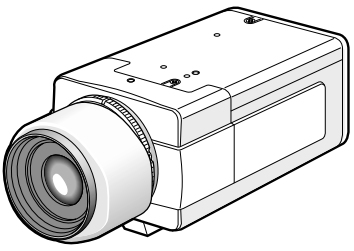


(Lens Option)

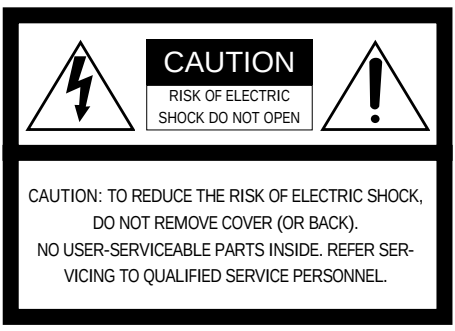
Panasonic

Color CCTV Cameras
Operating Instructions

Model No. WV-CP460
WV-CP464

Before attempting to connect or operate this product,
please read these instructions carefully and save this manual for future use.

N0100-1020 YWV8QA5377BN Printed in Japan
Ⓝ 19



SA 1965

The lightning flash with arrowhead symbol, within an equilateral triangle, is interned to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

SA 1966

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For U.S.A

NOTE: 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.

FCC Caution: To assure continued compliance, (example - use only shielded interface cables when connecting to computer or peripheral devices). Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

The serial number of this product may be found on the top of the unit.
You should note the serial number of this unit in the space provided and retain this instruction as a permanent record of your purchase to aid identification in the event of theft.

Model No._____

Serial No. _____

WARNING:
To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.

PREFACE

Panasonic's WV-CP460 (WV-CP464) series color digital camera introduces a new level of high picture quality and high resolution through the use of a 1/3-inch interline transfer CCD image sensor having 771 horizontal pixels (picture elements), and digital signal processing LSIs. This model offers cutting-edge technology for advanced video surveillance.

PRECAUTIONS

1. **Do not attempt to disassemble the camera.**
   To prevent electric shock, do not remove screws or covers.
   There are no user serviceable parts inside. Ask a qualified service person for servicing.

2. **Handle the camera with care.**
   Do not abuse the camera. Avoid striking, shaking, etc. The camera could be damaged by improper handling or storage.

3. **Do not expose the camera to rain or moisture, or try to operate it in wet areas.**
   Turn the power off immediately and ask a qualified service person for servicing. Moisture can damage the camera and also create the danger of electric shock.

4. **Do not use strong or abrasive detergents when cleaning the camera body.**
   Use a dry cloth to clean the camera when dirty.
   In case the dirt is hard to remove, use a mild detergent and wipe gently.

5. **Clean the CCD faceplate with care.**
   Do not clean the CCD with strong or abrasive detergents. Use lens tissue or a cotton tipped applicator and ethanol.

6. **Never face the camera towards the sun.**
   Do not aim the camera at bright objects. Whether the camera is in use or not, never aim it at the sun or other extremely bright objects. Otherwise, blooming or smear may be caused.

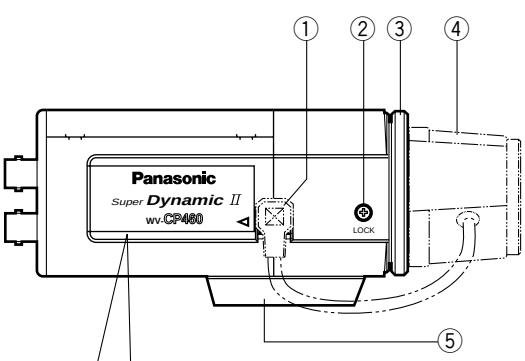
7. **Do not operate the camera beyond the specified temperature, humidity or power source ratings.**
   Use the camera under conditions where temperature is between –10°C - +50°C (14°F - 122°F), and humidity is below 90%. The input power source is 120 V AC 60 Hz for WV-CP460 and DC 12 V/AC 24 V for WV-CP464.

Caution:
To prevent fire or electric shock hazard, use a UL listed cable (VW-1, style 1007) for the DC 12 V or AC 24 V Input Terminal.

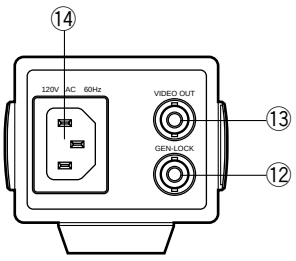
FEATURES

1. The following functions are built in.
   (1) Auto Light Control (ALC)/Electronic Light Control (ELC)
   (2) The SUPER-D Ⅱ function eliminates interference by strong background lighting which makes the camera picture dark, such as a spotlight.
   Dynamic range of 46 dB.
   (3) Various External Sync Functions, including Gen-Lock
   (4) Auto/Manual White Balance Function
   (5) Electronic Shutter Function
2. Signal-to-noise ratio of 50 dB
3. Minimum illumination of 0.8 lx (0.08 footcandle) with F 1.4 lenses.
4. Minimum illumination of 0.4 lx (0.04 footcandle) with Panasonic aspherical high speed (F0.75) lenses.
5. 480 lines of horizontal resolution

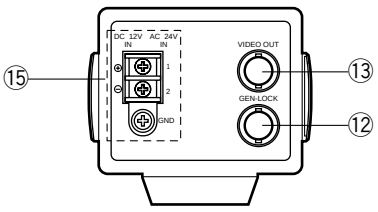
MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS



<WV-CP460>



<WV-CP464>



Slide the panel to the left until it locks.

① **Auto Iris Lens Connector**
This connector is used to connect the auto iris lens with a 4-pin male connector supplied as a standard accessory (Part No. YFE4191J100).

② **Focus Fixing Screw**

③ **Flange-back Adjusting Ring**
This ring is used to adjust the back focal length or picture focus. Rotate this ring clockwise for a C-mount lens or counterclockwise for a CS-mount lens.

④ **Lens (Option)**

⑤ **Camera Mounting Screw Hole**
This hole is used to mount the camera onto a mounting bracket.

CONNECTIONS

A. WV-CP460 (120 V AC 60 Hz)

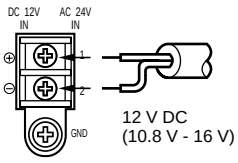
1. Plug the AC power cord (supplied as standard accessory) into the AC Inlet Socket.
2. Connect the AC power cord to a 120V AC 60 Hz outlet.

Notes:
- Connect the power cord firmly.
- The power cord should be long enough for panning and tilting.
  If the cable is too short, the power cord plug may be pulled off the camera when the camera pans or tilts.

B. WV-CP464 (12 V DC/24 V AC)

The WV-CP464 has an AC/DC compatible input terminal. The 12 V DC or 24 V AC power supply cord can be connected to this terminal. The camera detects the power source automatically.

1. 12 V DC Power Supply
Connect the power cord to the AC/DC compatible input terminal on the rear panel of the camera.



Resistance of copper wire [at 20°C (68°F)]

Copper wire size (AWG)	#24 (0.22mm²)	#22 (0.33mm²)	#20 (0.52mm²)	#18 (0.83mm²)
Resistance Ω/m	0.078	0.050	0.030	0.018
Resistance Ω/ft	0.026	0.017	0.010	0.006

- Calculation of maximum cable length between camera and power supply

  10.8 V DC ≤ V_A - (R x 0.42 x L) ≤ 16 V DC
  L : Cable length (m)
  R : Resistance of copper wire (Ω/m)
  V_A : DC output voltage of power supply unit

$$L\ standard = \frac{V_A - 12}{0.42 \times R}\ (m)$$

$$L\ minimum = \frac{V_A - 16}{0.42 \times R}\ (m)$$

$$L\ maximum = \frac{V_A - 10.5}{0.42 \times R}\ (m)$$

6. High quality picture:
   (a) 2H type vertical enhancer for greater picture sharpness
   (b) Chroma averaging circuit for better color signal-to-noise ratio
   (c) Minimum of aliasing on fine objects
   (d) Expanded dynamic range by use of knee circuit
   (e) Highlight aperture correction for greater picture detail of bright objects
7. Ability to shoot indoor scenes with fixed iris lens by use of Electronic Light Control (ELC) function.
8. Selectable electronic sensitivity enhancing modes including AUTO, MANUAL and OFF
9. Built in Digital Motion Detector

⑥ **Down Button ( )**
This button is used to move the cursor downward. It is also used to select items in the CAM SET UP menu.

⑦ **Left Button ( )**
This button is used to move the cursor to the left. It also selects the mode and can be used to adjust some levels.

⑧ **Up Button ( )**
This button is used to move the cursor upward. It is also used to select items in the CAM SET UP menu.

⑨ **Right Button ( )**
This button is used to move the cursor to the right. It also selects the mode and can be used to adjust some levels.

⑩ **Set Button ( )**
This button is used to activate an item selected in the CAM SET UP menu.

⑪ **Gen-lock Termination Switch (Hi-Z, G/L 75 Ω)**
Set this switch to Hi-Z when a gen-lock video input signal is looped through. In all other cases, set this switch to 75 Ω.

⑫ **Gen-lock Input Connector (GEN-LOCK)**
This connector is used to connect an external system for synchronization.

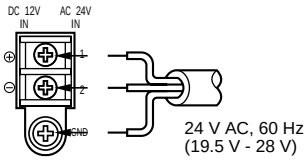
⑬ **Video Output Connector (VIDEO OUT)**
This connector is used to connect the VIDEO IN connector of the monitor.

⑭ **AC Inlet Socket**
This socket is used to connect the power cord (supplied as a standard accessory).

⑮ **AC/DC Compatible Input Terminal**
(DC 12 V IN/AC 24 V IN)
This terminal is for connecting the 12 V DC or 24 V AC power supply cord.

Cautions:
1. Connect to 12 V DC (10.8 V-16 V) or 24 V AC (19.5 V-28 V) class 2 power supply only. Make sure to connect the grounding lead to the GND terminal when the power is supplied from a 24 V AC power source.
2. To prevent fire or electric shock hazard, use a UL listed cable (VW-1, style 1007) for the Input Terminal.

2. 24 V AC Power Supply
Connect the power cable to the AC/DC compatible input terminal on the rear panel of the camera.



Recommended wire gauge sizes for 24 V AC line.

Copper wire size (AWG)		#24 (0.22mm²)	#22 (0.33mm²)	#20 (0.52mm²)	#18 (0.83mm²)
Length of Cable (Approx.)	(m)	95	150	255	425
	(ft)	314	495	842	1 403

Caution:
To prevent fire or electric shock hazard, use a UL listed cable (VW-1, style 1007).

Video Cable

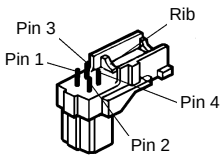
1. It is recommended to use a monitor whose resolution is at least equal to that of the camera.
2. The maximum extensible coaxial cable length between the camera and the monitor is shown below.

Type of coaxial cable		RG-59/U (3C-2V)	RG-6U (5C-2V)	RG-11/U (7C-2V)	RG-15/U (10C-2V)
Recommended maximum cable length	(m)	250	500	600	800
	(ft)	825	1 650	1 980	2 640

Installation of Auto Iris Lens Connector

Install the lens connector (YFE4191J100) when using a video drive ALC lens.
The installation should be made by qualified service personnel or system installers.

(1) Cut the iris control cable at the edge of the lens connector to remove the existing lens connector and then remove the outer cable cover as shown in the diagram below.
The pin assignment of the lens connector is as follows:
Pin 1: Power source; +9 V DC, 50 mA max.
Pin 2: Not used
Pin 3: Video signal; 1.3 V[p-p]/40 kΩ
Pin 4: Shield, ground

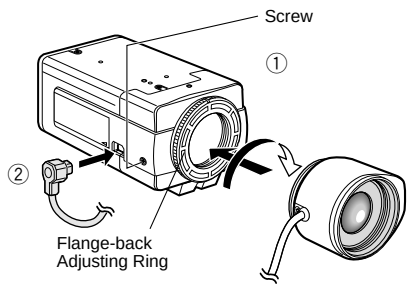


(2) Solder the lens cable to the pins of the supplied connector.

Mounting the Lens

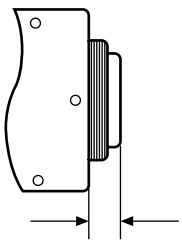
Caution:
Before you mount the lens, loosen the screw on the side of the camera, and rotate this ring clockwise until it stops. If the ring is not at the end, the inner glass or CCD image sensor may be damaged.

1. Mount the lens by turning it clockwise on the lens mount of the camera.
2. Connect the lens cable to the auto iris lens connector on the side of the camera.



Caution for Mounting the Lens

The lens mount should be a C-mount or CS-mount (1”-32UN) and the lens weight should be less than 450 g (0.99 lbs). If the lens is heavier, both the lens and camera should be secured by using the supporter.
The protrusion at the rear of the lens should be as shown below:



C-mount: Less than 13 mm (1/2”)
CS-mount: Less than 8 mm (5/16”)

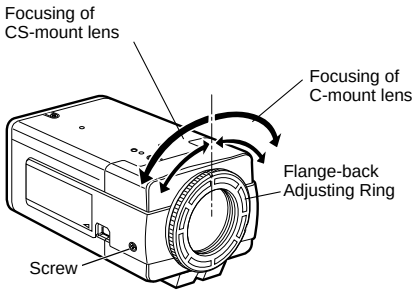
FOCUS OR FLANGE-BACK ADJUSTMENT

The following adjustment should be made by qualified service personnel or system installers.

1. Loosen the screw on the side of the camera.

2. Turn the flange-back adjusting ring to the desired position.
Caution: When the C-mount lens is mounted, do not rotate the ring counterclockwise by force after it stops. If the ring is rotated by force, the inner lens or CCD image sensor may be damaged.

3. Tighten the screw on the side of the camera.

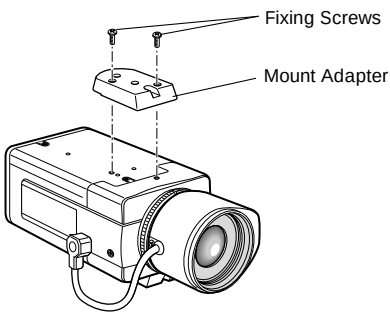


Caution: Tightening the screw by force will cause damage to the screw or deviation of focus.

INSTALLATION OF CAMERA

- **Mounting from the top**
Remove the mount adapter from the bottom of the camera by removing the two fixing screws. Attach the mount adapter to the top as shown in the diagram, then mount the camera on the mounting bracket.

Make sure that the two original fixing screws are used when mounting the mount adapter as longer length screws may damage inner components.



SETUP

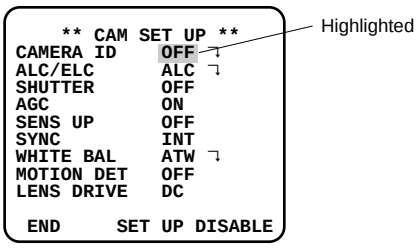
1. CAMERA SETUP MENU

This camera utilizes a user setup menu that is displayed on-screen.

• Opening the Setup Menu

Press and hold down ▭ for 2 seconds or more.

The CAM SET UP menu appears on the monitor as shown at right.
Check the current settings on the menu.

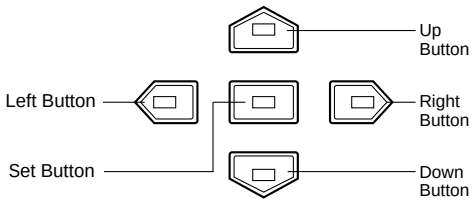


Refer to the sections below for a detailed description of menu items. If you decide not to make any changes after checking the current settings, move the cursor to END at the start of the bottom line, and press ▭ to close the CAM SET UP menu and return to normal camera picture mode.

Note: If no button is pressed for 6 minutes while the CAM SET UP menu or any other menu is opened, the menu is automatically closed and the mode returns to the normal camera picture.

2. SETUP OPERATION

This camera utilizes a user setup menu (CAM SET UP) that is displayed on the monitor.
To set items on the CAM SET UP menu, use the following buttons on the side panel.



Up Button **( )**: Moves the cursor upwards. Use this button to select an item or adjust the parameters.
Down Button **( )**: Moves the cursor downwards. Use this button to select an item or adjust the parameters.
Right Button **( )**: Moves the cursor to the right. Use this button to select or adjust the parameters of the selected item. The parameter changes each time this button is pressed.
Left Button **( )**: Moves the cursor to the left. Use this button to select or adjust the parameters of the selected item. The parameter changes each time this button is pressed.
Set Button **( )**: Executes selections and displays a submenu for an item with ⌝ mark.
END: Close Setup menu.
RET: Return to the previous menu or page.

To return to the CAM SET UP menu
Move the cursor to RET and press ▭. The CAM SET UP menu appears.

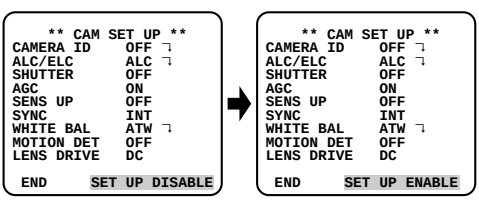
• All Reset Operation

All Reset allows you to reset all setup menu items to the factory default settings if you are unsure about the correct settings. Proceed as follows:
(1) Make sure that the CAM SET UP menu is not displayed (a camera picture is displayed).
(2) While pressing both ◁ and ▷, press ▭ for a few seconds. The message ALL RESET momentarily appears on the monitor.
This resets all adjustments and parameters to the factory default settings.

• Editing the CAM SET UP Menu

Important Notice:
When SET UP DISABLE appears in the bottom line of the CAM SET UP menu, you cannot change the currently active settings. This is to prevent accidental changing of the settings.

To edit the CAM SET UP menu (change settings), press △ and ▽ or ◁ and ▷ to move the cursor to SET UP DISABLE in the bottom line.
Press ▭. SET UP DISABLE changes to SET UP ENABLE. Move the cursor to END, then to the item(s) you want to change.



Important Notice:
When the cursor is moved to END and the CAM SET UP menu closed after changing the parameters, the new values are saved in the EEPROM (Electric Erasable and Programmable Read Only Memory). These values remain valid until new values are saved, even if the power of the camera is off.

(To be continued reverse page)

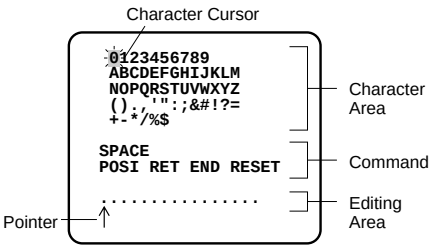
SETTING PROCEDURES

1. Camera Identification (CAMERA ID) Setting

You can use the camera identification (CAMERA ID) to assign a name to the camera. The camera ID consists of up to 16 alphanumeric characters. The camera ID display can be switched on or off on the monitor screen.

To edit the CAMERA ID

1. Move the cursor to the CAMERA ID parameter.
2. Press . The CAMERA ID menu appears. The cursor on the letter "0" is highlighted.
3. Move the cursor to the character you want to edit by pressing / / / .
4. After selecting the character, press . The selected character appears in the editing area. (The pointer in the editing area moves to the right automatically at this moment.)
5. Repeat the steps above until all characters are edited.



CAMERA ID menu

To enter a blank space in the CAMERA ID

Move the cursor to SPACE and press .

To replace a specific character in the CAMERA ID

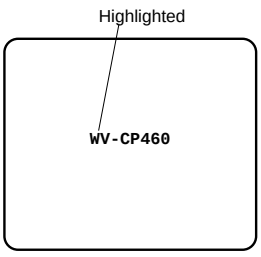
1. Move the cursor to the editing area by pressing .
2. Move the pointer to the character to be replaced by pressing or . Then move the cursor to the character area and select a new character.
3. Press to determine the CAMERA ID.

To erase all characters in the editing area

Move the cursor to RESET and press . All characters in the editing area disappear.

To determine the display position of the CAMERA ID

1. Move the cursor to POSI, and press . The display shown below appears and the CAMERA ID is highlighted.



2. Move the CAMERA ID to the desired position by pressing / / / .
3. Press to fix the position of the CAMERA ID. The mode returns to the previous CAMERA ID menu.

Notes:

- The CAMERA ID stops at the edges of the monitor screen.
- The CAMERA ID moves faster if any of / / / is kept pressed for a second or more.

2. Light Control Setting (ALC/ELC)

You can select the light control mode according to the lens type.
ALC: If you use the auto iris lens, select this parameter.
ELC: If you use a fixed or manual iris lens, select this parameter.

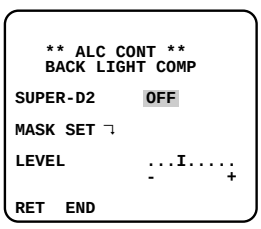
1. Move the cursor to the ALC/ELC parameter.
2. Select ALC or ELC.

2-1. ALC Mode with SUPER-D2 ON

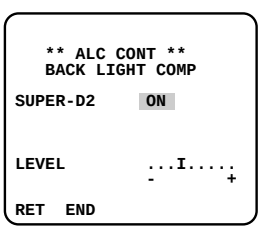
Super Dynamic2 Function (SUPER-D2)

The important object in a scene is usually placed in the center of the monitor's screen. In SUPER-D2 mode, more photometric weight is given to the center of the screen (where the important object is located) than to the edge of the picture (where a bright backlight would most likely be located). You can use the SUPER-D2 function if you select ALC. It eliminates interference by strong background lighting which makes the camera picture dark, such as a spotlight.

1. After selecting ALC, press to open the ALC CONT menu.
2. Move the cursor to the SUPER-D2 parameter and select ON



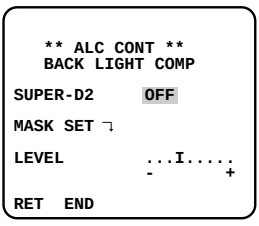
3. If you want to adjust the video output level, move the cursor to the "I" position. Adjust to the desired level by pressing or .



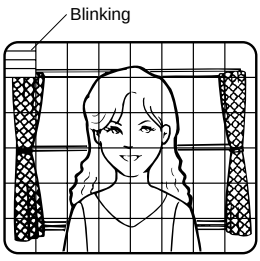
2-2. ALC Mode with SUPER-D2 OFF and ELC Mode

Note: If ELC is selected, set MASK SET according to this procedure.

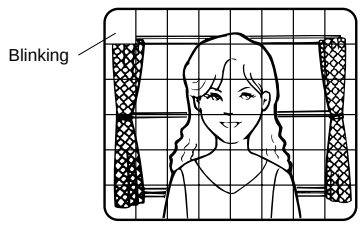
1. Move the cursor to the SUPER-D2 parameter and select OFF. (When you select ELC, SUPER-D2 is not available.) The item MASK SET appears on the menu.



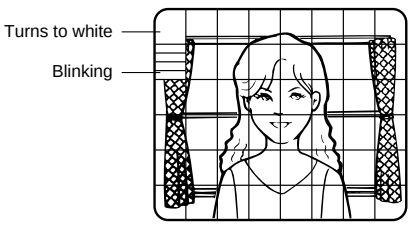
2. Move the cursor to MASK SET and press ▭. 48 mask areas appear on the monitor screen. The cursor is blinking in the upper left corner of the screen.



3. Move the cursor to the area where backlight is bright and press ▭ to mask that area. The mask turns to white. (When the cursor is moved on an area that has already been masked, the mask and cursor start blinking.)



4. Repeat step 3 to mask the desired area. To cancel masking, move the cursor to that area and press ▭.
5. After masking is completed, press ▭ for 2 seconds or more. The ALC CONT menu appears.
6. If you want to change the video output level (picture contrast), move the "I" cursor for LEVEL and adjust the level.



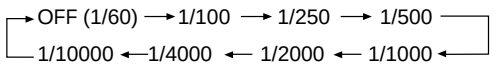
Note: If ON is selected for the SUPER-D2 parameter, a shadow (black line) may appear at the boundary between the bright and the dim scene. This is a natural phenomenon and does not indicate trouble.

3. Shutter Speed Setting (SHUTTER)

Note: When ELC is selected for ALC/ELC on the CAM SET UP menu or ON is selected for SUPER-D2 on the ALC CONT menu, this item is not available.
To select electronic shutter speed, select OFF for SUPER-D2 in the ALC CONT menu.

Move the cursor to the SHUTTER parameter and select the electronic shutter speed.

The preset values for SHUTTER (electronic shutter speed) change by pressing ◁ or ▷ as shown at below:



4. Gain Control Setting (AGC ON/OFF)

You can set the gain (brightness level portion of an image) to automatic level adjustment (ON) or fixed level (OFF).
Move the cursor to the AGC parameter and select automatic level adjustment (ON) or fixed level (OFF).

Note: If ON is selected for the AGC parameter, the noise reduction function is automatically activated under low light conditions to reduce noise. In pictures containing a moving object, this may result in an afterimage.

5. Electronic Sensitivity Enhancement (SENS UP)

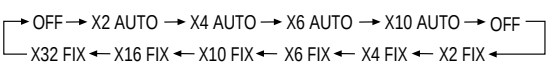
There are two modes for SENS UP.

AUTO: If you select X10 AUTO, for example, the sensitivity is raised automatically to X10 max. When AUTO is selected, AGC is automatically set to ON.

FIX: If you select X32 FIX, for example, the sensitivity is raised to just X32.

Move the cursor to the SENS UP parameter and select the parameter for electronic sensitivity enhancement.

The preset values for SENS UP (electronic sensitivity enhancement) change by pressing ◁ or ▷ as shown right:



Notes:

- When ON is selected for SUPER-D2 in the ALC CONT menu, FIX is not available for this item.
- When you select AUTO for SENS UP and ON for SUPER-D2, the SENS UP function has priority so that the SUPER-D2 function is not activated automatically.
- While the SENS UP function is selected, noise, spots or a whitish phenomenon may appear in the picture when the sensitivity of the camera is increased. This is a normal phenomenon.

6. Synchronization Setting (SYNC)

You can select internal sync mode (INT) or line-lock mode (LL). Additionally, this model accepts the VBS signal (color composite video or blackburst signal) and VS signal (B/W composite video or composite sync signal). The VD2 signal (multiplexed vertical drive signal) with the composite video output signal from external equipment such as a Matrix Switcher is also acceptable.
Whenever the VD2 signal is supplied to this camera, the camera automatically switches to the VD2 sync mode.

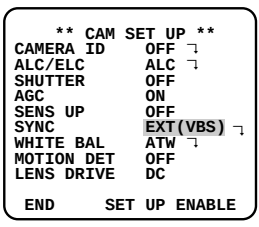
1. Move the cursor to the SYNC parameter and select line-lock (LL) or internal (INT).
2. Press ▭.
   If LL is selected, the SYNC menu appears. (If INT is selected, the synchronization mode is automatically set to internal sync pulse, and the menu is not displayed.)

Important Notice:

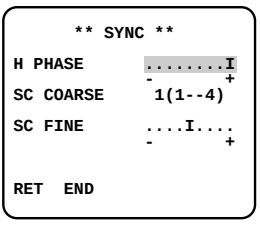
1. The priority for the sync modes is as follows:
   1. Multiplexed Vertical Drive (VD2) (Highest priority)
   2. Line-lock (LL)
   3. Color Composite Video or Blackburst Signal (VBS)
   4. B/W Composite Video or Composite Sync Signal (VS)
   5. Internal Sync (INT) (Lowest priority)
2. When the internal sync mode is to be used, select INT. No gen-lock input signal should be supplied to the Gen-lock Input Connector on the rear panel.
3. Whenever the multiplexed vertical drive pulse (VD2) is supplied to the camera from an external equipment such as a Matrix Switcher, the camera sync mode is automatically switched to the VD2 mode.
4. When the VBS or VS gen-lock mode is to be used select INT from this menu and supply the gen-lock input signal to the Gen-lock Input Connector on the rear panel.
5. The VBS gen-lock mode has a submenu for horizontal and subcarrier phase adjustments. When the cable length of the video output or the gen-lock input is changed, the horizontal and subcarrier phase must be re-adjusted.
6. The VS gen-lock mode has a submenu for horizontal phase adjustments. When the cable length of the video output or the gen-lock input is changed, the horizontal phase must be re-adjusted.
7. The line-lock mode has a submenu for line-lock vertical phase adjustment. If the camera installation is relocated, check the vertical phase adjustment again since the AC line phase may be different.

6-1. VBS Gen-lock Mode (EXT (VBS))

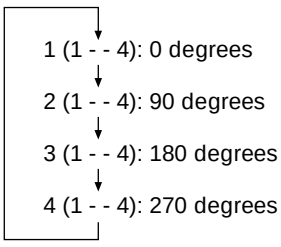
1. Move the cursor to the SYNC parameter and select INT.
2. Connect the coaxial cable for the blackburst or composite color video signal to the gen-lock input connector.
3. Confirm that the INT parameter changed to EXT (VBS) on the menu.
   Caution: The gen-lock input signal should meet EIA RS-170A specifications and should not contain jitter, such as a VCR playback signal, as it could disturb synchronization.



4. After confirming that the cursor is on EXT (VBS), press ▭. The phase adjustment menu appears on the monitor.
5. Supply the video output signal of the camera to be adjusted and the reference gen-lock input signal to a dual-trace oscilloscope.
6. Set the oscilloscope to the horizontal rate and expand the horizontal sync portion on the oscilloscope.



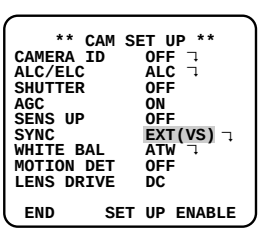
7. Move the cursor to H PHASE.
8. Adjust the horizontal phase by pressing ◁ or ▷. The adjustable range is 0-2.0 µs.
9. Move the cursor to SC COARSE.
10. Press ◁ or ▷ to match the chroma phase of the camera's video signal, when observed at the output of the special effects generator (SEG) or Switcher, as closely as possible to the color of the original scene. (SC COARSE adjustment can be incremented in steps of 90 degrees (4 steps) by pressing ◁ or ▷.)
    Note: After the fourth step, the adjustment returns to the first step.



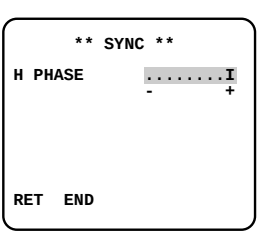
11. Move the cursor to SC FINE.
12. Press ◁ or ▷ to match the color (hue) of the camera's video signal, when observed at the output of the special effects generator (SEG) or Switcher, as closely as possible to the color of the original scene.
    The SC FINE adjustment has a range of 90 degrees of color shift.
    Notes:
    - When the "I" cursor reaches the "+" end, it jumps back to "–" . At the same time, SC COARSE is incremented by one step to enable a continuous adjustment. The reverse takes place when the "I" cursor reaches the "–" end.
    - When ◁ or ▷ is kept pressed for a second or more, the "I" cursor moves faster.
    - For more accurate adjustment, supply both the original camera video output signal and the effect output video signal (program output video signal) of the special effects generator (SEG) to a vectorscope and compare the chroma phase of both signals.
    - To reset SC COARSE and SC FINE to the values preset at the factory, press ◁ or ▷ simultaneously. SC COARSE is reset to the factory setting.

6-2. VS Gen-lock Mode (EXT (VS))

1. Move the cursor to the SYNC parameter and select INT.
2. Connect the coaxial cable for the composite sync or composite B/W video signal to the gen-lock input connector.
3. Confirm that the parameter INT changed to EXT (VS) on the menu.
   Caution: The gen-lock input signal should meet EIA RS-170 specifications and should not contain jitter, such as a VCR playback signal, as it could disturb synchronization.



4. After confirming that the cursor is on EXT (VS), press ▭. The phase adjustment menu appears on the monitor.
5. Supply the video output signal of the camera to be adjusted and the reference gen-lock input signal to a dual-trace oscilloscope.
6. Set the oscilloscope to the horizontal rate and expand the horizontal sync portion on the oscilloscope.
7. Move the cursor to H PHASE.



8. Adjust the horizontal phase by pressing ◁ or ▷. The adjustable range is 0-2.0 µs.

6-3. Line-lock Sync Mode (LL)

Note: The line-lock (LL) sync mode is not available when the camera operates on DC power.

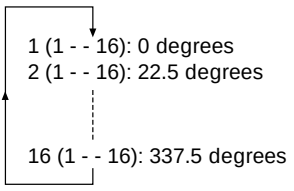
1. Move the cursor to the SYNC parameter and select LL.
   Note: The settings in this menu can be made only when the multiplexed vertical drive signal (VD2) is not supplied to the camera.
2. After confirming that the cursor is on LL, press ▭. The vertical phase adjustment menu appears on the monitor.
3. Supply the video output signal of the camera to be adjusted and the reference camera video output signal to a dual-trace oscilloscope.
4. Set the oscilloscope to the vertical rate and expand the vertical sync portion on the oscilloscope.

```
      ** SYNC **
V PHASE
COARSE          1(1--16)
FINE            I........
                -       +

RET  END
```

5. Move the cursor to COARSE.
6. Press ◁ or ▷ to match the vertical phase for both video output signals as closely as possible. (COARSE adjustment can be incremented in 16 steps by 22.5 degrees by pressing ◁ or ▷.)
   Note: After the sixteenth step, the adjustment returns to the first step.

7. Move the cursor to FINE.
8. Press ◁ or ▷ to match the vertical phase for both video output signals as closely as possible.
   (FINE adjustment can be made up to 22.5 degrees by pressing ◁ or ▷.)



Notes:

- When the "I" cursor reaches the "+" end, it jumps back to "–". At the same time, COARSE is incremented by one step to enable a continuous adjustment. The reverse takes place when the "I" cursor reaches the "–" end.
- When ◁ or ▷ is kept pressed for a second or more, the "I" cursor moves faster.
- To reset COARSE and FINE to the values preset at the factory, press ◁ or ▷ simultaneously. COARSE and FINE adjustments are preset at the factory to zero-crossing of the AC line phase.
- If the AC line contains noise (spike noise, etc.), the stability of the vertical phase of the camera video output signal may be disturbed.

7. White Balance Setting (WHITE BAL)

7-1. Auto-Tracing White Balance Mode (ATW)

You can select one of two modes for white balance adjustment as follows:

- **ATW (Auto Tracing White Balance)**
  In this mode, the color temperature is monitored continuously and thereby white balance is set automatically. The color temperature range for the proper white balance is approximately 2 600 - 6 000K. Proper white balance may not be obtained under the following conditions:
  1. The color temperature is out of the 2 600 - 6 000K range.
  2. When the scene contains mostly high color temperature objects, such as a blue sky or sunset.
  3. When the scene is dim.
     In these cases, select the AWC mode.

  Move the cursor to the WHITE BAL parameter and select ATW. The white balance of the camera is automatically set.

- **Automatic White Balance Control Mode (AWC)**
  In this mode, accurate white balance is obtained within a color temperature range of approximately 2 300-10 000K.

1. Move the cursor to the WHITE BAL parameter and select AWC → PUSH SW.
2. Press ▭ to start the white balance setup. The PUSH SW is highlighted to indicate that the white balance is being set.
3. When the white balance setting is completed, the PUSH SW returns to normal display.
   Note: In case that the white balance is not set, the PUSH SW Is being highlighted.

```
    ** CAM SET UP **
CAMERA ID     OFF ┐
ALC/ELC       ALC ┐
SHUTTER       OFF
AGC           ON
SENS UP       OFF
SYNC          INT
WHITE BAL     AWC→PUSH SW
MOTION DET    OFF
LENS DRIVE    DC

 END      SET UP ENABLE
```

4. When you want to adjust the white balance manually, press ▷ to select AWC and press ▭. The AWC menu appears on the monitor. (When ATW is selected, pressing ▭ displays the ATW menu.)

```
      **  AWC  **

R             ....I....
              -       +
B             ....I....
              -       +

MASK SET ┐


RET  END
```

Fine Adjustment for AWC (ATW) Manually

You can add the detailed setting for white balance setting manually.

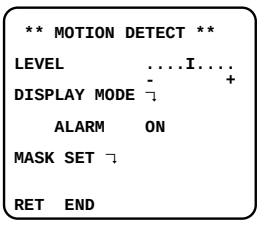
1. To set MASK SET, proceed as described in steps 2 to 4 of "ALC mode with SUPER-D2 OFF and ELC mode".
2. Move the cursor to R.
3. Press ◁ or ▷ to obtain the optimum amount of red gain.
4. Move the cursor to B.
5. Press ◁ or ▷ to obtain the optimum amount of blue gain.

Note: When you need to set MASK SET, re-adjust to obtain the optimum amount of red and blue gain.

8. Motion Detector Setting (MOTION DET)

The motion detector detects the moving objects in the scene by monitoring changes in brightness level. You can select the level of sensitivity for motion detection.
When this camera is connected to a compatible intelligent CCTV system, the camera transmits an alarm signal by multiplexing it with the video signal.

1. Move the cursor to the MOTION DET parameter and select ON.
2. Press SET. The MOTION DETECT menu appears on the monitor screen.



3. Move the cursor to MASK SET and press SET. MASK SET lets you set 48 mask areas. To set MASK SET, proceed as described in steps 2 to 4 of "ALC mode with SUPER-D2 OFF and ELC mode".
4. Move the cursor to the ALARM parameter and select ON or OFF to set the alarm for DISPLAY MODE.
   Note: When the system controller WV-RM70, WV-CU550, WV-CU550A, or WV-CU151 is used with this model, select OFF for ALARM.
5. Move the cursor to DISPLAY MODE and press SET to see the current setting. The masks that detect the brightness changes start blinking.
6. To raise detection sensitivity, press SET to return to the MOTION DETECT menu.
7. To obtain the optimum detection level, move the "I" cursor to adjust the level.
8. Repeat the procedures above to obtain a satisfactory setting.

Notes:

- Masking or adjusting the detection level is needed to prevent malfunction under the following conditions:
- When shooting an object under flickering fluorescent light or shooting in ELC.
- When leaves or curtains etc. are swayed by the wind.
- When the object is lighted by lighting equipment that constantly turns on and off.
- It takes about 0.2 seconds for the alarm signal to reach the alarm terminal of the VCR after the camera detects the object.
  Because the alarm signal is multiplexed on the video signal, it may be mistakenly interpreted by other video equipment as a time code signal.
  Therefore, when the camera is not used in a Panasonic Intelligent CCTV System select OFF to prevent the above from occurring.

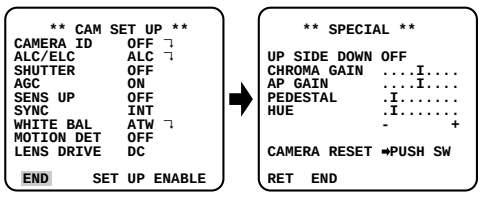
9. Lens Drive Signal Selection (LENS DRIVE)

This item is used to select the type of auto iris lens drive signal to be supplied to the lens from the auto iris lens connector.

1. Move the cursor to the LENS DRIVE parameter.
2. Select DC if you are using the auto iris lens that requires a DC drive signal.
   Select VIDEO if you are using the auto iris lens that requires a video drive signal.

10. Special Menu

This menu lets you adjust and setup the video signal of the camera to meet your requirements.
Move the cursor to END on the bottom line of the CAM SET UP menu and press ◁ and ▷ simultaneously (holding down ◁ and press ▷) for 2 seconds or more. The SPECIAL menu appears on the monitor as shown at right.



10-1. Camera Picture Upside Down Positioning (UP SIDE DOWN)

1. Move the cursor to the UP SIDE DOWN parameter.
2. Select ON when you want to turn the picture upside down.

10-2. Chroma Level Setting (CHROMA GAIN)

1. Move the cursor to the CHROMA GAIN parameter.
2. While observing the vectorscope or color video monitor, move the "I" cursor to adjust the chroma level.

10-3. Aperture Gain Setting (AP GAIN)

1. Move the cursor to the AP GAIN parameter.
2. While observing the wave form monitor or color video monitor, move the "I" cursor to adjust the aperture gain level.

10-4. Pedestal Level Setting (PEDESTAL)

1. Move the cursor to the PEDESTAL parameter.
2. While observing the wave form monitor or color video monitor, move the "I" cursor to adjust the pedestal level (black level).

10-5. Chroma Phase (Hue) Setting (HUE)

1. Move the cursor to the HUE parameter.
2. While observing the vectorscope or color video monitor, move the "I" cursor to adjust the hue (chroma phase) level.

To reset to the factory settings (CAMERA RESET)

1. Move the cursor to the CAMERA RESET parameter. PUSH SW is highlighted.
2. While holding down ◁ and ▷, press SET for 2 seconds or more. The camera is reset to the factory settings.

SPECIFICATIONS

Pick-up Device:	771 (H) x 492 (V) pixels, Interline Transfer CCD
Scanning Area:	4.8 (H) x 3.6 (V) mm (Equivalent to scanning area of 1/3” pick-up tube)
Scanning:	525 lines/60 fields/30 frames
Horizontal:	15.734 kHz
Vertical:	59.94 Hz
Synchronization:	Internal, Line-locked, External (VS/VBS) or Multiplexed Vertical Drive (VD2) selectable
Video Output:	1.0 V[p-p] NTSC composite 75 Ω/BNC connector
Horizontal Resolution:	480 lines
Signal-to-Noise Ratio:	50 dB (AGC OFF, weight ON)
Dynamic Range:	46 dB
Minimum Illumination:	0.4 lx (0.04 footcandle) at F0.75 [Equivalent to 0.8 lx (0.08 footcandle) at F1.4]
Gain Control:	AGC ON or OFF (SET UP MENU) selectable
White Balance:	ATW or AWC (SET UP MENU) selectable
Aperture:	Set Variable (SET UP MENU)
Electronic Light Control:	Equivalent to continuous variable shutter speeds between 1/60 s and 1/10 000 s
Super Dynamic Ⅱ:	ON or OFF (SET UP MENU) selectable
Electronic Shutter Speed:	1/60 (OFF), 1/100, 1/250, 1/500, 1/1 000,1/2 000, 1/4 000, 1/10 000 s selectable
Lens Mount:	C-mount or CS-mount selectable
ALC Lens:	DC or Video selectable
Ambient Operating Temperature:	–10°C - +50°C (14°F - 122°F)
Ambient Operating Humidity:	Less than 90 %
Power Source and Power Consumption:	WV-CP460: 120 V AC 60 Hz, 4.8 W WV-CP464: 24 V AC 60 Hz, 4.9 W 12 V DC, 490 mA
Dimensions (without lens):	74 (W) x 55 (H) x 123 (D) mm [2-15/16” (W) x 2-3/16” (H) x 4-13/16” (D)]
Weights (without lens):	WV-CP460: 0.41 kg (0.9 lbs.) (without power cord) WV-CP464: 0.4 kg (0.9 lbs.)

Weights and dimensions indicated are approximate.
Specifications are subject to change without notice.

STANDARD ACCESSORIES

Body Cap.....1 pc.
ALC Lens Connector (YFE4191J100).....1 pc.
AC Power Cord (only WV-CP460) .....1 pc.

OPTIONAL ACCESSORIES

Lenses : WV-LA2R8C3B, WV-LA4R5C3B, WV-LA9C3B, WV-LA210C3, WV-LA408C3 WV-LA908C3, WV-LZ61/10, WV-LZ61/15, WV-LZ62/2, WV-LZ62/8, WV-LF4R5C3A, WV-LF9C3A

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