera head side : R05-R8F
Cable side : R05-PB8M (8-pin male plug)

Pin No.	Name	Function	I/O	External Interface
Ⓐ	PWR CONT (H)	CCU power ON/OFF control signal input (H)	IN	
Ⓑ	HP ON / OFF	Camera head power ON/OFF control signal input	IN	
Ⓒ	N . C	———————	—	
Ⓓ	N . C	———————	—	
Ⓔ	N . C	———————	—	
Ⓕ	N . C	———————	—	
Ⓖ	PWR CONT (C)	CCU power ON/OFF control signal input (C))	IN	
Ⓗ	GND	Ground for camera head power ON/OFF control signal	GND	

■ *MIC-1 OUT Connector and MIC-2 OUT Connector*

Used for microphone output.

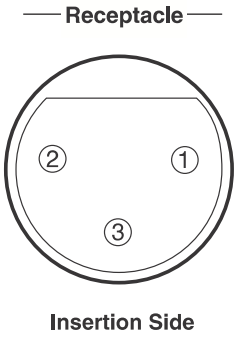


Camera head side : HA16RM-3PE (76)
Cable side : XLR-3-11C (3-pin female plug) or equivalent

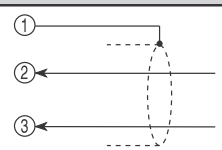
Pin No.	Name	Function	I/O	External Interface
①	MIC (S)	Shield for MIC output	GND	
②	MIC (H)	MIC (H) line balanced output	OUT	
③	MIC (C)	MIC (C) line balanced output	OUT	

■ *AUD TRUNK Connector*

Used to receive AUDIO TRUNK line signal.



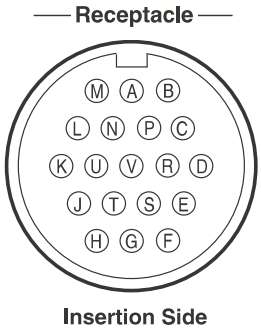
Camera head side : HA16PRM-3SE (71)
Cable side : XLR-3-12C (3-pin male plug) or equivalent

Pin No.	Name	Function	I/O	External Interface
①	SHIELD	Shield for AUDIO TRUNK signal	GND	
②	AUD T IN (H)	AUDIO TRUNK (H) line balanced input	IN	
③	AUD T IN (C)	AUDIO TRUNK (C) line balanced input	IN	

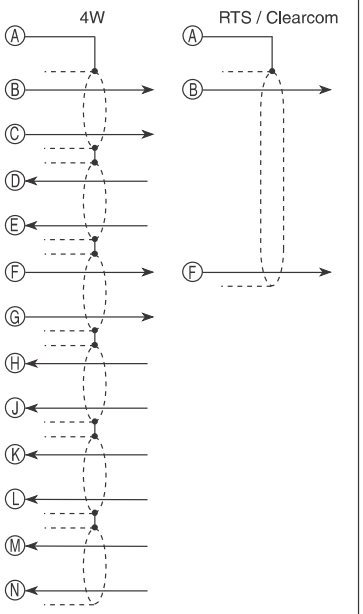
■ *INTERCOM Connector*

Used to connect an external intercom system.
Two types of INTERCOM connector are available.

[BTA S-1005B-compliant type]

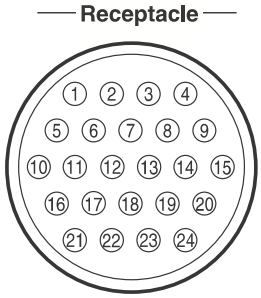


Camera head side : KPT 02E14-19P
Cable side : KPT 06F14-19S (19-pin female plug) or equivalent

Pin No.	Name	Function	I/O	External Interface
Ⓐ	SHIELD	Shield for each intercom and audio signal	GND	
Ⓑ	PROD C - S (H)	PROD intercom output (H) from CCU to system	OUT	
Ⓒ	PROD C - S (C)	PROD intercom output (C) from CCU to system	OUT	
Ⓓ	PROD S - C (H)	PROD intercom input (H) from system to CCU	IN	
Ⓔ	PROD S - C (C)	PROD intercom input (C) from system to CCU	IN	
Ⓕ	ENG C - S (H)	ENG intercom output (H) from CCU to system	OUT	
Ⓖ	ENG C - S (C)	ENG intercom output (C) from CCU to system	OUT	
Ⓗ	ENG S - C (H)	ENG intercom input (H) from system to CCU	IN	
Ⓙ	ENG S - C (C)	ENG intercom input (C) from system to CCU	IN	
Ⓚ	PGM - 1 (H)	PGM-1 audio input (H)	IN	
Ⓛ	PGM - 1 (C)	PGM-1 audio input (C)	IN	
Ⓜ	PGM - 2 (H)	PGM-2 audio input (H)	IN	
Ⓝ	PGM - 2 (C)	PGM-2 audio input (C)	IN	
Ⓟ	N . C	———————	—	
Ⓡ	R TALLY (+)	R TALLY signal input (+)	IN	
Ⓢ	G TALLY (+)	G TALLY signal input (+)	IN	
Ⓣ	N . C	———————	—	
Ⓤ	N . C	———————	—	
Ⓥ	TALLY COM	Ground for R TALLY signal input or G TALLY signal input	GND	

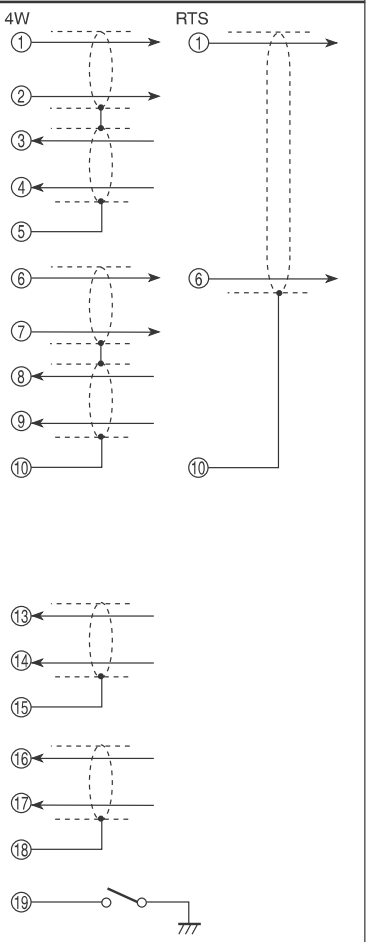
When only one external line is provided, the ENG line is used.

[24-pin type]



Camera head side : TRC01-C25R24MA
Cable side : TRC01-25P24FA (24-pin female plug) or equivalent

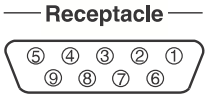
Pin No.	Name	Function	I/O	External Interface
①	PROD C - S (H)	PROD intercom output (H) from CCU to system	OUT	
②	PROD C - S (C)	PROD intercom output (C) from CCU to system	OUT	
③	PROD S - C (H)	PROD intercom input (H) from system to CCU	IN	
④	PROD S - C (C)	PROD intercom input (C) from system to CCU	IN	
⑤	PROD (S)	Shield for PROD intercom	GND	
⑥	ENG C - S (H)	ENG intercom output (H) from CCU to system	OUT	
⑦	ENG C - S (C)	ENG intercom output (C) from CCU to system	OUT	
⑧	ENG S - C (H)	ENG intercom input (H) from system to CCU	IN	
⑨	ENG S - C (C)	ENG intercom input (C) from system to CCU	IN	
⑩	ENG (S)	Shield for ENG intercom	GND	
⑪	N . C	———	—	
⑫	N . C	———	—	
⑬	PGM - 1 (H)	PGM-1 audio input (H)	IN	
⑭	PGM - 1 (C)	PGM-1 audio input (C)	IN	
⑮	PGM - 1 (S)	Shield for PGM-1 audio	GND	
⑯	PGM - 2 (H)	PGM-2 audio input (H)	IN	
⑰	PGM - 2 (C)	PGM-2 audio input (C)	IN	
⑱	PGM - 2 (S)	Shield for PGM-2 audio	GND	
⑲	REMOTE ISOLATE OFF	ON/OFF for REMOTE ISOLATE OFF: OPEN, ON: GND	IN	
⑳	N. C	———	—	
㉑	N. C	———	—	
㉒	N. C	———	—	
㉓	N. C	———	—	
㉔	N. C	———	—	



When the intercom system to be connected is one line, the ENG line is used.

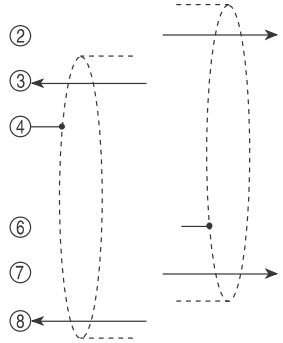
■ *RS422 TRUNK Connector*

This is an input/output connector for RS422 serial communication standard.



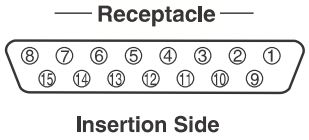
Insertion Side

Camera head side : DE-9SF-T-N
Cable side : D-sub connector (9-pin male plug and inch screws)

Pin No.	Name	Function	I/O	External Interface
①	N . C	———	—	
②	TR1 OUT (-)	Digital data output (-)	OUT	
③	TR1 IN (+)	Digital data input (+)	IN	
④	IN (S)	SHIELD	—	
⑤	N . C	———	—	
⑥	OUT (S)	SHIELD	—	
⑦	TR1 OUT (+)	Digital data output (+)	OUT	
⑧	TR1 IN (-)	Digital data input (-)	IN	
⑨	GND	Ground for input/output signal	GND	

■ *AUX Connector*

Used to control external devices (to support the special specification).

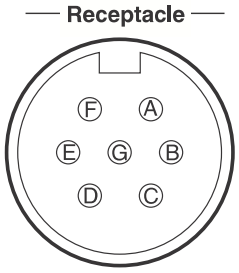


Camera head side : DA-15SF-T-N
Cable side : D-sub connector (15-pin male plug and inch screws)

Pin No.	Name	Function	I/O	External Interface
①	WFM CT0	Control signal output	OUT	
②	WFM CT1	Control signal output	OUT	
③	WFM CT2	Control signal output	OUT	
④	N . C	———————	—	
⑤	PREVIEW SW	Preview signal output (ON: GND)	—	
⑥	PREVIEW COM	Common preview signal output	—	
⑦	N . C	———————	—	
⑧	WFM CT3	Control signal output	OUT	
⑨	GND	Ground for control signal output	RET	
⑩	N . C	———————	(OUT)	
⑪	N . C	———————	—	
⑫	WFM CT4	Control signal output	OUT	
⑬	WFM CT5	Control signal output	OUT	
⑭	WFM CT6	Control signal output	OUT	
⑮	WFM CT7	Control signal output	OUT	

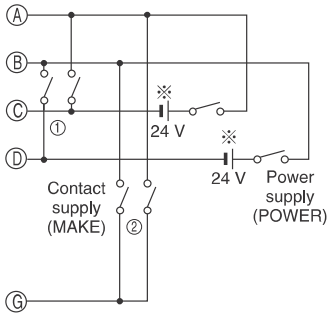
■ *TALLY IN Connector*

Used to receive tally control signal.



Camera head side : PRC 03-25A10-7M
Cable side : PRC 03-12A10-7F10.5 or equivalent

Pin No.	Name	Function	I/O	External Interface
Ⓐ	R TALLY (+)	R TALLY input (+)	IN	
Ⓑ	G TALLY (+)	G TALLY input (+)	IN	
Ⓒ	TALLY (-)	TALLY input (-)	IN	
Ⓓ	TALLY (-)	TALLY input (-)	IN	
Ⓔ	Y TALLY (+)	Y TALLY input (+)	IN	
Ⓕ	$\overline{\text{HPIND}}$	HEAD POWER ON indicator output	OUT	
Ⓖ	GND	Common TALLY	GND	



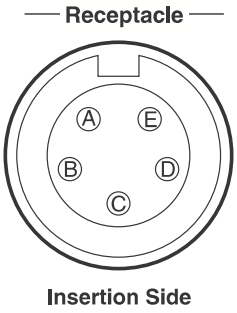
- Control DC input voltage (*) is in a nonpolarized state.
- MAKE can use either of ① and ② .
- Set the tally input mode (MAKE/POWER) by the switch on the AUX-A module.
- $\overline{\text{HPIND}}$ function is output from the open collector.

Note:

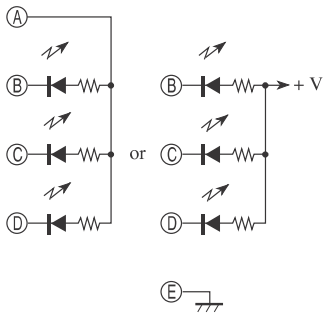
Y TALLY only supports contact supply (MAKE). Power supply (POWER) is currently not supported.

■ *TALLY OUT Connector*

Used to send TALLY control signal.



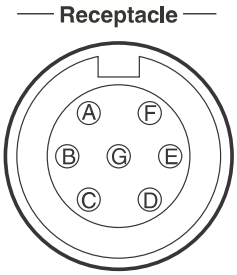
Camera head side : PRC05-RB5F1
Cable side : PRC 05-P5M or equivalent

Pin No.	Name	Function	I/O	External Interface
Ⓐ	+12 V OUT	+12V power output	OUT	
Ⓑ	R TALLY	R TALLY output (ON: GND)	OUT	
Ⓒ	Y TALLY/COM TALLY	Y TALLY output or COMMON TALLY output (ON: GND)	OUT	
Ⓓ	G TALLY	G TALLY output (ON: GND)	OUT	
Ⓔ	TALLY GND	Ground for TALLY signal	GND	

- Select one from Y TALLY output or COMMON TALLY output for the pin C.
  Use of COMMON TALLY OUT enables to control both R TALLY and G TALLY simultaneously.

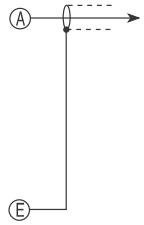
■ *WFM REMOTE Connector*

Used to send STAIR waveform signal for waveform monitor. (for NTSC waveform monitor)



Insertion Side

Camera head side : PRC 03-25A10-7F
Cable side : PRC 03-12A10-7M10.5 or equivalent

Pin No.	Name	Function	I/O	External Interface
Ⓐ	STAIR OUT	STAIR signal output	OUT	
Ⓑ	SEQ ON	Output of control signal which selects SEQ	OUT	
Ⓒ	NC	———————	—	
Ⓓ	-15 V RET	-15 V RET voltage	RET	
Ⓔ	GND	Ground for WFM control signal	GND	
Ⓕ	EXPAND	Ground for EXPAND control signal	OUT	
Ⓖ	-15 V IN	-15V input voltage	IN	

Depending on the waveform monitor to be used, the method for the external connection varies.
Cable connection examples for some waveform monitors are shown below.

[1730/1731]

WFM REMOTE	
FUNCTION	No.
STAIR OUT	A
SEQ ON	B
NC	C
-15 V RET	D
EXPAND	E
NC	F
-15 V IN	G

PRC03 - 12A10 - 7M10.5

REMOTE	
No.	FUNCTION
1	RGB STAIR
2	$\overline{\text{RGB ENABLE}}$
3	$\overline{\text{1 LIN / 1 FLD}}$
4	$\overline{\text{REMOTE SYNC ENABLE}}$
5	$\overline{\text{RECALL 2}}$
6	$\overline{\text{RECALL 3}}$
7	$\overline{\text{RECALL 1}}$
8	$\overline{\text{RECALL 4}}$
9	GND
10	REMOTE SYNC IN
11	$\overline{\text{STORE}}$
12	$\overline{\text{PRESET 4}}$
13	$\overline{\text{PRESET 1}}$
14	$\overline{\text{PRESET 2}}$
15	$\overline{\text{PRESET 3}}$

DA-15P : JAE or AMP
DA-C1-J10-36 (HOOD) : JAE or
206471-1 (HOOD) : AMP

[1740/1741/1750/1751]

WFM REMOTE	
FUNCTION	No.
STAIR OUT	A
SEQ ON	B
NC	C
-15 V RET	D
EXPAND	E
NC	F
-15 V IN	G

PRC03 - 12A10 - 7M10.5

REMOTE		1740 FUNCTION
No.	FUNCTION	
1	GND	
2	$\overline{\text{CHROMA FILTER}}$	
3	$\overline{\text{LOW PASS FILTER}}$	
4	$\overline{\text{2 LINE (2H)}}$	
5	$\overline{\text{+V}}$	
6	$\overline{\text{EXT BLANK}}$	
7	$\overline{\text{WFM SEL}}$	
8	REMOTE SYNC	SPARE 1
9	GND	SPARE 2
10	$\overline{\text{REMOTE SYNC ENABLE}}$	SPARE 3
11	$\overline{\text{VECTOR}}$	SPARE 4
12	$\overline{\text{SCH}}$	REMOTE ENABLE
13	$\overline{\text{REMOTE ENABLE}}$	
14	$\overline{\text{CH B}}$	
15	$\overline{\text{CAL}}$	
16	$\overline{\text{DC RECT}}$	
17	$\overline{\text{MAG}}$	
18	$\overline{\text{EXT REF}}$	
19	RGB STAIR CASE	
20	-12 V	
21	$\overline{\text{1 FLD}}$	
22	$\overline{\text{X5 VERT}}$	
23	$\overline{\text{R - Y (V AXIS) SEL}}$	
24	$\overline{\text{1 LINE (1H)}}$	
25	$\overline{\text{RGB ENABLE}}$	

DB - 25S - N
DB - C2 - J9 - S6 (HOOD)
(DB - 25P)

[1740A/1750A]

WFM REMOTE	
FUNCTION	No.
STAIR OUT	A
SEQ ON	B
NC	C
-15 V RET	D
EXPAND	E
NC	F
-15 V IN	G

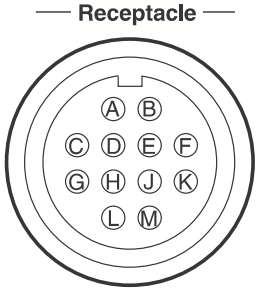
PRC03 - 12A10 - 7M10.5

REMOTE	
No.	FUNCTION
1	RGB/YRGB STAIR CASE
2	GND
3	STAIR CASE / EXT
4	EXT BLANK IN
5	REMOTE SYNC IN
6	REMOTE SYNC ENABLE
7	GND
8	+Y AUDIO IN
9	-Y AUDIO IN
10	-X AUDIO IN
11	+X AUDIO IN
12	+TIME CODE IN
13	-TIME CODE IN
14	GND
15	NC
16	NC
17	PRESET1
18	PRESET2
19	PRESET3
20	PRESET4
21	PRESET5
22	PRESET6
23	PRESET7
24	PRESET8
25	STORE

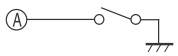
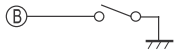
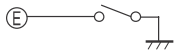
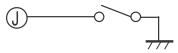
DB - 25P - N
DB - C8 - J10 - B2-1 (HOOD)
(DB - 25S)

■ *SCAN CONT Connector*

Used to receive control signal from an external system.



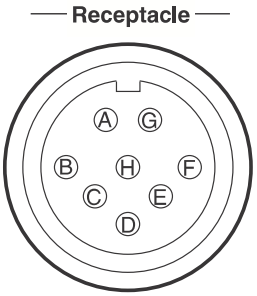
Camera head side : PRC05-RB12F1
Cable side : PRC05-PB12M1

Pin No.	Name	Function	I/O	External Interface
Ⓐ	SW'BLE ENABLE	Enables the function which switches the aspect ratio Enable: GND, Disable: OPEN	IN	
Ⓑ	16 : 9 ON	Control over switch of aspect ratio (valid only when pin Ⓐ is grounded) 16:9 : GND, 4:3 : OPEN	IN	
Ⓒ	N . C	———	—	
Ⓓ	N . C	———	—	
Ⓔ	LETTER BOX ON	Control over letter box ON : GND, OFF : OPEN	IN	
Ⓕ	N . C	———	—	
Ⓖ	N . C	———	—	
Ⓗ	N . C	———	—	
Ⓙ	TRIAX ON	CCU triax specification control signal (ON: GND)	—	
Ⓚ	N . C	———	—	
Ⓛ	+12 V	DC +12V power output	OUT	
Ⓜ	GND	Ground for DC +12V power output	GND	

- TRIAX ON for the pin J is an optional function.

■ *OCP/CCP Connector and MCP/CCP Connector*

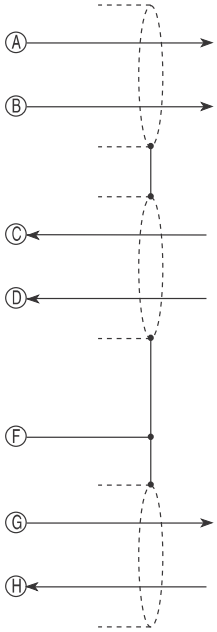
Used to connect each type of control panel.



Insertion Side

Camera head side : RPC05-RB8F1
Cable side : PRC05-PB8M or equivalent

Pin No.	Name	Function	I/O	External Interface
Ⓐ	HED (+)	Digital data input (+) from CCU to control panel	OUT	
Ⓑ	HED (-)	Digital data input (-) from CCU to control panel	OUT	
Ⓒ	HEC (+)	Digital data input (+) from control panel to CCU	IN	
Ⓓ	HEC (-)	Digital data input (-) from control panel to CCU	IN	
Ⓔ	+12 V	DC +12V power output for control panel	OUT	
Ⓕ	+12 V RET	DC +12V power RET	GND	
Ⓖ	INC C-CP	Audio signal output from CCU to control panel	OUT	
Ⓗ	INC CP-C	Audio signal input from control panel to CCU	IN	



CCU SETTINGS and ADJUSTMENT

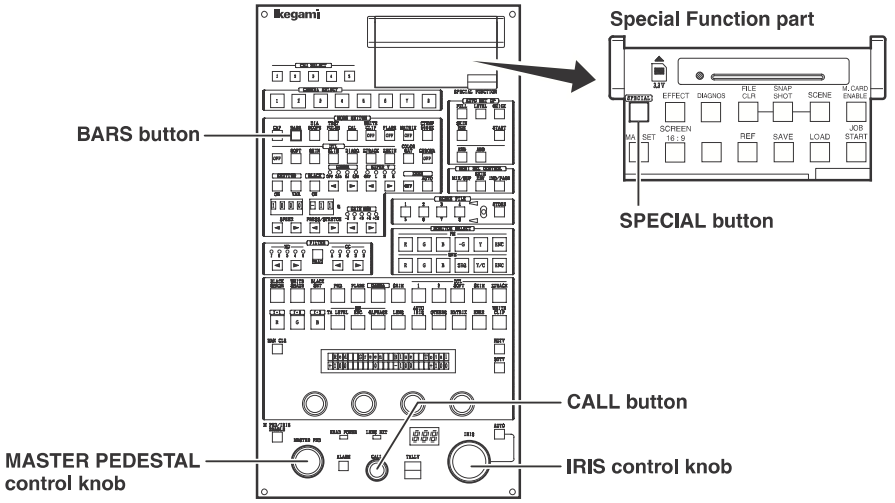
5

5.1 Settings from the CCU Menu

The menu operation for the CCU-970 is performed from the MCP or OCP. The setting of each item is performed by displaying the main menu/submenu screen on the PM screen.

Basic Operation of the Menu (Operation from the MCP)

The menu operation for the CCU-970 is performed from the MCP. The setting of each item is performed by displaying the main menu/submenu on the Picture Monitor (PM).



SPECIAL button/BARS button	:	Pressing the SPECIAL button then pressing the BARS button will switch to the menu mode and display the menu.
CALL button	:	Pressed to confirm the selection and setting.
MASTER PEDESTAL control knob/IRIS control knob	:	Used to select a setting item.

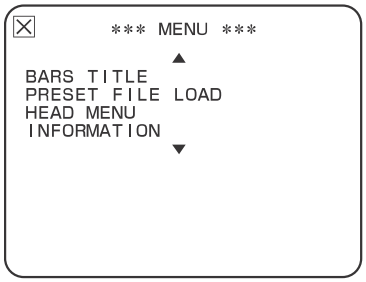
■ *Displaying the Main Menu*

This section explains how to display the main menu on the PM screen.

1 Press the SPECIAL button on the MCP.

2 Press the BARS button.

The main menu appears on the PM screen.



Note:

The flashing item on the main menu indicates the currently focused item. This flashing status is called the "flashing cursor" hereafter (displayed in gray in the screen example).

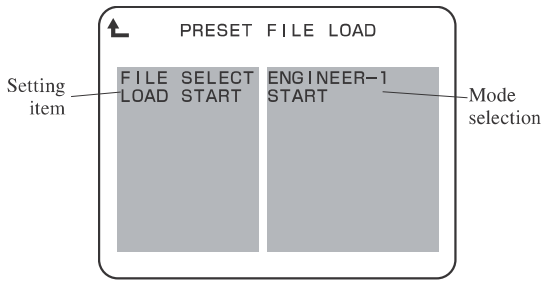
■ *Displaying the Submenu*

You can perform various settings on the submenu that is displayed from the main menu on the PM screen.

1 Make sure that the main menu is displayed on the PM screen.

2 Turn the MASTER PEDESTAL control knob or IRIS control knob on the MCP to position the flashing cursor on the setting item, and press the CALL button.

The submenu appears, on which you can perform various settings.



CAUTION:

Depending on the functions of the setting items, some items change the setting when the knob is turned; others change the setting when the CALL button is pressed.

Note:

- To return to the main menu, select "↰" and press the CALL button.
- The flashing item on the submenu indicates the currently focused item. This flashing status is called the "flashing cursor" hereafter (displayed in gray in the display example).
- Each time the CALL button is pressed, the flashing cursor switches to setting item -> mode selection -> setting item -> mode selection and so on.

■ *Exiting the Menu*

This section explains how to exit the main menu/submenu on the PM screen.

1 Exit the menu screen in the following two ways:

a) Select "☒" on the CCU main menu and press the CALL button.
b) Press the BARS button.
The main menu/submenu disappears.

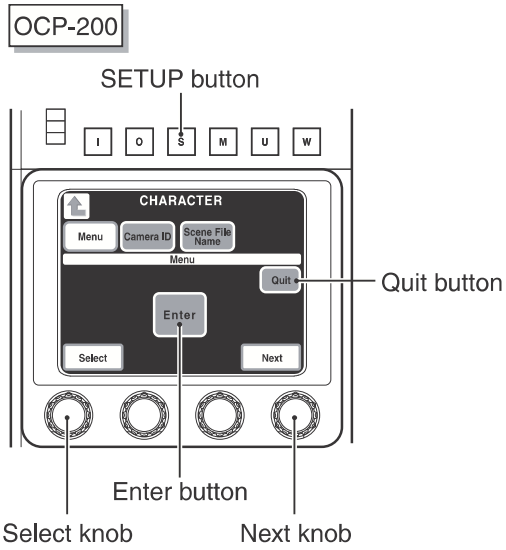
Basic Operation of the Menu (Operation from the OCP-200)

■ *Displaying the Main Menu*

This section explains how to display the main menu on the PM screen.

1 Press the SETUP button among the FUNCTION buttons on the OCP-200.

The screen shown in Fig.1 is displayed on the liquid crystal display (LCD) of the OCP.



2 Press the CHARACTER button on the LCD.

The screen shown in Fig.2 is displayed.

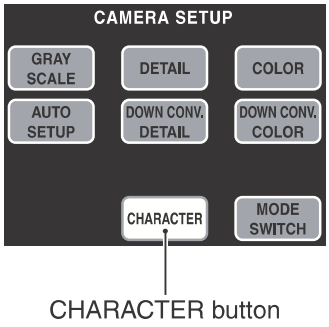


Fig.1

3 Press the Menu button on the LCD for a while.

The menu screen (Fig.3) appears on the LCD, and the main menu screen appears on the PM.

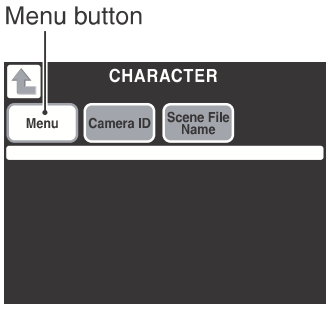


Fig.2

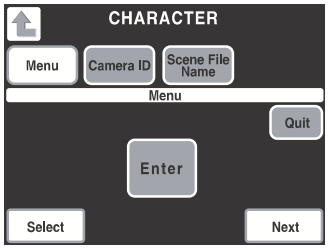


Fig.3 (Menu screen)

■ *Displaying the Submenu*

You can perform various settings on the submenu that is displayed from the main menu on the PM screen.

1 Make sure that the main menu screen is displayed on the PM screen.

2 Turn the Select knob or Next knob to position the flashing cursor on the setting item, and press the Enter button on the LCD.

The submenu appears, on which you can perform various settings.

CAUTION:

Depending on the functions of the setting items, some items change the setting when the knob is turned; others change the setting when the Enter button on the LCD is pressed.

■ *Exiting the Menu*

This section explains how to exit the main menu/submenu on the PM screen.

1 Exit the menu screen in the following ways:

a) Select "☒" on the CCU main menu and press the Enter button.
b) Press the QUIT button on the LCD.
c) Press the BARS button on the OCP.

Menu Configuration

The following lists the CCU-970 menu configuration.

Main menu name | Submenu name | Item	Description
☒	Exits the main menu.
■ MENU	
BARS TITLE	
↰	Returns to the main menu.
DISPLAY	Turns ON/OFF the BARS TITLE character display.
TITLE EDIT	Edits the BARS TITLE characters.
POSITION	Sets the display position of the BARS TITLE characters.
PRESET FILE LOAD	
↰	Returns to the main menu.
FILE SELECT	Sets the file to be initialized.
LOAD START	Sets the start of the initialization.
HEAD MENU	
	Sets the camera head menu.
INFORMATION	
↰	Returns to the main menu.
MODULE SW	Displays the switch setting status of the PULSE module and CONT/REF module.
ROM VER	Displays the ROM version of the CONT/REF module.
CHECK SUM	Displays the ROM data check sum.
■ ENGINEER (1/2)	
SYSTEM FORMAT	
↰	Returns to the main menu.
1080XXX or 720PXX	Selects the system format.
OUTPUT FORMAT	
↰	Returns to the main menu.
HD OUT-1	Sets HDTV output1 (2 channels) formats.
HD OUT-2	Sets HDTV output2 (2 channels) formats.
HD PM OUT-1	Sets HDTV PM output1 format.
HD PM OUT-2	Sets HDTV PM output2 format.
SD SCREEN MODE	Sets the screen display mode.
SD PM OUT-1	Selects the signal type for SD-PM output1.
SD PM OUT-2	Selects the signal type for SD-PM output2.
WFM OUT-1	Sets the type of the signal for WFM output1.
WFM OUT-2	Sets the type of the signal for WFM output2.
ANALOG OUT	Sets the type of the analog component output.
ANALOG SYNC ADD	Sets whether to add synchronization signals to the analog component output.
SYNC OUT	Sets the format of the synchronization signal output.
HD-SYNC 2-3ID ADD	Sets whether to embed pulse signals, which counted 1 to 5 frames, in the SYNC output.
SD-10 FIELD ID SIG	Selects whether to embed pulse signals (level 40IRE), which counted 1 to 5 frames on 15H and 278H, in the ENC signal (SMPTE 318M-compliant).
RET VIDEO FORMAT	
↰	Returns to the main menu.
FRAME SYNCHRO	Sets ON/OFF of the frame synchronization function.
RET1 VIDEO FORMAT	Sets the format of the return signal input to the camera head.
RET2 VIDEO FORMAT	
RET3 VIDEO FORMAT	
RET4 VIDEO FORMAT	
SDTV TYPE	Sets the type of the SDTV return signal input.
SD SCREEN MODE	Sets the screen display mode.
V PHASE	Sets the vertical phase.

PHASE CONTROL

- ↰ ..... Returns to the main menu.
- PRIORITY ..... Sets the priority system.
- SYNC CONT ..... Sets the vertical synchronization phase in the HDTV format and in the SDTV format each.
- HD MASTER V PHASE ..... Adjusts the vertical phase of the HDTV output signals to match the input GENLOCK signal.
- HD OUT H PHASE ..... Adjusts the horizontal phase of the HD OUT signals to match the input GENLOCK signal.
- HD PM H PHASE ..... Adjusts the horizontal phase of the HD PM OUT signals to match the input GENLOCK signal.
- HD ANALOG H PHASE ..... Adjusts the horizontal phase of the HD ANALOG OUT signals to match the input GENLOCK signal.
- SD MASTER V PHASE ..... Adjusts the vertical phase of the SDTV output signals to match the input GENLOCK signal.
- SD SC PHASE COARSE ..... Coarse adjusts the sub carrier phase.
- SD SC PHASE FINE ..... Fine adjusts the sub carrier phase.
- SD SDI H PHASE ..... Adjusts the horizontal phase of the SD SDI OUT signals to match the input GENLOCK signal.
- SD ENC H PHASE ..... Adjusts the horizontal phase of the SD ENC OUT signals to match the input GENLOCK signal.
- SD ANALOG H PHASE ..... Adjusts the horizontal phase of the SD ANALOG OUT signals to match the input GENLOCK signal.
- SD PM H PHASE ..... Adjusts the horizontal phase of the SD PM OUT signals to match the input GENLOCK signal.
- SD WFM H PHASE ..... Adjusts the horizontal phase of the SD WFM OUT signals to match the input GENLOCK signal.
- SYNC OUT H PHASE ..... Adjusts the horizontal phase of external synchronization output.
- SYNC OUT V PHASE ..... Adjusts the vertical phase of external synchronization output.

AUDIO MANAGEMENT

- ↰ ..... Returns to the main menu.
- HD SYS EMBEDDED
  - HD OUT ..... Sets whether to embed audio signals to HD OUT signals.
  - HD PM ..... Sets whether to embed audio signals to HD PM OUT signals.
  - HD WFM ..... Sets whether to embed audio signals to HD WFM OUT signals.
- SD SYS EMBEDDED
  - SD SDI ..... Sets whether to embed audio signals to SD SDI OUT signals.
  - SD PM-1 ..... Sets whether to embed audio signals to SD PM-1 OUT signals.
  - SD PM-2 ..... Sets whether to embed audio signals to SD PM-2 OUT signals.
  - SD WFM ..... Sets whether to embed audio signals to SD WFM OUT signals.
- MASTER DELAY ..... Sets the amount of delay for the audio signals of all channels.
  - HD SYS DELAY ..... Sets the amount of delay for the audio signals of HDTV channels.
  - SD SYS DELAY ..... Sets the amount of delay for the audio signals of SDTV channels.
  - DIGITAL DELAY ..... Sets the amount of delay of the digital audio output.
  - MIC1/2 OUT DELAY ..... Sets the amount of delay of MIC output.

■ **ENGINEER (2/2)**

HDTV VIDEO PROCESS

- ↰ ..... Returns to the main menu.
- HV SLIM DTL TYPE ..... Sets a horizontal and/or vertical SLIM DTL for HDTV.
- V SLIM DTL FREQ ..... Sets a boost band and boost frequency for HDTV.
- V DTL FILTER ..... Turns ON/OFF a vertical DTL filter.
- FINE DTL ..... Sets the FINE DTL for HDTV.
- PbPr FILTER ..... Sets filter characteristic of HDTV color-difference signals.
- H FILTER ..... Sets the horizontal filter for HDTV output.
- V FILTER ..... Sets the vertical filter for HDTV output.
- MOTION DETECT ..... Sets the motion detection of HDTV output.
- GAMUT CLIP ..... Sets ON/OFF of the gamut clip function.
  - LEVEL ..... Sets the gamut clip level for HDTV output.
- HDTV BARS TYPE ..... Sets the type of the HDTV color bar.
  - ARIB BARS TYPE ..... Sets the pattern of the ARIB bar.
  - SMPTE BARS TYPE1 ..... Sets the pattern of the SMPTE bar.
  - SMPTE BARS TYPE2
- CCU MENU&HUE MARKER ..... Sets the main output of CCU MENU/ HUE MARKER.
- SKIN TONE&COLOR KEY ..... Sets the main output of SKIN DTL/COLOR DTL KEY signal.
- CHAR LEVEL ..... Sets the character level on the HD OUT signals.
- CHAR BG LEVEL ..... Sets the background level of characters on the HD OUT signals.

SDTV VIDEO PROCESS

- ↰ ..... Returns to the main menu.
- HV SLIM DTL TYPE ..... Sets a horizontal and/or vertical SLIM DTL for SDTV.
- V SLIM DTL FREQ ..... Sets a boost band and boost frequency for SDTV.
- FINE DTL ..... Sets the FINE DTL for SDTV.
- COMB ..... Sets in the factory.
- COMB GAIN ..... Sets in the factory.
- H FILTER ..... Sets the horizontal filter for SDTV output.
- V FILTER ..... Sets the vertical filter for SDTV output.
- MOTION DETECT ..... Sets the motion detection of SDTV output.
- GAMUT CLIP ..... Sets ON/OFF of the gamut clip function.
  - LEVEL ..... Sets the gamut clip level for SDTV output.
- SDTV SETUP SEL ..... Sets in the factory.
- SDTV BARS TYPE ..... Sets the pattern of the SDTV bar.
- CHAR LEVEL ..... Sets the character level on the SDTV OUT signals.
- CHAR BG LEVEL ..... Sets the background level of characters on the SDTV OUT signals.

HD PM VIDEO PROCESS

- ↰ ..... Returns to the main menu.
- PM DTL ..... Sets the DTL for HD PM output.
  - H LEVEL ..... Sets the horizontal level of DTL.
  - V LEVEL ..... Sets the vertical level of DTL.
- FRAME MARKER ..... Sets the frame marker for HD PM output.
- ACTION MARKER ..... Sets the action marker for HD PM output.
- TITLE MARKER ..... Sets the title marker for HD PM output.
- CENTER MARKER ..... Sets the center marker for HD PM output.
- SIDE MASK ..... Sets the side mask for HD PM output.
  - CONTRAST ..... Adjusts the side mask contrast.
  - BRIGHT ..... Adjusts the side mask brightness.
- SIDE MASK MARKER ..... Sets the side mask marker for HD PM output.
  - WIDTH ..... Selects the side mask marker width.
- CHAR LEVEL ..... Sets the character level on the HD PM OUT signals.
- CHAR BG LEVEL ..... Sets the background level of characters on the HD PM OUT signals.

SD PM VIDEO PROCESS

- ↰ ..... Returns to the main menu.
- PM DTL ..... Sets the DTL for SD PM output.
  - H LEVEL ..... Sets the horizontal level of DTL.
  - V LEVEL ..... Sets the vertical level of DTL.
- FRAME MARKER ..... Sets the frame marker for SD PM output.
- ACTION MARKER ..... Sets the action marker for SD PM output.
- TITLE MARKER ..... Sets the title marker for SD PM output.
- CENTER MARKER ..... Sets the center marker for SD PM output.
- SIDE MASK ..... Sets the side mask for SD PM output.
  - CONTRAST ..... Adjusts the side mask contrast.
  - BRIGHT ..... Adjusts the side mask brightness.
- SIDE MASK MARKER ..... Sets the side mask marker for SD PM output.
  - WIDTH ..... Selects the side mask marker width.
- CHAR LEVEL ..... Sets the character level on the SD PM OUT signals.
- CHAR BG LEVEL ..... Sets the background level of characters on the SD PM OUT signals.

FUNCTION SETTING

- ↰ ..... Returns to the main menu.
- INCOM LINE SEL ..... Sets the number of intercom lines at the system side.
- CAM PGM NO. ENABLE ..... Sets whether the CCU manages the camera program numbers.
- CAM PGM NO. SET ..... Sets how to display the camera program numbers for the camera head and control panel.
- CAM CODE ..... option
- SAFETY&H.PWR ..... option
- REPEATER MODE ..... option
- CAM PWR CONT ..... option
- SYNC FOLLOW ..... Sets whether output signals are made to follow the format of GENLOCK signal.
- OUTPUT PRIORITY ..... Sets the priority system format.
- Q-TV1 LEVEL ..... Adjusts the Q-TV1 level.
- Q-TV1 BLACK ..... Adjusts the Q-TV1 black level.
- Q-TV2 LEVEL ..... Adjusts the Q-TV2 level.
- Q-TV2 BLACK ..... Adjusts the Q-TV2 black level.

ENGINEER SET FILE RENEW
- ↰ ..... Returns to the main menu.
- FILE SELECT..... Sets the number of ENGINEER file.
- DATA RENEW MODE..... Renew the ENGINEER file.

PASSWORD ENTRY..... Sets the password.

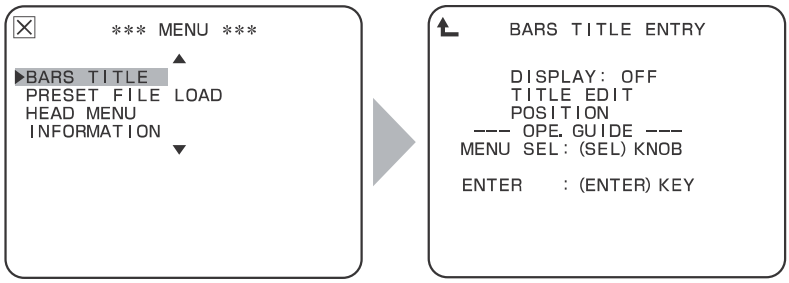
PROGRAM UPDATE
- ↰ ..... Returns to the main menu.
- CCU ROM..... Execute program update mode.

BARS TITLE

BARS TITLE sets the bars title related data.

Reference:

Refer to the manual for each control panel for details on how to set the bars title data.

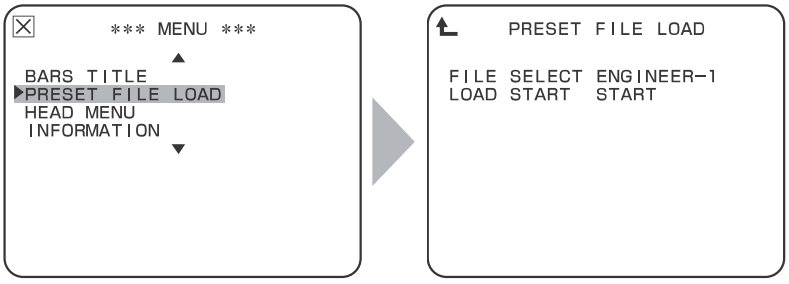


Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "BARS TITLE," and press the CALL button.

The submenu "BARS TITLE ENTRY" is displayed, on which you can perform various settings.

PRESET FILE LOAD

PRESET FILE LOAD loads the PRESET file.



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "PRESET FILE LOAD," and press the CALL button.

The submenu "PRESET FILE LOAD" is displayed, on which you can perform various settings.

Setting Item	Set Value	Description
FILE SELECT	ENGINEER-1	Sets the ENGINEER-1 file
	ENGINEER-2	Sets the ENGINEER-2 file
	ENGINEER-3	Sets the ENGINEER-3 file
	FACTORY	Sets the FACTORY file
LOAD START	READY	Ready for initialization.
	START	Start initialization.
	CANCEL	Cancels initialization.

1 Positions the flashing cursor on "LOAD START," and presses the CALL button.

Flashing cursor moves to the mode setting and also the display of the mode setting value switches from "READY" to "START."

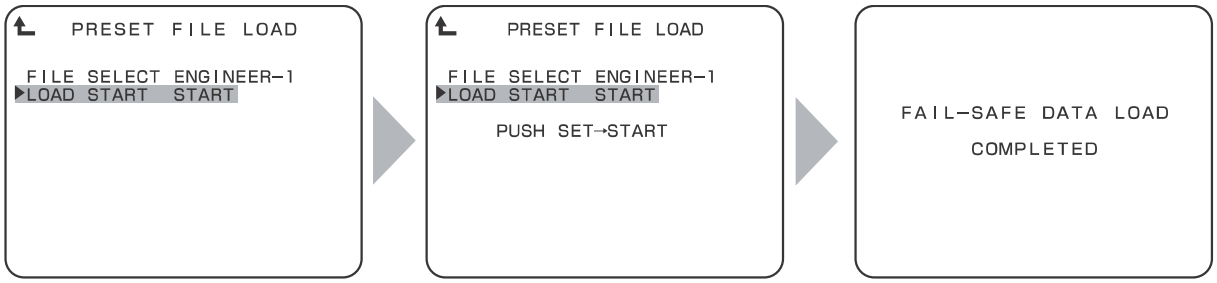
2 Turns the MASTER PEDESTAL control knob or IRIS control knob to adjust the setting value, and presses the CALL button.

The value can be confirmed.
- When "CANCEL" is selected, the setting is canceled and "PRESET FILE LOAD" exits.
- When "START" is selected, "PUSH SET → START" is displayed in the bottom of the screen.

When you select "START", take the step 3.

3 Presses the CALL button.

Starts initialization.
After reading data, "FAIL-SAFE DATA LOAD COMPLETED" is displayed.
And after that, CCU restarts and initialization is completed.



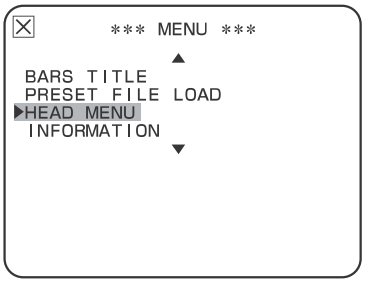
Position the flashing cursor on "LOAD START," and confirm the selection.

When "START" is selected, the message is displayed in the bottom of the screen.

"FAIL-SAFE DATA LOAD COMPLETED" is displayed in the middle of the screen.

HEAD MENU

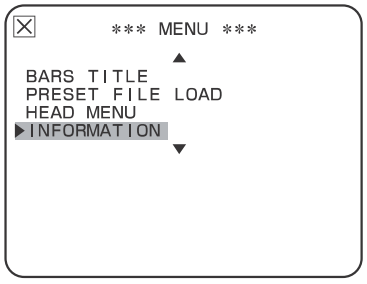
The camera head menu is displayed, and its control is possible.



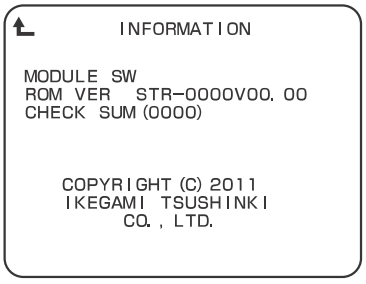
Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "HEAD MENU," and press the CALL button.

INFORMATION

INFORMATION displays the DIP switch settings and ROM version.



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on "INFORMATION," and press the CALL button.

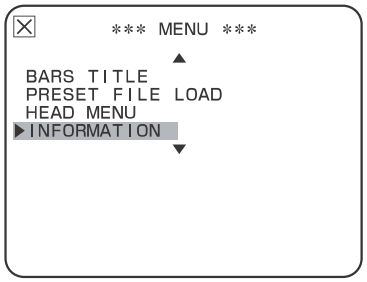


The submenu "INFORMATION" is displayed, on which you can check the settings.

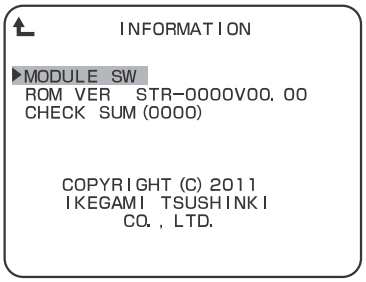
Setting Item	Set Value	Description
MODULE SW	-	Displays the DIP switch settings of the PULSE module and CONT/REF module.
ROM VER	-	Displays ROM version.
CHECK SUM	-	Displays the ROM check sum.

■ *MODULE SW*

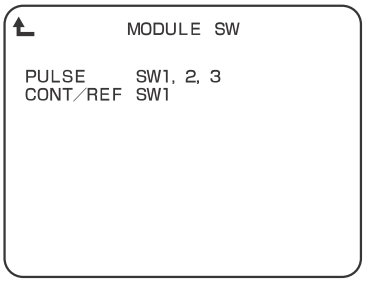
MODULE SW displays the DIP switch settings of the PULSE module and CONT/REF module.



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on "INFORMATION," and press the CALL button.

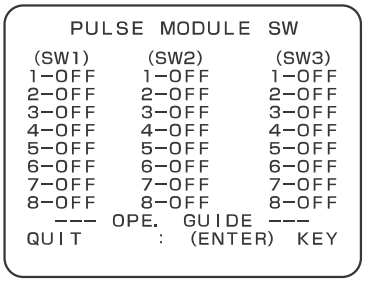


The submenu "INFORMATION" is displayed. Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on "MODULE SW," and press the CALL button.



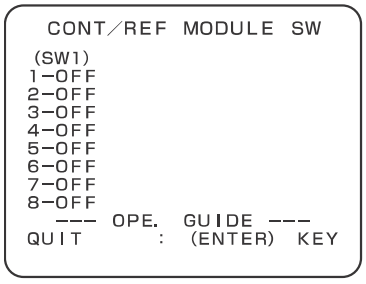
The submenu "MODULE SW" is displayed. Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the switch number, and press the CALL button.

● When "PULSE" is selected



The DIP switch settings of the PULSE module are displayed.

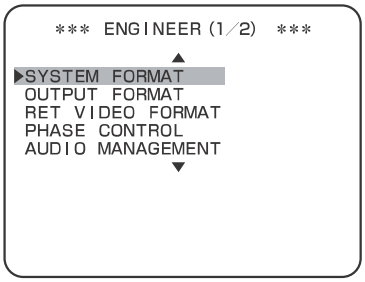
● When "CONT/REF" is selected



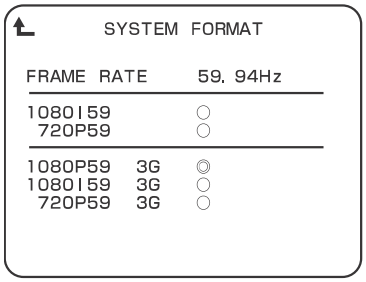
The DIP switch settings of the CONT/REF module are displayed.

SYSTEM FORMAT

SYSTEM FORMAT sets the system format.



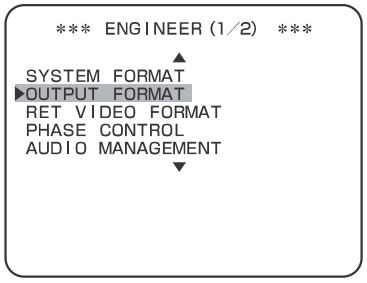
Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "SYSTEM FORMAT," and press the CALL button.



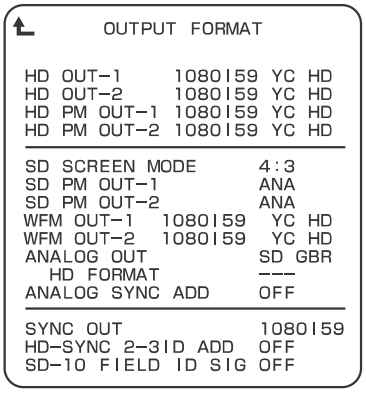
Position the flashing cursor on the format to set, and press the CALL button. Then the display changes to " ◎ ." (The figure is the case that FRAME RATE is 59.94Hz.)

OUTPUT FORMAT

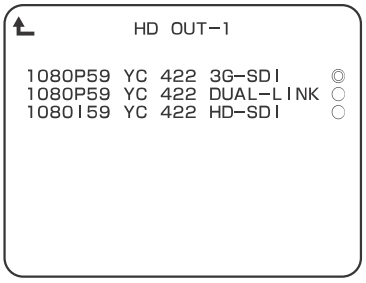
OUTPUT FORMAT sets the output format.



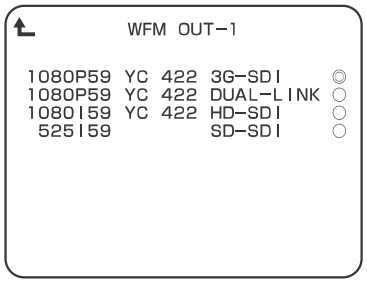
Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "OUTPUT FORMAT," and press the CALL button.



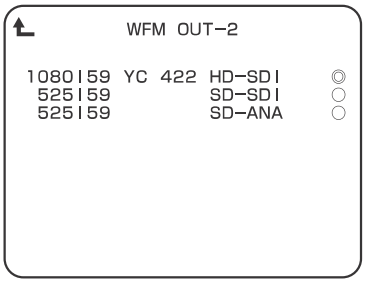
The submenu "OUTPUT FORMAT" is displayed, on which you can perform various settings.



This submenu is displayed in "HD OUT-1," "HD OUT-2," "HD PM OUT-1," and "HD PM OUT-2." (The figure is the case that SYSTEM FORMAT is 1080P59.)



This submenu is displayed in "WFM OUT-1." (The figure is the case that SYSTEM FORMAT is 1080P59.)



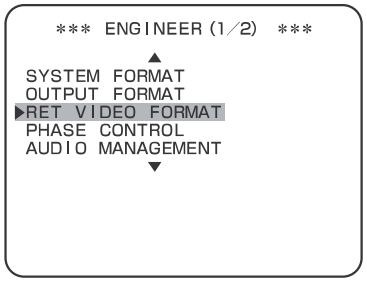
This submenu is displayed in "WFM OUT-2." (The figure is the case that SYSTEM FORMAT is 1080P59.)

Setting Item	Set Value			Description
HD OUT-1	-			Position the flashing cursor on the format to set, and press the CALL button. Then the display changes to " ◎."
HD OUT-2	-			Position the flashing cursor on the format to set, and press the CALL button. Then the display changes to " ◎."
HD PM OUT-1	-			Position the flashing cursor on the format to set, and press the CALL button. Then the display changes to " ◎."
HD PM OUT-2	-			Position the flashing cursor on the format to set, and press the CALL button. Then the display changes to " ◎."
SD SCREEN MODE	4:3			Sets the screen display mode to "4:3."
	16:9			Sets the screen display mode to "16:9."
	LETTER			Sets the screen display mode to "Letterbox."
SD PM OUT-1	SDI			Selects the SD-PM output1 to the SD-SDI signal.
	ANA			Selects the SD-PM output1 to the SDTV analog signal.
SD PM OUT-2	SDI			Selects the SD-PM output2 to the SD-SDI signal.
	ANA			Selects the SD-PM output2 to the SDTV analog signal.
WFM OUT-1	-			Position the flashing cursor on the format to set, and press the CALL button. Then the display changes to " ◎."
WFM OUT-2	-			Position the flashing cursor on the format to set, and press the CALL button. Then the display changes to " ◎."
ANALOG OUT	SD			Sets the analog component output to "SDTV."
	HD			Sets the analog component output to "HDTV."
	GBR			Sets the analog component output to "GBR."
	YPbPr or YCbCr			Sets the analog component output to "YPbPr" (when "HDTV" is selected) or "YCbCr" (when "SDTV" is selected).
HD FORMAT	-			-
ANALOG SYNC ADD	(HDTV selected)	(GBR selected)	OFF	Sets not to add tri-sync signals to all the analog HDTV RGB output.
			ON	Sets to add tri-sync signals to all the analog HDTV RGB output.
		(YPbPr selected)	Y ONLY	Sets to add tri-sync signals only to the Y signal among the analog HDTV YPbPr output.
			ALL	Sets to add tri-sync signals to all the analog HDTV YPbPr output.
	(SDTV selected)	(GBR selected)	OFF	Sets not to add tri-sync signals to all the analog SDTV RGB output.
			ON	Sets to add tri-sync signals to all the analog SDTV RGB output.
		(YCbCr selected)	Y ONLY	Sets to add tri-sync signals only to the Y signal among the analog SDTV YCbCr output.
SYNC OUT	1080P59.			The synchronization signal for the external synchronization output associates with the "1080P59.94" format.
	1080I59.			The synchronization signal for the external synchronization output associates with the "1080I59.94" format.
	1080P23.SF			The synchronization signal for the external synchronization output associates with the "1080P23.97 segment frame" format.
	1080P23.			The synchronization signal for the external synchronization output associates with the "1080P23.97" format.
	720P59.			The synchronization signal for the external synchronization output associates with the "720P59.94" format.
	1080P50.			The synchronization signal for the external synchronization output associates with the "1080P50" format.
	1080I50.			The synchronization signal for the external synchronization output associates with the "1080I50" format.
	720P50.			The synchronization signal for the external synchronization output associates with the "720P50" format.
	SDTV.			The external synchronization output becomes the SDTV synchronization signal.
HD-SYNC 2-3ID ADD*	OFF			Sets not to embed pulse signals, which counted 1 to 5 frames, in the SYNC output.
	ON			Sets to embed pulse signals, which counted 1 to 5 frames, in the SYNC output.
SD-10 FIELD ID SIG	OFF			Sets not to embed pulse signals (level 40IRE), which counted 1 to 5 frames on 15H and 278H, in the ENC signal.
	ON			Sets to embed pulse signals (level 40IRE), which counted 1 to 5 frames on 15H and 278H, in the ENC signal.

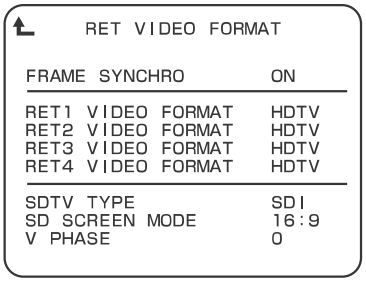
* When "OUT1/OUT2 FORMAT" of "HDTV CONT (1/2)" is either "1080I59.PD," "1080P23.SF" or "1080P23," and "SYNC OUT SEL" is other than "SDTV," selecting ON/OFF is enabled.

RET VIDEO FORMAT

RET VIDEO FORMAT sets the return video signals.



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "RET VIDEO FORMAT," and press the CALL button.



The submenu "RET VIDEO FORMAT" is displayed, on which you can perform various settings.

Setting Item	Set Value	Description
FRAME SYNCHRO	OFF	Sets the function to synchronize the RET signal to be input with the CCU to OFF.
	ON	Sets the function to synchronize the RET signal to be input with the CCU to ON.
RET1 VIDEO FORMAT	HDTV *1	Selects "HD-SDI" from the RET1 signal input to the HD RET IN module and SD RET IN module.
	SD-SDI/(SDTV) *3	Selects "SD-SDI" from the RET1 signal input to the HD RET IN module and SD RET IN module.
RET2 VIDEO FORMAT	HDTV *1	Selects "HD-SDI" from the RET2 signal input to the HD RET IN module and SD RET IN module.
	SD-SDI/(SDTV) *3	Selects "SD-SDI" from the RET2 signal input to the HD RET IN module and SD RET IN module.
RET3 VIDEO FORMAT *2	HDTV *1	Selects "HD-SDI" from the RET3 signal input to the HD RET IN module and SD RET IN module.
	SD-SDI	Selects "SD-SDI" from the RET3 signal input to the HD RET IN module and SD RET IN module.
RET4 VIDEO FORMAT *2	HDTV *1	Selects "HD-SDI" from the RET4 signal input to the HD RET IN module and SD RET IN module.
	SD-SDI	Selects "SD-SDI" from the RET4 signal input to the HD RET IN module and SD RET IN module.
SDTV TYPE *3	SDI	Sets to "SD-SDI" when "SDTV" is selected in RET VIDEO FORMAT and the input RET signal is "SD-SDI."
	VBS (option)	Sets to "VBS" when "SDTV" is selected in RET VIDEO FORMAT and the input RET signal is "VBS."
SD SCREEN MODE	4:3	Sets the screen display mode to "4:3."
	16:9	Sets the screen display mode to "16:9."
	LETTER	Sets the screen display mode to "Letterbox."
V PHASE	Sets the vertical phase.	

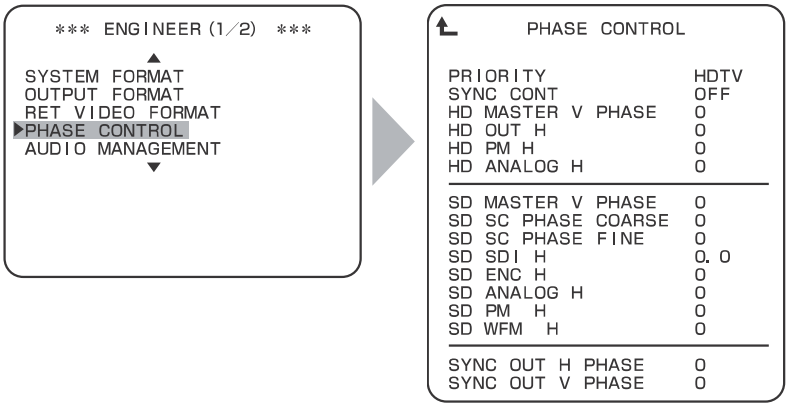
*1 When the SDTV RET module has not been installed, the set value is fixed to "HDTV." In this case, the setting is displayed as "(HD)."

*2 When FRAME SYNCHRO is set to "ON," the RET input supports 2 channels, and items for RET3 VIDEO FORMAT and RET4 VIDEO FORMAT are not displayed.

*3 When the SD RET IN module employs the RET2 channel specification (enabled by the switch in the module), "SDTV" is displayed for RET VIDEO FORMAT, and then "SDI" or "VBS" can be selected from SDTV TYPE.
However, when FRAME SYNCHRO is set to "ON," the setting of RET VIDEO FORMAT is fixed to "SDI," and the item for SDTV TYPE is not displayed.

PHASE CONTROL

PHASE CONTROL sets the various phases.



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "PHASE CONTROL" and press the CALL button.

The submenu "PHASE CONTROL" is displayed, on which you can perform various settings.

Setting Item	Set Value	Description
PRIORITY	HDTV	Priority is given to the HDTV system phase.
	SDTV	Priority is given to the SDTV system phase.
SYNC CONT *1	OFF	Each output SYNC signal in both the HDTV format and the SDTV format is in phase of each input SYNC signal.
	SD +90H	The output SYNC signal in the SDTV format is phase shifted by +90H of the input SYNC signal in the SDTV format.
	SD +90H CL	The output SYNC signal in the SDTV format is phase shifted by +90H of the input SYNC signal in the SDTV format. The phase difference between the video signal sent from the camera head and the SYNC signal of the video signal sent from the CCU-970 is delayed at least +6H to +8H. In this setting, when you switch the HDTV format signal to the return signal, the image on the viewfinder is less scrambled due to the switching.
	FD (FRAME DELAY)	Each output SYNC signal in both the HDTV format and the SDTV format is in phase of each input SYNC signal. The camera head operates in about 1 frame ahead. (The delay depends on transmission distance of the camera and the CCU.)
	SD FD +90H	The output SYNC signal in the SDTV format is phase shifted by +90H of the input SYNC signal in the SDTV format. The camera head operates in about 1 frame ahead. (The delay depends on transmission distance of the camera and the CCU.)
	SD +120H	The output SYNC signal in the SDTV format is phase shifted by +120H of the input SYNC signal in the SDTV format.
	SD +120H CL	The output SYNC signal in the SDTV format is phase shifted by +120H of the input SYNC signal in the SDTV format. The phase difference between the video signal sent from the camera head and the SYNC signal of the video signal sent from the CCU-970 is delayed at least +6H to +8H. In this setting, when you switch the HDTV format signal to the return signal, the image on the viewfinder is less scrambled due to the switching.
	SD FD +120H	The output SYNC signal in the SDTV format is phase shifted by +120H of the input SYNC signal in the SDTV format. The camera head operates in about 1 frame ahead. (The delay depends on transmission distance of the camera and the CCU.)
	HD -90H CL	The output SYNC signal in the HDTV format is phase shifted by -90H of the input SYNC signal in the HDTV format, and the output SYNC signal in the SDTV format is in phase with the input SYNC signal in the SDTV format. The phase difference between the video signal sent from the camera head and the SYNC signal of the video signal sent from the CCU-970 is delayed at least +6H to +8H. In this setting, when you switch the HDTV format signal to the return signal, the image on the viewfinder is less scrambled due to the switching.
	HD -120H CL	The output SYNC signal in the HDTV format is phase shifted by -120H of the input SYNC signal in the HDTV format, and the output SYNC signal in the SDTV format is in phase with the input SYNC signal in the SDTV format. The phase difference between the video signal sent from the camera head and the SYNC signal of the video signal sent from the CCU-970 is delayed at least +6H to +8H. In this setting, when you switch the HDTV format signal to the return signal, the image on the viewfinder is less scrambled due to the switching.
	AUTO CL	Depending on the input SYNC signal, following settings are automatically set. HDTV - Camera head format 1080I: SD +90H CL - Camera head format 720P: SD +120H CL SDTV or none - Camera head format 1080I: HD -90H CL - Camera head format 720P: HD -120H CL
HD MASTER V PHASE	0 to 1124	Adjusts the vertical phase of the HDTV output signals to match the input GENLOCK signal.
	0 to 1499 (720P)	
HD OUT H PHASE	*2	Adjusts the horizontal phase of the HD OUT signal to match the input GENLOCK signal.
HD PM H PHASE	*2	Adjusts the horizontal phase of the HD PM OUT signal to match the input GENLOCK signal.
HD ANALOG H PHASE	*2	Adjusts the horizontal phase of the HD ANALOG OUT signals to match the input GENLOCK signal.
SD MASTER V PHASE	0 to 524 (NTSC)	Sets vertical phases for all SDTV outputs (digital and analog).
	0 to 625 (PAL)	
SC PHASE COARSE	-100 to 100	Coarse adjusts the sub carrier phase.
SC PHASE FINE	-100 to 100	Fine adjusts the sub carrier phase.
SD SDI H PHASE	*3	Adjusts the horizontal phase of the SD SDI OUT signals to match the input GENLOCK signal.
SD ENC H PHASE	*3	Adjusts the horizontal phase of the SD ENC OUT signals to match the input GENLOCK signal.

SD ANALOG H PHASE	*3	Adjusts the horizontal phase of the SD ANALOG OUT signals to match the input GENLOCK signal.
SD PM H PHASE	*3	Adjusts the horizontal phase of the SD PM OUT signals to match the input GENLOCK signal.
SD WFM H PHASE	*3	Adjusts the horizontal phase of the SD WFM OUT signals to match the input GENLOCK signal.
SYNC OUT H PHASE	*4	Adjusts the horizontal phase of external synchronization output.
SYNC OUT V PHASE	*4	Adjusts the vertical phase of external synchronization output.

*1 Items to be set are very much depending on the HD-SDI output format.
*2 Depending on the format of the output signal, variable range for H PHASE.

Output Signal	Output H PHASE
1080I59.	-1100 to 1100
1080P59.	-1100 to 1100
1080P23.SF	-1300 to 1300
1080P23.	-1300 to 1300
720P59.	-825 to 825
1080I50.	-1320 to 1320
1080P50.	-1320 to 1320
720P59.	-990 to 990

*3 Depending on the format of the output signal, variable range for H PHASE.

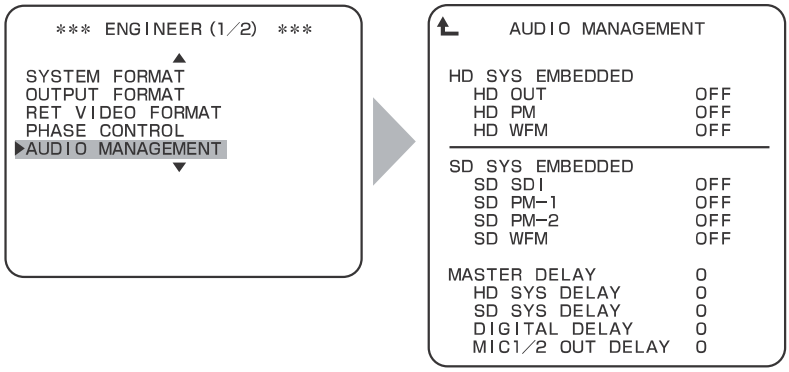
Output Signal	Output H PHASE
NTSC (525I/59)	-858 to 858
PAL(625I/50)	-864 to 864

*4 Depending on the format of the output signal, variable range for H PHASE and V PHASE.

Output Signal	Output H PHASE	Output V PHASE
1080I59.	-1100 to 1100	0 to 1124
1080P59.	-1100 to 1100	0 to 1124
1080P23.SF	-1300 to 1300	0 to 1124
1080P23.	-1300 to 1300	0 to 1124
720P59	-825 to 825	0 to 1499
1080I50.	-1320 to 1320	0 to 1124
1080P50.	-1320 to 1320	0 to 1124
720P59.	-990 to 990	0 to 1499
NTSC (525I/59)	-858 to 858	0 to 524
PAL(625I/50)	-864 to 864	0 to 625

AUDIO MANAGEMENT

AUDIO MANAGEMENT sets the various audio managements.



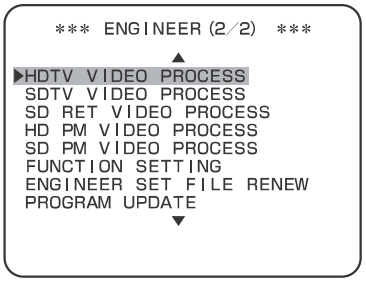
Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "AUDIO MANAGEMENT," and press the CALL button.

The submenu "AUDIO MANAGEMENT" is displayed, on which you can perform various settings.

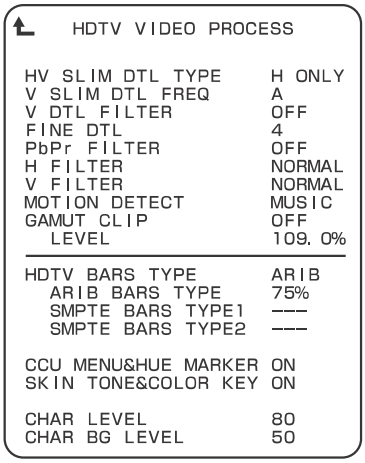
Setting Item		Set Value	Description
HD SYS EMBEDDED	HD OUT	OFF	Sets not to embed audio signals in the HD OUT signals.
		ON	Sets to embed audio signals in the HD OUT signals.
	HD PM	OFF	Sets not to embed audio signals in the HD PM OUT signals.
		ON	Sets to embed audio signals in the HD PM OUT signals.
	HD WFM	OFF	Sets not to embed audio signals in the HD WFM OUT signals.
		ON	Sets to embed audio signals in the HD WFM OUT signals.
SD SYS EMBEDDED	SD SDI	OFF	Sets not to embed audio signals in the SD SDI OUT signals.
		ON	Sets to embed audio signals in the SD SDI OUT signals.
	SD PM-1	OFF	Sets not to embed audio signals in the SD PM-1 OUT signals.
		ON	Sets to embed audio signals in the SD PM-1 OUT signals.
	SD PM-2	OFF	Sets not to embed audio signals in the SD PM-2 OUT signals.
		ON	Sets to embed audio signals in the SD PM-2 OUT signals.
	SD WFM	OFF	Sets not to embed audio signals in the SD WFM OUT signals.
		ON	Sets to embed audio signals in the SD WFM OUT signals.
MASTER DELAY		0 to 21	Sets the amount of delay for the audio signals of all channels.
HD SYS DELAY		0 to 21	Sets the amount of delay for the audio signals of HDTV channels.
SD SYS DELAY		0 to 21	Sets the amount of delay for the audio signals of SDTV channels.
DIGITAL DELAY		0 to 21	Sets the amount of delay of the digital audio output.
MIC1/2 OUT DELAY		0 to 21	Sets the amount of delay of the MIC output (2 channels).

HDTV VIDEO PROCESS

HDTV VIDEO PROCESS sets the various HDTV video processes.



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "HDTV VIDEO PROCESS," and press the CALL button.



The submenu "HDTV VIDEO PROCESS" is displayed, on which you can perform various settings.

Setting Item	Set Value	Description
HV SLIM DTL TYPE	H ONLY	Sets SLIM DTL to be effective only in the horizontal direction.
	V ONLY	Sets SLIM DTL to be effective only in the vertical direction.
	H+V	Sets SLIM DTL to be effective both in the horizontal/vertical direction.
V SLIM DTL FREQ*1	(In interlace frame output or segmented frame output)	Sets a boost band.
	A	Number of effective lines × 0.41
	B	Number of effective lines × 0.38
	C	Number of effective lines × 0.36
	D	Number of effective lines × 0.34
	(In progressive frame output)	Sets a frequency to boost.
	A	Number of effective lines × 0.64
	B	Number of effective lines × 0.75
	C	Number of effective lines × 0.86
	D	Number of effective lines
V DTL FILTER	OFF	Sets a vertical DTL filter to OFF.
	ON	Sets a vertical DTL filter to ON.
FINE DTL*2	0 to 8	Sets the FINE DTL.
PbPr FILTER	OFF	Sets filter characteristic of HDTV color-difference signals. (The level around 18MHz increases in 5% for WIDE compared to NORMAL.)
	NORMAL	
	WIDE	
H FILTER *3	NORMAL	Sets the horizontal resolution to NORMAL.
	WIDE	Though the horizontal resolution goes up, sets it such that a little bit false signal occurs.
	NARROW	Though the horizontal resolution goes down, sets it such that the false signal is suppressed.
V FILTER *3	NORMAL	Sets the vertical resolution to NORMAL.
	WIDE	Though the vertical resolution goes up, sets it such that a little bit false signal occurs.
	NARROW	Though the vertical resolution goes down, sets it such that the false signal is suppressed.

MOTION DETECT	Sets the motion detection function.	
	MUSIC	Normal mode.
	DRAMA	Suitable for still-image editing using a VTR in a drama. This remains a few afterimages because framing is done.
	STILL	Suitable for shooting still images such as picture shooting.
	OFF	Suitable for shooting from a helicopter. Neither afterimages nor images remain because field handling is done.
	SPORTS	Suitable for broadcasting quick-motion sports.
GAMUT CLIP	ON	Sets the gamut clip function to ON.
	OFF	Sets the gamut clip function to OFF.
LEVEL	98 to 109	Sets the gamut clip level for HDTV output.
HDTV BARS TYPE	ARIB	Sets the HDTV color bar complying with the ARIB-standard multi-format color bar.
	100/75	Sets the HDTV color bar complying with the 100/0/75/0 color bar.
	100/100	Sets the HDTV color bar complying with the 100/0/100/0 color bar.
	75/75	Sets the HDTV color bar complying with the 75/0/75/0 color bar.
	SMPTE	Sets the HDTV color bar complying with the SMPTE-standard color bar.
ARIB BARS TYPE	75%	Sets the pattern 2 of the ARIB-standard color bar to "75% White."
	100%	Sets the pattern 2 of the ARIB-standard color bar to "100% White."
	+I	Sets the pattern 2 of the ARIB-standard color bar to "+I signal."
SMPTE BARS TYPE1	75%	Sets the pattern 2 of the SMPTE-standard color bar to "75% White."
	100%	Sets the pattern 2 of the SMPTE-standard color bar to "100% White."
	+I	Sets the pattern 2 of the SMPTE-standard color bar to "+I signal."
	-I	Sets the pattern 2 of the SMPTE-standard color bar to "-I signal."
SMPTE BARS TYPE2	0%	Sets the pattern 3 of the SMPTE-standard color bar to "0% Black."
	+Q	Sets the pattern 3 of the SMPTE-standard color bar to "+Q signal."
CCU MENU/HUE MARKER	ON	Sets to embed the CCU MENU/HUE MARKER in the main signal.
	OFF	Sets not to embed the CCU MENU/HUE MARKER in the main signal.
SKIN TONE/COLOR KEY	ON	Sets to embed the SKIN DTL/COLOR DTL KEY signal in the main signal.
	OFF	Sets not to embed the SKIN DTL/COLOR DTL KEY signal in the main signal.
CHAR LEVEL	0 to 200	Sets the character level of the HD OUT signals.
CHAR BG LEVEL	-100 to 100	Sets the background level of characters on the HD OUT signals.

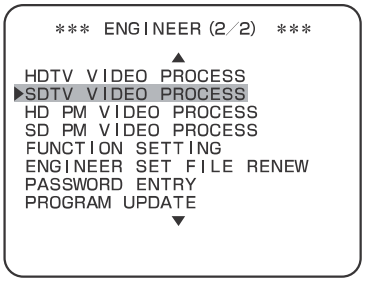
*1 When "SLIM DTL" is "OFF" or SLIM DTL is set to be effective only in the horizontal direction ("H ONLY" is set to "HV SLIM DTL TYPE"), the frequency to boost is half the number of effective lines.

*2 This item is valid only when the camera head to be connected is the HDK-790EXII or HDK-790EXIII or HDK-97A.

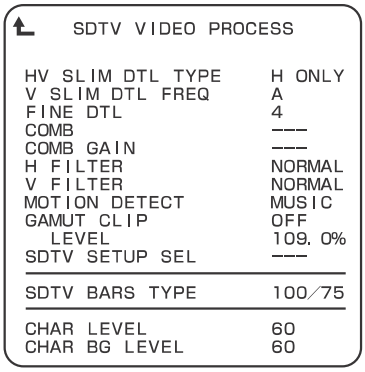
*3 It is displayed in 1080I → 720P convert.

SDTV VIDEO PROCESS

SDTV VIDEO PROCESS sets the various SDTV video processes.



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "SDTV VIDEO PROCESS," and press the CALL button.



The submenu "SDTV VIDEO PROCESS" is displayed, on which you can perform various settings.

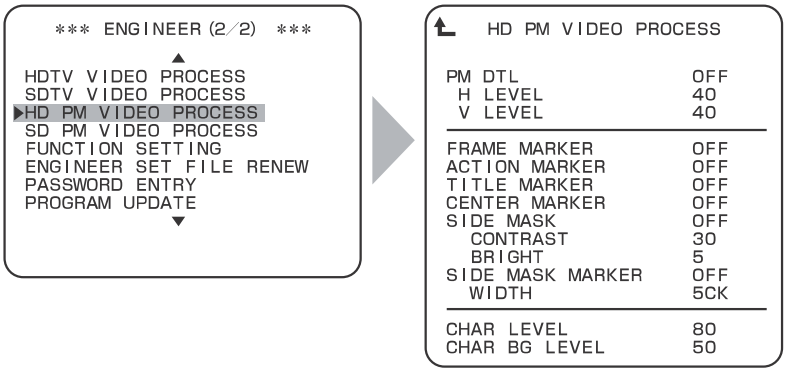
Setting Item	Set Value	Description
HV SLIM DTL TYPE	H ONLY	Sets SLIM DTL to be effective only in the horizontal direction.
	V ONLY	Sets SLIM DTL to be effective only in the vertical direction.
	H+V	Sets SLIM DTL to be effective both in the horizontal/vertical direction.
V SLIM DTL FREQ *1	Sets a boost band.	
	A	Number of effective lines × 0.41
	B	Number of effective lines × 0.38
	C	Number of effective lines × 0.36
	D	Number of effective lines × 0.34
FINE DTL*2	0 to 8	Sets the FINE DTL.
COMB	-	Sets in the factory.
COMB GAIN	-	Sets in the factory.
H FILTER *3	NARROW	Sets the horizontal filter. The frequency characteristics improve in the order of "NARROW" < "NORMAL" < "WIDE" < "SUPER."
	NORMAL	
	WIDE	
	SUPER	
V FILTER	NARROW	Sets the vertical filter. The frequency characteristics improve in the order of "NARROW" < "NORMAL" < "WIDE" < "SUPER."
	NORMAL	
	WIDE	
	SUPER	
MOTION DETECT	Sets the motion detection function of the down-converter.	
	MUSIC	Specifies the normal mode.
	DRAMA	Suitable for still-image editing using a VTR in a drama. This remains a few afterimages because framing is done.
	STILL	Suitable for shooting still images such as picture shooting.
	OFF	Suitable for shooting from a helicopter. Neither afterimages nor images remain because field handling is done.
	SPORTS	Suitable for broadcasting quick-motion sports.
GAMUT CLIP	ON	Sets the gamut clip function to ON.
	OFF	Sets the gamut clip function to OFF.
LEVEL	98 to 109	Sets the gamut clip level for SDTV output.
SDTV SETUP SEL	-	Sets in the factory.

SDTV BARS TYPE	100/75	Sets the SDTV color bar complying with the 100/0/75/0 color bar.
	100/100	Sets the SDTV color bar complying with the 100/0/100/0 color bar.
	75/75	Sets the SDTV color bar complying with the 75/0/75/0 color bar.
CHAR LEVEL	0 to 200	Sets the character level of the SDTV OUT signals.
CHAR BG LEVEL	-100 to 100	Sets the background level of characters on the SDTV OUT signals.

*1 When "SLIM DTL" is "OFF" or SLIM DTL is set to be effective only in the horizontal direction ("H ONLY" is set to "HV SLIM DTL TYPE"), the frequency to boost is half the number of effective lines.
*2 This item is valid only when the camera head to be connected is the HDK-790EXII or HDK-790EXIII or HDK-97A.
*3 When the format of the camera head is 720P59.94, only "NORMAL" can be selected.

HD PM VIDEO PROCESS

HD PM VIDEO PROCESS sets the various HDTV PM video processes. (* USA option)



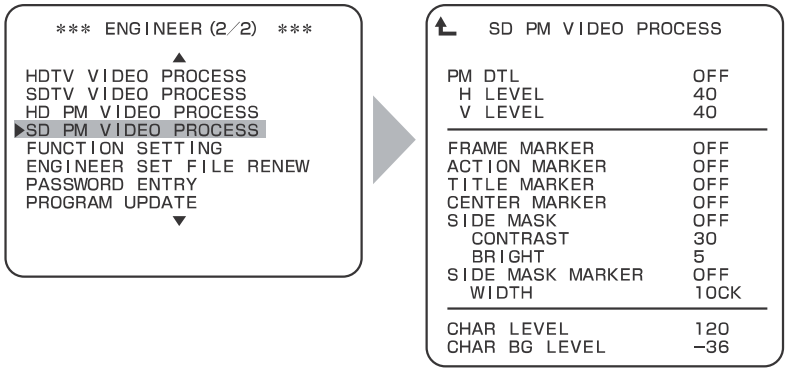
Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "HD PM VIDEO PROCESS," and press the CALL button.

The submenu "HD PM VIDEO PROCESS" is displayed, on which you can perform various settings.

Setting Item	Set Value	Description
PM DTL	OFF	Sets DTL to OFF.
	ON	Sets DTL to ON.
(PM DTL) H LEVEL	0 to 100	Sets the horizontal level of DTL.
(PM DTL) V LEVEL	0 to 100	Sets the vertical level of DTL.
FRAME MARKER	OFF	Does not display the frame marker.
	ON-16:9	Displays the frame marker with 16:9 aspect ratio.
	ON-14:9	Displays the frame marker with 14:9 aspect ratio.
	ON-13:9	Displays the frame marker with 13:9 aspect ratio.
	ON-4:3	Displays the frame marker with 4:3 aspect ratio.
ACTION MARKER	OFF	Does not display the action area marker.
	ON-16:9	Displays the action area marker with 16:9 aspect ratio.
	ON-14:9	Displays the action area marker with 14:9 aspect ratio.
	ON-13:9	Displays the action area marker with 13:9 aspect ratio.
	ON-4:3	Displays the action area marker with 4:3 aspect ratio.
TITLE MARKER	OFF	Does not display the title area marker.
	ON-16:9	Displays the title area marker with 16:9 aspect ratio.
	ON-14:9	Displays the title area marker with 14:9 aspect ratio.
	ON-13:9	Displays the title area marker with 13:9 aspect ratio.
	ON-4:3	Displays the title area marker with 4:3 aspect ratio.
CENTER MARKER	OFF	Does not display the center marker.
	ON	Displays the center marker.
SIDE MASK	OFF	Does not display the side mask.
	ON-14:9	Displays the side mask with 14:9 aspect ratio.
	ON-13:9	Displays the side mask with 13:9 aspect ratio.
	ON-4:3	Displays the side mask with 4:3 aspect ratio.
(SIDE MASK) CONTRAST	0 to 100	Adjusts the side mask contrast. (The larger the value, the contrast gets higher.)
(SIDE MASK) BRIGHT	0 to 100	Adjusts the side mask brightness. (The larger the value, the brightness gets higher.)
SIDE MASK MARKER	OFF	Does not display the side mask marker.
	ON	Displays the side mask marker.
(SIDE MASK MARKER) WIDTH	5CK	Selects the side mask marker width. (The width gets wider in the order of 5CK<10CK<15CK<20CK.)
	10CK	
	15CK	
	20CK	
CHAR LEVEL	0 to 200	Sets the character level of the HD PM OUT signals.
CHAR BG LEVEL	-100 to 100	Sets the background level of characters on the HD PM OUT signals.

SD PM VIDEO PROCESS

SD PM VIDEO PROCESS sets the various SDTV PM video processes. (* USA option)



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "SD PM VIDEO PROCESS," and press the CALL button.

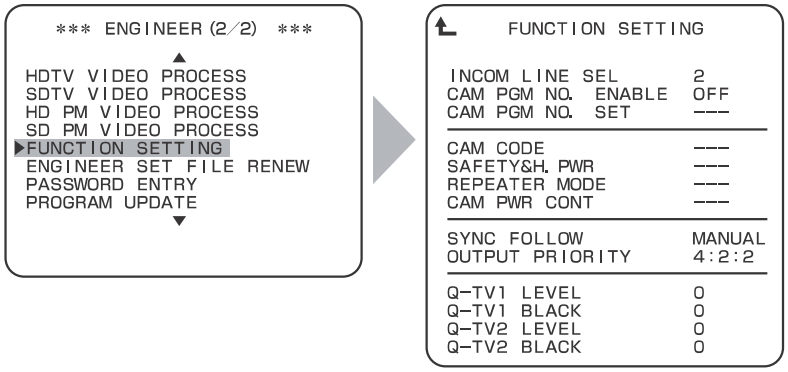
The submenu "SD PM VIDEO PROCESS" is displayed, on which you can perform various settings.

Setting Item	Set Value	Description
PM DTL	OFF	Sets DTL to OFF.
	ON	Sets DTL to ON.
(PM DTL) H LEVEL	0 to 100	Sets the horizontal level of DTL.
(PM DTL) V LEVEL	0 to 100	Sets the vertical level of DTL.
FRAME MARKER *1	OFF	Does not display the frame marker.
	ON-16:9	Displays the frame marker with 16:9 aspect ratio.
	ON-14:9	Displays the frame marker with 14:9 aspect ratio.
	ON-13:9	Displays the frame marker with 13:9 aspect ratio.
	ON-4:3	Displays the frame marker with 4:3 aspect ratio.
ACTION MARKER *1	OFF	Does not display the action area marker.
	ON-16:9	Displays the action area marker with 16:9 aspect ratio.
	ON-14:9	Displays the action area marker with 14:9 aspect ratio.
	ON-13:9	Displays the action area marker with 13:9 aspect ratio.
	ON-4:3	Displays the action area marker with 4:3 aspect ratio.
TITLE MARKER *1	OFF	Does not display the title area marker.
	ON-16:9	Displays the title area marker with 16:9 aspect ratio.
	ON-14:9	Displays the title area marker with 14:9 aspect ratio.
	ON-13:9	Displays the title area marker with 13:9 aspect ratio.
	ON-4:3	Displays the title area marker with 4:3 aspect ratio.
CENTER MARKER	OFF	Does not display the center marker.
	ON	Displays the center marker.
SIDE MASK *2	OFF	Does not display the side mask.
	ON-14:9	Displays the side mask with 14:9 aspect ratio.
	ON-13:9	Displays the side mask with 13:9 aspect ratio.
	ON-4:3	Displays the side mask with 4:3 aspect ratio.
(SIDE MASK) CONTRAST	0 to 100	Adjusts the side mask contrast. (The larger the value, the contrast gets higher.)
(SIDE MASK) BRIGHT	0 to 100	Adjusts the side mask brightness. (The larger the value, the brightness gets higher.)
SIDE MASK MARKER	OFF	Does not display the side mask marker.
	ON	Displays the side mask marker.
(SIDE MASK MARKER) WIDTH	10CK	Selects the side mask marker width. (The width of 20CK is wider than that of 10CK.)
	20CK	
CHAR LEVEL	0 to 200	Sets the character level of the SD PM OUT signals.
CHAR BG LEVEL	-100 to 100	Sets the background level of characters on the SD PM OUT signals.

*1 When "SCREEN MODE" is set to "4:3," only "OFF" or "ON-4:3" can be selected for "FRAME MARKER," "ACTION MARKER," and "TITLE MARKER."
*2 When "SCREEN MODE" is set to "4:3," "SIDE MASK" is fixed to "OFF."

FUNCTION SETTING

FUNCTION SETTING sets the various function settings.



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "FUNCTION SETTING," and press the CALL button.

The submenu "FUNCTION SETTING" is displayed, on which you can perform various settings.

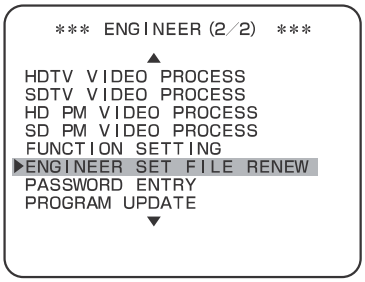
Setting Item	Set Value	Description
INCOM LINE SEL	2	Sets to "2" when 2 lines of intercom (ENG and PROD) are used for the system.
	1	Sets to "1" when the PROD line audio is mixed in the ENG line audio and 1 line of intercom (ENG) is used for the system.
CAM PGM NO. ENABLE *1	OFF	Sets to "OFF" when the CCU does not manage the camera program numbers.
	ON	Sets to "ON" when the CCU manages the camera program numbers.
CAM PGM NO. SET *2	OFF	Sets not to display the camera program numbers for the camera head and control panel.
	1 to 99	Sets to display the camera program numbers for the camera head and control panel.
CAM CODE	-	option
SAFETY&H.PWR	-	option
REPEATER MODE	-	option
CAM PWR CONT	-	option
SYNC FOLLOW	MANUAL	Output signals are not made to follow the format of GENLOCK signal.
	AUTO	Output signals are made to follow the format of GENLOCK signal. In addition, formats made to follow are only 1080I59, 720P59, 1080I50, and 720P50.
OUTPUT PRIORITY	4:4:4	Priority is given to 4:4:4 for the format made to follow.
	4:2:2	Priority is given to 4:2:2 for the format made to follow.
Q-TV1 LEVEL	0 to 100	Sets the Q-TV1 level. (Sets in the factory.)
Q-TV1 BLACK	0 to 100	Sets the Q-TV1 black level. (Sets in the factory.)
Q-TV2 LEVEL	0 to 100	Sets the Q-TV1 level. (Sets in the factory.)
Q-TV2 BLACK	0 to 100	Sets the Q-TV1 black level. (Sets in the factory.)

*1 For the camera program numbers, refer to the instructions accompanying the control panel such as the OCP-200 that supports the camera program numbers.

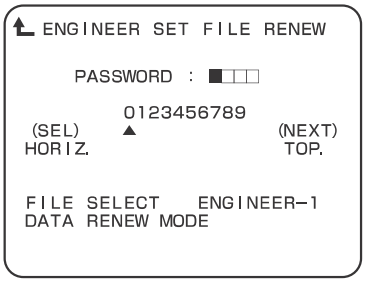
*2 The setting for the camera program numbers is enabled when CAM PGM NO. ENA is set to "ON."

ENGINEER SET FILE RENEW

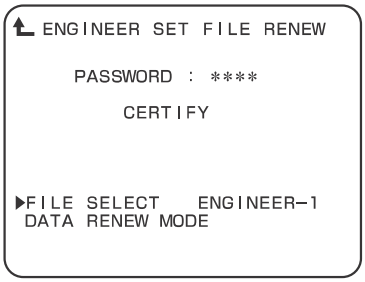
ENGINEER SET FILE RENEW renew the ENGINEER file.



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "ENGINEER SET FILE RENEW," and press the CALL button.



The submenu "ENGINEER SET FILE RENEW" is displayed. Turn the MASTER PEDESTAL control knob and IRIS control knob, input a password, and press the CALL button.



You can perform various settings.

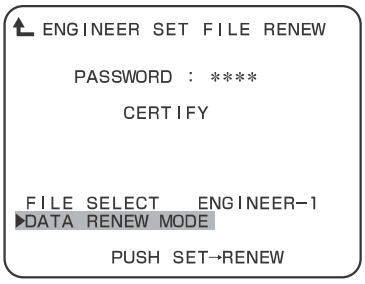
Setting Item	Set Value	Description
FILE SELECT	ENGINEER-1	Sets the ENGINEER-1 file
	ENGINEER-2	Sets the ENGINEER-2 file
	ENGINEER-3	Sets the ENGINEER-3 file
DATA RENEW MODE	-	The operation is as follows.

1 Position the flashing cursor on "DATA RENEW MODE," and press the CALL button.

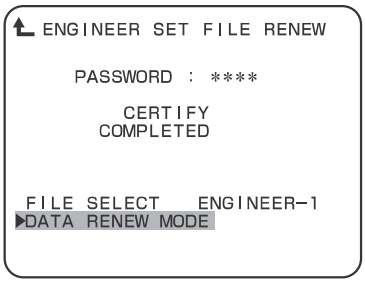
"PUSH SET → RENEW " is displayed in the bottom of the screen.

2 Press the CALL button.

Renew the ENGINEER file.
After the data is written, "COMPLETED" is displayed.



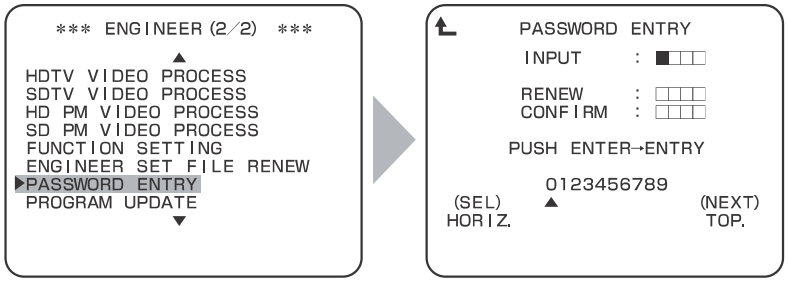
When the CALL button is pressed, the message is displayed in the bottom of the screen.



"COMPLETED" is displayed in the middle of the screen.

PASSWORD ENTRY

PASSWORD ENTRY sets the password.



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "PASSWORD ENTRY," and press the CALL button.

Turn the MASTER PEDESTAL control knob and IRIS control knob, input a password, and press the CALL button.

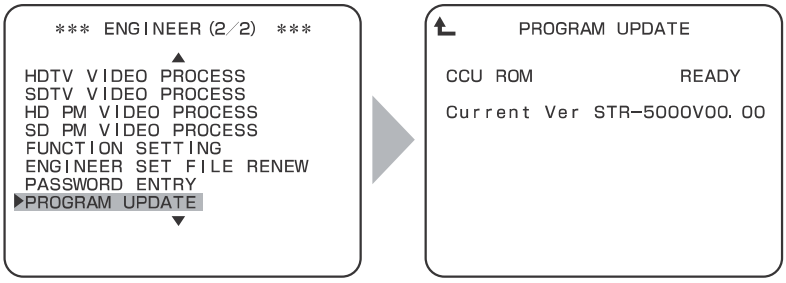
Note:

The initial password is "0000." The PASSWORD ENTRY is displayed when S3 No.3 ON of the PULSE module or the password except "0000" is registered.

In addition, this function is for preventing overwrite of the data by incorrect operation, and does not aim at perfect security.

PROGRAM UPDATE

PROGRAM UPDATE updates the CCU ROM.



Turn the MASTER PEDESTAL control knob or IRIS control knob to position the flashing cursor on the submenu "PROGRAM UPDATE," and press the CALL button.

The submenu "PROGRAM UPDATE" is displayed, on which you can perform various settings.

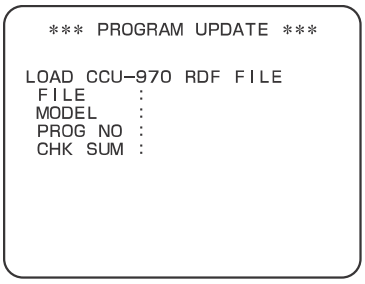
Setting Item	Set Value	Description
CCU ROM	READY	Ready for update.
	CANCEL	Cancels update.
	EXECUTE	Update the CCU ROM.

1 Position the flashing cursor on "CCU ROM," and presses the CALL button.

Flashing cursor moves to the mode setting, and also the display of the mode setting value switches from "READY" to "CANCEL."

2 Turn the MASTER PEDESTAL control knob or IRIS control knob to adjust the setting value, and press the CALL button.

The value can be confirmed.
- When "CANCEL" is selected, the setting is canceled and "PROGRAM UPDATE" exits.
- When "EXECUTE" is selected, the following screen is displayed.



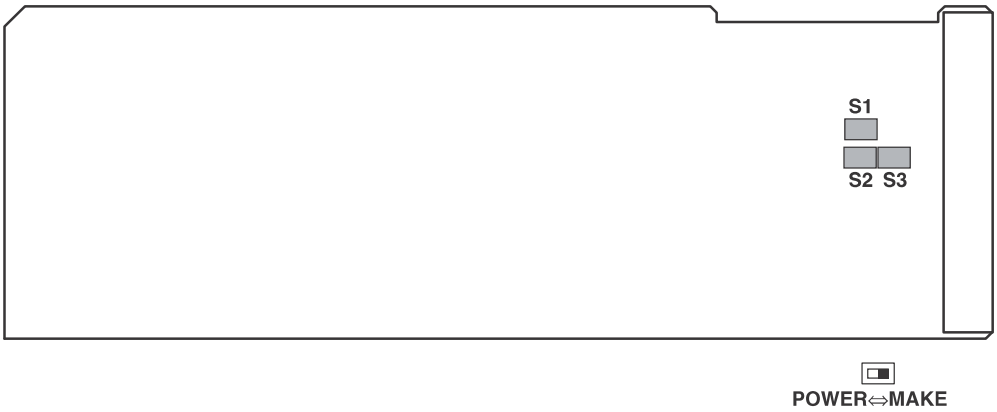
Please refer to "19.2 Update Procedure of Connected equipment" of OPERATION MANUAL of OCP-200 for the following operations.

5.2 Settings Using Switches on the Module

Depending on systems such as an external system connected to the CCU.

TALLY Mode Settings

Set the mode of the tally control signal input to the TALLY IN connector on the rear of the CCU. Select the mode by S1 to S3 switches on the AUX-A module.



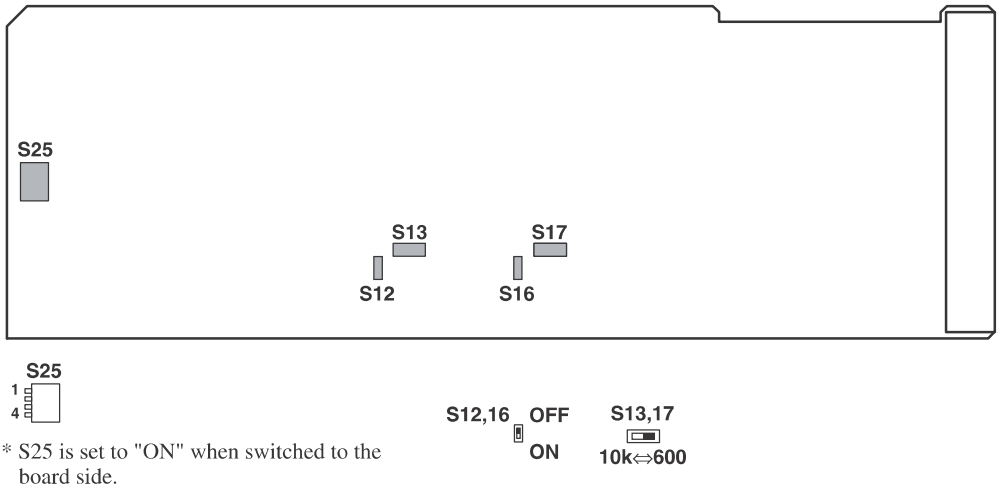
AUX-A Module (Side A)

Switch No.	Function Name	Setting	Description
S1	R TALLY	POWER	Sets the R TALLY signal input to the CCU to "POWER mode."
		MAKE	Sets the R TALLY signal input to the CCU to "MAKE/BREAK mode."
S2	G TALLY	POWER	Sets the G TALLY signal input to the CCU to "POWER mode."
		MAKE	Sets the G TALLY signal input to the CCU to "MAKE/BREAK mode."
S3 *	Y TALLY	POWER	Sets the Y TALLY signal input to the CCU to "POWER mode."
		MAKE	Sets the Y TALLY signal input to the CCU to "MAKE/BREAK mode."

* Currently, S3 supports "MAKE" only.

Intercom Settings

Set functions of the intercom according to the intercom system to be used. Select the function by S12, S13, S16, S17, and S25 switches on the AUX-A module.



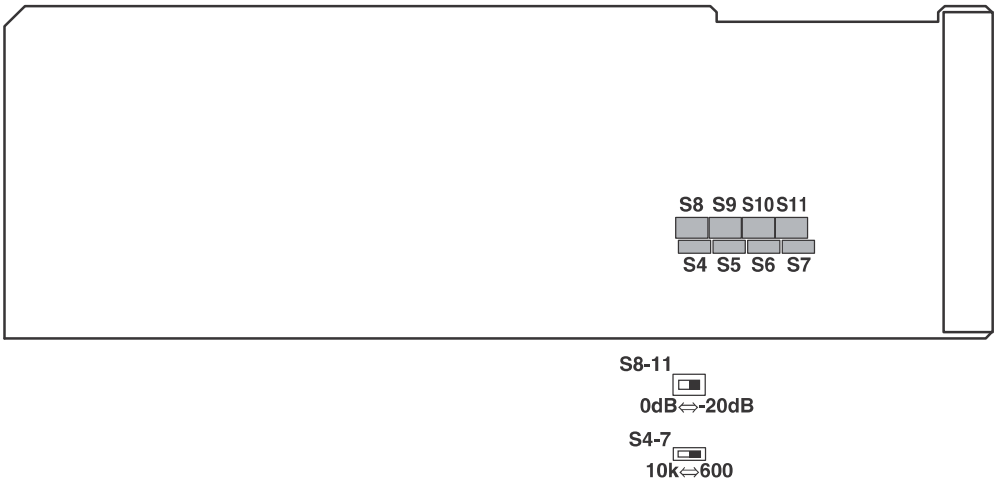
* S25 is set to "ON" when switched to the board side.

AUX-A Module (Side A)

Switch No.	Function Name		Setting	Description
S12	ENG RTS OFF		OFF	Sets to "OFF" when the ENG line of the system is used for "4W."
			ON	Sets to "ON" when the ENG line of the system is used for "RTS" or "clearcom."
S13	ENG TERMINATE		600	Sets terminal resistance of the ENG line to "600Ω."
			10k	Sets terminal resistance of the ENG line to "10kΩ."
S16	PROD RTS OFF		OFF	Sets to "OFF" when the PROD line of the system is used for "4W."
			ON	Sets to "ON" when the PROD line of the system is used for "RTS" or "clearcom."
S17	PROD TERMINATE		600	Sets terminal resistance of the PROD line to "600Ω."
			10k	Sets terminal resistance of the PROD line to "10kΩ."
S25	1	ENG RTS ON	OFF	Sets to "OFF" when the ENG line of the system is used for "4W."
			ON	Sets to "ON" when the ENG line of the system is used for "RTS" or "clearcom."
	2	ENG RTS -15dB ON	OFF	Sets to "OFF" when the ENG line of the system is used for "RTS."
			ON	Sets to "ON" when the ENG line of the system is used for "clearcom."
	3	PROD RTS ON	OFF	Sets to "OFF" when the PROD line of the system is used for "4W."
			ON	Sets to "ON" when the PROD line of the system is used for "RTS" or "clearcom."
	4	PROD RTS -15dB ON	OFF	Sets to "OFF" when the PROD line of the system is used for "RTS."
			ON	Sets to "ON" when the PROD line of the system is used for "clearcom."

PGM Settings

Set PGM (program sound) signals input to the INTERCOM connector on the rear of the CCU and audio trunk signals. Select the signal by S4 to S11 switches on the AUX-A module.



AUX-A Module (Side A)

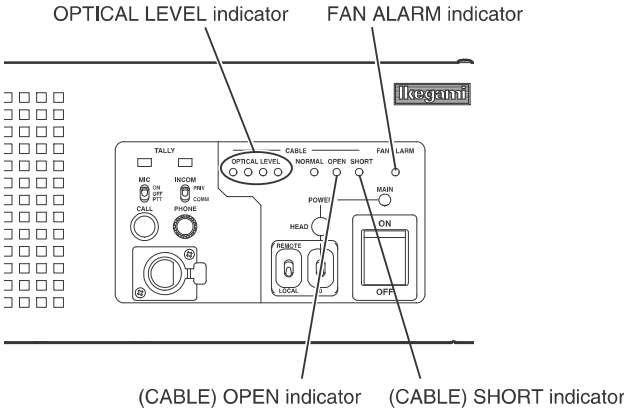
Switch No.	Function Name	Setting	Description
S4	PGM-1 TERMINATE	600	Sets the terminal resistance of the PGM-1 to "600Ω."
		10k	Sets the terminal resistance of the PGM-1 to "10kΩ."
S5	PGM-2 TERMINATE	600	Sets the terminal resistance of the PGM-2 to "600Ω."
		10k	Sets the terminal resistance of the PGM-2 to "10kΩ."
S6	PGM-3 TERMINATE	600	Sets the terminal resistance of the PGM-3 to "600Ω."
		10k	Sets the terminal resistance of the PGM-3 to "10kΩ."
S7	AUDIO TRUNK TERMINATE	600	Sets the terminal resistance of the AUDIO TRUNK to "600Ω."
		10k	Sets the terminal resistance of the AUDIO TRUNK to "10kΩ."
S8	PGM-1 LEVEL	0dB	Sets to "0dB" when the input level of the PGM-1 is "0dB."
		-20dB	Sets to "-20dB" when the input level of the PGM-1 is "-20dB."
S9	PGM-2 LEVEL	0dB	Sets to "0dB" when the input level of the PGM-2 is "0dB."
		-20dB	Sets to "-20dB" when the input level of the PGM-2 is "-20dB."
S10	PGM-3 LEVEL	0dB	Sets to "0dB" when the input level of the PGM-3 is "0dB."
		-20dB	Sets to "-20dB" when the input level of the PGM-3 is "-20dB."
S11	AUDIO TRUNK LEVEL	0dB	Sets to "0dB" when the input level of the AUDIO TRUNK is "0dB."
		-20dB	Sets to "-20dB" when the input level of the AUDIO TRUNK is "-20dB."

TROUBLE SHOOTING and MAINTENANCE

6

6.1 Indicator on the Front of CCU Lights

The indicator on the front of the CCU lights when the CCU becomes abnormal. Take the following actions since the cause varies depending on the indicator lit.



■ *When the OPTICAL LEVEL indicator lights*

Cause	Action
The optical connector is dirty. The lighting state of the OPTICAL LEVEL indicator changes.	Clean the optical connector.

■ *When the (CABLE) OPEN indicator lights*

Cause	Action
The (CABLE) OPEN indicator lights when the camera cable is not connected or there is an open.	Check if the camera cable is properly connected or there is no open. If there is an open, replace the camera cable with a new one.

■ *When the (CABLE) SHORT indicator lights*

Cause	Action
The (CABLE) SHORT indicator lights when a short circuit occurs in the camera cable or a short circuit occurs in the optical connector due to a cause such as water.	Check if a short circuit occurs in the camera cable or the optical connector is dry. If the optical connector is wet, dry it and then clean it.

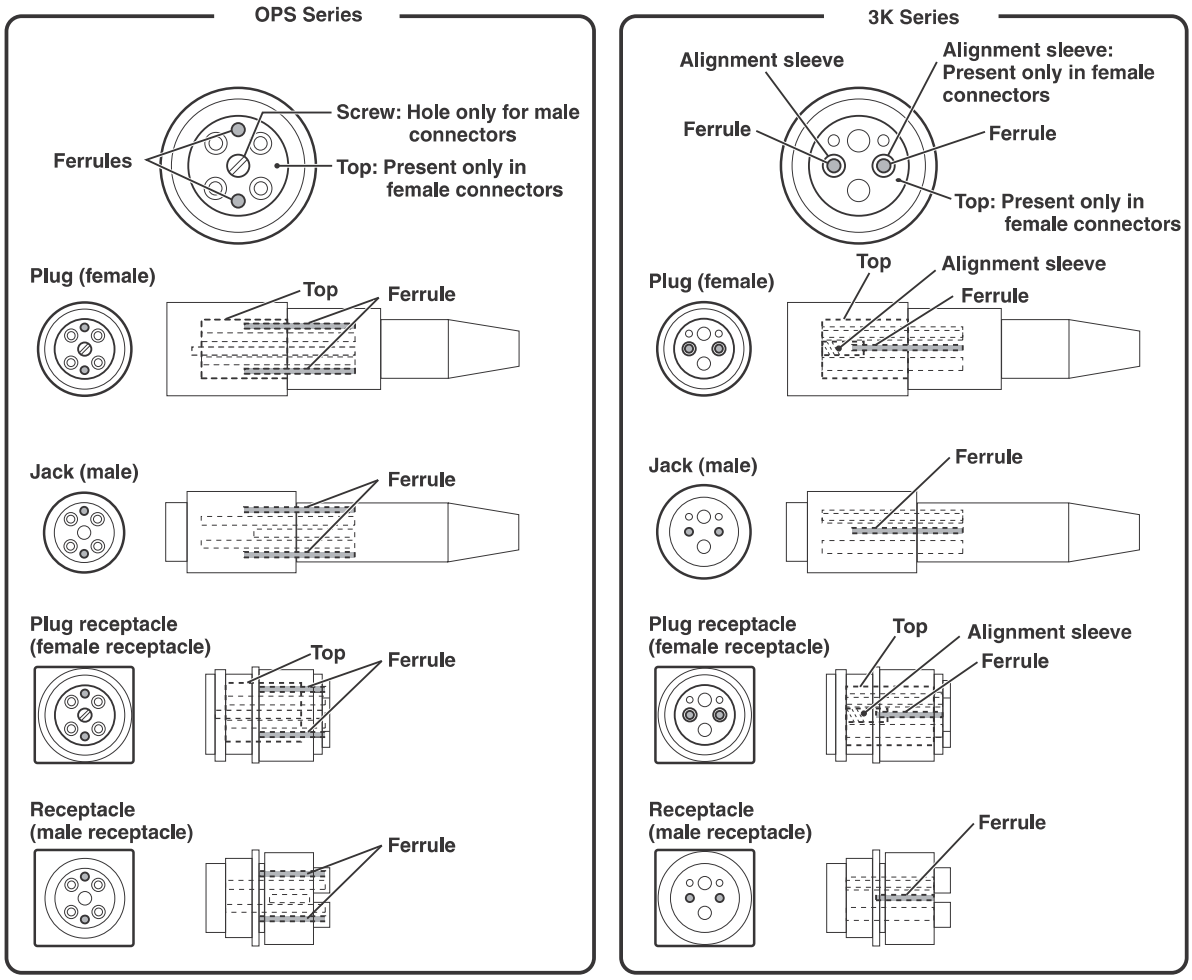
■ *When the FAN ALARM indicator lights*

Cause	Action
The FAN ALARM indicator lights when any of the fans (three in total) inside the CCU stops.	Check if the fans are normal. If any of the fans is abnormal or the lifetime of the fan expires, replace it with a new one.

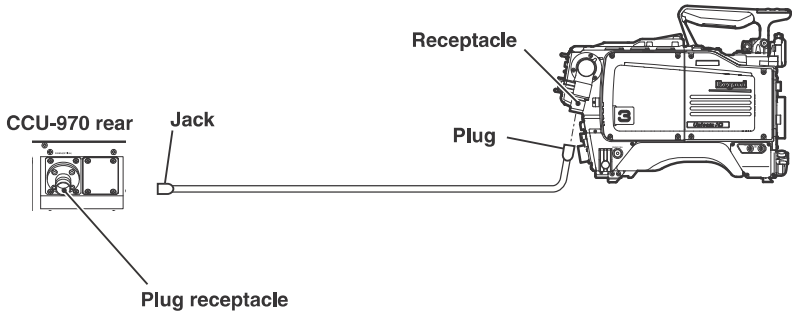
■ *Cleaning Optical Connectors*

The camera cable connecting the camera head and the CCU transmits optical signals through 10µm core glass fibers. If Ferrules, which secure glass fibers, are dirty or have dust on them, transmission loss (optical signal attenuation) occurs. If Ferrules are extremely dirty, optical signals are interrupted and the camera cable may not work properly.
Regular cleaning of Ferrules is suggested if the camera connector is frequently removed and inserted. The figures below show the shape of the camera connector joint section, location of the Ferrules, and how to clean the Ferrules:

● *Camera Connector Joint Section*



● *Plug/Jack for Camera Connectors*



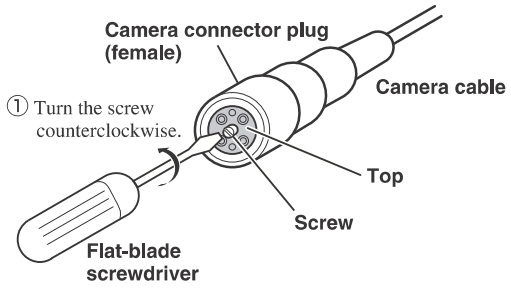
Clean the four sections: receptacle on the camera head, plug receptacle on the CCU, and plug/jack on both ends of the camera cable. The cleaning method for male connectors slightly differs from that for female connectors.

■ *OPS Series Connectors*

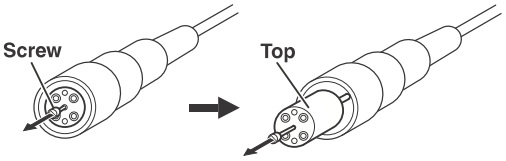
The following explains how to clean Ferrules using a Tajimi OPS series camera cable plug (female) as an example.

1 Loosen the screw at the center of the connector with a flat-blade screwdriver or a coin.

After turned 9 or 10 turns counterclockwise, the screw will come out. The screw is not removed because it is attached to the top.



2 Pull the screw and remove the top from the connector.

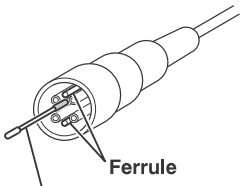


② Pull the screw to remove the top from the connector.

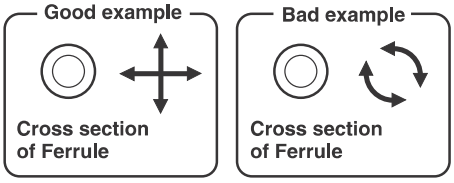
3 Wipe the Ferrule with a cotton swab dampened with alcohol.

CAUTION:

- When you wipe the Ferrule, move the cotton swab straight in a way in which you brush the dust off the Ferrule. Do not wipe back and forth or in a circle. Doing so may spread the dirt instead of removing it.
- Do not carelessly blow your breath on the Ferrule.



③ Wipe with a cotton swab dampened with alcohol.



4 After wiping the Ferrule with alcohol, wipe the Ferrule with a dry cotton swab.

5 Make sure that the dirt is removed.

Use a loupe to examine the Ferrule.

6 If the Ferrule is free from dirt, align the top with the connector guide and put it back in the connector.

Be sure to push the top securely into the connector.

7 Tighten the screw with a flat-blade screwdriver or a coin.

Male connectors have no "top"; therefore, steps 1, 2, and 6 above are not required.

■ *3K Series Connectors*

The following explains how to clean Ferrules using a Lemo 3K series camera cable plug (female) as an example.

CAUTION:

When removing the alignment sleeve, be sure to use a dedicated optical contact extractor (DCC.91.312.5LA). Also use the end of the extractor that has an inner thread.

1 Prepare a dedicated extractor and place the extractor in a position parallel to the connector.

2 Remove the cap of section A (with a thread).

3 Insert the extractor into the alignment sleeve and turn the extractor clockwise 8 to 10 turns until it stops. When it stops, pull the extractor out straight.

Leave the alignment sleeve attached to the extractor.

4 Wipe the Ferrule with a cotton swab dampened with alcohol.

CAUTION:

- When you wipe the Ferrule, move the cotton swab straight in a way in which you brush the dust off the Ferrule. Do not wipe back and forth or in a circle. Doing so may spread the dirt instead of removing it.
- Do not carelessly blow your breath on the Ferrule.

5 After wiping the Ferrule with alcohol, wipe the Ferrule with a dry cotton swab.

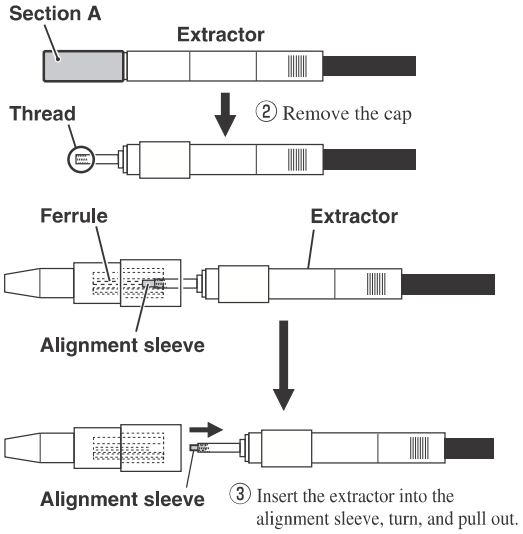
6 Make sure that the dirt is removed.

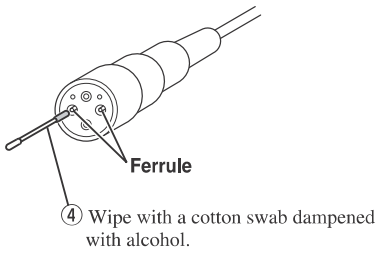
Use a loupe to examine the Ferrule.

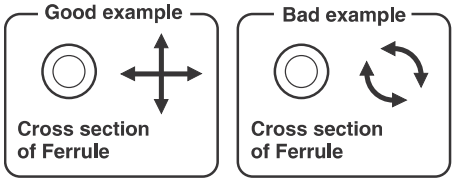
7 Wipe the electrical contact and alignment sleeve in the same way.

8 Insert the alignment sleeve into the optical contact until it clicks and turn the extractor counterclockwise 8 to 10 turns.

The extractor is removed from the alignment sleeve.







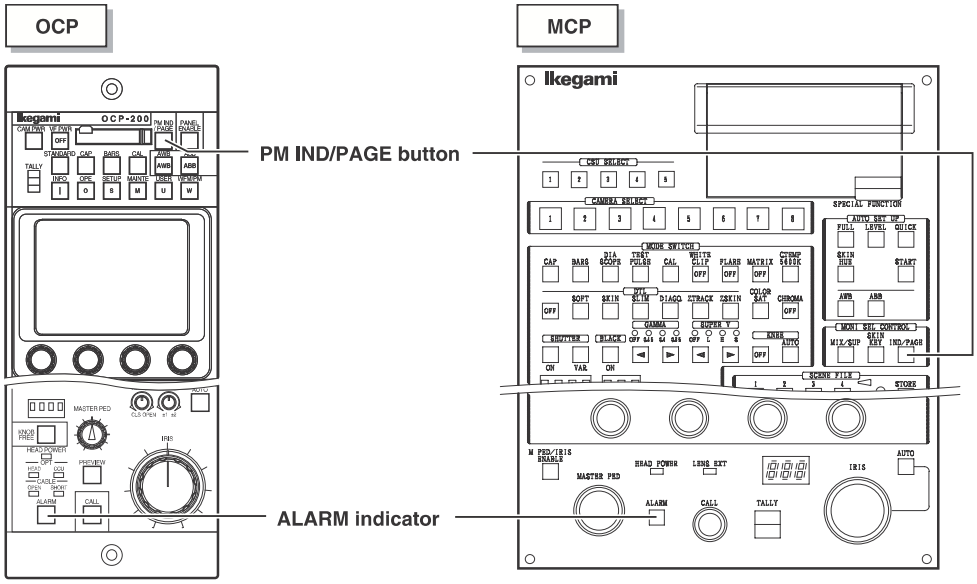
Male connectors have neither "top" nor "alignment sleeve"; therefore, steps 1 to 3 and 8 above are not required.

6.2 ALARM Indicator on the Control Panel Flashes ON and OFF

The CCU-970 is equipped with a self diagnostic function which monitors whether the CCU and camera head are running normal. As soon as the CCU power is turned ON, the self diagnostic function starts running, and always runs during operation.
If the CCU or camera head becomes abnormal, the diagnostic function immediately detects the abnormality, and the ALARM indicator on the control panel flashes ON and OFF. At this time, the self diagnostic information is displayed on the Picture Monitor, so that you can locate the abnormal point.

Note:

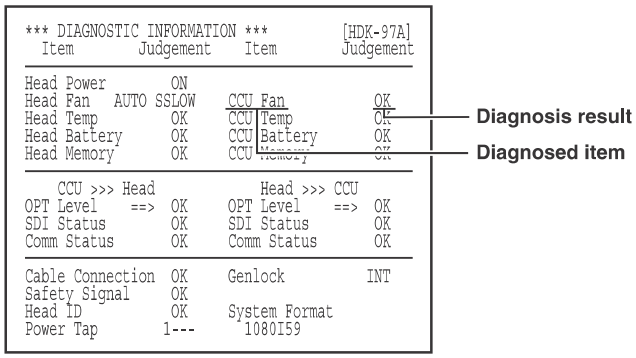
Even if the ALARM indicator does not flash, you can check whether CCU and camera are running normal by pressing the PM IND/PAGE switch on the control panel twice to display the self diagnostic information on the Picture Monitor.



CCU Self Diagnostic Information

■ *Self Diagnostic Information Screen*

The following is the Self Diagnostic Information Screen of the CCU.



■ *List of Self Diagnostic Information*

The following tables list the self diagnostic information for the standard specification.

List of Self Diagnostic Information

Diagnosed Item		Description	Diagnosis Result	Meaning
Head Power		Power status of the camera head	ON	The camera head is powered ON.
			OFF	The camera head is powered OFF.
Head Fan		Rotating status of fan of the camera head or FA (Fiber Adaptor)	AUTO SSLOW	Super-slow in auto mode
			AUTO SLOW	Slow in auto mode
			AUTO NOR	Normal in auto mode
			AUTO FAST	Fast in auto mode
			SSLOW	Super-slow in manual mode
			SLOW	Slow in manual mode
			NOR	Normal in manual mode
			FAST	Fast in manual mode
Head Temp		Internal temperature of the camera head	OK	Normal
			NG	The temperature is abnormally high or the difference between the internal temperature and outside-air temperature is at least 25°C.
Head Battery		Status of the battery in the MPU module of the camera head	OK	Normal
			NG	The backup battery voltage is low.
Head Memory		Status of the RAM IC memory in the MPU module of the camera head	OK	Normal
			NG	Data in the module is destroyed
CCU Fan		Rotating status of the fans on the rear and inside of the CCU	OK	Normal
			STOP	Any of the three fans is not working.
CCU Temp		Internal temperature of the CCU	OK	Normal
			NG	The temperature is abnormally high or the difference between the internal temperature and outside-air temperature is at least 25°C.
CCU Battery		Status of the battery in the CCU CONT/REF module	OK	Normal
			NG	The backup battery voltage is low.
CCU Memory		Status of the RAM IC memory in the CCU CONT/REF module	OK	Normal
			NG	Data in the module is destroyed.
CCU to Head transmission	OPT Level	Optical signal level sent from the CCU to the camera head (detected by the reception module in the camera head)	OK	Good
			ATTEN	The amount of light received decreased.
			WARN	The amount of light received significantly decreased.
			NG	Light cannot be received.
	SDI Status	Status of SDI signal	OK	The format is normal and there is no CRC error.
			NG	The format is abnormal or there is a CRC error.
	Comm Status	Status of the command signal sent from the CCU to the camera head	OK	Normal
			NG	No command signals are sent, or a CPU error occurs.
Head to CCU transmission	OPT Level	Optical signal level sent from the camera head to the CCU (detected by the reception module in the CCU)	OK	Good
			ATTEN	The amount of light received decreased.
			WARN	The amount of light received significantly decreased.
			NG	Light cannot be received.
	SDI Status	Status of SDI signal	OK	The format is normal and there is no CRC error.
			NG	The format is abnormal or there is a CRC error.
	Comm Status	Status of the command signal sent from the camera head to the CCU	OK	Normal
			NG	No command signals are sent, or a CPU error occurs.
Cable Connection		Camera cable connection status between the camera head and the CCU	OK	Normal
			OPEN	Cable is not connected, or there is an open.
			SHORT	A short circuit occurs in the cable.

Safety signal	Status of the safety signal sent from the camera head to the CCU	OK	Normal
		NG	The safety signal is not received, or the connected camera head is not supported by this CCU.
Head ID	Status of the model identification signal sent from the camera head to the CCU	OK	Normal
		NG	The model identification signal is not received, or the connected camera head is not supported by this CCU.
Power Tap	Transformer tap number in the CCU for transmitting power to the camera head	1, 2, 3, 4	Tap number used for the power being transmitted. The higher the number, the higher the voltage.
Genlock	Status of external SYNC signal	INT	No external SYNC signals are input (operation is performed with internal SYNC signals.)
		NTSC	When external SYNC signal is NTSC
		1080P59	When external SYNC signal is 1080P59
		1080I59	When external SYNC signal is 1080I59
		1080P23	When external SYNC signal is 1080P23
		1080P23SF	When external SYNC signal is 1080P23SF
		720P59	When external SYNC signal is 720P59
		PAL	When external SYNC signal is PAL
		1080P50	When external SYNC signal is 1080P50
		1080I50	When external SYNC signal is 1080I50
		720P50	When external SYNC signal is 720P50
		UNKNOWN	External SYNC signals are input, but synchronization is not performed.
10 Field Lock (option)	When the output format is "1080P23.PD", "1080P23.SF" or "1080P23.", output phase of first frame of "1080P23." or "1080P23.PD" is either locked or unlocked to external SYNC signal.	LOCK	Locked to external SYNC signal.
		UNLOCK	Unlocked to external SYNC signal.
System Format		1080P59 3G	1080P59 Y Pb Pr 4:2:2
		1080I59 3G	1080I59 R G B 4:4:4
		1080P23PD 3G	1080P23PD R G B 4:4:4
		1080P23 3G	1080P23 R G B 4:4:4
		1080P23SF 3G	1080P23SF R G B 4:4:4
		720P59 3G	720P59 R G B 4:4:4
		1080I59	1080I59 Y Pb Pr 4:2:2
		1080P23PD	1080P23PD Y Pb Pr 4:2:2
		1080P23	1080P23 Y Pb Pr 4:2:2
		1080P23SF	1080P23SF Y Pb Pr 4:2:2
		720P59	720P59 Y Pb Pr 4:2:2
		1080P50 3G	1080P50 Y Pb Pr 4:2:2
		1080I50 3G	1080I50 R G B 4:4:4
		720P50 3G	720P50 R G B 4:4:4
		1080I50	1080I50 Y Pb Pr 4:2:2
		720P50	720P50 Y Pb Pr 4:2:2

6.3 Replacing Fuses

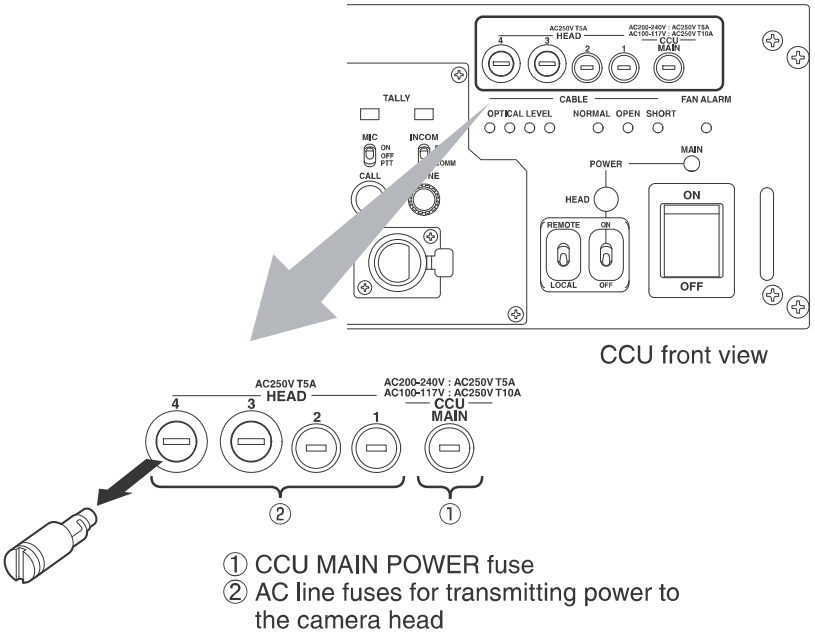
If this product does not turn on even if the AC power supply and peripheral equipment are properly connected, a fuse may have blown. If so, replace the fuse as described below.

CAUTION:

Use specified fuses or equivalent ones. For fuses that can be used, refer to "CCU-970 Front View With the Front Cover Off" (page 14).

1 Make sure the MAIN POWER switch on the front of the CCU is turned "OFF."

2 Use a flat-blade screwdriver or the like to press and turn the fuse on the front of the CCU counterclockwise and remove it.



CCU front view

3 Insert a new fuse into the fuse cap and turn it clockwise using a flat-blade screwdriver or the like until it seats firmly.

CHANGING INFORMATION

This chapter contains the revision information of user-specific specification or design change requested by users.
Read by comparing this information with the main part of the maintenance manual.

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Camera Control Unit
OPERATION MANUAL

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