

SONY

3-179-273-13(1)

Color Video Camera

DXC-107A/107AP

Operating Instructions Page 2

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

Mode d'emploi Page 30

Avant la mise en service de la caméra, prière de lire attentivement ce mode d'emploi que l'on conservera pour toute référence ultérieure.

Bedienungsanleitung Seite 58

Vor der Inbetriebnahme lesen Sie diese Anleitung bitte sorgfältig durch und bewahren Sie sie zum späteren Nachschlagen auf.

HyperHAD™



DXC-107AP ONLY



For the customers in the USA

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

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

The shielded interface cable recommended in this manual must be used with this equipment in order to comply with the limits for a digital device pursuant to Subpart B of Part 15 of FCC rules.

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

Owner's Record

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

Model No. DXC-107A/107AP Serial No. _____



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

Table of Contents

Features	4
Lens	5
Camera Adaptor	5
Care of the Unit	6
Location and Function of Parts	7
Installation	10
Attaching the Lens	10
Installing the Camera	12
Connections (For non-medical use)	13
When Not Inputting the Sync Signal	13
When Inputting the Sync Signal	14
Using Camera Adaptor CMA-D2/CMA-D2CE	16
Connections (For medical use)	18
Using Camera Adaptor CMA-D2MD/CMA-D2MDCE	18
Operation	20
Preparation	20
Adjusting the White Balance	21
Switching the Automatic Gain Control On or Off	21
Selecting the Shutter Speed	22
Setting the Camera ID	23
Internal Switch Setting	24
Adjusting the Flange Focal Length	25
Special Characteristics of a CCD Camera	26
Specifications	27

Features

The DXC-107A/107AP is a color video camera which uses a CCD (Charge Coupled Device) a solid state image sensor.

High quality picture

- **High resolution:** The CCD used in the camera has 768 x 494 (107A)/752 x 582 (107AP) picture elements, ensuring a high resolution picture.
- **Very faint after-images:** A clear picture can be obtained even when shooting a rapidly moving object or shooting in a place where illumination is very low.
- **Minimum image distortion:** Pictures can be shot in precise geometry.

High sensitivity

Will produce an image even in very poor lighting.

Four modes for white balance adjustment

You can choose the mode appropriate for the lighting conditions.

Electronic shutter with wide range of operating speeds

This camera has an electronic shutter whose operating speed can be selected from among ten settings. Of the ten settings, seven are fixed settings ranging from 1/60 (107A)/1/50 (107AP) to 1/10000 sec.; the other three are settings for automatic shutter speed control (CCD IRIS).

CCD iris function

The camera automatically adjusts the shutter speed for optimum exposure, even when using a lens with manual iris. Three modes are available to suit various lighting conditions: standard mode, backlight mode and spotlight mode (See page 22).

Internal/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 having the same quality.

Power feed and signal transmission with a single coaxial cable

When connected to a CMA-D7/CMA-D7CE camera adaptor (not supplied) using a 75-ohm coaxial cable, the camera can receive power from and transmit the video signal to the camera adaptor via that cable. In addition, an external sync signal can be input to the camera via the same cable.

Display of Camera ID on the monitor screen

A four-character camera ID (identification) can be superimposed on the picture at the lower right corner of the monitor screen.

Compact and lightweight

The camera is so compact and lightweight that you have a wide choice of place to install: wall, ceiling, tripod, etc.

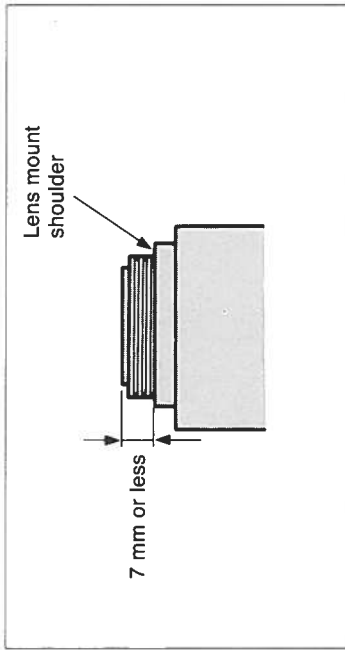
High resistance to vibration and mechanical shocks

You can obtain a fine picture with the least vibration noise even while the camera is moved.

S video output

When camera adaptor CMA-D2/D2MD/D2CE/D2MDC is connected, an S video output is available. (An internal switch in the camera must be set.) (See page 24.)

You can use any C-mount lens as long as its projection from the lens mount shoulder is not greater than 7 mm.



Whether lens iris control is manual or automatic is no problem. You can use, for example, the Sony VCL-06XK, which is a manual iris lens.

Important

Always use a 1/2-inch C-mount lens with this camera whose CCD size is 1/2 inch. If you use a lens of different size, 2/3 inches for example, the angle of view will be different from that covered by a 1/2-inch lens.

The camera adaptor you can use with this camera is as follows.

	For medical use	For non-medical use
DXC-107A	CMA-D2MD	CMA-D2 or CMA-D7
DXC-107AP	CMA-D2MDCE	CMA-D2CE or CMA-D7CE

Care of the Unit

Safety

- This camera is designed for operation on a power supply meeting the requirements indicated in the “Specifications” on page 27.
- Never open the body of the camera.
- Should any material, liquid or solid, get into the body, unplug the AC power cord of the camera adaptor, and have the camera checked by qualified personnel before operating it further.

Operation

- Avoid rough handling or mechanical shocks.
- Operate the camera at a temperature ranging from 0°C to 40°C (32°F to 104°F).
- Avoid shooting very bright objects (such as strong lights or the sun) for an extended period.

Installation

- Allow adequate air circulation to prevent internal heat build-up.
- Do not install the unit near a heat source such as a radiator or air duct or in a place subject to direct sunlight.

Cleaning

Clean the lens and filter with a blower.

Clean the body, panel and controls with a dry soft cloth, or soft cloth lightly moistened with a mild detergent solution. Do not use any organic solvents, such as alcohol or benzine, which might damage the finish.

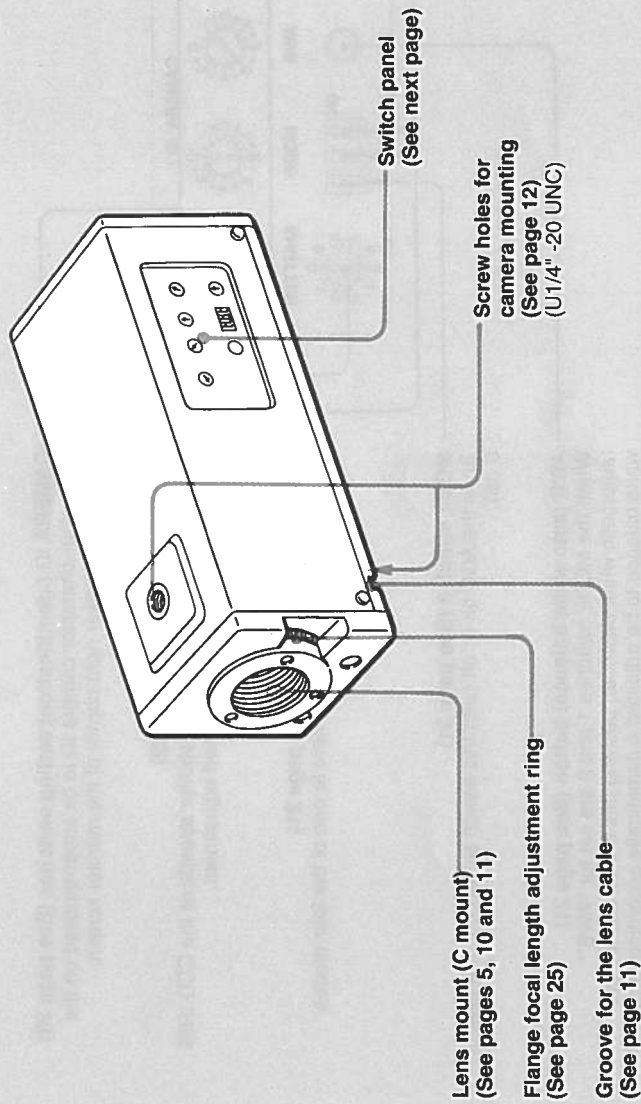
Repacking

Do not discard the carton. It affords maximum protection for shipping the camera. Repack the camera as it was originally packed at the factory.

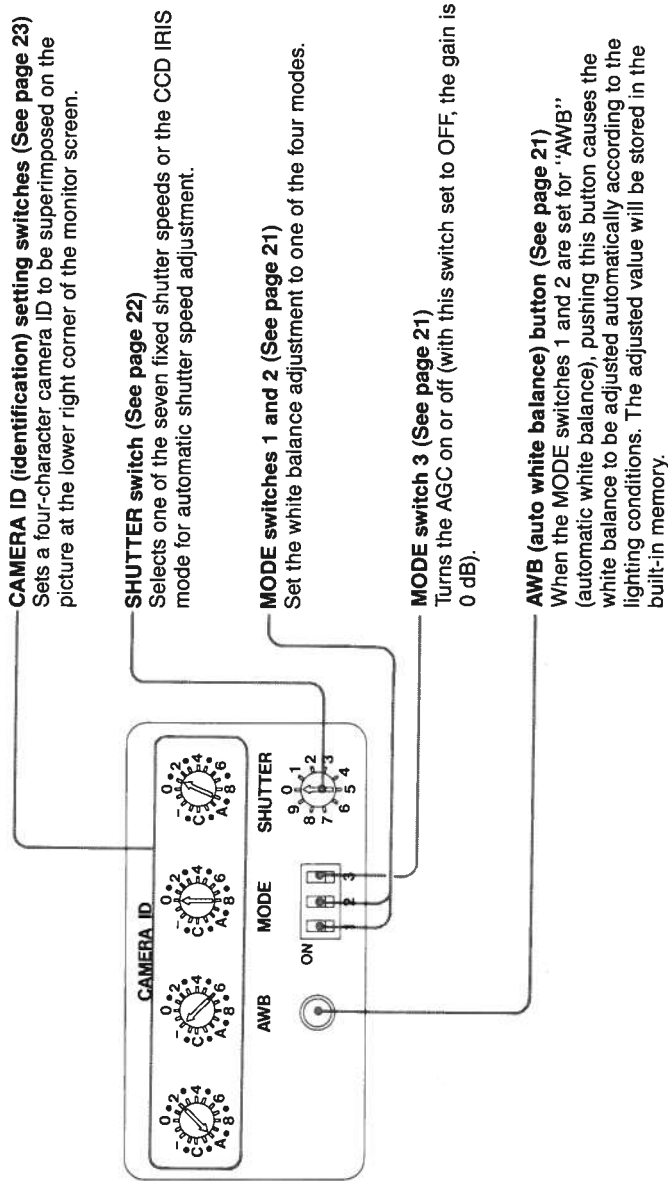
If you have any questions about this camera, contact your authorized Sony dealer.

Location and Function of Parts

Front and side



Switch panel



Rear

== DC IN (input) connector (12-pin) (See pages 13, 15, 16, 17, 18 and 19)

VIDEO OUT (output)/ == DC IN (input) connector (BNC type) (See pages 13, 14, 16 and 18)

LENS connector (4-pin) (See page 11)

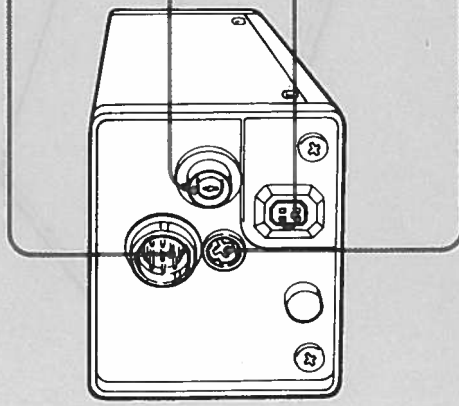
H (horizontal) PHASE control screw

Adjusts the H phase difference between the external sync signal and the video output signal when two or more cameras are used.

Turn the screw using a screwdriver, while checking the result on an oscilloscope.

Note

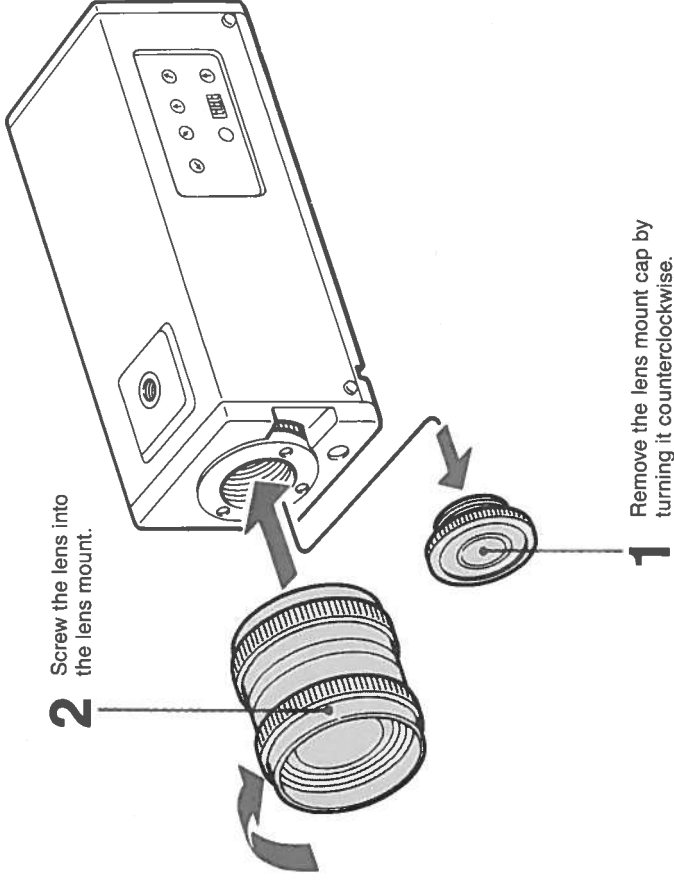
If the signal of this unit is synchronized with an external sync signal whereas the video monitor connected is in the internal sync mode, a vertical line — horizontal blanking signal — may appear on the screen. In that case, turn the H PHASE control screw so that the vertical line disappears.



Installation

Attaching the Lens

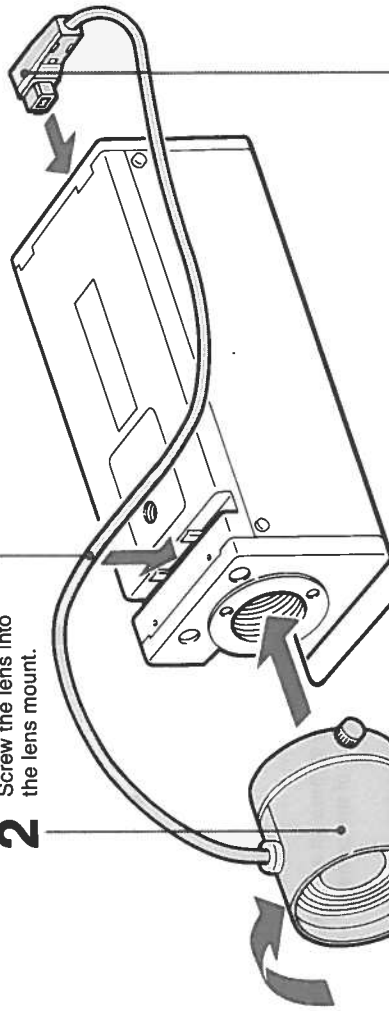
For a manual iris lens



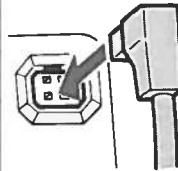
For an auto iris lens

4 Put the lens cable into the groove.

2 Screw the lens into the lens mount.



3 Connect the plug to the LENS connector.



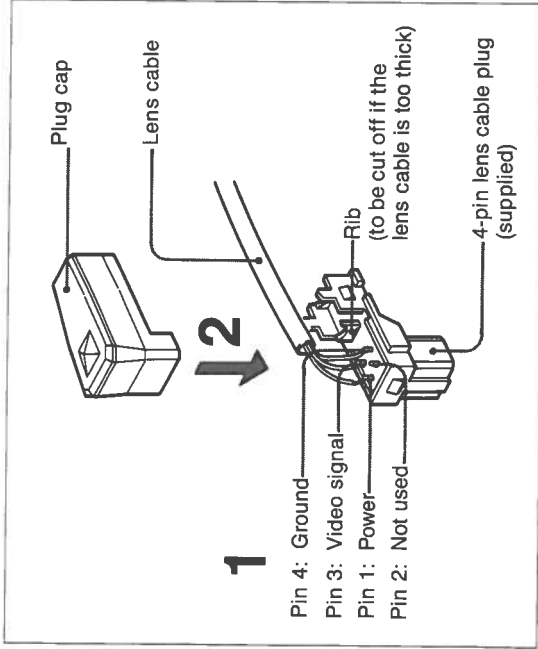
1 Remove the lens mount cap by turning it counterclockwise.

Make this connection after replacing the lens cable plug by the plug supplied with this camera. About cable connection to the plug, see next page.

Replacing the lens cable plug with the 4-pin plug supplied with the camera

To use an auto iris lens, replace its cable end plug by the 4-pin plug supplied with the camera, as shown below.

- 1 After disconnecting the lens cable from its plug, solder the cable wires to the pins on the supplied plug as illustrated. (For identification of the cable wires, refer to the manual for your lens.)
- 2 Place the cap on the plug.



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.

U $\frac{1}{4}$ " -20 UNC
 ℓ : ISO standard 4.5 mm \pm 0.2 mm
ASA standard 0.197 inches



- When mounting the camera on a tripod, use the screw hole provided in the bottom of the camera.

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

Connections (For non-medical use)

Notes on power supply

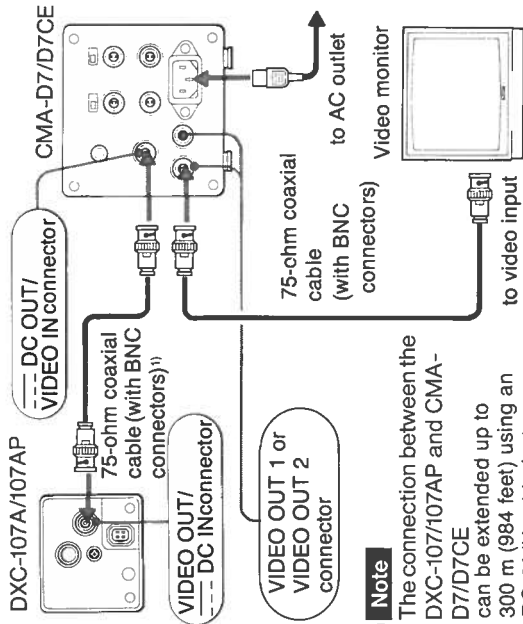
To supply power from the CMA-D7/D7CE camera adaptor to the camera, use either:

- a 75-ohm coaxial cable between the VIDEO OUT/DC IN connector of the camera and the --- DC OUT/VIDEO IN connector of the CMA-D7/D7CE, or

- a 12-pin CCMC cable between the --- DC IN connector of the camera and the CAMERA connector of the CMA-D7/D7CE. Do not make these connections at the same time. If you do, the camera will not output the video signal properly.

When Not Inputting the Sync Signal

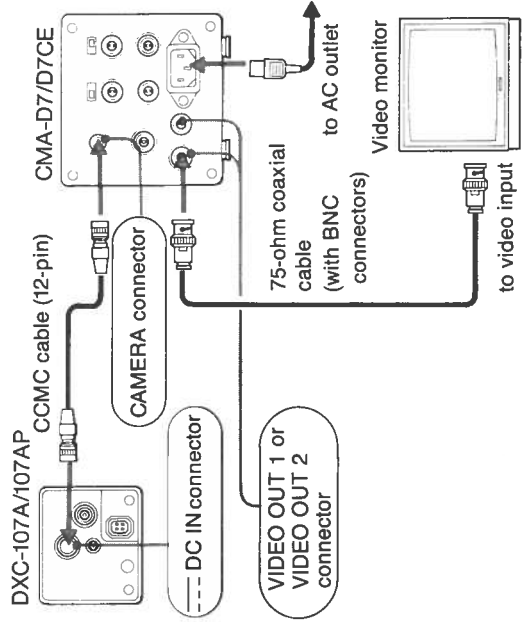
Using the VIDEO OUT/--- DC IN connector



1) **Note**

The connection between the DXC-107/107AP and CMA-D7/D7CE can be extended up to 300 m (984 feet) using an RG-6A/U cable (not supplied).

Using the --- DC IN connector (12-pin)



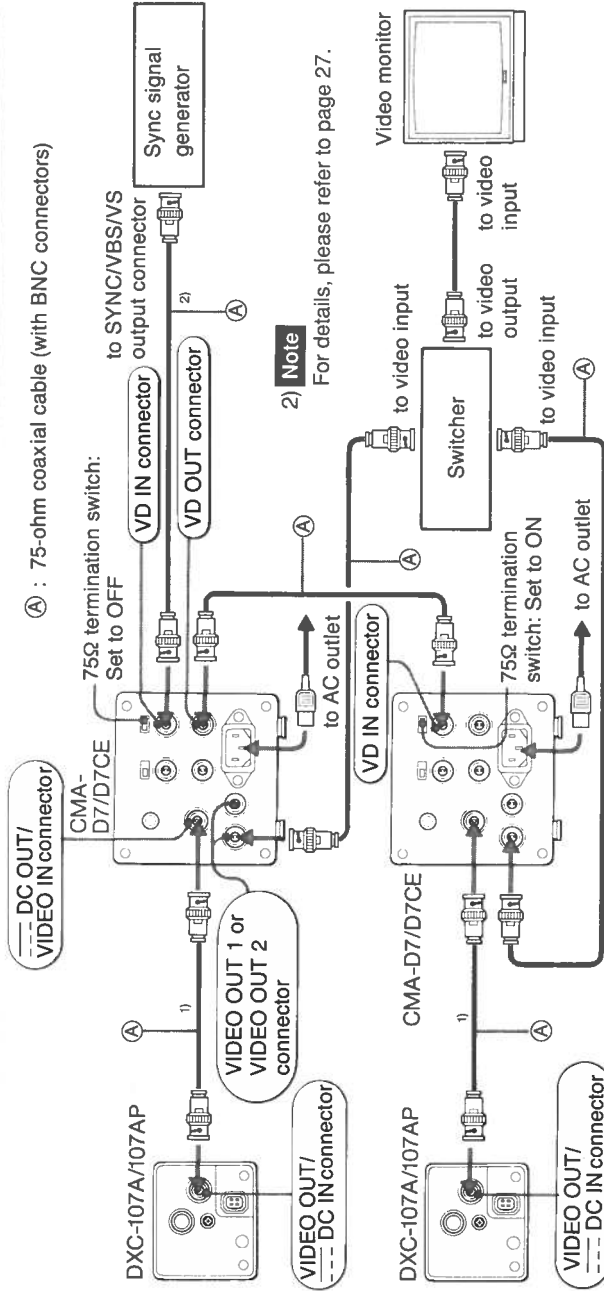
Connections (For non-medical use)

When Inputting the Sync Signal (Connection example for operating two or more cameras using a switcher)

When an external sync signal (SYNC, VBS, or VS) is input to the unit, the unit is synchronized with it automatically. However, note that the chrominance signal cannot be

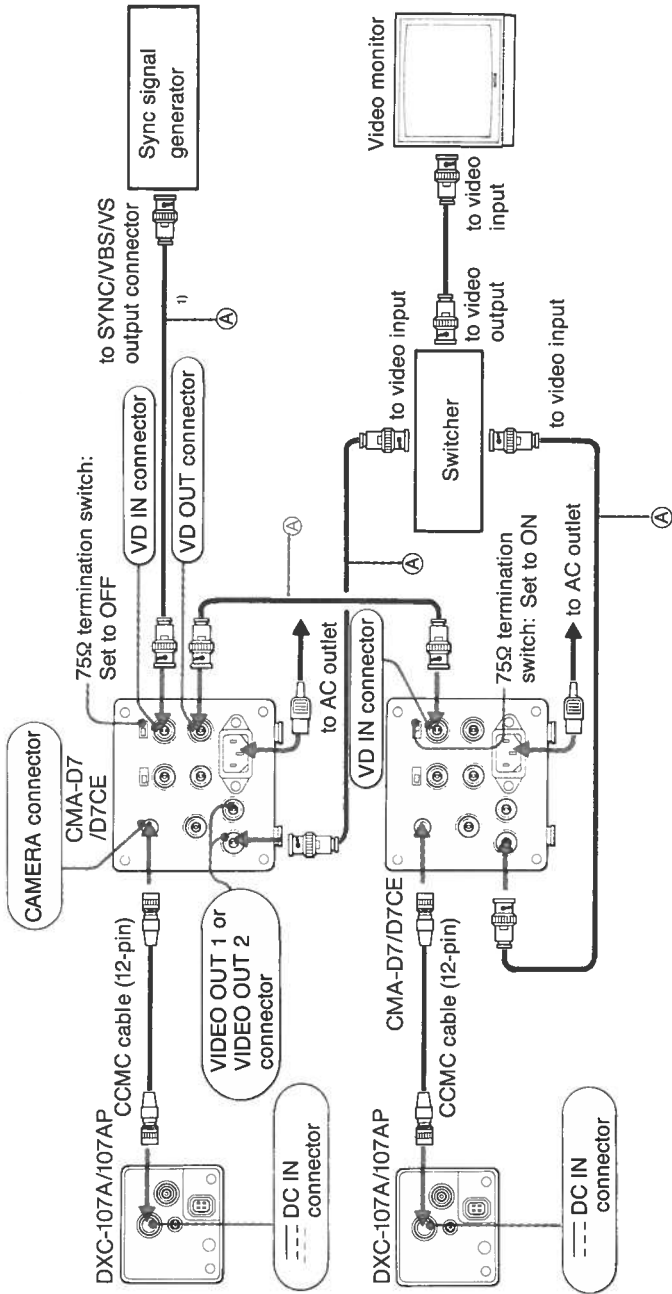
synchronized when you input a VBS. Also note that you cannot synchronize the unit with an HD or a VD signal.

Using the VIDEO OUT/--- DC IN connector



1) Note The connection between the DXC-107A/107AP and CMA-D7/D7CE can be extended up to 300 m (984 feet) using an RG-6A/U cable (not supplied).

Using the --- DC IN connector (12-pin)



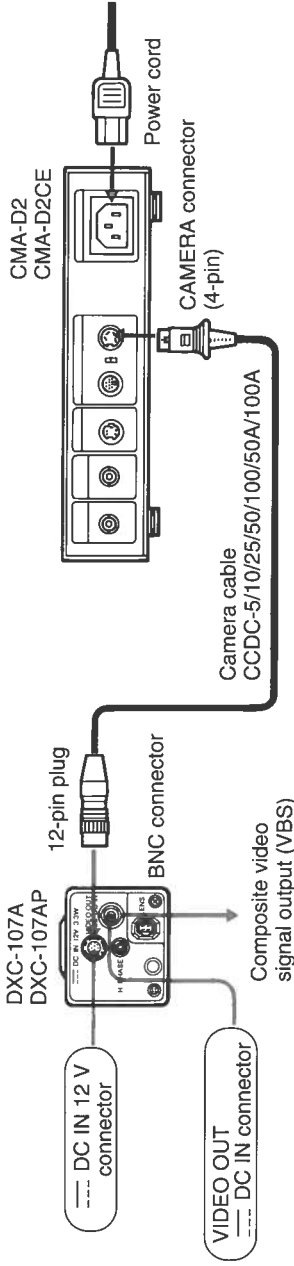
(A) : 75-ohm coaxial cable (with BNC connectors)

1) **Note** For details, please refer to page 27.

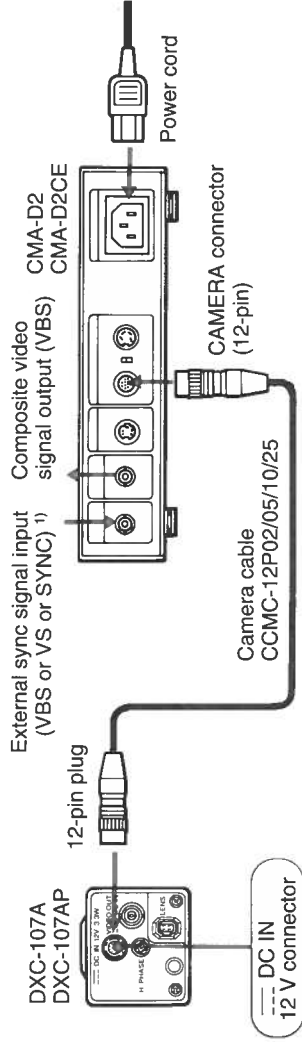
Connections (For non-medical use)

Using Camera Adaptor CMA-D2/CMA-D2CE

Using an Adapter for Power Supply Only

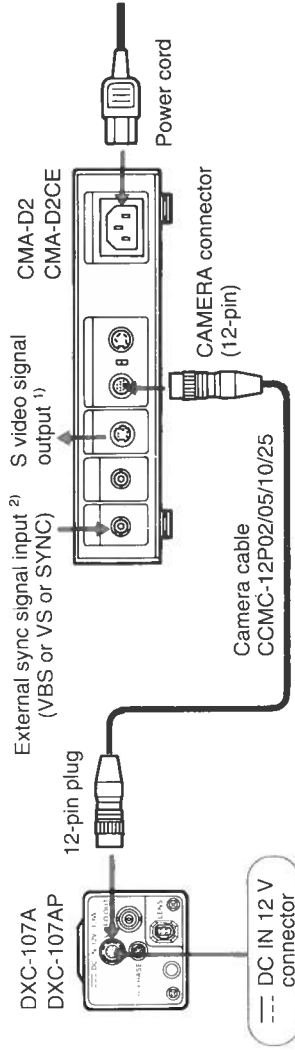


Using an Adapter for Power Supply/Sync Signal Input and Composite Video Output



1) Note For details, please refer to page 27.

Using an Adapter for Power Supply/Sync Signal Input and S Video Output



1) **Note**

To use the S video output, an internal switch in the DXC-107A/107AP camera must be set. For details, please refer to page 24.

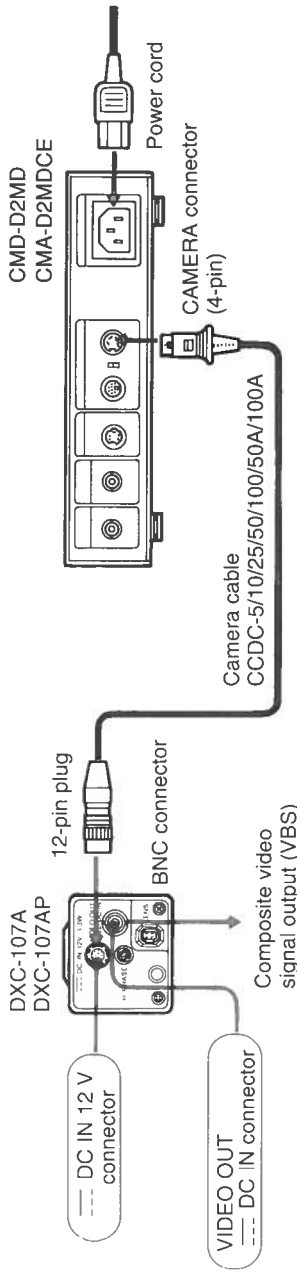
2) **Note**

For details, please refer to page 27.

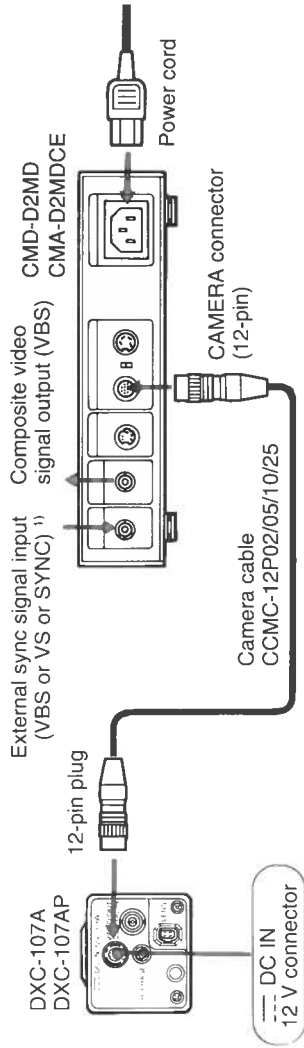
Connections (For medical use)

Using Camera Adaptor CMA-D2MD/CMA-D2MDCE

Using an Adaptor for Power Supply Only

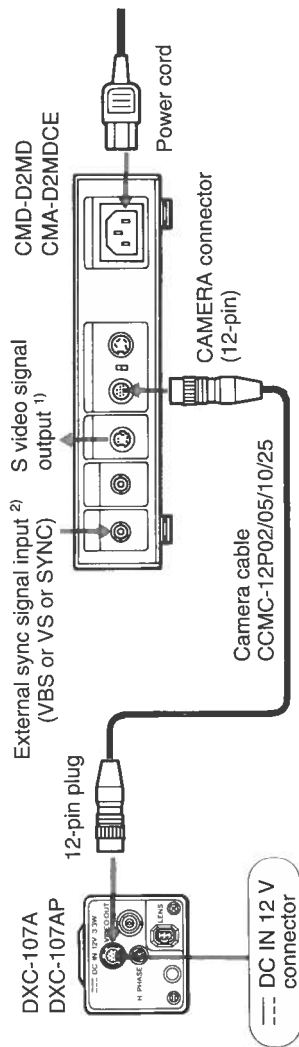


Using an Adaptor for Power Supply/Sync Signal Input and Composite Video Output



1) **Note** For details, please refer to page 27.

Using an Adapter for Power Supply/Sync Signal and S Video Output



1) Note

To use the S video output, an internal switch in the DXC-107A/107AP camera must be set. For details, please refer to page 24.

2) Note

For details, please refer to page 27.

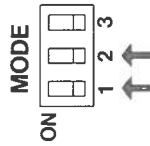
Preparation

- 1 Check that all the units are connected properly.
- 2 Turn the POWER switch of the CMA-D7/D7CE or CMA-D2/D2CE/D2MD/D2MDCE to on.
- 3 Turn on the video monitor, and adjust its controls properly.
- 4 Set the MODE switch 3 of the camera to OFF (GAIN: 0 dB). (Factory setting: OFF)
- 5 Illuminate the object properly.
- 6 When using a manual iris lens, adjust the iris depending on the lighting conditions.

When the preparation as described above has been completed, carry out the following adjustments and settings.

Adjusting the White Balance (for lifelike color reproduction)

Select the mode of white balance adjustment according to the lighting conditions by setting MODE switches 1 and 2 appropriately.



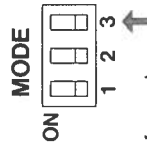
For better color setup according to the lighting conditions (Automatic white balance adjustment)

- 1 Set the white balance mode to AWB.
- 2 Shoot a white object (such as a white cloth or a white wall) so that it fills the screen.
- 3 Press the AWB button with the point of a ball-point pen or the like.

The white balance will be adjusted automatically so that the object looks white on the screen. The adjusted white balance is stored in the built-in memory and it is retained, until readjustment even if the camera is turned off. When the white balance mode is set to AWB 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.

Switching the Automatic Gain Control On or Off

To turn the automatic gain control (AGC) for video output on or off, use MODE switch 3.



OFF (0 dB): Automatic gain control is not performed.

ON (AGC): The gain of the video circuit is adjusted automatically according to the lighting conditions of the subject.

(Factory setting: OFF)

Mode	Color temperature	MODE switch settings	
		1	2
AWB (auto white balance)	When the AWB button is pressed, the white balance is adjusted according to the color temperature of the subject automatically. The adjusted white balance is stored in the built-in memory until readjustment. This mode is suitable for shooting to be repeated under the same conditions.	OFF	OFF
INDOOR	3200 K (fixed): Suitable for indoor shooting under the incandescent light.	ON	OFF
OUTDOOR	5600 K (fixed): Suitable for outdoor shooting on sunny days.	OFF	ON
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 variable lighting.	ON	ON

(Factory setting: INDOOR)

Selecting the Shutter Speed

To select the desired shutter speed, set the SHUTTER switch in the corresponding position by turning it with a standard screwdriver.



Shutter speed (in seconds)		Switch setting
107A	107AP	
OFF (1/60)	OFF (1/50)	0 ^{a)}
FL (1/100) ^{b)}	FL (1/120) ^{c)}	1
	1/250	2
	1/1000	3
	1/2000	4
	1/4000	5
	1/10000	6
CCD IRIS	Backlight mode: This mode reduces blackening when the light comes from behind the subject.	7
	Standard mode: Use this position under normal conditions.	8
	Spotlight mode: This mode reduces white blooming when there is strong light on the subject in front of a dark background.	9

- a) Normal position (factory setting)
- b) FL (flickerless): Setting to prevent the picture from flickering on 50-Hz power supply
- c) FL (flickerless): Setting to prevent the picture from flickering on 60-Hz power supply

Note

- It may not be possible to obtain an optimum picture using an automatic iris lens with the shutter set to CCD IRIS. If that is the case, select a fixed shutter speed (switch settings 0 through 6).
- When shooting under the light of fluorescent lamps on a 50-Hz (107A)/60-Hz (107AP) power supply, particularly at high shutter speed or in the CCD IRIS mode, the picture may flicker. If that is the case, set the shutter speed to FL.
- When shooting under fluorescent light, etc., in CCD IRIS mode, the color of the picture may be slow to change. Should this occur, or when you have any other problem with flicker, etc., set the CCD IRIS mode to OFF and use an automatic 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 OFF (0 dB).

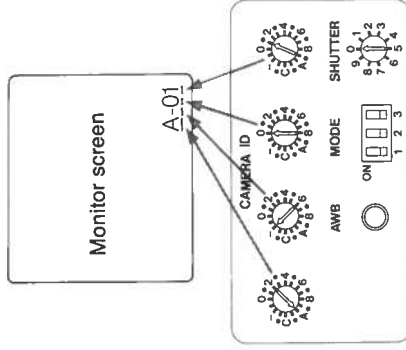
Setting the Camera ID

A four-character camera ID (identification) can be superimposed on the picture at the lower right corner of the monitor screen. When two or more cameras are used, the camera ID appearing on the monitor screen identifies the camera providing the image currently shown on the screen. To set the camera ID, set the four characters one by one using a standard screwdriver to turn the corresponding digit switches. You can set each digit to a number (0 to 9), letter (A to D), hyphen (-), or blank (no indication).

Switch setting	Display on the monitor
0 to 9	0 to 9
A to D	A to D
-	(hyphen)
(blank)	(blank)

(Factory setting: 0000)

Example of camera ID display

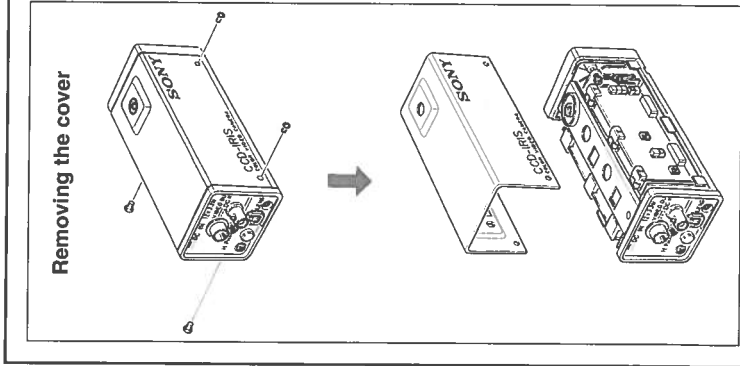


When you have completed the settings, shoot the subject and adjust the lens focus. Once you have made these adjustments, no further adjustment is necessary unless either the lighting conditions or the distance to the subject changes. To use the camera under the same conditions after turning the camera adaptor and video monitor off, just turn them on again.

Internal Switch Setting

The camera has two internal switches whose settings must be changed in order to use the S video output capability of the camera, or to defeat the noise reduction circuit in order to obtain maximum resolution under low-light conditions. To set these switches, the

camera cover must be removed, which should be performed by qualified service personnel. Please consult your dealer or an authorized Sony service station.



S202: Low-light noise reduction

Noise reduction active (factory setting)

Noise reduction disabled

S203: Video output selector

Composite video output (factory setting)

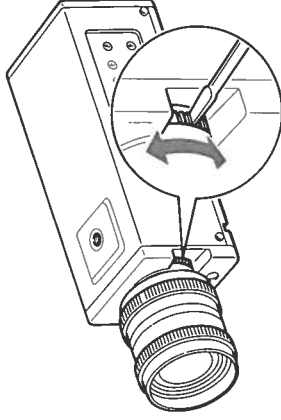
S video output → **Note**

Note
When using camera adaptor CMA-D7/CMA-D7CE with superimposed DC, the S video output is not available. Use camera adaptor CMA-D2/D2MD/D2CE/D2MDCE.

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). The 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 same camera.

- 1** When a manual iris lens is used, open the iris fully. When an auto iris lens is used, adjust lighting until the iris is fully open.
- 2** Point the camera at an object about 3 meters (10 feet) away.
- 3** Set the zoom in the telephoto position.
- 4** Observing the monitor screen, turn the focus ring to focus on the subject.
- 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.



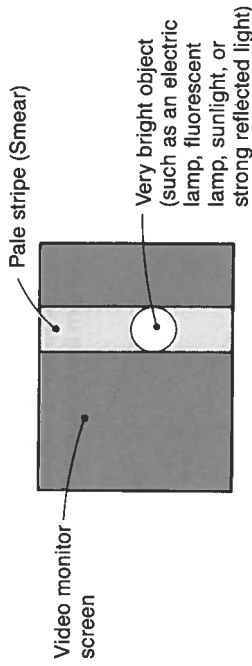
- 7** Repeat steps **3** to **6** until the subject is in focus both when the zoom is in the telephoto position and when it is in the wide-angle position.

Special Characteristics of a 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 fine stripes, straight lines, or the like are shot, the image monitored on the screen may appear jagged.

Specifications

Pickup device

Pickup device

Color filter

Interline-transfer CCD

Ye, Cy, Mg, G complementary color mosaic filter

Picture element

DXC-107A: 768 x 494 (horizontal x vertical) approximately 380,000

DXC-107AP: 752 x 582 (horizontal x vertical) approximately 440,000

Sensing area

Equivalent to a 1/2-inch pickup tube

Optical and others

Lens mount

Signal system

DXC-107A: NTSC color system

DXC-107AP: PAL color system

DXC-107A: 525 lines, 2:1 interlace, 30 frames/sec.

DXC-107AP: 625 lines, 2:1 interlace, 25 frames/sec.

Sync system

Internal/external (switched automatically)

External sync signal

VBS, VS, SYNC (Sync level 0.3 Vp-p ± 6 dB), high impedance (However, color lock function is disabled when inputting VBS.)

Horizontal resolution

DXC-107A: 470 TV lines

DXC-107AP: 460 TV lines

Minimum illumination

4.5 lux with F1.2

(AGC: ON, SHUTTER: OFF)

Sensitivity

2000 lux, F5.6 (GAIN: 0 dB)

Video output

1 Vp-p, sync negative, 75 ohms

Video signal to noise ratio

DXC-107A: 48 dB (GAIN: 0 dB)

DXC-107AP: 46 dB (GAIN: 0 dB)

Electronic shutter

DXC-107A: 10 speeds selectable: 1/60 sec. (OFF), 1/100 sec. (FL), 1/250 sec., 1/1000 sec., 1/2000 sec., 1/4000 sec., 1/10000 sec. and CCD IRIS mode (standard mode, backlight mode, spotlight mode)

DXC-107AP: 10 speeds selectable: 1/50 sec. (OFF), 1/120 sec. (FL), 1/250 sec., 1/1000 sec., 1/2000 sec., 1/4000 sec., 1/10000 sec. and CCD IRIS mode (standard mode, backlight mode, spotlight mode)

White balance adjustment

4 modes selectable: indoor (3200 K), outdoor (5600 K), AWB (auto white balance), ATW (auto tracing white balance)

AGC

ON/OFF (switchable)

Camera ID superimpose

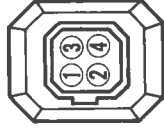
4 characters

Input/output connectors

VIDEO OUT/ --- DC IN: BNC type

DC IN: 12-pin connector

LENS: 4-pin connector (with the following pin assignment)



LENS connector of the camera

Pin	Signal
1	+8.5 V, 40 mA
2	Not used
3	Video output for lens
4	Ground

Specifications

Power requirements	11-16 V DC: supplied through the --- DC IN connector 25-30 V DC: supplied through the VIDEO OUT/ --- DC IN connector (when the CMA- D7/CMA-D7CE is used)	Accessories supplied	Lens mount cap (1) 4-pin lens cable plug matching the LENS connector (1) Operation manual (1)
Power consumption	3.3 W; supplied through the --- DC IN connector	Accessories not supplied	Camera adaptor For non-medical use CMA-D7/CMA-D7CE CMA-D2/CMA-D2CE For medical use CMA-D2MD/CMA-D2MDCE
Operating temperature	0 °C to 40 °C (32 °F to 104 °F) -20 °C to +60 °C (-4 °F to 140 °F)		12-pin cable
Storage temperature	Less than 80 % (no condensation allowed)		CCMC-12P02 (2 m)
Operating humidity	Less than 90 % (no condensation allowed)		CCMC-12P05 (5 m)
Storage humidity	686 m/s ² (70G)		CCMC-12P10 (10 m)
Shock resistance	55 x 50 x 130 mm (w/h/d)		CCMC-12P25 (25 m)
Dimensions	(2 1/4 x 2 x 5 1/8 inches) excluding projecting parts		Power supply cable
Mass	Approx. 360 g (13 oz)		CCDC-5 (5 m)
			CCDC-10 (10 m)
			CCDC-25 (25 m)
			CCDC-50 (50 m)
			CCDC-100 (100 m)
			CCDC-50A (50 m, low-loss type)
			CCDC-100A (100 m, low-loss type)
			Manual iris lens
			VCL-06XK (6 mm, F1.2)

Design and specifications are subject to change without notice.