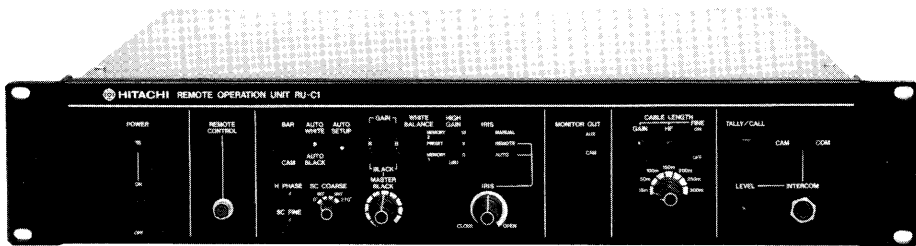


RU-C1

REMOTE OPERATION UNIT

Operation Manual



CONTENTS

1. General	1
2. Instructions for operation	1
3. Compositions	1
3.1 Standard composition	1
3.2 Optional accessories and related equipment	2
4. Names of each section	3
5. System configurations and connections	9
5.1 Typical system configuration	9
5.2 Connections	10
6. Specifications	12

PRECAUTIONS

1. Connection and disconnection of the camera cable
Be sure to turn off the RU-C1 before connecting and disconnecting the camera cable.
2. Fuse replacement
When the fuse is blown, remove the cause and replace the fuse with the supplied one. If a fuse other than specified is used, it may cause trouble.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

NOTE: The model and serial numbers of your Operation Unit are important for you to keep for your convenience and protection. These numbers appear on the name plate located on the rear panel of the products. Please record these numbers in the spaces provided below, and retain this manual for future reference.

Model No. _____

Serial No. _____

MODEL RU-C1

REMOTE OPERATION UNIT

1. GENERAL

The RU-C1 is a remote operation unit for the Hitachi FP-C1 and FP-C2 portable color cameras. The RU-C1 is used when using the cameras as an EFP or studio camera.

2. INSTRUCTIONS FOR OPERATION

- (1) The RU-C1 can be installed in the rack or on the table. For rack-mounting, remove the rubber feet, and for a desk-top use, remove the rack mount brackets.
- (2) When installing the RU-C1, note the internal heat radiation. Especially when using it on the table or floor, do not place things on the RU-C1. If doing so, internal heat radiation is prevented to raise the internal temperature, which may cause trouble.
- (3) Use the specified camera cable only.
- (4) Do not twist or fold the camera cable to avoid damage to the cable wires.
- (5) If the signal which is not synchronized with the camera is fed to AUX, the output signal may be interfered by the input signal.
- (6) A short-circuit protection circuit is built in the power supply section of the RU-C1. When the short-circuit protection circuit is activated, turn off power. Remove the cause of the short circuit, and then turn on power. Since it takes about 10 seconds to restore the short-circuit protection circuit, turn on power again ten seconds or more after turning off power.

3. COMPOSITIONS

3.1 Standard composition

Remote operation unit, RU-C1	1
Camera cable, 15 m, C-152KC	1
ROU adaptor unit, ROU-ADP	1
Shield plate	1
AC cord set	1
Spare fuse for remote operation unit	3
* 1	
Spare fuse for printed circuit board	3
* 2	
Operation manual	1

- *1 1.0A/125V for Japan
1.0A/250V for the United States and Canada
0.63A/250V for the United Kingdom and Europe
- *2 1A/125V for Japan, the United States and Canada
0.8A/250V for the United Kingdom and Europe

3.2 Optional accessories and related equipment

- Color cameras, FP-C1, FP-C2
- 4.5-inch viewfinder for studio use, GM-5-R2
- Viewfinder adaptor, AT-21
- Camera cable, 15 m, C-152KC
- Camera cable, 50 m, C-502KC
- Camera cable, 100 m, C-103KC
- Remote control box, RC-C1
- Headset, DR-10A

NOTE FOR USERS IN THE UNITED KINGDOM : IMPORTANT :

The wires of the mains lead are coloured in accordance with the following code :

Green and Yellow :EARTH
Blue : NEUTRAL
Brown :LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows :

- The wire which is coloured Green and Yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol \perp or coloured green and yellow.
- The wire which is coloured Blue must be connected to the terminal which is marked with the letter N or coloured black.
- The wire which is coloured Brown must be connected to the terminal which is marked with the letter L or coloured red.

WARNING : This apparatus must be earthed.

4. NAMES OF EACH SECTION

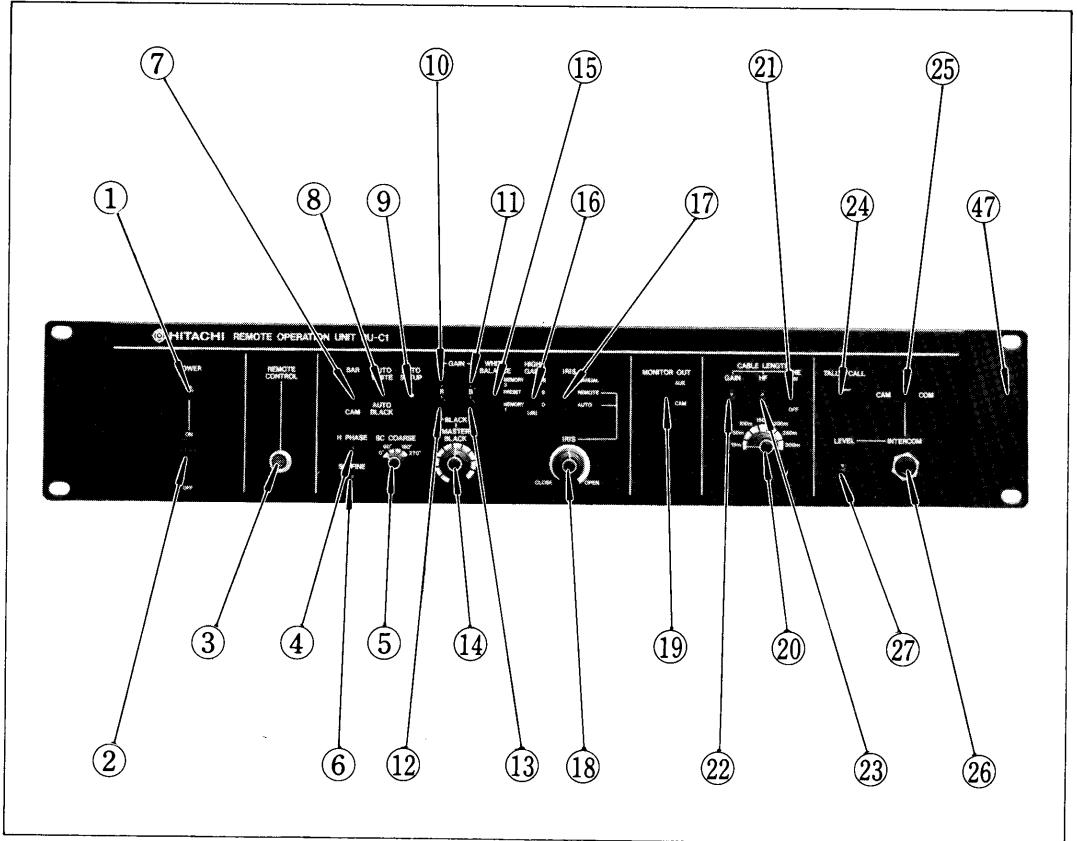


Fig. 4-1 Front panel

① Pilot lamp [POWER]

② Power switch [POWER ON-OFF]

③ Connector for RC-C1
[REMOTE CONTROL]

Connect the optional RC-C1 remote control box to this connector to perform the remote control of ④ to ⑱. Do not use this connector when the REMOTE CONTROL connector ④⑤ on the rear panel is used, because they are connected in parallel.

④ Horizontal phase [H PHASE]

Adjust the control so that the horizontal sync

signal and the genlock source are in phase.

⑤ Coarse hue control [SC COARSE]

Hue can be adjusted in approximately 90-degree steps in genlock mode.

⑥ Fine hue control [SC FINE]

Adjust the control so that the hues of the camera signal and the genlock source are in phase.

Adjust the SC COARSE control ⑤ first, and then adjust this control.

⑦ BAR/CAM switch [BAR/CAM]

When this switch is set to the BAR position,

the camera output signal is switched to the color bar signal. Use this signal for the adjustment of the camera and the color monitor. The camera signal is fed out when the switch is set to the CAM position.

⑧ AUTO WHITE/AUTO BLACK switch [AUTO WHITE/AUTO BLACK]

Set this switch up to AUTO WHITE for several seconds to activate the automatic white balance function, or set it down to AUTO BLACK to activate the automatic black balance function.

Then set the gain controls ⑩ and ⑪ and black level controls ⑫ thru ⑭ to their respective mid-positions for the optimum white balance or the optimum black balance. For details, refer to item 5 in page 9 of the operation manual of the FP-C1 camera.

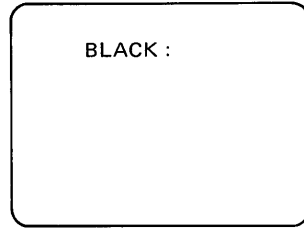
⑨ AUTO SETUP switch [AUTO SETUP]

With this switch, the white balance and the black balance are automatically set to their respective optimum values. The black balance is attained first, and then the white balance is attained.

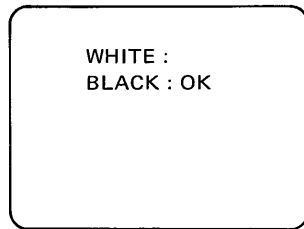
Operating procedures

- (1) Set the BAR/CAM switch ⑦ to CAM.
- (2) Set the lens IRIS mode switch ⑰ to AUTO.
- (3) Select the filter disc of the camera in accordance with the color temperature of the illumination source.
- (4) Display a white object on the whole screen.
- (5) Set the WHITE BALANCE mode switch ⑮ to MEMORY 1 or MEMORY 2.
- (6) Turn upward the AUTO SETUP switch ⑨.

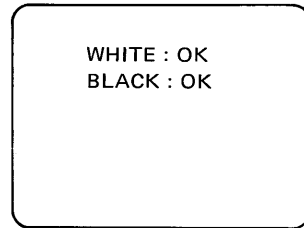
The display below appears on the viewfinder and monitor screens when auto setup has been set properly.



Auto black function is being performed.



Auto white function is being performed.



This is displayed for about 3 sec.

Message displayed when the balance has been properly set.

⑩ GAIN control [R. GAIN]

This control adjusts the gain of the red signal. To obtain white balance or to change hue, adjust this control and the GAIN control ⑪ alternately. For the automatic white balance control set this control to the center-click position.

⑪ GAIN control [B. GAIN]

⑫ BLACK level control [R. BLACK]

This control adjusts the black level of the red channel. When the black balance is not adequate or the balance should be changed, adjust this control and the B BLACK level control ⑬ alternately. For the automatic black balance control, set this control to the center-click position.

⑬ BLACK level control [B. BLACK]

⑭ BLACK level control [MASTER BLACK]

This control changes the black level of the video signal. For the automatic black balance control, set this control to the center-click position.

**⑮ WHITE BALANCE mode switch
[WHITE BALANCE]**

(MEMORY 1/PRESET/MEMORY 2)

This switch is used to switch the white balance mode to the PRESET mode or the MEMORY modes.

PRESET: At this position, the white balance which is set with a 3,200 K color temperature is obtained. (The filter disc is at the "1" position.)

MEMORY 1/MEMORY 2: Perform the automatic white balance with the switch set to either of the positions. Then, the white balance data is stored. MEMORY 1 and MEMORY 2 store different white balance data.

**⑯ HIGH GAIN switch [HIGH GAIN]
(0, 9, 18 dB)**

Use this switch when illumination is so low that the rated level can not be obtained by opening the lens iris fully. The sensitivity is changed by 9 dB or 18 dB. When illumination is bright enough, set the switch to 0 dB (standard).

**⑰ Lens IRIS mode switch [IRIS]
(MANUAL/REMOTE/AUTO)**

This switch selects the lens iris control mode.

MANUAL: The lens iris can be adjusted manually.

REMOTE: The lens iris can be controlled by the lens IRIS control ⑱.

AUTO: Auto iris control mode.

Note

1. When using the RU-C1, be sure to set the lens mode selection switch A/M to "M" (MANUAL).

2. In the AUTO mode, a fine lens iris control can be done with the lens IRIS control ⑱ at the mid-position.

⑱ Lens IRIS control [IRIS]

When controlling the lens iris on the PU-C1, set the lens IRIS mode switch ⑰ to "REMOTE" and adjust this lens IRIS control. When the lens IRIS mode switch ⑰ is at "AUTO", the fine lens iris control can be performed in the auto iris mode. When the video signal is at the rated level, set this control to the mid-position.

**⑲ MONITOR output selection switch
[MONITOR OUT] (AUX/CAM)**

At the AUX position the signal fed to the external input connector (AUX IN ⑳) is observed on the video monitor. At the CAM position, the camera signal is monitored on the video monitor.

**⑳ CABLE LENGTH selection switch
[CABLE LENGTH]**

Set this switch to the length of the cable used.

**㉑ ON/OFF switch for cable length GAIN
and HF controls [FINE ON-OFF]**

When this switch is at ON, the fine correction of frequency loss caused by the camera cable length can be performed with the GAIN control ㉒ and the HF control ㉓. When it is not needed to make fine correction of the frequency characteristics, set the switch to OFF.

Do not use this switch unless a fine adjustment is needed, since the correction of

frequency loss due to the cable length has been adjusted in accordance with the scale around the CABLE LENGTH switch.

22) GAIN control [GAIN]

This control performs a fine adjustment of the level of the camera video signal to compensate for a loss of frequency characteristics caused by the camera cable length this control is operated only when the FINE ON-OFF switch 21 is set to ON.

23) HF control [HF]

This control performs a fine adjustment of the level of the chroma band of the camera video signal to compensate for a loss of frequency characteristics caused by the camera cable length. This control is operated only when the FINE ON-OFF switch 21 is set to ON.

24) TALLY lamp/CALL switch [TALLY/CALL]

The TALLY lamp lights when the tally input is fed from an external unit or the call signal is sent from the camera. Press this switch to call the camera side.

25) Intercom selection switch [CAM/COM]

At the CAM position, the intercommunication with the camera side is possible. At the COM position, the intercommunication with the camera system including an external system is possible. When the communication with the external system is not needed for the communication between the camera and the RU-C1, set this switch to CAM.

26) INTERCOM connector [INTERCOM]

Connect the headset (DR-10A or equivalent) to this connector.

27) Intercom LEVEL control [LEVEL]

This control adjusts the volume of the intercom.

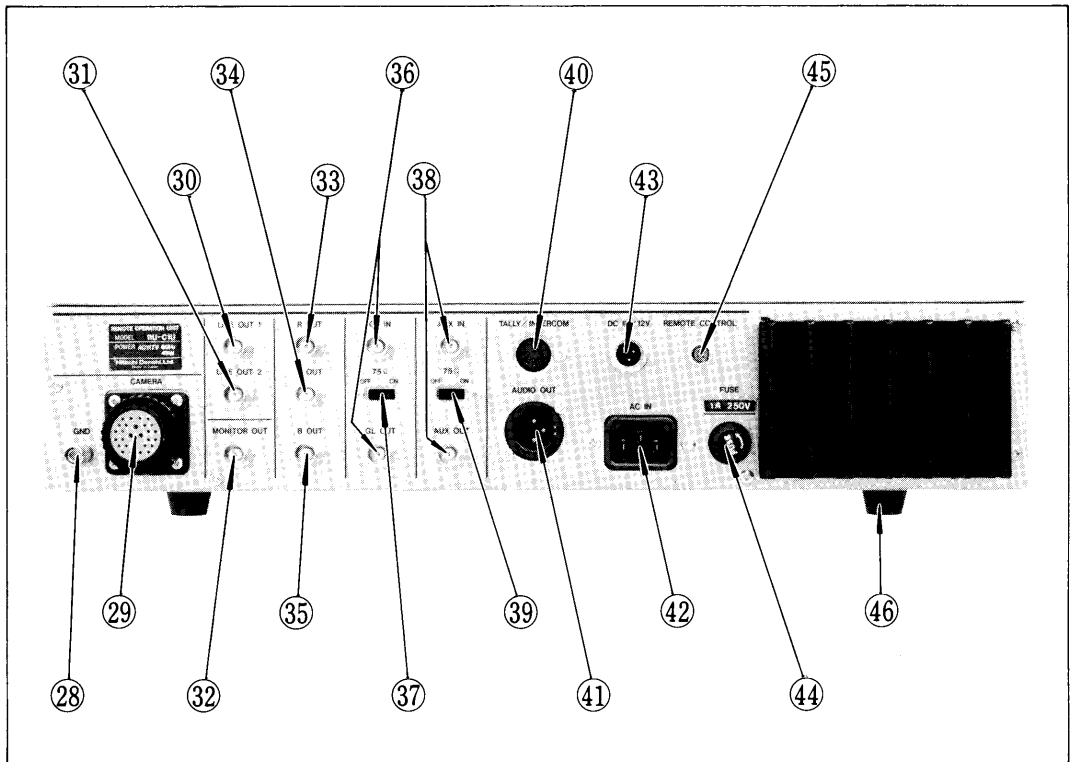


Fig. 4-2 Rear panel

②8 Grounding terminal [GND]

When the potential is developed between the RU-C1 and other unit in the system connection, connect a thick braided wire between this terminal and the grounding terminal of the unit.

②9 CAMERA cable connector [CAMERA]

Connect the FP-C1 or the FP-C2 to this connector using the specified camera cable.

③0 LINE output connector [LINE OUT 1]

A VBS signal is fed out.

③1 LINE output connector [LINE OUT 2]

A VBS signal is fed out.

③2 MONITOR output connector [MONITOR OUT]

The same signal (including the signal for character display) as that of the viewfinder is fed out as a VBS signal.

③3 Red signal output connector [R. OUT]

The red signal is fed out for the RGB monitor and the chroma key.

③4 Green signal output connector [G. OUT]

③5 Blue signal output connector [B. OUT]

Note The RGB output signals do not contain the sync signal, but the G signal can be switched to the signal with a sync signal by switch SW301 on the CMG unit inside the RU-C1. (Refer to Fig. 4-3.)

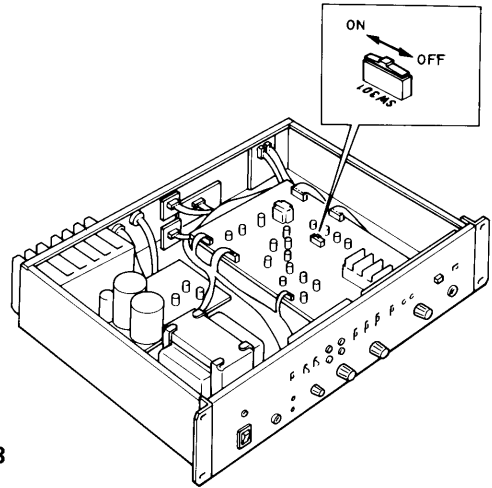
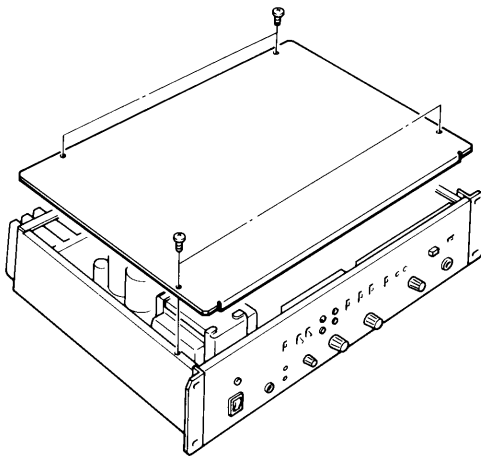


Fig. 4-3

③6 Genlock input/output connectors [GL IN, GL OUT]

Connect the black burst signal or the VBS signal to the GL IN connector when the camera is used with other video systems in the genlock mode.

When the GL IN signal is not looped through, set the genlock signal termination switch ③7 to ON. When the signal is looped through, set the switch ③7 to OFF and use the GL OUT connector.

③7 Genlock signal termination switch [75 ohms, ON/OFF]

③8 External signal input/output connectors [AUX IN, AUX OUT]

In the system using several cameras and a switcher, the return video signal from the system is connected to this connector.

When the MONITOR output selection switch ①9 is set to "AUX", the return video signal is fed out from the MONITOR output connector ③2. When the AUX IN is not looped

through, set the external signal termination switch (39) to ON. When the AUX IN is looped through, set the switch (39) to OFF and use the AUX OUT connector.

**(39) External signal termination switch
[75 ohms ON/OFF]**

**(40) TALLY/INTERCOM connector
[TALLY/INTERCOM]**

Connect the tally and intercom signals from external units to this connector. Refer to 5.2 connections for the pin connection.

(41) AUDIO signal output [AUDIO OUT]

The audio signal from the camera head is fed out at about 0 dBm. Refer to 5.2 Connections for the pin connection.

(42) AC input connector [AC IN]

Connect the supplied AC cord to this connector.

(43) DC input connector [DC IN]

When using an external DC power supply, connect the AP-60A/61 AC adaptor or the DP-15 battery. Do not use other power supplies.

Note Use a separate AC adaptor or battery for the camera, since the camera is not supplied with power from the RU-C1.

(44) Fuse holder [FUSE]

A fuse is included in this holder. ^{* 1} Before replacing the fuse, disconnect the power cord and remove the cause of the trouble.

* 1 Refer to * 1 in Section 3.1 Standard Composition.

**(45) Connector for RC-C1
[REMOTE CONTROL]**

Connect the RC-C1 (optional) to this connector. Do not use this connector when the REMOTE CONTROL connector (3) on the front panel is used, since the two connectors are connected in parallel.

(46) Rubber feet

Remove these feet when mounting the RU-C1 on the rack.

(47) Rack mount brackets

Remove these brackets when using the RU-C1 on a floor or table.

Note 1 As for the same controls on the camera and the operation unit, the controls from the operation unit has priority over those of the camera.

Note 2 The input and output levels at the TALLY/INTERCOM connector are 2 Vp-p and impedance is 220 ohms.

5. SYSTEM CONFIGURATIONS AND CONNECTIONS

5.1 Typical system configuration

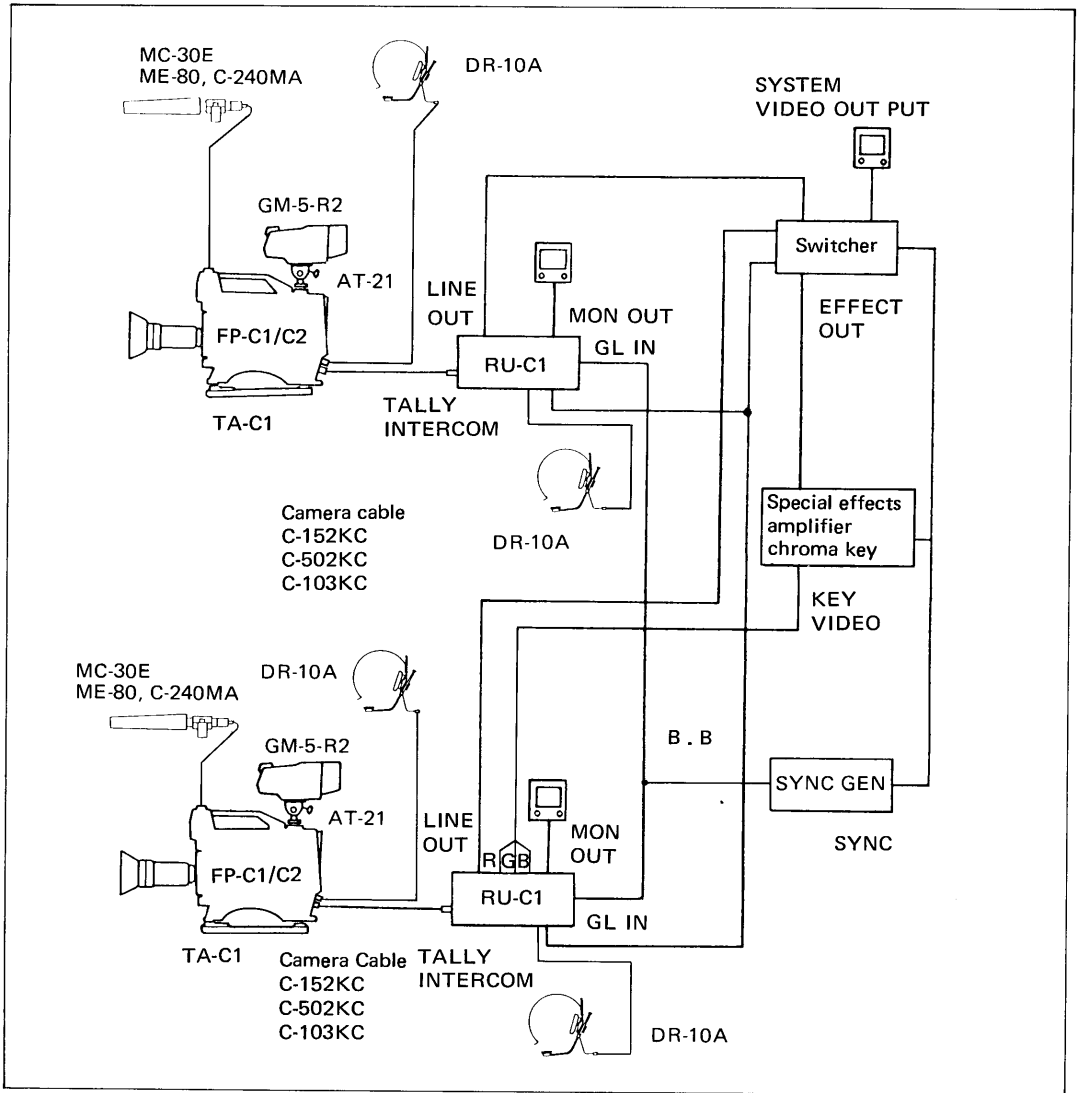


Fig. 5-1 System configuration

5.2 Connections

5.2.1 Installation of the ROU adaptor (ROU-ADP)

Remove the right side cover of the camera. Insert the supplied ROU-ADP unit and the

shield plate together into the camera along the guide rails. Make sure that they are inserted properly. Then reinstall the side cover.

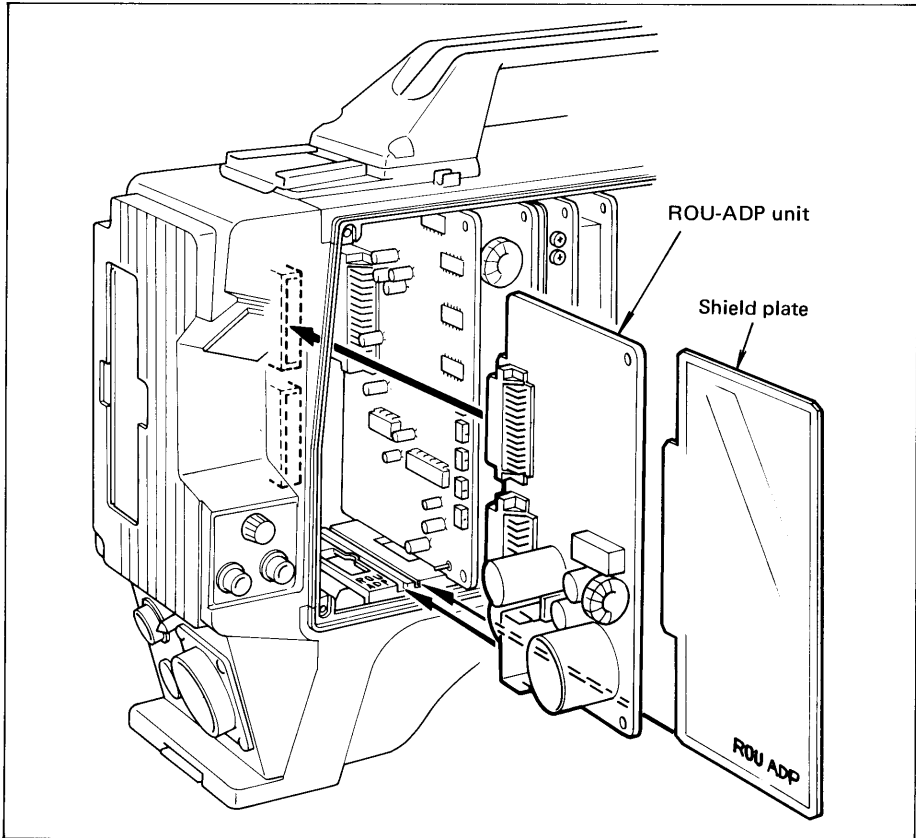


Fig. 5-2

Note Be sure to turn off the power of the camera before installing the ROU-ADP unit.

5.2.2 Camera cable connection

After turning off power, connect the RU-C1 to the FP-C1/C2 with the supplied camera cable. The optional camera cables 50 m and 100 m are available.

5.2.3 Connections with peripheral equipment

(1) TALLY/INTERCOM connection

The TALLY/INTERCOM connector (40) (DIN 5 pins) is connected as shown in Fig. 5-3. Connect the connector in accordance with the system configuration (contact supply or voltage supply).

(2) Connection of audio equipment

When connecting the audio output signal to other audio equipment, refer to Fig. 5-4. The level of the signal is about 0 dBm, and the impedance is 600 Ω balanced.

(3) Connection of genlock signal

Use the black burst signal as the genlock signal, if possible. When using a signal containing excessive chroma signal, cross-talk to the main line will occur.

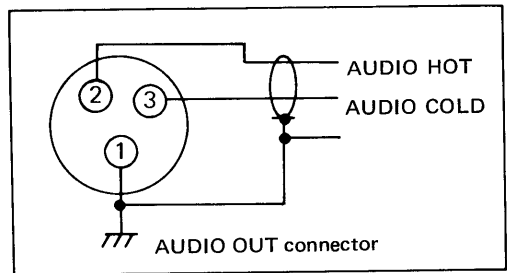


Fig. 5-4

6. SPECIFICATIONS

- | | |
|---------------------------------------|---|
| (1) Color system | : NTSC or PAL-B |
| (2) Output signals | |
| • LINE output 1 | : VBS 1.0 Vp-p/75 ohms |
| • LINE output 1 | : VBS 1.0 Vp-p/75 ohms |
| • MON | : VBS 1.0 Vp-p/75 ohms |
| • RGB output | : V 0.7 Vp-p/75 ohms
or G output only V 1.0 Vp-p/75 ohms |
| • Audio output | : 0 dBm/600 ohms |
| (3) Input signals | |
| • AUX VIDEO output | : VBS 1.0 Vp-p/75 ohms or loop through |
| • GENLOCK output | : VBS 1.0 Vp-p/75 ohms or loop through |
| • TALLY input | : Contact or voltage (24 V) |
| • INTERCOM input | : 2 Vp-p/220 ohms |
| • SERIAL DATA input | : 1.5 Vp-p/high impedance |
| (4) Power requirement | : U type: 117 V AC, 60 Hz
E type: 220 V AC, 50 Hz
K type: 240 V AC, 50 Hz |
| (5) Power consumption | : 45 W approx. |
| (6) Maximum cable length | : 300 m (approx. 980 ft) |
| (7) Ambient temperature | : +5 to +40°C (+41 to 104°F) |
| (8) Dimensions | : 482(W) x 89(H) x 302(D) mm (19 x 3.5 x 12 in) |
| (9) Weight | : 7.6 kg (17 lb) approx. |
| (10) Control items | |
| • R. GAIN | |
| • B. GAIN | |
| • BAR CAM selection | |
| • HIGH GAIN (0, +9, +18 dB) selection | |
| • MASTER BLACK LEVEL | |
| • R. BLACK LEVEL | |

- B. BLACK LEVEL
- WHITE BALANCE selection (MEMORY 1/PRESET/MEMORY 2)
- SC PHASE
- H. PHASE
- IRIS CONTROL
- IRIS selection (MANUAL/REMOTE/AUTO)
- MON selection
- AUTO WHITE
- AUTO BLACK
- AUTO SETUP
- CALL
- TALLY
- Intercommunication (CAM/COM) selection
- Cable length selection
- Cable length fine control ON/OFF selection
(Fine adjustment for GAIN and frequency characteristics)

Specifications are subject to change without notice.



HITACHI DENSHI, LTD.

23-2, Kanda Sudo-cho 1-chome, Chiyoda-ku, Tokyo 101, Japan
Phone: (03) 255-8411, Telex: J24178

HITACHI DENSHI AMERICA, LTD. *

Headquarters and New York Office

150 Crossways Park Drive, Woodbury, New York 11797, U.S.A.
Phone: (516) 921-7200, FAX: 516-496-3718, Telex: 510-221-1899

Chicago Office

250 East Devon Ave., Suite 115 Itasca, Illinois 60143, U.S.A.
Phone: (312) 250-8050 FAX: 213-250-8054

Los Angeles Office

371 Van Ness Way, Suite 120 Torrance, California 90501, U.S.A.
Phone: (213) 328-6116, FAX: 213-328-6252

Dallas Office

14169 Proton Road, Dallas, Texas 75234, U.S.A.
Phone: (214) 233-7623, FAX: 214-458-9284

Atlanta Office

3610 Clearview Parkway, Doraville, Georgia 30340, U.S.A.
Phone: (404) 451-9453, FAX: 404-458-8356

HITACHI DENSHI, LTD. (CANADA) *

Head Office

65 Melford Drive, Scarborough, Ontario M1B 2G6, Canada
Phone: (416) 299-5900, FAX: (416) 299-0450, Telex: 652-5324

Eastern Office

8096 Trans-Canadienne, St-Laurent, Quebec H4S 1M5, Canada
Phone: (514) 332-6687, FAX: (514) 335-1664, Telex: 582-4768

Western Office

3433-12th St North-East, Calgary, Alberta T2E 6S6, Canada
Phone: (403) 291-4388, FAX: (403) 250-1634, Telex: 382-5861

Ottawa Office

159 Colonnade Road, Unit #3, Nepean, Ontario, K2E 7J4, Canada
Phone: (613) 727-3930, FAX: (613) 727-3955, Telex: 053-4533

HITACHI DENSHI (EUROPA) GmbH *

Head Office

Weiskircher Straße 88, D-6054 Rodgau 1 (Jügesheim), West Germany
Phone: (06106) 13027, FAX: (06106) 16906, Telex: 417-849

HITACHI DENSHI (U.K.) LTD. *

Head Office

13-14 Garrick Industrial Centre, Irving Way, Hendon, London NW9 6AQ,
United Kingdom
Phone: (01) 202-4311, FAX: 01-202-2451, Telex: 27449

Leeds Office

Video House, 55 Manor Road, Leeds, LS11, 5PZ, United Kingdom
Phone: 0532-430294, FAX: 0532-459263

HITACHI DENSHI, LTD. BEIJING OFFICE

Xiyuan Hotel, Room No. 546 Xijiao ER LI GOU
Beijing, China
Phone: 89-0721

Beijing Service Center

57 Xisi Dongdajie, Beijing, China
Phone: 66-7643

* Subsidiaries of Hitachi Denshi, Ltd.