SONY

3-858-071-**03** (1)

3016072

3CCD Color Video Camera

⚠警告

DXC-9000

English

Owner's Record

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

Model No. DXC-9000 Serial No. _____

WARNING

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

For the customers in the U.S.A.

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 digital device pursuant to Subpart B of Part 15 of FCC Rules.

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Chapter 2 Operation

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English

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Symbol on the unit

Symbol	Location	This symbol indicates
	Side panel	This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.
	Rear panel	This symbol indicates that a direct current (DC) is input.
	Rear panel	The connector that outputs RGB signals and their respective sync signals.
	Rear panel	The connector that outputs the composite video signals.
	Rear panel	The connector to which a remote control signal is input from a remote control unit.
	Rear panel	The buttons for setting the automatic white balance.
	Rear panel	The button for capturing the image in memory as a still image.

Features

The DXC-9000 is a color video camera with an 1/2-inch, three-chip Progressive Scan CCD[1)].
The CCD uses an "all pixels read-out" method, which enables the CCD to output all pixel signals in 1/60 sec. This allows the unit to capture blur-free, clear images of fast-moving objects without a mechanical shutter.

High quality image

The DXC-9000 produces high quality images thanks to its 1/2inch, three-chip CCD containing some 330,000 effective picture elements (pixels). The camera has four features that ensure high image quality:

- High horizontal resolution:700 TV lines
- High sensitivity (defined as minimum required illumination): 2,000 lux at F5.6
- High signal-to-noise ratio: 58 dB
- Low smear

Square pixels

The unit uses pixels which have the same pitch horizontally and vertically, namely 9.9µm × 9.9µm, to make a square pixel. Because the pixels are geometrically the same in both directions, you do not need to adjust the aspect ratio when using with a computer, image processor, etc. This function is very helpful when using the camera for image processing. This is also useful for image composition by inputting the signals to a computer.

VGA compatible

The unit supports VGA (640 × 480) displays used by computers. An output of 60 frames of non-interlaced signals per seconds allows you to connect the unit to a multi-scan monitor or multi-scan printer which requires signals to be processed at high-speed.
However, connection with some multi-scan monitors may not be possible because of their input specifications.
When in doubt, contact your authorized Sony dealer.

1) CCD: Charge-Coupled Device

Broad exposure control

Thanks to the AGC (Automatic Gain Control) and CCD iris control functions, the camera can handle a broad range of subject lighting conditions. When shooting in poor lighting conditions, the AGC feature automatically increases the sensitivity up to eight times. When the amount of light is excessive, the CCD iris control function automatically increases the shutter speed to cut exposure. This function can cut the exposure to the equivalent of up to 4 aperture stops. When using this camera in a fixed location, AGC, CCD iris control and auto-iris control allow for shooting in a broad range of lighting conditions. Combined use of AGC and CCD iris control is also very helpful when using the camera in a microscope system.

Wide range of electronic shutter modes

The wide range of speeds for the electronic shutter helps you overcome difficult shooting conditions, minimizes blurring in fast-moving subjects, and produces acceptably bright still images of subjects shot in poor light. The exposure time can be automatically controlled according to the brightness of the subjects. (For details, contact your authorized Sony dealer.)

Flickerless mode: When set to flickerless mode, the electronic shutter allows you to take flickerless images even under fluorescent light.

Clear scan mode: When you use the electronic shutter in the clear scan mode, you can shoot computer screen displays without horizontal stripes or distortion.

Externally-triggered shutter: The external trigger for the shutter enables a camera in a fixed location to capture flickerless images of fast-moving objects.

Freeze function

The moving image is captured in the frame memory built into this unit as a still image. The still image captured in the memory can be output continuously.

RS-232C interface

The unit can be controlled from an computer via an RS-232C interface.

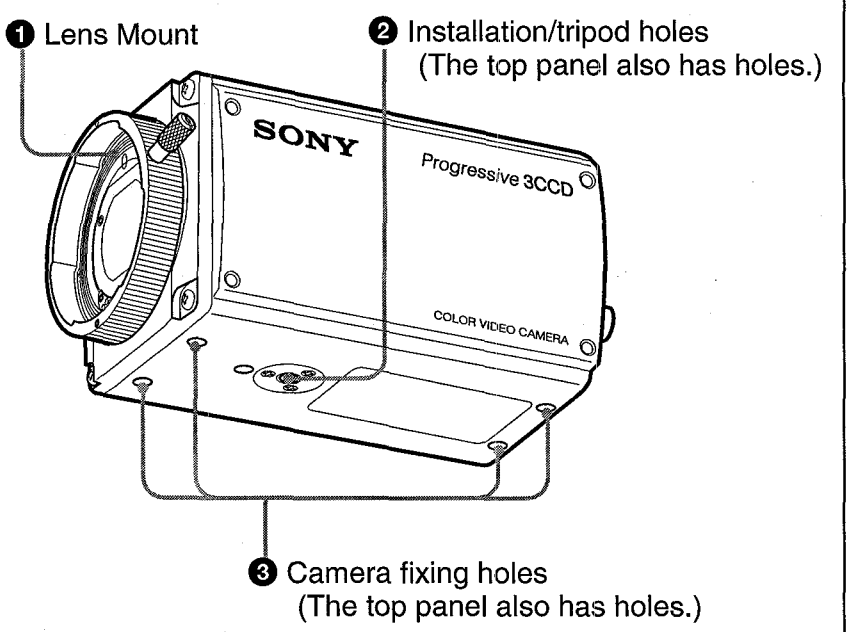
Compact and lightweight

The unit is very compact (79 × 72 × 145 mm) and very light (about 790 g), allowing for easy installation in places where space is a problem.

The following are some examples of applications:

- As a camera for microscope
- As a roof-top weather monitoring camera
- As a laboratory monitor camera
- As a camera used in a video conference systems

Front Panel/Top Panel/Bottom Panel

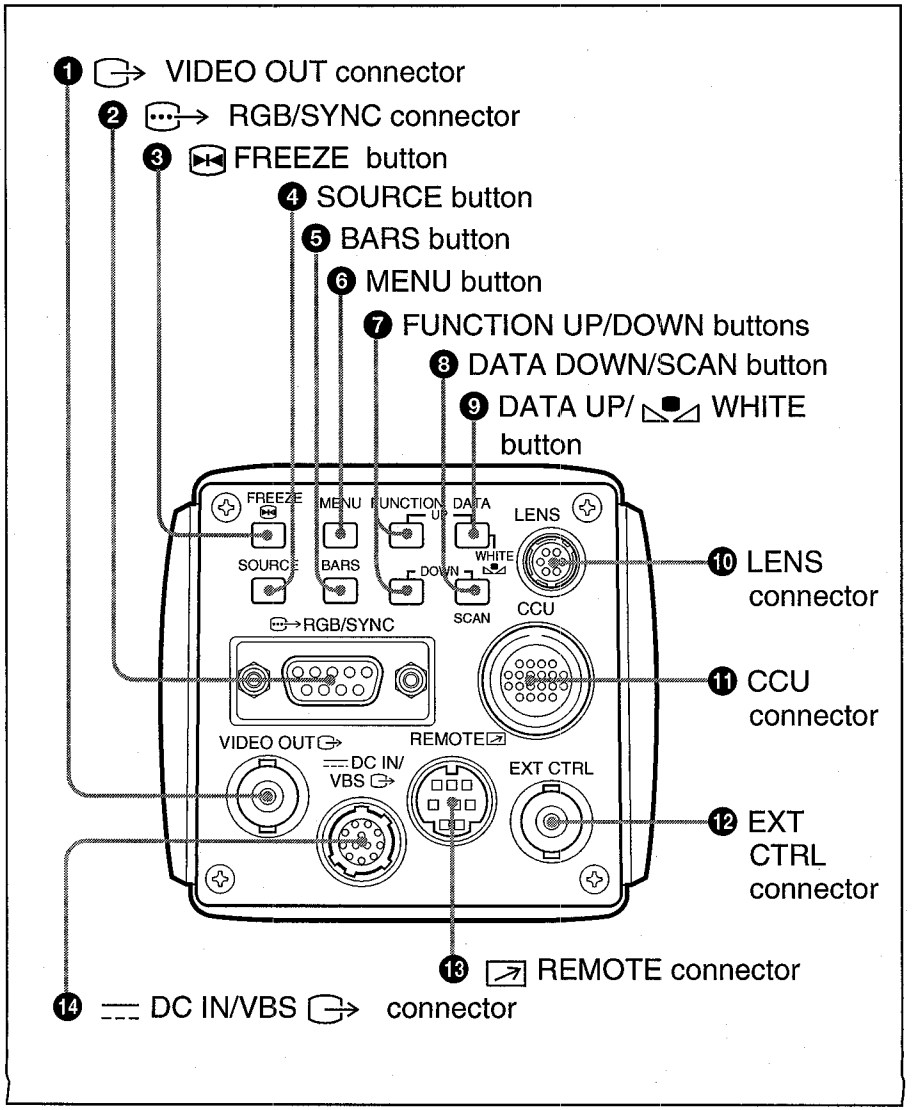


❶ Lens Mount
Attach a zoom lens or micropscope adaptor.

❷ Installation/tripod holes (top/bottom)
Use these holes when attaching the camera to a wall or ceiling or tripod (screw: 1/4", 20 ridges).

❸ Camera fixing holes (top/bottom)
Use these holes (M3, depth of the hole:5 mm) to attach the camera to a wall or ceiling when you do not use the Installation/tripod holes❷.

Rear Panel



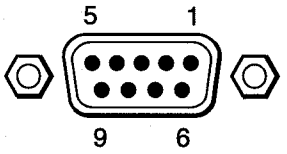
1 VIDEO OUT (output) connector (BNC-type)

Outputs composite video signals.

2 RGB/SYNC (RGB/sync signal output) connector (D-sub 9-pin)

Outputs RGB signals and their respective sync signals.
Use a CCXC-9DB/CCXC-9DD/CCMC-9DS cable for the connections.

Pin assignment



Pin No.	Signal	Pin No.	Signal
1	GND	6	VBS/Y/VD output
2	GND	7	SYNC/WEN/HD output
3	RED output	8	GND
4	GREEN output	9	NC/C output
5	BLUE output		

❸ FREEZE button
Pressing this button stores an image in memory. The image is captured in memory as a still image at the instant when you press this button.

❹ SOURCE button
Pressing this buttons clears freeze mode. The image which the unit is shooting appears on the monitor.

Note

The FREEZE button ❸ and SOURCE button ❹ function when "FREEZE" on PAGE 3 menu is set to INT.CTRL.
For detailed information, see "PAGE 3 menu" on page 83 in "Menu Function".

❺ BARS (color bars output) button
Pressing this button outputs the color bars signal. Press again to revert to video signal output.
For monitor adjustment, contact your authorized Sony dealer.

❻ MENU (menu recall) button
Pressing this button brings up the operational settings menu on the monitor connected to the camera. Press again to hide the menu.
For menu operation, see "Adjusting and Setting with Menus" on page 73.

❼ FUNCTION UP/DOWN (cursor up/down) buttons
UP button: Moves the menu cursor upward.
DOWN button: Moves the menu cursor downward.

❽ DATA DOWN/SCAN (setting value reduction/scan mode select) button
With the menu displayed: decreases the setting value.
With the menu hidden: activates the scan mode select button. Each time you press the button, the scan mode changes in the order of NOR, F.S and VGA.

❾ DATA UP/ WHITE (setting value increase/white balance adjustment) button
With the menu displayed: increases the setting value.
With the menu hidden: activates the automatic white balance adjustment function.

❿ LENS connector (6-pin)
Connects to a lens cable when a 2/3-inch zoom lens is used. This connector is not used for 1/2-inch zoom lenses.

⓫ CCU (camera control unit) connector (20-pin)
Connects to the CCU-M5 camera control unit (not supplied)

⑫ EXT CTRL (external control signal input) connector (BNC type)

Inputs the following signal according to the EXT. CTRL (BNC) setting on PAGE 3 menu.

When set to GENLOCK: Inputs reference sync signals for synchronizing the camera operation.

When set to TRIG.IN: Inputs pulses for controlling the memory or externally triggererd shutter.

⑬ REMOTE (remote control) connector (mini-DIN 8-pin)

Connects to the RM-C950 remote control unit (not supplied).

⑭ DC IN/VBS (DC power input/video signal output) connector (12-pin)

Connects to the CMA-D2/D2MD camera adaptor.
Inputs the DC power and outputs the video signal.

Adjusting and Setting with Menus

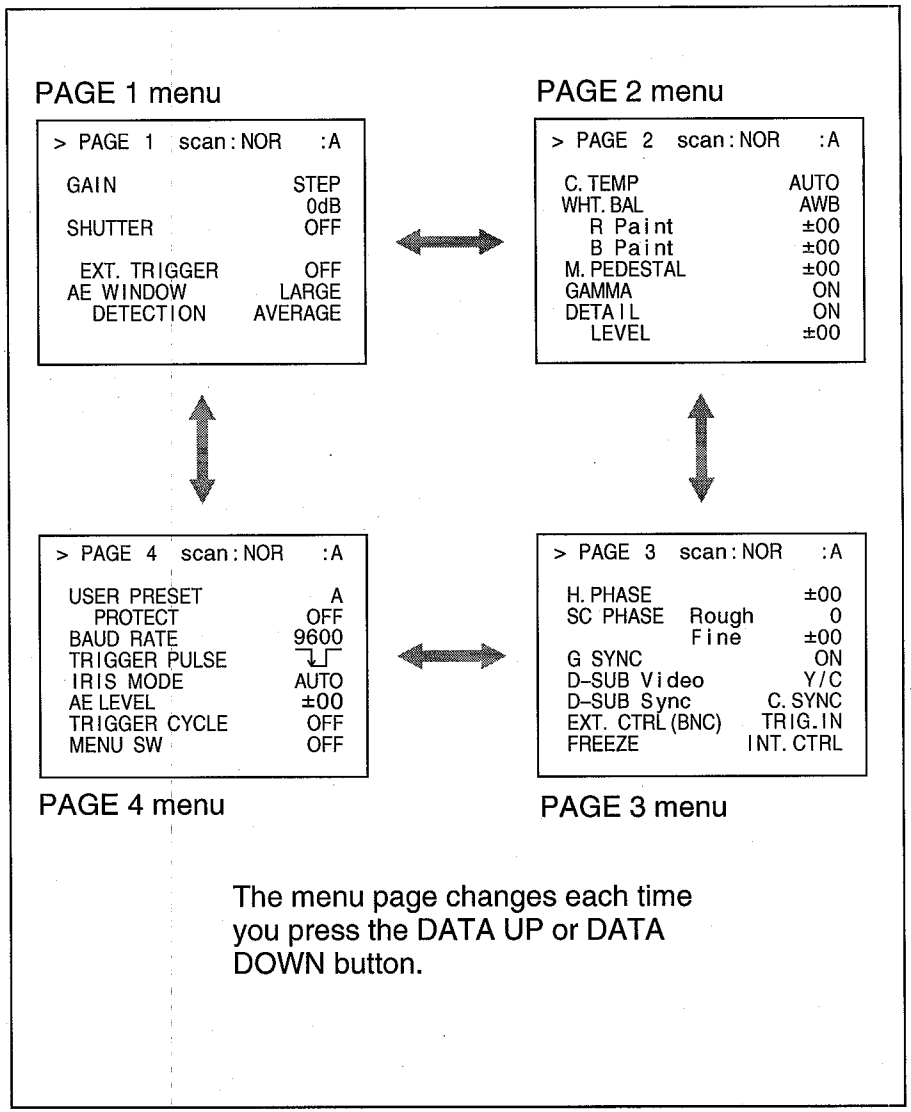
Camera operational settings can be changed through simple adjustment of the settings on the on-screen menus. Settings can be adjusted to get the best possible results for the given shooting conditions or to enhance the image with special effects.

Menu Configuration

There are four menus.

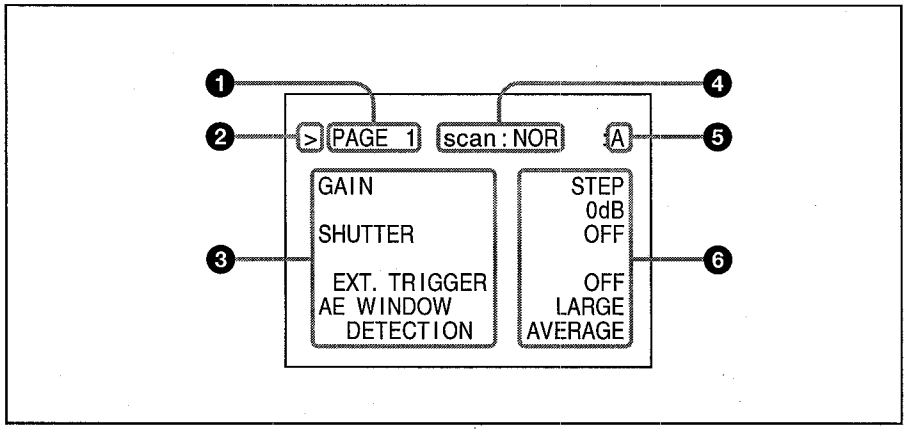
To display the menu

Press the MENU button.
The menu is displayed on the monitor.



About on-screen menu

This section explains how to read the on-screen menu before starting menu operation.



❶ Menu page

Displays the currently selected memory page.
Select the menu page using the DATA UP/DOWN buttons when the cursor is positioned on the menu page display.

❷ Cursor

Selects an item. Move the cursor up/down using the FUNCTION UP/DOWN buttons.

❸ Setting items

Scroll through the items to be set with the FUNCTION UP/DOWN buttons.

❹ SCAN mode

Indicates the currently selected scan mode.
For detailed information on the scan mode, see "Setting the Scan Mode" on page 97.

❺ User preset

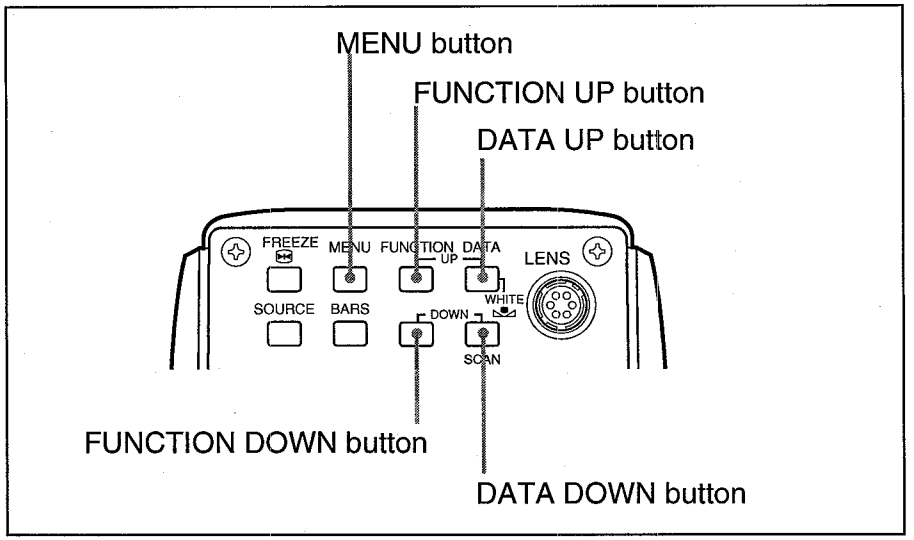
Indicates the currently selected user preset (A or B).
When "PROTECT" is set to "ON", a flashing "P" is displayed before the user preset A or B.
For details, see "PAGE 4 menu" on page 86.

❻ Set values

Indicates the currently set value.
Change the values using the DATA UP/DOWN buttons.

Menu operation buttons

There are five buttons for menu operations on the rear panel of the unit.

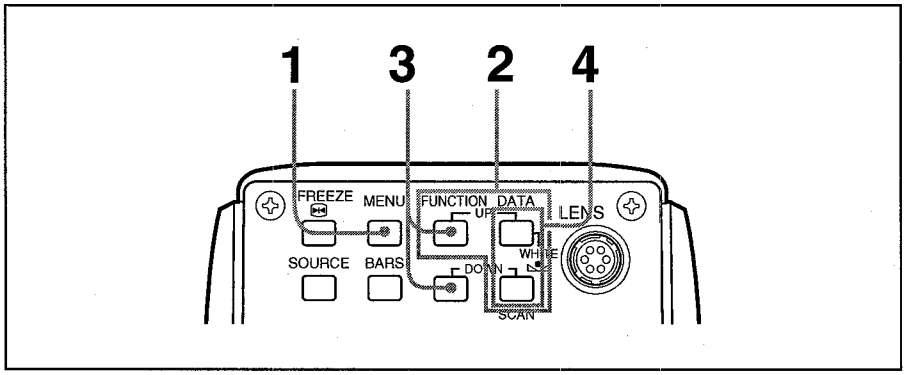


The following tables shows the functions of menu operation buttons.

Button	Function
MENU	Displays the menu by pressing this button. To hide the menu, press the button again.
FUNCTION UP	Moves the cursor upward.
FUNCTION DOWN	Moves the cursor downward.
DATA UP	Increases the value. Changes the menu page.
DATA DOWN	Decreases the value. Changes the menu page.

Menu operation procedure

To change the settings on the menu, proceed as follows.



1 Press the MENU button.
The menu page that was selected last is displayed on the monitor screen.

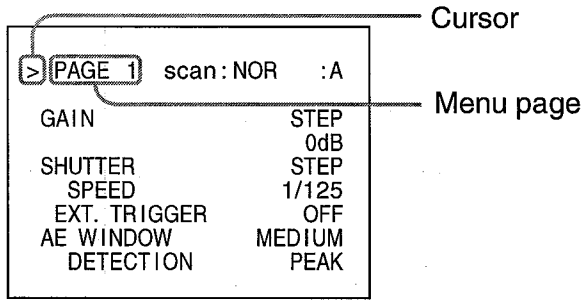
```
> PAGE 1   scan:NOR    :A

 GAIN                  STEP
                        0dB
 SHUTTER               STEP
   SPEED               1/125
  EXT. TRIGGER         OFF
 AE WINDOW             MEDIUM
   DETECTION           PEAK
```

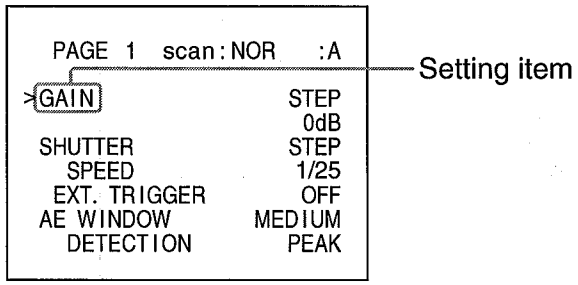
2 Select the desired page.

① Move the cursor to the first line on the menu by pressing the FUNCTION UP button.

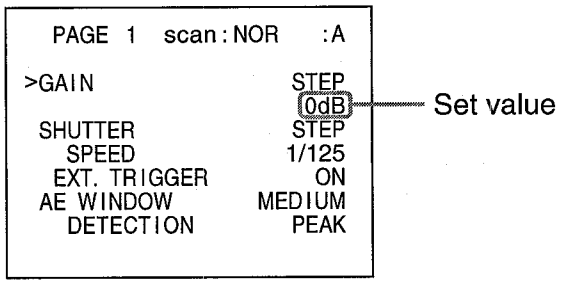
② Select the desired menu page by pressing the DATA UP or DOWN button.



3 Move the cursor to the item to be set by pressing the FUNCTION UP or DOWN button.



4 Change the value by pressing the DATA UP or DOWN button.

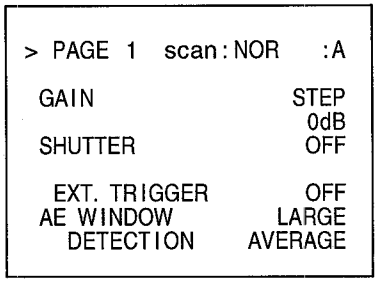


To return to the regular monitor screen
Press the MENU button.

Function of Menus

PAGE 1 menu

This section describes in detail items on PAGE 1 menu.



The following table shows the PAGE 1 menu items, their contents and reference pages in this manual.

Item	Contents of setting	Ref. page
GAIN	Adjusts video gain.	77
SHUTTER[a)]	Sets the electronic shutter.	78
EXT.TRIGGER	Sets the external trigger for the shutter to ON or OFF.	80
AE WINDOW	Selects the AE window when in the AGC, CCD IRIS or AUTO IRIS mode.	80
DETECTION	Selects the detection method of the luminance level for the selected AE WINDOW.	80

a) When "SHUTTER" is set to STEP or VARIABLE, "SPEED" appears and you can set the shutter speed.

GAIN

Adjusts the video gain.

Selection	Function
AGC	Automatic gain control. Automatically adjusts the gain of the video signal to match the brightness of the subject. This function is useful for shooting subjects under changing ighting conditions.
STEP	Sets the video gain to manual control. Use this function for shooting in extremely dark places where even fully opening the lens iris still does not produce an acceptably bright image. The gain level can be set in the range of 0 to 18 dB in units of 1 dB.

SHUTTER

The electronic shutter allows for blur-free images of fast-moving subjects and produces good still images of subjects shot in poor lighting conditions.

Selection	Function
OFF	Deactivates the electronic shutter.
STEP	Sets the shutter speed to any of 9 steps in high-speed shutter mode and 15 steps in long-exposure mode. **High-speed mode:** 1/60, FL (flickerless), 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000 and 1/10000 seconds **Long-exposure mode:** 0.1, 0.2, 0.3, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.0 and 8.0 sec. **To set the shutter speed** **1** Display 1/60 (factory-set value) by pressing the DATA UP and DATA DOWN button together. **2** Select the desired shutter speed by pressing the DATA UP or DOWN button. **On pressing the UP button:** The shutter speed changes in the order 1/60, FL (flickerless), 1/125,1/250, 1/500, 1/1000, 1/2000, 1/4000 and 1/10000 each time you press the UP button. **On pressing the DOWN button:** The shutter speed changes in the order 0.1, 0.2, 0.3, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.0 and 8.0 sec. When using the unit with 50 Hz lighting, setting the shutter to FL gives you flickerless images even under fluorescent light.
VARIABLE	Use for fine adjustment of the video output level. You can adjust the shutter speed in long exposure mode or clear scan mode. **In long exposure mode** You can set the shutter speed in units of 1 frame. For example, if the value is set to 50 frames (about 1.7 seconds in the NTSC format), the total video signal produced during this set time is output in the form of one complete frame at intervals of about 1.7 seconds. These pictures, which contain 50 frames of video information, are much brighter than normal one-frame images. This mode of setting the shutter speed is very useful for shooting a poorly illuminated subject in a dark place. **1** Display 262/525 (factory-set value) by pressing the DATA UP and DATA DOWN button together. **2** Select the desired shutter speed by pressing the DATA DOWN button. Each time you press the DATA DOWN button, the shutter speed changes in units of 1 frame from 1 FRM through 255 FRM. **Shutter speed calculation** **Example:** Shutter speed when the unit is set at 5 frames 5 × 1/30 = 0.1666 seconds **Note** In long exposure mode, AUTO IRIS cannot be used.

Selection	Function
VARIABLE (Continued)	**In clear scan mode** You can set the shutter speed in units of 1 H (horizontal scanning time: 63.56µs). The setting is made in units of 1H. This setting can be used to reduce noise (horizontal patterns) when shooting a computer screen. **1** Display 262/525 by pressing the DATA UP and DATA DOWN button together. **2** Select the setting which best reduces reduce the noise by pressing the DATA UP button while observing the noise on a monitor screen. Each time you press the DATA UP button, the shutter speed changes in units of 1 H from 262/525 through 1/525. **Shutter speed calculation** **Example:** Shutter speed in 250/525 (H) 250 x 63.56 µs (1H) + 34.78 µs (constant) = 15924.78 µs = about 0.016 seconds.

Selection	Function
CCD IRIS	When an excessive amount of light passes through the lens, this function increases shutter speed to cut exposure to the equivalent of up to 4 aperture stops. The function is useful for microscope applications where lighting that is just right for the human eye is often too bright for the video camera. When CCD-IRIS is set to ON, the excessive incident light is automatically decreased to an appropriate level for the video camera. The CCD iris function is also useful for cutting out excess incident light that is not cut out by the auto-iris lens in scenes containing very bright patches (such as snow, or sea water reflecting sunlight). You can use CCD IRIS in combination with AGC, and/or AUTO IRIS control.

EXT. TRIGGER

Enables and disables the external trigger for the shutter.

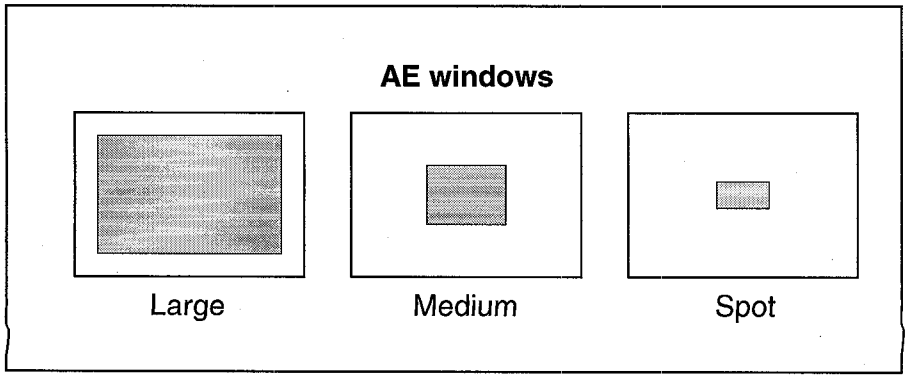
Selection	Function
ON	Enables the external trigger for the shutter.
OFF	Disables the external trigger for the shutter. Normally set this item to OFF.

AE WINDOW

Selects the AE (auto exposure) when the unit is used with the following setting.

- AGC (automatic gain control)
- CCD IRIS of SHUTTER
- Using the auto-iris lens

When shooting very small subjects, the point you want to see become bright if you set "AE WINDOW" to "SPOT". When you bring the cursor to AE WINDOW, the currently selected AE window appears on the monitor. Each time you press the DATA UP or DATA DOWN button, the AE window changes.



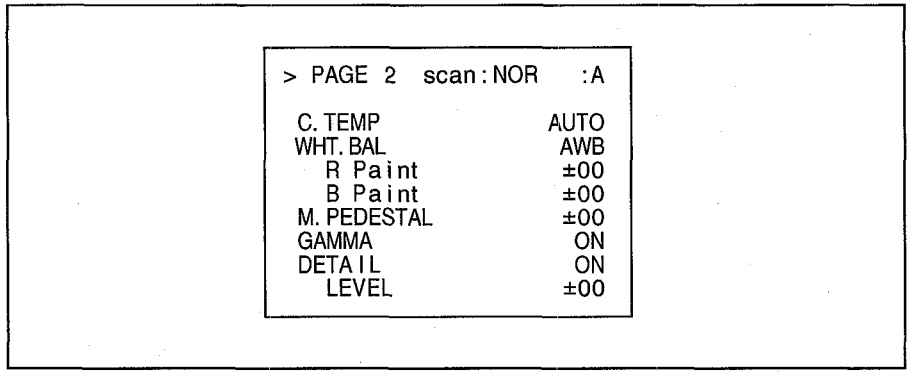
DETECTION

Selects the detection method of the luminance level of the selected AE window.

Selection	Function
AVERAGE	Select to see the whole AE window.
PEAK	Select to see the part with the highest video level in the AE window.

PAGE 2 menu

This section describes in detail items on PAGE 2 menu.



The following table shows the PAGE 2 menu items, their contents and reference pages in this manual.

Item	Contents of setting	Ref. page
C.TEMP	Selects the color temperature according to the lighting condition.	81
WHIT.BAL	Selects the white balance settings.	81
M.PEDESTAL	Sets the pedestal level of the output signal.	82
GAMMA	Gamma compensation (on/off).	82
DETAIL	Enables and disables the DETAIL function (on/off).	82
LEVEL[a)]	Adjusts the sharpness of the object outline.	83

a) This item appears when DETAIL is set to ON.

C. TEMP

Selects the color temperature according to the lighting.

Selection	Lighting condition
AUTO	Use for automatic adjustment of the color temperature with "WHIT.BAL" set to "AWB".
3200K	Use for indoor shooting.
5600K	Use for outdoor shooting.

WHIT.BAL

Selects the white balance settings.

Selection	Function
AWB	Use for automatic adjustment of the white balance. *For details, see "Adjusting the White Balance." For details of how to make fine adjustment using "R Paint" and "B Paint", see the following ATW.*
MANU	Use for manual adjustment of white balance. Both red gain (R gain) and blue gain (B gain) are adjustable. **R Gain:** Adjusts the red gain (-127 to +127) **B gain:** Adjusts the blue gain (-127 to +127) Ptress the DATA UP and DATA DOWN buttons together, to reset the values to ±000.

(Continued)

Selection	Function
ATW	Activates auto-tracing white balance. This mode is suitable for when the light source changes. The white balance is automatically adjusted as the color temperature changes. When WHIT.BAL is set to AWB or ATW, the "R Paint" and "B Paint" values are displayed on the menu. Use these for fine adjustment. Adjust these while looking at the screen. **R Paint:** Adjusts the red paint (-10 to +10) **B Paint:** Adjusts the blue paint (-10 to +10) Press the DATA UP and DATA DOWN buttons together to reset the values ±00.

M. PEDESTAL

Normally set to ±00.

Adjusts the darkness level of the black part of the image. Use this function to bring out details in heavily shaded areas. Use of a waveform monitor will make the adjustment easier.

The pedestal levels of the R, G, B output signals can be adjusted simultaneously within the range from -99 to +99.

Adjusting direction	Outline of the image
+	Lighter
−	Darker

Press the DATA UP and DATA DOWN buttons together to reset the values to ±00.

GAMMA

Gamma compensation.

Selection	Function
ON	Compensates the reproduction characteristics of the screen to produce natural-tone images. Use this setting for normal camera use.
OFF	Outputs the video signal linearly from the CCD without gamma compensation. Use this setting when you want to produce images for image processing or image analysis.

DETAIL

Enables and disabales adjustment of the sharpness of the object outlines.

Selection	Function
ON	Adjustment of the sharpness of the object outlines disabled.
OFF	Does not enable the adjustment of the sharpness of the object outlines.

LEVEL

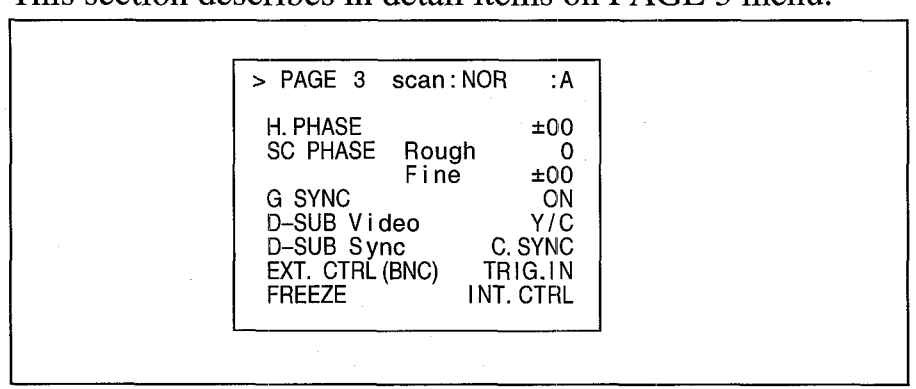
This item appears when "DETAIL" is set to "ON". Adjusts the sharpness of the subject outlines within the range from -99 to +99, when DETAIL is set to ON.

Adjusting direction	Outline of the image
+	Sharper with more detail on the image outline.
−	Softener with less detail.

By pressing the DATA UP and DATA DOWN buttons together, the values are reset to ±00

PAGE 3 menu

This section describes in detail items on PAGE 3 menu.



The following tables shows the PAGE 3 menu items, their contents and reference pages.

Item	Content of settings	Ref. page
H.PHASE SC PHASE	Adjusts the difference in phase between the subcarrier and horizontal synchronization during external synchronization.	84
G SYNC	Adds a sync signal to the G (green) channel of the RGB output.	84
D-SUB Video	Outputs the video signal from the RGB/SYNC (D-sub) connector.	84
D-SUB Sync	Outputs sync signal from the RGB/SYNC (D-sub) connector.	85
EXT.CTRL (BNC)	Selects the EXT CTRL signal input (sync signal/external pulse signal)	85
FREEZE	Selects how to capture the image into memory (external pulse signal/ FREEZE button on the rear panel).	85
MODE[a)]	Selects the memory mode (F/F or F/S)	85

a) This item appears when "FREEZE" is set to "EXT.CTRL".

H.PHASE

When an external reference sync signal for locking the camera sync generator is input to the EXT CTRL connector on the rear panel, the camera operates at the frequency of the reference signal. You can use the H. PHASE function to perfectly synchronize the camera operation with the reference signal to the level of the horizontal phase.
You can adjust the level within the range from -99 to +99.
Press the DATA UP and DATA DOWN buttons together to reset the values to ±00.

Notes

- To perform this adjustment, set "EXT.CTRL (BNC)" to "GENLOCK". If you set "EXT.CTRL (BNC)" to "TRIG.IN", no value is displayed.
- When an external reference signal is not input to the EXT CTRL connector, you cannot change the set value.

SC PHASE

When locking the camera sync generator, use the SC PHASE function to adjust the subcarrier phase.

Selection	Function
SC PHASE Rough	Rough adjustment by setting to between 0° and 180°.
SC PHASE Fine	Fine adjustment by adjusting the level within the range from -99 to +99.

Press the DATA UP and DATA DOWN buttons together to reset the values to ±00.

Notes

- To perform this adjustment, set "EXT.CTRL (BNC)" to "GENLOCK". If you set "EXT.CTRL (BNC)" to "TRIG.IN", no value is displayed.
- When an external reference signal is not input to the EXT CTRL connector, you cannot change the set value.

G SYNC

Adds a sync signal to the G signal in the RGB output.

Selection	Function
ON	Select when using a video monitor without a sync input connector. A sync-added G signal can be output form the → RGB/SYNC connector.
OFF	A sync signal is not added to the G output signal.

D-SUB Video

Selects the output signal of → RGB/SYNC connector (D-sub 9-pin).

Selection	Output signal
VBS	VBS signal
YC	YC signal
VD	VD signal .The VD signal is automatically selected when "D-SUB Sync" is set to "HD".

D-SUB Sync

Selects the output sync signal of ⊡→ RGB/SYNC connector (D-sub 9-pin).

Selection	Output sync signal
C.SYNC	Composite SYNC signal
WEN	WEN signal. The WEN signal is output to peripheral equipment as a trigger pulse.
HD	HD signal. When HD is selected, "D-SUB Video" is automatically set to "VD".

EXT. CTRL (BNC)

Selects the input signal to the EXT CTRL connector on the rear panel.

Selection	Input signal
TRIG.IN	Control signal for the built-in memory and external trigger shutter.
GENLOCK	Sync signal for synchronizing the camera operation with the reference signal.

FREEZE

Selects the control signal for capturing the image to the built-in memory.

Selection	Control signal
INT.CTRL	Enables the ⊡ FREEZE button on the rear panel to capture the image to the built-in memory.
EXT.CTRL	The external pulse signal is used to capture the image to the built-in memory.

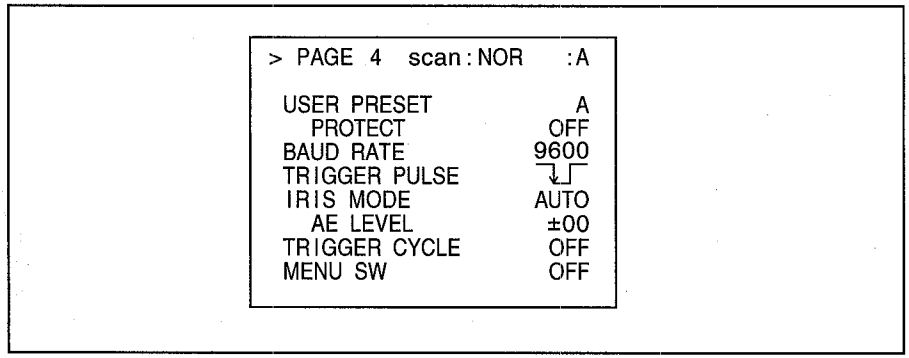
MODE

This item appears when "FREEZE" is set to "EXT.CTRL". Selects how to control the unit using the external pulse.

Selection	Control method
F/F	Whenever an external pulse is input, the image is captured to memory, replacing the previously captured image.
F/S	When an external pulse is input, the image is captured to memory replacing the previously captured image, and the captured image is output as a still image. When the next external pulse signal is input, the live image shot with the camera is output. These operations are repeated cyclically whenever external pulses are input.

PAGE 4 menu

This section describes in detail items on PAGE 4 menu.



The following tables shows the PAGE 4 menu items, their contents and reference pages.

Item	Content of settings	Ref. page
USER PRESET	Selects the user preset A or B.	86
PROTECT	Protects the user preset.	87
BAUD RATE	Selects the baud rate.	87
TRIGGER PULSE	Selects the polarity of the input pulse.	87
IRIS MODE	Selects the iris mode (auto/fixed)	87
AE LEVEL[a)]	Finely adjusts the focusing point of AE.	87
TRIGGER CYCLE	Selects the cycle of the internal trigger pulse.	88
MENU SW	Selects how to change the user preset (on the menu/using the FUNCTION UP button).	88

a) This item appears when IRIS MODE is set to AUTO.

USER PRESET

You can create up to two sets of menu settings for the camera, and save these settings as a user preset. You can switch to the set which is most suitable for the shooting condition at hand. The currrently active user set is shown in the upper left corner of the menu.

PROTECT

You can protect the current user settings by setting "PROTECT" to "ON."

To save user sets and protect them

1 Select user preset A or B as desired from "USER PRESET".

2 Make any settings or adjustments using the PAGE 1 to PAGE 4 menus.

3 Set "PROTECT" to "ON."
The flashing "P" appears in front of the displayed user preset A or B. This indicates that the user preset is protected.

Note that the following item can be changed even when a user preset is protected.
• USER PRESET
• PROTECT

BAUD RATE

Changes the baud rate of the REMOTE connector to any of 9600, 4800, 2400 or 1200.
Use a baud rate of 9600 when an RM-C950 is connected.

TRIGGER PULSE

Selects the same polarity as the input signal for controlling the memory or external trigger shutter.

Selection	Polarity
	Falling edge
	Rising edge

IRIS MODE

Sets the iris mode.

Selection	Function
AUTO	To use the auto iris lens.
FIX	To use the optical lens without the auto iris function.

AE LEVEL

This item appears when IRIS MODE is set to AUTO.
The auto exposure focusing level can be adjusted within the range from -31 to +31 by pressing the DATA UP or DATA DOWN button.
Press the DATA UP and DATA DOWN buttons together to reset the values to ±00.

TRIGGER CYCLE

Sets the cycle for the the built-in memory to be controlled by the internal pulse.

Selection	Function
OFF	The built-in memory is controlled by an external pulse.
2-FRM to 10 min	Sets the cycle of the internal pulse within the range from 2-FRM to 10 min.

MENU SW

Selects whether to switch the user preset A and B by using the FUNCTION UP button on the rear panel without the menu displayed.

Selection	Function
OFF	Disables the FUNCTION UP button to switch between the user presets.
ON	Enables the FUNCTION UP button to switch between user presets. When you press the FUNCTION UP button, the user preset is switched instantaneously.

For example, if user preset A is selected when the "MENU SW" is set to ON, pressing the FUNCTION UP button switches to user preset B after returning to the regular screen.

Note

When you switch between user presets with the FUNCTION UP button, the currently selected user preset name is not displayed on the monitor.

Initial Setting List

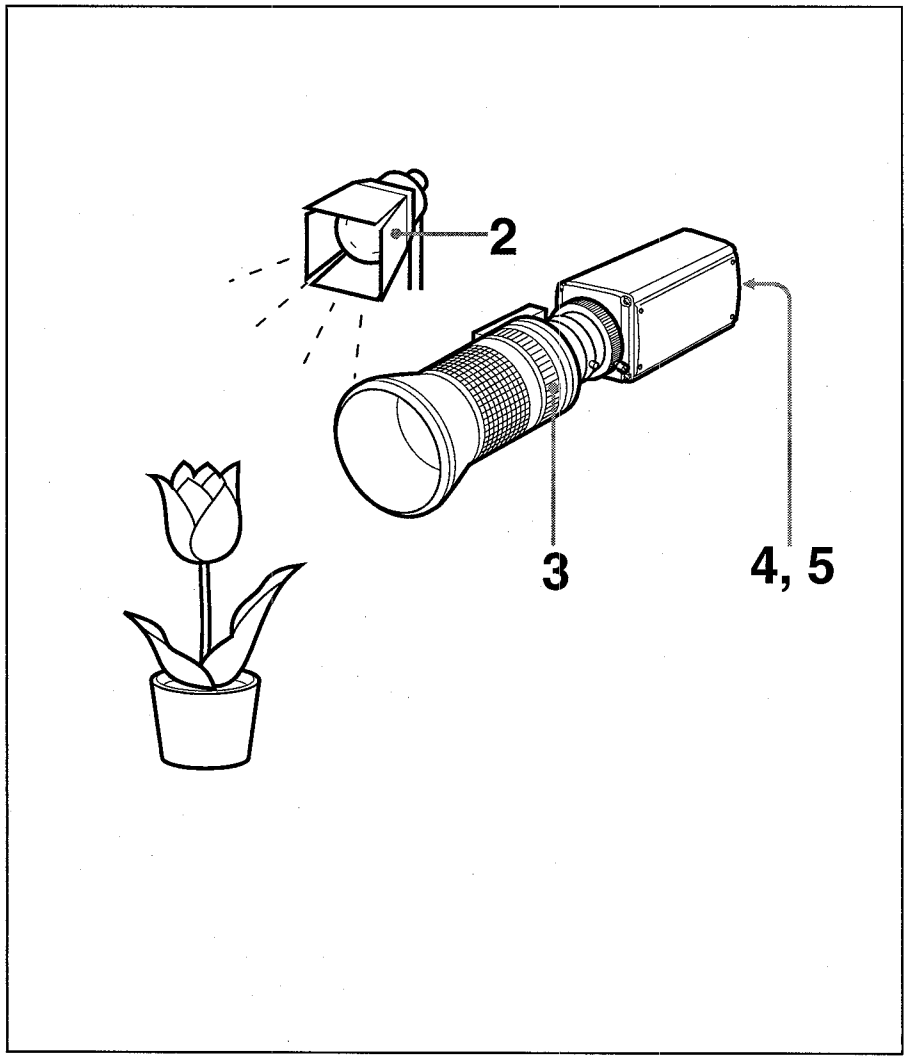
MENU PAGE	Item	Initial setting
PAGE 1	GAIN	STEP:0 dB
	SHUTTER	OFF
	SPEED[a)]	STEP:1/60 VARIABLE:262/525
	EXT.TRIGGER	OFF
	AE WINDOW	LARGE
	DETECTION	AVERAGE
PAGE 2	C.TEMP	AUTO
	WHT.BAL	AWB
		R Paint:±00 B Paint:±00 R Gain:±000 B Gain:±000
	M.PEDESTAL	±00
	GAMMA	ON
	DETAIL	ON
	LEVEL[b)]	±00

a) "SPEED" appears when "SHUTTER" is set to "STEP" or "VARIABLE".
b) "LEVEL" appears when "DETAIL" is set to "ON".

MENU PAGE	Item	Initial setting
PAGE 3	H.PHASE	±00
	SC PHASE Rough	0
	SC PHASE Fine	±00
	G SYNC	ON
	D-SUB Video	Y/C
	D-SUB Sync	C.SYNC
	EXT.CTRL(BNC)	TRIG.IN
	FREEZE	INT.CTRL
	MODE[c)]	F/S
PAGE 4	USER PRESET	A
	PROTECT	OFF
	BAUD RATE	9600
	TRIGGER PULSE	⌐⌐
	IRIS MODE	AUTO
	AE LEVEL[d)]	±00
	TRIGGER CYCLE	OFF
	MENU SW	OFF

c) "MODE" appears when "FREEZE" is set to "EXT. CTRL".
d) "AE LEVEL" appears when "IRIS MODE" is set to "AUTO".

Basic Shooting Procedure



1 Turn on the power of the camera and all connected devices.

2 Illuminate the subject with proper lighting.

3 Aim the camera and adjust the iris, focus and zoom.

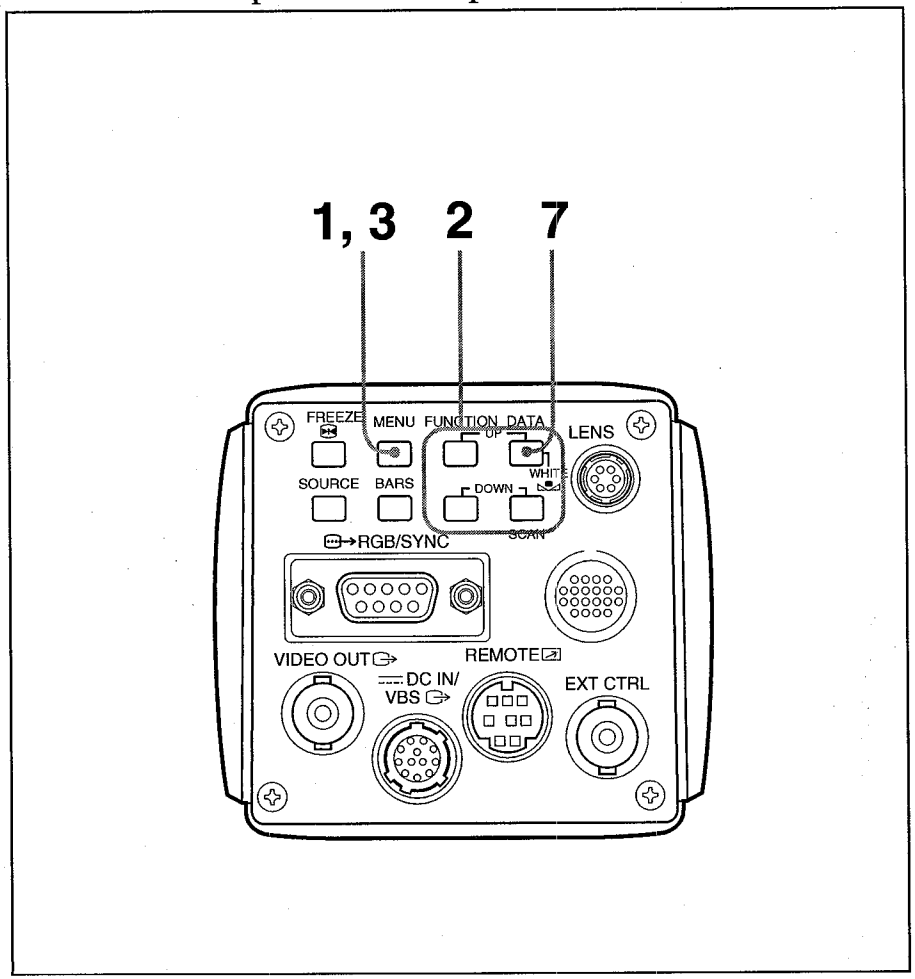
4 Adjust the white balance.
For more details, see "Adjusting the White Balance" on page 91.

5 Adjust the settings as needed.
For more details, see "Adjusting and Setting with Menus" on page 73.

6 Start shooting.

Adjusting the White Balance

Each time the lighting conditions change, adjust the white balance so that optimal color reproduction is obtained.



Operation procedure

1 Press the MENU button to display the menu.

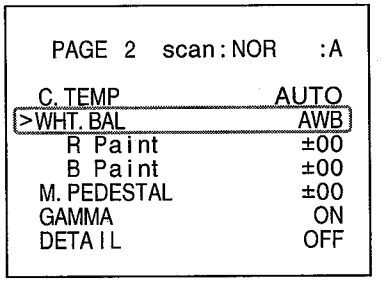
2 Select the PAGE 2 menu and set "WHT.BAL" to "AWB".

Note

Check that "PROTECT" on PAGE 4 menu is set to "OFF". If set to "ON", you cannot change "WHT.BAL" to "AWB".

For more details, see "PROTECT" of "PAGE 4 menu" on page 87.

For details of how to operate, see "Operation through Menus" on page 75.



3 Press the MENU button to make the menu disappear.

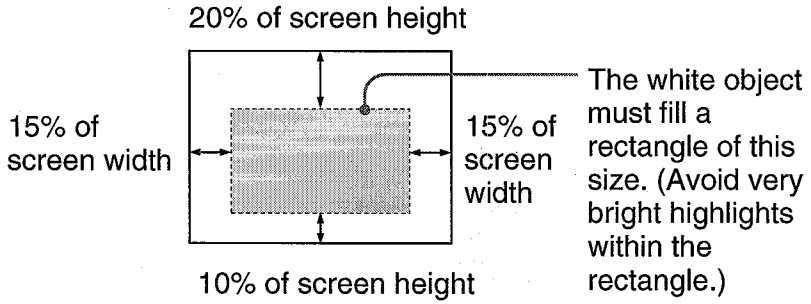
4 Display the camera image on the screen.

Note

If the color bar signal is displayed on the screen, press the BAR button to make it disappear.

5 Set the lens iris control as follows.
When using an auto-iris lens: Set to auto-iris control.
When using a manual-iris lens: Set to an appropriate iris opening value.

6 Place a white object in the same light as that falling on the subject to be shot, then zoom in on the object to fill the screen as follows.



The white object can be a piece of white paper or cloth, a white wall, or the like.

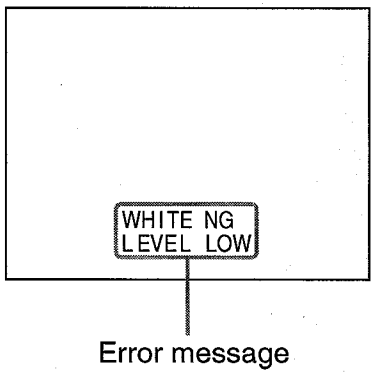
Notes

- Not to include highly reflective items in the picture.
- Always shoot the image under suitable lighting conditions.

7 Press the WHITE button.
The message "WHITE OK" appears on the screen when the adjustment is done.
The adjusted white level is automatically stored in memory and remains, even if the camera's power is turned off.
To shoot under the same condition, the stored white balance is reproduced with the "WHIT.BAL" set to "AWB".

White balance adjustment errors

If the white balance adjustment is not successful, an error message appears on the screen. If this happens, take the necessary measures and conduct steps 1 through 7 again.
For more details, see "Error messages" on page 93.



Error messages

The following table shows error messages which list problems when performing automatic white balance adjustment, together with their possible causes and remedies.
Note the message and check the listed causes.

Error message	Causes	Remedies
WHITE NG LEVEL LOW	The video level is too low.	Increase the illumination.
WHITE NG LEVEL HIGH	The video level is too high.	Decrease the illumination.
WHITE NG C.TEMP LOW	The color temperature is too low.	The camera cannot automatically adjust the white balance due to the illumination. Change the illumination to the proper one.
WHITE NG C.TEMP HIGH	The color temperature is too high.	The camera cannot automatically adjust the white balance due to the illumination. Change the illumination to the proper one.
WHITE NG TRY AGAIN	The camera has failed to adjust the white balance due to a cause other than the above. (ex. there is no white part on the object, the object is moving and so on).	Adjust the illumination and try automatic adjustment of the white balance again.
WHITE MANU	"WHT.BAL" is set to "MANU".	Change the setting of "WHT.BAL" to "AWB", then try automatic adjustment of the white balance again.
WHITE ATW	"WHT.BAL" is set to "ATW".	Change the setting of "WHT.BAL" to "AWB", then try automatic adjustment of the white balance again.

Using the Externally Triggered Shutter

A charge starts building up the instant an external trigger pulse is received, and then an image is output.
Triggering the electronic shutter externally lets you shoot an object moving at high speed from a fixed position with minimum blurring.

To use the external trigger shutter, make the following menu settings.
For details of how to use the menus, see "Operation through Menus" on page 75.

1 Set "EXT.TRIGGER" of "SHUTTER" on PAGE 1 menu to "ON".
Either STEP or VARIABLE appears in the SHUTTER column on the menu.

2 Select either "STEP" or "VARIABLE".
"SPEED" appears.

3 Move the cursor to "SPEED" by using the FUNCTION DOWN button, then set the shutter speed by using the DATA UP or DOWN button.

4 Set "EXT.CTRL(BNC)" on PAGE 3 menu to "TRIG.IN".

5 Set "TRIGGER CYCLE" on PAGE 4 menu to "OFF".

6 Set "TRIGGER PULSE" on PAGE 4 menu to match the polarity of the input tirgger pulses.

Note

When "EXT.TRIGGER" is set to "ON", ATW and AUTO IRIS cannot be used.

Capturing the Image into Memory by Using the Freeze Function

The unit has frame memory from which a captured image can be output as a still image to an image processor such as a computer or a printer.

Frame memory can be controlled in the following three ways:

- FREEZE button located on the rear panel
- Internal pulse signals
- External pulse signals

You have to change the menu setting to use the freeze function with these controls.

Note

While the captured image is being output as a still image, ATW, AUTO IRIS and CCD IRIS cannot be used.

To capture the image into memory using the FREEZE button

Set "FREEZE" on PAGE 3 menu to "INT.CTRL".

The FREEZE button and SOURCE button on the rear panel are enabled.

On pressing the FREEZE button: The image is captured into memory and the captured image is output.

On pressing the SOURCE button: The freeze function (memory mode) is cleared and the live image is output from the camera.

To capture to memory using an internal pulse signal

To capture to memory using internal pulse signals, make the following menu settings.

1 Set "FREEZE" on PAGE 3 menu to "EXT.CTRL".

2 Set "MODE" on PAGE 3 menu to the desired memory mode F/F or F/S.

F/F: Whenever an external pulse is input, the image is captured in the memory, replacing the previously captured image with the new one and the captured image is output as a still image. This operation is repeated cyclically whenever the external pulses are input.

F/S: When an external pulse is input, the image is captured to memory replacing the previously captured image, and the captured image is output as still image. When the next external pulse is input, the live image shot with the camera is output. These operations are repeated cyclically whenever external pulses are input.

For timing of the pulse signal in F/F mode and F/S mode, see "Timing of external pulse input to the EXT CTRL connector" on page 96.

(Continued)

3 Set the cycle to capture the image within the range from 2-FRM to 10 min using "TRIGGER CYCLE" on PAGE 3 menu.
The image is captured into memory in cycles as set in step 3.

Note

When the cycle to capture the image within the range from 2-FRM to 10 min is set using "TRIGGER CYCLE" on PAGE 3 menu., CCD IRIS and AUTO IRIS cannot be used.

To capture the image into memory using an external pulse

To capture the image into memory according to an external pulse input to the EXT CTRL connector on the rear panel, make the following menu settings.

1 Set "FREEZE" on PAGE 3 menu to "EXT.CTRL".

2 Set "MODE" on PAGE 3 menu to the desired mode F/F or F/S.
For details of memory mode, see step 2 of "To capture to memory using an internal pulse signal" on page 95.

3 Set "EXT.CTRL(BNC)" on PAGE 3 menu to "TRIG.IN".

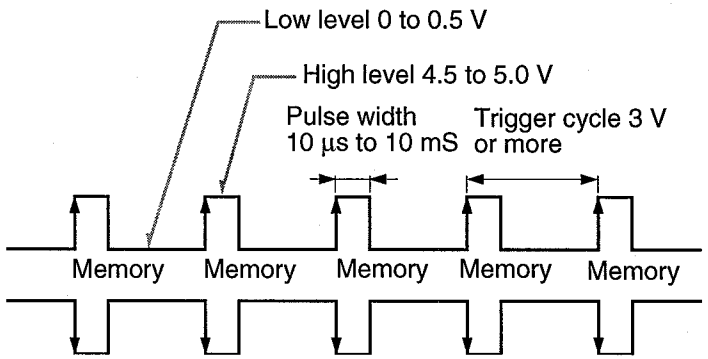
4 Set "TRIGGER CYCLE" on PAGE 4 menu to "OFF".

5 Set "TRIGGER PULSE" on PAGE 4 menu to the same polarity as the input trigger pulse.

6 Set "EXT.TRIGGER" of "SHUTTER" on PAGE 1 menu to "OFF".

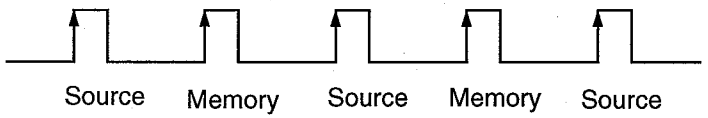
Timing of external pulse input to the EXT CTRL connector

F/F mode



Select either of the two illustrated above.

F/S mode



Memory: Capturing the image into memory and sending it as a still image.
Source: Chainging the output from the captured image to live image.

Setting the Scan Mode

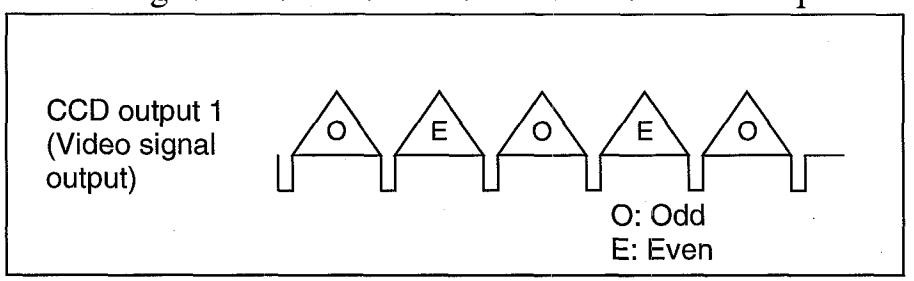
Since the DXC-9000 has a CCD that uses an "all pixels read-out" method, the unit has a frame shutter function. This allows the camera to output full-frame still image only using the electronic shutter.
The camera has the following three scan modes.

- NOR (normal mode)
- F.S (frame shutter mode)
- VGA mode

Each mode is described below using the timing charts.

NOR (normal) mode

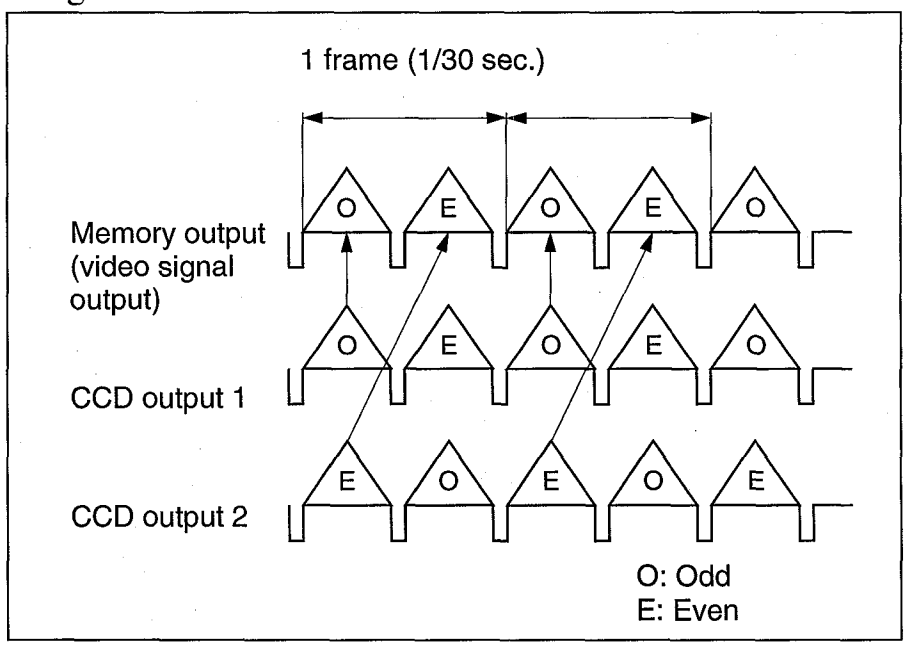
This mode is suitable when using the camera output only for monitoring where the frame shutter function is not required.



One channel of the CCD outputs is used. The video signal is output from the camera without passing through the memory. Odd-field and even-field video signals are output alterntely.

F.S (frame shutter) mode

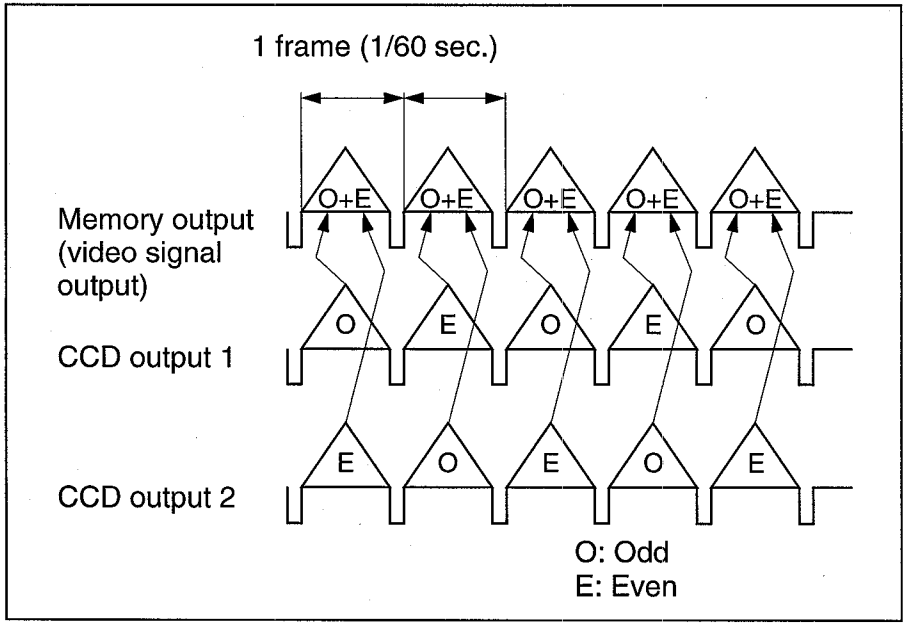
The video signals for 30 frames are output for one second. This mode is suitable when shooting an object moving at high speed from a fixed position with minimal blurring using the frame shutter function.



The odd-field signal and the even-field signal are sent to the memory together and they are interlaced in memory and output as the video signal for one frame.

VGA mode (RGB outputs)

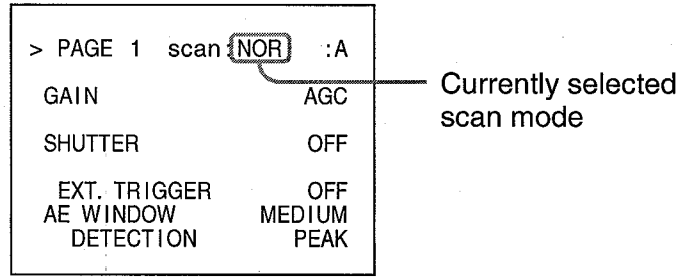
This mode has the frame shutter function and is VGA compatible.
This mode is suitable when connecting to a multi-scan monitor or multi-scan printer.



The odd-field signal and even-field signal are sent to memory together and processed as a one-frame video signal in within one field. The video signals for 60 frames are sent in a second. Thus, the unit can output twice the video signal that can be output from a conventional unit.

To select the scan mode

1 Press the MENU button.
The menu appears and the currently selected scan mode is displayed.
Check the currently selected scan mode.



2 Press the MENU button.
The regular monitor screen appears.

3 Select the desired scan mode by pressing the SCAN button on the rear panel.
The scan mode is switched in the order NOR, F.S and VGA whenever you press the SCAN button.

Note

You cannot switch the scan mode when the menu is displayed on the monitor.

Adjusting the Picture Tone in a Multi-Camera System

When configuring a multi-camera system, adjust all cameras to prevent camera-to-camera variations in picture tone. Before making the adjustments described below, supply the same sync signal to all cameras.
For more details, see "Connecting Two or More Cameras - Multi-Camera system" on page 107.

Connecting the cameras to video equipment with phase indication capability

When connecting to a special-effects generator, a chormakey unit, or other video equipment with phase indication capability, the basic adjustment procedure is as follows.

1 Turn on the phase indication capability of the connected video equipment.

2 Adjust the horizontal phase using the "H.PHASE" function on PAGE 3 menu.
For more details, see "Operation through Menus" on page 75.

3 Adjust the SC (subcarrier) phase using the "SC PHASE" function on PAGE 3 menu.
First set to between 0° and 180° for rough adjustment using the "SC PHASE Rough", then use "SC PHASE Fine".

For more details, refer to the instruction manual of the connected video equipment with phase indication capability.

Connecting the cameras to video equipment without phase indication capability

Use one of the cameras as a reference camera and adjust the other cameras to the reference camera one by one.

1 Adjust the horizontal phase using the "H. PHASE" function on PAGE 3 menu.

Using the "H. PHASE" function, adjust so that the reference video signal and the output signal have the same horizontal sync phase. Use a waveform monitor or an oscilloscope to check the phase.

(Continued)

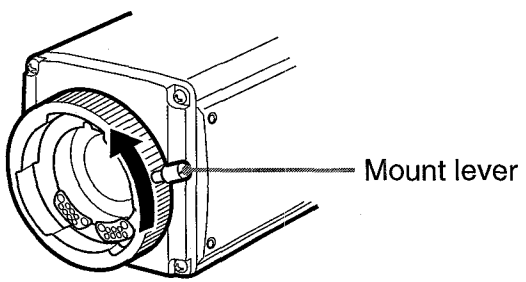
2 Adjust the SC phase using the "SC PHASE" function on PAGE 3 menu.

First set to between 0° and 180° for rough adjustment using the "SC PHASE Rough", then use "SC PHASE Fine" function for fine adjustment so that the reference video signal and the output video signal have the same carrier phase.
Use a vectorscope or the wiping function of a special-effects generator so that images of both the reference camera and the camera to be adjusted appear next to each other on the screen.

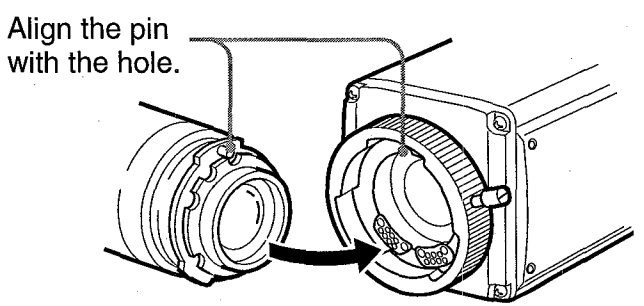
Mounting the Lens

Only 1/2-inch bayonet-mount lenses can be attached to the camera.
For 2/3-inch lenses, an LO-32BMT lens mount adaptor (not supplied) is required.

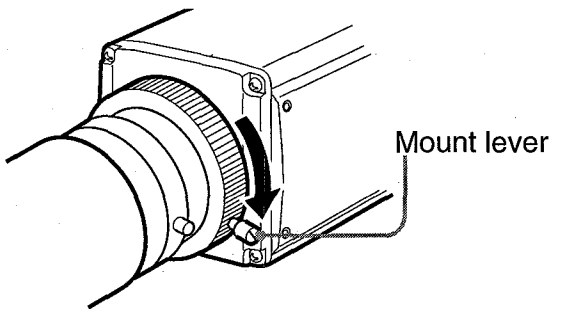
1 Turn the mount lever counterclockwise as far as it goes. (If the lens mount cap is in place, remove it.)



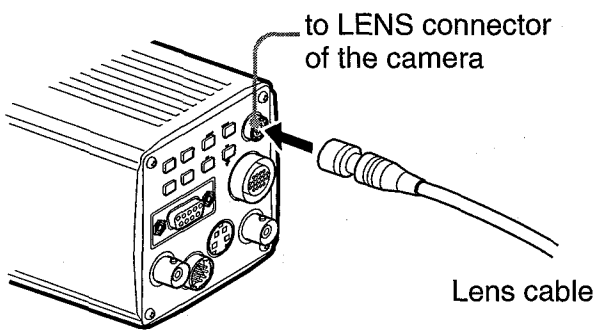
2 Align the positioning pin on the lens with the matching hole in the lens amount and attach the lens.



3 Turn the mount lever clockwise as far as it goes to lock the lens in the lens mount.



4 If the lens is a 2/3-inch type, connect the lens cable to the camera's LENS connector.
(This step is not necessary for 1/2-inch lenses.)



Mounting a Microscope Adaptor

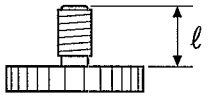
To attach the camera to a microscope, it is necessary to first mount an appropriate adaptor. The method for mounting these adaptors is the same as for lenses.
For more details, refer to the manual for each adaptor.

Mounting on a Tripod

To mount the camera on a tripod, use the screw hole in the bottom of the camera body.

Mounting screw to be used

U1/4", 20 UNC
ℓ: 4.5 ± 0.2 mm (ISO standard)
ℓ: 0.197 inches (ASA standard)



Mounting to a Wall or Ceiling

To attach the camera on a wall or ceiling, use the appropriate bracket and mounting screws (1/4", 20 ridges).
For more details, contact your authorized Sony dealer.

Basic System Connection

To supply power to the unit, use the CMA-D2/D2MD camera adaptor (not supplied).
There are two connections methods as follows.

- Using a CCDC cable which only supplies power to the unit.
- Using a CCMC cable which supplies power to the camera and transmits video signals to the camera adaptor.

The camera adaptor you can use with the unit is as follows.

	For medical use	For non-medical use
DXC-9000	CMA-D2MD	CMA-D2

Note on use of camera adaptors

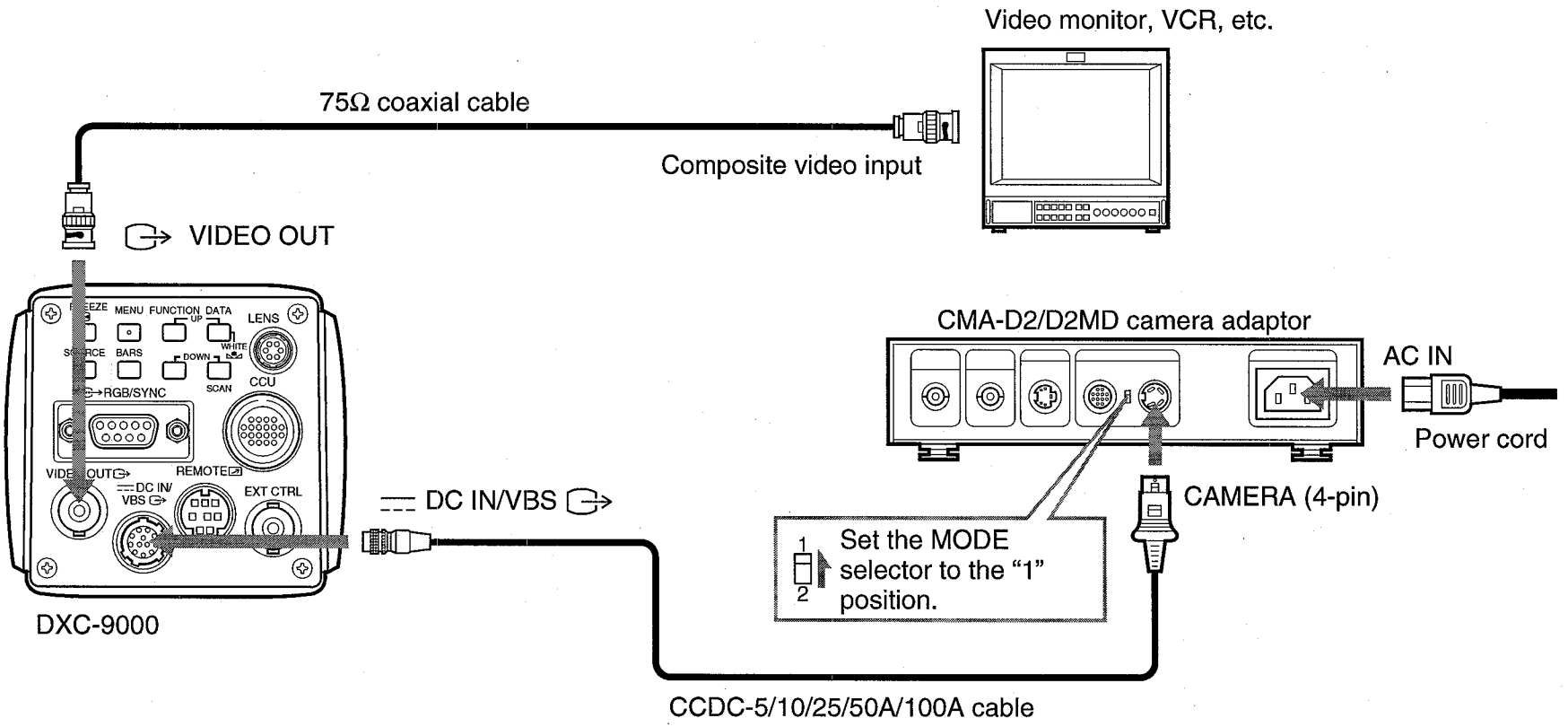
Be sure to use one camera adaptor for each DXC-9000 unit. Although the CMA-D2/D2MD camera adaptor has two CAMERA connectors (4-pin and 12-pin), the power consumption of the DXC-9000 is such that two camera units cannot be connected at the same time.

Note on connections

Be sure to turn off power supply for all equipment before making any connections.

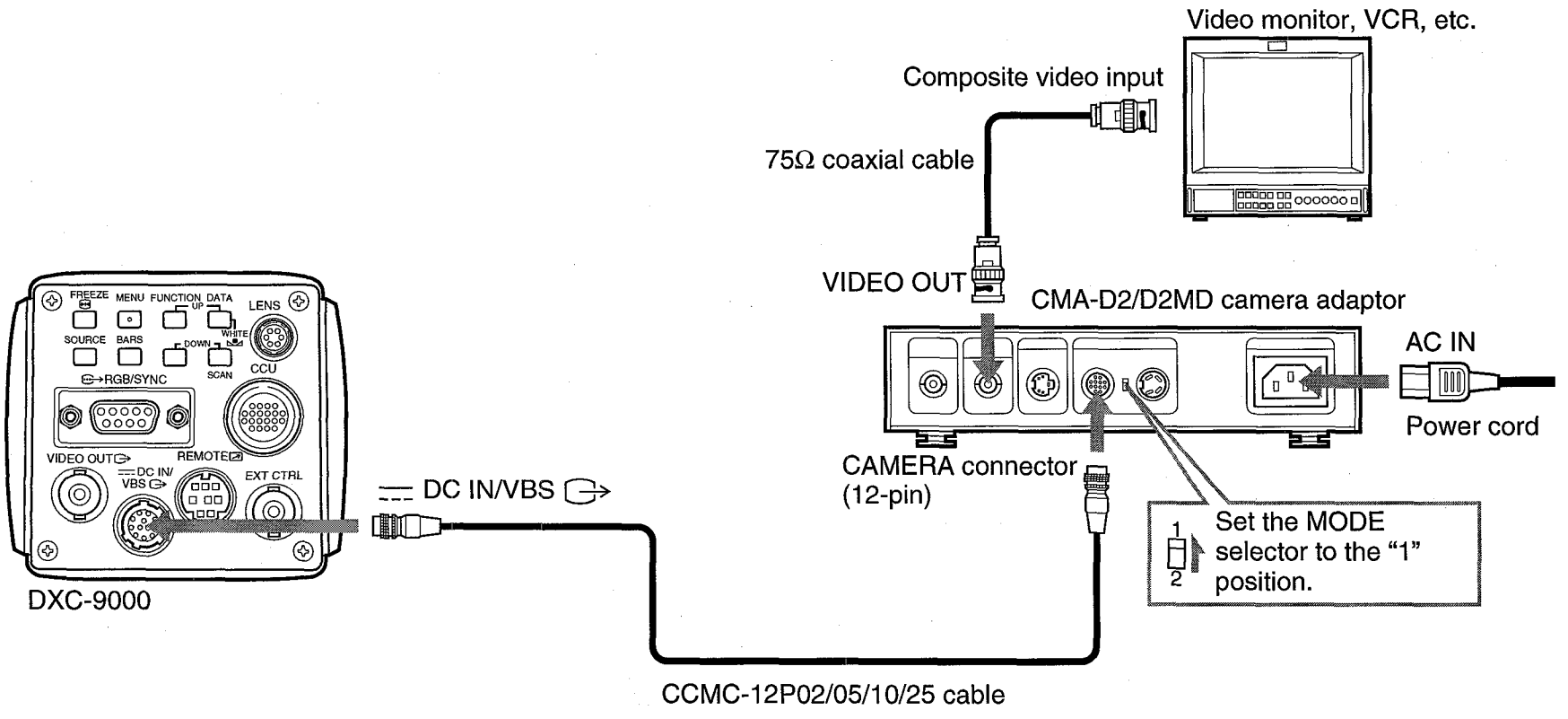
Connecting to Video Equipment With Composite Video Input Connectors

Connecting using a CCDC cable



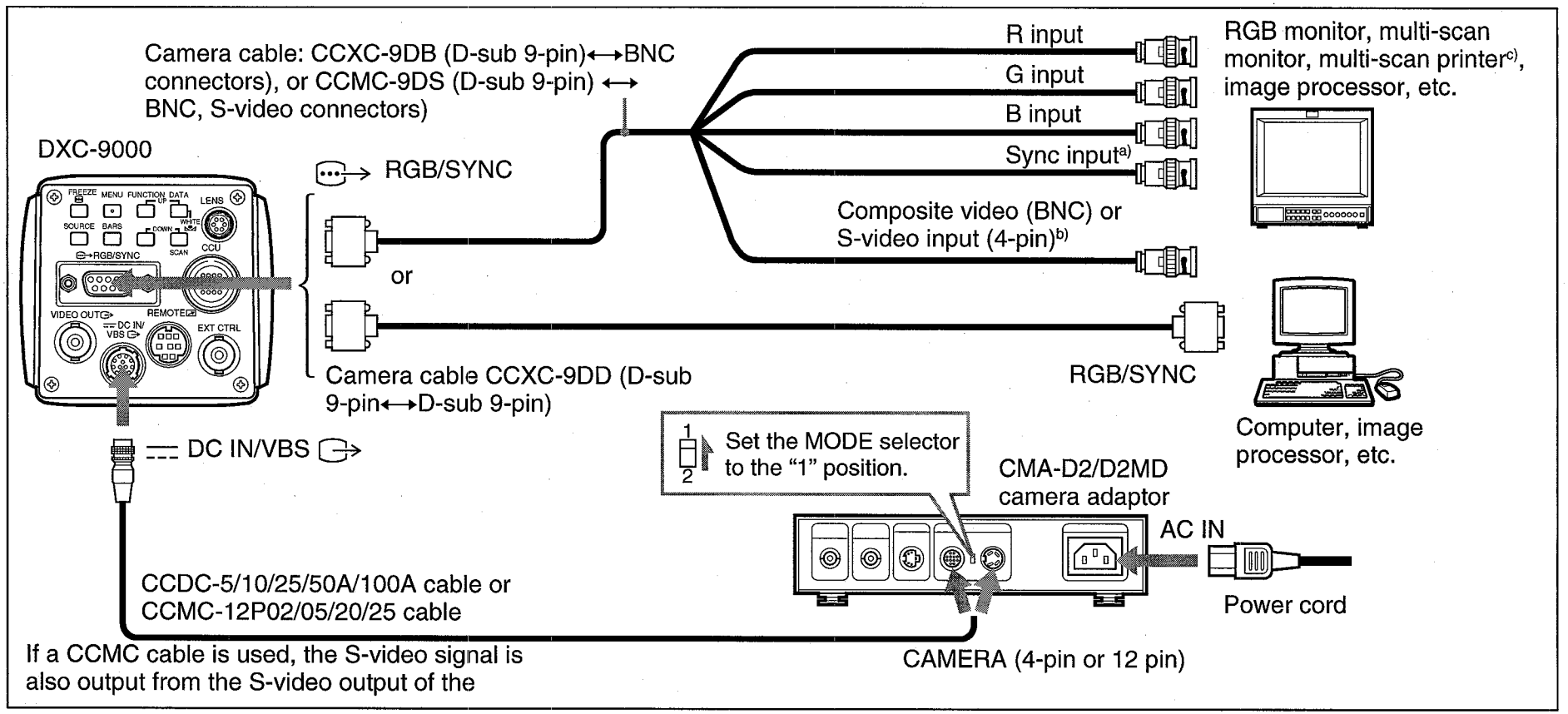
Setup using a CCDC cable (for supplying power only)

Connecting using a CCMC cable



Setup using a CCMC cable (for supplying power to the unit and video signals to the camera adaptor)

Connecting to Video Equipment With RGB or S-Video Inputs



a) When using a video monitor without a sync signal input connector, the unit can be set to output a sync signal with the G signal.
For details of how to add the G signal, see "G SYNC" of PAGE 3 menu (on page 84).

b) This setup is for connecting a composite video (VBS) connector. To send separated Y/C signals to the S-video input of video equipment, use a CCMC-9DS camera cable.
For details on switching camera output between VBS (composite video) and Y/C, see "D-SUB Sync" of PAGE 3 menu (on page 85).

c) When connecting to a multi-scan monitor or multi-scan printer, set the scan mode to VGA.
For details of how to set the scan mode, see "Setting the Scan Mode" on page 97.

Connecting Two or More Cameras — Multi-Camera System

Notes on multi-camera systems

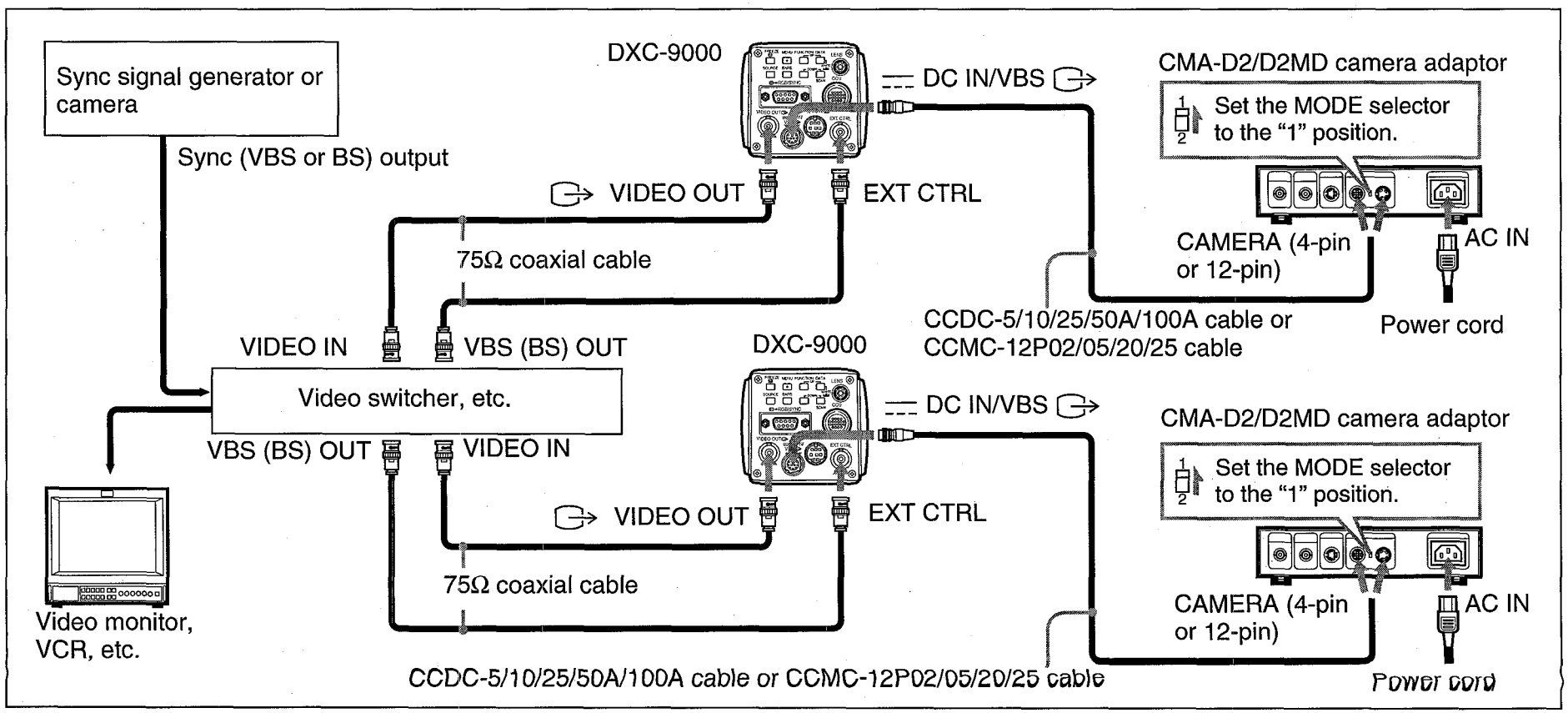
Take the following steps to prevent flicker when switching between two or more cameras connected to a video switcher.

- Supply the same sync signal to the EXT CTRL connectors on each camera (see below).

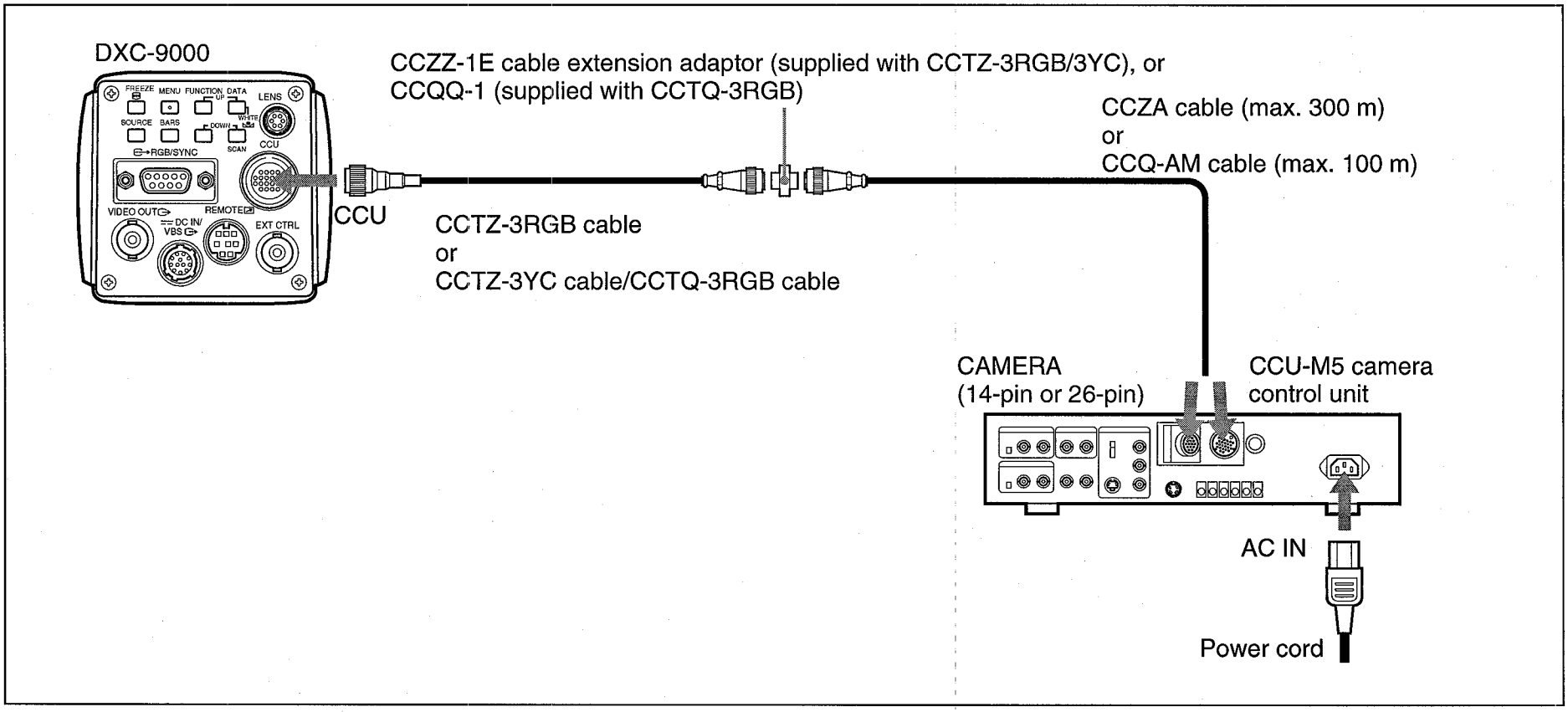
Set "EXT.CTRL (BNC)" to "GENLOCK" on PAGE 3 menu. For details, see page 85.

- Adjust the subcarrier and horizontal synchronization phases for all cameras.

For more details, see "Adjusting the Picture Tone in a Multi-Camera System" on page 99.



Connecting to a Camera Control Unit (For Non-Medical Use)



Notes

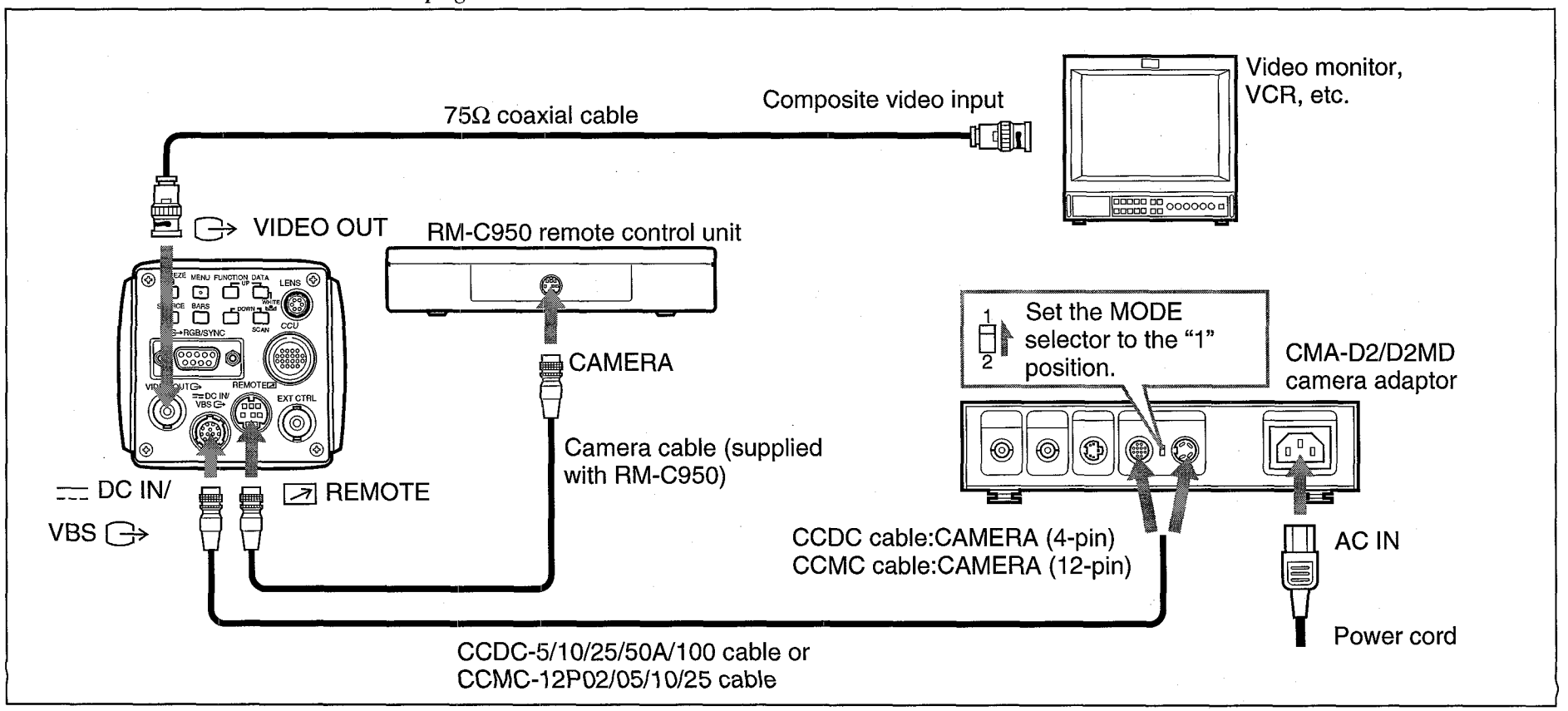
- Never connect the CCU-M5 camera control unit and the CMA-D2/D2MD camera adaptor at the same time. Doing so could damage equipment.
- Operation through menus of the DXC-9000 cannot be performed when the unit is controlled from the remote control unit.

Connection to Enable Remote Control

Connecting to the RM-C950 Remote Control Unit

Note

When the RM-C950 remote control unit is used with the DXC-9000, the functions availables on the PRINT, FLASH and LONG EXPOSURE buttons on the RM-C950 change.
For details, see "The PRINT, FLASH and LONG EXPOSURE buttons on the RM-C950" on the next page.



The PRINT, FLASH and LONG EXPOSURE buttons on the RM-C950

The names and functions of the PRINT, FLASH and LONG EXPOSURE buttons on the RM-C950 change as follows, when the RM-C950 is used with the DXC-9000.

Button on the RM-C950	Button names when used with the unit	Function
PRINT	FREEZE	Press this button to capture the image into the memory of the DXC-9000. The image is captured into memory at the instant you press this button.
FLASH	SCAN	**With the menu displayed:** Use this button for data setting. The setting value is increased by pressing this button. **With the menu hidden:** Use this button to set the scan mode. Each time you press the button, the scan mode changes in the order NOR→F.S→VGA.
LONG EXPOSURE	SHUTTER SPEED	This button works only when the menu is not displayed. Use this button for setting the shutter speed.

Buttons labels supplied with the unit

New labels for the FREEZE, SCAN and SHUTTER SPEED buttons are supplied with the unit. Stick the new labels on to the appropriate PRINT, FLASH and EXPOSURE buttons on the RM-C950.

How to use the buttons

FREEZE button

You can control the memory of the unit using the FREEZE button on the RM-C950. The function of the FREEZE button depends on "MODE" on PAGE 3 menu setting for the unit.

For details on how to set, see "MODE" on PAGE 3 menu on page 85.

The following two memory modes are available.

F/F: Whenever an external pulse is input, the image is captured to memory, replacing the previously captured image and the captured image is output as a still image. This operation is repeated cyclically whenever an external pulse is input.

F/S: When an external pulse is input, the image is captured to memory replacing the previously captured image, and the captured image is output as a still image. When the next external pulse signal is input, the live image shot with the camera is output. These operations are repeated cyclically whenever an external pulse is input.

SCAN button

The SCAN button functions the same as the SCAN button on the unit.

For details, see "Setting the Scan Mode" on page 97.

SHUTTER SPEED button

To use this SHUTTER SPEED button, set "SHUTTER" on PAGE 1 menu to "STEP" or "VARIABLE". You can change the shutter speed using the SHUTTER button on the RM-C950.

Notes

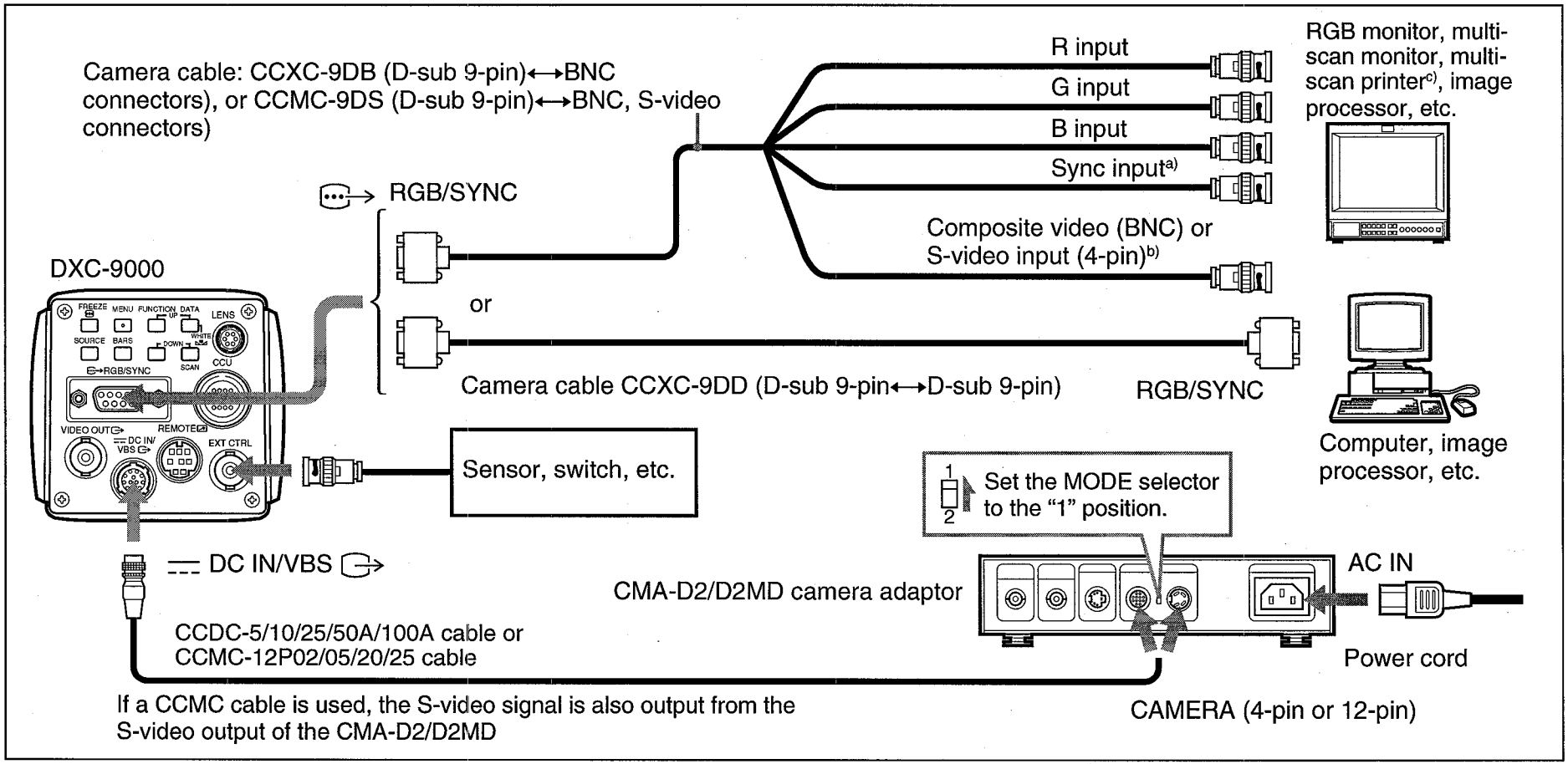
- Make sure that the no menus are displayed when setting the shutter speed using the SHUTTER SPEED button on the RM-C950.
- This function is disabled when the user presets are protected.

For details, see "PROTECT" on PAGE 4 menu on page 87.

Remote Controlling the Camera from an External Pulse Signal

The image can be captured to the built-in frame memory as a still image using a pulse signal input to the EXT CTRL connector from a remote sensor and switch.

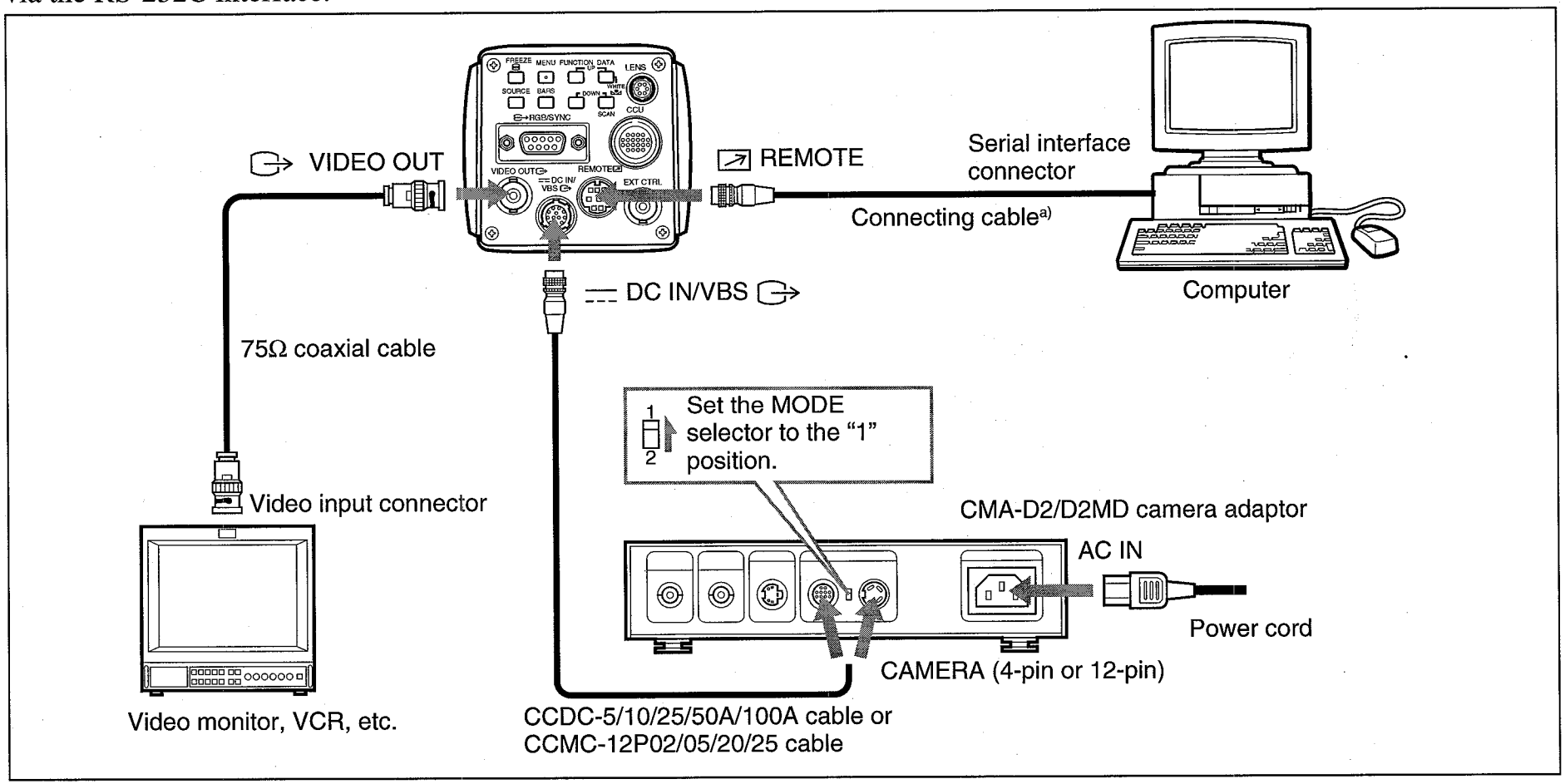
For details of the timing of the pulse input to the EXT CTRL connector, see "Capturing the Image into Memory by Using the Freeze Function" on page 95.



For information on a), b), C), see "Connecting to Video Equipment With RGB or S-Video Inputs" on page 106.

Connecting to a Computer

The figure below shows the system for controlling the unit via the RS-232C interface.



a) Use the shielded connecting cable for connecting to a computer.

For more details on RS-232C protocol and cables for connection to a computer, contact your authorized Sony dealer.

Connection With a Printer/Digital Still Recorder

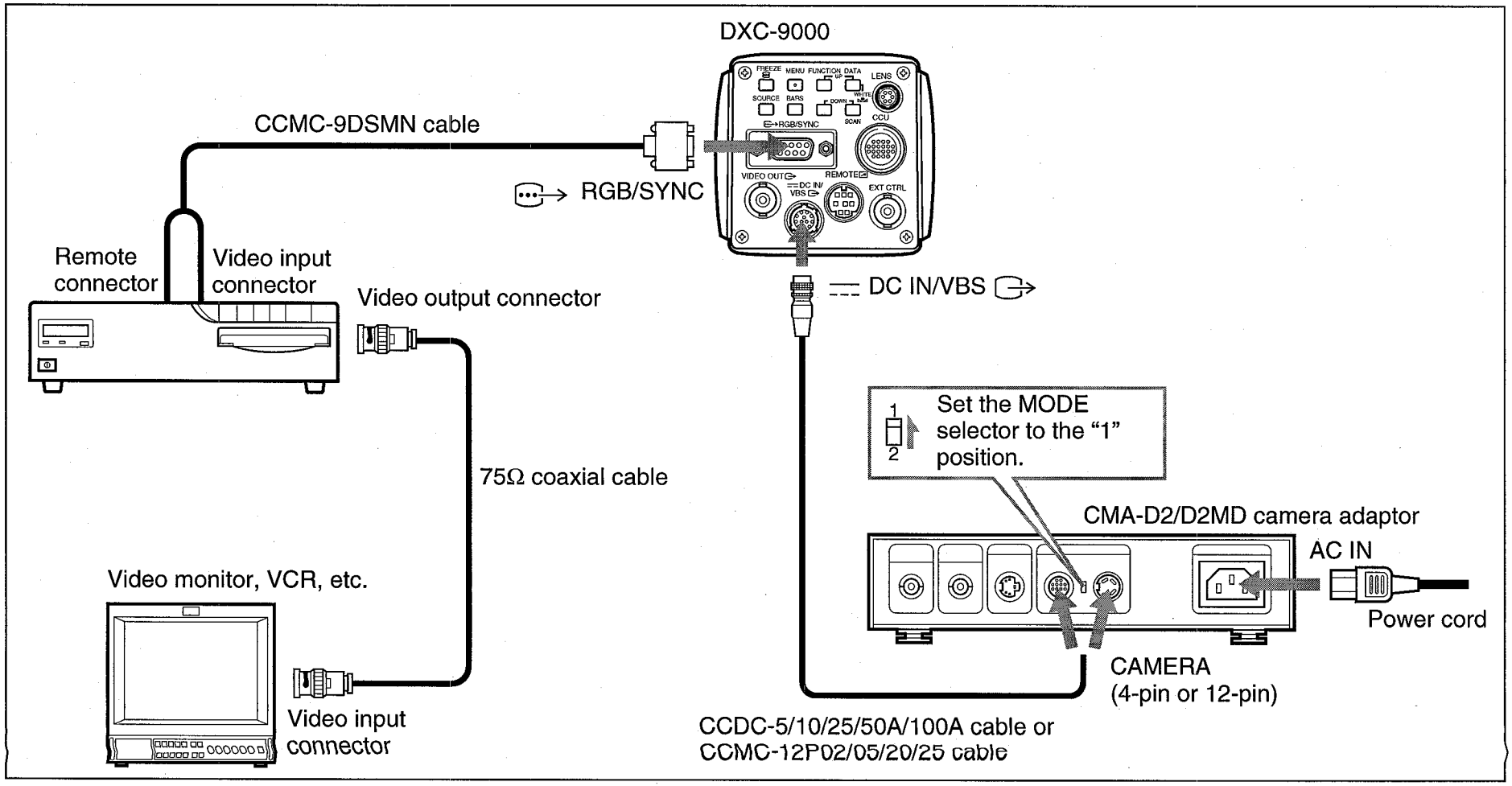
The unit outputs a write enable control signal (WEN) with the video signal so as to enable a printer or digital still recorder to capture the image to memory.

For details on remotely controlling the operation of the printer or digital still recorder, refer to the manuals supplied with them.

To set up the system, perform the following settings on the menus.

- Set "G SYNC" on PAGE 3 menu to "ON".
- Set "D-SUB Sync" on PAGE 3 menu to "WEN".

For details on menu settings, see "G SYNC" on page 84 and "D-SUB Sync" on page 85.



Precautions

This Sony product has been designed with safety in mind. However, if not used properly electrical products can cause fires which may lead to serious body injury.
To avoid such accidents, be sure to heed the following.

Heed the safety precautions

Be sure to follow the general safety precautions pages 116, 117, and 118, and in the "Operating Precautions" section on page119.

In case of a breakdown

In case of system breakdown, discontinue use and contact your authorized Sony dealer.

In case of abnormal operation

- If the unit emits smoke, unusual or smells,
- If water or other foreign objects enter the cabinet, or
- If you drop the unit or damage the cabinet:

1 Cut the power supplied to the unit.

2 Disconnect the DC power cord.

3 Contact your authorized Sony dealer or the store where you purchased the product.

Safety Precautions

Note

To ensure the safe operation of this unit, be sure to heed the following precautions.

Do not allow foreign matter to enter the unit

Allowing water or other foreign matter to enter the cabinet may lead to fire and/or injury. If water or other foreign objects happen to enter the cabinet, switch off the power supplied to the unit, disconnect the DC power cord or connections cables and contact your authorized Sony dealer.

Do not dismantle or modify the unit

Disassembly or modification of the unit may lead to fire and/or injury. Leave all adjustments, inspections and repairs of internal components to your authorized Sony dealer.

Be sure to install the unit properly

For queries on installation, contact the store where you purchased the product, or contact your authorized Sony dealer.
When attaching the unit to a wall or ceiling, make sure the point of attachment has sufficient strength to support the weight of the unit and mounting bracket. If the point of attachment lacks sufficient strength, the unit may fall, resulting in severe injury. Check the mounting brackets once a year to see that it remains tight.

Use recommended power supplies

Be sure to use the power supply (camera adaptor) specified in this manual. An unspecified power supply used with this unit may become a fire hazard.

Use recommended DC cables and connection cables

Use of DC cables and connection cables other than those specified in this manual may lead to fire.

Take care not to damage cables

Use of damaged DC cables can lead to fires. Take special note of the following.

- Take care not to wedge cables between equipment and racks, walls, etc., during installation.
- Do not modify the DC cables and take care not to damage them.
- Do not place heavy objects on the cables or pull them with excessive force.
- Do not place the cables near heating devices or other heat sources.
- When disconnecting a cable, always pull from the plug; not the cable itself.
- If the DC cables become damaged, discontinue use and contact your authorized Sony dealer for replacement. Continued use of damaged cables may lead to fire.

Do not install or operate in environments subject to high levels of smoke, steam, humidity or oil

Operation in any of the above environment may lead to fire. Use of this product in environments other than those specified in this manual may lead to fire.

Do not place the unit on an unstable base

The unit may fall, causing physical injury if used in any of the following places:
- On top of shaky, unstable table.
- On inclined surfaces
- In places subject to vibration or shock

Check that the place of attachment is strong enough to support the weight of this unit, and that the unit and attachment device are secure.

Be sure that the lens is screwed on properly

Always be sure that the lens is mounted securely. A loosely attached lens may come loose and fall, resulting in personal injury.
Check to see that the lens remains attached firmly once every year.

Disconnect the DC cable and connection cables before moving the unit

If the unit is moved with the DC power cable and connection cables still attached, the cables may be damaged, resulting in fire.

Operating Precautions

Operating or storage location

Avoid operating or storing the camera in the following locations:

- Extremely hot or cold places (Operation temperature: -5°C to +45°C [23°F to 113°F])
- In direct sunlight for long periods, or close to heating equipment (e.g., near heaters)
- Close to sources of strong magnetism
- Close to sources of powerful electromagnetism
- Close to sources of powerful electromagnetic radiation, such as radios or TV transmitters

Ventilation

To prevent internal heat buildup, do not block air circulation around the camera.

Connections

Do not connect the CCU connector and the ⎓ DC IN/ VBS ⮑ connector simultaneously. If they are connected simultaneously, the unit may be damaged.

Transportation

When transporting the camera, repack it as originally packed at the factory or in materials equal in quality.

Cleaning

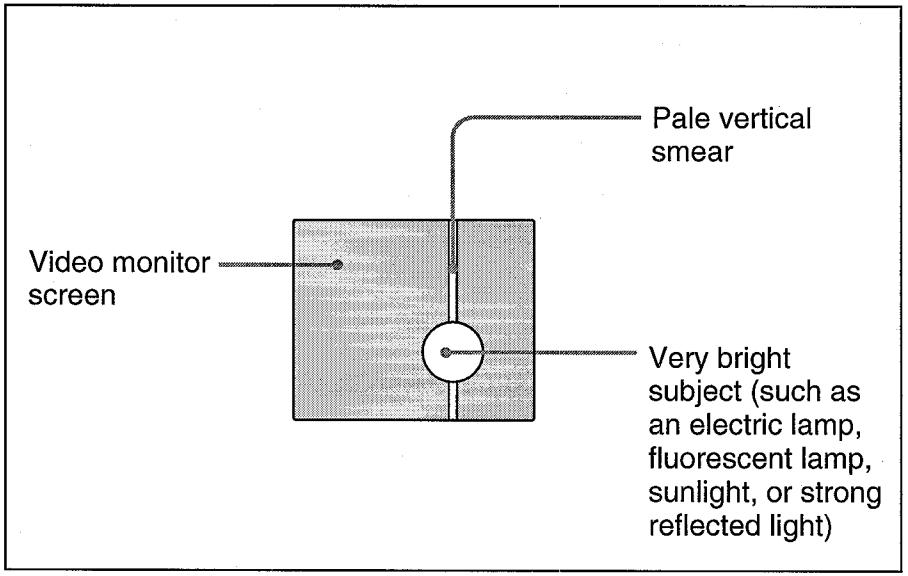
- Use a blower to remove dust from the lens or optical filter.
- Use a soft, dry cloth to clean the external surfaces of the camera. If it is very dirty, use a soft cloth dampened with a small quantity of neutral detergent, then wipe dry.
- Do not use volatile solvents such as alcohol, benzene or thinners as they may damage the surface finishes.

Typical CCD Phenomena

The following phenomena may appear on the monitor screen while you are using the DXC-9000 color video camera. These phenomena stem from the high sensitivity of the CCD image sensors, and do not indicate a fault within the camera.

Vertical smear

A "smear" may appear to extend vertically from very bright subjects, as shown below.



This phenomenon is common to CCD imaging elements using an interline transfer system, and is caused when an electric charge induced by infrared radiation deep within the photosensor is transferred to the resistors.

Aliasing

When shooting fine stripes, straight lines or similar patterns, the lines may become slightly jagged.

Blemishes

A CCD image sensor consists of an array of individual picture elements (pixels). A malfunctioning sensor element will show up as a single pixel blemish in the image. This is generally not a problem.

White speckles

When you shoot a poorly illuminated object at a high temperature, small white dots may appear all over the entire screen image.

Specifications

Image system/optical system

Pickup device 1/2-inch CCD, interline transfer type
Effective picture elements
659 (horizontal) × 494 (vertical)
Lens mount 1/2-inch bayonet type

Video system

Synchronization
Internal/external (VBS, BS, SYNC, HD/VD) synchronization, automatic switching
Signal format
NTSC standard format
Scanning
525 lines, 2:1 interlace
Scanning frequency
Horizontal: 15.734 kHz
Vertical: 59.94 Hz
VGA format
Scanning
640 × 480, 1/60, non-interlace
Scanning frequency
Horizontal: 31.469 kHz
Vertical: 59.94 Hz

Functions/performance

Horizontal resolution
Horizontal: 700 TV lines
Vertical: 480 TV lines
Sensitivity 2,000 lux (F5.6, 3200K)
Signal-to-noise ratio
58 dB
Gain control AGC and 0 to 18 dB in units of 1 dB
White balancing
Automatic
Manual: Red gain and green gain adjustable individually
ATW
Electronic shutter speed
Step mode: Adjustable in range of 1/10,000 to about 8.0 seconds
Variable mode: Adjustable range of 1 to 255 frame and 262/525H to 1/525H (Usable with CCD IRIS)
External trigger shutter
On/off switchable
Gamma compensation
On/off switchable
Color temperature
3200K/5600K
Freeze control
Switchable between INT. CTRL and EXT. CTRL

Inputs/outputs

Video output signals
- Composite: 1.0 Vp-p, 75 ohms
- RGB: 0.7 Vp-p, 75 ohms
- Y/C: 1 Vp-p, same level as VBS chroma, 75 ohms
- SYNC/HD/VD: 2 Vp-p, 75 ohms
- WEN: 5 Vp-p, high impedance

External sync input
- VBS/BS/SYNC/HD/VD (VBS 1.0 Vp-p or burst 0.3 Vp-p, SYNC 0.3 Vp-p, HD/VD:4.0 Vp-p), 75 ohms

External trigger input
- Trigger pulse, low level: 0 to 0.5 V, high level: 4.5 to 5.0 V, high impedance

Input/output connectors
- VIDEO OUT: BNC type, 75 ohms, unbalanced
- EXT CTRL: BNC type, 75 ohms, unbalanced
- DC IN/VBS: 12-pin
- REMOTE: mini-DIN 8-pin
- RGB/SYNC:D-sub 9-pin
- LENS: 6-pin connector for ⅔-inch lens
- CCU: 20-pin

Miscellaneous

Power supply 12 V DC

Power consumption
- 11.5 W

Operating temperature
- -5°C to +45°C (23 °F to +113°F)

Transport/storage temperature
- -20°C to +60°C (-4 °F to +140°F)

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

Transport/storage humidity
- 20 % to 90 % (no condensation allowed)

Dimensions (w/h/d)
- 79 × 72 × 145 mm (3⅛ × 2⅞ × 5¾ inches)

Mass
- About 790 g (1 lb 12 oz)

Supplied accessories
- Lens mount cap (1)
- Buttons label for the RM-C950 remote control unit (1)
- Operating Instructions (1)

Design and specifications are subject to change without notice.

Recommended Equipment

Lenses

VCL-707BXM (automatic zoom, 7 ×)
VCL-712BXEA (automatic zoom, 12 ×)
VCL-716BXEA (automatic zoom, 16 ×)

Camera adaptor

CMA-D2/D2MD Camera adaptor

Camera control unit

CCU-M5 camera control unit

Remote control unit

RM-C950 remote control unit (connection cable supplied)

Microscope adaptors and couplers

MVA-40 microscope adaptor (with automatic dimmer)
MVA-41A microscope adaptor
MVA-265 microscope adaptor (with automatic dimmer)
MVAC-33-O microscope adaptor (for Olympus micropscope)
MVAC-33-N microscope adaptor (for Nikon micropscope)
MVAC-33-SM microscope adaptor (for Nikon micropscope)

Lens mount adaptor

LO-32BMT lens mount adaptor

Power supply cable

CCDC series (length: 5 m, [16 ft], 10 m [32 ft], or 25 m [82 ft])
CCDCA series (length: 50 m [164 ft], or 100 m [328 ft])
CCMC series (length: 2 m [7 ft], 5 m [16 ft], 10 m [32 ft], or 25 m [82 ft])

CCU connection cable

CCTZ-3RGB (for RGB output, with CCZZ-1E extension connector, length 3 m [9 ft 10 in])
CCTZ-3YC (for Y/C output, with CCZZ-1E extension connector, length 3 m [9 ft 10 in])
CCTQ-3RGB (for RGB output, with CCQQ-1 extension connector, length 3 m [9 ft 10 in])

Extension cables for CCU connection

CCZA (max. length 300 m [984 ft])
CCQ-AM (max. length 100 m [328 ft])

Camera cables

CCXC-9DB (D-sub ⟷ BNC × 5)
CCXC-9DD (D-sub⟷ D-sub)
CCMC-9DS (D-sub ⟷ BNC × 4, S-video connector)
CCMC-9DSMN (D-sub ⟷ BNC × 3, phono jack, S-video connector)

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