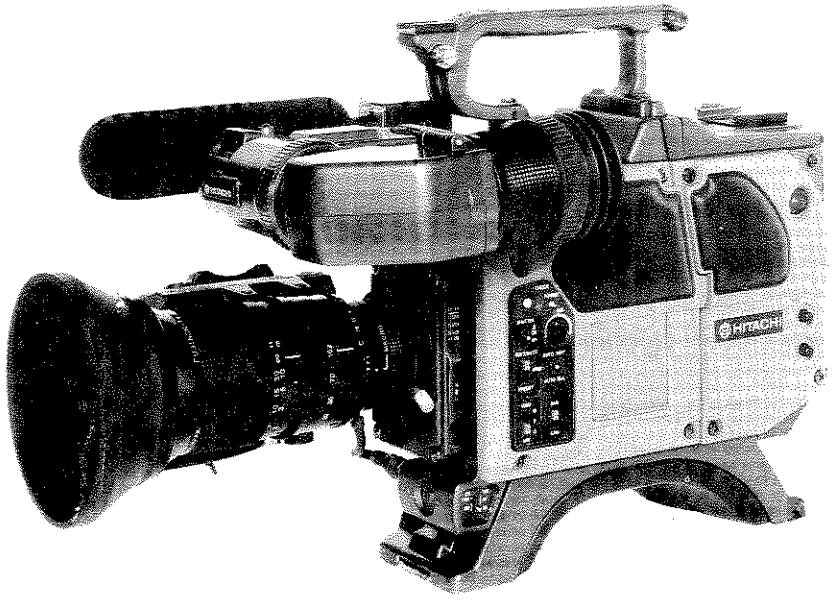
Z-ONE · B

Portable Color Camera

Operation Manual



IMPORTANT: READ "CAUTION FOR SAFE OPERATION" CAREFULLY AND UNDERSTAND THEM BEFORE USING YOUR COLOR CAMERA. RETAIN THIS OPERATION MANUAL FOR FUTURE REFERENCE.

READ AND SAVE THIS BOOK

Hitachi Denshi, Ltd.

⚠CAUTION FOR SAFE OPERATION

CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION:TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER(OR BACK).
NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

This symbol is intended to alert the user to the presence of unisulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

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

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

AVERTISSEMENT

Afin d'éviter tout risque d'incendie ou d'électrocution, ne pas exposer l'appareil à la pluie ou à l'humidité.
Afin d'écarter tout risque d'électrocution, garder le coffret fermé. Ne confier l'entretien de l'appareil qu à un personnel qualifié.

VORSICHT

Um Feuergefahr und die Gefahr eines eiektrischen Schiages zu vermeiden, darf das Gerät weder Regen noch Feuchtigkeit ausgesetzt werden.
Um einen elektrischen Schiag zu vermeiden, darf das Gehäuse richt geöffnet werden. Überiassen Sie Wartungsarbeiten stets nur einem Fachmann.

Note: The model and serial numbers of your COLOR CAMERA are important for you to keep for your convenience and protection. These numbers appear on the nameplate located on the bottom of the products. Please record these numbers in the spaces provided below, and retain this manual for future reference.

Model No. _____ **Serial No.** _____

IMPORTANT NOTICE

Z-ONE·BU for U. S. A

This product 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 product 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.

WARNING

Changes or modifications not expressly approved by Hitachi Denshi responsible for compliance could void the user's authority to operate the equipment.

Z-ONE·BU for Canada

This product does not exceed the class A/class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations.

Le présent appareil n'émet pas de bruits radioélectriques dépassant les limités applicable aux appareils numériques de classe A prescrites dans le règlement sur le brouillage radioélectrique édicter par le ministère des communications du canada.

Z-ONE·BE/K

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß Farbkamera Z-ONE·B in Übereinstimmung mit den Bestimmungen der Amtsblattverfügung Nr. 1046/1984 funkentstört ist. Der Deutschen Bundespost wurde das inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Hitachi Denshi(Europa) GmbH

Weiskircher Straße 88, D-6054 Rodgau 1 (Jügesheim)

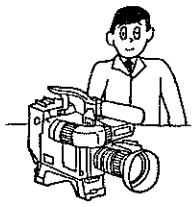
F. R. Germany

⚠CAUTION FOR SAFE OPERATION
IMPORTANT SAFEGUARDS

CAUTION: PLEASE READ AND OBSERVE ALL WARNINGS AND INSTRUCTIONS CONTAINED IN THIS MANUAL AND THOSE ON YOUR COLOR CAMERA. RETAIN THIS MANUAL FOR FUTURE REFERENCE.

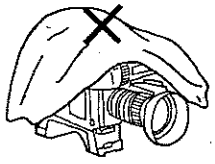
Electrical energy can perform many useful functions. This color camera has been engineered and manufactured to assure your personal safety. However, improper use can result in potential electrical shock or fire hazards. In order not to defeat the safeguards incorporated in this color camera, observe the following basic rules for its installation, use and servicing. Your color camera is fully transistorized and does not contain any user serviceable components.

Removal of the cabinet cover may expose you to dangerous voltages. Refer all servicing to qualified service personnel.

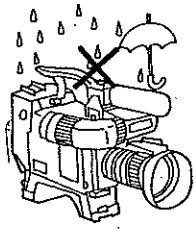


After unpacking the carton, examine the color camera carefully for possible damage. If any damage is detected, do not plug the color camera into outlet. Contact our sales person or technician.

Ventilation

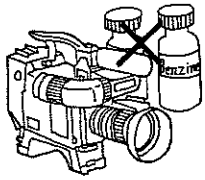


Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the color camera and to protect the color camera from overheating, and these openings must not be blocked or covered. The openings should never be blocked by placing the color camera on a bed, sofa, rug, or similar surface. This color camera should never be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.



Water and Moisture

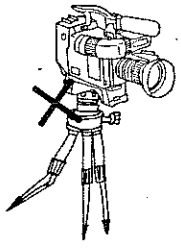
Do not expose the color camera to rain or moisture, or use near water --- for example, near a bath tub, wash bowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool, and the like.



Cleaning

Unplug this color camera from the power source before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

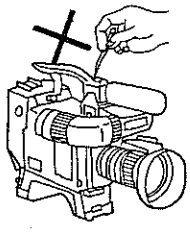
⚠CAUTION FOR SAFE OPERATION



Stand, Tripod, etc.

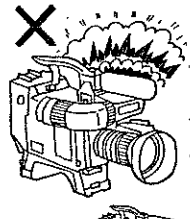
Do not place this color camera on an unstable cart, stand, tripod, bracket, or table. The color camera may fall, causing serious injury to a child or adult, and serious damage to the appliance. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer, or sold with the color camera. Any mounting of the appliance should follow the manufacturer's instructions, and should use a mounting accessory recommended by the manufacturer.

An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.



Accessories

Never add accessories that have not been specifically designed for this color camera.



Object and Liquid Entry

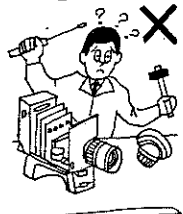
Never push objects of any kind into this color camera through openings as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the color camera.

Flammable and Explosive Substance

Avoid using this color camera where there are gases, and also where there are flammable and explosive substances in the immediate vicinity.

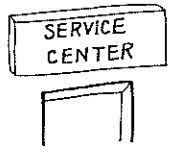
Heavy Shock or Vibration

When carrying this color camera around, do not subject the color camera to heavy shock or vibration.



Servicing

Do not attempt to service this color camera yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.



Damage Requiring Service

Unplug this color camera from the power source and refer servicing to qualified service personnel under the following conditions:

⚠CAUTION FOR SAFE OPERATION

A. When the power-supply cord or plug is damaged.
B. If liquid has been spilled, or objects have fallen into the color camera.
C. If the color camera has been exposed to rain or water.
D. If the color camera does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the color camera to its nomal operation.
E. Do not leave the viewfinder with the eyepiece oriented to the sun. The sunlight may be focussed through the eyepiece to melt the inside of the viewfinder.
F. If the color camera has been dropped or the cabinet has been damaged.
G. When the color camera exhibits a distinct change in performance– this indicates a need for service.

Replacement Parts

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original parts. Unauthorized substitutions may result in fire, electric shock or other hazards.

Safety Check

Upon completion of any service or repairs to this color camera, ask the service technician to perform safety checks to determine that the color camera is in proper operating condition.

OPERATING CONSIDERATIONS

The Z-ONE·B Color Camera converts an optical signal coming through the lens into an electric signal, and feeds out the signal to a VTR or a monitor. Handle the camera with great care to protect the sophisticated imaging section.

1. For protecting camera

(1) Do not use or store the camera in an environment exposed to direct sunlight, rain or snow, or flammable and corrosive gasses.

(2) Though the camera can be operated in a temperature range between -10 and + 45°C, the life of the camera may be shortened when the camera is used for a long time under a high temperature (more than 40°C). For continuous operation, do not install the camera in an environment exposed to a high temperature or high humidity to avoid possible failure.

(3) Do not drop the camera or apply a heavy shock to the camera.

2. Connection of camera

(1) When plugging or unplugging each connector, hold the connector body after turning off the camera.

(2) When shooting a scene including intense light (a lamp, a fluorescent lamp, the sun or strong reflecting light), vertical white streaking will arise. But this is not a defect. When shooting such a scene, avoid shooting such light.

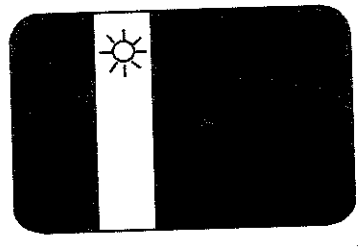
CONTENTS

PHENOMENA INHERENT IN CCD SENSORS

The following are the phenomena inherent in CCD sensors and not due to defective CCD sensors.
Use utmost care when a quality picture is required in broadcast applications.

Smear

When a highly bright object is shot, one or more vertical stripes may appear above and below the object. The faster the electronic shutter speed, the stronger this phenomenon.



Fixed pattern noise

When the camera is used in a high temperature, fixed pattern noise (vertical stripes or white spots) may appear. When the sensitivity of the camera is increased, fixed pattern noise is easier to see.

MODEL Z-ONE·B
PORTABLE COLOR CAMERA

1. GENERAL

The Hitachi Z-ONE·B is a 2/3-inch 3-CCD color camera provided with an electronic shutter, and the camera realizes high resolution and high sensitivity. The Z-ONE·B can be connected with a BETACAM SP*1 recorder as a recording camera. The CCD is provided with micro lens and has about 400,000 pixels (NTSC) (480,000 pixels for PAL). with a wide range of automatic functions by a micro-processor and correction circuits, even an unskilled operator can obtain a high quality picture easily. Since a wide range of accessories are available, the camera can be used for a variety of applications not only as a portable camera but also as an EFP/studio camera.

2. FEATURES

(1) High sensitivity and high resolution
By using a newly developed 2/3-inch CCD with about 400,000 pixels (NTSC) (480,000 pixels for PAL) and high accuracy CCD cladding technology, high sensitivity (2000 lux, f8) and high resolution of 750 TV lines (luminance channel) have been realized.

(2) High S/N
High S/N of 62dB (NTSC) (60dB for PAL) has been achieved by using the high sensitivity CCD and low noise circuit design. Noise at a dark portion under low illumination is remarkably reduced and a sharp, clear picture with little lag can be obtained.

(3) Multistep electronic shutter with lock scan mode provided
In addition to the preset system 5-step electronic shutter mode:1/100(NTSC), 1/60(PAL), 1/250, 1/500, 1/1000, 1/2000 seconds, the lock scan mode enabling continuous setting of the shutter speed in 1H step is newly equipped, so that the camera can shoot a display screen with different frequency without flickers.

(4) High performance viewfinder GM-8 employed
- Resolution of 600 TV lines is achieved, so that focusing can be made easily.
- Shooting at a wide angle is made possible by the sideways and back and forth movement and tilt mechanism of the viewfinder.
- The camera head can be rotated by 90° to stand erect, so that mobility at shooting and moving is improved.
- Top tally:The tally lamp is also equipped on the top of the camera, so that the recording mode can be identified from the side and the rear.
- Safe title marks which indicates the effective screen of a receiver can be displayed.

(5) Professional design concept
- The video output signal conforms to the broadcast standard RS-170A (NTSC).

*1 Registered trade mark of Sony Corporation

- The SMPTE color bar generator is incorporated (NTSC).

(6) Real-time auto white balancce function provided

- Since white balance is automatically corrected by a microprocessor in real time, excellent white balance is always obtained.

(7) Connectable to various VTRs

- The camera can be docked to the broadcast BETACAM SP*1 (BVV-5)*2 VTR without using an adaptor.
- The camera can also be docked to the NEW BETACAM SP*1 (PVV-1)*2, MII, Hi8, and S-VHS VTRs using the VTR adaptor.
- By using the camera adaptor (CA-Z1) and the VTR cable for exclusive use, the camera can be used as a self-contained camera in conjunction with the BETACAM, MII, U-format, S-VHS, and VHS VTRs.

(8) System operation

- The camera can be used as a studio camera in conjunction with the remote operation unit RU-C1 and the 5-inch viewfinder GM-50 (maximum cable lenght: 300m).
- The various control items of the camera can be remotecontrolled in conjunction with the remote control box RC-C10.
- The camera can be connected to a personal computer through RS-232C for remote-control from the personal computer.
- Tne camera can be remote-controlled in conjunction with the motorized pan-tilt head (U-4) made by Canon.
- Since the genlock function is incorporated in the camera in the recording camera configuration, the combined VTR records the scene while the camera is genlocked, and the composite video output of the camera can thus be processed for system operation.

(9) A variety of functions enabling shooting for various applications

- Contrast function for improving black suppression in shooting a scene against the light
- Auto knee function for improving white suppression at highlighting
- Six-memory auto white balance for an optical filter
- Self-diagnosis display function and atate display function of various automatic functions
- ID display function in the color bar mode
- Memory backup by E^2 PROM (battery unnecessary)
- Masking circuit enabling subtle colo adjustment
- Flare correction circuit providing a even, pure picture
- Vertical resolution can be switche between the normal mode (fiel integration mode) : 350 TV lines an the high resolution mode (fram integration mode) useful for shootir a still picture (using an intern switch).

*2 Product model name of Sony Corporation

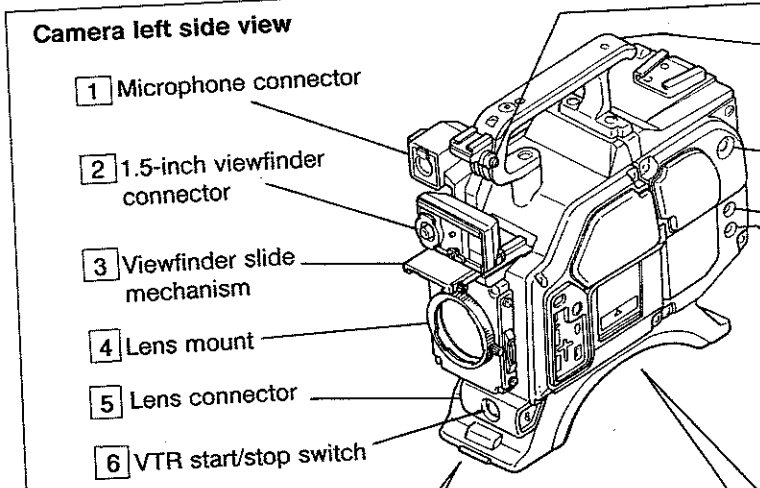
Standard composition

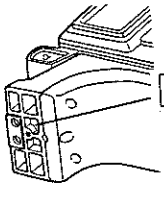
Component and model name	Q'ty
Camera head, Z-ONE·B	1
Camera adaptor, CA-Z1	1
16X zoom lens, A16x9.5BRM-17C	1
1.5-inch viewfinder, GM-8	1
Tripod adaptor, TA-Z1	1
Carrying case, CL-Z1	1
Extension board, EXT-C1	1
Extension board, EXT-3	1
Board extractors 1 and 2	1 each
Spare fuses, 2A	3
Operation manual	1
Service manual	1
Label (for RU-C1 and RC-C1)	1

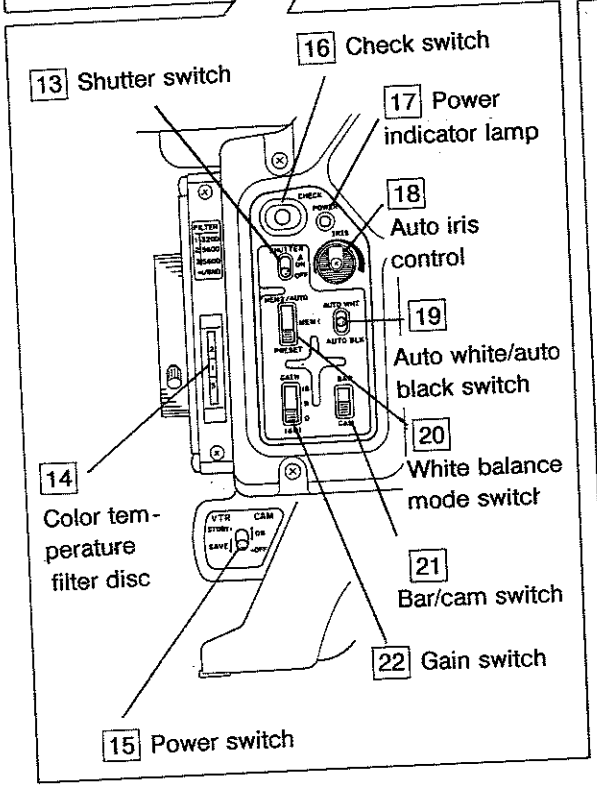
3. NAME AND FUNCTION OF EACH SECTION

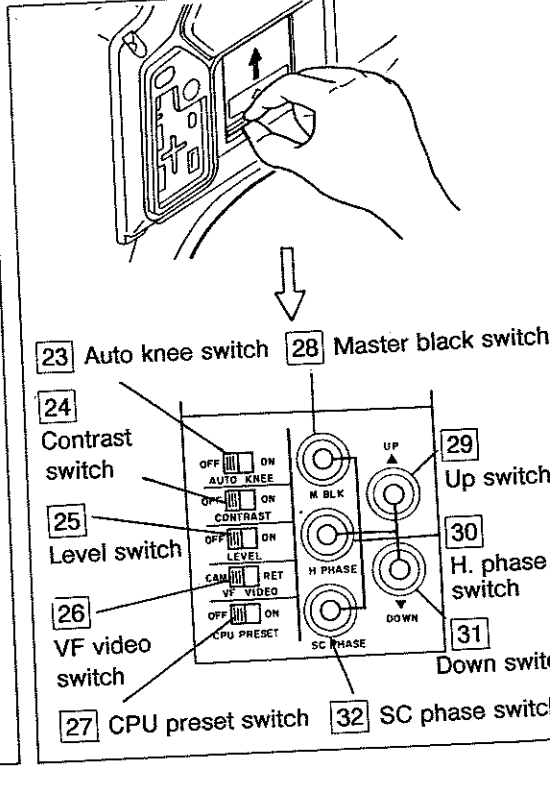
3.1 Camera head

Camera left side view









1 Microphone connector [MIC]

Insert the microphone cable plug into the connector by aligning the guide key.

2 1.5-inch viewfinder connector

Note: The 1.5-inch viewfinder and the 5-inch viewfinder cannot be used at the same time.

3 Viewfinder slide mechanism

The 1.5-inch viewfinder can be moved back and forth or in the horizontal direction. For details, refer to section 5.2.2.

4 Lens mount

The bayonet mount is employed. For installation and removal of a lens, refer to section 5.1.

5 Lens connector [LENS]

Insert the cable plug into this connector by aligning the guide key, and the auto iris and the powered zoom lens can be operated. To unplug the cable, hold and pull the lock ring on the plug. Do not attempt to pull the cable itself to unplug the cable.

6 and 9 VTR start/stop switches [VTR]

These switches control the operation of the VTR. Pressing either of the switches starts or stops the VTR operation.

When the remote operation unit is connected, these switches are used as a call button.

7 Hook for shoulder belt

This hook is used to install the optional shoulder belt. For details, refer to section 5.11.

8 Handle

This handle is integral with the camera adaptor. When using the optional VTR adaptor, remove this handle from the camera adaptor. For details, refer to the operation manual of the optional VTR adaptor.

10 Intercom level control [INTERCOM]

The intercom level (sound volume) can be adjusted when the RU-C1 Remote Operation Unit is connected.

11 Audio monitor level control [AUDIO MON]

Refer to the description of the AUDIO MON jack 45 .

12 Monopod mounting screw hole

The screw hole of 1/4" -20UNC is provided for mounting a usual monopod available on the market.

Note: Do not use this hole for fixing the camera on a tripod. To fix the camera on a tripod, use the TA-Z1 Tripod Adaptor.

13 Shutter switch [SHUTTER]

When this switch is turned upward, the shutter speed can be selected. When this switch is turned downward, the shutter is turned off. For operation, refer to item 7 Electronic shutter function.

14 Color temperature filter disc

Select a proper filter in accordance with the color temperature of the illumination source by rotating the disc until a click sounds. The built-in filters are "3,200K" (position 1) for tungsten and halogen lamps, and "5,600K" (position 2) and "5,600K + 1/8 ND" (position 3) for sunlight. The filter position is displayed on the viewfinder screen.

15 Power switch [CAM ON/OFF] [VTR STDBY/SAVE]

To save power when a VTR, is docked this switch has three positions.

See the Power indicator lamp 17 .

Turn the Power selector switch on the rear of the camera when the camera is not used for an extended period of time with the batteries installed.

Note: The save mode may not be established for some VTRs.

16 Check switch [CHECK]

Press this switch to check the state of the camera operating switches, the remaining tape time and the audio level on the viewfinder screen.

17 Power indicator lamp [POWER]

The following are displayed according to the setting of the Power switch 15 .

VTR	CAM	Lamp
STANDBY	ON	Red
SAVE	ON	Red
SAVE	OFF	Green

18 Auto iris control [IRIS]

When the camera is in the auto iris mode, the video output level can be adjusted by this control. The level is 100% at the center detent position.

19 Auto white/auto black switch [AUTO WHT/AUTO BLK]

Set this switch to AUTO BLK, then the black balance function operates.

Set the switch to AUTO WHT, then the white balance function operates. (Set the White balance mode switch 20 to MEM1 or MEM2.)

20 White balance mode switch [PRESET/MEM1/MEM2 or AUTO)

PRESET: At this position, optimum white balance is obtained with color temperature filter disc 14 set to 1 under illumination of color temperature of 3200K.

MEM1 or MEM2: At this position, white balance can be adjusted by using the AUTO WHT/AUTO BLK switch 19 . Two memories are provided for each position of the color temperature filter disc 14 . The data can be retained in the memories for about 10 years without a battery.

AUTO: Real-time auto white balance mode.

MEM2/AUTO can be selected by pressing the M BLK switch 28 with the CPU PRESET switch 27 set to ON. For details, refer to section 7.

21 Bar/cam switch [BAR/CAM]

When this switch is set to BAR, the camera output signal is switched to the color bar signal. Use this signal to adjust the camera and the color monitor. When this switch is set to CAM, the camera signal is fed out .

When this switch is set to BAR, the lens iris automatically closes.

22 Gain switch [GAIN]

This switch increases the gains of the three channels (R, G, B) by 9dB or 18dB simultaneously. Set this switch appropriately when the "L" indicator inside the 1.5-inch viewfinder lights to indicate insufficient light. When this switch is set to 9dB or 18dB, the "H" indicator inside the viewfinder lights to indicate the high gain operation.

23 Auto knee switch [AUTO KNEE]

By setting this switch to ON, a natural picture without white compression can be obtained even for highlighted scenes.

24 Contrast switch [CONTRAST]

When a dark portion in a scene against illumination is not clear on the viewfinder, set this switch to ON. Then the black level of the picture is automatically corrected to provide a clear picture

25 Level switch [LEVEL]

Set this switch to ON, then the zebra stripes are displayed on the viewfinder at a portion where the video signal level exceeds 90% of the rated level. Use this function to set the lens iris manually

26 VF video switch [VF VIDEO]

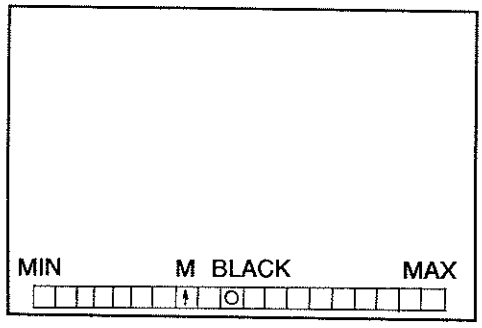
This switch selects a picture displayed on the viewfinder. At the CAM position, a picture from the camera is displayed. At the RET position, a picture played back by the docked VTR is displayed, or a picture from the AUX IN connector is displayed when the RU-C1 is connected.

27 CPU preset switch [CPU PRESET]

This switch turns on/off the preset mode of the CPU. At the ON position, selection of MEM2/AUTO of the white balance function, (see section 8), and a lens setting mode can be made (see section 10.1(2)). Further, an ID signal (see section 9.4) can be written.

28 Master black switch[M BLK]

Press this switch, then the following screen is displayed. Adjust the UP switch 29 and the DOWN switch 31 . Keep pressing these switches, then the black level varies continuously. Normally set this switch where the arrow mark is positioned at the center. The display disappears in six seconds.(Press also the UP/DOWN switch with the MASTER BLACK switch displayed, and the mark ↑ is reset to the mid-position.)

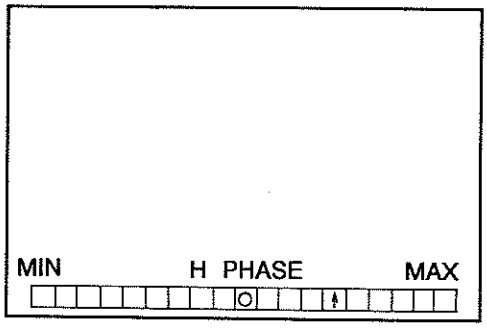


29 Up switch [UP]

See the Down switch 31 .

30 H. phase switch [H PHASE]

Press this switch, then the following screen is displayed. Adjust the H. phase with UP switch 29 or the DOWN switch 31 . Keep pressing this switch, then the H. phase varies continuously. The display disappears in six seconds.



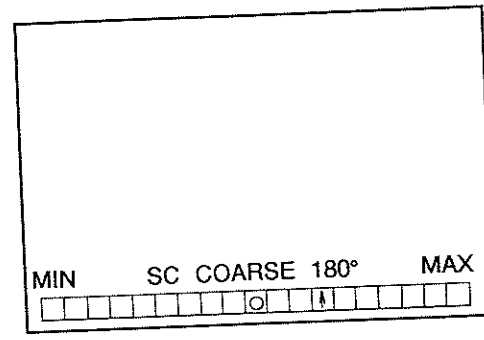
31 Down switch [DOWN]

The UP/DOWN switches are used to adjust M BLACK, H PHASE and SC PHASE, and to set the shutter speed in the lock scan mode.

32 SC phase switch [SC PHASE]

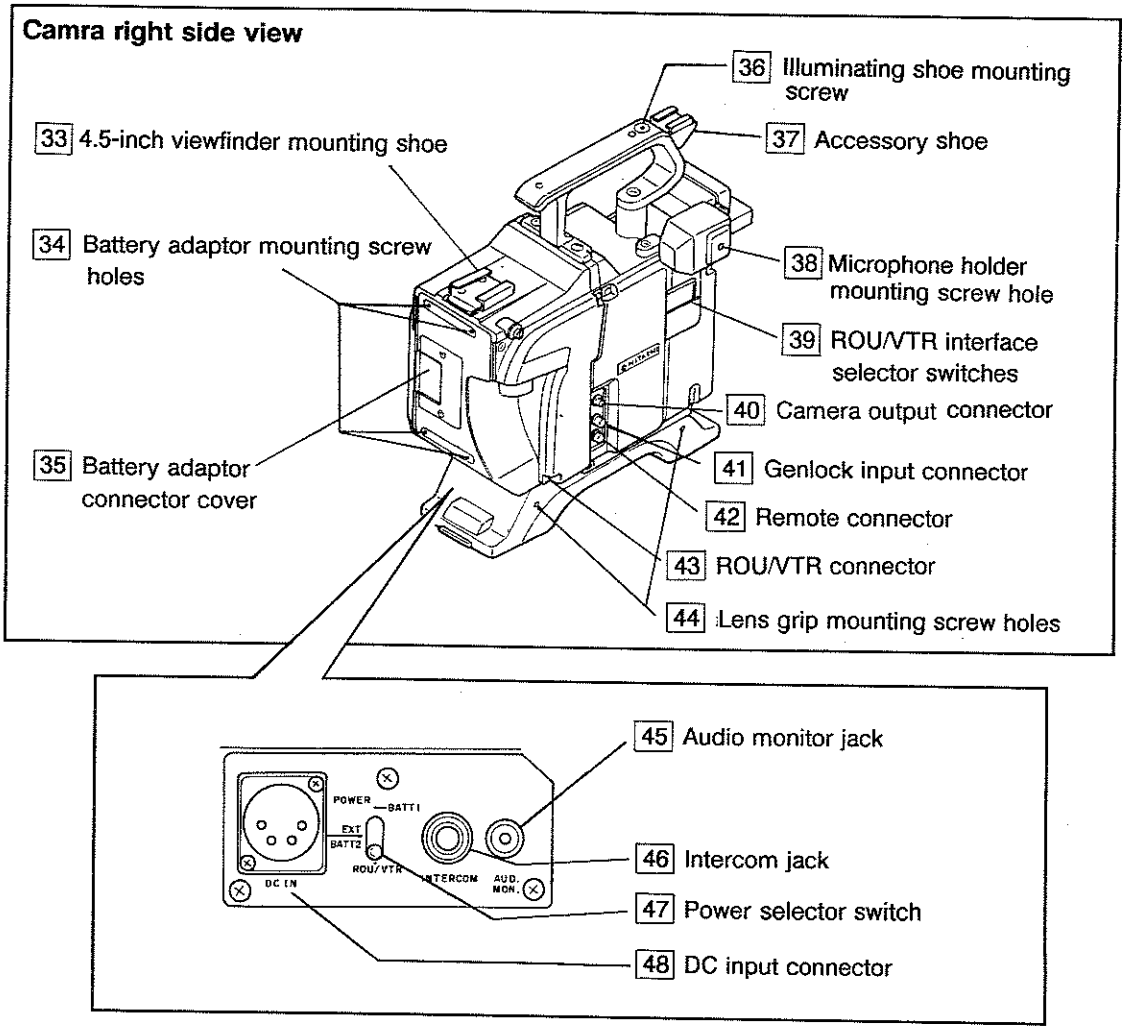
1) Press this switch, then the following screen is displayed.

2) First adjust the SC phase by the UP or DOWN switch in 90 degree steps.



3) Press this switch again, then the characters "SC COARSE" changes to "SC FINE".

4) Adjust the phase finely by the UP or DOWN switch. "SC COARSE" and "SC FINE" are displayed alternately each time the SC PHASE switch is pressed. The display disappears in six seconds.



33 5-inch viewfinder mounting shoe

When using the GM-50 5-inch Viewfinder instead of the 1.5-inch Viewfinder, secure the GM-50 5-inch Viewfinder to this mounting shoe with the AT-21A Viewfinder Adaptor. Connect the viewfinder cable connector to the 1.5-inch viewfinder connector 2 . Refer to section 5.12 for details.

34 Battery adaptor mounting screw holes

When using the camera as a portable camera, mount the BA-15 Battery Adaptor on the camera. Secure the mounting screws of the BA-15 Battery Adaptor to these holes.

35 Battery adaptor connector cover [PUSH OPEN]

When mounting the Anton/Bauer battery adaptor, slide this cover gently to the right to open it, and connect the battery adaptor to the connector in the compartment. Then, secure the adaptor screws to the screw holes 34 .

36 Illuminating lamp shoe mounting screw

The screw hole of 1/4"-20UNC is provided for mounting the illuminating lamp shoe.

37 Accessory shoe

Insert a lighting lamp mounting fixture into this shoe.

38 Microphone holder mounting screw hole

Mount the MH-C1 Microphone Holder in this hole.

39 ROU/VTR interface selector switches

These switches are arranged behind the cover and used to select the video signal supplied to the connected RU-C1 Remote Operation Unit or the connected VTR or used for the interfaces for various VTRs. For details, refer to section 5.6 Connection to VTR.

40 Camera output connector [VIDEO OUT]

The composite signal of 1Vp-p/75 ohms is fed from this connector.

41 Genlock input connector [GL IN]

Connect the black burst signal or the composite signal to this connector when the camera is used with other video systems in the genlock mode. When the RU-C1 Remote Operation Unit is used in the genlock mode, connect the black burst signal or the composite, signal only to the GL In connector of the RU-C1, and do not use this connector.

42 Remote connector [REMOTE]

Connect the cable of the RC-C1, RC-C10 or RC-C11 Remote Control Box to this connector.

43 ROU/VTR connector [ROU/VTR]

When using a VTR, connect the specified VTR cable to this connector. When using the RU-C1 Remote Operation Unit, connect the specified camera cable to this connector.

44 Lens grip mounting screw hole

The screw hole of 1/4"-20UNC is provided for mounting the optional lens grip, etc.

45 Audio monitor jack [AUD. MON.]

When an earphone (3.5 in dia) is connected to this jack, the sound picked up by the microphone can be monitored. When a U-matic or S-VHS VTR is docked. Press the RET switch 65 . Then the playback sound can be monitored, while viewing the playback picture on the viewfinder the RET switch 65. Adjust the sound volume by the AUDIO MON level control 11 .

Note: The playback sound may not be monitored for some types of VTRs.

46 Intercom jack [INTERCOM]

Plug the intercom headset to this jack when the RU-C1 Remote Operation Unit is used. When the headset is plugged to this jack without using the RU-C1 Remote Operation Unit, a sharp sound may sound. This is not a trouble.

47 Power selector switch [POWER]

This switch turns on/off power. When power is supplied from the ROU/VTR connector 43, set this switch to ROU/VTR .*1 When power is supplied from the DC input connector 48 , set this switch to EXT BATT2. When

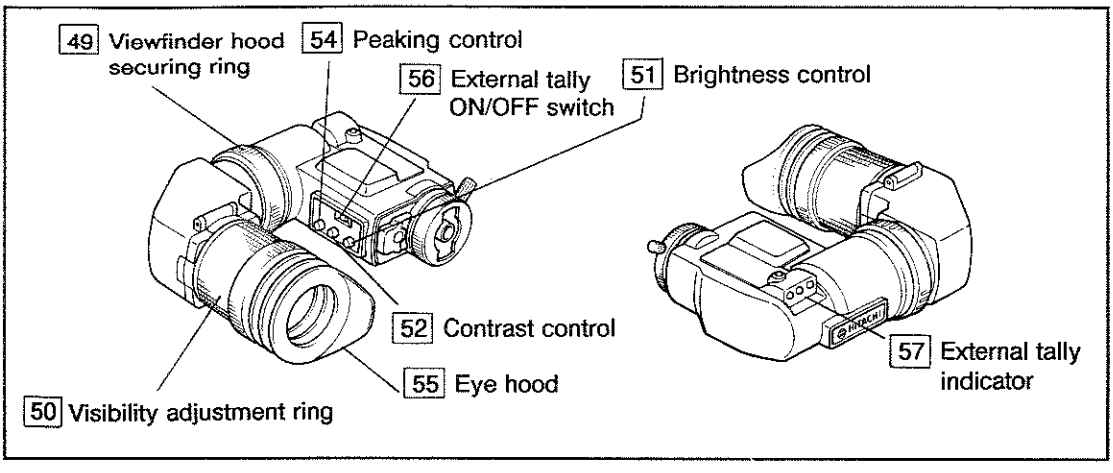
power is supplied from the Anton/Bauer battery connected to the connector behind the Battery adaptor connector cover [35], set this switch to BATT1.

*1: When power is supplied from the battery of the VTR, note that the life of battery shortens.

[48] DC input connector [DC IN]

Plug the AP-60B/-61B AC adaptor, the DP-15B battery Pack, or the BX-Z1 Battery Case to this connector, Do not connect other power supplies.

3.2 Viewfinder



[49] Viewfinder hood securing ring

To tilt the eye hood, use this securing ring. For details, refer to section 5.2.3.

[50] Visibility adjustment ring

To make the screen of the viewfinder easy to view, adjust this ring. For details, refer to section 5.2.3.

[51] Brightness control [BRIGHT]

[52] Contrast control [CONTRAST]

[53] Viewfinder connector

The viewfinder can be connected to the camera without a cable. For installation and removal of the viewfinder, refer to section 5.2.1.

[54] Peaking control [PEAKING]

Eye hood

For details, refer to section 5.2.3.

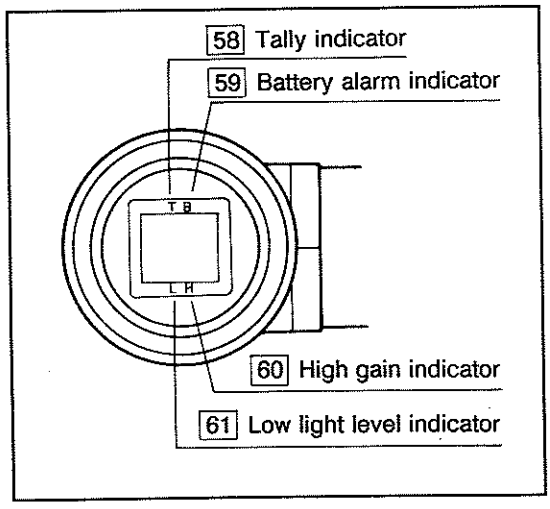
[55] Eye hood

Refer to section 5.2.3

[56] External tally ON/OFF switch [TALLY ON/OFF]

[57] External tally indicators

These indicators light when the VTR is in the record mode, when the remote operation unit is connected and an external tally signal is supplied or when the CALL switch is pressed. The external tally indicators can be put out with the external tally ON/OFF switch [56].



58 **Tally indicator [T]**

59 **Battery alarm indicator [B]**

This indicator lights when the battery voltage drops to approximately 11.2V. The battery life depends on the characteristics of a battery and an ambient temperature. In case this lamp lights, replace the battery as soon as possible. Otherwise, the camera will not operate normally several minutes after this indicator lights.

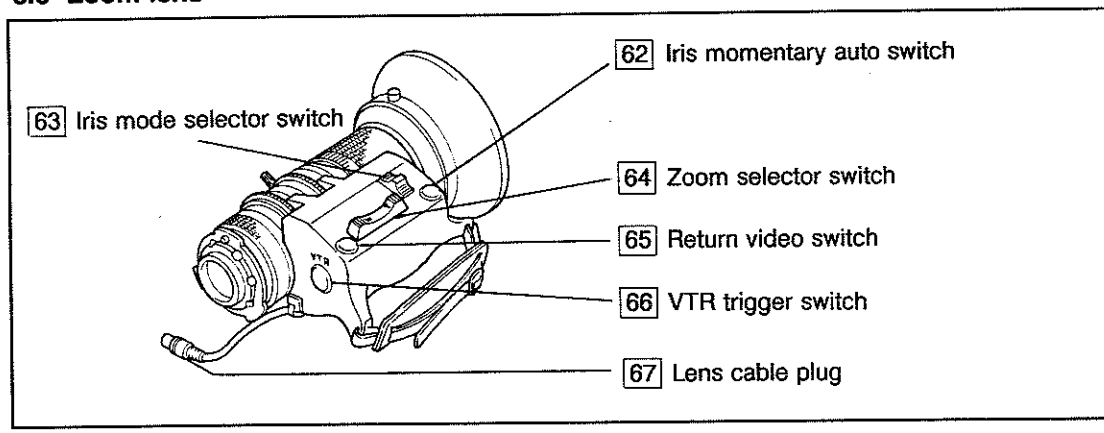
60 **High gain indicator [H]**

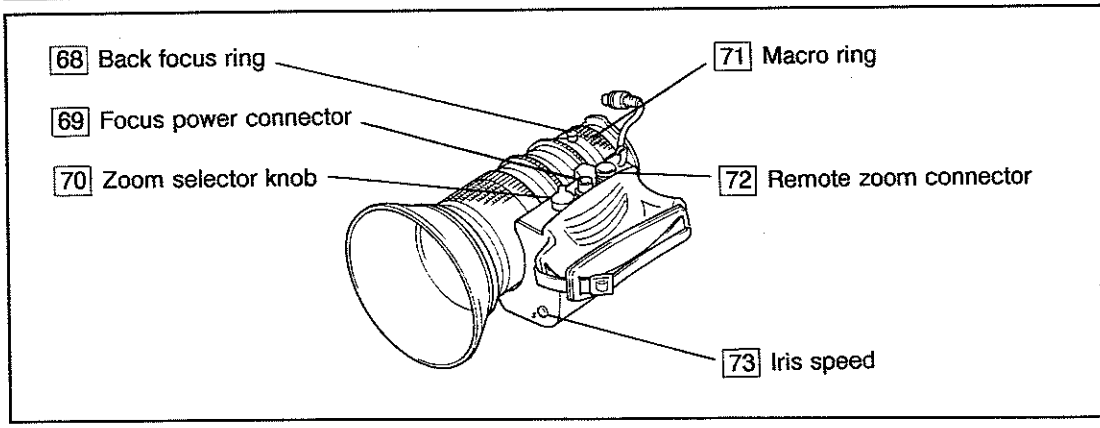
When the GAIN switch 22 is set to 9dB or 18dB, the indicator lights to indicate that the camera is in the high gain mode.

61 **Low light level indicator [L]**

When the scene illumination is insufficient, this indicator lights. Note that the auto white balance cannot be set while the indicator lights.

3.3 Zoom lens





62 Iris momentary auto switch

This switch establishes the automatic iris mode only while this switch is pressed in the manual iris control mode.

63 Iris mode selector switch [A/M/R]

A: Auto iris adjustment mode using the rectified video signal

M: Manual iris adjustment mode

R: Remote control mode

64 Zoom selector switch [T/W]

T: Telephoto angle

W: Wide angle

The zoom speed can be varied continuously by changing the force applied to this switch. Full range operating time is approx. 2.5 to 20 sec.

65 Return video switch [RET]

While this switch is pressed, the playback signal from the VTR or the signal connected to the AUX connector on the operation panel is displayed on the viewfinder.

66 VTR trigger switch [VTR]

This switch controls the VTR start/stop. Every time the switch is pressed, start and stop are alternated.

67 Lens cable plug

Connect this plug to the LENS connector on the camera head. Once the plug is pushed, it is automatically locked. To disconnect the plug, hold the plug body and pull to release the lock.

68 Back focus ring

Loosen the screw securing ring, and rotate the ring to adjust the tracking of lens (flange-focal distance). For details, see page 47.

69 Focus power connector

Connect the optional FSM-30B Focus Servo Module to this connector.

70 Zoom selector knob [M/S]

S: Zooming can be made by the Zoom selector switch 64 .

M: Zooming can be made manually.

71 Macro ring [MACRO]

Rotate the ring for close-up shooting. No fixing screw is provided. Return to the click point to gain the normal condition.

72 Remote zoom connector [REM]

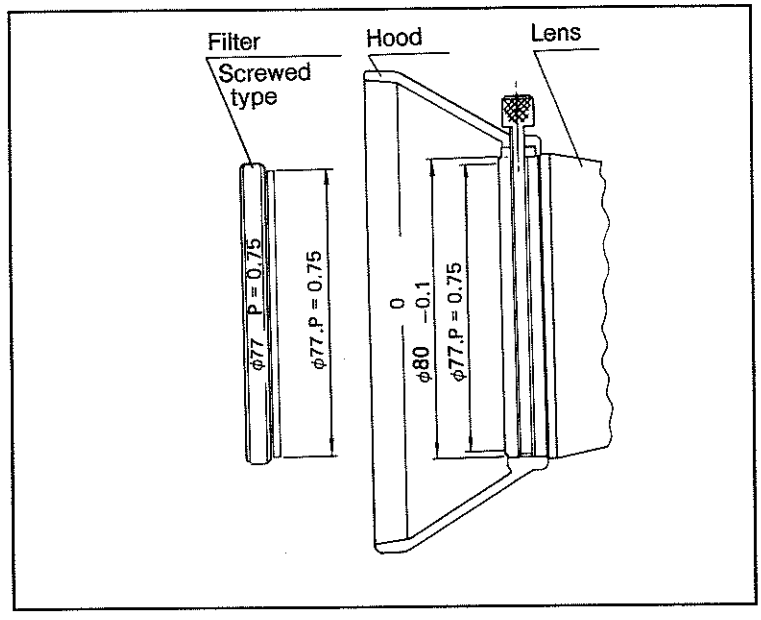
Connect the ZL-7W Lens Cable Kit to this connector, then VTR start/stop and the return video signal can be remote-controlled in addition to zooming operation of the zoom lens.

73 Iris speed control

This control controls the lens iris speed. The iris moves faster when the control is rotated clockwise. When rotated counterclockwise, the response speed is reduced. Hunting (a condition in which the iris ring moves back and forth several times before it stops at the prescribed position) is caused if the speed is not appropriate. The control should therefore be set so that hunting does not arise.

How to mount filter(for A16×9.5BRM)

The standard lens filters can be mounted on the front frame screw section of this lens. Rotate the filter clockwise until it is secured. Filter size: 77mm in diameter, Pitch: 0.75mm. Filters (including special effects filters) which are available at ordinary camera shops can be used. When purchasing filters, designate the multicoated filters.

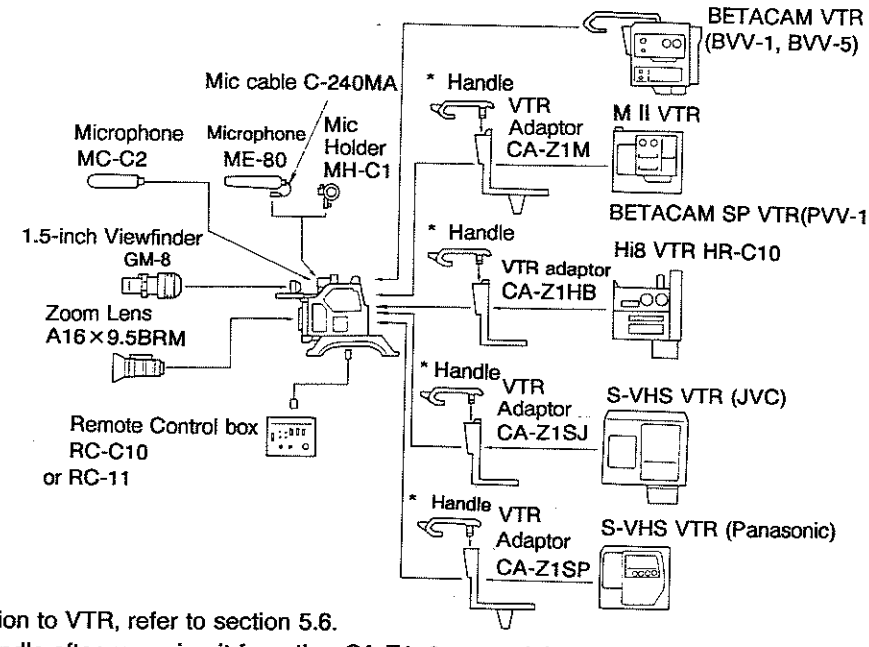


Notice for using the macro lever

When shooting a scene with the lens set to the macro position, set the focus ring to the symbol B, and adjust the angle of view and the focus with the zoom lever and the macro lever. When setting the focus ring set to a position other than the macro position, the shooting range will be limited and the picture at the four corners of the screen will be lost.

4. EXAMPLES OF SYSTEM CONFIGURATIONS

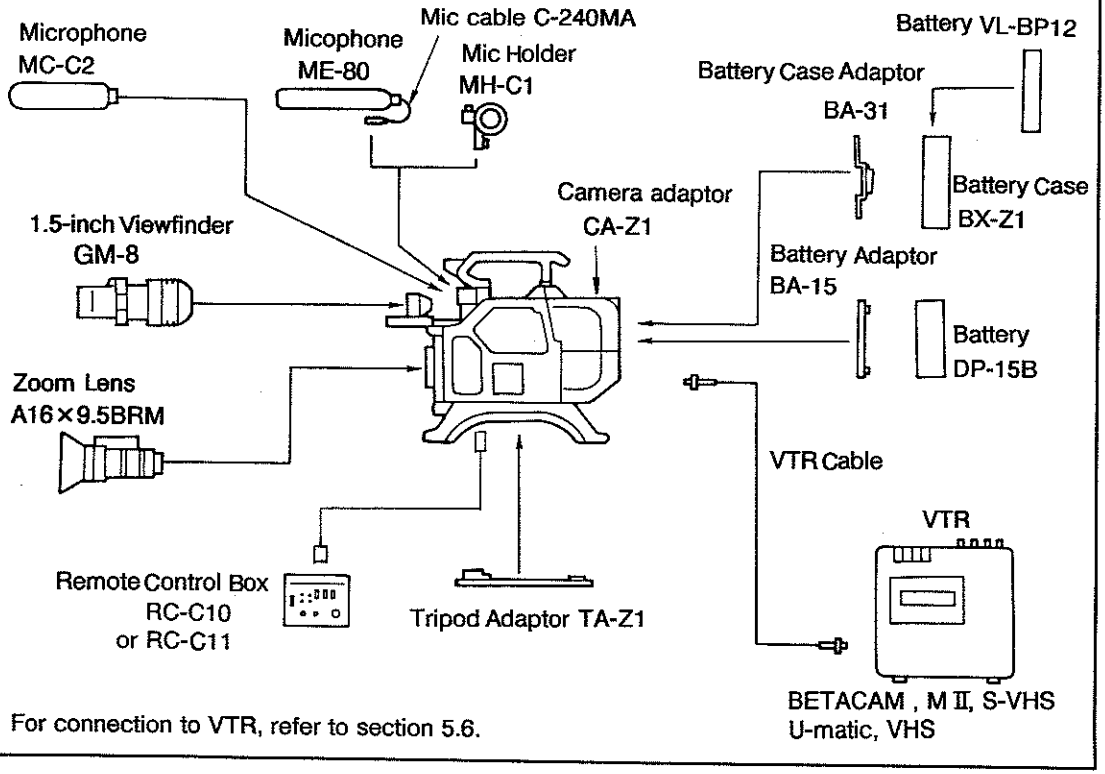
4.1 ENG configuration (when using the camera as a recording camera)



For connection to VTR, refer to section 5.6.

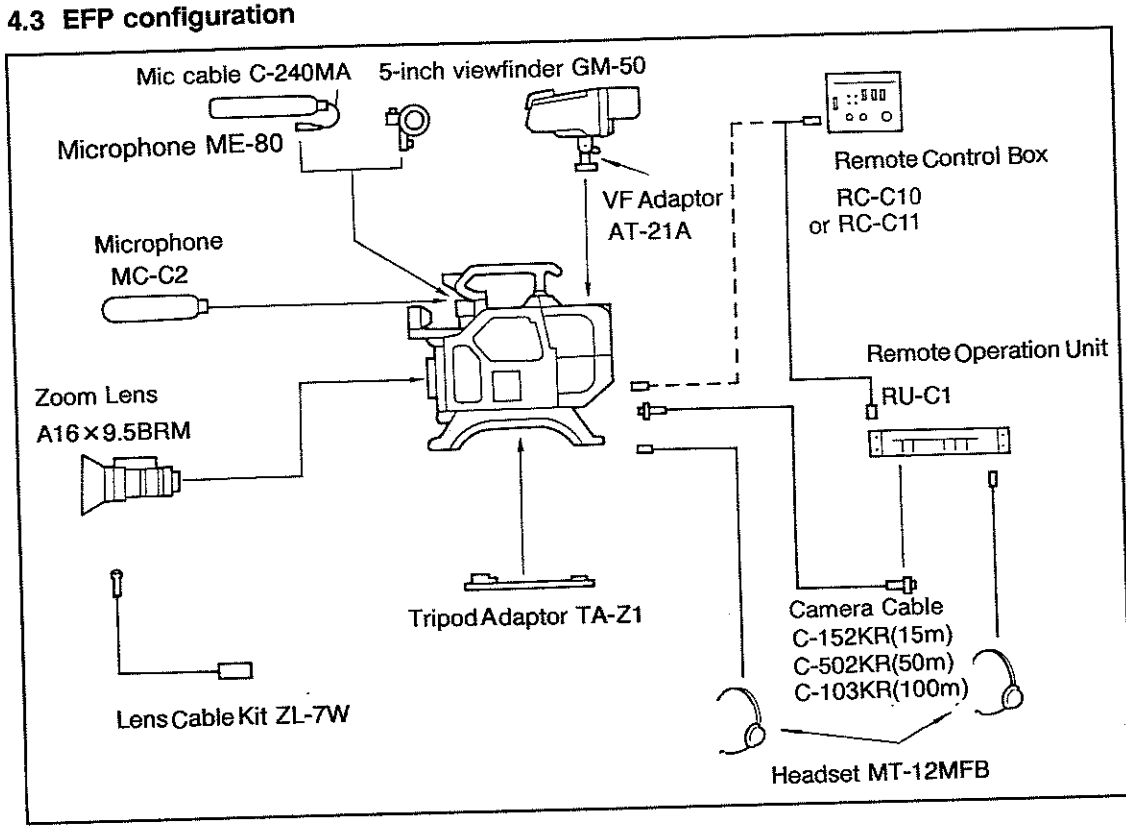
* Use the handle after removing it from the CA-Z1 Camera Adaptor.

4.2 ENG configuration (when using the camera connected to a VTR through the VTR cable)



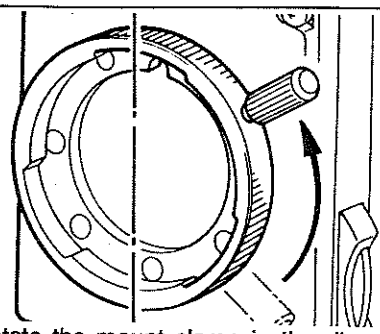
For connection to VTR, refer to section 5.6.

4.3 EFP configuration

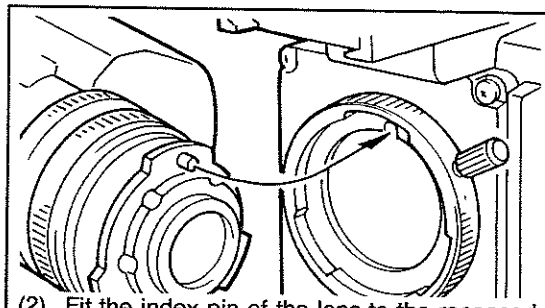


5. HOW TO ASSEMBLE CAMERA

5.1 Mounting the lens



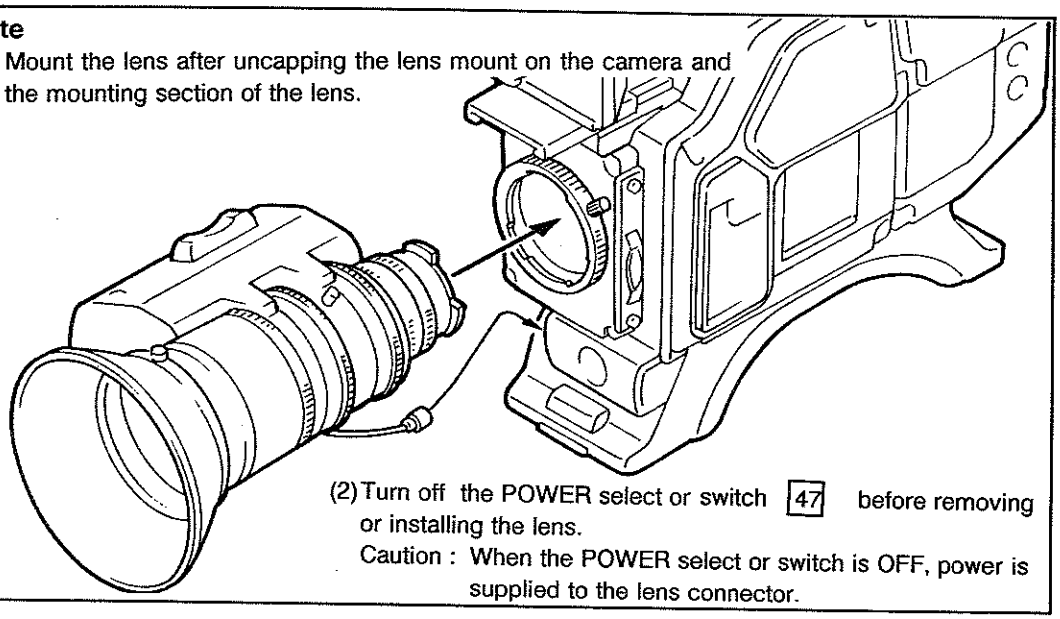
(1) Rotate the mount clamp in the direction of arrow



(2) Fit the index pin of the lens to the recessed portion of the lens mount, and insert the lens into the lens mount.

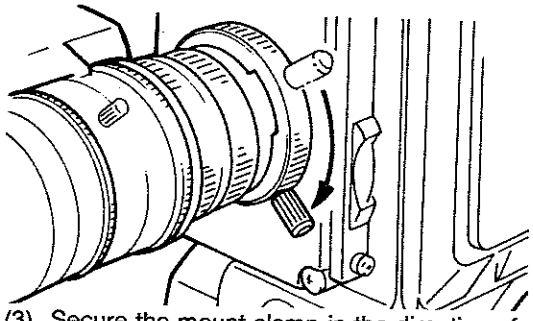
Note

(1) Mount the lens after uncapping the lens mount on the camera and the mounting section of the lens.

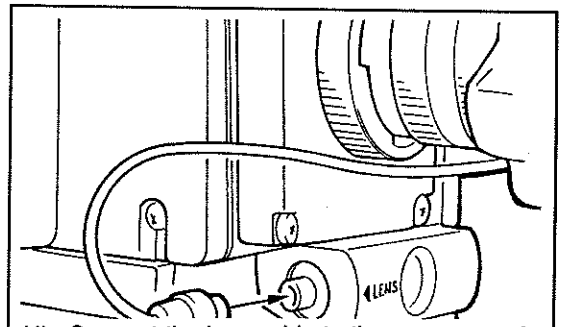


(2) Turn off the POWER select or switch [47] before removing or installing the lens.

Caution : When the POWER select or switch is OFF, power is supplied to the lens connector.



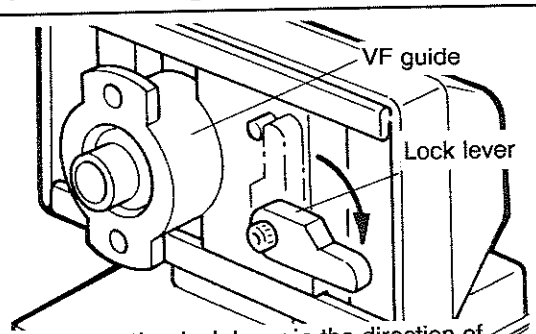
(3) Secure the mount clamp in the direction of arrow.



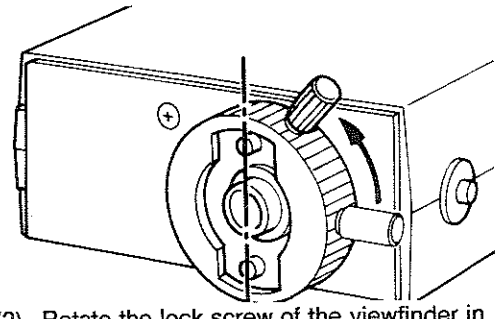
(4) Connect the lens cable to the connector of the camera.

5.2 mounting GM-8 1.5-inch viewfinder and position adjustment

5.2.1 Mounting



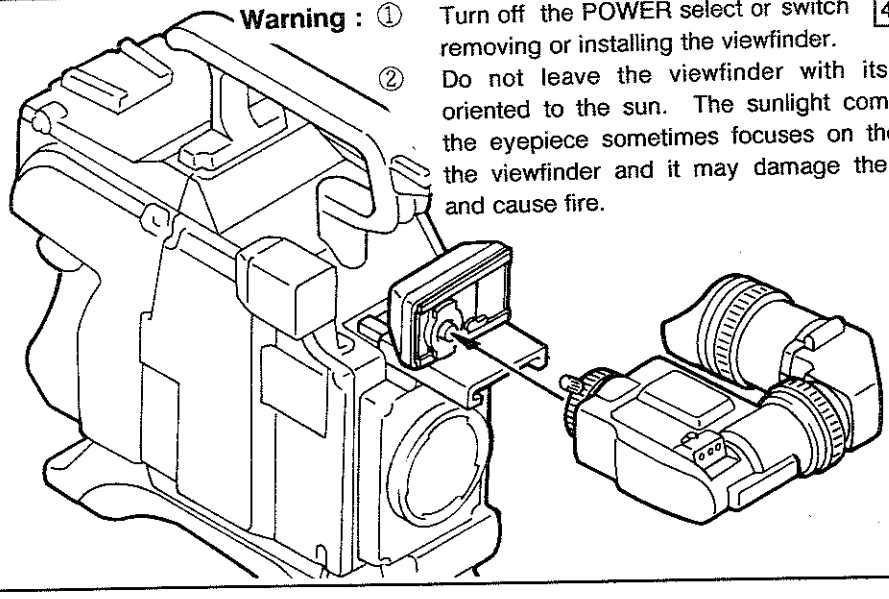
(1) Rotate the lock lever in the direction of arrow to secure the VF guide.

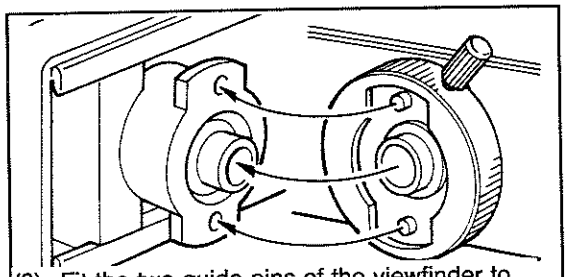


(2) Rotate the lock screw of the viewfinder in the direction of arrow.

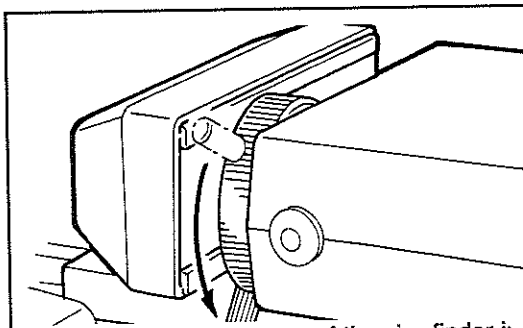
Warning : ① Turn off the POWER select or switch 47 before removing or installing the viewfinder.

② Do not leave the viewfinder with its eyepiece oriented to the sun. The sunlight coming though the eyepiece sometimes focuses on the inside of the viewfinder and it may damage the viewfinder and cause fire.





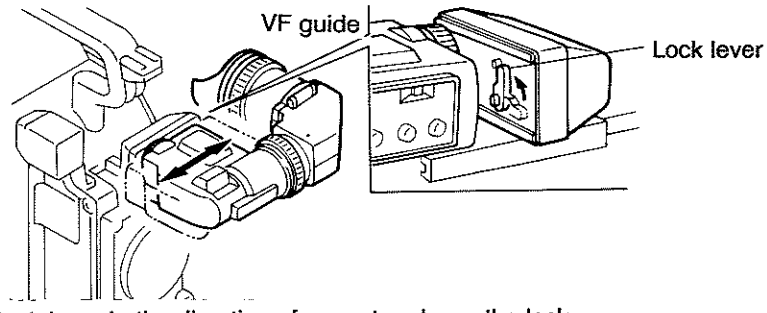
(3) Fit the two guide pins of the viewfinder to the respective guide holes of the VF guide, and insert the viewfinder firmly into the VF guide.



(4) Secure the lock screw of the viewfinder in the direction of arrow.

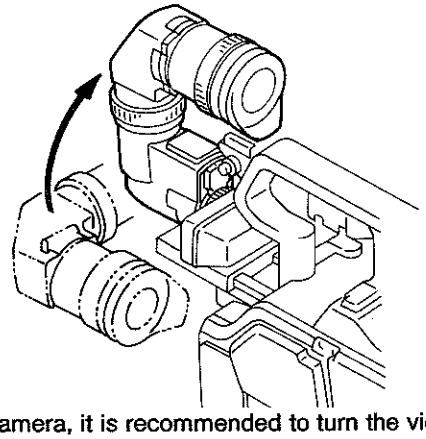
5.2.2 Position adjustment

(1) Horizontal position



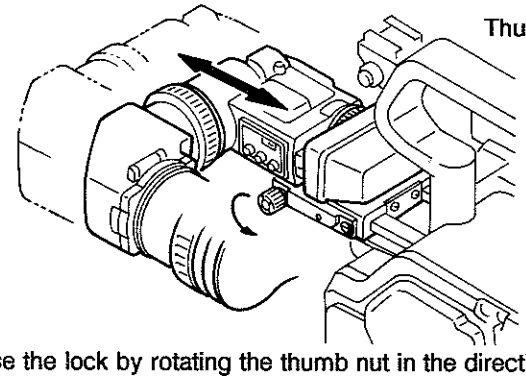
(1) Rotate the lock lever in the direction of arrow to release the lock.
(2) Move the viewfinder left or right to determine an appropriate position.
(The viewfinder and the VF guide move in pairs.)
(3) Rotate the lock lever in the opposite direction of arrow, and lock it.

(2) Vertical position



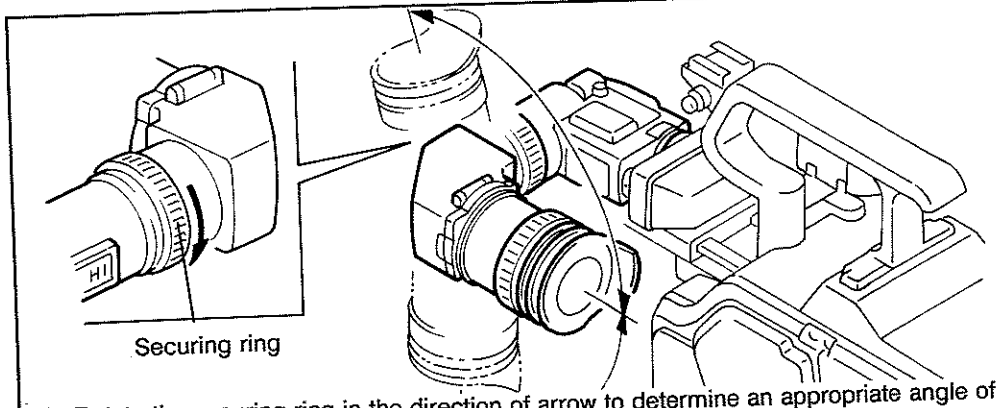
When carrying the camera, it is recommended to turn the viewfinder as shown in the illustration, so that the viewfinder does not tuch your leg.

(3) Back and forth position

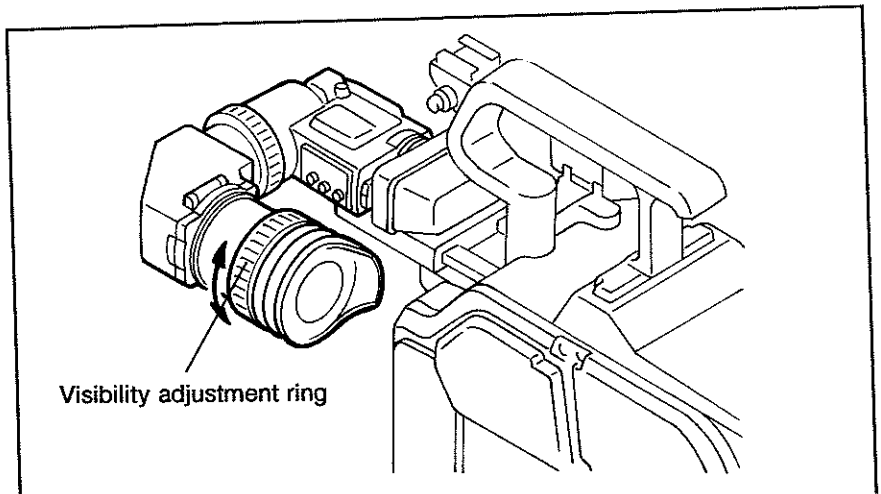


(1) Release the lock by rotating the thumb nut in the direction of arrow.
(2) Move the viewfinder back and forth to determine an appropriate position.
(The viewfinder and the VF guide move in pairs.)
(3) Rotate the thumb nut in the opposite direction of arrow, and lock it.

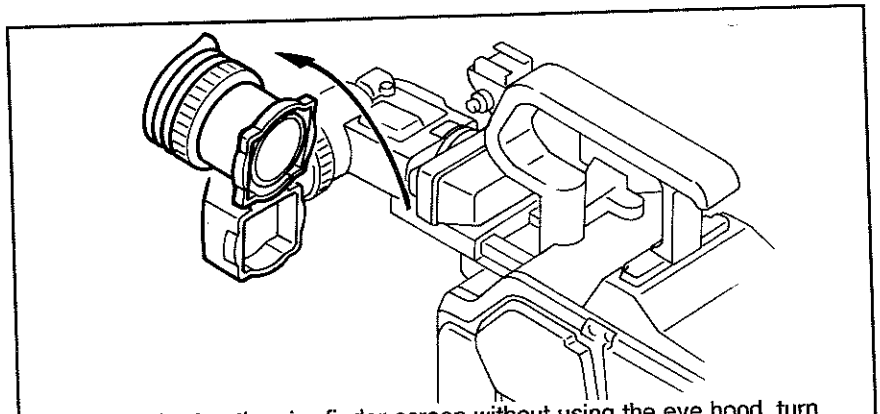
5.2.3 Eye hood adjustment



(1) Rotate the securing ring in the direction of arrow to determine an appropriate angle of the eye hood, then rotate the ring in the opposite direction of arrow to lock it.



(2) Rotate the visibility adjustment ring appropriately.



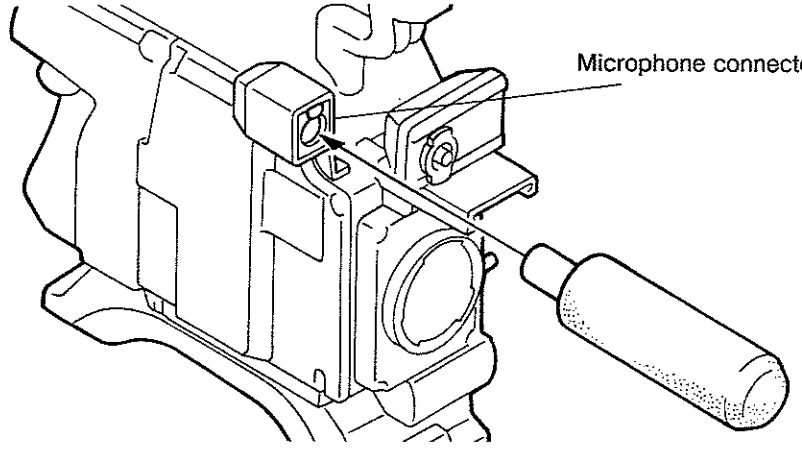
(3) When viewing the viewfinder screen without using the eye hood, turn the visibility adjustment section upward in the direction of arrow.

Warning : Never see the sun or intense light source through the eyepiece to avoid a burn or a loss o

5.3 Microphone installation

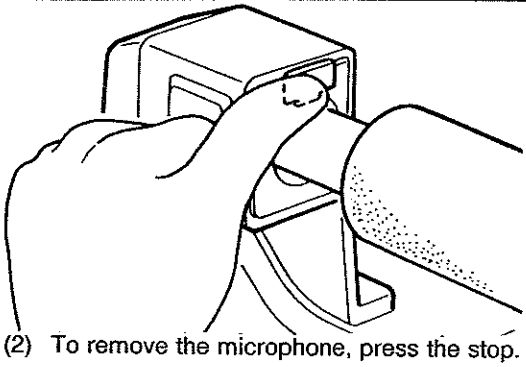
When connecting a microphone, set the MIC DC ON/OFF switch [77] and the MIC LEVEL switch [78] by referring to section 5.6.1

5.3.1 Installation of MC-C2 Microphone(option)



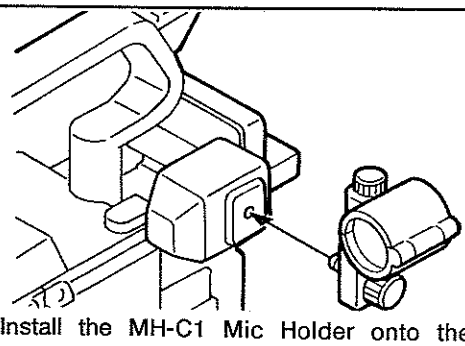
(1) Insert the microphone into the microphone connector. When it is locked, a click sounds.

Removal of microphone

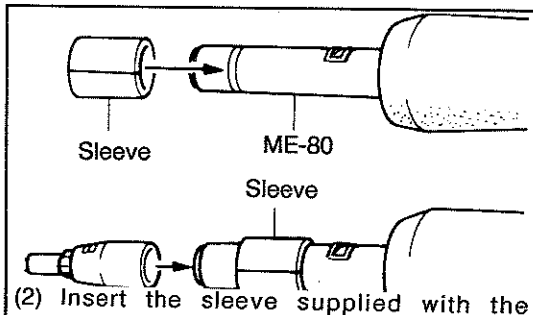


(2) To remove the microphone, press the stop.

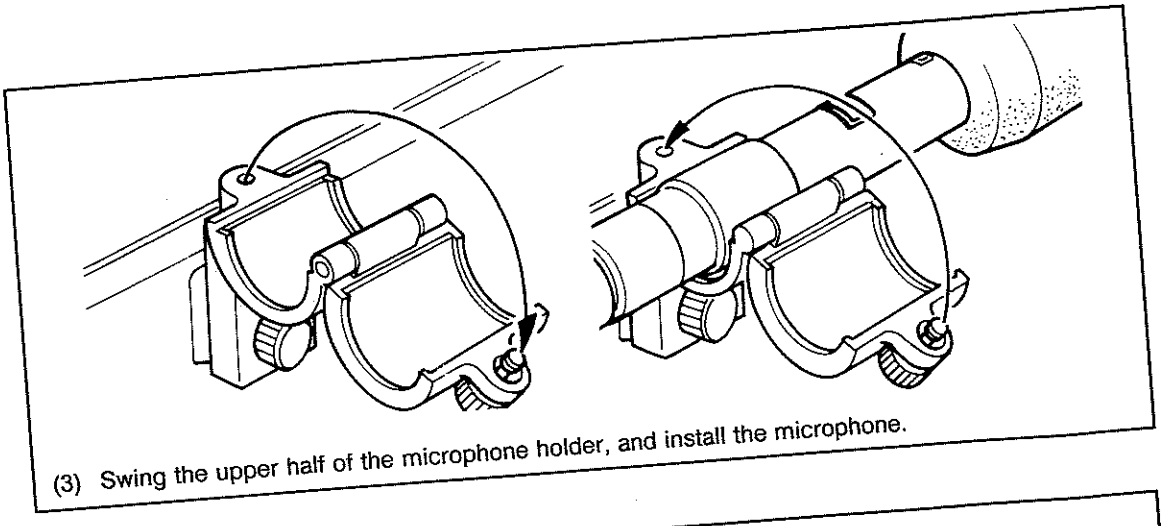
5.3.2 Installation of ME-80 Microphone(option)



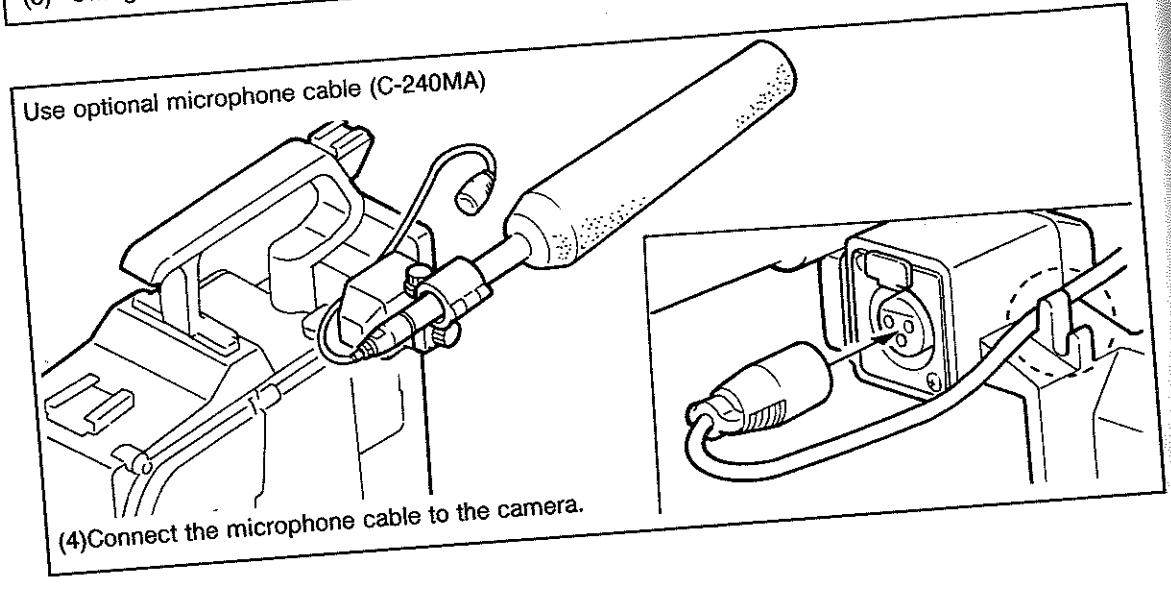
(1) Install the MH-C1 Mic Holder onto the camera side cover.



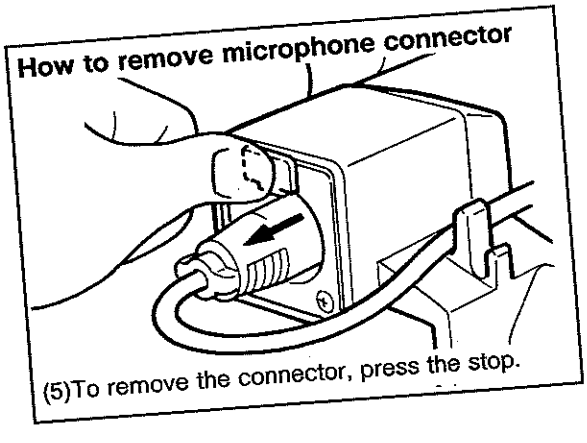
(2) Insert the sleeve supplied with the microphone holder into the microphone, and connect the connector.



(3) Swing the upper half of the microphone holder, and install the microphone.

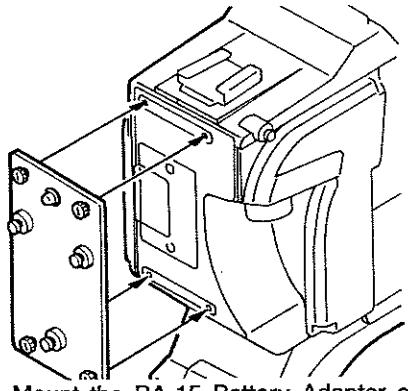


(4)Connect the microphone cable to the camera.



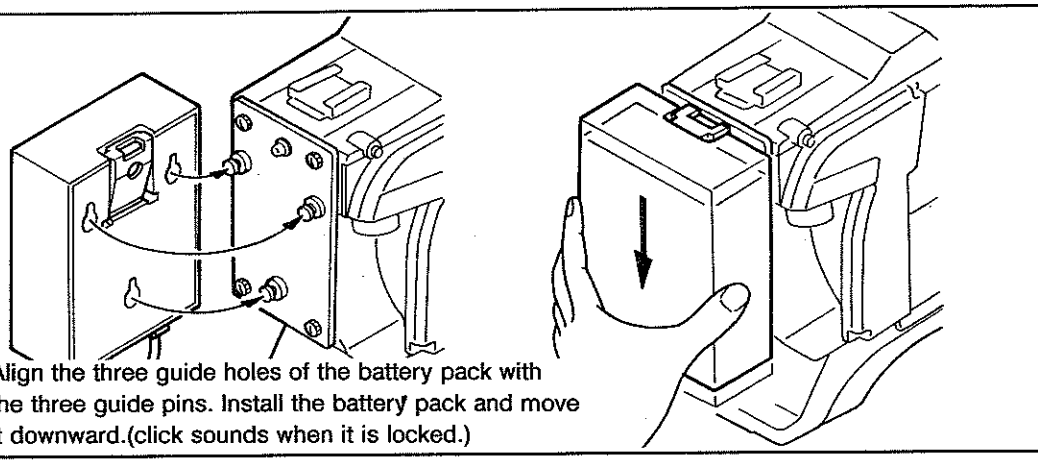
(5)To remove the connector, press the stop.

5.4 Installation of DP-15 Battery Pack(option)

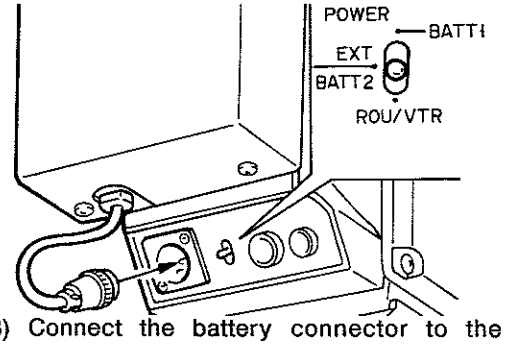


(1) Mount the BA-15 Battery Adaptor on the camera adaptor.

Note : When installing or removing a battery, set the POWER select or switch to BATT 1 or ROU/VTR.

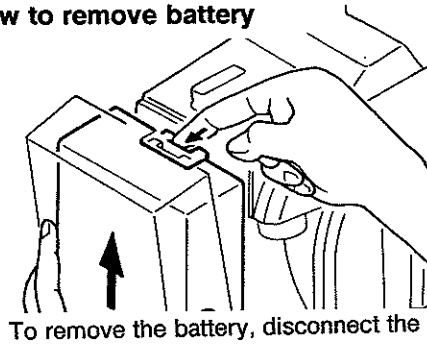


(2) Align the three guide holes of the battery pack with the three guide pins. Install the battery pack and move it downward.(click sounds when it is locked.)



(3) Connect the battery connector to the camera connector. When setting the POWER selector switch to EXT/BATT2, power is supplied from the battery.

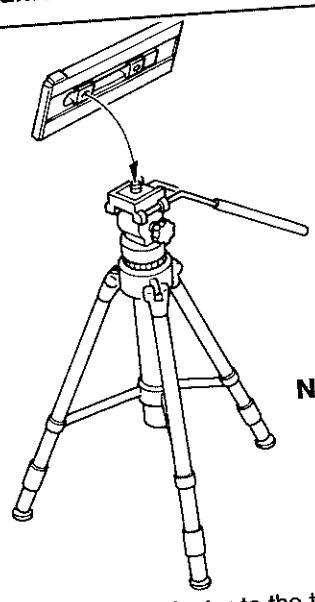
How to remove battery



(4) To remove the battery, disconnect the battery connector. Then keep pressing the lock lever of the battery pack in the direction of arrow, and lift the battery pack.

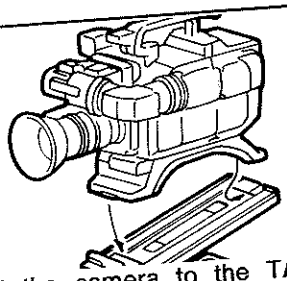
Note : To mount the DP-15, use the C-100EG Conversion Cable(option)

5.5 Mounting camera to tripod

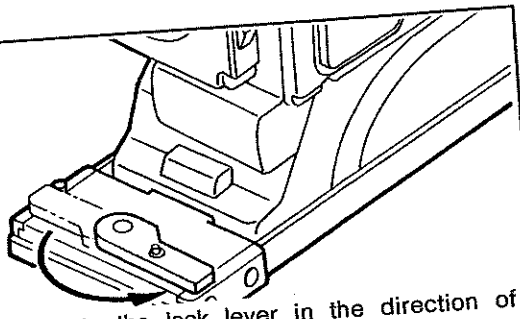


Note : 1/4"-20 UNC and 3/8"-16 UNC screw holes are provided for the tripod adaptor shoe. Select the hole in accordance with the tripod in use.

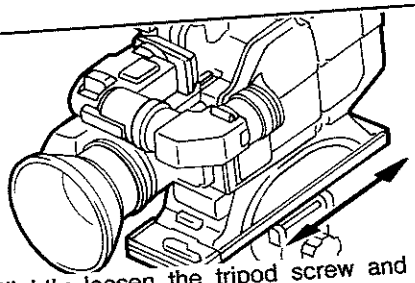
(1) Mount the TA-Z1 Tripod Adaptor to the tripod.



(2) Mount the camera to the TA-Z1 Tripod Adaptor. Align the front and rear hooks on the adaptor exactly with the hooks on the bottom of the camera.

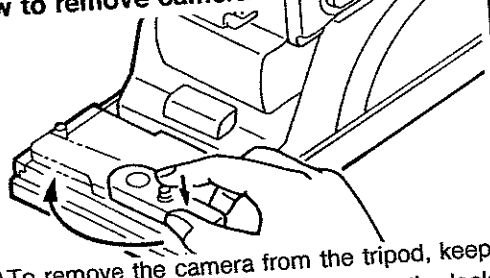


(3) Rotate the lock lever in the direction of arrow, and lock the camera. (When the camera is locked, click sounds.)



(4) Slightly loosen the tripod screw and move the tripod adaptor so that the optimum balance is obtained. Then secure the tripod screw again.

How to remove camera

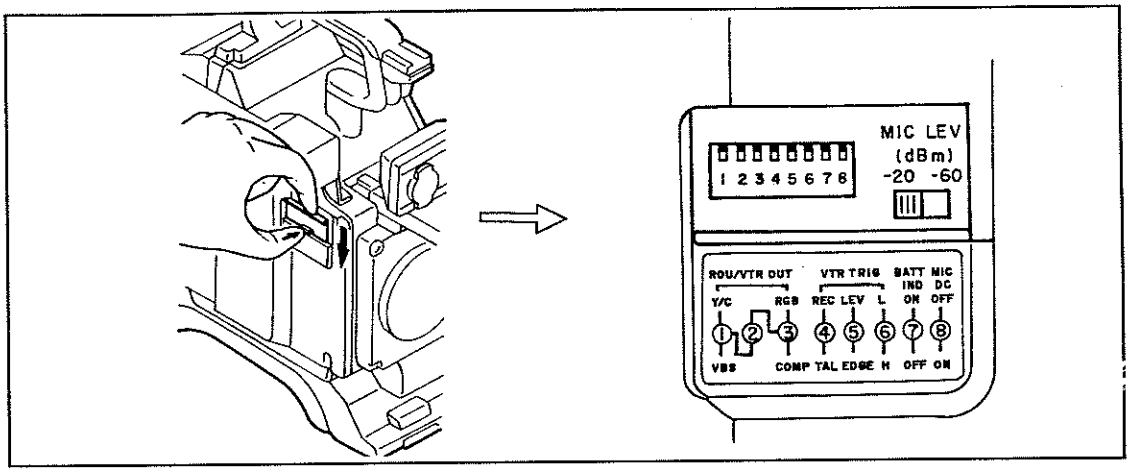


(5) To remove the camera from the tripod, keep pressing the red lock pin, and rotate the lock lever in the direction of arrow.

5.6 Connection to VTR

There are different formats of VTRs (Betacam, MII, S-VHS,U-matic and VHS), and further there are many models in each format. The control methods differ slightly in each model This camera can be connected to various types of major VTRs by setting switches behind the right side cover, the switch on the ENC unit behind the right side cover of the camera head and the switches behind the left side cover of the camera adaptor. The name and function of each switch are described below.

5.6.1 Setting of switches behind right side cover



74 ROU/VTR output switch [ROU/VTR OUT]

This switch selects four kinds of the video signals: Y/C, VBS (composite), RGB and COMP (component) to be supplied to the RU-C1 Remote Operation Unit or the VTR. (Select Y/C, VBS, RGB or COMP by the switch ②.)

Y/C: Y/C signal is fed out (when an S-VHS VTR is used).

VBS: Composite signal is fed out (when a U-matic VTR is used).

COMP: Component signal is fed out (when a Betacam or an MII VTR is used).

RGB: RGB signals are fed out (when the RU-C1 or the C-501RB RGB Cable is used).

75 VTR trigger switch [VTR TRIG]

This switch selects the mode in accordance with the interface of the VTR to be connected.

REC/TAL: Switch to select the signal for lighting the tally lamp of the viewfinder

REC: For a VHS VTR

TAL: For a VTR other than a VHS VTR

LEV/EDGE: Switch to select the VTR trigger signal

LEV: For a VTR other than the Panasonic AG7450

EDGE: For the Panasonic AG7450 VTR

L/H: Selector switch for selecting the polarity of the VTR trigger signal.

L: L polarity is established during VTR recording.

H: H polarity is established during VTR recording.

Caution: Before operating the VTR trigger switch [75], be sure to turn off the Power selector switch [47] because the microprocessor built in the camera reads the status of the VTR trigger switch [75] at camera power on.

[76] Battery indicator ON/OFF switch [BATT IND ON/OFF]

This switch selects the detecting method for the battery alarm lamp "B" of the viewfinder.

ON: The power supply voltage level in the camera and the battery indicator signal from the VTR are detected to turn on the lamp.

OFF: Only the battery indicator signal from the VTR is detected to turn on the lamp.

When this camera is docked with a Betacam or S-VHS VTR set this switch to OFF and set it to ON in the other applications.

[77] Mic DC ON/OFF switch [MIC DC ON/OFF]

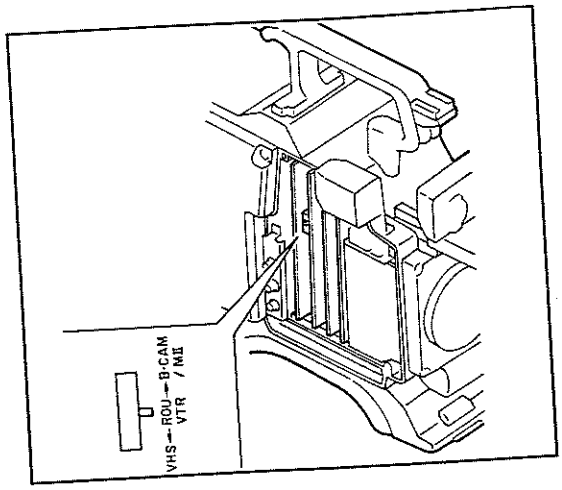
ON: When using the optional microphone MC-C2 or ME-30E, set this switch to ON.

OFF: When using the optional microphone ME-80 or any other microphone with a built-in battery, set this switch to OFF.

[78] Mic output level switch [MIC LEV]

This switch selects the microphone output level. Select the level in accordance with the connected VTR.

5.6.2 Setting of switch SW201 on ENC unit behind right side cover of camera head



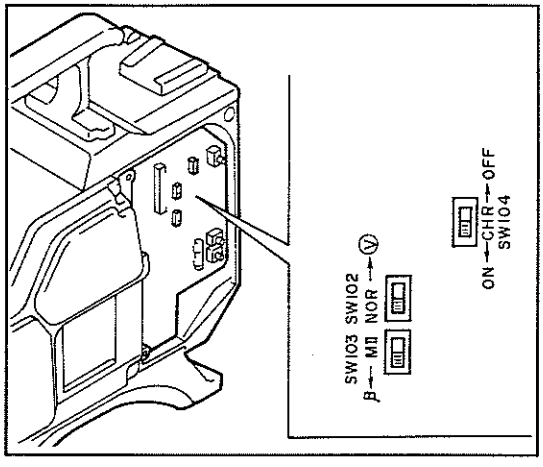
ROU/VTR: This switch is set to this position at the factory. Set this switch to this position except for connecting the following VTRs.

Betacam/MII: Set to this position only when connecting a Betacam or an MII VTR using a VTR cable (C-201VW/C-501VW).

Note: When using the VTR cable C-201TE/C-501TE, set SW201 on the ENC unit to ROU/VTR.

VHS: Set t to this position to monitor a playback picture on the viewfinder when a VHS VTR is connected. (Recording can be made even when this switch is set to ROU/VTR.)

5.6.3 Setting of switches SW102 to SW104 behind left side cover of camera adaptor



SW102:This switch is set to NOR at the factory. Set to V only when connecting a VHS VTR made by JVC. (Set this switch to NOR when connecting on S-VHS VTR.)

SW103:This switch is set to B at the factory. Set to MII only when connecting an MII VTR using a VTR cable.

SW104:This switch is set to ON at the factory. When connecting a VTR using an RGB cable (C-501RB), the sync signals are as follows

CHR ON: Sync and character signals, 1Vp-p/75 ohms

CHR OFF:Sync signal, 2Vp-p/75 ohms

Connection to various VTRs

System		Switches in right side cover: ROU/VTR OUT Y/C ① VBS ② RGB ③ COMP	REC ④ TAL	LEV ⑤ EDGE	L ⑥ H	BATT IND ⑦ ON OFF	MIC DC ⑧ OFF ON	MIC LEVEL −60 ⇔ −20	ENC SW-201 mode selection VHS⇔ ROU/VTR⇔ B-CAM/MII	Applicable VTR cable (VTR adaptor)	Major applicable VTR: Model name	Maker
1	BETA-CAM	* ↑ ↓	↓	↑	↑	↓	Note 1	−60	ROU/VTR	Not necessary	BVV-1 BVV-5	Sony
										(CAZ1HB)	PVV-1	
						↑			ROU/VTR	C-201TE C-501TE	BVW-25 Note2 BVW-35 Note2 BVW-50	
									B-CAM/MII	C-201VW C-501VW		
2	MII					↓			ROU/VTR	(CA-Z1M)	AU-400	Panasonic
										C-201TE C-501TE	AU-500 Note2	
						↑			B-CAM/MII	C-201VW C-501VW		
3	S-VHS	↑ ↓ *	↓	↑ ↓	↑	↑ ↓	Note 1	−20 −60	ROU/VTR	C-201TD C-501TD	VL-S100	Hitachi
											AG-7400	Panasonic
											BR-S400	JVC
										(CA-Z1SJ)	BR-S410	
										(CA-Z1SP)	AG-7450	Panasonic
4	Hi8	↑ ↓ *	↓	↑	↑	↓	Note 1	−60	ROU/VTR	(CA-Z1HB)	EVV-9000	Sony
											HR-C10	Hitachi Denshi
5	U-matic	↓ ↓ *	↓	↑	↑	↑		−20 −60 −60		C-201TD C-501TD	BVU-50 BVU-110 BVU-500H BVU-150	Sony
											CR-4700	JVC
											V0-4800 V0-6800	Sony
6	VHS	↓ ↓ *	↑	↑	↓ ↑	↑	Note 1	−20	VHS Note 3	C-201VT C-501VT	SV-650 SV-690	Hitachi Denshi
											VT-6800 VT-7 VT-8	Hitachi
											HR-2650 Note4 BR-6200 Note4	JVC
											NV-8420 NV-100 NV-150 NV-180 AG-6400	Panasonic

Note 1: Refer to item 77 Mic DC ON/OFF switch of section 5.6.1.

Note 2: Refer to description of SW103 of section 5.6.3.

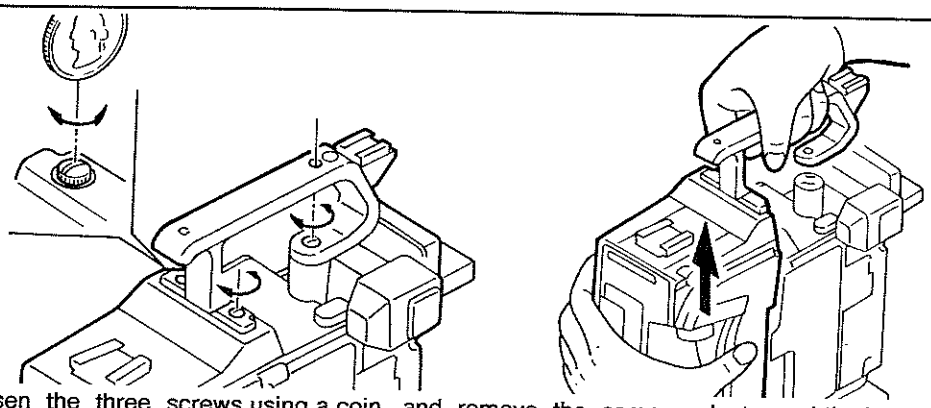
Note 3: Refer to description of SW201 of section 5.6.2.

Note 4: Refer to description of SW102 of section 5.6.3.

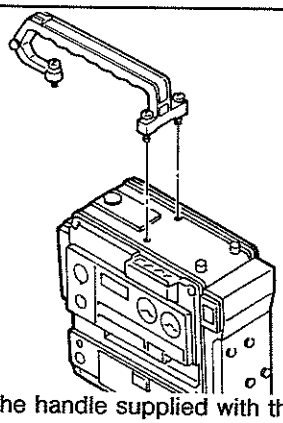
Note 5: When setting a switch, be sure to turn off the camera once completely.

* means that any position is acceptable.,

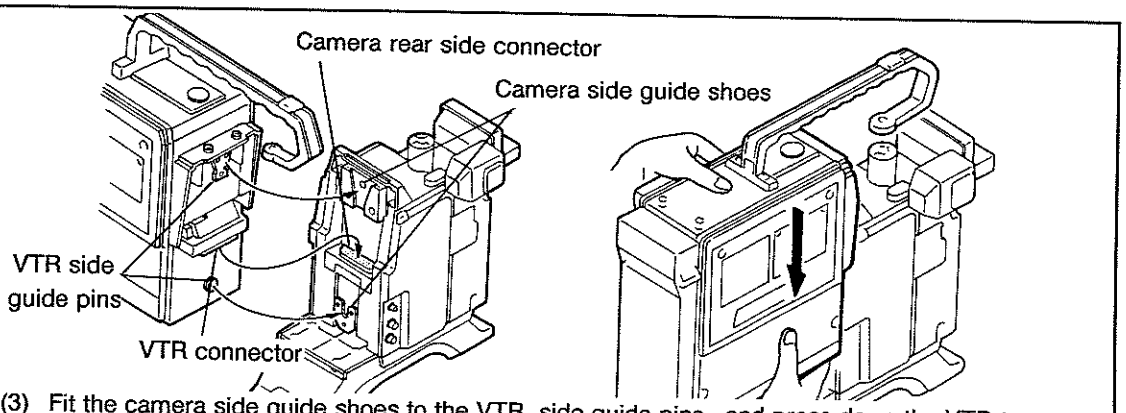
5.7 How to connect Betacam VTR (BVV-1, BVV-5)



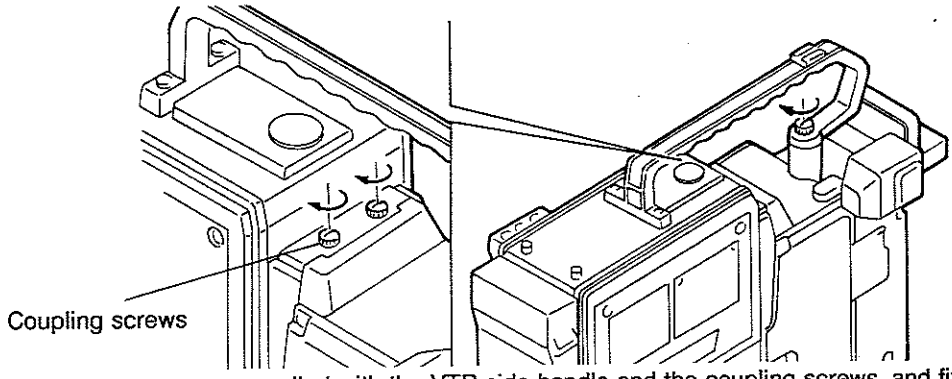
(1) Loosen the three screws using a coin, and remove the camera adaptor and the handle together.



(2) Install the handle supplied with the VTR, as shown in this figure.



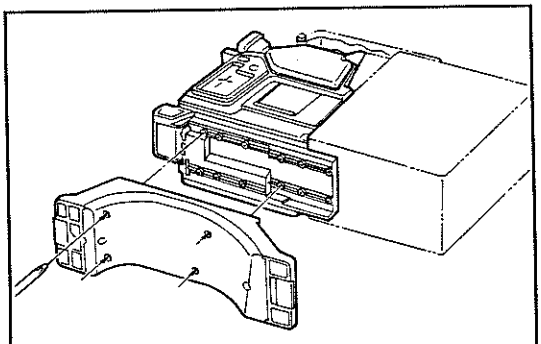
(3) Fit the camera side guide shoes to the VTR side guide pins, and press down the VTR to engage the VTR connector with the camera rear side connector.



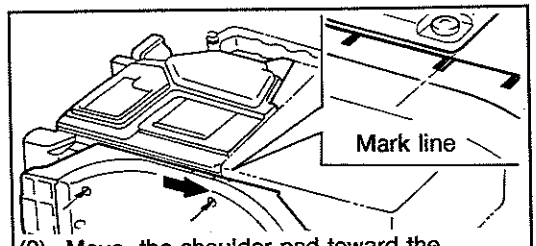
(4) Secure the screw supplied with the VTR side handle and the coupling screws, and fix the VTR to the camera.

5.8 How to move shoulder pad

When using the camera as a recording camera, the center of gravity moves according to the combined VTR. For better weight balance, the shoulder pad can be moved backward by 25mm and 45mm.



(1) Loosen the four screws on the bottom of the camera and remove the shoulder pad.



(2) Move the shoulder pad toward the rear of the camera, and fix the shoulder pad to the camera by securing the four screws. Align the mark line of the shoulder pad frame with the rear of the camera for easy positioning of the screws.

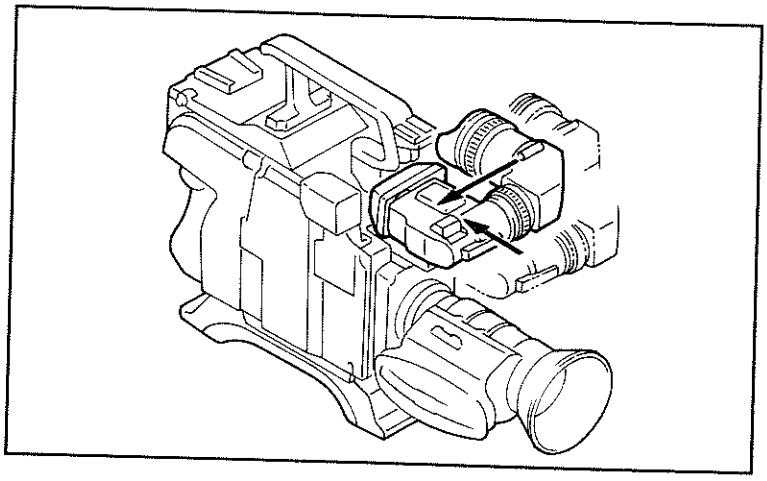
⚠Caution 1: Never use a screw of more than 12mm in length for the screw (M4 x 12mm in length) fixing the shoulder pad to avoid trouble.

Note 1: When mounting the camera adaptor on the camera, be sure to move the shoulder pad forward.

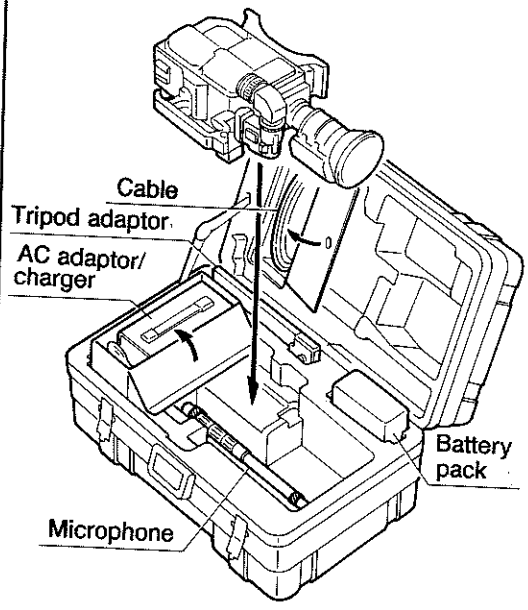
Note 2: When using an M II VTR, the shoulder pad can be moved by 25mm only.

5.9 How to store camera in carrying case

When storing the camera in the carrying case (CL-Z1), move the viewfinder to the ends in the direction of arrows. For removal of the viewfinder, refer to section 5.2.2.

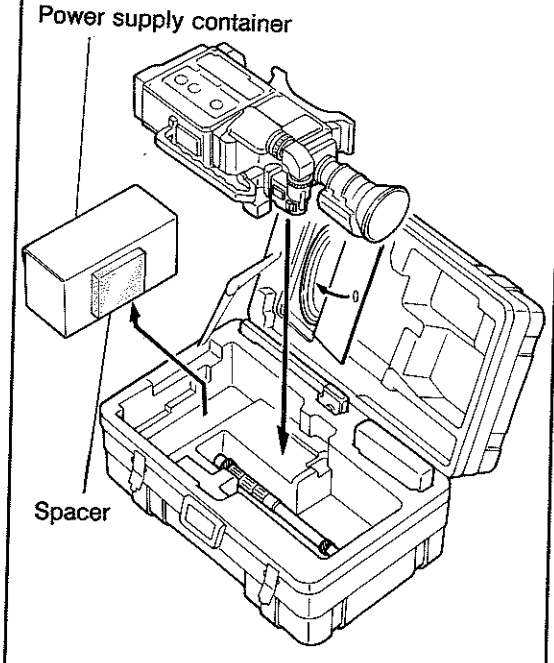


(1) How to store camera and camera adaptor



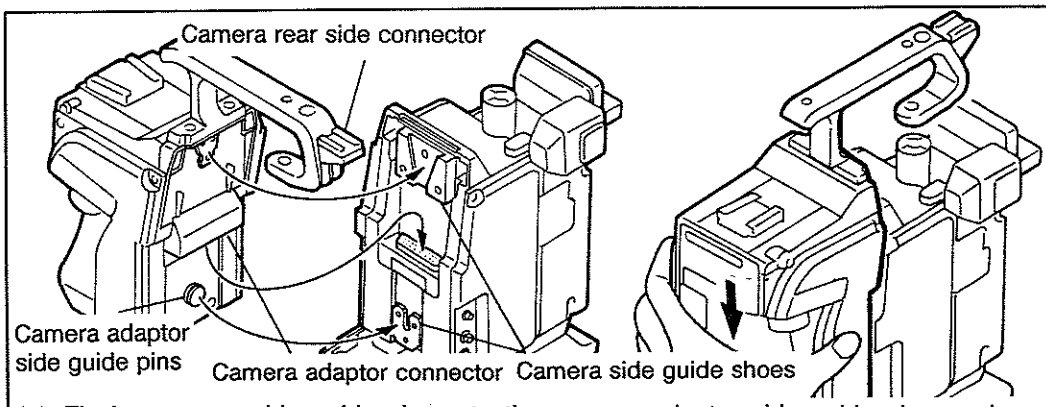
Note: A spacer is stuck on the power supply container. When storing the camera in the carrying case with the battery adaptor mounted on the rear of the camera adaptor, remove the spacer.

(2) How to store camera docked with Betacam recorder (BVV-5)

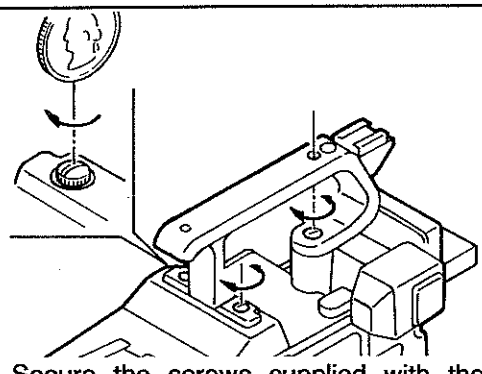


When sotring the camera docked with Betacam recorder (BVV-5) in the carrying case, remove the power supply container and the spacer together.

5.10 How to install camera adaptor (CA-Z1)

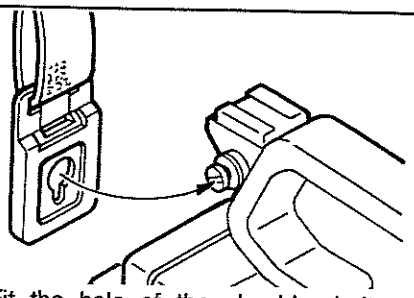


(1) Fit the camera side guide shoes to the camera adaptor side guide pins, and press down the camera adaptor to engage the camera adaptor connector with the camera rear side connector.

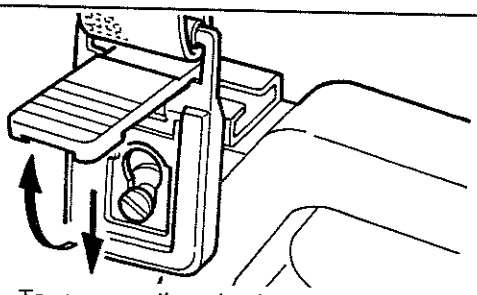


(2) Secure the screws supplied with the handle using a coin, and fix the camera adaptor to the camera.

5.11 How to install shoulder belt (SB-1) (option)

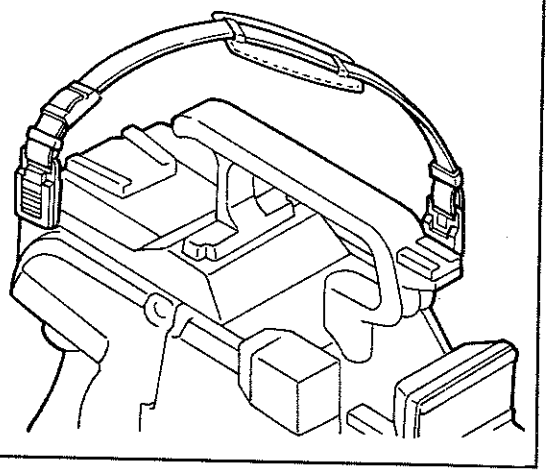


(1) Fit the hole of the shoulder belt to the camera side hook. Lift the belt, pressing it to the hook. A click sounds when locked.

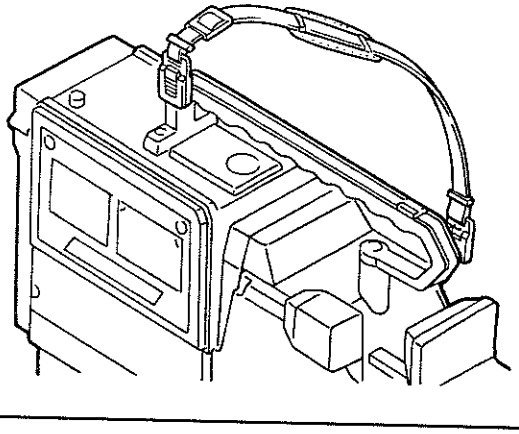


(2) To remove the shoulder belt, open the cover of the shoulder belt in the direction of arrow and lower the belt.

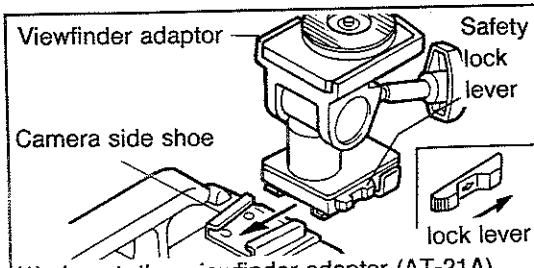
In the case of camera only



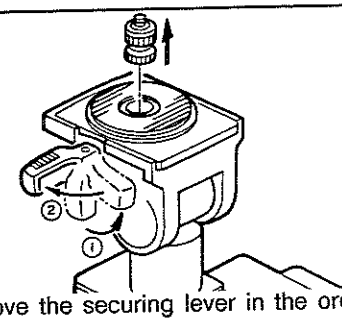
In the case of recording camera



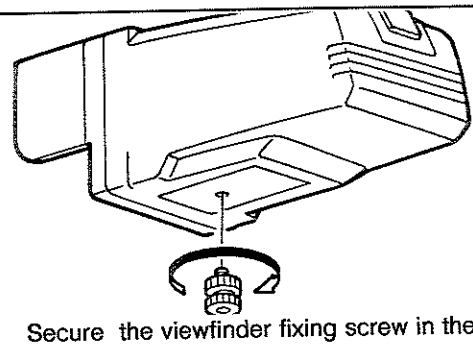
5.12 How to install 5-inch viewfinder (GM-50) (option)



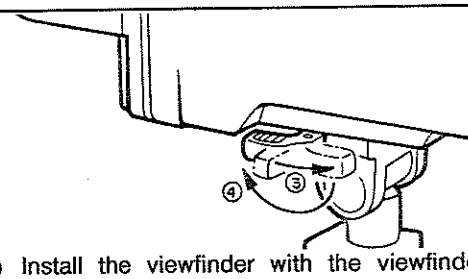
(1) Insert the viewfinder adaptor (AT-21A) into the camera side shoe to install the adaptor. Then, slide the safety lock lever in the direction of arrow to lock the lever.



(2) Move the securing lever in the order of ① and ②, and remove the viewfinder fixing screw.

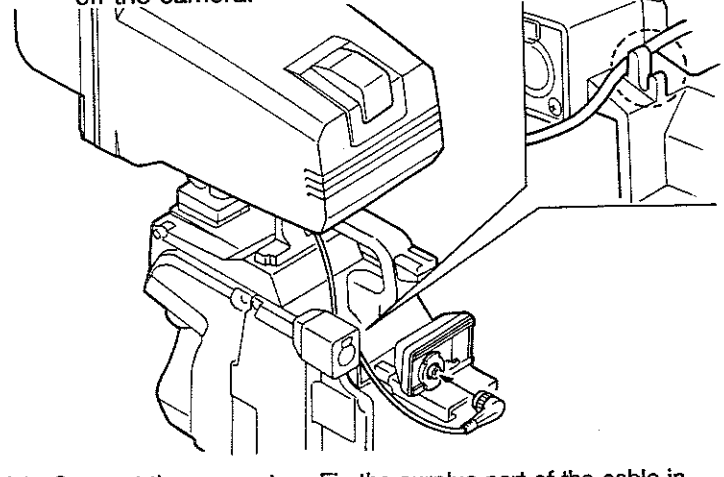


(3) Secure the viewfinder fixing screw in the fixing hole on the bottom of the viewfinder.



(4) Install the viewfinder with the viewfinder fixing screw mounted in the viewfinder adaptor. Move the securing lever in the order of ③ and ④, and fix the viewfinder.

Note: Prior to installing and removing the viewfinder, turn off the camera.



(5) Connect the connector. Fix the surplus part of the cable in the cable clamp.

6. OPERATION CHECKS AND INITIAL ADJUSTMENT

Upon completion of the connection and preparation of lighting equipment, perform the operational checks of the camera in the order described below. Conduct the initial adjustment when the camera has not been used for a long period of time.

(1) Color bar check

Turn on power and set the POWER selector switch [47] to ON.

color bar signals are obtained from the VIDEO OUT connector when the power ON/OFF switch [15] is set to ON and the BAR/CAM switch [21] is set to BAR. Check the black balance, white balance and color bar vectors of the color bar signals.

(2) Video signal check

A color video signal is obtained from the VIDEO OUT connector when the BAR/CAM switch [21] is set to CAM and the filter disc is set to "1."

Check white balance and black balance as follows:

(a) Set the GAIN switch [22] to 0dB.

(b) Set the color temperature filter disc [14] to the position corresponding to the color temperature of the lighting source. Refer to the table on page 35 for the filter disc types and their usage.

(c) Set the white balance mode switch [20] to MEM1 or MEM2.

(d) Set the AUTO WHT/AUTO BLK switch [19] to the bottom position. The lens iris closes for several seconds and black balance is set.

(e) Shoot a white object to display it on the entire screen. (Use care not to allow reflections from the light source or strong reflected light to shine on the object.)

(f) Set the AUTO WHT/AUTO BLK switch [19] to AUTO WHT, and white balance is set in several seconds. When the white balance has been set, the message "AUTO WHITE: OK" appears on the viewfinder screen. This completes the setting of the white balance and black balance. Both data are held in the memory even when the power is switched off and so there is no need to reset the black and white balance under the same conditions. (The memory is retained for approximately 10 years.)

(g) When the color temperature of the lighting source changes

The white balance changes when the color temperature of the lighting source changes. In such cases, reset the white balance according to the color temperature of the lighting source by the color temperature filter disc [14]. Select the filter disc number by referring to the table on page 35.

Filter disc number	Color temperature	Type of lighting source
1	3,200K	Tungsten or halogen lamps
2	5,600K	For outdoor use
3	5,600K + 1/8ND (VF display: 5600K + ND)	When ND filter is required (too bright) in outdoors

o Auto white balance setting

Take steps (e) and (f) for setting the auto white balance. Even such a big white object is not available, the auto white balance can be set if the following three conditions are satisfied:

(1) There must be a white object with an area which is more than 10% of the whole screen.

(2) The white object must be brighter than any other objects.

(3) The signal level of the white object must be between 100% and 70%.

Note 1: The auto black balance and auto white balance can be set with the lens IRIS AUTO/MAN switch set to A (auto) or M (manual). If it is set to M when setting the black balance, the iris will close automatically and the auto black balance will be set. However, the iris will remain closed and must therefor be opened manually. When set to the A position, the iris will open to have the appropriate value after completion of the setting.

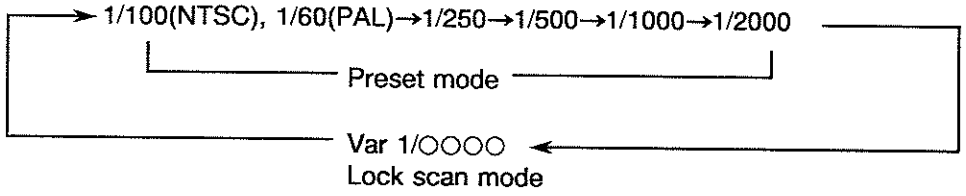
Note 2: The AUTO WHT/AUTO BLK switch [19] must be operated properly. If this switch should be flipped with a finger, the intended operation may not be obtained. This switch is operated with light force. Use care not to touch this switch accidentally.

7. ELECTRONIC SHUTTER FUNCTION

In addition to the preset 5-step electronic shutter mode, this camera is provided with the lock scan mode which enables to set the shutter speed continuously in 1H steps (horizontal period). As the shutter speed can be set arbitrarily down to approximately 1/2000 seconds, it is possible to correspond the shutter speed with a scan speed of a display unit when shooting the screen of the display unit operated on a different scan frequency. Thus, a picture without flicker is obtained.

7.1 Setting of shutter mode

Set the SHUTTER switch [13] to ON. Each turning the switch upward changes shutter speed in the following sequence and the selected shutter speed is displayed for about three seconds on the viewfinder screen. When the selected shutter speed disa-ppears, the setting finishes and the shutter speed data is memorized to the camera



7.2 Setting of shutter speed in lock scan mode

When the UP switch [29] or the DOWN switch [31] is pressed while "Var.1/OOOO" is being displayed (for about six seconds), a shutter speed is chaged as follows.

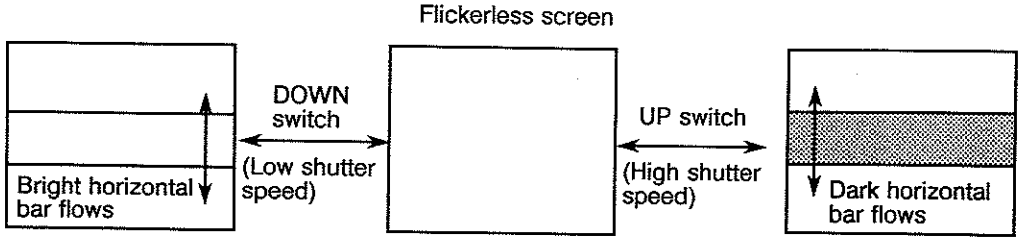
1/61.58 ⟷ 1/2098 (NTSC)

DOWN ⟷ UP

1/51.15 ⟷ 1/2028 (PAL)

Set a shutter speed appropriately.

When shooting the screen of a display unit operated on a different scan frequency, a bright or dark horizontal bar flows upward or downward on the screen as shown below. In this case, press the UP or DOWN switch [29] or [31], and select the shutter speed so that the horizontal bar is minimum (flickerless).



Memo

1. Each pressing the UP or DOWN switch [29] or [31] changes the shutter speed in 1H steps (horizontal period). However, continuous pressing the switch changes the shutter speed continuously.
2. When the UP and DOWN switches [29] and [31] are pressed simultaneously while "Var. 1/OOOO" is being displayed, the shutter speed is reset to the initial value : 1/61.58(NTSC), 1/51.15(PAL).
3. Though the shutter speeds in hte preset mode are expressed comprehensively, the actual speeds are as listed below .

Display in preset mode		Actual shutter speed in lock scan mode NTSC	PAL
1/60(PAL)	:	———	1/59.98
1/100(NTSC)	:	1/100.5	———
1/250	:	1/251.8	1/250.0
1/500	:	1/499.5	1/496.0
1/1000	:	1/1015	1/1008
1/2000	:	1/2098	1/2083

4. When the camera is used with the Remote Operation Unit (RU-C1) and the Remote Control Box (RC-C1, RC-C10, etc), see10.3.

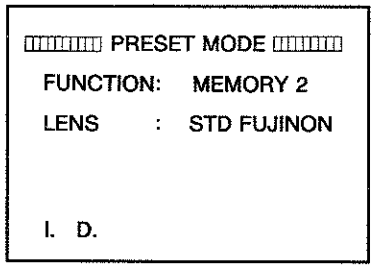
Note:

1. As the shutter speed becomes higher, the dynamic resolution of a moving object increases. However, the sensitivity becomes lower. When the camera is used indoors, use appropriate illumination.
2. In the NTSC area, when the scan frequency of the display screen is 60Hz or lower, shooting in the flickerless mode is not available.

8. REAL-TIME AUTO WHITE BALANCE

This camera is provided with a newly developed real-time auto white function in addition to the conventional auto white function (six memories). This function detects the signal of a white portion in the scene shot by the camera and the built-in microprocessor corrects white balance in real time. This function automatically corrects white balance when color temperature changes. Change the mode to this real-time auto white balance mode according to the following steps.

(1) Set BAR/CAM switch [21] to CAM.
(2) Set the CPU PRESET switch [27] to ON, then the following characters are displayed on the viewfinder screen.



(3) Press the M BLK switch [28], then the display on the line FUNCTION: changes from MEMORY 2 to AUTO. (Each pressing this switch changes the display from AUTO to MEMORY 2 or from MEMORY 2 to AUTO.)
(4) Set the CPU PRESET switch [27] to OFF. Then, the real-time auto white balance mode is established by setting the white balance mode switch [20] to MEM2/AUTO.

Notes for operating the real-time auto white balance function

The real-time auto white balance function detects the signal of the brightest portion except a portion shining with high luminance such as light in a scene, and processes so that the brightest portion becomes white by the built-in microprocessor. This method utilizes the condition that a white portion is normally included in a scene. Therefore, the error of white balance will increase in the following scenes. Use this function properly in consideration of its features.

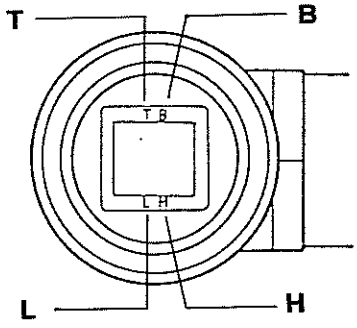
(1) When there are objects in the same scene which are illuminated by light sources of different color temperatures, white balance is set for an object whose luminance is higher than the other.
Example: Room illuminated by lighting equipment and room shone by sunlight
Example: Outdoor place under sunlight with some shadows
(2) When there is no white portion in scene, a bright portion is processed as white.
Example: When displaying light color similar to white on the entire screen, the light color becomes lighter.
Example: When shooting a man's face in close-up, even subtle change of the flesh tone may cause a sense of incongruity because the flesh tone is a memory color.

It is recommended to shoot an object under single lighting in the mode of MEMORY1 or 2.

9. Display of viewfinder screen

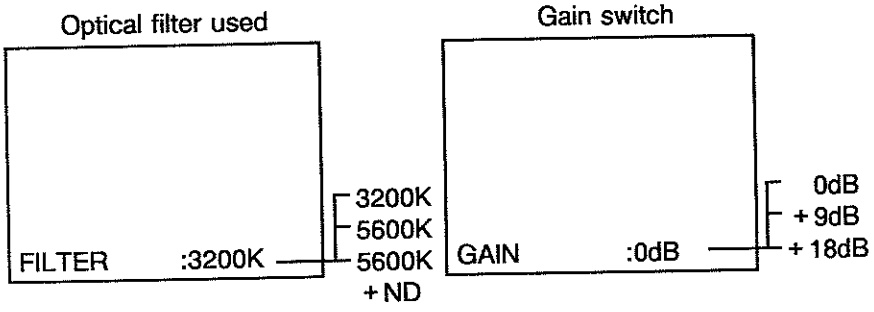
9.1 The following various types of information are displayed on the viewfinder screen.

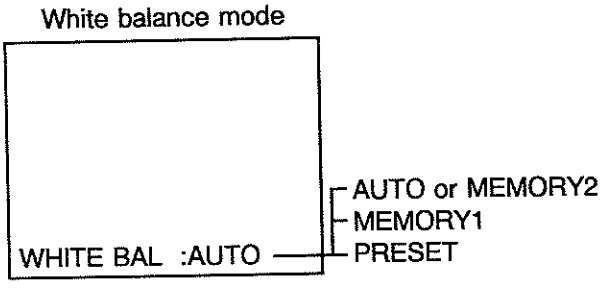
Warning and status display ... The red LEDs on the top and the bottom outside the screen light.



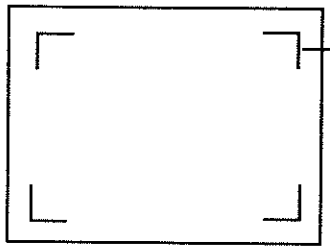
T (tally display) ..... Under recording
B (battery alarm) ..... Battery voltage drops. If this indicator lights, charge the battery immediately.
L (low light level) ..... Insufficient light quantity. If this indicator lights, increase lighting or set the gain switch to 9dB or 18dB.
H (high gain mode) ... The video circuit is being activated with increased gain of 9dB or 18dB.

9.2 Switch selection display ... When a switch is operated, the status of the switch is automatically displayed.
When operating the following switches, the status of the switches is displayed for about three seconds.





9.3 tatus check ... Press the CHECK button, and marks for status check wil appear.



Safe title marks for shooting indicate the range where a picture can be observed on the screen of a normal overscan color monitor. (Note)

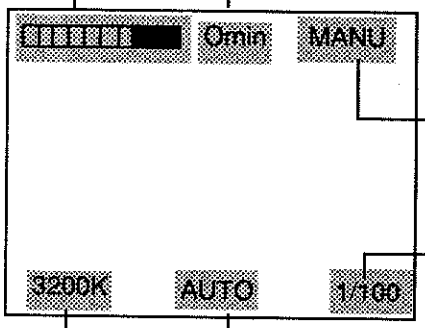
Press the button further.

Note:

Shooting area

The viewfinder is set to the just scan mode so that the entire picture being shot can be observed. On the other hand, since a normal color monitor is set to about 5% over scan mode, the entire picture cannot be observed.

Therefore, when shooting, do not fix the composition on the entire screen of the viewfinder, but allow 5 to 10% space inside the top, bottom, right and left edge of the viewfinder screen. For the reference, the safety zone mark can be displayed.



Audio level indicator (Note 1)

0min~100min
Record lapse of time
(Note 2)

t>15min, t>10min, t>5min, t<2min, end
Tape remaining time display *2

AUTO/MANU/REMOTO
REMOTE mode display (Note 2)

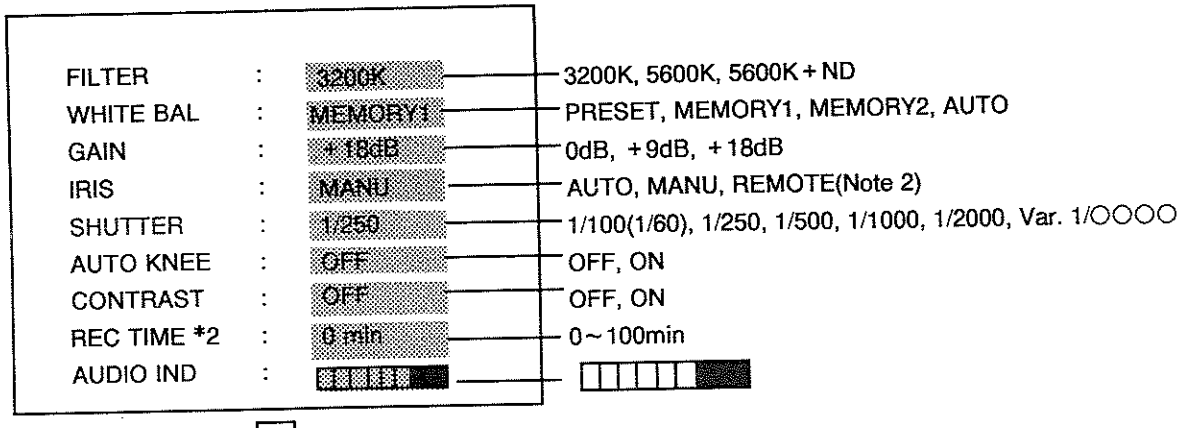
OFF, 1/100(1/60)/1/250/1/500/1/1000/1/2000 Var. *1
Shutter speed set

PRESET, MEMORY1, MEMORY2 or AUTO
Setting of white balance mode switch

3200K/5600K/5600K+ND
Setting of color temperature filter

Press the button further.

*1 Though this indicates the lock scan mode, a shutter speed is not displayed.



Press the button further.

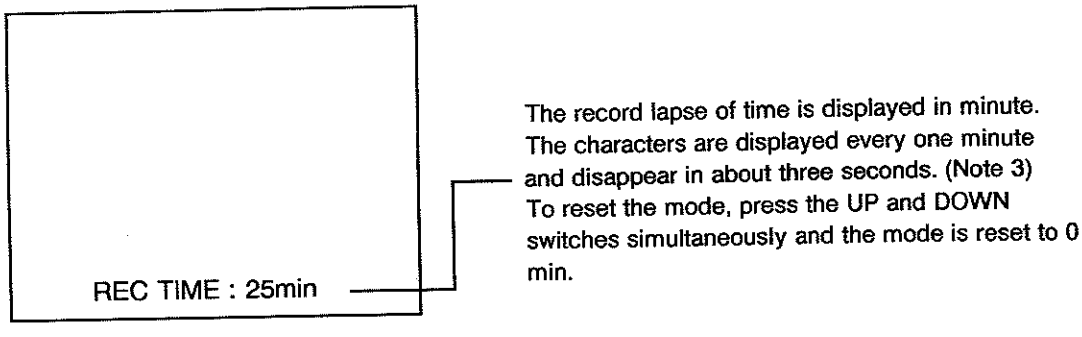
The display disappears.

*** 2**

When using the camera as a recording camera combiend with a Betacam VTR, the tape remaing time is displayed.

t>15min:	Tape remaining time is 15 minutes or more
t>10 min:	Tape remaining time is 10 minutes or more
t>5min:	Tape remaining time is 5 minutes or more
t>2min:	Tape remaining time is 2 minutes or more
t<2min:	Tape remaining time is 2 minutes or less (Tally lamp blinks at 1Hz)
End:	Tape end (Tally lamp blinks at 4Hz.)

Display of record lapse of time



The record lapse of time is displayed in minute. The characters are displayed every one minute and disappear in about three seconds. (Note 3) To reset the mode, press the UP and DOWN switches simultaneously and the mode is reset to 0 min.

(Note)

1. Audio level indicator

As the level of the mic becomes higher, □ increases. When the level exceeds an appropriate level, ■ is displayed. When the camera adaptor is installed, the audio output level from the camera is displayed. When a VTR is docked to the camera, the return signal level of the VTR is displayed.

2.REMOTE mode

REMOTE is displayed only when the RU-C1, the RC-C1, the RC-C10 or the RC-C11 is connected, the level is remote-controlled, and the iris mode switch on the RU-C1, the RC-C1, the RC-C10 or the RC-C11 is set to REMOTE.

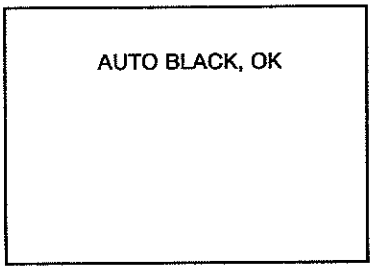
3. Record lapse of time

The record lapse of time is calculated by accumulating the time when the tally lamp is lit and displayed. When the time exceeds 100 minutes, the time returns to one minute.

9.4 Display of auto black balance

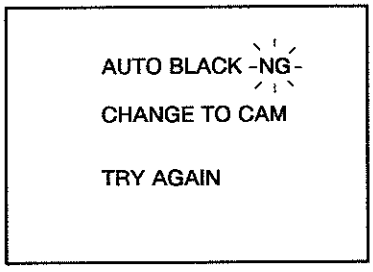
When the AUTO WHT/AUTO BLK switch [19] is set to the AUTO BLK, auto black operates and the results are displayed as shown below.

(1) When results are normal



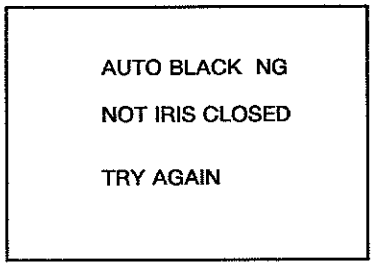
Displayed for approx. three seconds.

(2) When the BAR/CAM switch [21] is set to BAR

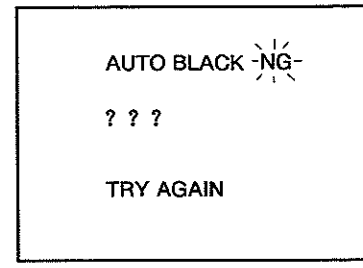


Displayed for approx. six seconds.

(3) When the lens iris does not close

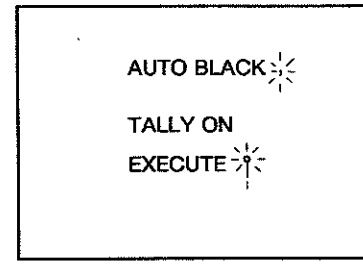


(4) When adjustable range of black balance is exceeded



Displayed for approx. six seconds.

(5) When tally lamp is lit during recording or on-the-air.



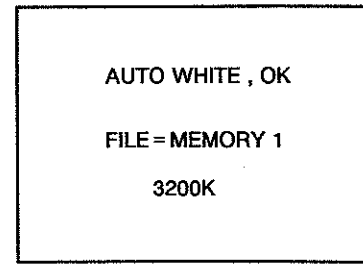
Displayed for approx. six seconds.

To execute auto black balance, set the switch to the bottom position again during this display.

9.5 Display of auto white balance

When the AUTO WHT/AUTO BLK switch [19] to is set to AUTO WHT, auto white operates and the results are displayed as shown below.

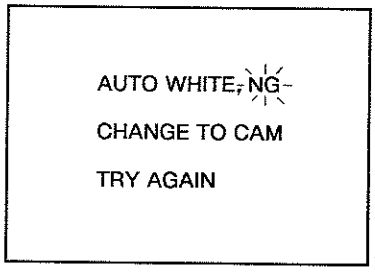
(1) When results are normal



Displayed for approx. three seconds.

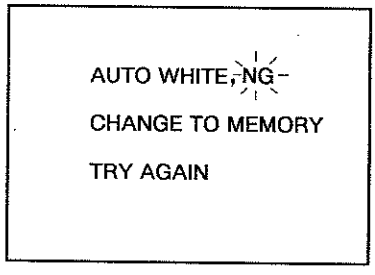
The file to be stored in the memory (status of the color temperature filter disc [14] and the white balance mode switch [20]) is displayed.

(2) When the BAR/CAM switch [21] is set to BAR



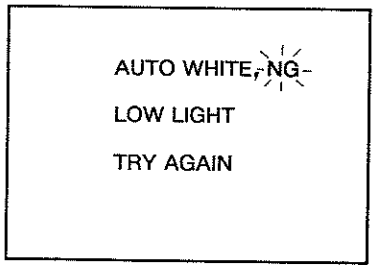
Displayed for approx. six seconds.

(3) When the white balance mode switch [20] is not set to MEM1 or MEM2



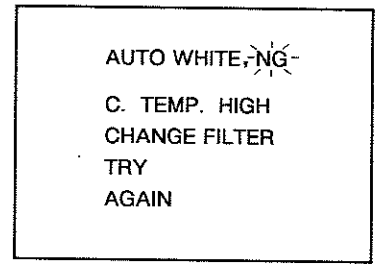
Displayed for approx. six seconds.

(4) When the L lamp in viewfinder lights because of insufficient light



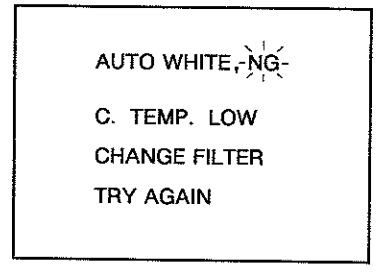
Displayed for approx. six seconds.

(5) When white balance cannot be obtained because color temperature is too high.



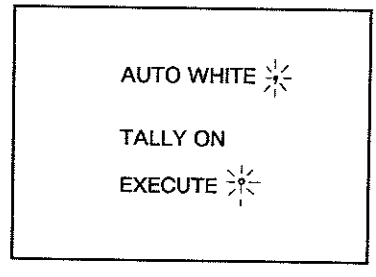
Displayed for approx. six seconds.

(6) When white balance cannot be obtained because color temperature is too high



Displayed for approx. six seconds.

(7) When the tally lamp lights during recording or on-the-air.



Displayed for approx. six seconds.

To execute auto white balance, set the switch to ALT WHT again during this display.

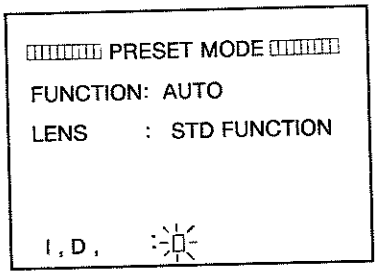
9.6 ID display

The ID signal (with 14 characters) can be added to the color bar signal (composite signal, Y/C signals and component signal).

Display of ID characters
Each pressing the CHECK switch [16] turns on/off the written ID characters in the BAR mode.

How to write ID characters

(1) Set the BAR/CAM switch [21] to BAR.
(2) Set the CPU PRESET switch [27] to ON, then the following characters are displayed on the viewfinder screen and the cursor blinks on the ID line at the bottom of the screen.



(3) Move the cursor to the desired position with the UP switch [27] and the DOWN switch [31] .
(4) Press the M BLK switch [28] , then the cursor disappears and characters appear when they have been written. Press the UP and DOWN switches [29] [31] , then characters change.
(5) Press the M BLK switch [28] , then the characters stop blinking, and a cursor appears on the right side of the characters and blinks. Repeat these steps to write ID characters. Up to [14] ID characters can be written.

10. ADJUSTMENT AND CONFIRMATION OF CAMERA OPERATION

10.1 Adjustment needed for lens replacement

Take the following steps when replacing the lens.

(1) Ajustment of back focal distance (back focus ring)

In the case the accurate focus is not obtained when the lens is zoomed in and out, take the following steps.

① Set the AUTO/MANU switch of a lens to MANU.

② Open the iris fully.
Apply light to the object so that the proper video level is obtained with the iris opened.

③ Loosen the screw securing the back focus ring of the lens.

④ Set the zoom servo lever to the telephoto end.

⑤ Shoot an object at a distance of 3m or more while adjusting the focus by the focus ring.

⑥ Set the zoom servo lever to the wide end.

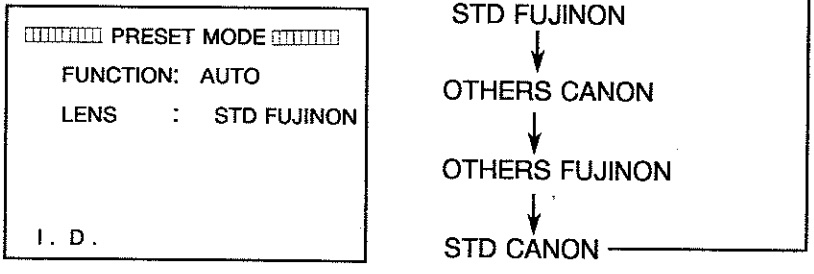
⑦ Adjust the back focus ring of the lens, and focus on the same object as 5 without adjusting the focus ring.

⑧ Repeat the steps 4 to 7 two or three times so that the object can be focused at both telephoto and wide ends.

⑨ Fasten the securing screw of the back focus ring of the lens.

(2) Lens setting

Set the CPU RESET switch [27] to ON, then the following screen is displayed on the viewfinder. Each pressing the CHECK switch [16] changes the messages on the viewfinder in sequence as follows.



(Note) When using the camera in the "OTHERS CANON" or "OTHERS FUJINON" mode, lens mode character (AUTO, MANU or REMOTE) is not correctly displayed on the Viewfinder. This is not a fault.

Select the appropriate setting in accordance with the lens used.

Display on viewfinder screen	Lens in use
STD FUJINON	A16x9.5BRM-17B(Fujinon) A16×9.5BRM-17C (Fujinon) A12x10BRM-7 (Fujinon lens for FP-C1)
OTHERS CANON	J15x9.5B4KRS (Canon lens for FP-Z31)
OTHERS FUJINON	A16x9.5BRM-17 (Fujinon lens for FP-Z31)
STD CANON	J15x9.5B4KRSH (Canon lens for FP-C1/C2) J15x9.5B4KRSH II (Canon lens for FP-C1/C2) J15x9.5B4IRSHX-6(Canon)

In this state, shoot an electric bulb and the like and set the iris to the value just before close with the UP switch [29] and DOWN switch [31] . The resultant f value *1 is the limit point to stop down the lens in the auto iris mode. After completion of the above adjustment, set the CPU PRESET switch [27] to OFF.

*1 The standard setting of the f value is between 16 and C.

Note: When using a lens other than supplied, registration errors and deterioration of resolution may occur because of the scale factor aberration of the lens.

10.2 Masking adjustment

The masking is used for the fine color adjustment, subtle hue adjustment of flesh tone, and color balance between cameras.

(1) Remove the left side cover of the camera head, and set MASK SW3 on the PRC unit to ON.

(2) Adjust RV24 (B-G), RV25 (R-G), RV26 (R/B) and RV27 (G-R/B) while observing a vectorscope or a picture. Note that each color does not change independently because of the masking system.

10.3 Connection to RU-C1, RC-C1, RC-C10 and RC-C11

(1) To connect the RU-C1 Remote Operation Unit, install the ROU adaptor (ROU-ADP) supplied with the RU-C1, as shown in Fig. A.

How to install ROU Adaptor (ROU-ADP) Unit

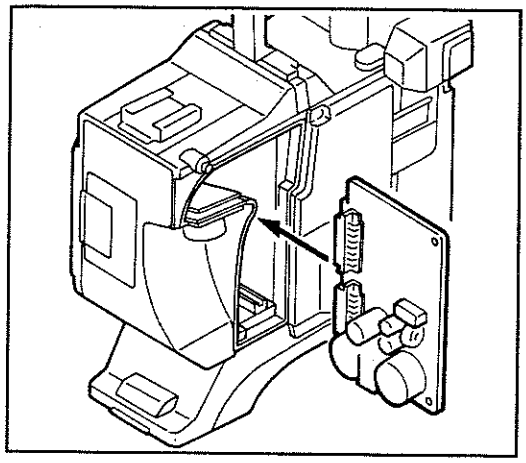


Fig. A

① Remove the right side cover, then insert the ROU Adaptor Unit along the guide rail.

② Ensure that the unit is surely inserted, then install the right side cover of the camera adaptor.

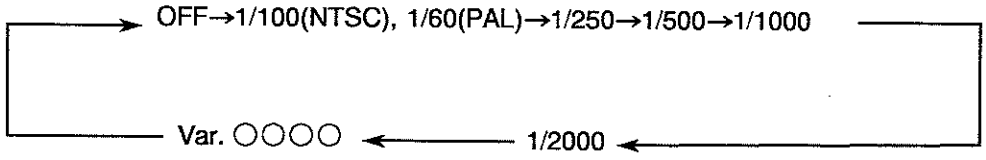
Note: A shield plate is supplied with the ROU adaptor unit.
This plate is for the FP-C1/-C2 series cameras, not for this camera.

(2) When the camera is used with the RU-C1/RC-C1 and RC-C10, the switch capabilities are changed as listed below.

	RU-C1/RC-C1		RC-C10	
Switch name (mode)	AUTO SETUP	WHITE BALANCE (MEMORY2)	OPTION 1	OPTION 2
New capability	SHUTTER*1, 2	MEMORY/AUTO*1	SHUTTER*2	CHECK

*1 As the actual capabilities differ from the marked functions, affiy the enclosed labels to the positions labeld Ⓑ and Ⓒ in the figure.

*2 Each pressing (or turning upward) the switch changes a chutter speed in the following sequance.



The shutter speed set in the lock mode cannot be changed in the remote control mode. To change the speed, use the SHUTTER switch [13] and the UP or DOWN switch [29] or [31] . When the power is turned or after power off, the shutter speed becomes off regardless of the previous setting state. When using the camera at a shutter speed other than off, set the shutter speed again.

*The RC-C11 is not provided with the CHECK switch.

Remote Operation Unit (RU-C1)

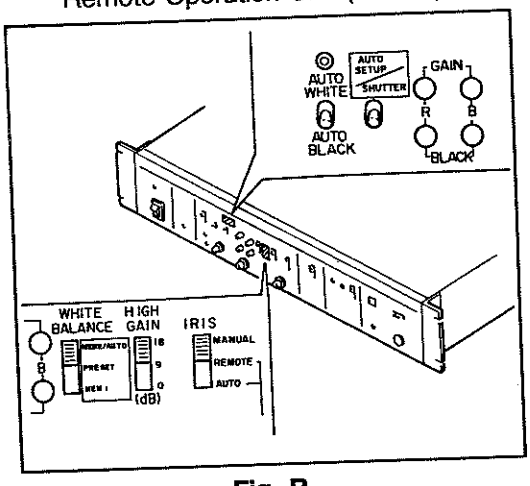


Fig. B

Remote control box (RC-C1)

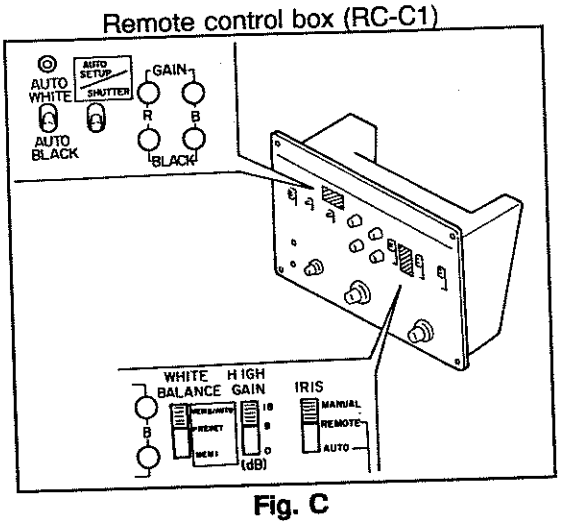
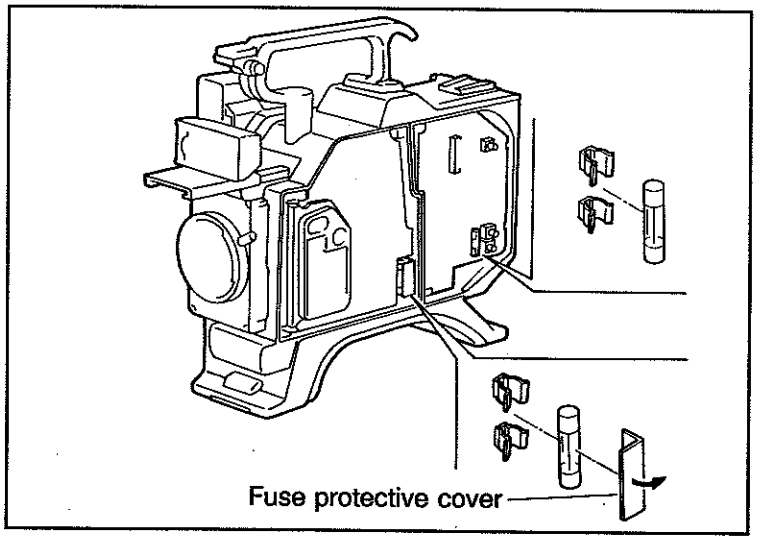


Fig. C

Operating considerations for the Remote Control Box RC-C1

The RC-C1 is an optional remote control box which controls the auto white, auto black, lens iris, high gain switch function, and the external sync phase. When the RC-C1 is connected to the camera or the Remote Operation Unit RU-C1, the control functions of the RC-C1 has priority over those of the camera or the RU-C1 except for the auto white and auto black functions. Therefore, the control cannot be performed on the camera or the RU-C1 side. The AUTO SETUP switch operates as a shutter speed selector switch.

How to replace fuse



Z-ONE·B camera head

(1) Remove the left side cover of the camera head, then replace the fuse.
(2) After replacing the fuse, install the left side cover.

Camera adaptor

(1) Remove the left side cover of the camera adaptor, then replace the fuse.
(2) After replacing the fuse, install the left side cover.

⚠**Warning**: Be sure to use the fuse of the same rating.

11. SPECIFICATIONS

11.1 Z-ONE·B camera head

(1) Color system:	NTSC (conforming to RS-170A), PAL-B
(2) Optical system:	2/3-inch, f1.4 prism
(3) Pickup system:	RGB 3-chip system
(4) Imaging device:	CCD equivalent to 2/3-inch tube with micro lens
(5) Encoding system:	I, Q system for NTSC, U, V system for PAL
(6) Sync system:	Internal or genlock
(7) Horizontal resolution:	750 lines at center (DTL off, Y OUT)
(8) Signal-to-noise ratio:	NTSC: 62dB (typical), PAL: 60dB(typical) (Gamma = 1, DTL off, sensitivity 0dB, Y OUT)
(9) Standard sensitivity:	2000 lux, f8
(10) Minimum sensitivity:	12 lux, f1.8 (sensitivity + 18dB)
(11) Gamma correction:	0.35 to 1.0(ON/OFF possible by switch)
(12) Geometric distortion:	All zones : 0% excluding lens
(13) Registration:	All zones : 0.05% excluding lens
(14) Optical filter :	3,200K, 5,600K, 5,600K + 1/8ND
(15) Vertical contour correction:	2H
(16) Lens mount:	Bayonet (B. F = 48mm in air)
(17) Sensitivity switching:	0dB, +9dB, +18dB
(18) Electronic shutter speed:	
Preset mode:	1/100, 1/250, 1/500, 1/1000, 1/2000sec
Lock scan mode:	1/61.6 (1/51 for PAL) to about 1/2000sec(1H step)
(19) Power requirement :	12V DC (rated input voltage)
(20) Power consumption:	13W Approx. (including GM-8 and excluding camera adaptor)
(21) Dimensions:	120(W)x293(H)x156(D)mm (4.7x11.5x6.1 in)
(22) Weight:	3.5kg (7.7lb) approx. (camera head with GM-8 excliding lens and camera adaptor)

11.2 GM-8 1.5-inch Viewfinder

(1) Input signal :	1Vp-p, composite video signal, sync negative
(2) Picture tube:	1.5-inch B/W, direct heating type
(3) Resolution (horizontal) :	600 lines Approx. (at center)
(4) LED display:	B, T, L, H (four kinds)
(5) Controls:	Brightness, peaking, contrast, front tally ON/OFF
(6) Power requirement:	9V DC
(7) Power consumption:	1.4W Approx.
(8) Weight:	0.6kg Approx. (1.3lb)

11.3 Input, output and operating conditions

(1) Input signals

①	GENLOCK input : (BNC or multi-connector)	VBS 1.0Vp-p ± 3dB or black burst/75 ohms (sync: 0.3 ± 0.1Vp-p, burst 0.3 ± 0.1Vp-p)
②	VF AUX input: (multi-connector)	VBS 1.0Vp-p ± 3dB/ 75 ohms

(2) Output signals

①	VIDEO output (BNC):	VBS 1.0Vp-p/75 ohms
②	VTR output 1: (multi-connector)	VBS 1.0Vp-p/75 ohms
③	VTR output 2: (multi-connector) (See Note)	VBS 1.0Vp-p/75 ohms
④	VTR output 3: (multi-connector) (See Note)	Y: 1.0Vp-p/75 ohms C: 0.286Vp-p(burst)/75 ohms
⑤	R, G, B output: (multi-connector) (See Note)	0.7Vp-p/75 ohms
⑥	Component output (multi-connector) (See Note):	VS: 1.0Vp-p/75 ohms R-Y, B-Y: 0.7Vp-p/75 ohms(Betacam)* 0.525Vp-p/75 ohms (MII) *
⑦	Audio output: (multi-connector)	-20dBm or -60dBm

Note : Select any of items ③ to ⑥ by using the switch

(3) Ambient temperature

①	Safety operation temperature:	-10 to +45°C (14 to 113°F)
②	Storage temperature:	- 20 to +60°C (-4 to 140°F)

(4) Power supply voltage fluctuations: 12V DC rated input voltage (stable between 10.5 and 17V DC)

* at 75% color bar

12. MAJOR ACCESSORIES

12.1 Standard accessories

	Name	Model name	Remarks
1	1.5-inch viewfinder	GM-8	Standard/configuration
2	Camera adaptor	CA-Z1	Standard/configuration
3	Tripod adaptor	TA-Z1	Standard/configuration
4	Carrying case	CL-Z1	Standard/configuration
5	16X zoom lens	A16x9.5BRM-17C	Standard/configuration

12.2 Optional accessories

	Name	Model name	Remarks
1	5-inch viewfinder	GM-50	Standard/configuration
2	VF adaptor	AT-21A	*
3	Remote operation unit	RU-C1	*
4	Remote control box	RC-C1	*
5	Remote control box	RC-C10 (Note2)	*
6	Remote control box (Joistick remote-control)	RC-C11	*
7	AC adaptor	AP-60B	*
8	AC adaptor charger	AP-61B	*
9	Battery pack	DP-15B	*
10	Battery adaptor	BA-15	*
11	Conversion cable (from 3p to 4p)	C-100EG (Note1)	*
12	Microphone	MC-C2	*
13	Microphone	ME-80	*
14	Microphone cable for ME-80	C-240MA	*
15	Microphone holder for ME-80	MH-C1	Standard/configuration
16	Camera cable, 15m	C-152KR	*

	Name	Model name	Remarks
17	Camera cable, 50m	C-502KR	*
18	Camera cable, 100m	C-103KR	*
19	VTR cable for VHS 2m	C-201VT	*
20	VTR cable for VHS 5m	C-501VT	*
21	VTR cable for S-VHS/U-format 2m	C-201TD	*
22	VTR cable for S-VHS/U-format 5m	C-501TD	*
23	VTR cable for Btacam/MII 2m	C-201TE	*
24	VTR cable for Btacam/MII 5m	C-501TE	*
25	Lens cable kit	ZL-15WR	*
26	Rack mount adaptor (for RC-C10x3)	MA-C10	*
27	Rack mount adaptor (for RC-C1x3)	MA-C1	*
28	Shoulder belt	SB-1	*
29	VTR adaptor for MII	CA-Z1M	*
30	VTR adaptor for S-VHS VTR (BR-S411)	CA-Z1SJ	*
31	VTR adaptor for S-VHS VTR (AG-7450)	CA-Z1SP	*
32	VTR adaptor for Hi8, BETACAM (PVV-1)	CA-Z1HB	*
33	Large size lens adaptor	LA-Z1	*

Note 1: Use the C-100EG conversion cable when using the AP-61A, the AP-61 or the DP-15, an option of FP-C1/-C2 series.

Note 2: When the remote control box RC-C10 is used, the DTL control function is disabled because remote-control is unavailable in the camera head.

* represents an option.

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