SONY

3-756-859-02(1)

CCD Color Video Camera

Model:

DXC-151A
DXC-151AP

取扱説明書 5ページ

Operating Manual Page 29

Mode d'emploi Page 53

Bedienungsanleitung Seite 77

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English

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

This instruction manual is for both the DXC-151A and the DXC-151AP color video cameras.
The operating instructions for both cameras are the same, but their signal systems and camera adaptors are different.

	Signal system	Camera adaptor
DXC-151A	EIA standards, NTSC color system	For non-medical use CMA-D2 For medical use CMA-D2MD
DXC-151AP	CCIR standards, PAL color system	For non-medical use CMA-D2CE For medical use CMA-D2MDCE

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Features

The DXC-151A/151AP is a 2/3-inch color video camera which uses a CCD (Charge Coupled Device), a solid stage image sensor.

Mechanical Features

You can obtain optimal picture quality with a minimum of vibration noise even when the camera is moved.

The camera is so small and lightweight that you can attach it anywhere such as on a wall or ceiling. It can be used in the following situations.

- For use with a tripod
- For use in televised conferences
- For use with a microscope or endoscope
- For permanent use in halls and auditoriums

Video Features

High-quality picture

This unit can playback pictures at a resolution of 460 horizontal TV lines.

RGB output connector

In addition to a composite video signal output, the camera has an RGB signal output, so you can connect it to an RGB monitor or an image processing device.

Y/C separated video output

By switching the setting of the internal switch, the camera outputs the luminance (Y) signal and the chrominance (C) signal separately. This allows you to connect a special cable (CCMC-9DS) or a camera adaptor (CMA-D2/D2CE) to a monitor equipped with an S-video connector, and gives you a picture with a minimum of flicker and/or color blur.

Function Features

Four modes for white balance adjustment

You can choose the appropriate mode (AUTO, 3200K, 5600K, or ATW) according to the lighting conditions.

Ten shutter speed settings

This camera's has ten electronic shutter settings: seven shutter speed settings (ranging from OFF to 1/10000 sec) and three CCD IRIS settings (SPOT, STD, and BACK).

Four modes for gain control (video output level)

You can choose the gain control (video output level) from among four modes, according to the lighting conditions: AGC (Auto-Gain Control), 0 dB, 6 dB, and 12 dB.

External sync system

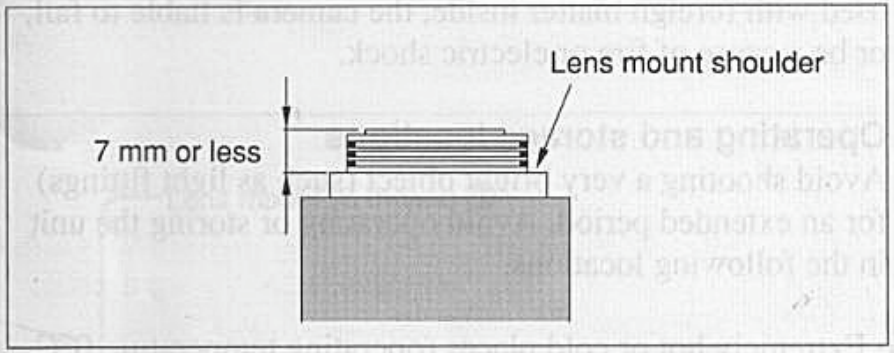
When you use a video switcher to control two or more cameras, you can input the same sync signal to all of them so that they output pictures of the same quality.

CCD IRIS function

You can choose the appropriate setting among SPOT (spotlight), STD (standard), and BACK (backlight), according to the lighting conditions.

Lens

You can mount any 2/3-inch C-mount lens, as long as it does not project more than 7 mm from the lens mount shoulder.



Camera Adaptor

The camera adaptor you can use with this camera is shown in the table on page 29.

Note

The CMA-D2/D2MD/D2CE/D2MDCE camera adaptor is equipped with two DC OUT connectors. Using the CCMC connecting cable or the CCDC connecting cable you can connect the camera.

If you use two cameras at the same time they may malfunction so be sure to use a camera adaptor for each camera.

Notes on Use

Handling of the unit

Be careful not to spill water or other liquids on the unit, or to get combustible or metallic material inside the body. If used with foreign matter inside, the camera is liable to fail, or be a cause of fire or electric shock.

Operating and storage locations

Avoid shooting a very bright object (such as light fittings) for an extended period. Avoid operating or storing the unit in the following locations.

- Extremely hot or cold places (operating temperature 0°C to 40°C; 32°F to 104°F)
- Damp or dusty places
- Locations exposed to rain
- Locations subject to strong vibration
- Close to generators of powerful electromagnetic radiation, such as radio or TV transmitters

Handling of the lens

As the lens could be damaged if not attached properly, make sure to see the section "Attaching the lens" on page 38 before attaching it.

Care of the unit

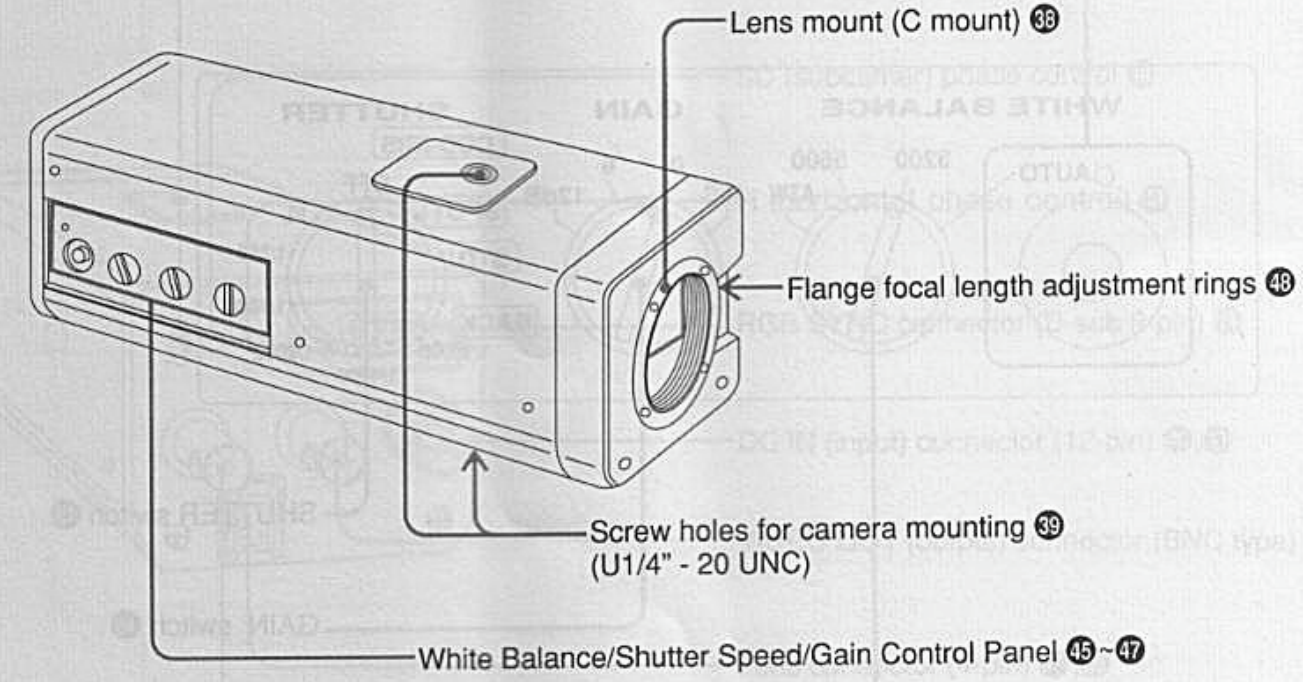
- Remove dust or dirt from the surface of the lens or optical filter with a blower.
- Use a dry, soft cloth to clean the body. If it is very dirty, use a cloth dampened with a small quantity of neutral detergent, then wipe dry. Avoid the use of volatile solvents such as thinners, alcohol, benzene, and insecticides. They may damage the surface finish or impair the operation of the camera.

In the event of any problems with the operation of the camera, contact your Sony service representative.

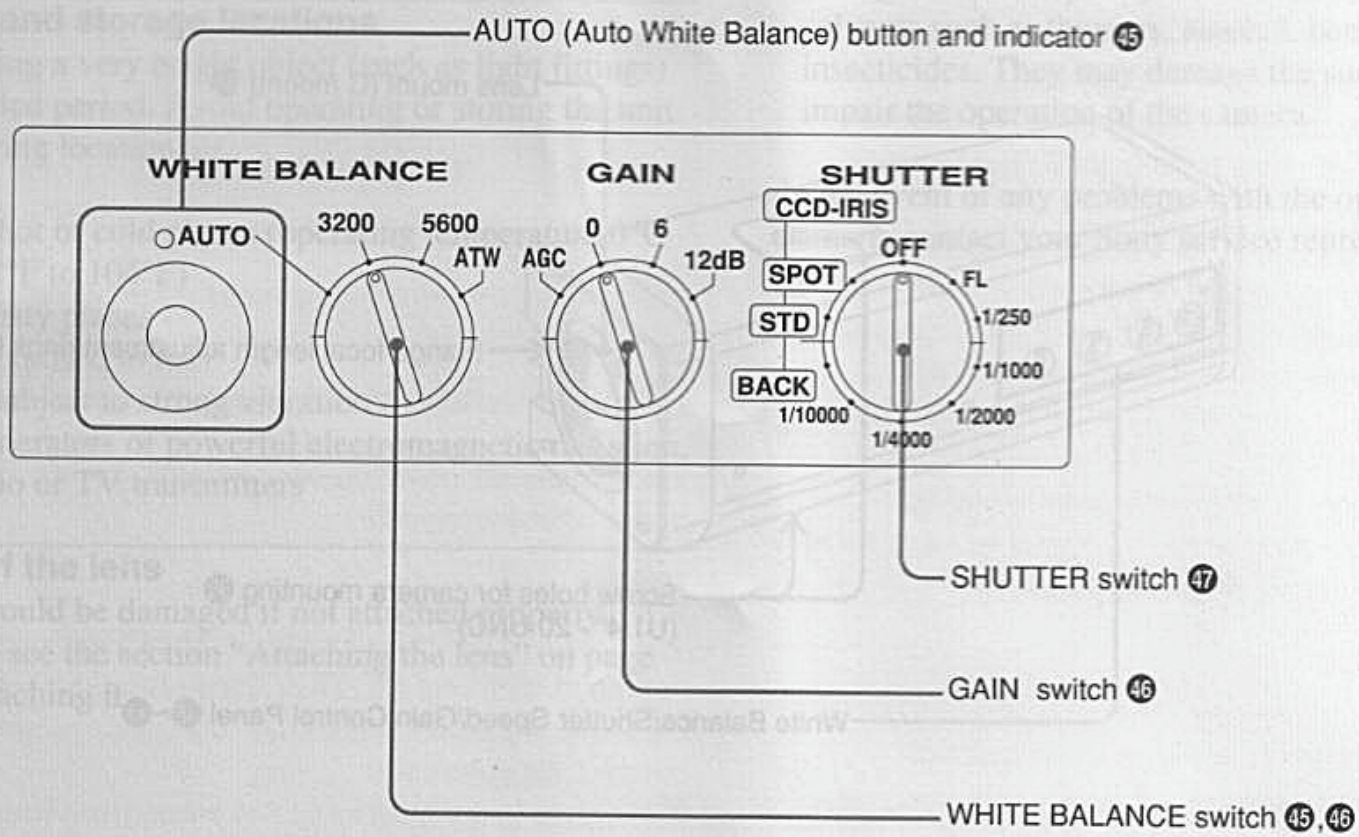
Location of Parts and Controls

The numerals such as ● in the illustrations indicate the page number on which this part is discussed.

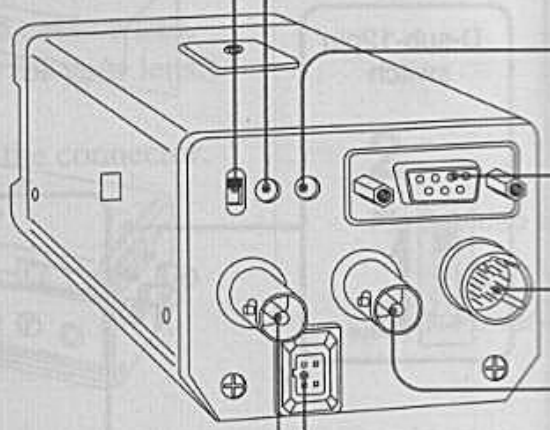
Front and Side



White Balance/Shutter Speed/Gain Control Panel



Connector Panel



Subcarrier phase switch ㊹

SC (subcarrier) phase control ㊹

H (horizontal phase control) ㊹

RGB SYNC connector (D-sub 9-pin) ㊶

DC IN (input) connector (12-pin) ㊵,㊸

VIDEO OUT (output) connector (BNC type) ㊵ ㊸

Lens connector (4-pin) ㊲,㊳

GEN LOCK IN (input) connector (BNC type) ㊸

Internal Switch Settings

There are four internal switches that you can set inside the unit.

- Y/C-VBS switch: video output signal from a D-sub 9-pin or 12-pin connector
- SW1 switch: level of the sync signal
- SW2 switch: adding the sync signal to the G signal
- D-sub-12pin switch: selecting the output connector

Y/C-VBS switch: video output signal from D-sub 9-pin or 12-pin connector

Y/C:	The camera outputs the Y/C separated signal (factory setting).
VBS:	The camera outputs the composite signal.

SW1 switch: level of the sync signal

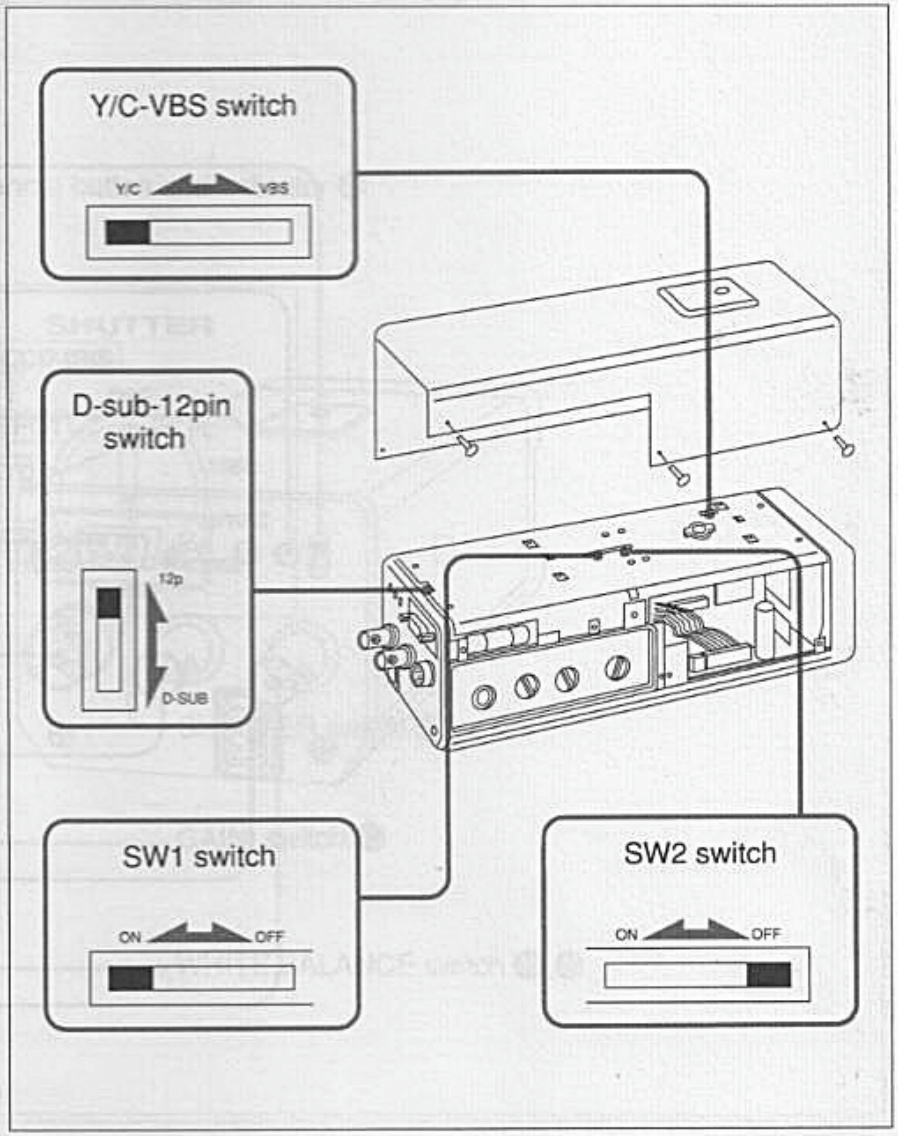
ON:	The level is set to 2.0Vp-p (factory setting).
OFF:	The level is set to 0.3Vp-p.

SW2 switch: adding the sync signal to the G signal

ON:	The sync signal is added to the G signal.
OFF:	The sync signal is not added (factory setting).

D-sub-12 pin switch: selecting the output connector

D-sub:	The video (Y/C or VBS) signal outputs from the D-sub 9-pin connector. (DXC-151A factory setting)
12 pin:	The video (Y/C or VBS) signal outputs from the 12-pin multi connector. (DXC-151AP factory setting)



Installation

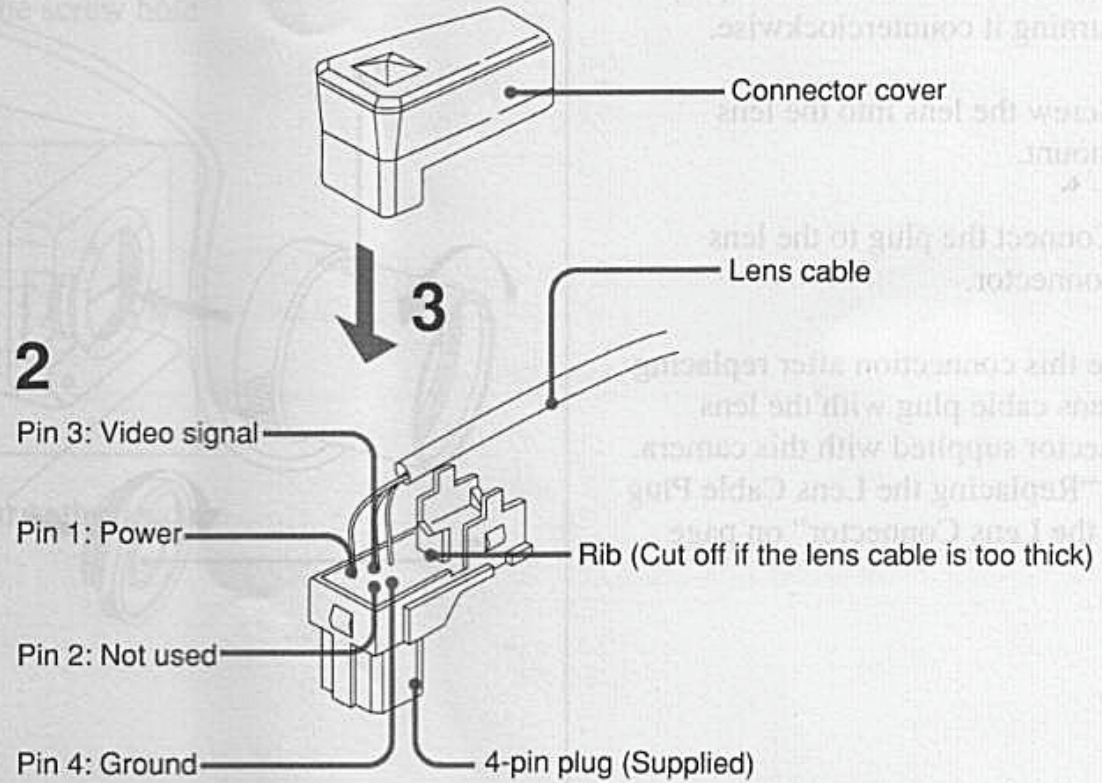
Replacing the Lens Cable Plug with the Lens Connector (supplied)

To use an auto iris lens, replace its cable and plug with the supplied lens connector as shown below.

1 Disconnect the lens cable from its plug.

2 Solder the cable wires to the pins on the supplied lens connector as illustrated on the right. (For identification of the cable wires, refer to the manual for your lens.)

3 Place the cover on the connector.



Attaching the Lens

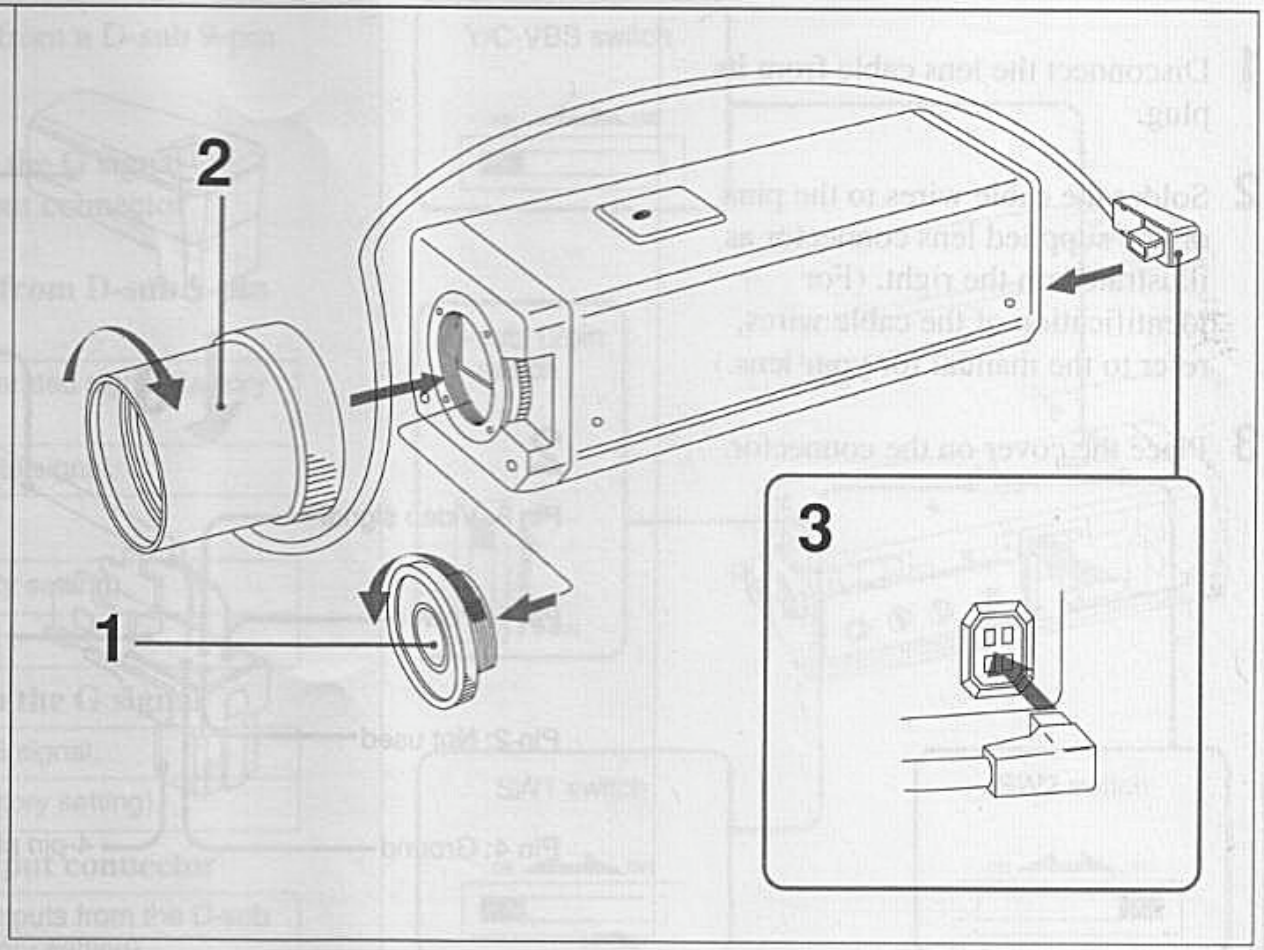
To use an auto-iris lens, attach the lens as shown below. When using a manual iris lens, omit step 3.

1 Remove the lens mount cap by turning it counterclockwise.

2 Screw the lens into the lens mount.

3 Connect the plug to the lens connector.

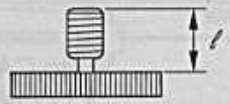
Make this connection after replacing the lens cable plug with the lens connector supplied with this camera. (See "Replacing the Lens Cable Plug with the Lens Connector" on page 37.)



Installing the Camera

- When installing the camera on a wall or ceiling, use an appropriate support or mounting bracket. Fix the camera to the support or bracket using screws as specified below, which match the screw holes in the camera body.
- When mounting the camera on a tripod, use the screw hole provided on the bottom of the camera

U -1/4" 20 UNC
ℓ: ISO standard 4.5 mm ± 0.2 mm
ASA standard 0.197 inches



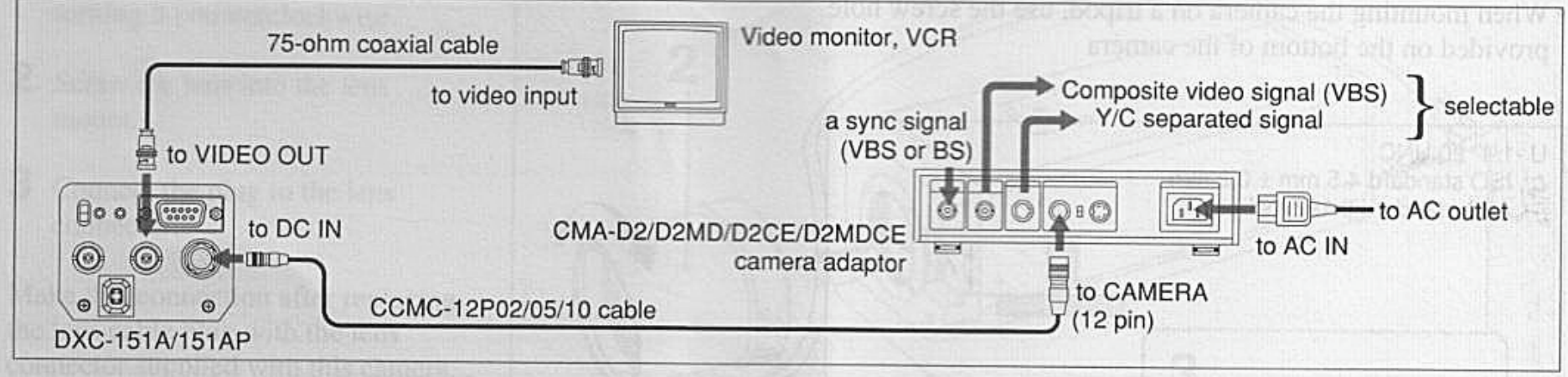
For more details about installation, consult your authorized Sony dealer.

Connections

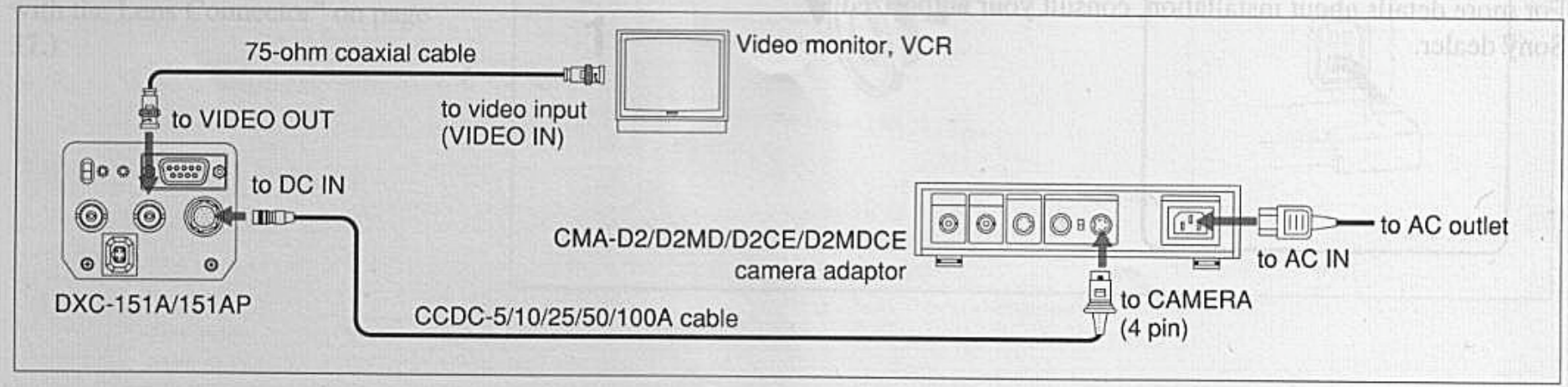
For the DXC-151A camera, supply the power from the CMA-D2/D2MD camera adaptor.
For the DXC-151AP camera, supply the power from the CMA-D2CE/D2MDCE camera adaptor.

Connecting One Camera Using the VIDEO OUT Connector

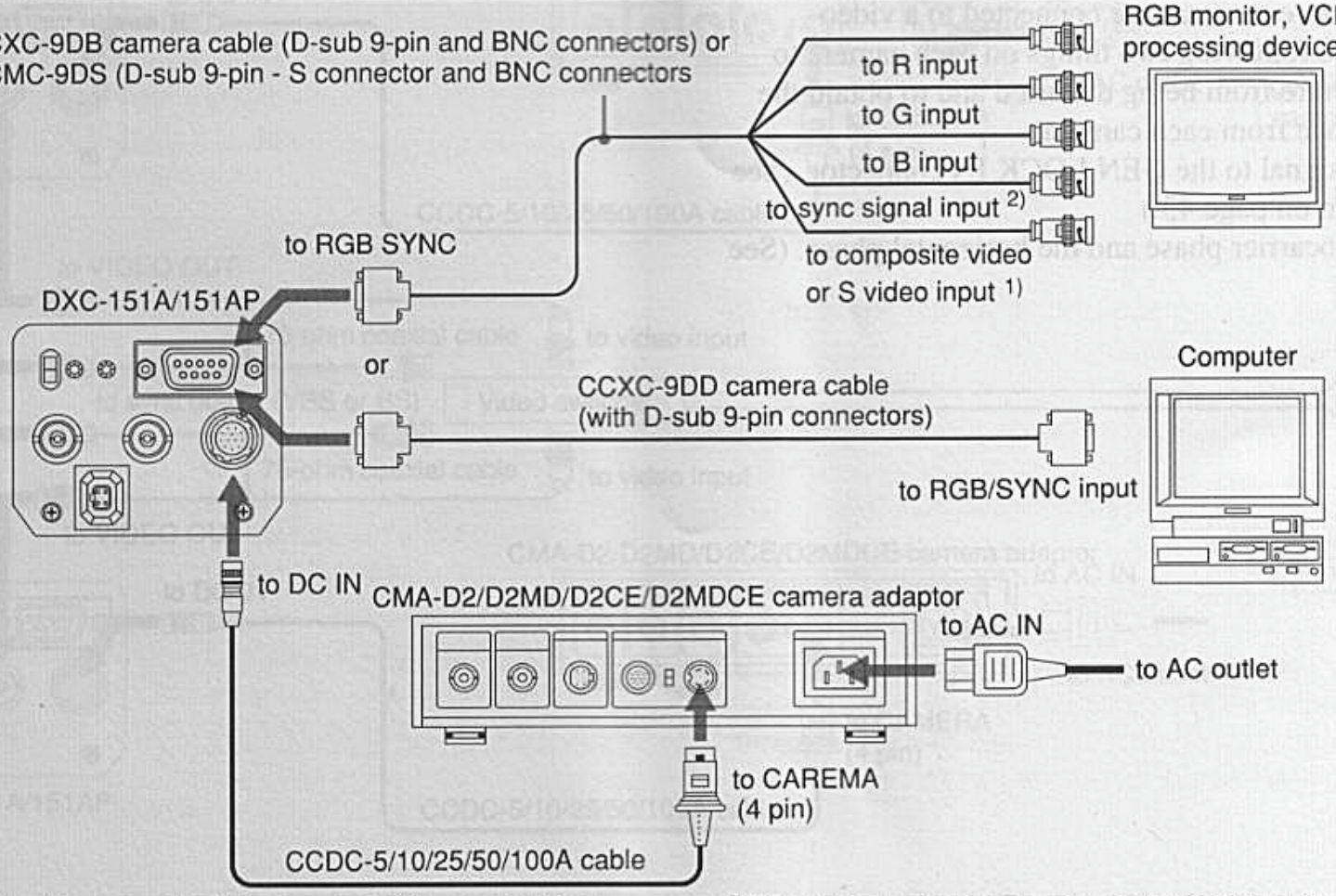
Connecting the camera using the power supply and external sync signal connections.



Connecting the camera using the power supply connection only.



Connecting One Camera Using the RGB SYNC Connector



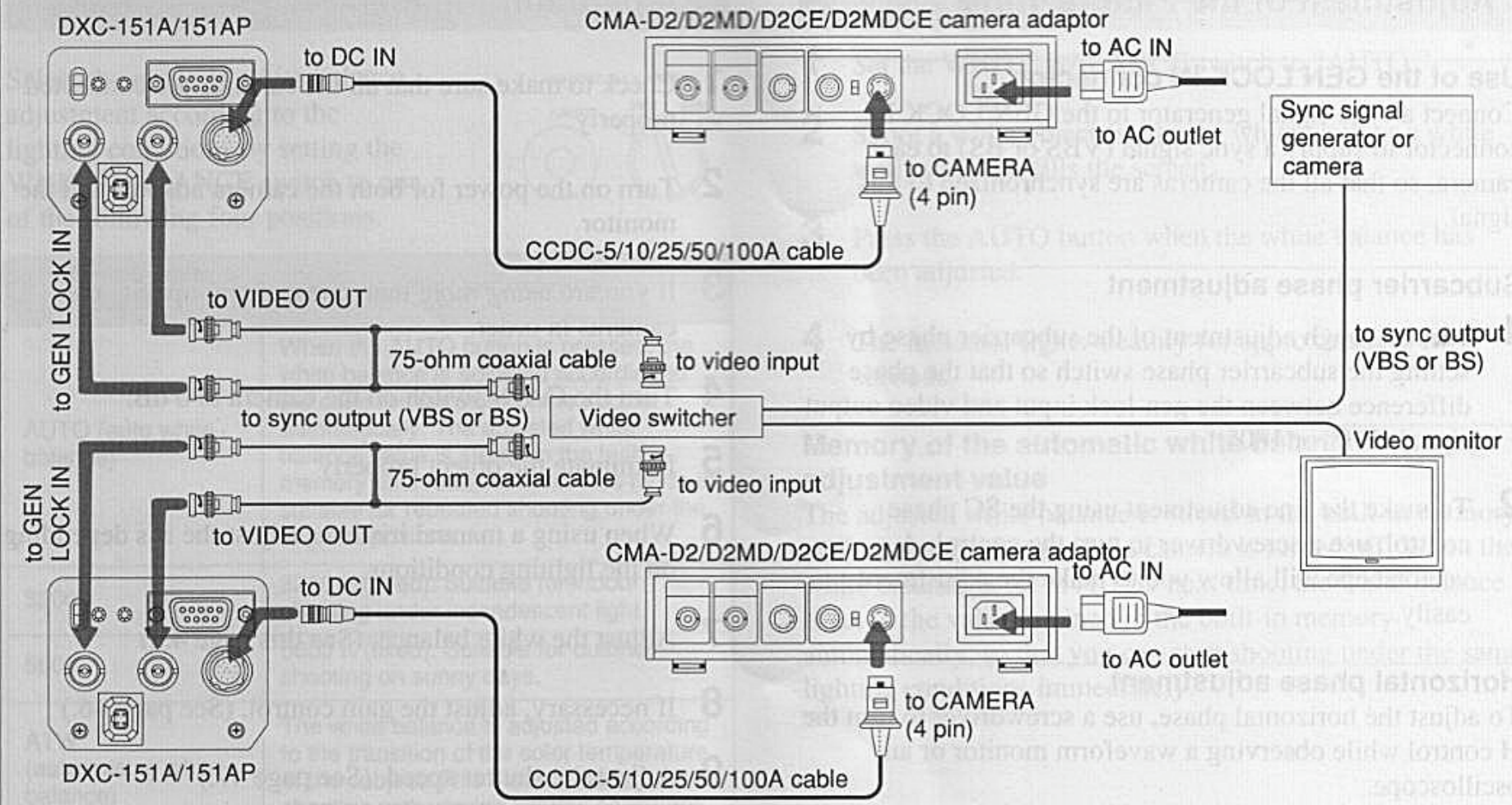
1) To select either the composite video signal or Y/C separated signals, change the setting of the Y/C-VBS switch located on the internal board. (See "Internal Switch Settings" on page 36.)

2) When using a monitor not equipped with a sync signal input connector, the camera can output the sync signal with the G signal. Change the setting of the SW2 switch located on the internal board. (See "Internal Switch Settings" on page 36.)

When Using Two or More Cameras

When two or more cameras are connected to a video switcher, do the following two things on each camera to prevent the picture from being distorted and to obtain the same picture tone from each camera.

- Input a sync signal to the GEN LOCK IN connector. (See the illustration on page 43.)
- Adjust the subcarrier phase and the horizontal phase. (See page 44.)



With the camera connected to the CMA-D2/D2MD/D2CE/D2MDCE camera adaptor via a CCMC cable, you can use the VIDEO OUT connector (or the S-connector) and the GEN LOCK IN connector.

Adjustment of the Picture Tone

Use of the GEN LOCK IN connector

Connect a sync signal generator to the GEN LOCK IN connector to supply a sync signal (VBS or BS) to each camera, so that all the cameras are synchronized to this signal.

Subcarrier phase adjustment

1 Make a rough adjustment of the subcarrier phase by setting the subcarrier phase switch so that the phase difference between the gen-lock input and video output signals is 0° or 180°.

2 To make the fine adjustment using the SC phase control, use a screwdriver to turn the control. A vectorscope will allow you to make the adjustment easily.

Horizontal phase adjustment

To adjust the horizontal phase, use a screwdriver to turn the H control while observing a waveform monitor or an oscilloscope.

Operation

Preparation

1 Check to make sure that all the cameras are connected properly.

2 Turn on the power for both the camera adaptor and the monitor.

3 If you are using more than one camera, operate the cameras in order.

4 Turn the GAIN switch on the camera to 0 dB.

5 Illuminate the object properly.

6 When using a manual iris lens, adjust the iris depending on the lighting conditions.

7 Adjust the white balance. (See this page 45.)

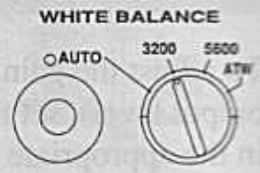
8 If necessary, adjust the gain control. (See page 46.)

9 Adjust the shutter speed. (See page 47.)

10 Start recording.

White Balance Adjustment

Select the mode of white balance adjustment according to the lighting conditions by setting the WHITE BALANCE switch to one of the following four positions.



Mode/Switch position	Color temperature
AUTO (auto white balance)	When the AUTO button is pressed, the white balance is adjusted according to the color temperature of the subject automatically. The adjusted white balance value is stored in the built-in memory until readjustment. This mode is suitable for repeated shooting under the same conditions.
3200	3200 K (fixed): Suitable for indoor shooting under incandescent light.
5600	5600 K (fixed): Suitable for outdoor shooting on sunny days.
ATW (auto tracing white balance)	The white balance is adjusted according to the transition of the color temperature of the subject. This mode is suitable for shooting with varying lighting conditions.

Automatic white balance adjustment

1. Set the WHITE BALANCE switch to "AUTO."
2. Shoot a white object (such as a white cloth or a white wall) so that it fills the screen.
3. Press the AUTO button when the white balance has been adjusted.
4. The indicator lights steadily for approximately two seconds.

Memory of the automatic white balance adjustment value

The adjusted white balance is stored in the built-in memory and it is retained even if the camera is turned off. When the white balance is set to AUTO next time, the white balance is set to the value retained in the built-in memory automatically, so that you can start shooting under the same lighting conditions immediately.

When the white balance cannot be adjusted automatically

When the white balance cannot be adjusted, adjust the white balance again as follows, depending on the type of lens you are using.

Lens type	Lighting condition	Indicator	Corrective measures
Auto iris lens	too dark	flashes	If the lighting is insufficient, increase the lighting and press the AUTO button again. Also, adjust the level or the ALC on the lens as required.
Manual iris lens	too dark	flashes	If the lighting is insufficient, open the iris or increase the lighting and press the AUTO button again.
Manual iris lens	too bright	lights steadily	If the lighting is excessive, the colours on the display will not appear as they should indicating that white balance adjustment cannot be made properly. In this case stop down the lens and press the AUTO button again.

Adjusting the Gain Control (Video Output Level)

To adjust the gain control (video output level), set the GAIN switch in the appropriate position.

GAIN switch position	Video output level
AGC (automatic gain control)	The video output level is automatically adjusted according to the lighting condition. Set the switch in this position when the lighting conditions are subject to change, as in conditions outdoors.
0 dB	Generally, set the switch in this position.
6 dB	The video output level is raised by 6 dB or 12 dB depending on the position of the switch. When the lighting is insufficient and the picture observed on the monitor is too dim, set the switch in one of these positions.
12 dB	

Selecting the Shutter Speed

To select the desired shutter speed, set the SHUTTER switch in the corresponding position.

Note

Using an auto-iris lens while in CCD IRIS mode may sometimes produce a picture of less than optimum quality. If this is the case, set the SHUTTER switch to a fixed shutter speed (ranging from OFF to 1/10000 sec).

When using this unit in CCD IRIS mode under fluorescent light, etc., a slow color change may occur. To avoid this, set the SHUTTER switch to FL or OFF and use the auto-iris lens.

When using the CCD IRIS SPOT mode with the GAIN switch set to AGC, the effect is not sufficient. To assure sufficient effect, set the GAIN switch to 0 dB.

Switch position	Operating condition, shutter speed
OFF	The electronic shutter speed function does not operate.
FL (flickerless)	This setting is provided to prevent the picture from flickering on a 50 Hz power supply.
1/250	1/250 sec
1/1000	1/1000 sec
1/2000	1/2000 sec
1/4000	1/4000 sec
1/10000	1/10000 sec
BACK (backlight)	Use this setting when the subject is brightly illuminated from the back.
STD (standard)	Generally, set the switch in this position.
SPOT (spotlight)	Use this setting when the subject is brightly illuminated from the front.

Adjusting the Flange Focal Length

When using a zoom lens with this camera, it may be necessary to adjust the flange focal length (the distance between the lens mounting plane and the image plane). A properly adjusted flange focal length ensures that the subject is in focus whether the zoom is in the wide-angle position or telephoto position. Once the flange focal length has been adjusted, readjustment is not necessary as long as the same lens is mounted on the camera.

How to adjust

1 When a manual iris lens is used, open the iris fully. When an auto iris lens is used, adjust the lighting until the iris is fully open.

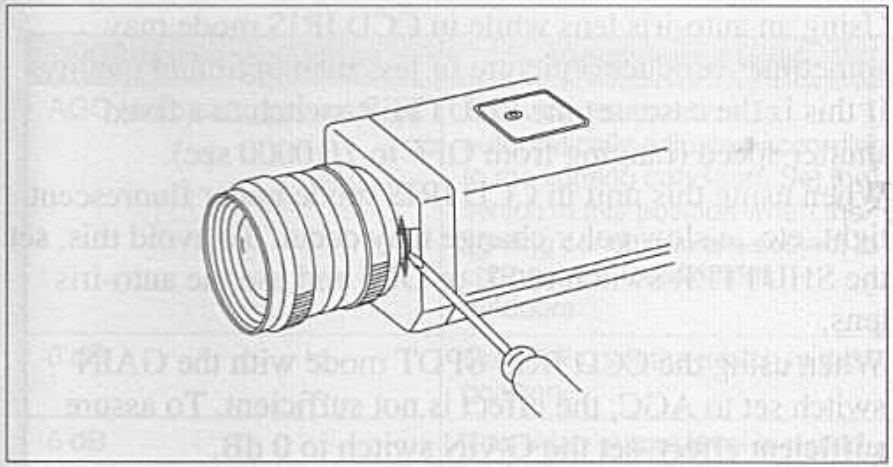
2 Point the camera at a subject approximately 3 meters (10 feet) away.

3 Set the zoom in the telephoto position.

4 Turn the focus ring to focus on the subject while observing the monitor screen.

5 Set the zoom in the wide-angle position.

6 Turn the flange focal length adjustment ring until the same subject is in focus. Do not turn the focus ring.



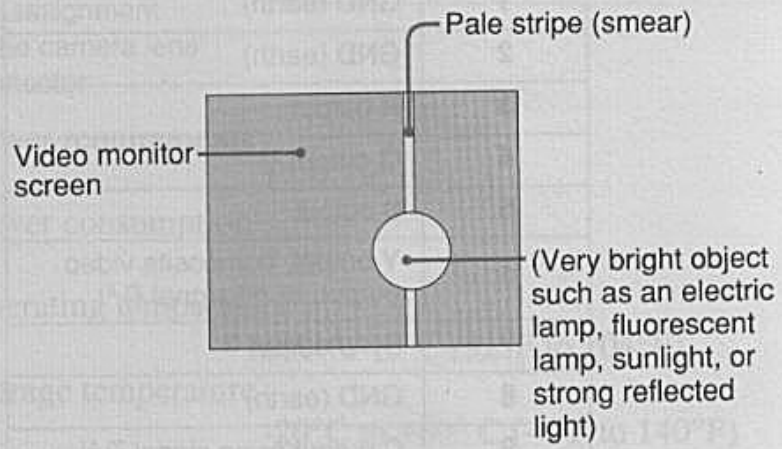
7 Repeat steps 3 to 6 until the subject is in focus both when the zoom is in the telephoto position and when it is in the wide-angle position.

Special Characteristics of the CCD Camera

The following conditions that may be observed during the use of a CCD video camera are not associated with any fault of the camera.

Smearing

The picture may be smeared when a very bright object is shot.



Patterned noise

This may appear over the entire monitor screen when the camera is operated at a high temperature.

Jagged picture

When thin stripes, straight lines, or the like are shot, the image monitored on the screen may appear jagged.

Specifications

Pickup device

Pickup device	Interline-transfer 2/3-inch CCD
Color filter	Primary color filter
Picture elements	380,000
	DXC-151A: 768 × 493 (horizontal × vertical)
	DXC-151AP: 756 × 581 (horizontal × vertical)
Sensing area	Equivalent to a 2/3-inch pickup tube

Optical system and miscellaneous

Lens mount	C mount
Signal system	For the DXC-151A:
	EIA standards, NTSC color system
	For the DXC-151AP:
	CCIR standards, PAL color system
Scanning system	DXC-151A: 525 lines 2:1 interface, 30 frames/sec.
	DXC-151AP: 625 lines 2:1 interface, 25 frames/sec.
Synchronization	Internal/external (switched automatically)
External synchronizing signal	VBS or BS signal (Sync level 0.3 Vp-p) (Burst level 0.3 Vp-p)

Specifications

Horizontal resolution
460 TV lines

Minimum illumination
13 lux F1.4 (GAIN: +12 dB, SHUTTER: OFF)

Sensitivity 2000 lux, over F5.6 (GAIN 0 dB)

Video output RGB: 0.7Vp-p, 75 ohms
VIDEO OUT: 1Vp-p, 75 ohms, sync negative
Y: 1Vp-p, 75 ohms
C: C level is in accordance with VBS.

Video S/N ratio DXC-151A: 48dB or over (GAIN: 0 dB)
DXC-151AP: 46dB or over (GAIN: 0 dB)

Electronic shutter 10 modes
OFF, FL, 1/250, 1/1000, 1/2000, 1/4000, 1/10000 sec, CCD IRIS mode (Standard mode, Backlight mode, Spotlight mode)

White balance 4 modes
AUTO, 3200, 5600, ATW

Gain control 4 modes
AGC, 0 dB, 6 dB, 12 dB

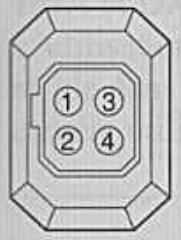
Input and output connectors

GEN LOCK IN: BNC type
DC IN: 12-pin connector
VIDEO OUT: BNC type
RGB SYNC: D-sub 9-pin connector

Pin No.	Signal
1	GND (earth)
2	GND (earth)
3	R output
4	G output [1]
5	B output
6	Y output, composite video output, or no signal [2] [4]
7	Sync output [3]
8	GND (earth)
9	C output or no signal [2] [4]

1) Change the setting of the internal switch to add the sync signal.
2) Change the setting of the internal switch between Y output and composite video output.
3) Change the setting of the internal switch to change the level of the sync signal.
4) Change the setting of the internal switch to either 12-pin or D-sub 9-pin.

Lens: 4-pin connector



Pin assignment of the camera lens connector

Pin No.	Signal
1	Power (+8.5, 40 mA)
2	Not used
3	Video output signal for lens
4	GND (earth)

Power requirements
12 V DC

Power consumption
7 W

Operating temperature
0°C to 40°C (32°F to 104°F)

Storage temperature
-20°C to +60° C (-4°F to 140°F)

Operating humidity 20% to 80% (no condensation allowed)

Storage humidity 20% to 90% (no condensation allowed)

Shock resistance Less than 686 m/s² (70 G)

Dimensions 65 × 50 × 170 (w/h/d)
(2 5/8 × 2 × 6 3/4 inches)
excluding projecting parts

Mass Approx. 520 g (1 lb. 2 oz.)

Accessories supplied
Lens mount cap (1)
Lens connector (1)

Accessories not supplied

Camera adaptor for the DXC-151A:
For non-medical use CMA-D2
For medical use CMA-D2MD

Camera adaptor for the DXC-151AP:
For non-medical use CMA-D2CE
For medical use CMA-D2MDCE

12-pin cable:
CCDC-10 (10 m)
CCDC-25 (25 m)
CCDC-50 (50 m)
CCDC-100A (100 m)
CCMC-12P02 (2 m)
CCMC-12P05 (5 m)
CCMC-12P10 (10 m)

D-sub 9-pin, D-sub 9-pin cable:
CCXC-9DD

D-sub 9-pin, BNC × 5 cable:
CCXC-9DB

D-sub 9-pin, BNC × 4, and S connector cable:
CCMC-9DS

Design and specifications are subject to change without notice.