

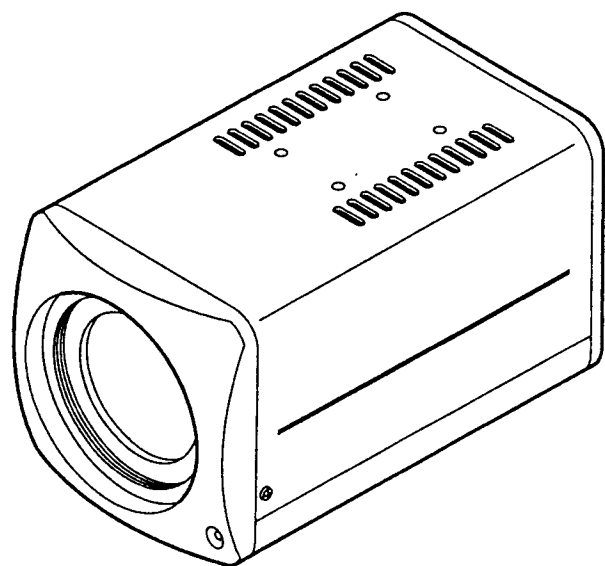
HITACHI

OPERATION MANUAL

TK

No. 8604E

VK-C77E



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SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

COLOUR VIDEO CAMERA

SPECIFICATIONS

Signal	: PAL standard 625 TV lines, 50 fields
Image sensor	: 1/4" CCD image sensor Number of effective pixels: 752(H) X 582(V)
Total number of pixels	: 795(H) X 596(V)
Scanning system	: 2:1 interlaced
Scanning frequency	: Horizontal : 15.625 kHz Vertical : 50 Hz
Sync format	: Internal/external (auto switching)
External sync input	: VBS signal (1 Vp-p, 75Ω) C.SYNC (0.3 Vp-p, 75Ω) Connector : BNC type
Video signal output	: VBS : 1.0 Vp-p Video : approx. 0.7 Vp-p positive Sync : approx. 0.3 Vp-p negative Burst : approx. 0.3 Vp-p 8 cycles or more Impedance : 75 Ω unbalanced Connector : BNC type
S/N ratio	: 46 dB or more
Horizontal resolution	: 450 TV lines or more
Minimum required illumination	: 6 lux (without magnification)
White balance adjustment	: Automatic or manual (switchable) Adjustment range : 2,500 ~ 8,000K
S-VIDEO outputs	: Y: Luma : approx. 0.7 Vp-p Sync : approx. 0.3 Vp-p C: Burst : approx. 0.3 Vp-p 8 cycles or more Impedance : 75Ω unbalanced
Permissible operating temperature/humidity:	Range in which operation is possible: -5~+40°C, 10~85% RH Range in which performance is assured: +5~30°C, 45~75% RH
Power input	: DC 12V (usable voltage range: 11~14V)
Power consumption	: 280 mA
Dimensions	: 64(W) X 64(H) X 112(D) mm (excluding lens protrusions)
Weight	: 390g

* The specifications are subject to change for improvement without notice.

CAUTIONS WHEN HANDLING THE CAMERA

Take great care when handling the camera to protect the image sensor which is easily damaged.

Cautions when installing

- **Avoid places where there is danger of a fire or sparks**
Be sure not to use the camera in a place filled with gas or in a place where there is a danger of fire or sparks. This could result in a malfunction or accident.
- **Be careful of temperatures and humidity**
Do not use the camera in hot or cold places where the temperature is over 40°C or under -5°C or in a place where the humidity is too high. It could result in degradation of picture quality, a malfunction or accident.
- **Avoid water, dust and soot**
If water, dust or soot enters the camera, it could cause a malfunction or accident. Avoid installing the camera where it could be exposed to rain or snow.
 - * When using the camera in a place where there is a high level of dust, you need a suitable camera case. Consult the dealer from whom you purchased the camera.
- **Avoid strong radio waves or magnetic fields**
Do not install the camera where strong radio waves or magnetic fields may be generated, near a transmitter or an electric appliance with a motor as it could cause the picture to be distorted.

Cautions on use

- **Do not insert an inflammable or metal object into the camera.**
This could result in a malfunction or accident.
 - **Do not point the camera at the sun or a bright light.**
The image sensor could be burned which could make recording impossible.
 - **Handle the camera with care.**
Do not drop the camera or apply any impact or vibrations to it.
 - **When dust adheres to the lens, turn the power off and use an air brush to lightly wipe it off.**
 - **To reduce the risk of electric shocks, do not open the cover.**
 - **Copyright law**
Recordings you made cannot be used without permission or the owner of the copyright in cases other than for your private entertainment. In certain circumstances, copyright law may apply to private in-home video-taping of copyrighted materials.
 - **Do not use benzine or thinner to wipe the case.**
- 3 The coating of the case may come off or deteriorate.

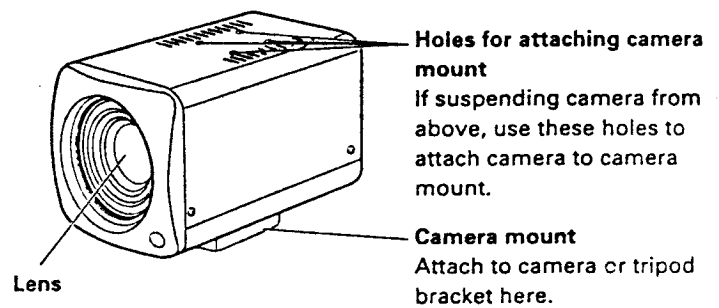
PROCEDURE FROM CONNECTION TO ADJUSTMENT

Connect and adjust the camera by the following procedure.

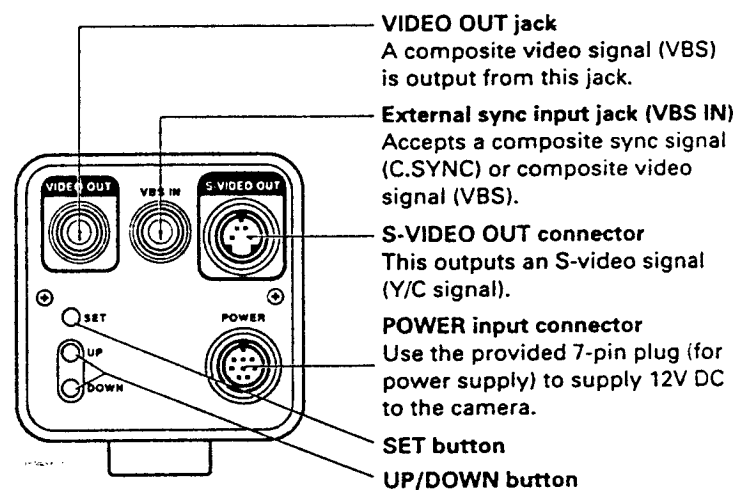
	Page
Connect a power source.	6
↓	
Connect to a monitor TV.	8
↓	
Perform the following adjustments as required.	
• Adjust the focus	13
• Adjust the magnification of the zoom.	16
• Control the shutter speed.	19
• Adjust the white balance.	22
• Adjust the tone.	25
• Adjust the auto light control (ALC) level.	27
• Correct for backlighting.	29
• Invert the video between negative and positive.	32
• Suppress variations in contrast.	33
• Add a title to the picture.	35

CONTROLS AND FUNCTIONS

Front and Side Views



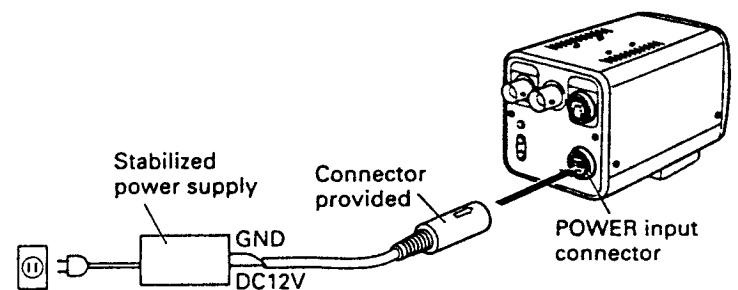
Rear View



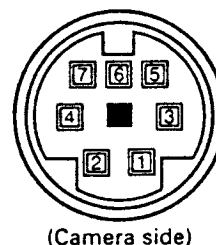
4

CONNECT A POWER SOURCE

Use the 7-pin plug (for power supply) provided to connect the power supply to the POWER input connector as shown in the figure below.



Pin allocations of POWER input connector

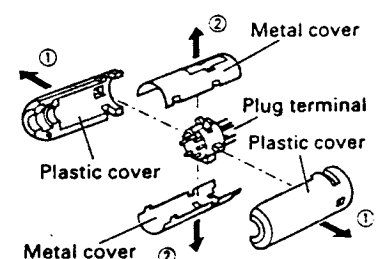


Pin No.	Description
①	RS-485 ⊖
②	RS-485 ⊕
③	RS-232C RD
④	DC 12V IN
⑤	GND
⑥	GND
⑦	RS-232C SD

Disassembling the 7-pin plug

Dismantle the 7-pin plug by the following procedure.

- ① Remove the plastic covers of the plug in the directions of the arrows.
- ② Remove the metal covers of the plug in the directions of the arrows.

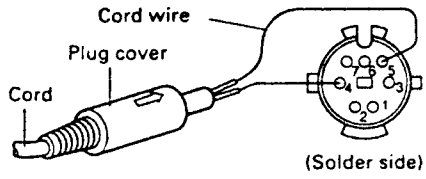


CONNECT A POWER SOURCE (Cont'd)

Connecting the 7-pin plug

Connect the plug to the plug terminal by the following procedure.

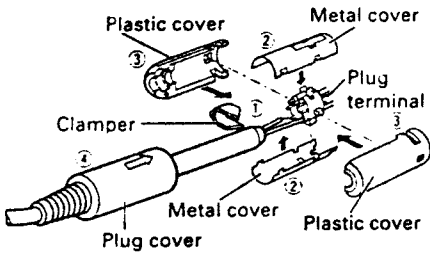
- ① Put the plug cover over the cord.
- ② Solder the cord wires to the plug terminal as shown in the figure on the right.



Reassembling the 7-pin plug

Reassemble the 7-pin plug by the following procedure.

- ① Attach the clammer to the cord and crimp it.
- ② Attach the metal covers over the plug terminal.
- ③ Attach the plastic covers over the metal covers.
- ④ Cover with the plug cover.



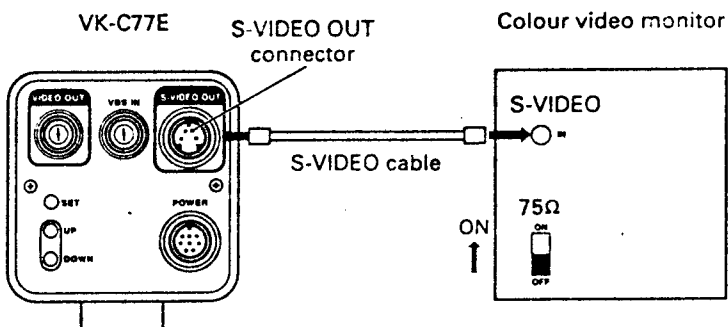
7

CONNECTING TO COLOUR VIDEO MONITOR(S) (Cont'd)

Connecting to a colour video monitor with an S-VIDEO input

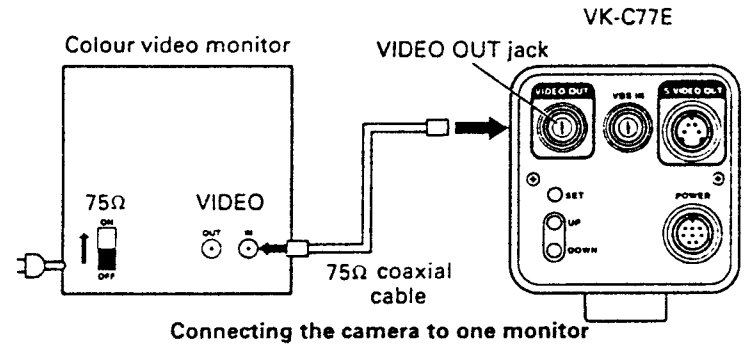
Use an S-VIDEO cable to connect the camera's S-VIDEO OUT connector and the monitor's S-VIDEO IN connector.

Set the monitor's S-VIDEO 75Ω ON-OFF switch to "ON".

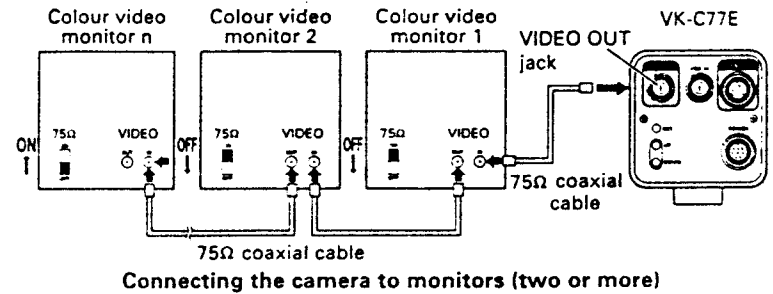


CONNECTING TO COLOUR VIDEO MONITOR(S)

If you use one colour video monitor, connect the camera's VIDEO OUT jack to the monitor's VIDEO IN jack using a coaxial cable. Set the 75Ω ON-OFF switch on the monitor to ON.



If you use two or more colour video monitors, connect the camera's VIDEO OUT jack of the first monitor's VIDEO IN jack using a coaxial cable, connect the first monitor's VIDEO OUT jack to the 2nd monitor's VIDEO IN jack, then connect in this way to the last monitor. Set the 75Ω ON-OFF switches on each monitor to OFF apart from the last monitor which must be set to ON. Use coaxial cables for all connections.



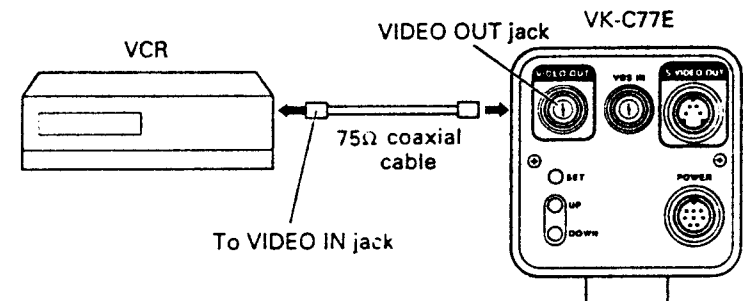
8

CONNECTING TO A VCR

Use a coaxial cable to connect the camera's VIDEO OUT jack to the VCR's VIDEO IN jack.

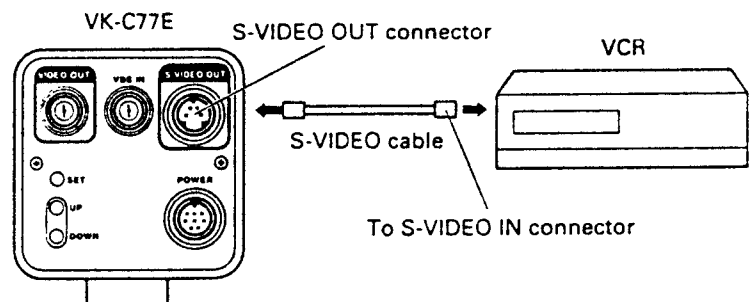
Since the camera's internal sync signal is 2:1 interlaced, a good slow-motion picture or still picture can be played by the VCR.

Also read the VCR's instruction manual for connecting to a VCR.



Connecting to a VCR with an S-VIDEO input connector

Use an S-VIDEO cable to connect the camera's S-VIDEO OUT connector and the VCR's S-VIDEO IN connector.



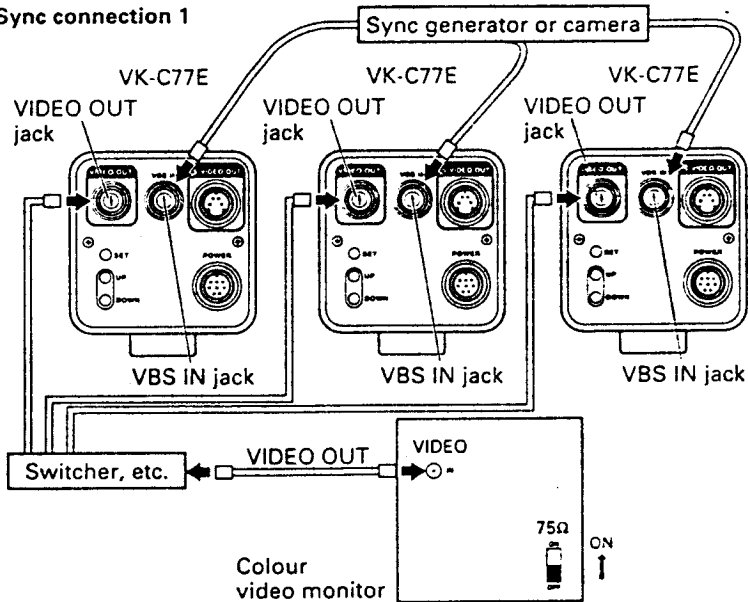
SYNC CONNECTION

When you use a switcher, etc. to switch between several cameras for monitoring, the cameras can use the same sync signal so the picture is not distorted when the camera is switched.

Sync signals that can be input

Type of sync signal	Level	Genlock function
Composite sync signal	0.3 – 1 Vp-p, 75Ω	Possible
Composite video signal	1 Vp-p, 75Ω	Possible
Black burst signal	0.429 Vp-p, 75Ω	Not possible

Sync connection 1

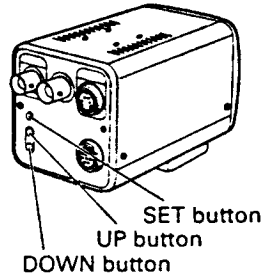
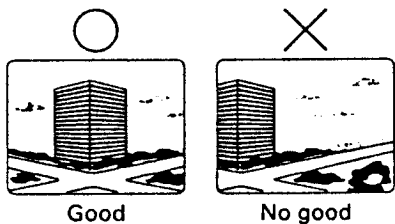


- Use 75Ω coaxial cables to connect the sync signal outputs of the sync generator or switcher to the VBS IN jacks of each camera.
- Read the instruction manual of the switcher or sync generator to use it correctly.

11

ADJUSTING THE FOCUS

This camera can focus on a subject at the center of the screen automatically.



Range of subject which can be focused

At telephoto position (when the image of subject is large): about 1m from the lens surface to infinity

At wide-angle position (when the image of subject is small): about 1 cm from the lens surface to infinity

The camera may not be able to focus on the following objects automatically.

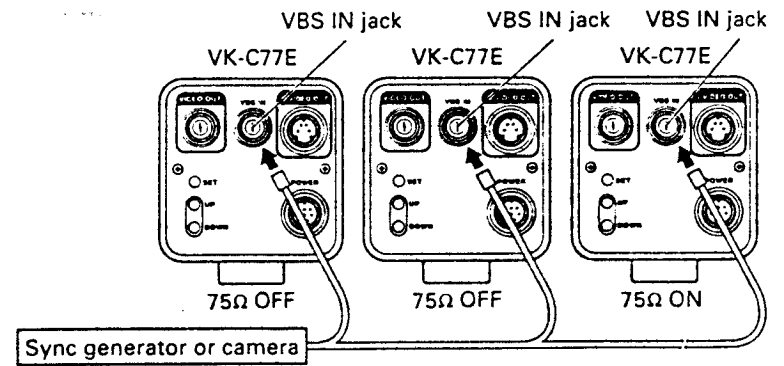
- Objects not at the center of the screen
- Objects at far and near positions at the same time
- Shiny objects or when strong light such as a neon sign, spotlight, etc. reflects from them
- Objects behind glass with water droplets or dust on it
- Objects moving rapidly
- Objects with almost no difference in brightness such as a white wall
- Dark objects

If a subject is not focused automatically, focus it manually.

13

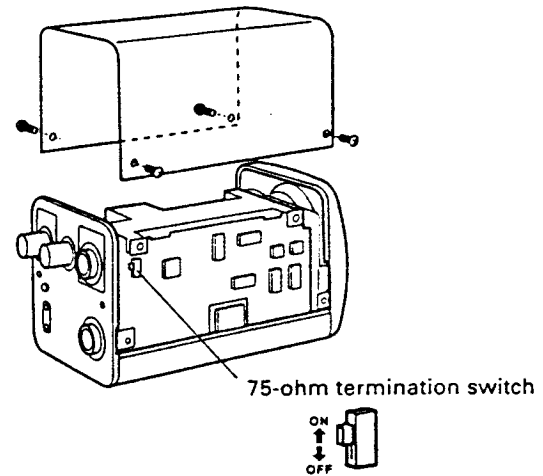
Sync connection 2

- When the sync signal is supplied externally and two or more cameras are to be connected, set the 75-ohm termination switches of all cameras except the last camera to "OFF" and set the 75-ohm termination switch of the last camera to "ON".



External sync input 75-ohm termination switch

This switch is set to "ON" when the camera is shipped from the factory.



12

Manual focusing

Perform the following procedure when focusing to a certain point manually regardless of the object.

1 Display the menu.

- Press the SET button twice within one second. The menu display appears and number 1 flashes.

Note: Press the SET button twice quickly without an interval.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

2 Select the "FOCUS" mode.

- Press the UP or DOWN button until number 8 flashes.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

3 Specify the FOCUS option to "MANU".

- Press the SET button once to switch the option from "AUTO" to "MANU" (manual).
- Pressing the SET button alternates between "AUTO" and "MANU".

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: MANU
END	

4 Display the MANUAL FOCUS adjustment menu.

- Press the SET button twice within one second. The manual focus menu display appears and number 1 flashes.

MANUAL FOCUS	
1. FAR/NEAR	: PUSH SET
2. SET	: PUSH SET
RETURN	

5 Set to the manual focus setting mode.

- Press the SET button once to switch the option from "PUSH SET" to "UP/DOWN".

MANUAL FOCUS	
1. FAR/NEAR	: UP/DOWN
2. SET	: PUSH SET
RETURN	

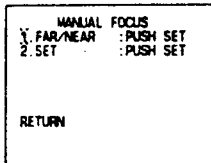
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14

ADJUSTING THE FOCUS (Cont'd)

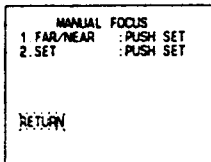
6 Adjust the focus.

- Press the UP or DOWN button to focus.
- After adjustment, press the SET button once to switch the option from the "UP/DOWN" to "PUSH SET".



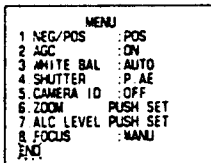
7 Return to the initial menu.

- Press the UP or DOWN button until RETURN flashes. Then press the SET button once to restore the initial menu.



8 End the setting.

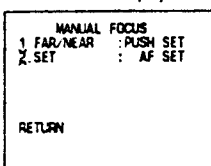
- Press the UP or DOWN button until END flashes. Then press the SET button once so the menu disappears.



■ One time autofocus

It is also possible to focus a subject at the center of the screen simply.

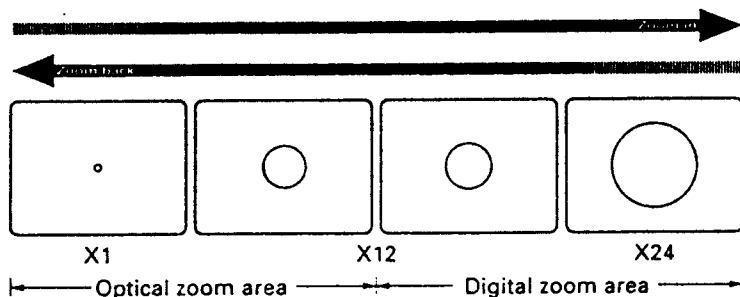
- Select "2. SET" in step 4 of "Manual Focusing". Then press the SET button once, and the subject at the center of the screen is brought into focus. When the focus is being adjusted, the message "PUSH SET" will change to "AF SET", and when the subject is brought into focus, "PUSH SET" will be displayed again.



ADJUSTING THE MAGNIFICATION OF THE ZOOM (Cont'd)

5 Specify the magnification.

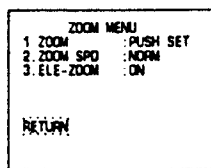
- Press the UP or DOWN button to adjust the size of the subject (magnification).
- Pressing UP zooms in on the subject and pressing DOWN zooms back from it.



- More than X12 to X24 are in the digital zoom area. Since the image is processed digitally in this area, the picture on the screen becomes slightly rough.
- It is recommended that you use the zoom in the optical zoom area when you want a clearer picture.
- The magnification ratio in the optical zoom area is maintained even when the power is turned off. However, when the camera was in the digital zoom area before the power was turned off, the ratio is set to X12 automatically when the power is turned on again.
- After adjusting the magnification, press the SET button once to switch the option from "TELE/WIDE" to "PUSH SET".

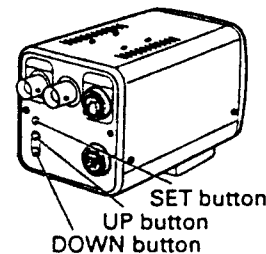
6 Return to the initial menu.

- Press the UP or DOWN button until RETURN flashes. Then press the SET button once to restore the initial menu.



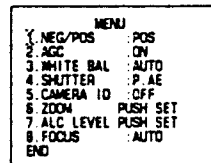
ADJUSTING THE MAGNIFICATION OF THE ZOOM

You can zoom in on a subject up to X12 optically (up to X24 when used together with the digital zoom).



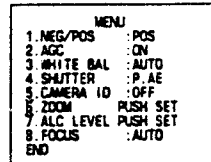
1 Display the menu.

- Press the SET button twice within one second. The menu display appears and number 1 flashes. Note: Press the SET button twice quickly without an interval.



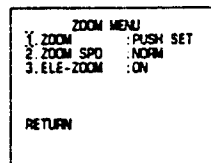
2 Select the ZOOM mode.

- Press the DOWN or UP button until number 6 flashes.



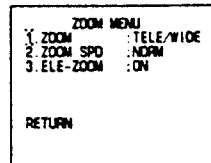
3 Display the ZOOM MENU display.

- Press the SET button once. The zoom menu display appears and 1 flashes.



4 Set to the magnification adjustment mode.

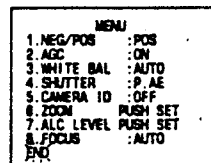
- Press the SET button once to switch the option from "PUSH SET" to "TELE/WIDE".



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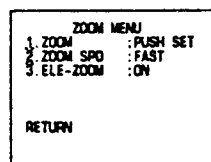
7 End the setting.

- Press the DOWN or UP button until END flashes.
- Press the SET button once so the menu disappears.



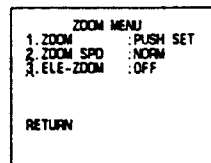
■ Changing the zoom speed

You can increase or decrease the zoom speed. Select "2. ZOOM SPD" in step 3. Then press the SET button to specify the required zoom speed (NORM (normal), FAST or SLOW).



■ When not using the digital zoom

Select "3. ELE-ZOOM" in step 3. Then press the SET button, and the setting will change from "ON" to "OFF" and the optical zoom mode will be engaged. In this mode, you can magnify the image of the subject up to 12 times.

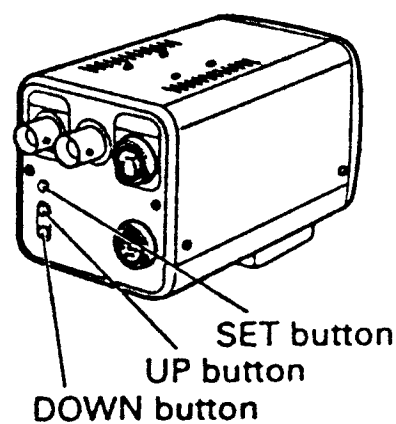


CONTROLLING THE SHUTTER SPEED

The shutter speed can be switched in fifteen steps.

- Observing the monitor screen, adjust the shutter speed referring to the table below.
- The shutter speed is set to P. AE (Programme Auto Exposure) at the factory.

Shutter speed(s)	Suitable for shooting the following
P. AE	When using the electronic shutter to adjust the amount of light automatically. (See page 27).
1/50	
1/100	
1/120	
1/150	
1/250	
1/350	
1/500	
1/750	
1/1000	
1/1500	
1/2000	
1/4000	
1/10000	
1/30000	
1/30000	When recording an object moving rapidly.



19

CONTROLLING THE SHUTTER SPEED (Cont'd)

Shutter speed

- If a rapidly moving object is recorded at a higher shutter speed, a little shaking is likely to occur in the picture played back by a time-lapse VCR in the still or slow play mode. The higher the shutter speed, the more light is necessary, so use the camera in as bright a place as possible at higher shutter speeds.
- If the shutter speed is increased with fluorescent lighting, etc., flickering becomes conspicuous. Also smear (a phenomenon with vertical lines above and below bright objects) are likely to be obvious.

Brightness of subject and lighting

The subject has to be properly lighted to obtain a good picture. The table below gives approximate brightness values. Refer to this table and use a light with sufficient brightness for the subject.

10	• Brightness of candle (20 cm away) (10~15)
100	<ul style="list-style-type: none"> • Indoor driving range (200~300) • Room illuminated by 2 30W fluorescent lamps (300) • Study desk illuminated by fluorescent lamp (400) • Office illuminated by fluorescent lamps (400~500) • Bowling alley (500) • Department store (500~700)
1,000	<ul style="list-style-type: none"> • Direct light of flashlight (1m away) (250) • Subway platform (300) • Clothes shop (400~500) • Reading room of library (400~500) • Inside subway car (500) • Station (650)
10,000	<ul style="list-style-type: none"> • Office near window with fluorescent lighting (1,000) • Outdoors 1 hour before sunset in fine weather (1,000) • Outdoors 1 hour after sunset in cloudy weather (2,000) • Sunlight at 10 a.m. in cloudy weather (250 x 10³) • Sunlight at noon in cloudy weather (320 x 10³) • Sunlight at 3 p.m. in fine weather (350 x 10³) • Sunlight at 10 a.m. in fine weather (650 x 10³)
100,000	• Sunlight at noon in fine weather (1,000 x 10 ³)
Lux	

21

1 Display the menu.

- Press the SET button twice within one second. The menu display appears and number 1 flashes.

Note: Press the SET button twice quickly without an interval.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

2 Select the SHUTTER mode.

- Press the DOWN or UP button until number 4 flashes.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

3 Specify the shutter speed.

- Press the SET button to switch the shutter speed. The speed changes as follows each time the button is pressed.

P. AE → 1/50 → 1/100 → 1/120 → 1/150 → 1/250 → 1/350 → 1/500 → 1/750 → 1/1000 → 1/1500 → 1/2000 → 1/4000 → 1/10000 → 1/30000

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: 1/50
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

4 End the setting.

- Press the DOWN or UP button until END flashes.
- Press the SET button once so the menu disappears.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: 1/50
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

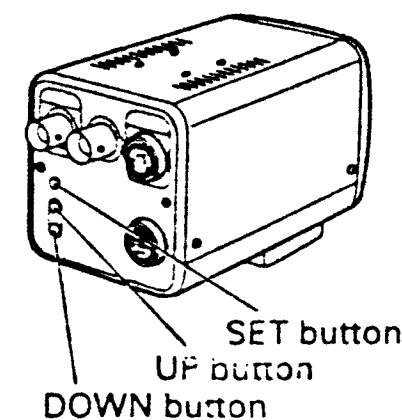
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ADJUSTING THE WHITE BALANCE

This camera is equipped with an auto white balance function that automatically adjusts the tone according to the colour temperature of the light source illuminating the subject. The auto white balance function may not function correctly in the following cases.

- If the subject is illuminated by several different light sources.
- If a sodium lamp, mercury vapour lamp or special-effects lamp is used.
- If the subject has a single colour (red, blue, etc.)

- In the above cases, point the camera at a white object in the actual lighting condition and adjust the white balance manually.



1 Display the menu.

- Press the SET button twice within one second. The menu display appears and number 1 flashes.

Note: Press the SET button twice quickly without an interval.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

2 Select the WHITE BAL mode.

- Press the DOWN or UP button until number 3 flashes.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

(continued on next page)

22

ADJUSTING THE WHITE BALANCE (Cont'd)

3 Specify the manual white balance mode.

- Press the SET button once to switch the option from "AUTO" to "MANU" (manual).

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: MANU
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

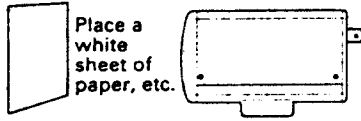
4 Display the MANUAL WHITE BALANCE setting menu.

- Press the SET button twice within one second. The white balance adjusting menu appears and number 1 flashes.

MANUAL WHITE BALANCE	
1. R-GAIN	: PUSH SET
2. B-GAIN	: PUSH SET
3. SET	: PUSH SET
RETURN	

5 Point the camera at a white object and bring it into focus.

- Point at the subject to fill the TV screen.
- Use a light to illuminate the subject.



6 Select the SET mode.

- Press the DOWN or UP button until number 3 flashes.

MANUAL WHITE BALANCE	
1. R-GAIN	: PUSH SET
2. B-GAIN	: PUSH SET
3. SET	: PUSH SET
RETURN	

7 The white balance is optimized.

- Press the SET button once to switch the option from "PUSH SET" to "AWB SET". This adjusts the colour to a natural tone automatically.
- After adjustment is completed, the option switches from "AWB SET" to "PUSH SET" automatically.

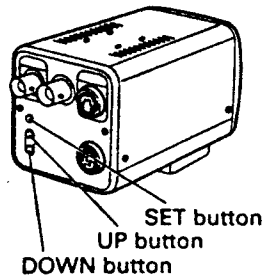
MANUAL WHITE BALANCE	
1. R-GAIN	: PUSH SET
2. B-GAIN	: PUSH SET
3. SET	: AWB SET
RETURN	

23

ADJUSTING THE TONE

The auto white balance function adjusts the tone automatically. You can also adjust the tone as required by displaying the MANUAL WHITE BALANCE menu.

- You can adjust the tones in the red (R) and blue (B) directions independently.
- Each tone is set to "AUTO" at the factory.
- It is recommended that you use the camera set to "AUTO".



1 Display the menu.

- Press the SET button twice within one second. The menu display appears and number 1 flashes.
- Note: Press the SET button twice quickly without an interval.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

2 Select the WHITE BAL mode.

- Press the DOWN or UP button until number 3 flashes.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

3 Specify the manual white balance mode.

- Press the SET button once to switch the option from "AUTO" to "MANU".

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: MANU
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

4 Display the MANUAL WHITE BALANCE setting menu.

- Press the SET button twice within one second. The white balance adjusting menu appears and number 1 flashes.

MANUAL WHITE BALANCE	
1. R-GAIN	: PUSH SET
2. B-GAIN	: PUSH SET
3. SET	: PUSH SET
RETURN	

25

8 Return to the initial menu.

- Press the DOWN or UP button until RETURN flashes.
- Press the SET button once to restore the initial menu.

MANUAL WHITE BALANCE	
1. R-GAIN	: PUSH SET
2. B-GAIN	: PUSH SET
3. SET	: PUSH SET
RETURN	

9 End the setting.

- Press the DOWN or UP button until END flashes.
- Press the SET button once so the menu disappears.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: MANU
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

24

5 Specify the tone to be adjusted.

- Example: To adjust 2. B - GAIN.
Press the DOWN or UP button until number 2 flashes.

MANUAL WHITE BALANCE	
1. R-GAIN	: PUSH SET
2. B-GAIN	: PUSH SET
3. SET	: PUSH SET
RETURN	

6 Set to the required tone.

- Press the SET button once to switch the option from "PUSH SET" to "UP/DOWN".
- Press the UP and DOWN buttons to adjust the tone. (Refer to the table below.)
- After adjustment is complete, press the SET button once to switch the option from "UP/DOWN" to "PUSH SET".
- To reset the adjusted tone, press the DOWN or UP button until number 3 flashes and then press the SET button once.

MANUAL WHITE BALANCE	
1. R-GAIN	: PUSH SET
2. B-GAIN	: UP/DOWN
3. SET	: PUSH SET
RETURN	

The tone changes as follows as the UP or DOWN button is pressed.

R/B mode	Press UP	Press DOWN
R-GAIN	Red increases	Cyan increases
B-GAIN	Blue increases	Yellow increases

7 Return to the initial menu.

- Press the DOWN or UP button until RETURN flashes.
- Press the SET button once to restore the initial menu.

MANUAL WHITE BALANCE	
1. R-GAIN	: PUSH SET
2. B-GAIN	: PUSH SET
3. SET	: PUSH SET
RETURN	

8 End the setting.

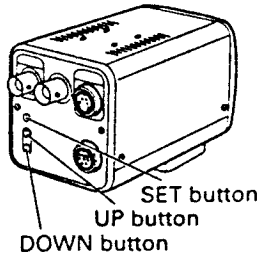
- Press the DOWN or UP button until END flashes.
- Press the SET button once so the menu disappears.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: MANU
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

26

ADJUSTING THE AUTO LIGHT CONTROL (ALC) LEVEL

When the shutter speed is set to "P. AE" (see page 19), you can change the brightness of the picture as required.



1 Display the menu.

- Press the SET button twice within one second. The menu display appears and number 1 flashes.
- Note: Press the SET button twice quickly without an interval.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

2 Select the ALC LEVEL mode.

- Press the DOWN or UP button until number 7 flashes.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

3 Display the ALC LEVEL setting menu.

- Press the SET button once. The ALC LEVEL setting menu appears and number 1 flashes.

ALC LEVEL	
1. PRESET	: ON
2. LEVEL	: UP/DOWN
3. BACK LIGHT	: PUSH SET
RETURN	

4 Specify the PRESET option to "OFF".

- Press the SET button once to switch the option from "ON" to "OFF".
- Pressing the SET button alternates between "ON" and "OFF".

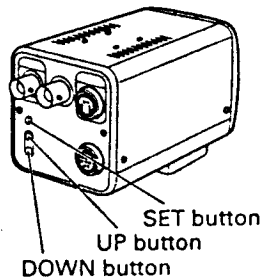
ALC LEVEL	
1. PRESET	: OFF
2. LEVEL	: PUSH SET
3. BACK LIGHT	: PUSH SET
RETURN	

27

CORRECTING FOR BACKLIGHTING

If the subject is strongly illuminated from the back by a spot light, etc., you can correct the brightness (backlight correction) so the subject does not become dark.

- You can correct the brightness for backlighting in up to six areas.



1 Display the menu.

- Press the SET button twice within one second. The menu display appears and number 1 flashes.
- Note: Press the SET button twice quickly without an interval.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

2 Select the ALC LEVEL mode.

- Press the DOWN or UP button until number 7 flashes.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

3 Display the ALC LEVEL setting menu.

- Press the SET button once. The ALC LEVEL setting menu appears and number 1 flashes.

ALC LEVEL	
1. PRESET	: ON
2. LEVEL	: UP/DOWN
3. BACK LIGHT	: PUSH SET
RETURN	

4 Specify the PRESET option to "OFF".

- Press the SET button once to switch the option from "ON" to "OFF".
- Pressing the SET button alternates between "ON" and "OFF".

ALC LEVEL	
1. PRESET	: OFF
2. LEVEL	: PUSH SET
3. BACK LIGHT	: PUSH SET
RETURN	

29

5 Select the LEVEL mode.

- Press the DOWN or UP button until number 2 flashes.

ALC LEVEL	
1. PRESET	: OFF
2. LEVEL	: PUSH SET
3. BACK LIGHT	: PUSH SET
RETURN	

6 Set to the signal level setting mode.

- Press the SET button once to switch the option from "PUSH SET" to "UP/DOWN".
- You can set the signal level when the shutter speed is set to "P.AE" (see page 19).

ALC LEVEL	
1. PRESET	: OFF
2. LEVEL	: UP/DOWN
3. BACK LIGHT	: PUSH SET
RETURN	

7 Adjust the signal level.

- Press the UP and DOWN buttons to adjust the level.
- After adjustment is completed, press the SET button once to switch the option from "UP/DOWN" to "PUSH SET".

ALC LEVEL	
1. PRESET	: OFF
2. LEVEL	: PUSH SET
3. BACK LIGHT	: PUSH SET
RETURN	

8 Return to the initial menu.

- Press the DOWN or UP button until RETURN flashes.
- Press the SET button once to restore the initial menu.

ALC LEVEL	
1. PRESET	: OFF
2. LEVEL	: PUSH SET
3. BACK LIGHT	: PUSH SET
RETURN	

9 End the setting.

- Press the DOWN or UP button until END flashes.
- Press the SET button once so the menu disappears.

MENU	
1. NEG/POS	: POS
2. AGC	: ON
3. WHITE BAL	: AUTO
4. SHUTTER	: P. AE
5. CAMERA ID	: OFF
6. ZOOM	: PUSH SET
7. ALC LEVEL	: PUSH SET
8. FOCUS	: AUTO
END	

28

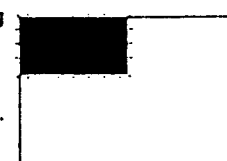
5 Select the BACK LIGHT mode.

- Press the DOWN or UP button until number 3 flashes.

ALC LEVEL	
1. PRESET	: OFF
2. LEVEL	: PUSH SET
3. BACK LIGHT	: PUSH SET
RETURN	

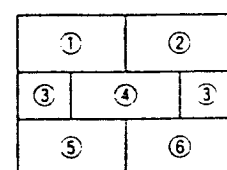
6 Display the backlight correction area setting screen.

- Press the SET button once.
- The area at the top left of the screen flashes.



7 Select the areas to be corrected for backlighting and store them in memory.

- You can select up to six areas to be corrected for backlighting as shown on the right.
- Press the UP and DOWN buttons so the area to be selected flashes.
- Press the SET button to store the area in memory. When it is stored in memory, "MASK" appears.



Example: To store areas ① and ② in memory:

- Press the UP and DOWN buttons to make the area to be stored first flash.
- Press the SET button to cause the letters "MASK" to appear in that area.
- Perform the same procedure to cause the letters "MASK" to appear in the other area.
- To erase the area from memory, press the UP and DOWN buttons to cause the letters "MASK" in the area to go out and then press the SET button once.



(continued on next page)

30

CORRECTING FOR BACKLIGHTING (Cont'd)

8 Return to the ALC LEVEL setting menu.

- Press the SET button twice within one second.

```

ALC LEVEL
1. PRESET : OFF
2. LEVEL : PUSH SET
3. BACK LIGHT : PUSH SET

RETURN
    
```

9 Return to the initial menu.

- Press the DOWN or UP button until RETURN flashes.
- Press the SET button once to restore the initial menu.

```

ALC LEVEL
1. PRESET : OFF
2. LEVEL : PUSH SET
3. BACK LIGHT : PUSH SET

RETURN
    
```

10 End the setting.

- Press the DOWN or UP button until END flashes.
- Press the SET button once so the menu disappears.

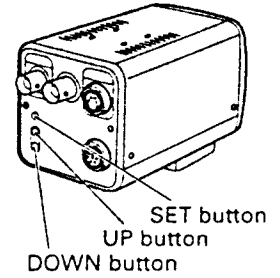
```

MENU
1. NEG/POS : POS
2. AGC : ON
3. WHITE BAL : AUTO
4. SHUTTER : P. AE
5. CAMERA ID : OFF
6. ZOOM : PUSH SET
7. ALC LEVEL : PUSH SET
8. FOCUS : AUTO
END
    
```

INVERTING THE VIDEO BETWEEN NEGATIVE AND POSITIVE

You can invert a picture from a negative film to record it as positive.

- The camera is set to "POS" at the factory.
- Switch to "NEG" to invert the picture.



1 Display the menu.

- Press the SET button twice within one second. The menu display appears and number 1 flashes.

Note: Press the SET button twice quickly without an interval.

```

MENU
1. NEG/POS : POS
2. AGC : ON
3. WHITE BAL : AUTO
4. SHUTTER : P. AE
5. CAMERA ID : OFF
6. ZOOM : PUSH SET
7. ALC LEVEL : PUSH SET
8. FOCUS : AUTO
END
    
```

2 Set the picture to the negative state.

- Press the SET button once to switch the option from "POS" to "NEG".
- Pressing the SET button alternates between "POS" and "NEG".

```

MENU
1. NEG/POS : NEG
2. AGC : ON
3. WHITE BAL : AUTO
4. SHUTTER : P. AE
5. CAMERA ID : OFF
6. ZOOM : PUSH SET
7. ALC LEVEL : PUSH SET
8. FOCUS : AUTO
END
    
```

3 End the setting.

- Press the DOWN or UP button until END flashes.
- Press the SET button once so the menu disappears.

```

MENU
1. NEG/POS : NEG
2. AGC : ON
3. WHITE BAL : AUTO
4. SHUTTER : P. AE
5. CAMERA ID : OFF
6. ZOOM : PUSH SET
7. ALC LEVEL : PUSH SET
8. FOCUS : AUTO
END
    
```

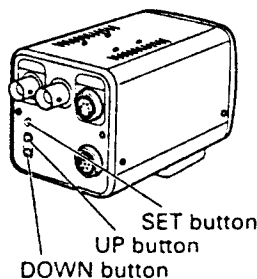
SUPPRESSING VARIATIONS IN CONTRAST (AGC)

AGC (automatic gain control) adjusts the camera's gain automatically according to the brightness of the subject to reduce variations in contrast.

- AGC is set to ON at the factory.
- Usually, AGC is set to ON.

How to use AGC:

	ON	OFF
When the camera is used	Outdoor where the brightness varies	Indoors where the brightness is fixed
AGC	Reduces variations in contrast according to the brightness.	Does not operate and a fixed picture quality is obtained.



1 Display the menu.

- Press the SET button twice within one second. The menu display appears and number 1 flashes.

Note: Press the SET button twice quickly without an interval.

```

MENU
1. NEG/POS : POS
2. AGC : ON
3. WHITE BAL : AUTO
4. SHUTTER : P. AE
5. CAMERA ID : OFF
6. ZOOM : PUSH SET
7. ALC LEVEL : PUSH SET
8. FOCUS : AUTO
END
    
```

2 Select the AGC mode.

- Press the DOWN or UP button until number 2 flashes.

```

MENU
1. NEG/POS : POS
2. AGC : ON
3. WHITE BAL : AUTO
4. SHUTTER : P. AE
5. CAMERA ID : OFF
6. ZOOM : PUSH SET
7. ALC LEVEL : PUSH SET
8. FOCUS : AUTO
END
    
```

3 Set the AGC option to "OFF".

- Press the SET button once to switch the option from "ON" to "OFF".
- Pressing the SET button alternates between "ON" and "OFF".

```

MENU
1. NEG/POS : POS
2. AGC : OFF
3. WHITE BAL : AUTO
4. SHUTTER : P. AE
5. CAMERA ID : OFF
6. ZOOM : PUSH SET
7. ALC LEVEL : PUSH SET
8. FOCUS : AUTO
END
    
```

4 End the setting.

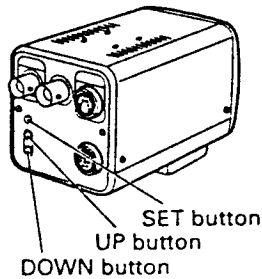
- Press the DOWN or UP button until END flashes.
- Press the SET button once so the menu disappears.

```

MENU
1. NEG/POS : POS
2. AGC : OFF
3. WHITE BAL : AUTO
4. SHUTTER : P. AE
5. CAMERA ID : OFF
6. ZOOM : PUSH SET
7. ALC LEVEL : PUSH SET
8. FOCUS : AUTO
END
    
```

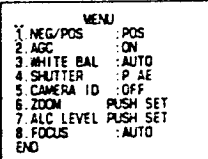
ADDING A TITLE TO THE PICTURE

You can superimpose a title (up to eight characters) on a picture being recorded. For example, when several cameras are used, you can easily see which camera is recording by checking the title.



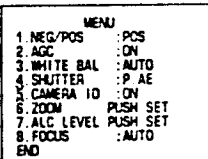
1 Display the menu.

- Press the SET button twice within one second. The menu display appears and number 1 flashes.
- Note:** Press the SET button twice quickly without an interval.



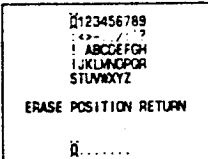
2 Select the CAMERA ID mode.

- Press the DOWN or UP button until number 5 flashes.
- Press the SET button once to switch the option from "OFF" to "ON".
- Note:** "ON" displays the title and "OFF" erases it.



3 Display the character setting screen.

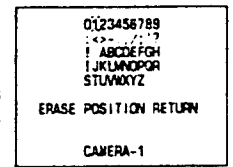
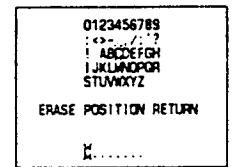
- Press the SET button twice within one second.
- Numeral "0" flashes. "0" also flashes in the location where a character is entered.



4 Input characters to be entered.

Example: To enter CAMERA-1:

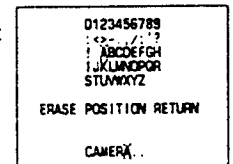
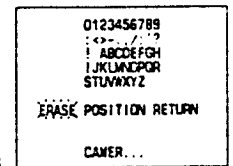
- Press the UP or DOWN button until "C" flashes.
- Check that "C" also flashes in the location where the character is entered.
- Press the SET button once to enter "C".
- Press the DOWN button so "A" flashes.
- Press the SET button once to enter "A".
- Press the UP or DOWN and SET buttons alternately to enter the remaining characters.
- Up to eight characters can be entered.



5 If you have entered incorrectly.

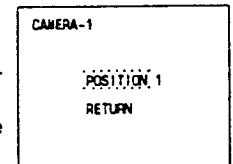
Example: If you have entered CAMERR-1

- Press the DOWN or UP button until "ERASE" flashes.
- Press the SET button to erase the characters back to the incorrect position.
- The characters will be erased from the last character entered.
- Press the DOWN or UP button until "A" flashes.
- Press the SET button once to enter "A".
- Press the UP/DOWN and SET buttons to enter the remaining characters "-" and "1".



6 Display the title location setting screen.

- Press the DOWN or UP button until "POSITION" flashes.
- Press the SET button once to display the title location setting screen.
- The "POSITION 1" display appears.



(continued on next page)

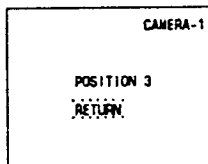
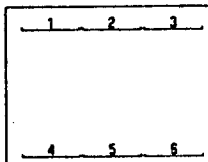
ADDING A TITLE TO THE PICTURE (Cont'd)

7 Determine the title location.

- There are six locations where the title can be entered as shown on the right.
- Each time the SET button is pressed, the "CAMERA-1" display position moves.

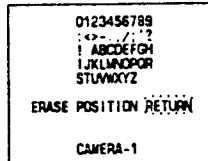
Example: To enter CAMERA-1 in POSITION 3:

- Press the SET button to select "POSITION 3".
- Press the UP or DOWN button to cause "RETURN" to flash.
- Press the SET button once to display the character setting screen.



8 Return to the initial menu.

- Press the DOWN or UP button until RETURN flashes.
- Press the SET button once to restore the initial menu.



9 End the setting.

- Press the DOWN or UP button until END flashes.
- Press the SET button once so the menu disappears.

