Canon

BROADCAST TELEVISION LENS

HJ40x LENSES DIGITAL DRIVE DD

HJ40x10B 10-400mm 1 : 2.0
HJ40x14B 14-560mm 1 : 2.8

OPERATION MANUAL

Read this operation manual before using the product.
Keep the manual safe so that it can be referenced when it is needed.

E

FCC REGULATIONS

Note : This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference, when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the operation manual, may cause harmful interference to radio communications. Operation to this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- Use of shielded cable is required to comply with Class A limits in Subpart B of Part 15 of the FCC rules.

Do not make any changes or modifications to the equipment unless otherwise specified in the manual. If such changes or modifications should be made, you could be required to stop operation of the equipment.

Canadian Radio Interference Regulations

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil mumérique de la classe A respecte toutes les exigences du Réglement sur le matériel brouilleur brouilleur du Canada.

CE

We, Canon Inc., in Japan and Canon Europa N. V., in The Netherlands, confirm that the **HJ40x10B , HJ40x14B** series zoom lens is conformity with the essential requirements of EC Directive (s)

89/336/EEC, and 93/68/EEC

by applying the following standards

EN55103-1, and EN55103-2

Note:

a) Applicable Electromagnetic Environment:
   E1 (Residential area)
   E2 (Commercial and light industrial area)
   E3 (Urban outdoors area)

b) Use of shielded cable is required to comply with limits specified by above standards.

FOREWORD

Thank you for purchasing the Canon TV zoom lens HJ40x.

This operation manual consists of the operation manual for the lens and Japanese/English technical documents.

This operation manual is applicable for the following lens models:

HJ40x10B IASD-V
HJ40x14B IASD-V

Overview

The HJ40x series lens is an HDTV-compatible super-telescopic zoom lens that has been designed to meet customer requirements for higher magnification and performance in a portable lens, where maneuverability is paramount. To maximize the full power of this higher magnification and performance, the highly-popular image stabilizer in the box-type super-telescopic lens DIGI SUPER 86xs has been reduced in size to fit portable lenses and is installed as standard with this lens. The result is a lens providing high-quality, vivid images with no blurring even at the telescopic end.

CONTENTS

⚠ GENERAL SAFETY INFORMATION

The safety warnings and cautions provided on the product or in this operation manual must be observed. Failure to observe warnings and cautions provided to guard against hazards may result in injury or accident.
Read this operation manual carefully to familiarize yourself with its contents and ensure that you can operate the product properly.
Also, store this manual in a safe place where it can easily be referenced whenever required.

This operation manual uses the following symbols and terms to identify hazards to protect you and others by aiming to prevent the occurrence of accidents.

⚠ WARNING	Indicates hazardous situations which, if not heeded, may result in death or serious injury to you or other persons.
⚠ CAUTION	Indicates hazardous situations which, if not heeded, may result in minor or moderate injury to you or other persons, or damages to your property.
※ (NOTE)	Emphasizes essential information which, if not heeded, may render the product unworkable or cause it to function improperly. Also, provides helpful information for operation.

HANDLING THE PRODUCT

⚠ WARNING

1. Never allow water to enter or be spilled on the product. Immediately stop using the product if water enters the product. Otherwise, a fire or electric shock hazard may result.

2. Do not stare at the sun or other source of high-intensity light through the lens. Doing so may result in injury to your eyes.

⚠ CAUTION

1. Do not drop the lens when transporting it or when attaching or detaching it to or from the camera head. The lens may fall, possibly causing injury.

2. Make sure all mountings are tightened securely. If any of these mountings becomes loose, the lens may fall, possibly causing injury.

3. Always grasp the connector itself when connecting or disconnecting the lens cable. Pulling on the cable portion may result in damage to the cable, such as exposure or breakage of the conductors.
   Power leaking from a damaged cable may present a fire or electric shock hazard.

4. Inspect all mountings periodically (about every 6 months to 1 year) to make sure they are securely tightened, and tighten any loose portions.
   Otherwise, the lens may fall, possibly causing injury.

5. If it becomes necessary to repair this product, or to perform any operations or adjustments not mentioned in this operation manual, contact Canon's representative or the dealer who originally supplied the lens.

※ (NOTE)

1. Protect the lens from strong impacts of shocks. Striking or dropping the lens may result in a malfunction.

2. This lens is not completely waterproof, so avoid exposing it directly to rain or snow.
   When the lens must be used in rain or snow, provisions should be made to prevent the lens from getting wet.

3. Under dusty conditions, the lens should be mounted or dismounted with a cover placed over the mount so as to prevent dust from entering into the interior.

4. Do not bring the lens, kept in a very cold ambient temperature, into a warm room, because the lens may fog on the inside or condensation may occur.
   In these cases, the lens cannot be used until these problems clear.
   If the lens must be used under such conditions, countermeasures are recommended.
   (For instance, before bringing the lens into a warm room, put it in a vinyl bag with an effective desiccant, and then bring it into the room. After the temperature acclimatizes to the same level as the room temperature, take out the lens out of the vinyl bag.)

5. If the lens is to be used in adverse environments, such as in a chemical laden atmosphere, consult with Canon's representative beforehand.

DEALING WITH ABNORMALITIES

⚠ WARNING

1. Should any of the abnormalities described below occur, immediately unplug the lens cable from the camera, and then contact Canon's representative or the dealer from whom you purchased the lens.
   - Smoke, abnormal smell, or abnormal noise.
   - Entry of foreign objects (including metals and liquids) inside the lens.

MAINTENANCE AND INSPECTION

⚠ WARNING

1. Unplug the lens cable and remove the lens from the camera, before attempting to clean the lens.
   Never use flammable substances such as benzene or thinner for cleaning, as this may present a serious fire or electric shock hazard.

※ (NOTE)

1. Dust or fingerprints on the lens surface.
   Gently blow or brush away dust or dirt on the lens surface using a lens blower or a soft lens brush. Remove any fingerprints or other stains with a clean cotton cloth moistened with commercially available lens cleaning fluid or lens cleaning paper.
   Gently swirl the cloth or cleaning paper over the lens surface, starting at the center area of the lens, and then circling gradually outward until whole lens surface has been covered.
   Be careful not to rub dust across the lens, as the lens surface may be scratched.

2. Periodic inspection
   A periodic inspection about once a year is recommended.
   The inspection and maintenance interval depends on the operating conditions, the frequency of use, and the environment. If required, overhaul the lens.

STORAGE

⚠ CAUTION

1. Always attach the lens cap (or hood cap) and the dust cap before storing the lens.
   Stroring the lens without these caps attached may present a fire hazard. (Very bright light, such as sunlight, may be focused by the lens and cause a fire.)

※ (NOTE)

1. Moisture inside the lens
   If the lens becomes damp because of use in fog, mist or drizzle, wipe off the moisture with a soft dry cloth and seal the lens together with an efficient desiccant in a vinyl bag to remove moisture which has entered into the interior.

TO THE CUSTOMER

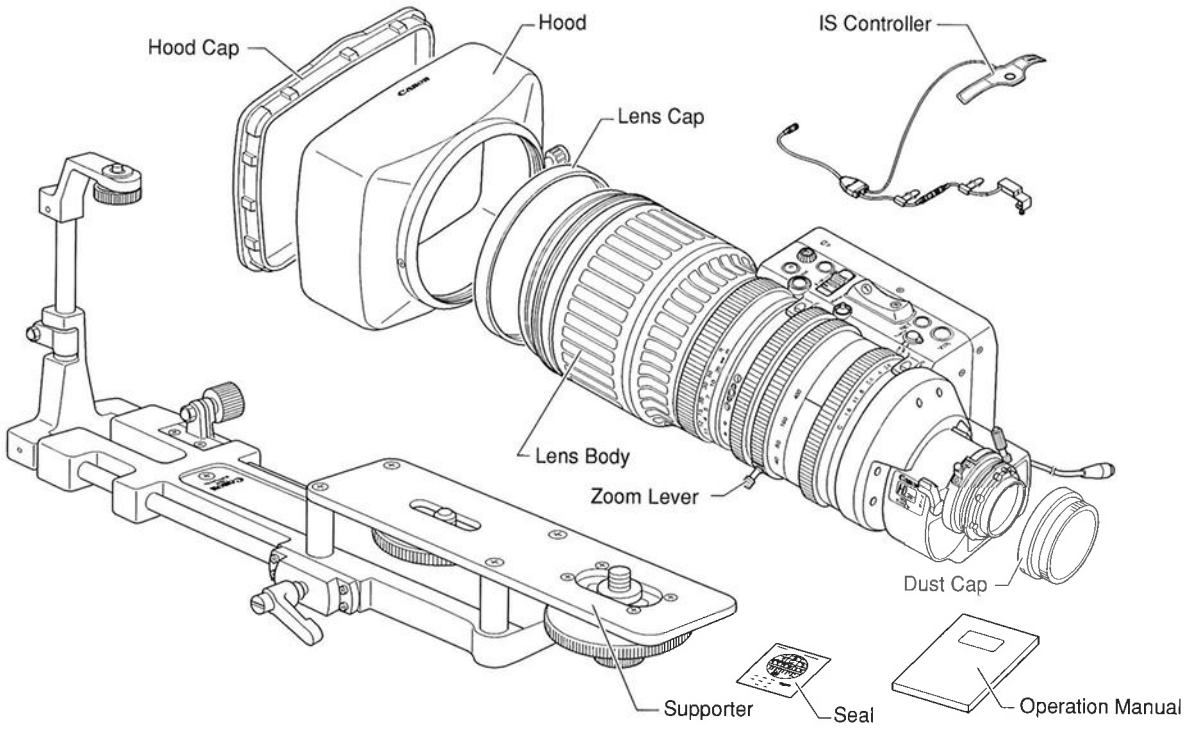
1. Canon shall bear no responsibility for damage resulting from improper operation of this roduct by the customer.
2. Canon shall make no guarantees about the product quality, functions, or operation manual and its marketability and suitability for the customer's purpose.
   Moreover, Canon shall bear no responsibility for any damage, direct or incidental, that results from usage for the customer's purpose.
3. Canon shall make no guarantees about the results obtained using this product or the operation manual.
4. The product specifications, configuration, and appearance are subject to change without prior notice.
5. Repairs or modifications of this product, or adjustments not mentioned in this operation manual require special service manuals and training in some cases. For further information on these adjustments, repairs or modifications, contact your Canon dealer or your Canon sales representative.
6. Note that Canon may be unable to undertake servicing or repair of a product if it is modified without consulting Canon or your Canon sales representative.

Contact :
Broadcast Equipment Group
Canon Inc.
23-10 Kiyohara Kogyo Danchi,
Utsunomiya-shi, Tochigi-ken, 321-3298, Japan
TEL: 81-(028)-667-5711
FAX: 81-(028)-667-8672

§ 1. STANDARD COMPOSITION OF THE LENS

Make sure all of the following items are included in the packing box.
(If you find any item missing, please contact the dealer from whom you purchased this product.)

UNIT	Q'TY
LENS BODY	1
HOOD CAP	1
HOOD	1
LENS CAP	1
DUST CAP	1
ZOOM LEVER (mounted on lens body)	1
SUPPORTER	1
IS CONTROLLER	1
OPERATION MANUAL	1
SEAL	1



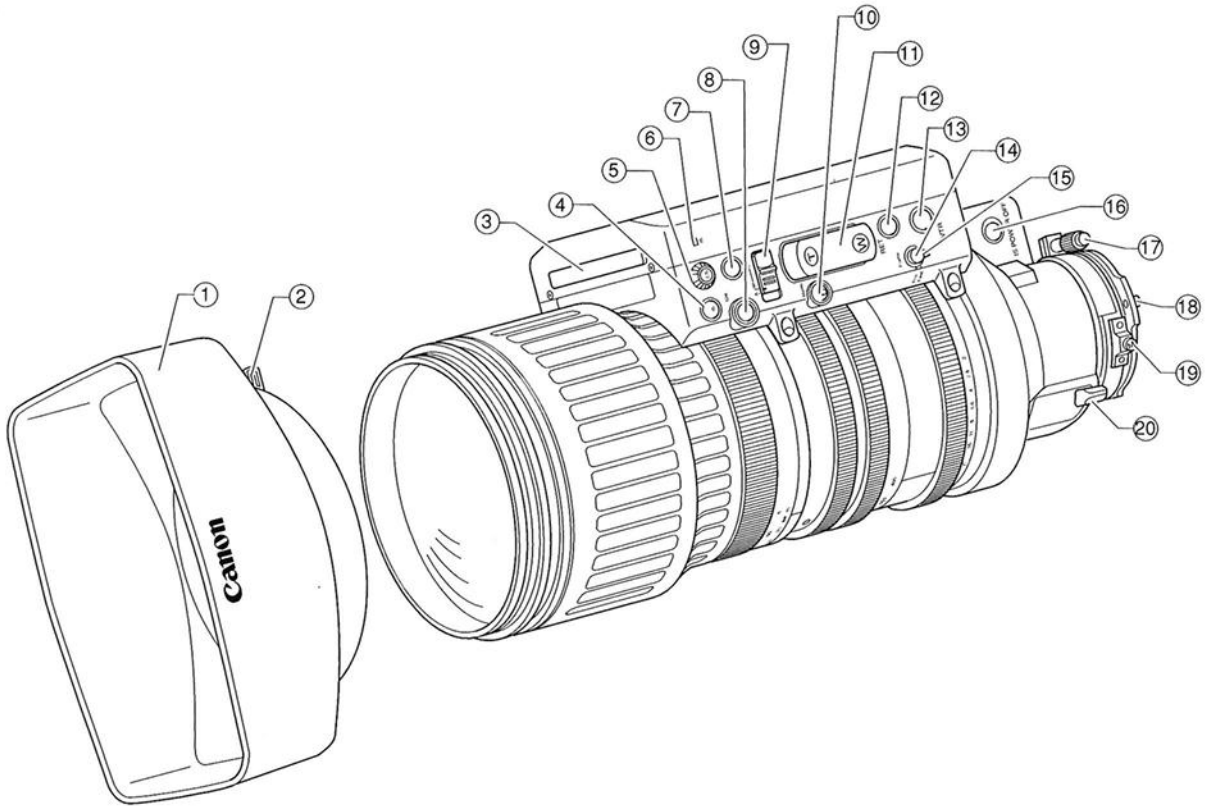
(The above drawing shows the HJ40x 10B IASD-V; shapes of other models differ slightly from this sketch.)

※ (NOTE): Storage environment

Check the following points, and make sure the place where the lens is stored satisfies the following conditions.

1) Store the lens only under the following ambient conditions.
   - Ambient temperature : -30℃ to +60℃
   - Ambient humidity : up to 60% RH (no condensation)
2) Do not suddenly move the lens from storage at a very cold ambient temperature into a warm room. Doing so may cause the lens to fog on the inside or may cause condensation.
3) Do not subject the lens to strong physical shocks or vibration.

§ 2. NOMENCLATURE



(This drawing shows the model HJ40x 10B IASD-V)

① Hood

This hood is used to cut or reduce ghosting / flaring.

② Hood Lock Knob

Loosen or tighten this knob to remove or fix the lens hood on the lens.

③ DIP Switches

DIP switches for various settings.

④ IS ON/OFF Switch

Use this switch to turn image stabilizer (IS) operation on and off.

⑤ Max. Zoom Speed Volume

The maximum zoom speed available when pressing the zoom seesaw switch all the way down can be adjusted by turning this volume.

⑥ IS Operating Status Indicator LED

This LED indicates the operating or standby status of the image stabilizer and the status of power supplied to the image stabilizer circuitry.

⑦ Momentary Auto-Iris Switch (Momentary Automatic Iris Switch)

While pressing this switch, momentary automatic iris operation takes effect.

⑧ Shtl Button (Shuttle-Shot Button)

This switch is used for the shuttle-shot function.

⑨ Iris Operation Change-over Switch

Slide this switch to change from manual to servo iris operation or vice versa.

⑩ Memo Button (Memory Button)

Memorize the zoom position and/or zoom speed by pressing this button together with one of the other buttons (Shtl, Frame, or Zoom seesaw switch).

⑪ Zoom Seesaw Switch

Use this switch for servo zoom operation.
The zoom speed changes according to how far down the switch is pressed.

⑫ RET Switch (Return Video Switch)

While pressing this switch, the external video sent to the camera can be seen on the viewfinder.

⑬ VTR Switch

Press this switch to start or stop the VTR.

⑭ Frame Button (Framing Preset Button)

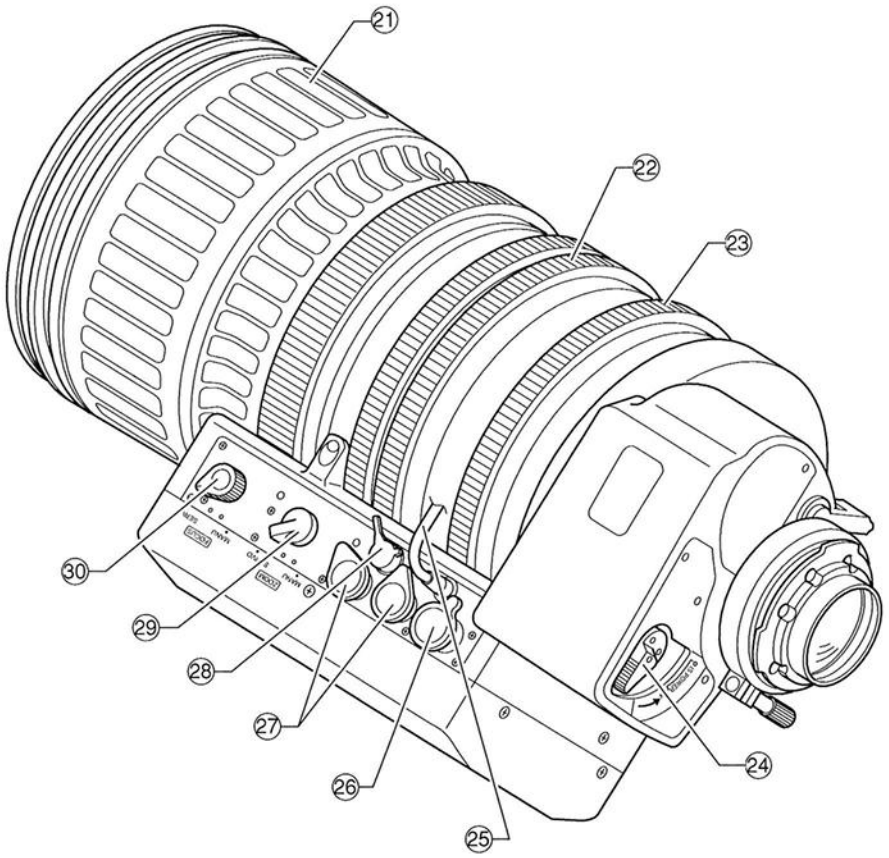
Press this button to zoom to a preset zoom position.

⑮ Speed Mode Selector Lever

Use this lever to select the speed setting for the framing preset function.

⑯ IS Power Off Switch

Use this switch to turn off the power supply to the image stabilizer.



⑰ F.B. Adjusting Lock Screw

Turn this screw to tighten or loosen the F.B. adjusting ring.

⑱ Positioning Pin

Determines the mounting position of the lens.

⑲ Macro Button

Use this button to shoot an object which is closer than the M.O.D.

⑳ Extender Lever

The built-in 2x extender can be moved in and out by turning this lever.

㉑ Focus Ring

Turn this ring to focus on the object manually.

㉒ Zoom Ring

Use the zoom ring to operate the zoom manually.

㉓ Iris Ring

Turn this ring to operate the iris manually.

㉔ IS Power On Lever

Use this lever to release the mechanical lock on the image stabilizer.

㉕ Lens Cable

Power and signals are sent to the lens from the camera head through this cable.

㉖ Connector for Remote Zoom Control (8pin)

Plug in the 8 pin connector from the remote servo zoom accessories.

㉗ Remote Zoom & Remote Focus Control Connectors (20pin)

Plug in the 20 pin connector from the zoom or the focus control accessories.

㉘ IS Remote Connector

This connects the Image Stabilizer (IS) controller.

㉙ Zoom Operation Change-over Knob

Use this knob to change from manual to servo zoom operation or vice versa.

㉚ Focus Operation Change-over Knob

Use this knob to change from manual to servo focus operation or vice versa.

§ 3. MOUNTING AND CONNECTIONS

3-1. MOUNTING THE SUPPORTER, LENS, AND TRIPOD

This lens is provided with the dedicated supporter SUP-300. To protect the lens and camera, the dedicated supporter should always be used. The lens, camera, supporter, and tripod are mounted in the order shown below.

① Mount the supporter on the tripod. Section (A)

↓

② Mount the camera on the supporter. Section (B)

↓

③ Mount the lens on the camera. Section (C)

↓

④ Adjust the balance. Section (D)

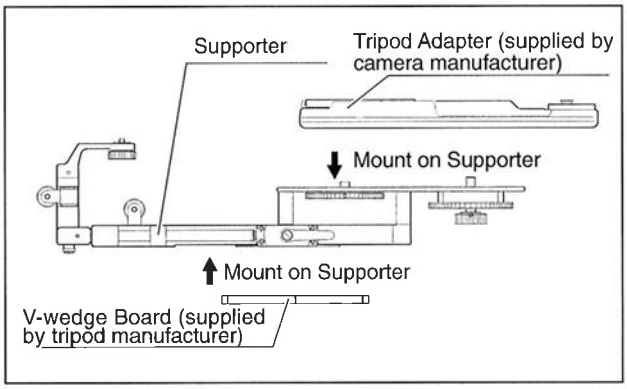
(A) MOUNTING THE SUPPORTER ON THE TRIPOD

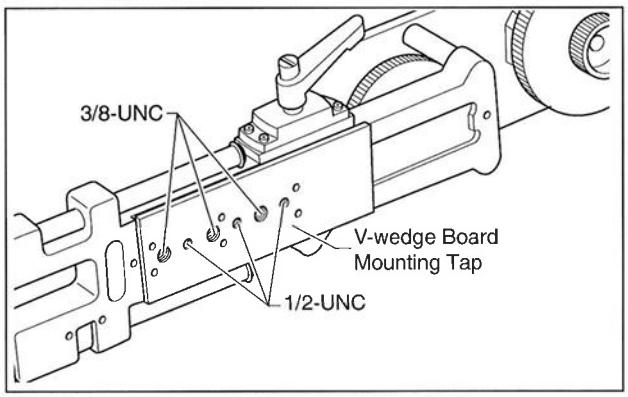
1. Mount the tripod's V-wedge board to the bottom of the supporter. V-wedge board mounting tap have 3/8-UNC and 1/2-UNC mounting screw holes. (The V-wedge board is not supplied by Canon.) The V-wedge board mounting tap can be moved forwards or backwards, and the lock handle for the system center of gravity can be locked or unlocked by turning in the following directions.

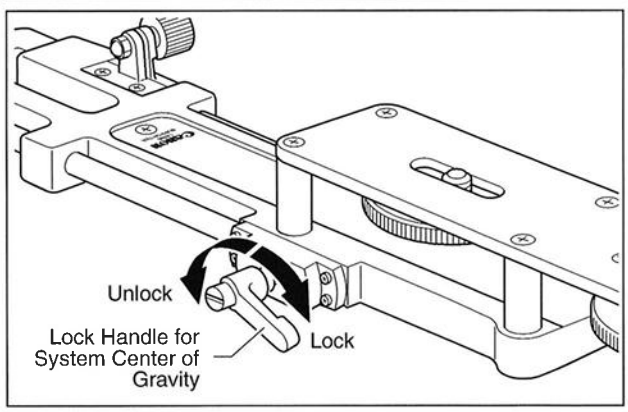
   Clockwise direction ..... Lock

   Counterclockwise direction .... Unlock

   Be sure to lock the V-wedge board once it is mounted.



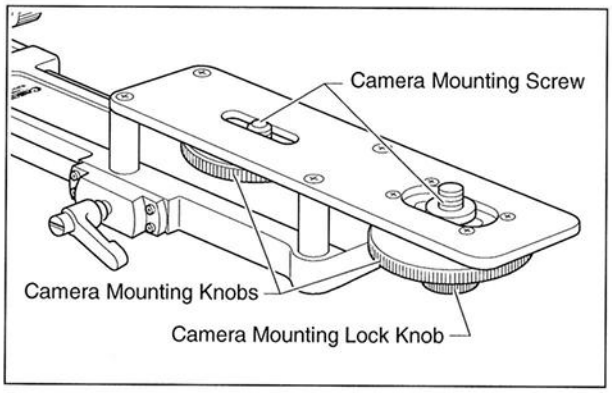




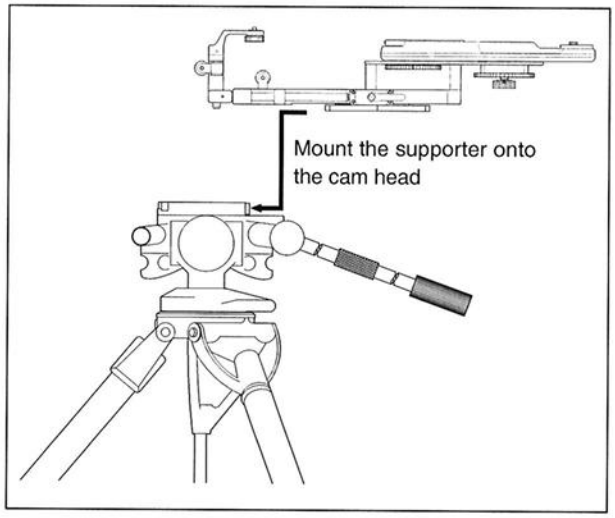
2. Mount the tripod adapter on the supporter using the procedure below.
(The tripod adapter is supplied by the camera manu facturer. Be sure to also refer to the camera operation manual when performing the mounting procedure.)

2-1. Insert the two camera mounting screws (3/8-UNC) into the tripod screw holes on the tripod adapter, and then turn the camera mounting knob to tighten the two screws.

2-2. Then, to stop any looseness, turn the camera mounting lock knob to tighten and secure in place.



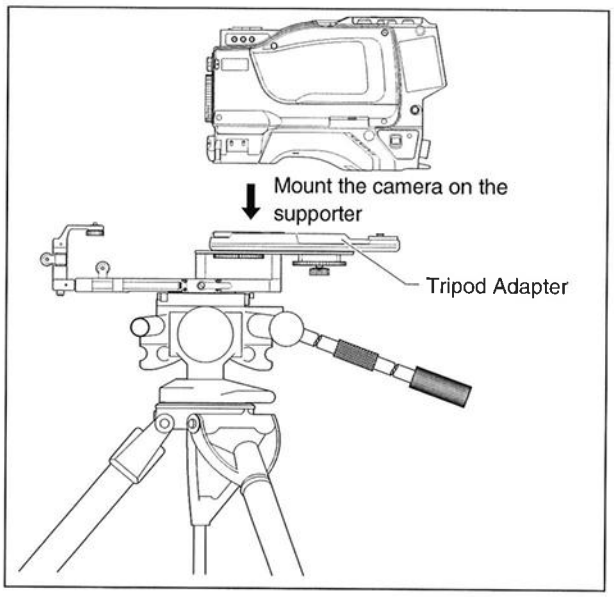
3. Check that the pan and tilt mechanisms of the tripod and the lock handle for the system center of gravity are locked. Then, take the supporter where the V-wedge board and tripod adapter were mounted in steps 1 and 2, and mount it onto the cam head.



⚠ CAUTION: Before mounting the supporter, thoroughly read the operation manual for the tripod and pedestal, and be sure that you fully understand how to lock and unlock the pan and tilt mechanisms on the cam head. Then, mount the V-wedge board onto the cam head. If you mount the supporter without locking the pan and tilt mechanisms on the cam head, the camera, lens, or supporter can fall and be damaged or cause an injury. Therefore, be sure to always lock the pan and tilt mechanisms in place before starting any mounting procedures.

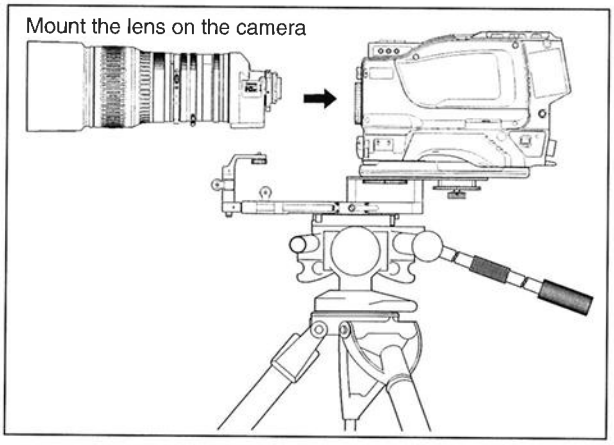
(B) MOUNTING THE CAMERA ON THE SUPPORTER

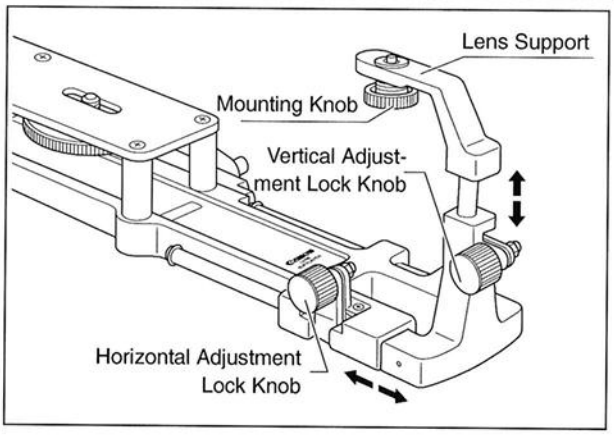
Mount the camera on the tripod adapter where the supporter is already mounted.
(The tripod adapter is supplied by the camera manufacturer. Refer to the camera operation manual for the mounting procedure.)



(C) MOUNTING THE LENS

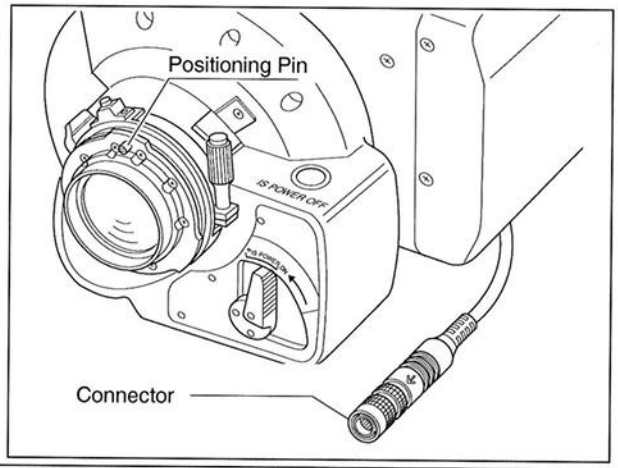
1. Loosen the vertical adjustment lock knob, and then lower the lens support.
2. Use the procedure below to mount the lens on the camera.
   2-1. Turn the bayonet mount of the camera counterclockwise, and then remove the protective cap.
   2-2. Turn the dust cap on the lens counterclockwise and then remove it.
   2-3. Align the positioning pin on the lens mount with the groove on the camera mount, and then press the lens firmly into the camera mount surface.
   2-4. Turn the bayonet ring of the camera clockwise as viewed from the lens side to secure the lens in place.





⚠ CAUTION: In this state, the lens is only supported by the mount section. Therefore, the mount connection part can be damaged with just a slight amount of pressure. Be careful not to apply external pressure to lens, especially until the mounting procedure is completed.

   2-5. Connect the connector at the end of the lens cable coming out from the bottom of the lens drive unit to the camera.



3. Loosen the vertical adjustment lock knob, and also loosen the horizontal adjustment lock knob so that the lens support can be moved to the front or back and up or down.

※ (NOTE): 1) Be sure to also refer to the camera operation manual when performing the mounting procedure.
2) When removing the protective cap and dust cap, be sure to keep them in a safe place so that they do not get lost.

4. Adjust the lens support to the front or back and up or down, insert the mounting knob end screws into the lens unit stand, and then turn the knob to secure in place.
   If the positions of the mounting knob and lens unit stand are not aligned within the range where the lens support can be adjusted forward or backward, the camera position is too far either forward or backward. Therefore, loosen the two camera mounting screws and camera mounting lock knob, adjust the camera position, and then tighten them to secure in place.
   (Refer to step 2 of "3-1.(A) MOUNTING THE SUPPORTER ON THE TRIPOD" for the mounting procedure.)

5. Once the mounting knob is secured to the lens body, tighten the vertical adjustment lock knob and horizontal adjustment lock knob and secure in place.

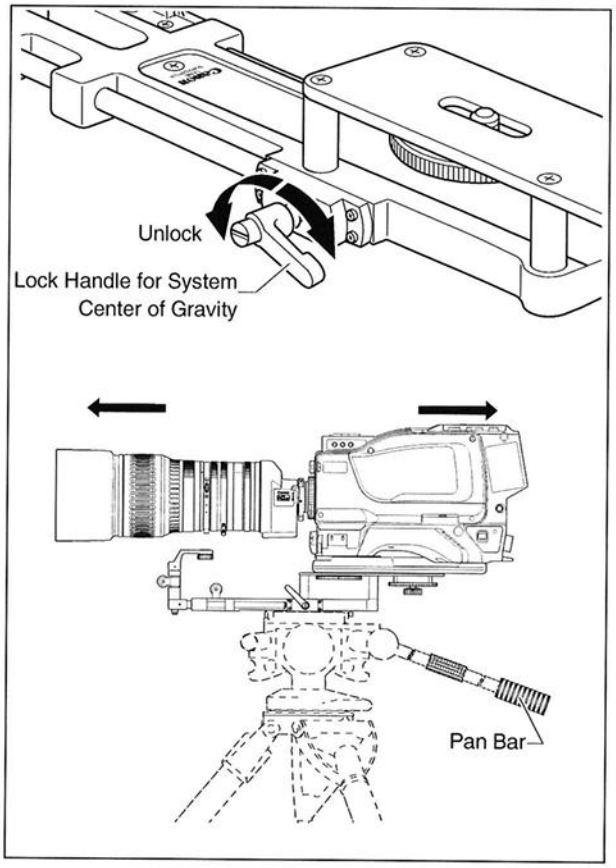
※ (NOTE): When tightening the lock knob, set it to the suitable position when the lens is attached to the camera in section 2, and be careful that you mount the lens without raising or pulling the lens or forcing it to move.

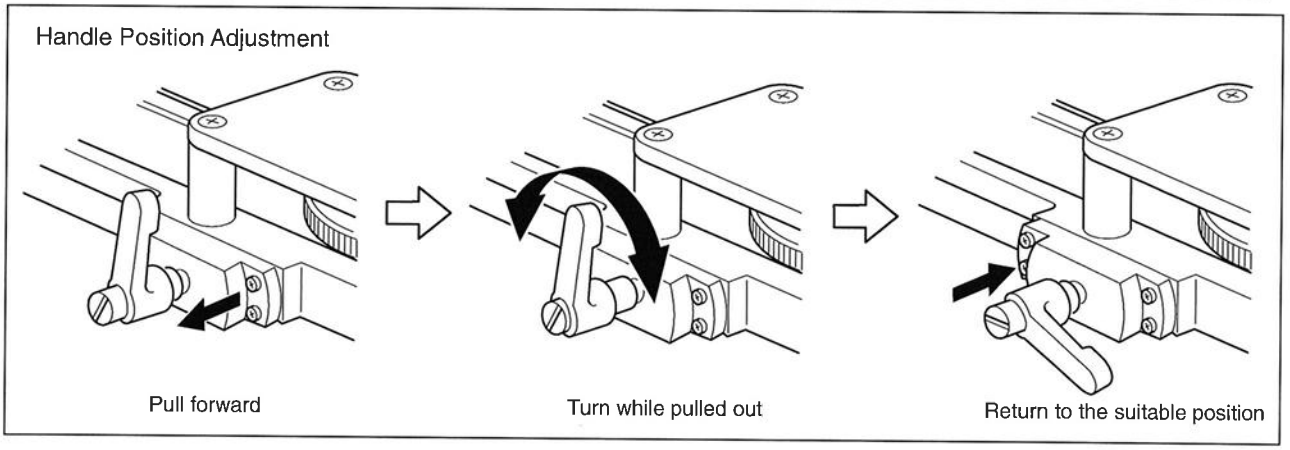
(D) BALANCE ADJUSTMENT

1. Loosen the pan and tilt mechanisms of the cam head, and then check the balance of the center of gravity and other parts by grasping the pan bar of the tripod.

2. Unlock the lock handle for the system center of gravity so that the lens, camera, and supporter can be moved forward or backward as one unit while it is mounted to the tripod. Adjust the center of gravity position if it is misaligned.

3. Once the center of gravity position is adjusted, lock the lock handle of the system center of gravity. Also, when the lock handle of the system center of gravity is pulled forward, the handle can be changed to any direction over the full 360° range while keeping it locked. Set it to a position so that will not be accidentally touched during later shooting or other operations.



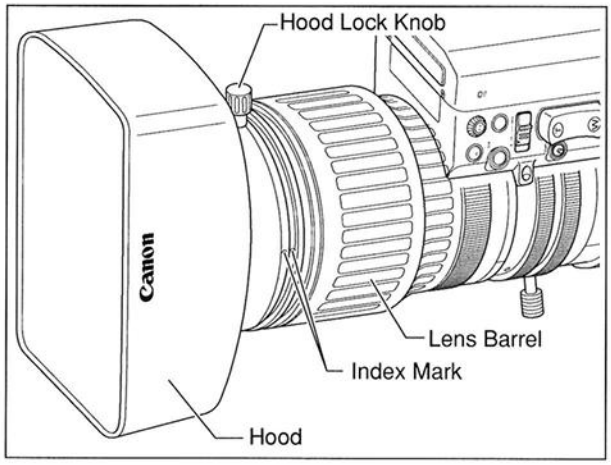


4. Finally, tighten all knobs and screws, and check that they are secured in place.

※ (NOTE): The dedicated supporter SUP-300 does not currently support some cameras. For more detail, be sure to direct your inquiries to Canon. Also, if you like to use a supporter other than the SUP-300, be sure to direct your inquiries to Canon.

3-2. MOUNTING THE HOOD ON THE LENS

1. When the lens is shipped from the factory, the lens cap is normally attached to the lens. Remove the lens cap from the front barrel of the lens.
2. Snap the hood on to the front barrel of the lens, and align the index mark on the hood with the mark on the front barrel of the lens. Then, tighten the hood securely by turning the hood lock knob clockwise.
3. Remove the hood cap from the hood.



※ (NOTE): Be sure to store the lens cap and hood cap in a safe place so as not to lose them.

3-3. MOUNTING AND CONNECTING THE IMAGE STABILIZER (IS) CONTROLLER

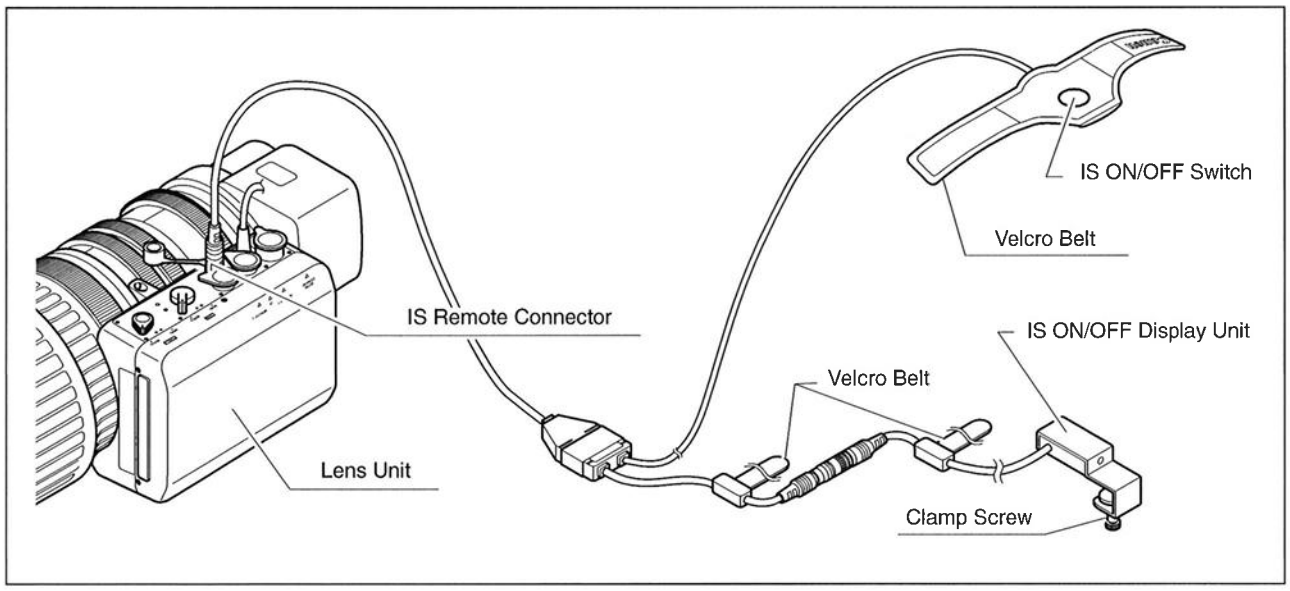
The image stabilizer (IS) controller is an accessory consisting of a switch unit for turning the image stabilizer (IS) on and off and a display unit indicating the operating status. It can be mounted in any location that allows easy operation for performing remote control of the image stabilizer.

Use the procedure below to mount and connect the IS controller.

1. Connect the connector on the IS controller to the IS remote connector at the bottom of the lens drive unit.
   (Normally, the IS remote connector is covered with a protective cap. Remove this cap before connecting to the connector.)

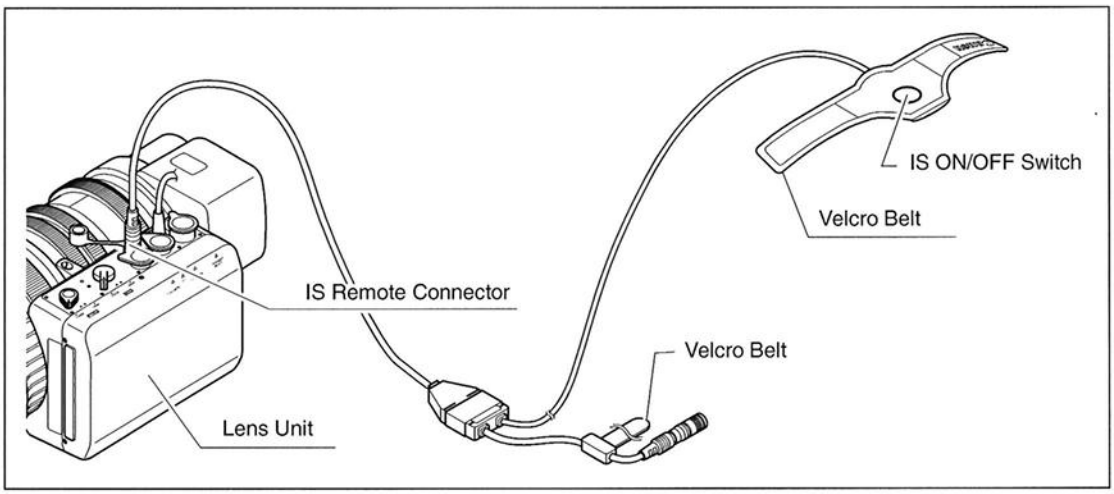
2. The IS ON/OFF switch belt branching off from the cable is provided with a velcro strip. Attach it to any location that allows easy operation.

3. The IS ON/OFF display unit (IS operating status indicator LED) on the other end branching off from the cable is provided with a clamp screw. Attach it to the edge of the viewfinder or other location where the status of the LEDs can be checked easily.



※ (NOTE): 1) An IS ON/OFF switch and IS operating status display LED are also provided on the drive unit of the lens. Therefore, these units can be used together with the IS controller.

2) If the IS operating status does not need to be displayed, remove the display unit from the IS controller, and use by connecting the switch unit only.
(See the figure below.)



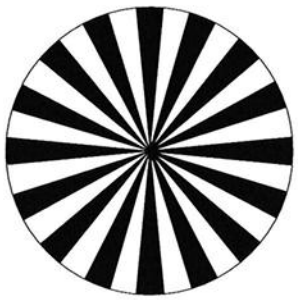
3) See section 5-4., "IMAGE STABILIZER OPERATION" for the operating procedures for the image stabilizer.

§ 4. PREPARATION

4-1. FLANGE BACK ADJUSTMENT OF THE LENS

If the relationship between the image plane of the lens and the image plane of the television camera is incorrect, the object goes out of focus when the lens is zoomed.
In the case of 3 CCD cameras, the CCDs are permanently fixed and unable to be moved, so that only the lens can be adjusted.

Follow the procedure below to adjust the flange back of the lens.



Siemens Star Chart

1.Select the green channel component video on the monitor.

2.Select an object at an appropriate distance (5 to 7 meters recommended).
A Siemens star chart is perfect for this adjustment. If no such chart is available, use any object that offers sharp contrast to facilitate the adjustment work.

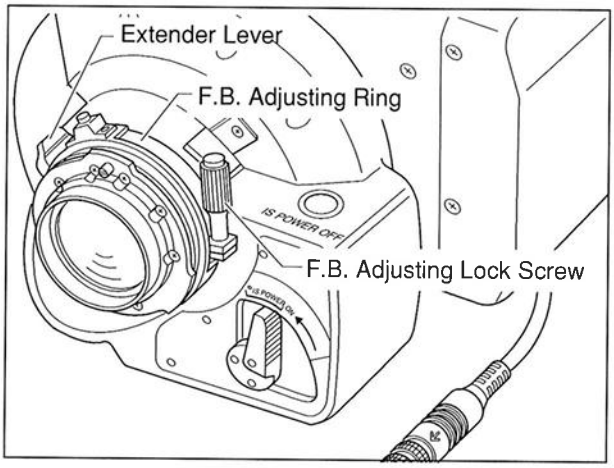
3. Select the 1x extender position.

4. Open the iris of the lens fully.

5. Set the lens to the telephoto end by turning the zoom ring.

6. Bring the object into focus by turning the focus ring.

7. Set the lens to the wide end by turning the zoom ring.



8. Loosen the flange back adjusting lock screw of the lens (located at the rear of the lens).
Turn the flange back adjusting ring to bring the object into focus, and then tighten the flange back adjusting lock screw.

9. Repeat steps 5 to 8 several times until the object is brought into focus at both the wide and telephoto ends. After making sure that the object is in sharp focus, tighten the flange back adjusting lock screw.
The adjustment procedure is now completed.

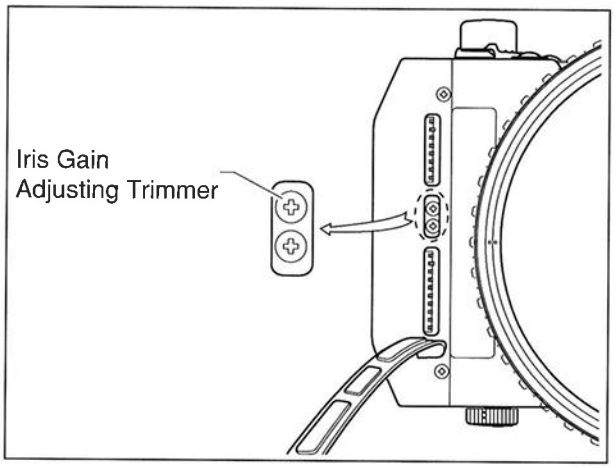
※ (NOTE):1) Use the Siemens star chart attached to the last page of this operation manual.
2) For a lens with a built-in extender, keep the extender lever at the 1x position during flange back adjustment. However, after completing the adjustment, check that the object is brought into focus at both the wide and telephoto ends with the extender.

4-2. IRIS GAIN ADJUSTMENT

An iris gain adjusting trimmer is located on the front of the lens drive unit.
The iris gain is set at the factory. However, if you wish to change the iris gain, adjust the trimmer through the procedure described below.

1. Normally, the iris gain trimmer is protected with a rubber cap. Before starting the adjustment work, remove the rubber cap.

2. Slide the iris operation change-over switch to the "A" position (auto).
   (The camera is required to set an automatic iris mode. Refer to the TV camera operation manual provided by the camera manufacturer for details of how to change this setting.)



3. Turn the iris gain adjusting trimmer (marked as "I.GAIN" on the sticker next to the trimmer) using a small screwdriver to set the level as desired.
   To increase the gain, turn the trimmer clockwise. To decrease the gain, turn the trimmer counterclockwise.

4. To determine the maximum gain, set the trimmer at a level where no hunting occurs while the iris is controlled from the camera by the automatic control mode.

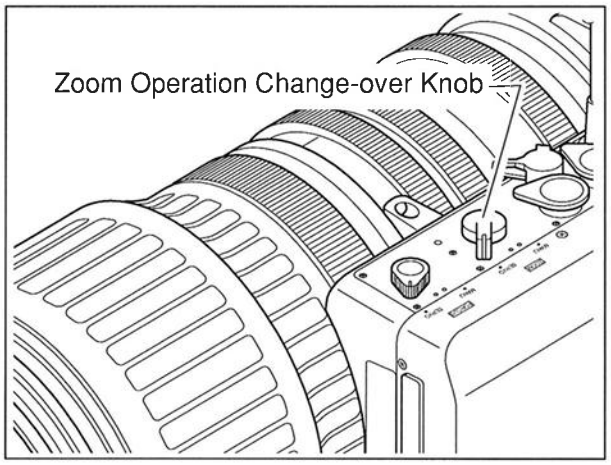
5. After the adjustment is completed, replace the rubber cap on the lens drive unit.

§ 5. OPERATION

5-1. ZOOM OPERATION

(A) MANUAL ZOOM OPERATION

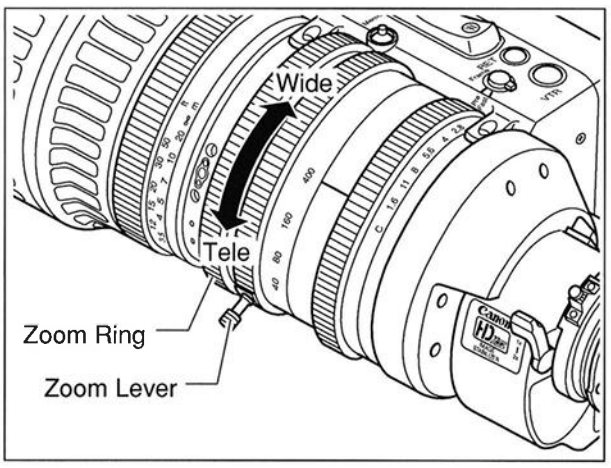
Set the zoom operation change-over knob at the bottom of the lens drive unit to the "MANU." position.



⚠ CAUTION: The zoom mechanism can be damaged if the lens is forced to perform manual zoom while the lens is set to the "SERVO" side. Therefore, be sure that the lens is set to the "MANU." side before performing manual zoom.

● Manual zoom operation with the zoom ring

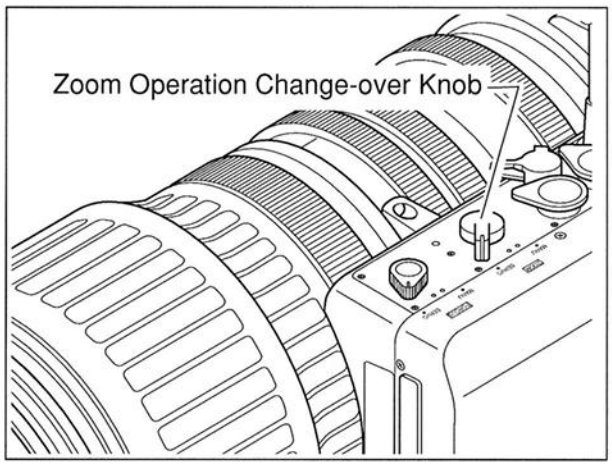
Turn the zoom ring (itself or with the zoom lever) clockwise, as viewed from behind the camera, to zoom out (to Wide-end).
Turn it counterclockwise to zoom in (to Telephoto-end).



(B) SERVO ZOOM OPERATION

Set the zoom operation change-over knob at the bottom of the lens drive unit to the "SERVO" position.

For a smooth change, turn the change-over knob while rotating the zoom ring slightly.



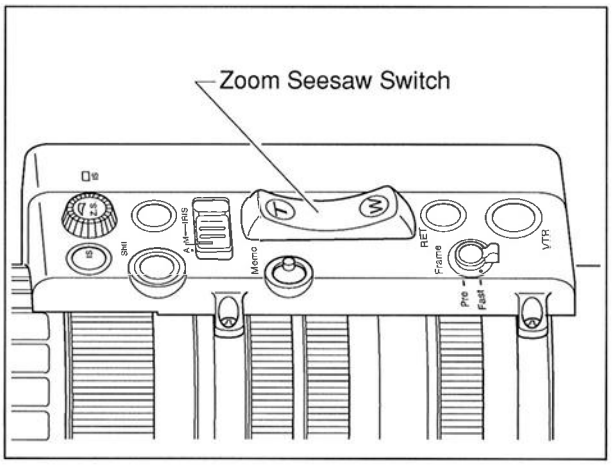
(B-1) BASIC SERVO ZOOM OPERATION

● Servo zoom operation with the zoom seesaw switch

The zoom can be operated by pressing the zoom seesaw switch located on the top of the lens drive unit.

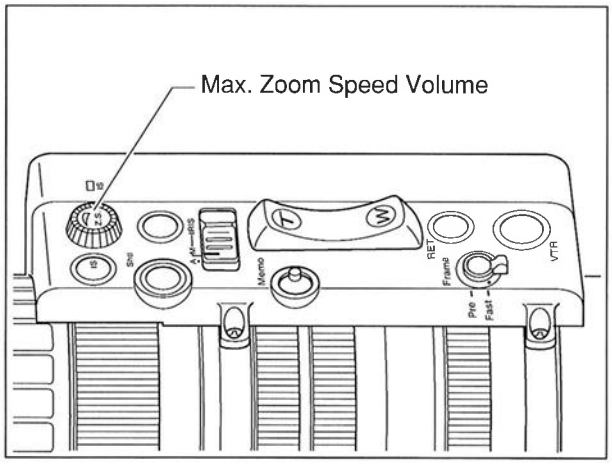
Press "T" to zoom in (to Telephoto-end).
Press "W" to zoom out (to Wide-end).

The zoom speed changes according to how far down the switch is pressed.



● You can adjust the zoom speed when the zoom seesaw switch is pressed.

The max. zoom speed volume, located at the top of the lens drive unit, adjusts the maximum zoom speed when the zoom seesaw switch is pressed all the way down.
Turn the volume clockwise to increase the speed, or turn the volume counterclockwise to decrease the speed.



(B-2) EXPANDED SERVO ZOOM OPERATION

In addition to the basic servo zoom operation described in section (B-1), the Digital Drive servo provides other useful functions for zoom operation.
The following are the main functions.

- Function 1 : Shuttle Shot ..... This function is useful when you frequently switch between two zoom positions.
- Function 2 : Framing Preset ..... This function allows you to easily reproduce a specific angle of field and zoom speed which were determined at rehearsal shooting.
- Function 3 : Speed Preset ..... Any specific desired zoom speed can be preset in the memory, and it is possible to repeat that speed as often as you like.

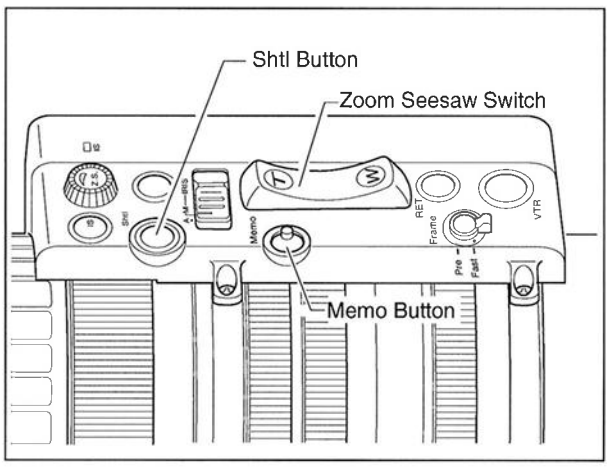
● Function 1. Shuttle-Shot

By simply pressing the Shtl button, you can zoom to a shuttle memory position (preset zoom position) at the maximum speed. When the Shtl button is released, the zoom returns to the original position. In other words, this allows the zoom to shuttle between two zoom positions (shuttle memory and original positions) at the maximum speed.

1. How to store the shuttle memory position

Step 1. Zoom to any desired zoom position, such as telephoto-end.

Step 2. Press the Shtl button while holding down the memo button.
(Steps 1 and 2 above complete the storing of the shuttle memory position.)



※ (NOTE):This shuttle memory position is different from the framing preset memory position (Refer to function 2).
The stored zoom position remains in the memory, even after the power is turned off.

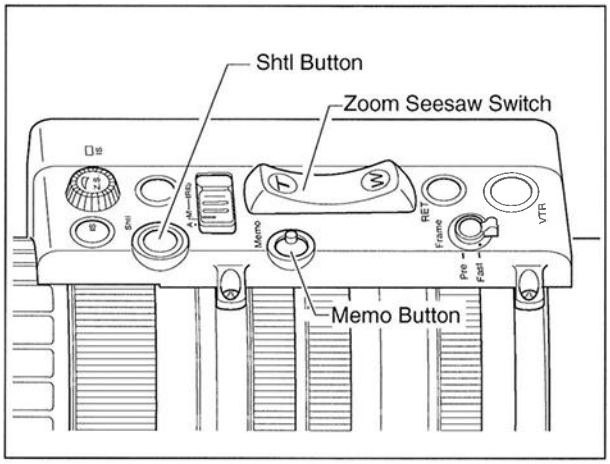
2. How to use the shuttle-shot

When holding down the Shtl button, the zoom moves toward the shuttle memory position at the maximum speed, and stops at the shuttle memory position (preset zoom position).
As long as the Shtl button is held down, the zoom stays at the shuttle memory position.
When the Shtl button is released, the zoom returns automatically to the original position at the maximum speed, or alternatively zoom operation with the zoom seesaw switch can be performed immediately.

※ (NOTE): Since priority is given to zoom operation with the Shtl button, zoom operation with the zoom seesaw switch cannot be performed while the Shtl button is held down.

3. How to return to the original position

The original position is not changed as long as zoom operation is only performed using the Shtl button. The zoom position obtained by manual operation or any servo zoom operations other than using the Shtl button, will automatically become the new original position for the next shuttle-shot operation.



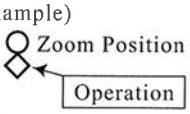
※ (NOTE): Since operation with the Shtl button is given priority, operation cannot be performed with the zoom seesaw switch while the Shtl button is held down.

4. Updating the original position

- The original position (original position: see section 3 above) for the next shuttle-shot operation is the position where the lens was last stopped using the manual or servo zoom operations.
- The original position is not updated when the zoom operation is performed using the Shtl button only.

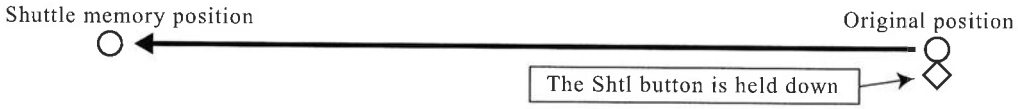
Function 1. Shuttle Shot Operation Diagrams

(Example)

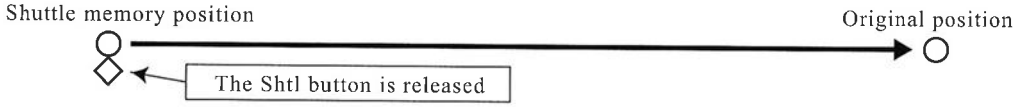


● Basic Movement of the Shuttle Shot Operation

- While the Shtl button is held down, the zoom moves toward the shuttle memory position (preset zoom position) at the maximum speed. Once the zoom reaches to this point, the zoom stops and stays there, so long as the Shtl button is held down.



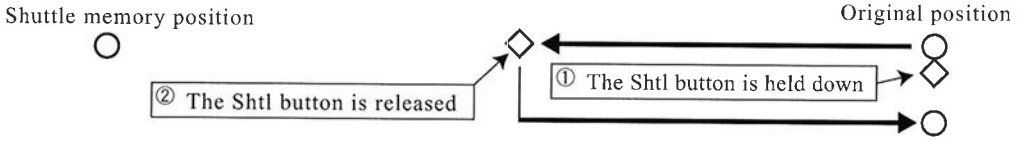
- When the Shtl button is released, the zoom returns automatically to the original position.



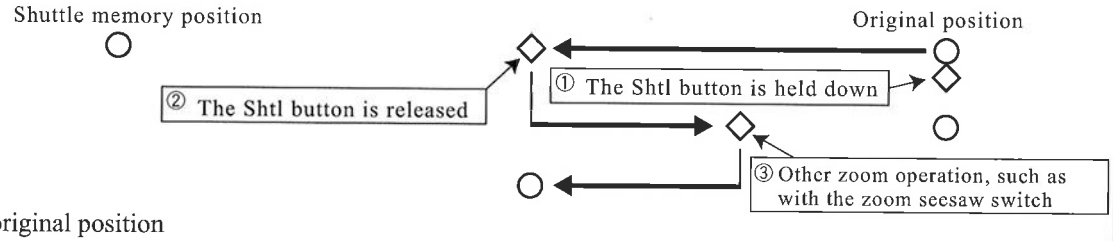
● Other

Either of the following operations cancels the zoom movement to the shuttle memory position.

- Releasing the Shtl button prior to reaching the memory position returns the zoom to the original position.

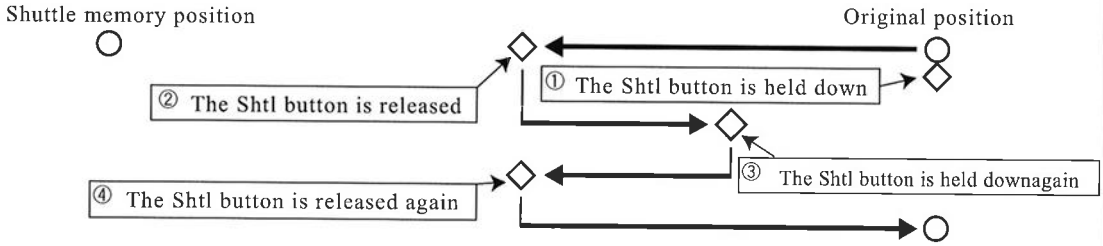


- When the Shtl button is released, the zoom operation (with the zoom seesaw switch for example) can be performed. However, since the priority is given to the Shtl shot operation, other zoom operations can not be performed while pressing the Shtl button.

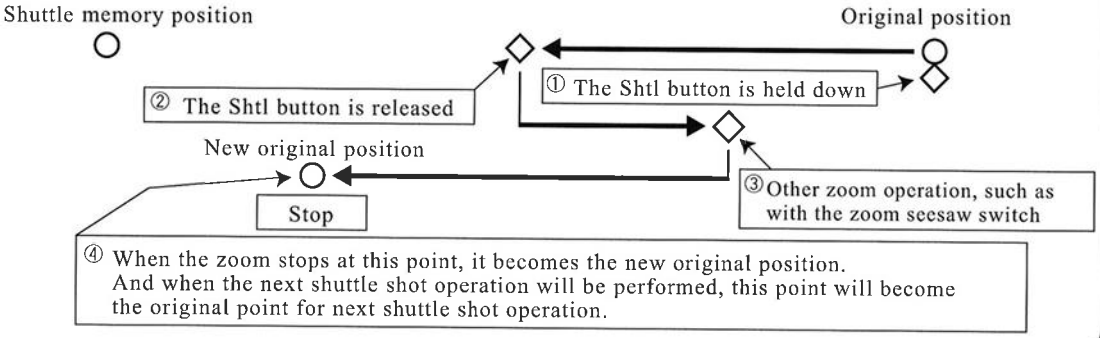


The original position

- The original position remains unchanged, so long as the zoom operation is only performed by the Shtl button.



- The original position is changed whenever the zoom operation is performed by any other means than the Shtl button.

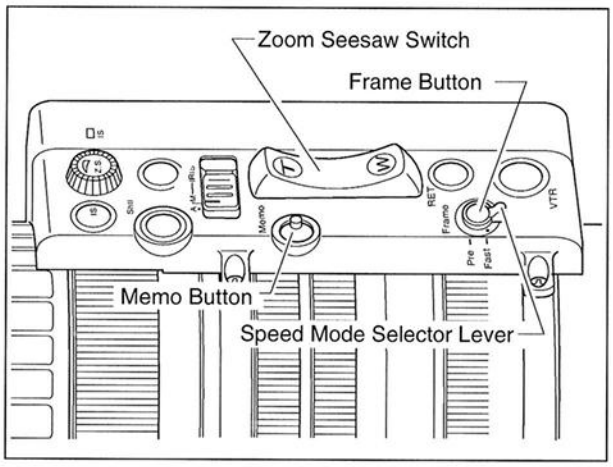


●Function 2. Framing Preset

Pressing the frame button allows you to zoom to a framing memory position (preset zoom position) from any zoom position. The zoom speed to the framing memory position can be chosen as either the maximum speed or the preset zoom speed (See function 3).

1. How to store the Framing memory position

Step 1. Zoom to any desired zoom position.
Step 2. Press the Frame button while holding down the Memo button.
(Steps 1 and 2 above complete the storing of the framing memory position.)



※ (NOTE): This framing memory position is different from the shuttle shot memory position (Refer to function 1).
The stored zoom position remains in the memory, even after the power is turned off.

2. How to set the zoom speed to the framing memory position

The speed mode selector lever located around the Frame button is used to select one of the following speeds.

Fast : For the maximum speed setting
Pre : For the preset speed setting
(Setting the preset speed is based on operation by function 3)

3. How to use the Frame button

Once the frame button is pressed, the zoom starts to move toward the framing memory position.
The zoom moves at the preset speed when the speed mode selector is set to "Pre" position, or at the maximum speed when it is set to "Fast" position.
When the zoom reaches the framing memory position, it stops and remains at that position.

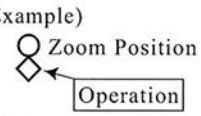
※ (NOTE): It is not necessary to hold down the frame button until the zoom reaches the framing memory position, as for the Shtl button. (Refer to function 1)
Simply press the frame button.

4. How to cancel movement to the framing memory position or shift other zoom operations

During movement to the framing memory position, the movement can be cancelled and/or shifted to another zoom operation by any of the following operations.

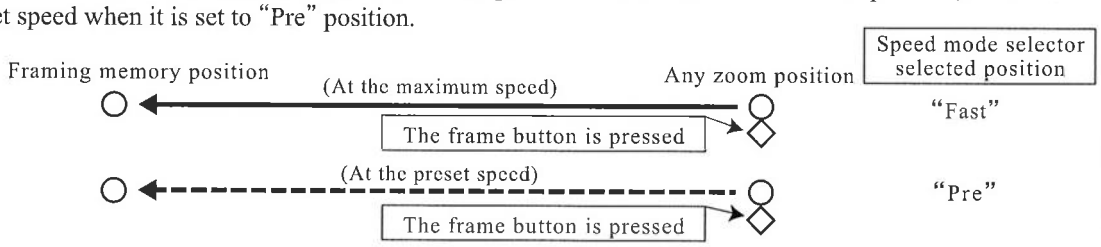
- Pressing the frame button again stops movement to the framing memory position, and the zoom remains at that point.
- Zoom operation with the zoom seesaw switch can immediately take over.
- Zoom operation with the Shtl button can immediately take over.
- Zoom operation with the button (either the "VTR" or "RET" switch which is set for the speed preset function) can immediately take over.
(Refer to "Function 3. Speed Preset" for details about the speed preset function.)

Function 2. Framing Preset Operation Diagrams



● Basic Movement of the Framing Preset Operation

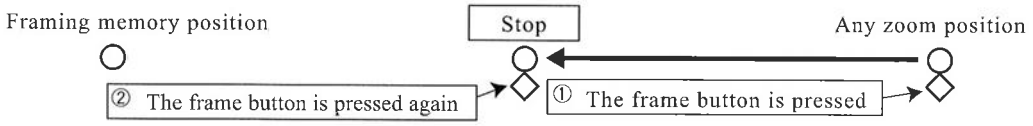
• When the frame button is pressed, the zoom moves toward the framing memory position (preset zoom position) and stops at the framing memory position.
The zoom moves at the maximum speed when the speed mode selector is set to "Fast" position, or at the preset speed when it is set to "Pre" position.



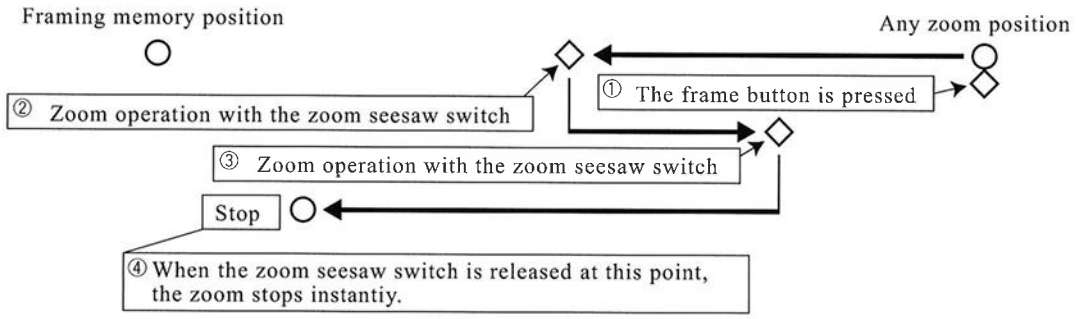
● Other

Any of the following zoom operations can be used to cancel the framing preset operation and/or change to other zoom operation.

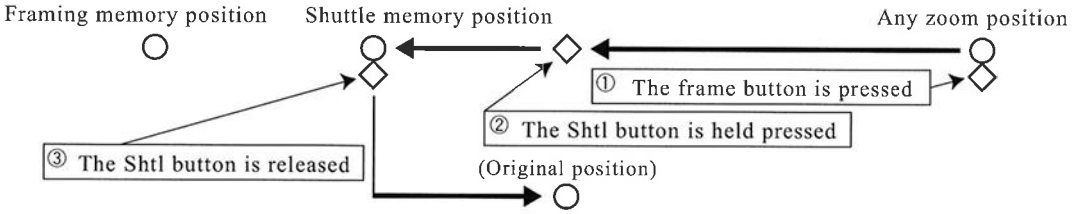
• Before the zoom reaches to the framing memory position, by pressing the frame button again, the zoom stops instantly at that position.



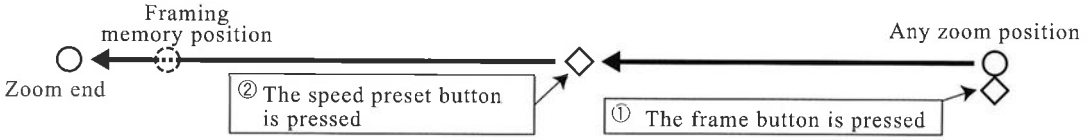
• Zoom operation with the zoom seesaw switch can immediately take over.



• Zoom operation with the Shtl button will immediately take over.
(Note: The frame memory position and the shuttle memory position are independently stored.)



• Zoom operation with the switch (either "VTR" or "RET" switch can be set for the speed preset function) can immediately take over.
Once the speed preset button is pressed, the zoom moves at the preset speed and direction until it reaches its end.



Note : The zoom moves at the preset speed and direction until it reaches its end, once the speed preset button is pressed.

● Function 3. Speed Preset

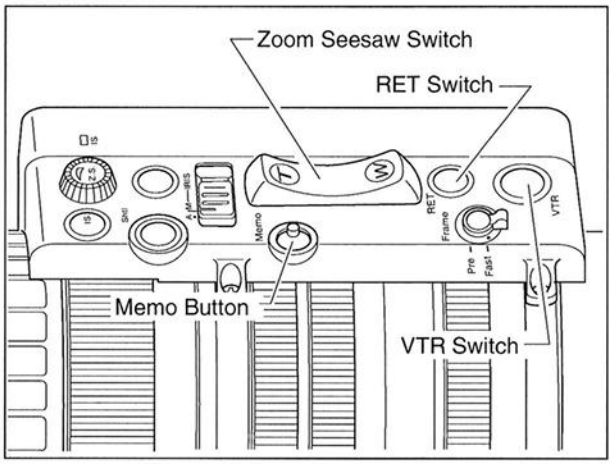
By simply pressing a button, you can reproduce a preset zoom speed and direction (towards narrow angle end or wide angle end) as many times as you want.
However, as the specific button for this function is not installed on the lens, assignment to either the "RET" or "VTR" switch is required.

1. How to set the speed preset button

To make assignments, make the following settings for the DIP switch 8 pins (top) at the front of the drive unit.

To assign to the "RET" switch,
→ DIP 1 : OFF, DIP 2 : ON
To assign to the "VTR" switch,
→ DIP 3 : OFF, DIP 4 : ON

To return "RET" to the original function,
→ DIP 1 : OFF, DIP 2 : OFF
To return "VTR" to the original function,
→ DIP 3 : OFF, DIP 4 : OFF



※ (NOTE): For details on the DIP switch settings, see section 5-8, "DIP SWITCH SETTINGS".

2. How to preset the zoom speed and direction

2-1. Operate the zoom seesaw switch to determine the zoom speed and direction (towards narrow angle end or wide angle end) which you want to store.

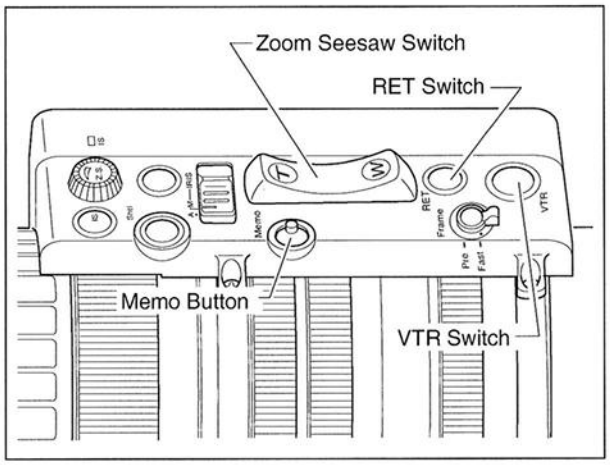
2-2. Press the memo button while maintaining the desired zoom speed and direction in step 2-1 above.

※ (NOTE): Even if you do not allocate this function to either the "RET" or the "VTR" switch, the zoom speed and direction can be memorized by pressing the memo button while the zoom is operated by the zoom seesaw switch.
Then you may allocate these memories to either the "RET" or the "VTR" switch by the setting mentioned in section 1 above, or the memorized zoom speed only can be stored to the framing preset (function 2) by changing the speed mode selector lever to set "Pre" position.

3. How to operate the speed preset function

When the button (the "RET"or the "VTR" switch which is allocated to this function) is pressed, the zoom starts to move at the preset speed and in the determined direction (towards narrow angle end or wide angle end) until the zoom reaches its end.

※ (NOTE) : When the speed preset button is pressed once, the zoom moves to its end, and remains there.
It is not necessary to hold down the button as for the Shuttle Shot operation. (see function 1)



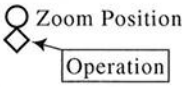
4. How to cancel the speed preset function

Movement in Speed Preset can be cancelled by any of the following operations.

- Pressing the preset button ("RET" or "VTR") again stops zoom movement.
- Performing zoom operation with the zoom seesaw switch.
- Performing zoom operation with the shtl button.
- Performing zoom operation with the frame button.

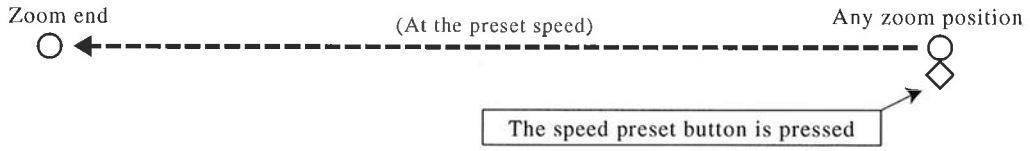
Function 3. Speed Preset Operation Diagrams

(Example)



● Speed Preset Function

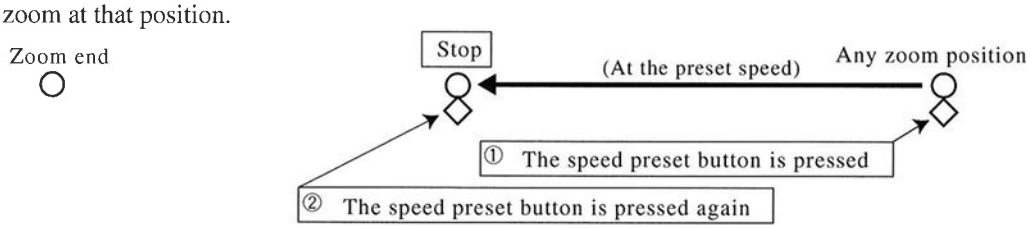
• When the button ("RET" or "VTR" switch can be assigned for the speed preset function) is pressed, the zoom starts to move at the preset speed and to the determined direction and stops at the zoom end. (either narrow angle end or wide angle end).



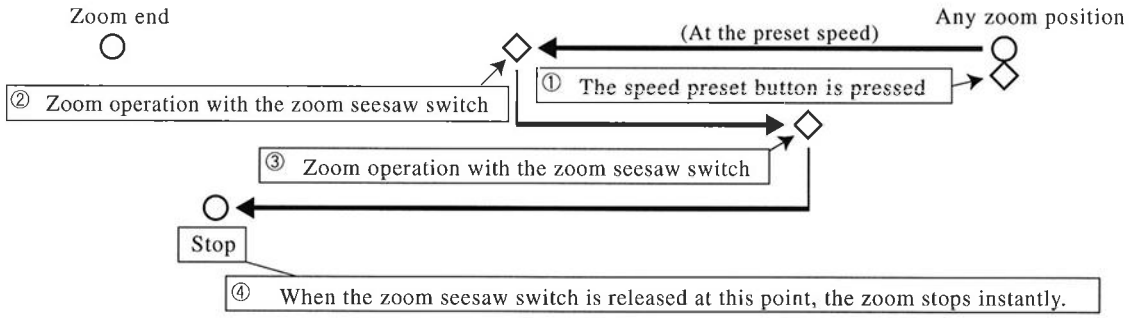
● Other

The following operations cancel the zoom movement by the speed preset operation, and shifts to other zoom operations.

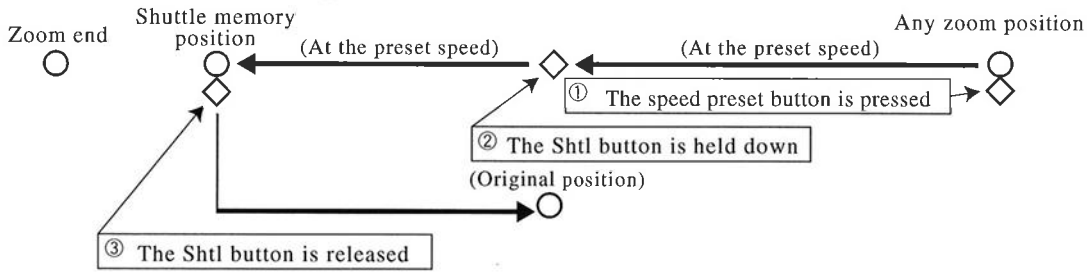
• When the button ("RET" or "VTR" switch which is allocated to this function) is pressed again, stops the zoom at that position.



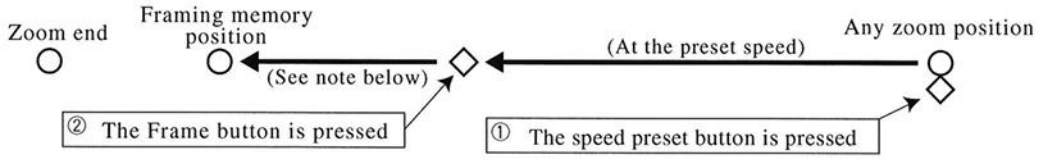
• The priority is given to the zoom operation with the zoom seesaw switch.



• The priority is given to the zoom operation with the Shtl button.



• The priority is given to the zoom operation with the frame button.



Note : When the frame button is pressed, the zoom speed changes, according to where the speed mode selector is set.
The zoom moves at the maximum speed, when it is set to "Fast" position, or at the preset speed, when it is set to "Pre" position.

List of Digital Function Buttons

"Shtl" button

- The zoom moves to the shuttle memory position while the Shtl button is held down. Once this position is reached, the zoom stays in this position while the Shtl button is held down.

Shuttle memory position — Shtl button is held down — Original position

- Releasing the Shtl button returns the zoom to the original position.

Shuttle memory position — Shtl button is released — Original position

For the details of this function, see the section "● Function 1. Shuttle Shot".

"Memo" button

Pressing the memo button together with other button allows you to preset the zoom position, direction and/or speed.

- Setting the shuttle memory position

Press (Memo) + (Shtl) at the desired position.

- Setting the framing memory position

Press (Memo) + (Frame) at the desired position.

- Setting the zoom speed and zoom direction

During pressing (Zoom seesaw switch) + (Memo)

"Frame" button

The zoom moves to the preset zoom position, when the frame button is pressed. The zoom moves at the preset speed when the speed mode selector lever is set to "Pre" position, or at the maximum speed when it is set to "Fast" position.

Framing memory position — Any zoom position — Frame button is pressed

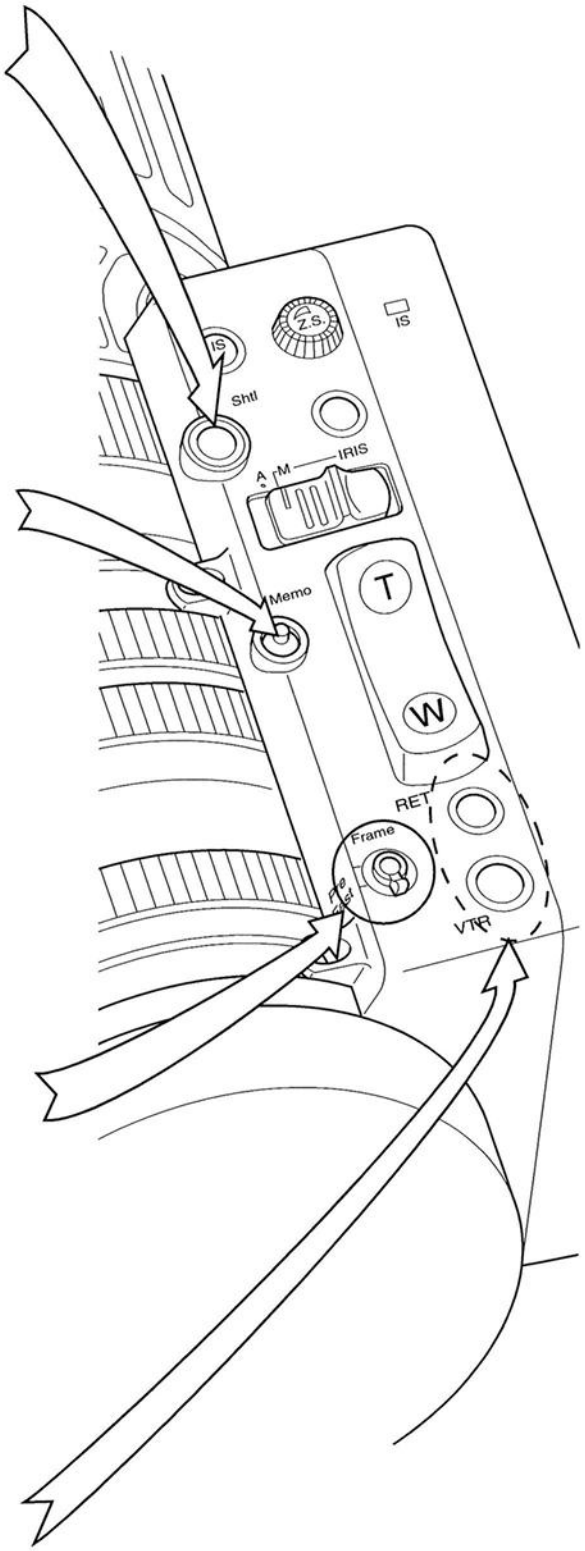
For the details of this function, see the section "● Function 2. Framing Preset".

Speed button (When assigning the function)

When the button ("RET" or "VTR" switch which is assigned for the speed preset function) is pressed, the zoom starts to move at the preset speed and to the determined direction and stops at the zoom end. (either narrow angle end or wide angle end).

Zoom end — Moves at the preset speed — Any zoom position — Preset button is pressed

For the details of this function, see the section "● Function 3. Speed Preset".

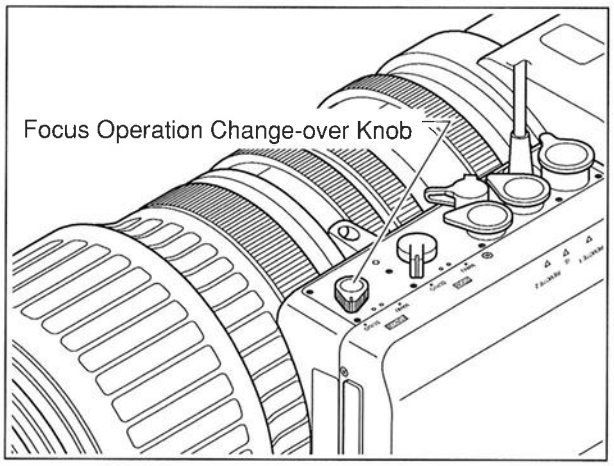


※ (NOTE) : The seal is very useful to remind these digital servo functions.
So, put it on your convenient place.

5-2. FOCUS OPERATION

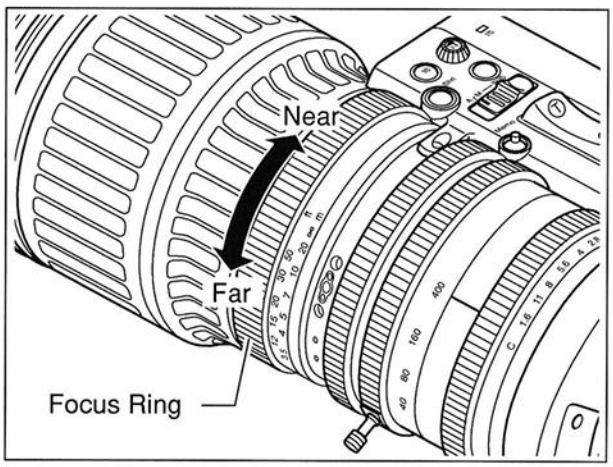
● Manual operation with the focus ring of the lens

Make sure that the focus operation change-over knob is set to the "MANU." position, before starting manual focus operation. If it is set to the "SERVO" position, change it to the "MANU." position.



⚠ CAUTION: The zoom mechanism can be damaged if the lens is forced to perform manual zoom while the lens is set to the "SERVO" side. Therefore, be sure that the lens is set to the "MANU." side before performing manual zoom.

Turn the focus ring clockwise, as viewed from the camera, to focus the lens on a close object.
Turn it counterclockwise, as viewed from the camera, to focus the lens on an object farther away.



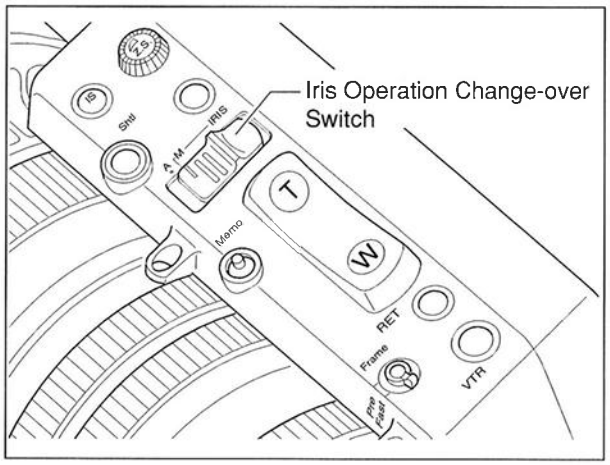
5-3. IRIS OPERATION

The iris can be operated automatically or manually by changing the position of the iris operation change-over switch.

"A" (automatic) : Automatic iris operation by signals fed from the TV camera.
"M" (manual) : Manual iris operation by the iris ring of the lens.

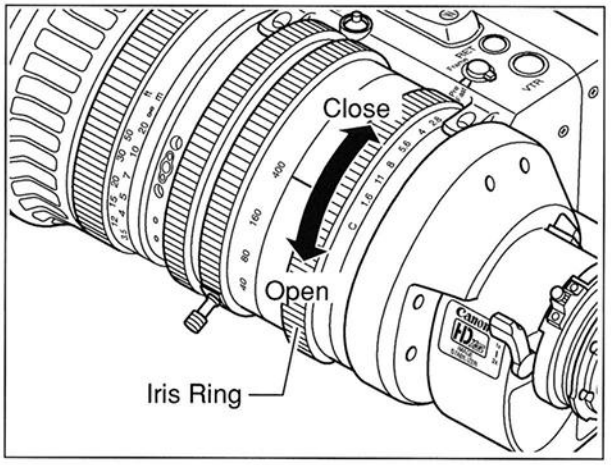
MANUAL IRIS OPERATION

Slide the iris operation change-over switch to the "M" position.



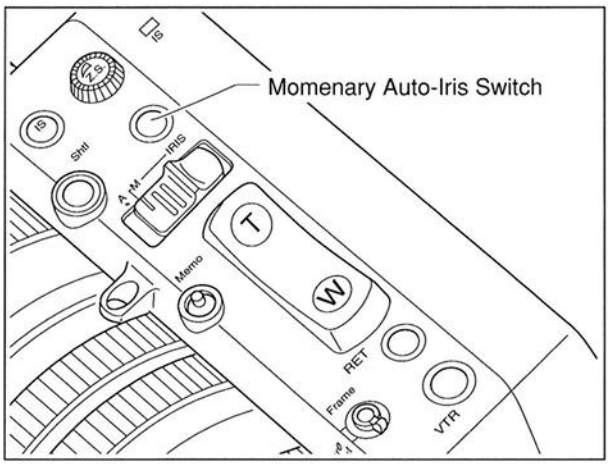
● Adjust the video level by rotating the iris ring of the lens manually.

Turn the iris ring clockwise, as viewed from behind the camera, to lower the video level. Turn the iris ring counterclockwise, as viewed from behind the camera, to increase the video level.



● Momentary automatic iris switch

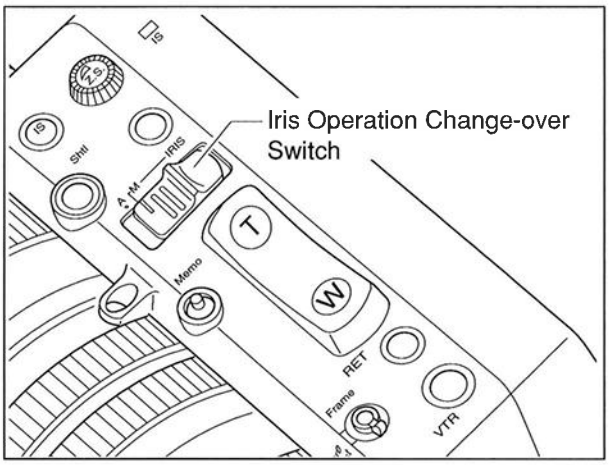
When the momentary auto-iris switch is pressed during manual iris operation mode, the iris changes to automatic operation mode while the switch is held down.
This feature is helpful when the correct iris setting is momentarily required.



AUTOMATIC IRIS OPERATION

Slide the iris operation change-over switch to the "A" position.

The video level (or the iris) is automatically adjusted by signals sent from the camera.
The iris ring rotates automatically (driven by a motor in the drive unit) so that the video signal is kept at a constant level.



※ (NOTE) : Make sure that the TV camera is also set to automatic iris operation.

5-4. IMAGE STABILIZER OPERATION

The image stabilizer incorporated in this lens is provided with a mechanical locking mechanism for protecting the anti-vibration optical system from shocks during transport. To enable usage of the image stabilizer, the lock must first be released, and then power must be supplied to the anti-vibration optical system driving circuits. The image stabilizer can be used in one of two statuses when the lock is released. Switch to the required status when using.

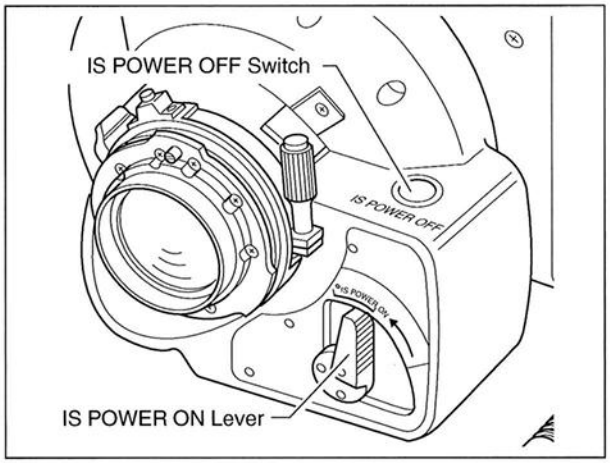
Operating status where the anti-vibration optical system performs image stabilization. ---------- IS ON

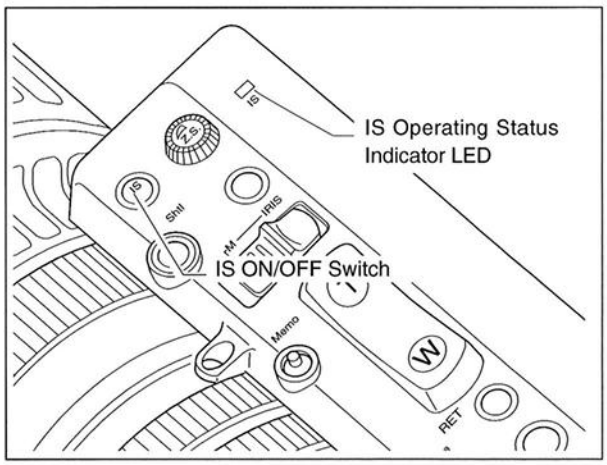
Standby status where the anti-vibration optical system is electrically held to the optical axis center ---------- IS OFF

(A) RELEASING THE MECHANICAL LOCK

A mechanical lock is applied to the image stabilizer immediately after the power is turned on from the camera. The IS POWER ON lever at the side of the camera next to the mount is used to both release the lock and supply power to the anti-vibration optical system driving circuits.

Turn the IS POWER ON lever counterclockwise from the horizontal position until it is nearly vertical. If you release the lever in this position, the lever will lock and the image stabilizer can be used. (In this case, you can check that the IS status indicator LED on the lens drive unit turns on and power is supplied to the anti-vibration optical system driving circuits.)





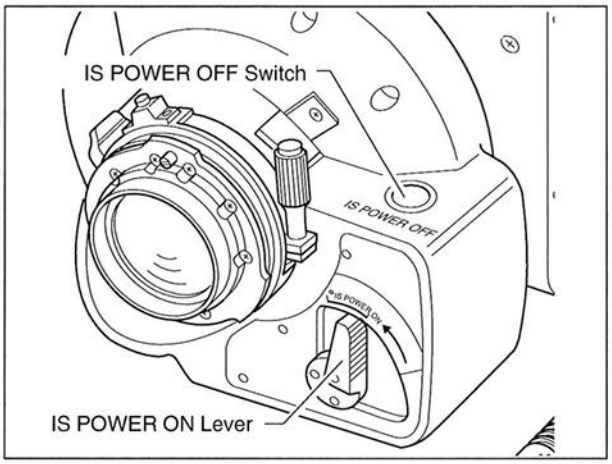
※ (NOTES): 1) If the IS POWER ON lever returns to the horizontal position without locking, the mechanical lock has not been released. Therefore, turn the lever again to lock it in the vertical position.

2) To maximize its performance, the image stabilizer needs a warming-up time of about 40 seconds for the first time that the mechanical lock is released after turning on the power from camera. Although the image stabilizer can still be used during this warming-up time, anti-vibration performance may not be fully maximized.

(B) APPLYING THE MECHANICAL LOCK

In the image stabilizer incorporated in this lens, a mechanical lock is automatically applied to the anti-vibration optical system when the power supply to the lens is cut off. As a result, the mechanical lock does not need to be applied manually when photography is finished.

Also, the anti-vibration optical system applies a mechanical lock precisely at the optical axis center position. Therefore, if the anti-vibration function is not needed, photographs can be taken with the anti-vibration optical system under a mechanical lock.



This is the reason that the IS POWER OFF switch for cutting off power only to the anti-vibration optical system driving circuits is located next to the IS POWER ON lever. If necessary, press this button to activate the mechanical lock.

Power can be saved by applying the mechanical lock since the anti-vibration optical system consumes a slight amount of power even when it is inactive (standby status) due to its anti-vibration optical system driving circuits.

The IS POWER ON lever automatically moves to the horizontal position when the power to the lens is cut off or when the IS POWER OFF switch is pressed to apply the mechanical lock.

⚠ CAUTION: Always use the IS POWER OFF switch to apply the mechanical lock to the anti-vibration system during shooting. Never try to apply the mechanical lock by forcing back the IS POWER ON lever to the horizontal position. Doing so could damage the lens mechanism.

(C) IMAGE STABILIZATION BY THE IMAGE STABILIZER

The image stabilizer can be used in one of two statuses when the mechanical lock is released. Switch to the required status when using.

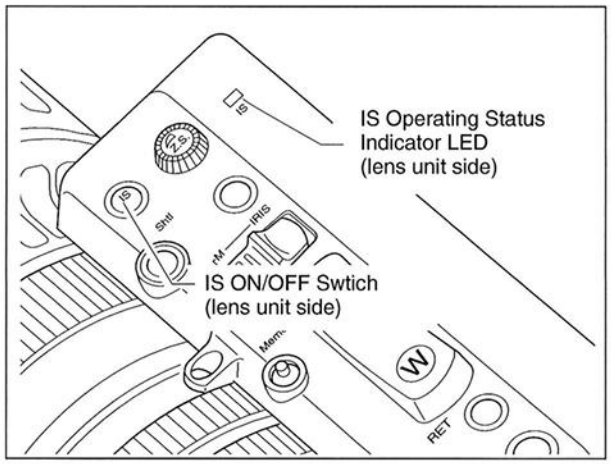
Operating status where the anti-vibration optical system performs image stabilization ---------- IS ON

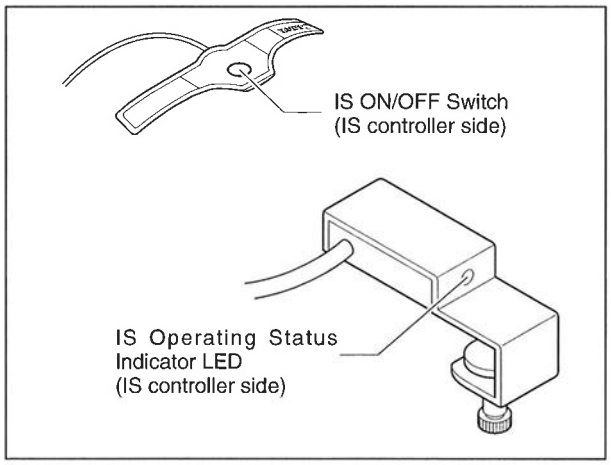
Standby status where the anti-vibration optical system is electrically held to the optical axis center ---------- IS OFF

(C-1) SWITCHING BETWEEN OPERATING AND STANDBY OPERATION

The operating and standby statuses are switched using the IS ON/OFF switch on the IS controller or the lens drive unit. When in the IS ON status, both LEDs turn green to indicate that image stabilization is in progress. When in the IS OFF status, the LED on the IS controller turns off, and the LED on the drive unit turns orange. (The LED (green/orange) on the drive unit is supplied power from the anti-vibration optical system driving circuits.)

	IS ON (operating status)	IS OFF (standby status)	Mechanical lock
IS opetating status indicator LED (lens unit side)	Green	Orange	Off
IS opetating status indicator LED (IS controller side)		Off	Off





(C-2) BASIC OPERATION OF IMAGE STABILIZER

1. Use the pan-tilt operation to determine the picture composition.
2. If there is any noticeable shaking, turn on the image stabilizer to stabilize the image.
3. Perform the pan-tilt operation when the image stabilizer is turned off and in standby status.

※ (NOTES): If the pan-tilt operation is performed rapidly while the image stabilizer is activated, the image may exhibit an unintended, unnatural movement. This is because the image stabilizer is detecting the pan-tilt movement as image shaking and trying to make the appropriate corrections. Turn off the image stabilizer before performing the pan-tilt operation.

(C-3) SELECTING THE IMAGE STABILIZER OPERATING ENVIRONMENT

The default settings for behavior (switch mode) of the IS ON/OFF switch and image stabilization direction of the image stabilizer are shown below.

Switch mode ..... Alternate operation (ALT) where the ON and OFF settings change each time the button is pressed

Stabilization direction .. Performed for both the horizontal (H) and vertical (V) directions

The following settings can also be made according to the usage environment and user preferences.

Switch mode ..... Momentary operation (MOM) where the image stabilizer is activated only while the ON button is pressed

Stabilization direction ... Performed for the vertical (V) direction only

Anti-vibration direction (10-pin DIP switch 9)	Switch mode (10-pin DIP switch 8)	IS ON/OFF switch operation	IS function operation
H+V (Horizontal + Vertical)	ALT	Each time button is pressed and released	Switches between standby and operation of the image stabilization for both the H and V directions each time the IS switch is pressed
	MOM	While the button is held down	Operation of the image stabilization for both the H and V directions
		Button is released	Standby of the image stabilization function
V (Vertical)	ALT	Each time button is pressed and released	Switches between standby and operation of the image stabilization for the V direction only each time the IS switch is pressed
	MOM	While the button is held down	Operation of the image stabilization for the V direction only
		Button is released	Standby of the image stabilization function

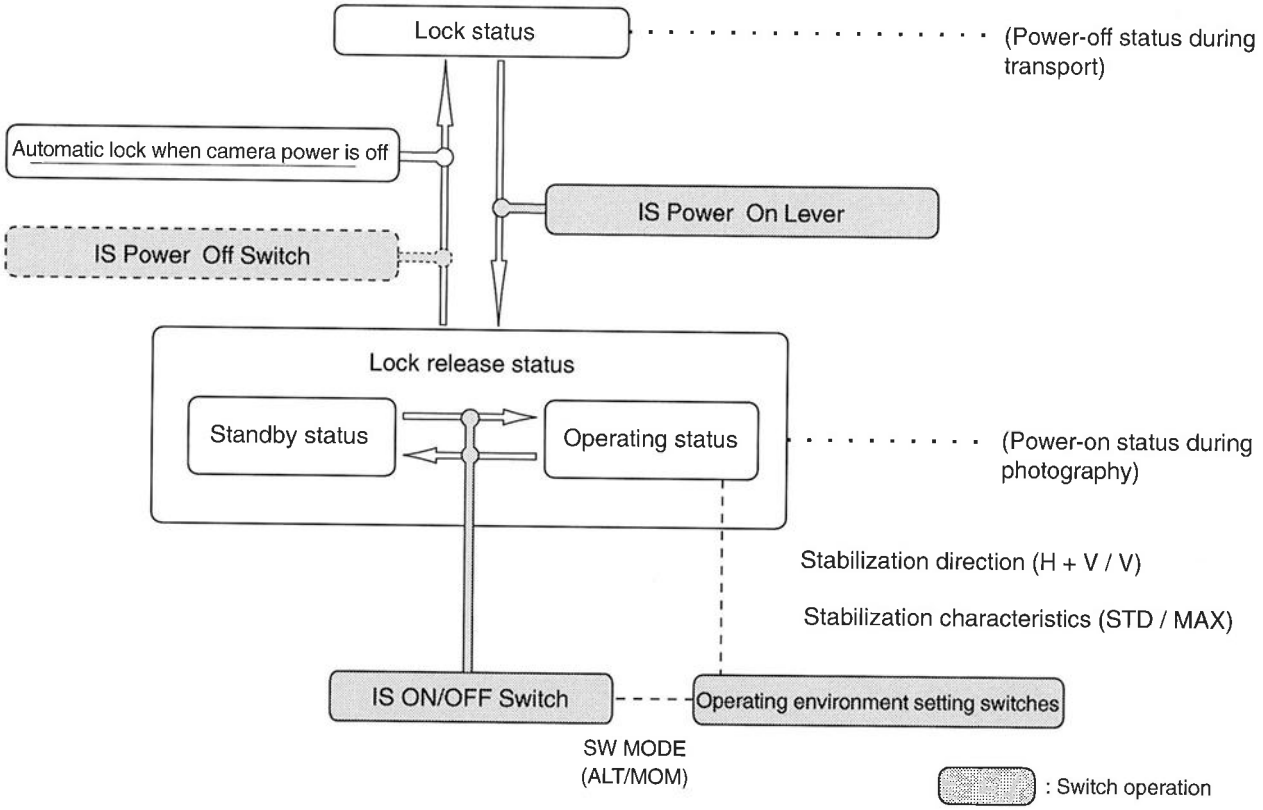
The default setting for image stabilization is the standard characteristics (STD) which perform special processing for fluctuation in low-frequency waves due to slow-moving camera work to minimize unnatural movements. However, image stabilization can also be set to the maximum characteristics (MAX) for correcting frequency fluctuation.

Horizontal anti-vibration characteristics (10-pin DIP switch 6)	Vertical anti-vibration characteristics (10-pin DIP switch 7)	Low frequencyfluctuation correction characteristics
STD	STD	Standard characteristics for both the H and V directions
	MAX	H: Standard characteristics V: Maximum characteristics
MAX	STD	H: Maximum characteristics V: Standard characteristics
	MAX	Maximum characteristics for both the H and V directions

See section 5-8, "DIP SWITCH SETTINGS" for the setting procedures for the switch mode (SW MODE) and image stabilization directions and correction characteristics.

※ (NOTES): 1) To activate the image stabilizer in a pinpoint fashion, set the switch mode to momentary (MOM) for rapid switching.
2) If only panning will be performed repeatedly, set the stabilization direction to vertical (V) only. This will not stabilize the horizontal (H) direction and will eliminate any un-natural movement (see the note above) due to panning.
3) If the fluctuation of slow-moving low-frequency waves is noticeable in still shots, set the stabilization characteristics to MAX (setting of the horizontal and vertical according to the fluctuation direction) to improve the anti-vibration effect.

Relationship between the image stabilizer status and switching/setting switch



※ (NOTES): Whether the image stabilizer is operating or in standby when the lock is released will depend on the IS ON/OFF switch setting mode. When set to alternate (ALT) operation, the image stabilizer is operating. When set to momentary (MOM) operation, the image stabilizer is in standby.

5-5. EXTENDER OPERATION

The 2x extender built into the lens changes the focal length of the lens by a factor of two, and at the same time the F number is changed by the same factor.

● HJ40x10B IASD-V

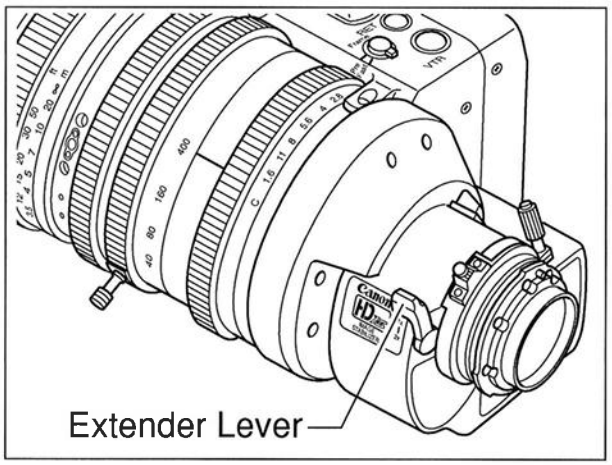
	Master Lens	With 2x Extender
Focal Length	10 ~ 400 mm	20 ~ 800 mm
Max. Relative Aperture	1 : 2.0 (10 ~ 220 mm)	1 : 4.0 (20 ~ 440 mm)
	1 : 3.65 (400 mm)	1 : 7.3 (800 mm)

● HJ40x14B IASD-V

	Master Lens	With 2x Extender
Focal Length	14 ~ 560 mm	28 ~ 1120 mm
Max. Relative Aperture	1 : 2.8 (14 ~ 307 mm)	1 : 5.6 (28 ~ 614 mm)
	1 : 5.1 (560 mm)	1 : 10.2 (1120 mm)

● Operation

The 2x extender is inserted into the lens optical system by turning the extender lever on the rear of the lens to the 2x indication side.
The 2x extender is removed from the lens optical system by turning back the extender lever to the original position (1x position).



5-6. MACRO OPERATION

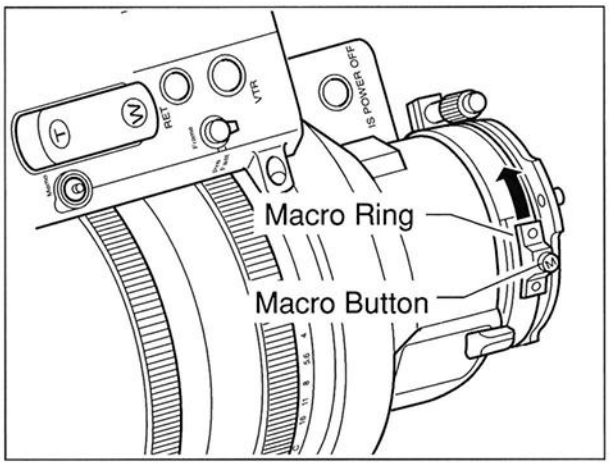
When the macro function of the lens is used, macro shooting is enabled.
In macro shooting, the object distance becomes shorter than the normal minimum object distance (M.O.D.).
The minimum object distance in macro operation for this lens is only 1 cm at the wide end of the focal length and maximum macro position.

● Operation

To operate the macro function, turn the macro ring at the back of the lens manually.
Press the macro button to unlock the macro ring. While holding it down, turn the macro ring clockwise as viewed from behind the camera to allow macro shooting.

1. Set the lens to wide-end by manual or servo zoom operation.

2. Bring the object into focus by using the macro button (macro ring).



● Object distance and object dimensions in macro shooting

HJ40x10B IASD-V

	Zoom position	Position of macro ring or button	Minimum object distance *1	Object dimensions*3
Normal operation	10 mm	Locked	280 cm	248.4 x 139.7 cm
	400 mm	Locked	280 cm	6.2 x 3.5 cm
Macro operation	10 mm	Max. Macro position *2	1 cm	8.6 x 4.8 cm

HJ40x14B IASD-V

	Zoom position	Position of macro ring or button	Minimum object distance *1	Object dimensions*3
Normal operation	14 mm	Locked	280 cm	177.1 x 99.5 cm
	560 mm	Locked	280 cm	4.5 x 2.5 cm
Macro operation	14 mm	Max. Macro position *2	1 cm	6.0 x 3.3 cm

*1 : The object distance is measured from the front lens vertex.
*2 : Macro shooting is possible, regardless of where the macro ring is positioned between the locked position and maximum macro rotated position. At the intervening positions, the above data vary.
*3 : These data are for 16 : 9 aspect ratio camera systems.

※ (NOTE): Macro operation is also possible at any zoom position other than the wide end of the focal length, but the object distance increases.

● Multi-point focus shooting

In macro shooting, when zooming to change the focal length, the focal point varies.
The multi-point focus shooting technique uses this characteristic.
The focal point is shifted by zoom operation.

Follow the steps below :

Setting procedure

Step 1 : Zoom in to a far object, and bring it into focus by normal focus operation.

Step 2 : Zoom out to a near object and bring it into focus by macro operation.

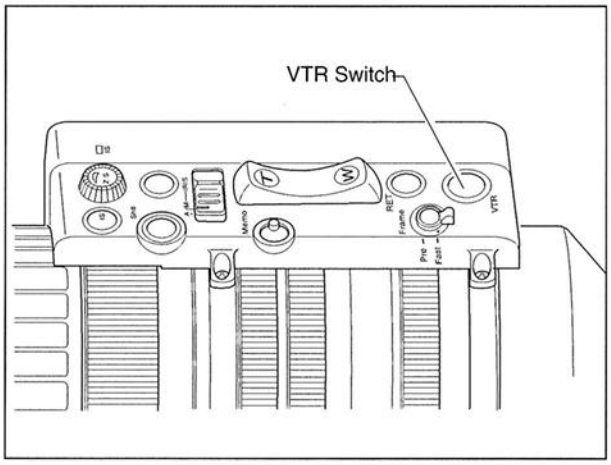
Step 3 : Zoom in to the far object again whithout touching the macro button set in step 2 above, and bring it into focus again by normal focus operation.

When steps 1 to 3 have been performed, the setting for multi-point focus shooting is completed.
When zooming in, the focal point is continuously shifted from the object in the foreground to the farther object in the background.
When zooming out, the focal point is continuously shifted from the farther object in the background to the object in the foreground.

5-7. VTR SWITCH AND RET SWITCH OPERATIONS

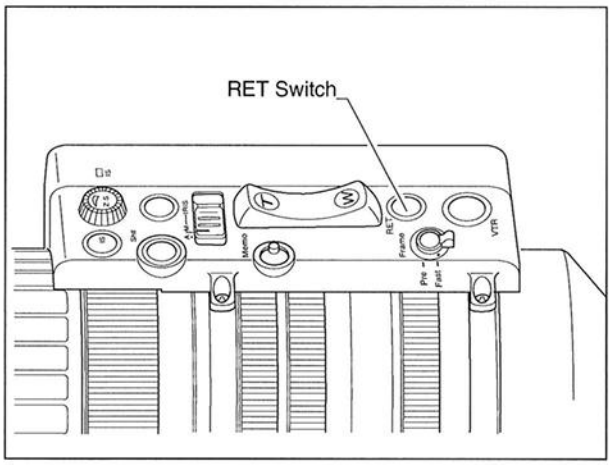
● VTR Switch

Press the VTR switch to execute operation of the VTR and press again to stop operation of the VTR.



● RET Switch (Return Video Switch)

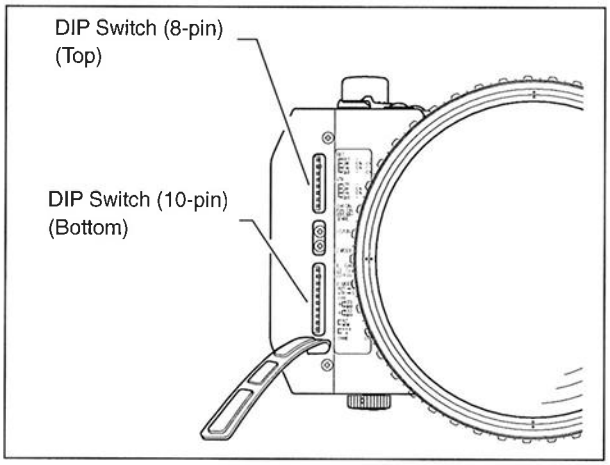
While the RET switch is pressed, the external video picture sent to the TV camera head can be seen on the viewfinder.



※ (NOTE): When the speed preset function or another function is assigned to either the VTR or RET switch, resetting to the original function of that button is required. Refer to section 5-8 for details on how to reset.

5-8. DIP SWITCH SETTINGS

DIP switches for making settings are located under the rubber cap at the front of lens drive unit.



(A) DIP SWITCH SETTING FUNCTION

(A-1) ASSIGNING SWITCH FUNCTIONS

Zoom preset function switches such as shuttle shot and framing preset can be assigned to the RET and VTR switches. This allows you to use these functions at conventional demands (demands that do not have a Shtl or Frame button) that can be connected. Assignment of the IS ON/OFF switch function is also possible.

(A-2) SETTING THE ZOOM PRESET FUNCTION

If unused functions are assigned to shuttle shot and framing preset, the functions can be disabled individually to prevent accidental operation.

(A-3) SETTING THE IRIS FUNCTION

- The torque of the iris ring in iris manual operation can be set to L (light) or H (heavy).
- The iris correction function can be enabled or disabled.

(A-4) SETTING THE ZOOM CONTROL FUNCTION

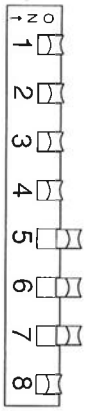
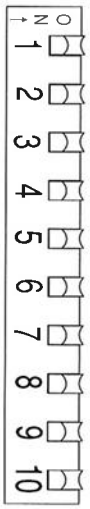
- Turning the maximum zoom speed volume on the drive unit allows you to change the zoom speed when the zoom seesaw switch is pressed. However, you can select to enable or disable the zoom speed setting made by the maximum zoom speed volume when using the zoom demand.
- The zoom can be controlled using a speed signal or position signal. Controlling the zoom with the position signal requires a special controller.

(A-5) SETTING THE IMAGE STABILIZER FUNCTION

- The stabilization characteristics can be set to standard (STD) or maximum (MAX).
- The behavior of the IS ON/OFF switch can be set to alternate (ALT) or momentary (MOM).
- The stabilization direction can be set to horizontal (H) + vertical (V) or vertical (V) only.

(B) SETTING PROCEDURE

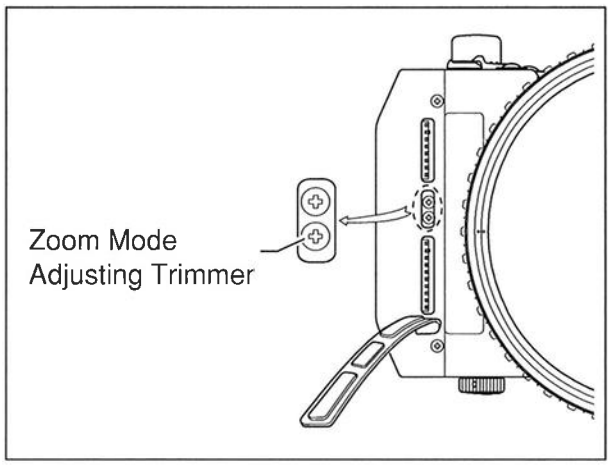
1. DIP switches are covered by a rubber cap. Remove it before making any DIP switch setting.
2. The table below shows the function settings for DIP switch positions.
   As viewed from the front of the lens, the right side of the switch is ON and the left side is OFF.
3. After completing the above setting, replace the rubber cap to protect the DIP switches from any unwanted setting.

	Setting Items		DIP Switch Settings
		Function selection	
DIP switch (8-pin) (Top) Initial settings 	Assingning a Function to the RET switch	Return (RET)	1 : OFF 2:OFF
		Shuttle Shot (Shtl)	1 : ON 2:ON
		Framing Preset (Frame)	1 : ON 2:OFF
		Speed Preset	1 : OFF 2:ON
	Assingning a Function to the VTR switch	VTR on-off (VTR)	3:OFF 4:OFF
		Shuttle Shot (Shtl)	3:ON 4:ON
		Framing Preset (Frame)	3:ON 4:OFF
		Speed Preset	3:OFF 4:ON
	Shuttle Shot function	Enabled	5:ON
		Disabled	5:OFF
	Framing Preset function	Enabled	6:ON
		Disabled	6:OFF
	Selecting the iris ring rotating force (torque)	H (heavy)	7:ON
		L (light)	7:OFF
	Spare DIP switch		8:OFF
DIP switch (10-pin) (Bottom) Initial settings 	Iris correction function	Enabled	1:ON
		Disabled	1:OFF
	Speed dial function for zoom demand	Enabled	2:ON
		Disabled	2:OFF
	Zoom control signal option	Position signal	3:ON
		Speed signal	3:OFF
	Assingning a Function to the RET switch	IS ON/OFF switch	4:ON
		Functions selected by 8-pin DIP switches 1 and 2	4:OFF
	Assingning a Function to the VTR switch	IS ON/OFF switch	5:ON
		Functions selected by 8-pin DIP switches 3 and 4	5:OFF
	Horizontal anti-vibration characteristics	MAX (Maximum)	6:ON
		STD (Standard)	6:OFF
	Vertical anti-vibration characteristics	MAX (Maximum)	7:ON
		STD (Standard)	7:OFF
	IS ON/OFF switch operation	MOM (Momentary)	8:ON
		ALT (Alternate)	8:OFF
	Anti-vibration direction	V (Vartical)	9:ON
		H+V (Horizontal+Vartical)	9:OFF
	Spare DIP switch		10:OFF

Initial settings

5-9. ZOOM MODE ADJUSTMENT

During servo zoom operation with the zoom seesaw switch, the further down the switch is pressed, the faster the zoom speeds. The max. zoom speed volume can be used to adjust the maximum zoom speed when the switch is pressed all the way down. (see section 5-1 "BASIC SERVO ZOOM OPERATION")
The zoom mode adjusting trimmer adjusts the zoom speed when the zoom seesaw switch is pressed to the same level.

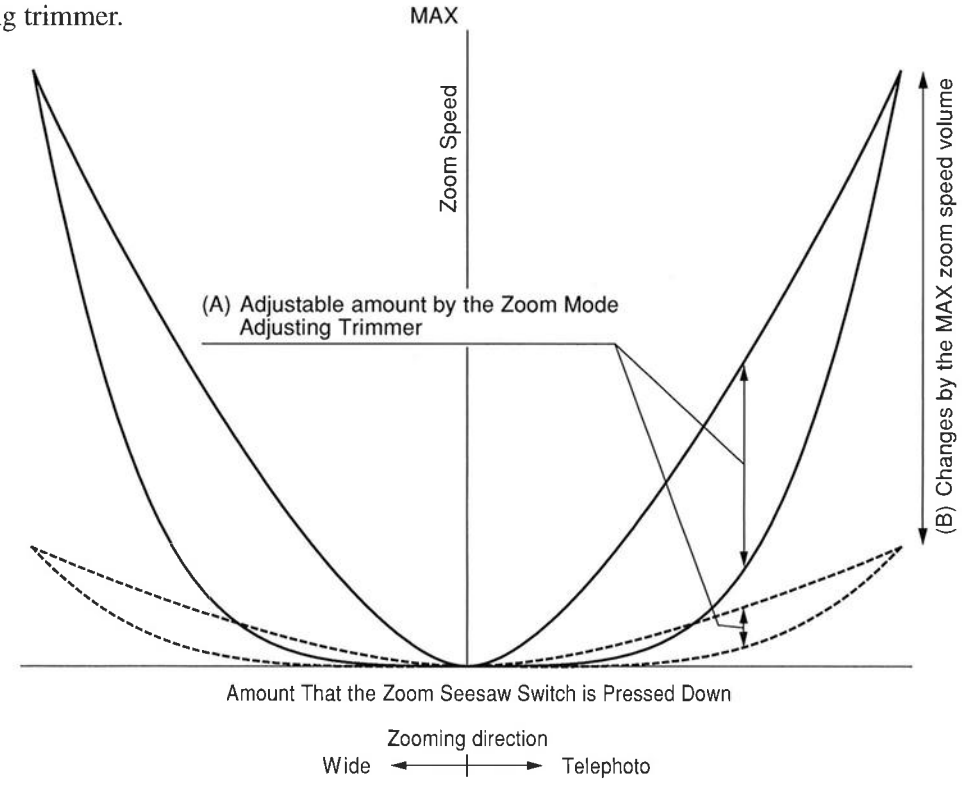


1. A zoom mode adjusting trimmer is provided under the rubber cap on the front of the lens drive unit. The zoom mode adjusting trimmer is normally protected with a rubber cap. Before starting the adjustment, remove the rubber cap.

2. Turn the zoom mode adjusting trimmer (marked as "Z. MODE" on the sticker next to the trimmer), using a small screw driver to set the desired level.
   To increase the zoom speed, turn the trimmer clockwise.
   To decrease the zoom speed, turn it counterclockwise.

3. After the adjustment is completed, replace the rubber cap.

The chart below shows the relationship of the zoom speed change between "(A) Adjustable amount by the zoom mode adjusting trimmer" and "(B) Changes by the max. zoom speed volume".
For the shuttle-shot (function 1) and the framing preset (function 2) in expanded servo zoom operation, the zoom always moves at the maximum speed, regardless of the adjustment made with the zoom mode adjusting trimmer.



§ 6. PRODUCT SPECIFICATIONS

HJ40x10B IASD-V

		1x	2x
Focal Length		10 - 400 mm	20 - 800mm
Zoom Ratio		40x	
Maximum Relative Aperture		1:2.0 (10-220 mm) 1:3.65 (400 mm)	1:4.0 (20-440 mm) 1:7.3 (800 mm)
Image Format		9.6 x 5.4 mm (Dia. 11 mm)	
Angular Field of View	(Wide) (Tele)	51.3° x 30.2° 1.4° x 0.8°	27.0° x 15.4° 0.7° x 0.4°
Minimum Object Distancre (M.O.D.)		2.8 m (from the front lens vertex)	
Object Dimensions at M.O.D.	(Wide) (Tele)	248.4 x 139.7 cm 6.2 x 3.5 cm	124.2 x 69.9 cm 3.1 x 1.8 cm

HJ40x14B IASD-V

		1x	2x
Focal Length		14 - 560 mm	28 - 1120 mm
Zoom Ratio		40x	
Maximum Relative Aperture		1:2.8 (14-307 mm) 1:5.1 (560 mm)	1:5.6 (28-614 mm) 1:10.2 (1120 mm)
Image Format		9.6 x 5.4 mm (Dia. 11 mm)	
Angular Field of View	(Wide) (Tele)	37.8° x 21.8° 1.0°x 0.6°	19.4° x 11.0° 0.5° x 0.3°
Minimum Object Distancre (M.O.D.)		2.8 m (from the front lens vertex)	
Object Dimensions at M.O.D.	(Wide) (Tele)	177.1 x 99.5 cm 4.5 x 2.5 cm	88.6 x 49.8 cm 2.3 x 1.3 cm

Flange back	48 mm (in air)
Thread for filters	127 m pitch 0.75 (Front lens barrel)
Zoom speed	Max. 1.5 ± 0.2 s
Focus speed	1.8 ± 0.2 s
Iris	Control from camera
Mount	Bayonet Mount
Power (input)	Nominal DC 12V (10V to 17V)
Power consumption	Max. 600mA
Weight	Approx. 5.4 kg (HJ40x10B) Approx. 5.45kg (HJ40x14B)
Operating temperature	Temperature : -20℃ to +45℃ Humidity : 5% to 95%RH (no condensation)

Reference : Lens Designation (For Portable Type Zoom Lens)

A Canon TV zoom lens model name is designated by image size, zoom ratio, focal length at wide end, operation system (focus, zoom and iris), and other information as shown below.

Ex.) J 22e × 7.6 B4 I R S D - C

① Image Size & Applicable Camera
② Zoom Ratio
③ Focal Length at Wide End
④ Prism Compensation
⑤ Extender
⑥ Focus & Zoom Operation System
⑦ Iris Operation System
⑧ Special Feature (1)
⑨ Special Feature (2)

① Image Size & Applicable Camera
- J : 11mm Dia. & for 2/3″ SDTV portable camera
- HJ : 11mm Dia. & for 2/3″ HDTV portable camera
- YJ : 11mm Dia. & for 2/3″ Pro-video portable camera
- H : 8mm Dia. & for 1/2″ SDTV portable camera
- YH : 8mm Dia. & for 1/2″ Pro-video portable camera

② Zoom Ratio
- 17 : 17x zoom
- 22 : 22x zoom

③ Focal Length at Wide End
- 7.7 : 7.7 mm
- 7.6 : 7.6 mm

④ Prism Compensation
- B : Compensated for prism*
- B3 : Compensated for 2/3″ B3 prism
- B4 : Compensated for 2/3″ B4 prism
- C : Without prism compensation

(In case of 1/2″ prism, designation for prism compensation may be omitted, since only one type of prism exists.)

⑤ Extender
- I : Built-in extender (s)
- K : No Built-in extender
- V : Built-in COU* unit
- W : Built-in COU* unit

*COU : Crossover unit

⑥ Focus & Zoom Operation System
- A — Focus : Manual (with built-in motor for servo); Zoom : Servo/Manual
- L — Focus : Manual (Rotation); Zoom : Manual (Rotation)
- R — Focus : Manual; Zoom : Servo/Manual
- T — Focus : Servo; Zoom : Servo

⑦ Iris Operation System
- L : Manual
- S : Servo

⑧ Special Feature (1)
- (none) : No special feature
- D : Digital servo

⑨ Special Feature (2)
- (none) : No special feature
- C : Clutch-less
- V : Anti-vibration function included

§ 7. OPTIONAL ACCESSORIES (SOLD SEPARATELY)

To maximize the performance of the lens and provide more flexibility in operation, Canon provides the following accessories (sold separately). Refer to the operation manual for the respective accessory for the installation, connection, and operating procedures.

7-1. AVAILABLE ACCESSORIES

(A) CONTROL ACCESSORIES

- Recommended Accessories

FFC-200	FLEXIBLE FOCUS CONTROL UNIT
FZC-100	FLEXIBLE ZOOM CONTROL UNIT
FC-40	32″ FLEXIBLE CABLE
FFM-300	FLEXIBLE FOCUS MODULE
FFM-400	FLEXIBLE DUAL MODULE
FPD-400D	FOCUS POSITIONAL SERVO DEMAND FOR DIGITAL DRIVE
ZSD-300D	ZOOM SERVO DEMAND FOR DIGITAL DRIVE
ZSG-200M	ZOOM SERVO GRIP
EC-80	EXTENSION CABLE

- Other Compatible Accessories

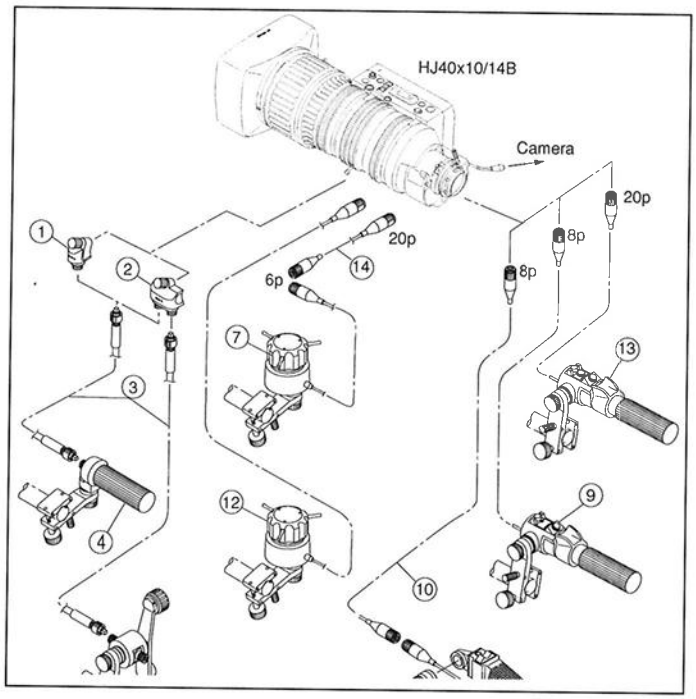
FPD-400	FOCUS POSITIONAL SERVO DEMAND
ZSD-300M	ZOOM SERVO DEMAND
ZSD-350M	ZOOM SERVO DEMAND
CC-2006	CONVERSION CABLE 20P-6P

(B) OPTICAL ACCESSORIES

UV/127mm	UV (ULTRA VIOLET) FILTER 127mm
ND8/127mm	ND8 FILTER 127mm
SFT/127mm	SOFTON FILTER 127mm
CRS/127mm	CROSS SCREEN FILTER 127mm
SNW/127mm	SNOW CROSS FILTER 127mm
SNY/127mm	SUNNY CROSS FILTER 127mm
PL/127mm	POLARIZED FILTER 127mm

7-2. SYSTEM CONFIGURATION FOR ZOOM AND FOCUS OPERATIONS

Select the necessary accessories for operating the zoom and focus functions from the following table.



① Flexible Focus Module
② Flexible Dual (Zoom/Focus) Module
③ Flexible Cable
④ Flexible Focus Control Unit
⑤ Flexible Zoom Control Unit
⑦ Focus Positional Servo Demand Unit
⑧ Zoom Servo Grip
⑨ Zoom Servo Demand Unit
⑩ Extension Cable
⑪ Clamp
⑫ Focus Positional Servo Demand for Digital Drive
⑬ Zoom Servo Demand for Digital Drive
⑭ Conversion Cable 20P-6P

Operation Systems and Required Accessories

	Focus Function		Zoom Function	
	Operation	Accessories Used	Operation	Accessories Used
Manual	Manual	None	Manual	None
	Remote Manual	②*③④	Remote Manual	②*③⑤
Semi-Servo	Manual	None	Servo	None
	Remote Manual	①③④	Remote Servo	⑧⑩⑪
	Remote Manual	①③④	Remote Servo	⑨
	Remote Manual	①③④	Remote Servo	⑬
Servo	Remote Servo	⑦⑭	Remote Servo	⑧⑩⑪
	Remote Servo	⑦⑭	Remote Servo	⑨
	Remote Servo	⑦⑭	Remote Servo	⑬
	Remote Servo	⑫	Remote Servo	⑧⑩⑪
	Remote Servo	⑫	Remote Servo	⑨
	Remote Servo	⑫	Remote Servo	⑬

Note : * ② Only one (Flexible dual module) is required for focus and zoom manual operations.

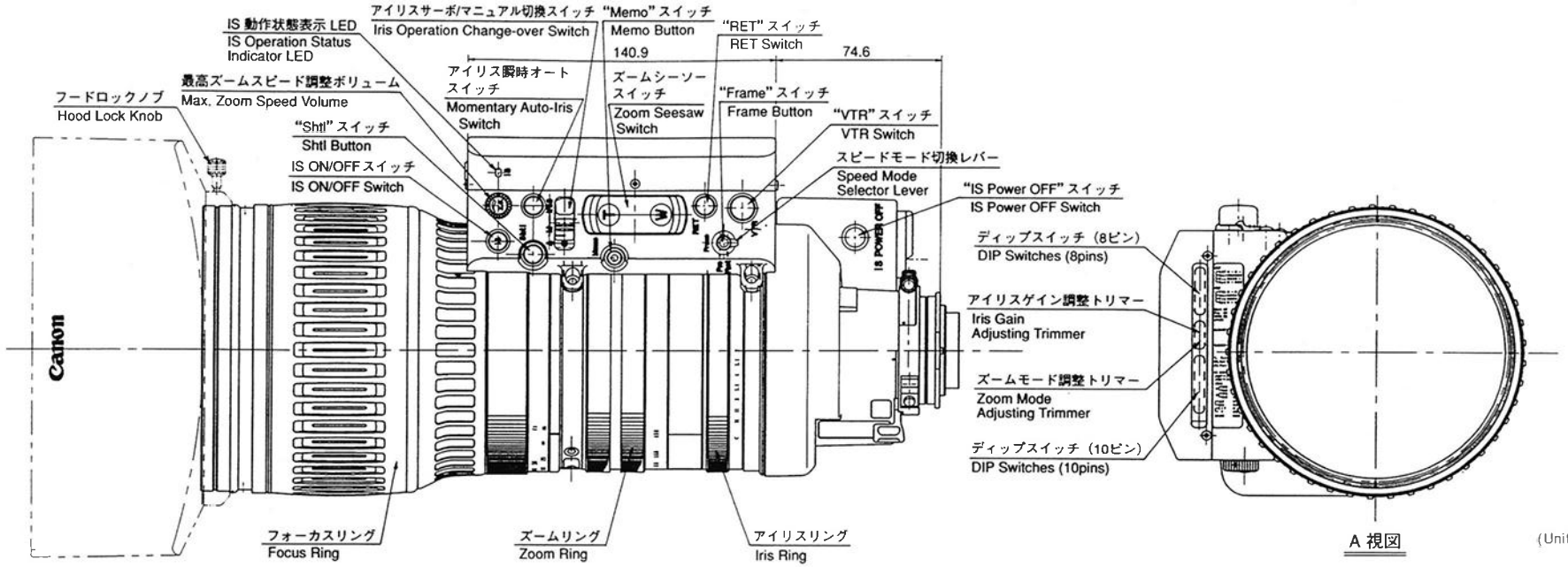
資　料　集
TECHNICAL DOCUMENTS

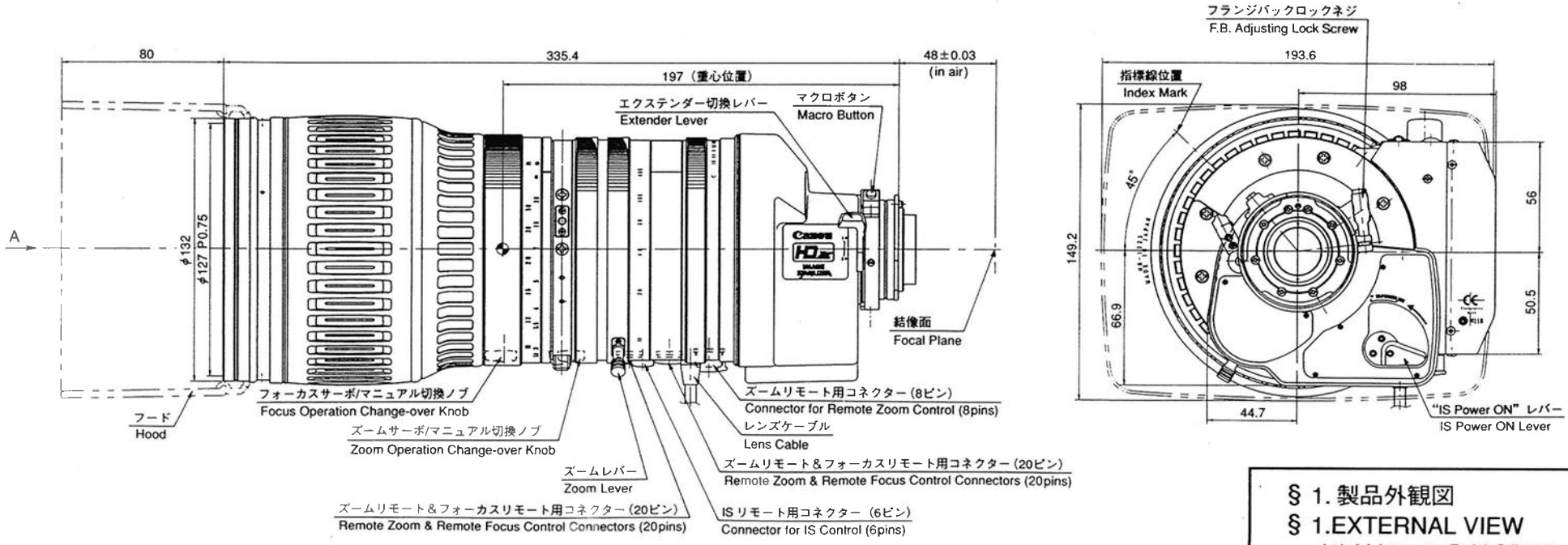
目　次

資料集として「ドライブユニット結線図及び製品の外観図」をまとめてあります。
必要に応じてご使用ください。

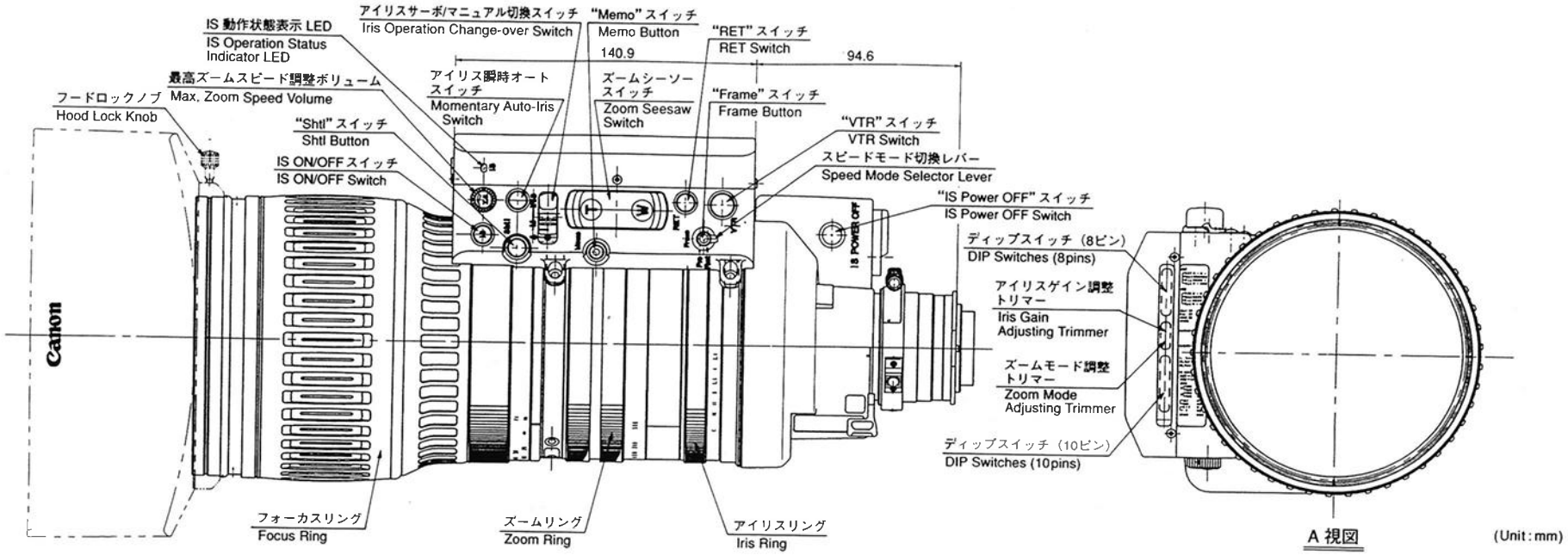
CONTENTS

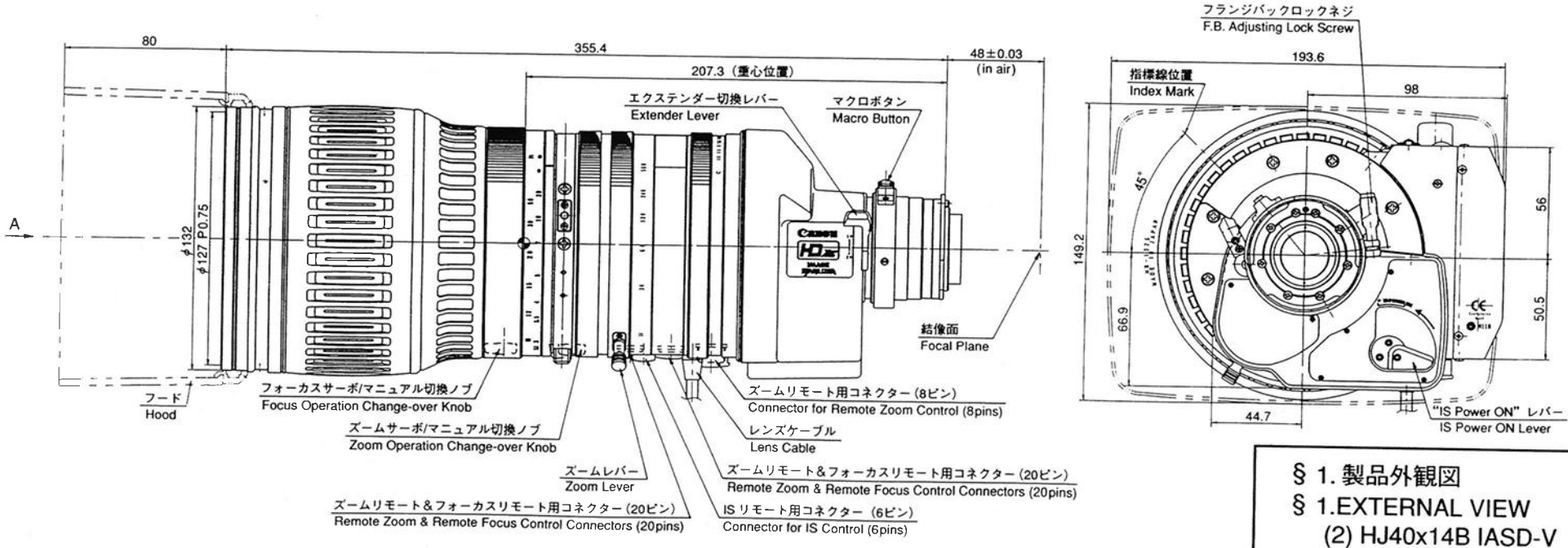
This technical document consists of the lens external views and their Drive Unit circuit diagram.
Recommended to refer them whenever required.



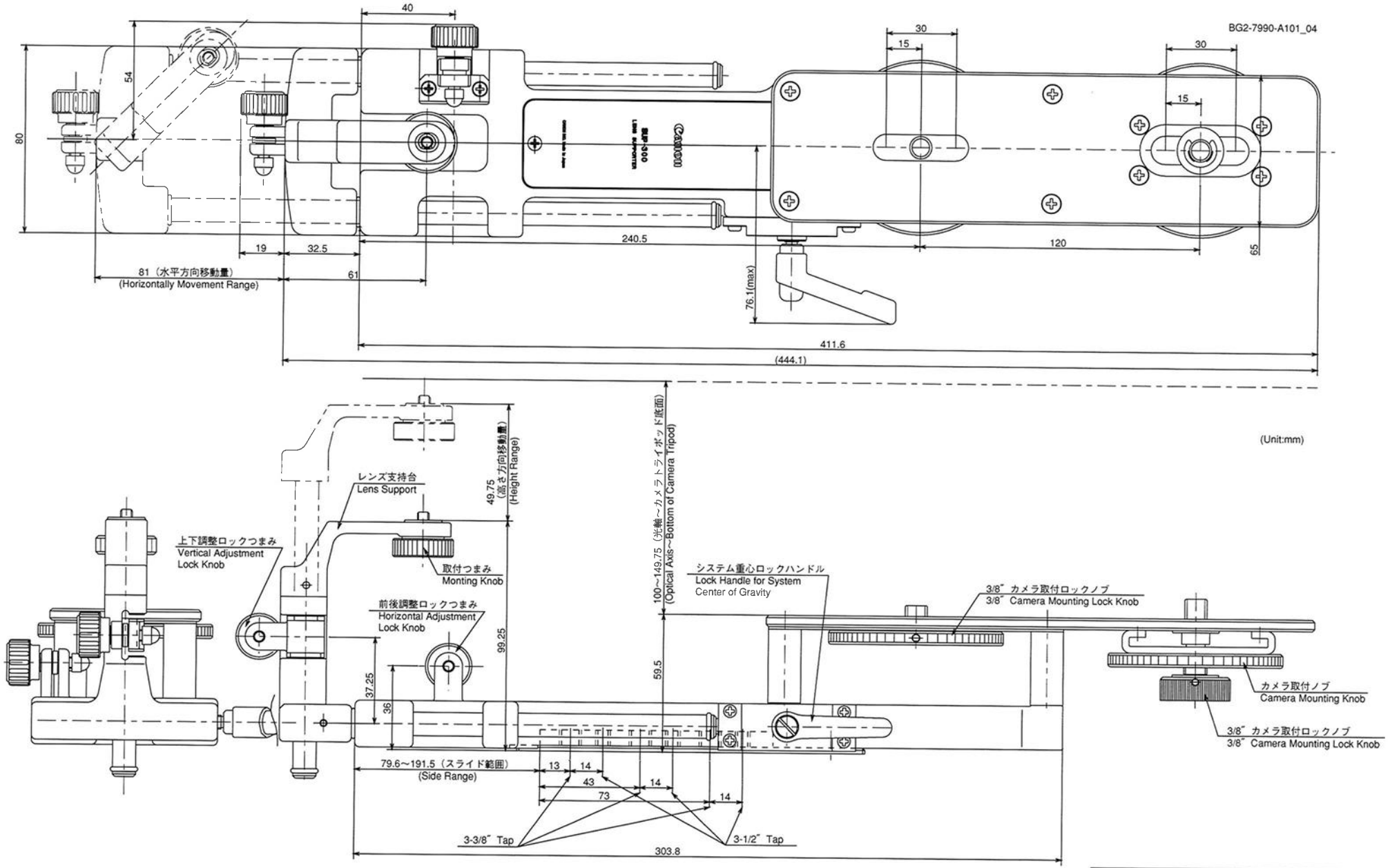


§ 1. 製品外観図
§ 1.EXTERNAL VIEW
(1) HJ40x10B IASD-V

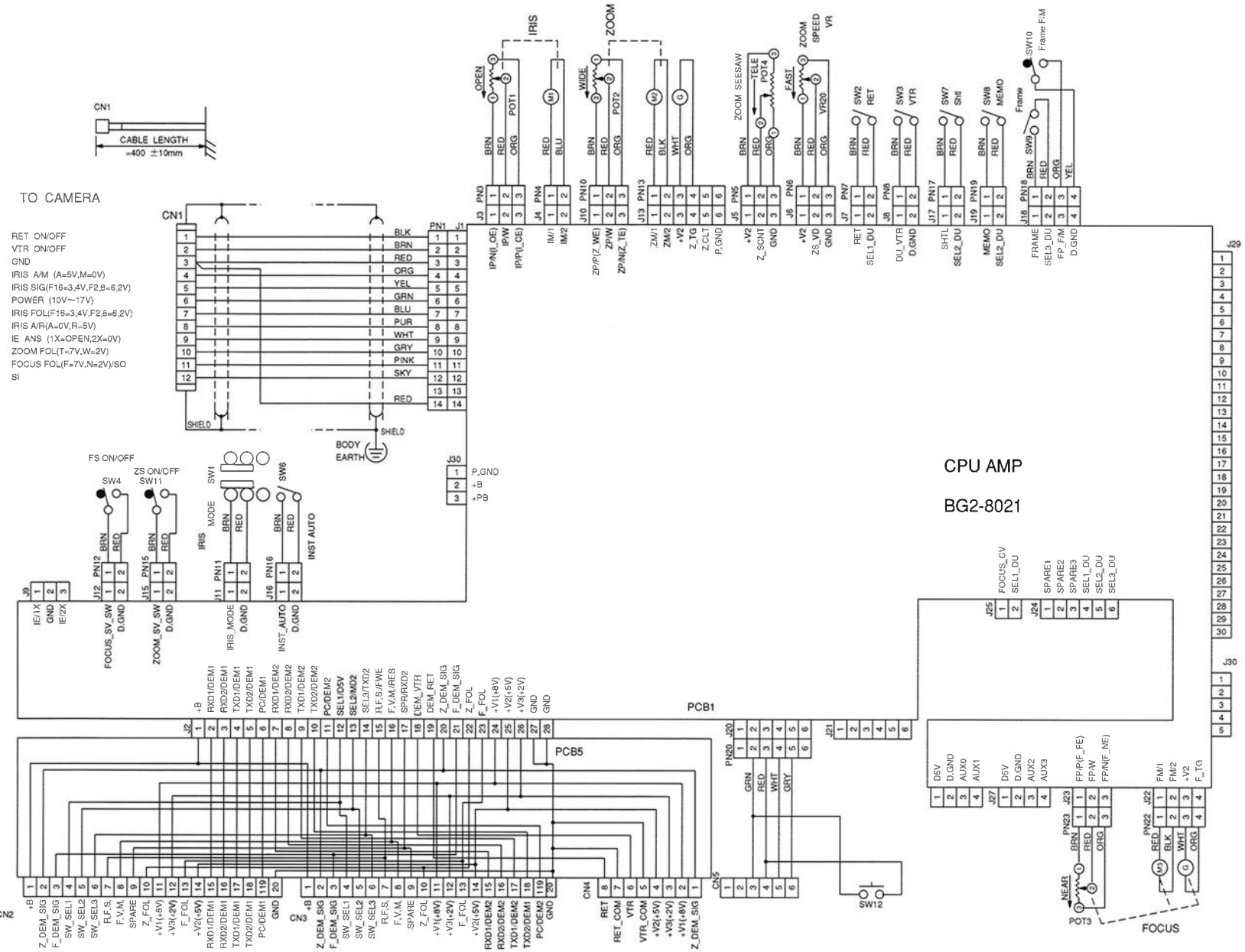




§ 1. 製品外観図
§ 1.EXTERNAL VIEW
(2) HJ40x14B IASD-V



§ 1. 製品外観図
§ 1.EXTERNAL VIEW
(3) SUP-300



HJ40x drive unit circuit diagram
BG2-7988-A501-02

§ 2. ドライブユニット結線図
§ 2.DRIVE UNIT CIRCUIT DIAGRAM

ASIA / JAPAN — Canon Inc.
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