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Canon

SPEEDLITE 155A

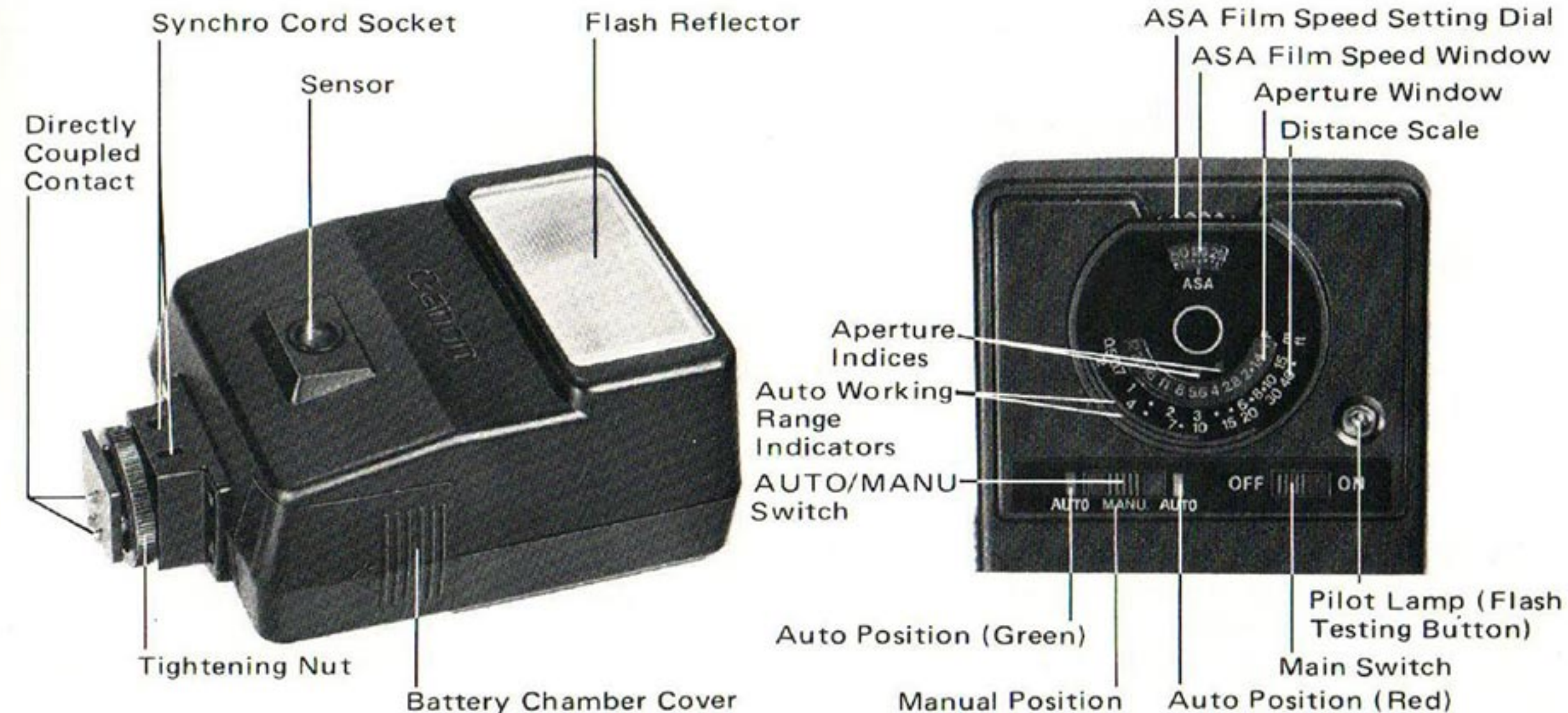
INSTRUCTIONS



English Edition

The Canon Speedlite 155A is an automatic electronic flash developed especially for AE flash photography with the Canon AE-1. It also makes AE flash photography possible with the A-1 and serves as an ordinary computer flash with the Canon AT-1, AV-1 and other cameras. When the A-1 or AE-1 is set for automatic exposure photography and the pilot lamp lights up, the epoch-making system of the 155A functions to automatically adjust the camera's shutter speed to the X synchronization speed as well as the aperture to the prescribed aperture. The exposure is automatically determined by the amount of light reflected back from the subject. This flash employs a unique averaged light sensing system which reduces excessive reflection from the central area to give better overall exposure. Thus, the 155A offers

more appropriate exposure than do other current flash units. An outstanding feature particular to the 155A is the automatic switching from the flash photography mode over to the normal AE photography mode when the flash is not charged providing the AE exposure is within the AE coupling range. In addition, the Speedlite 155A can be used with the Power Winder A on the AE-1 or the A-1 for sequential AE flash photography.



Specifications

Type: Electronic computer flash unit with a series control system.

Contact: Clip-on type with a directly coupled contact. With lock mechanism.

Guide Number: 17m or 55ft. (ASA 100). The guide number is obtained 30 seconds after the pilot lamp lights up when new batteries are loaded.

Flash Coverage Angle: Adequately covers angle of view of any lens with a focal length of at least 35mm on a 35 mm camera.

Flashing Intervals: (Interval between firing of flash and relighting of pilot lamp when using new batteries.)

Alkaline-manganese batteries: About 7 seconds.

Ni-Cd batteries: About 5 seconds.

Number of Flashes: (When the flash is fired at intervals of 30 seconds with new batteries loaded).

Alkaline-manganese batteries: About 300.

Ni-Cd batteries: About 90.

Color Temperature: The equivalent of average daylight. Correction made by a Canon-exclusive green-tinted diffuser.

Flash Duration: 1/1000 sec. to 1/50000 sec.

Flash Control System: By measuring the amount of light reflected back from the subject. A series control system saves unneeded energy. The flash offers an averaged light sensing distribution.

AUTO/MANU. Switch: A choice of three different positions: two AUTO positions (red and green) and a MANU. position. The red position is f/2.8 at ASA 100 and green position is f/5.6 at ASA 100.

Auto Working Range: 0.5 m to 6 m with the AUTO/MANU. switch set to the red position. 0.5 to 3 m with the AUTO/MANU. switch set to the green position.

ASA Film Speed: ASA 25 to ASA 800.

Aperture Scale: f/1 to f/32

Distance Scale: 0.5 m to 15 m or 2 feet to 40 feet

Power Source: Use four size AA alkaline-manganese batteries (AM-3). Ni-Cd

batteries can also be used.

Pilot Lamp: When charged, the pilot lamp lights up automatically switching the camera over to flash photography mode. There is no flash if the pilot lamp does not light up. This lamp goes out when the main switch is turned off. The pilot lamp also works as a flash testing button.

Size: 70 mm x 51 mm x 105 mm (2-3/4" x 2" x 4-1/8")

Weight: 300 g (10-9/16 ozs.), including batteries.

Accessories: Synchronization Cord A (Sold separately) and Case

Subject to change without notice.

Main Features

1. The aperture selected on the 155A is set on the camera automatically via an electrical signal sent by the flash (in the case of the AE-1 and A-1).
2. In the same way, the light output signal from the 155A automatically sets the shutter speed of the camera to 1/60 sec. (X contact).
3. Battery consumption is reduced with the employment of the series control system.
4. Average distribution metering is obtained by suppressing the peak sensitivity at the center of the picture.
5. When the main switch of the flash is at OFF, the camera returns to normal non-flash AE photography while the 155A is still attached to the camera.
6. Manually operated flash by cancelling the automatic flash is possible.

Summary for Use of the 155A

See pp. 8-23 for detailed explanation.

1. Load the batteries correctly.
2. Attach the 155A to the camera.
3. Set the ASA film speed on the calculator dial.
4. Select the aperture with the AUTO/MANU. switch.
5. Set the 155A's main switch to ON.
6. Focus.
7. Check the pilot lamp.
8. Check the display information in the finder.
9. Press the shutter release button.

Automatic flash photography means that the photocell of the flash picks up the light bounced back from the subject, its capacitor stores up energy and stops discharge of

light as soon as the flash unit determines sufficient light was reflected from the subject to the unit's photocell.

There are three conditions in performing automatic flash photography.

1. Set the 155A to the film speed of the film to be used.
2. Set the shutter speed to the X synchronization speed (when using cameras other than the Canon A-1, the AE-1, the AT-1 or the AV-1).
3. Decide the aperture to be used (and, with cameras other than the Canon A-1 or AE-1, set that same aperture on the lens aperture ring).

If the above three conditions are fulfilled, then all there is left to do is to switch the flash on, focus and release the shutter.

When the Speedlite 155A is used on the A-1

or AE-1 cameras, there is no need to remove the aperture ring of the lens from the 'A' mark (automatic setting).

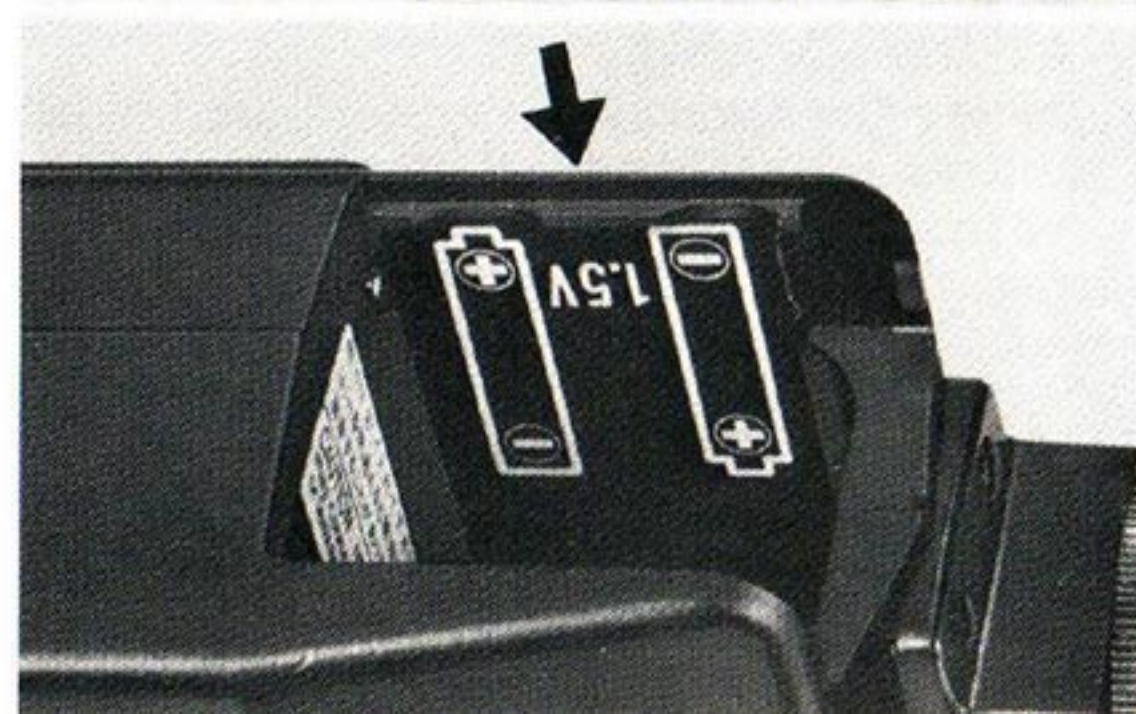


Synchronization Cord A (optional)

Loading the Batteries

Use four new size AA alkaline-manganese batteries (AM-3 or RL6) or four new Ni-Cd batteries. Manganese batteries can be used but will not last as long as alkaline-manganese or Ni-Cd batteries.

1. To remove the battery chamber cover, press and slide it off in the direction of the arrow.
2. Load the batteries following the diagram on the inside of the battery chamber. If the battery poles are not facing in the correct directions, the batteries may burst and leak, causing damage to the flash.
3. After having loaded the batteries, slide the battery chamber cover back on in the direction opposite the arrow while



holding down the batteries. Be careful to fit the positioning tabs on the bottom part of the cover into the grooves.

- * Since battery performance deteriorates in cold conditions, keep the batteries warm until just before use. Keep a set of spare batteries warm and alternate them with the loaded batteries so that warm batteries are always in use. Especially in temperatures of 0°C or lower, the use of fully charged Ni-Cd batteries is recommended.
- * When replacing the batteries, replace all at the same time with four new batteries, all of the same brand.
- * The batteries should be unloaded if

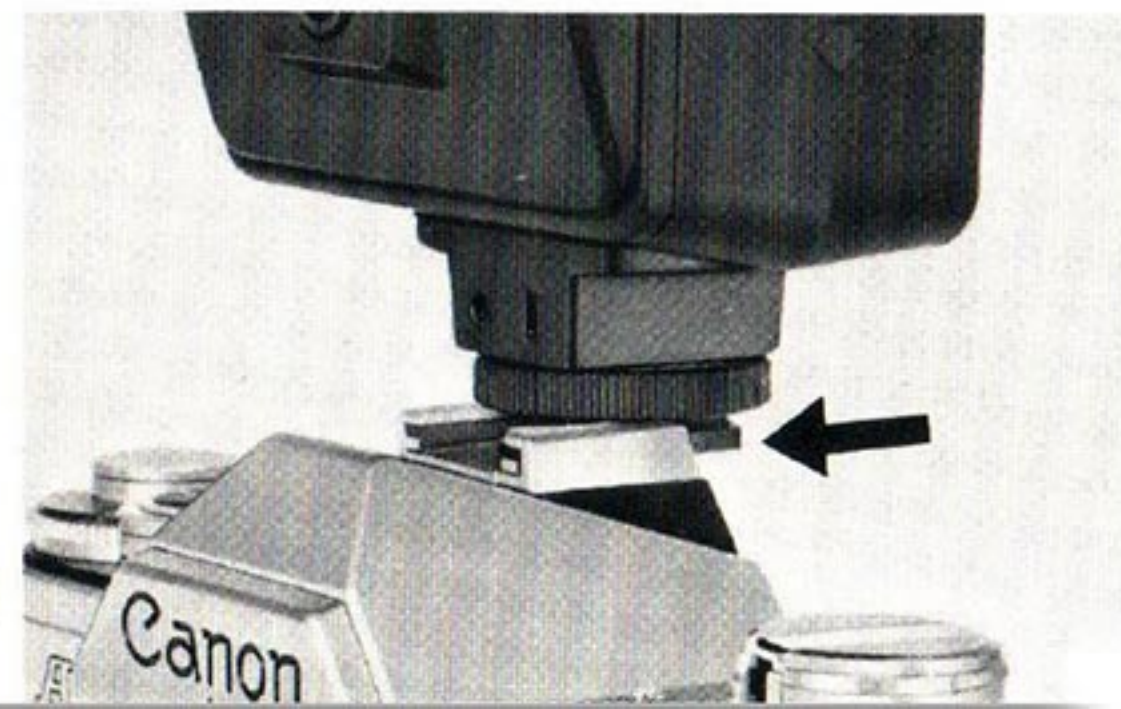
the 155A is not to be used for a long period of time.

- * Follow the instructions of the battery manufacturer when recharging Ni-Cd batteries.

Attaching to the Camera

1. Turn the main switch off.
2. After loosening the tightening nut of the attachment leg, insert the attachment leg all the way into the camera's accessory shoe. If it is not pushed completely in, correct electrical contact may not be made.

3. Retighten the nut to lock the flash on.
 - * When attaching this flash to a camera that does not have a directly coupled contact, connect the optional Synchronization Cord A first to the 155A's synchro cord socket and then to the camera's PC socket.
 - * When not shooting with flash, make sure the 155A's main switch is at OFF.



HOW TO USE WITH THE CANON AE-1 AND A-1

The Speedlite 155A can be used in three ways.

- I. AE flash photography with Canon FD lenses.
- II. Automatic flash photography with Canon FL lenses.
- III. Manual flash photography.

These three usages, though somewhat similar, are explained separately below.

I. AE Flash Photography with Canon FD Lenses

Setting on the Cameras

With an A-1 or AE-1 plus FD lens combination, the lens' aperture ring should remain on the "A" mark for AE flash photography. With the lighting up of the pilot lamp, the camera automatically switches over to the flash circuit. The shutter speed and

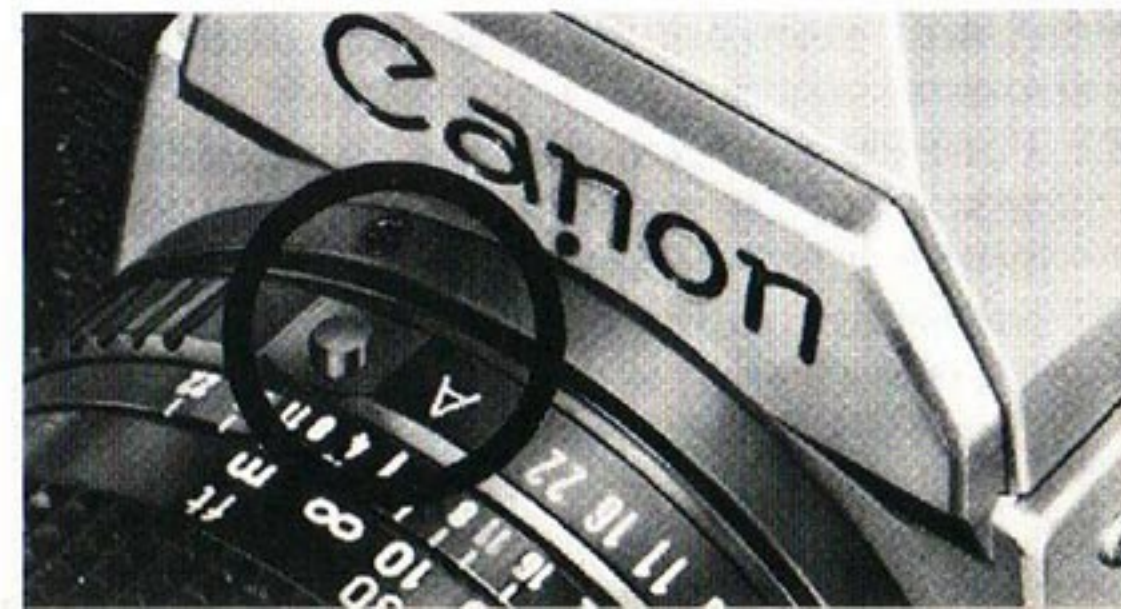
aperture are set automatically and proper exposure is obtained from the amount of light reflected back from the subject.

Preparations for AE Flash with the A-1 or AE-1

Aperture

Keep the aperture ring of the lens set at the "A" mark.

- * In the case of the A-1 it does not matter if the AE mode selector is set at Av or Tv. It also does not matter where the AT dial is set (except for the "B" setting).



Shutter Speed

1. The shutter speed is set at B when B is used.
2. At all other speeds it is automatically set at 1/60 sec.

Setting the ASA Film Speed

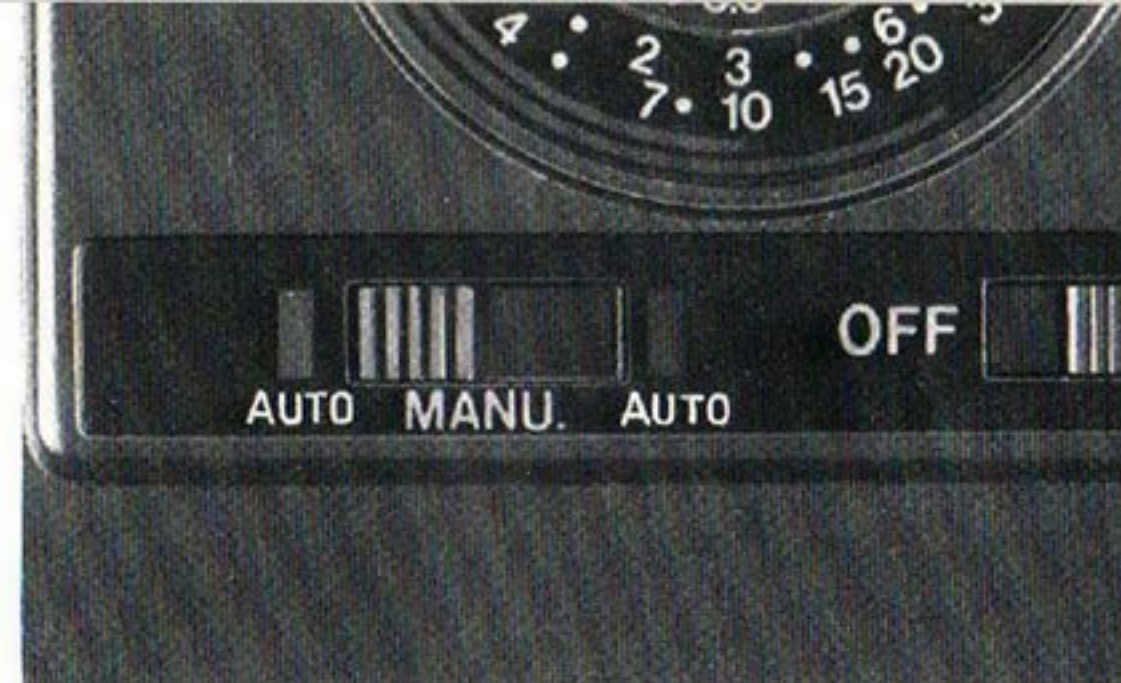
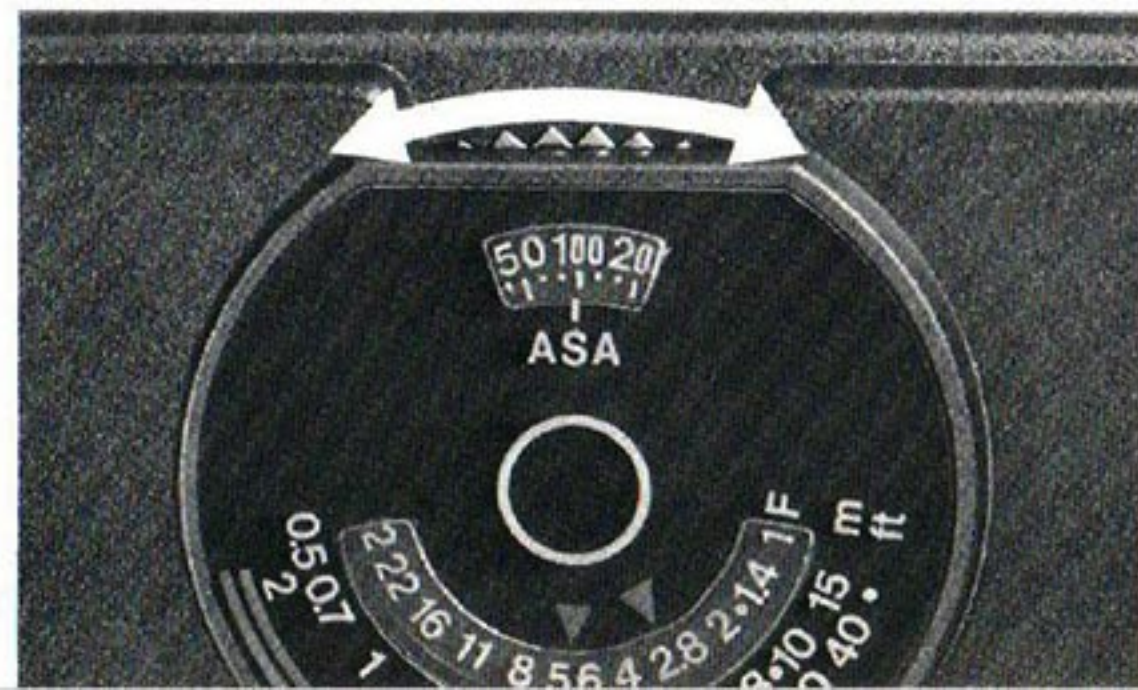
Because the guide number of the flash will change depending on the sensitivity of the film being used, be sure to set the ASA film speed correctly. If you forget to do this, you will not be able to get the correct exposure.

1. Turn the ASA setting dial until the proper ASA value of your film appears in the ASA window and is aligned with the white index mark. At this time, the aperture will also change accordingly. Dots represent intermediate film speeds

as shown by the numbers in parentheses.

A S A 25 ⁽³²⁾ ⁽⁴⁰⁾ 50 ⁽⁶⁴⁾ ⁽⁸⁰⁾ 100 ⁽¹²⁵⁾ ⁽¹⁶⁰⁾ 200 ⁽²⁵⁰⁾ ⁽³²⁰⁾ 400 ⁽⁵⁰⁰⁾ ⁽⁶⁴⁰⁾ 800

- * Also, check that the ASA film speed is set properly on the camera.

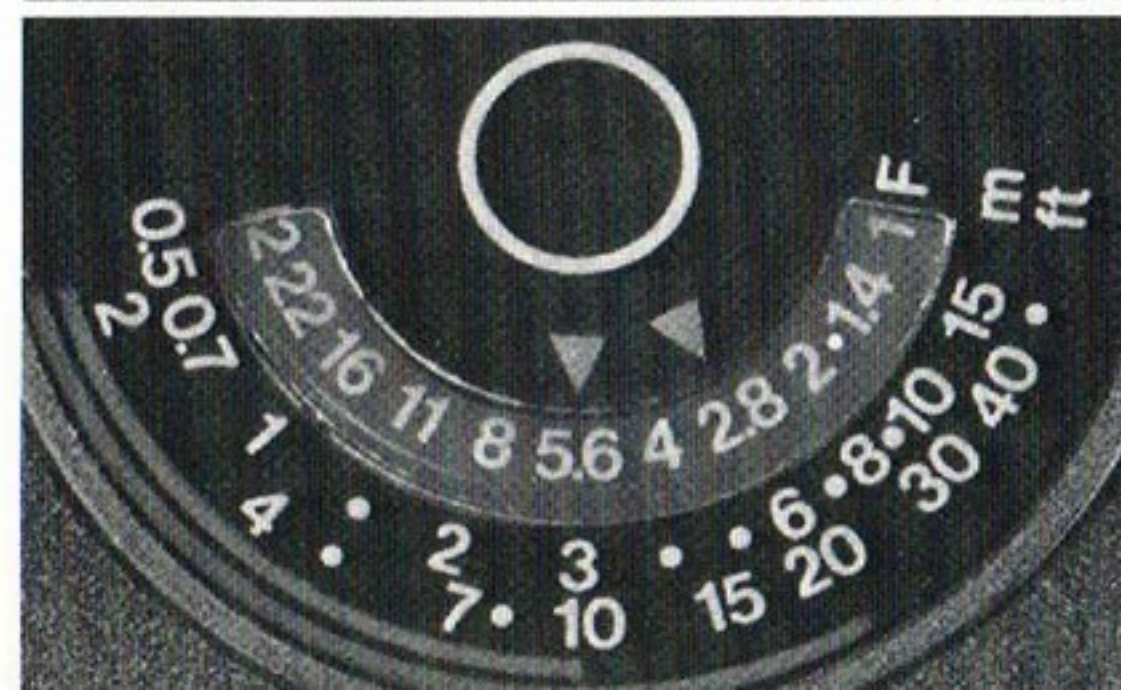


Switching the AUTO/MANU. Switch

This switch is used to set the prescribed apertures coupled with AE flash photography. There are two aperture settings for AE flash photography: the red position and green position. (The MANU. position in the center of this switch should be set when you perform manual flash photography.)

Reading the Apertures

The aperture fixed by the AUTO/MANU. switch is the value below the aperture index mark of the same color as the switch position. For example, if the AUTO/MANU. switch is set at the red position, the aperture below the red aperture index mark is used for AE flash photography. The aperture will change depending on the setting of the ASA film speed. In the case of ASA 100, the red position is f/2.8 while the green position is f/5.6.



Limits of the Auto Working Range

Once you have chosen an aperture by setting the AUTO/MANU. switch to the red or green position, there is only a certain range of shooting distances which will give correct exposure. The correct shooting distance range is called the auto working range and is indicated by two lines below the distance scale. For correct exposure, use a shooting distance which is within that auto working range which corresponds to the color of the setting of the AUTO/MANU. switch. When the AUTO/MANU. switch is set at the green position the auto working range will read 0.5 m to 3m while at the red position the auto working range will read 0.5 m to 6 m.

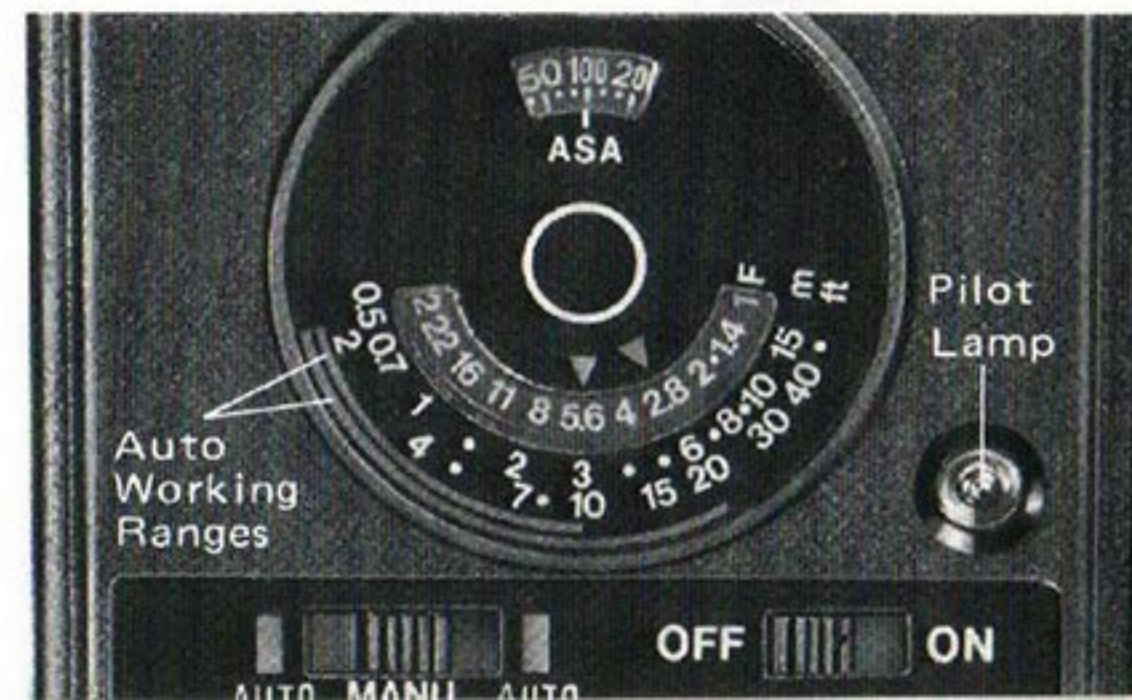
* Despite changes in the aperture due to changes in the ASA film speed setting, the limits of the auto working range

always remain fixed.

* You may wish to use the following hints for choosing an appropriate aperture in AE flash photography.

Green Position: For deep depth of field.

Red Position: For shallow depth of field to make the subject stand out from its surroundings. Also to be used if the subject distance is greater than 3 m.



* When the distance is less than 1 m, the light distribution may be uneven due to differences in the optical axes between the lens and the flash.

Main Switch and Pilot Lamp

After completing the above processes, turn the main switch on. The pilot lamp lights up when the flash is charged.

Test Firing

If a flash is fired when the flash testing button is pressed after the pilot lamp lights up, the flash is operating correctly.

Focusing

After confirming the limits of the auto working range, look into the viewfinder and focus. If the focused distance is outside the limits of the auto working range, ex-

posure will not be correct. For correct exposure, change the shooting distance or set the AUTO/MANU. switch to a more appropriate position.

Checking the Exposure and Shooting

After the pilot lamp lights up, press the shutter release button halfway and check the viewfinder information. Confirm proper focusing and press the shutter release button all the way down for shutter release.

Automatic Switch Back to Normal AE Mode

During each flash interval between flash firing and the time the pilot lamp relights, the camera automatically reverts to the non-flash AE mode for which it is set—shutter-speed priority on the AE-1 and shutter-speed or aperture priority or programmed AE on the A-1 depending on the

setting of the AE mode selector and the AT dial. This is possible only when the AE exposure is within the AE coupling range. Once the pilot lamp relights, the camera will automatically switch back to AE flash photography. This means that you can shoot continuously if necessary while the camera alternates between the AE flash mode and the normal AE mode.

Switching Off

Set the main switch at OFF after completion of flash photography in order to prevent battery drain. The connecting circuit between the flash unit and camera is cut off when the main switch is set at OFF, and normal AE photography can be performed with the flash unit still attached to the camera.

Viewfinder Information and Warnings

Viewfinder information is displayed as you depress the shutter button halfway after the pilot lamp comes on. Proper flash exposure is assured unless an exposure warning appears.

1. A-1 Display



Selected Mode	Shutter Speed	Flash Charge Signal	Flash Control Aperture	Manual Display
AE Flash control	60 (bu)	F	2.8 (for example)	—
Automatic flash control	60 (bu)	F	2.8 (for example)	M
Manual flash control	60 (bu)	F	—	M

With the exception of B, 1/60 will be displayed in the viewfinder irrespective of the shutter speed setting on the camera. A "bu" will be displayed if the

shutter speed is set to "B" on the camera. When the pilot lamp lights up, F will be displayed to indicate charge completion.

The aperture selected in the automatic mode on the 155A will be displayed.

2. Exposure Warnings

When the aperture selected on the 155A is larger than the maximum aperture of the lens, the maximum aperture of the lens will be displayed and will flash on and off to warn of underexposure. In such a case, select a smaller aperture on the 155A.

* Discrepancy between the Flash-selected Aperture and the Aperture Display in the Viewfinder.

Due to the fact that the aperture displayed in the finder is rounded to half f/stops, it may differ from the one set on the flash

by half an f/stop. This will, however, have no effect on exposure which will take place at the aperture set on the flash.

There is also a possibility that the aperture displayed in the finder may flash on and off if the aperture set on the flash coincides with the maximum aperture of the lens. In this case it does not indicate underexposure. Exposure will be correct. However, it is advisable to check the aperture on the flash to make sure it is not larger than the lens' maximum aperture.

AE-1 Viewfinder Information

Once the flash is charged and the pilot lamp glows, the meter needle will swing to the aperture pre-selected on the 155A. If the pre-selected aperture is outside the aperture range of the lens, either the under-exposure lamp blinks or the meter needle enters the overexposure mark. In these cases, change the aperture setting on the 155A. Since the meter needle does not swing to the flash-selected aperture until the flash is charged, you could tell the flash was ready for firing simply by looking into the viewfinder. However, since it is possible that the flash-selected aperture might be the same as that chosen by the camera for non-flash AE photography, it is advisable to make sure the pilot lamp is glowing before firing.

* When you are performing normal AE photography during the flash interval,

there may be a very rare occurrence where the pilot lamp will light up while the shutter is in operation if the flash is charged. If this should happen, the frame will be improperly exposed.

Precautions in Automatic Flash Photography

In some cases AE flash photography may not be suited to your subject. If, for instance, your main subject is small while the background is dark or distant or if the background is whitish or bright with strong reflections, AE flash exposure may be affected by the background, causing under- or overexposure. This can be avoided by switching to manual flash control.

If using a self-timer, do not press the shutter release until the pilot lamp glows.

When the shooting distance is less than one meter, the difference between the optical axes of the lens and the flash may result

in uneven flash distribution.

I. Automatic Flash Photography

When the AUTO/MANU. switch is on AUTO, it is necessary to set the aperture manually when using an FL lens. (or when using the flash on the AT-1 or AV-1). Setting the aperture manually can also be done when using an FD lens on the A-1 or AE-1 when the aperture ring is disengaged from "A" for making exposure corrections. The shutter speed will automatically be set to 1/60 sec. (unless set to "B") on the A-1, AE-1, AT-1 or AV-1. Make sure the ASA film speed is set on the flash.

1. using an FD lens, disengage the aperture ring from the "A" mark.
2. Pre-select an aperture on the flash by setting the AUTO/MANU. switch to the red or green AUTO position. Take into

consideration the auto working range. (see pp. 13-14).

3. Manually set the flash-selected aperture, or a different one if correcting exposure, on the lens aperture ring.

Viewfinder Displays and Warnings

The A-1's digital display will include the same information as in AE Flash (p. 16) with the addition of the "M" signal for manual aperture control. When using an FD lens, exposure warnings will be the same as those for AE Flash. If using an FL lens, the lens' lack of a full aperture signal pin may cause the aperture display and exposure warnings to be unreliable. In this case, it is advisable to switch off the viewfinder display lever. Viewfinder information in the AE-1 is the same as that for AE Flash (see p. 18) with the addition of the flashing "M" LED to indicate manual aperture control.

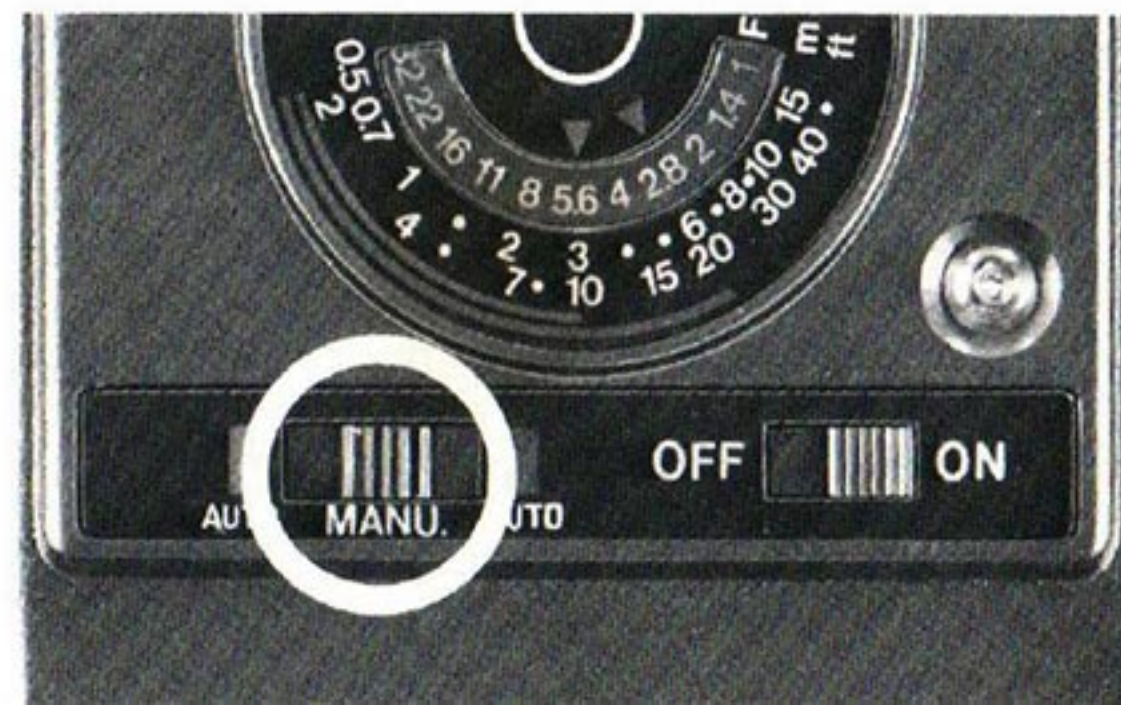
III. Manual Flash Photography

Setting the AUTO/MANU. switch at the back to MANU. places the 155A in the manual mode. When using the A-1, AE-1, AT-1 or AV-1, the shutter speed is set automatically as in automatic flash photography. The aperture must be determined for each change in shooting distance either by guide number calculation or by using the calculator dial on the flash as described in the following:

1. Set the AUTO/MANU. switch to MANU.
2. Be sure to set the film speed on the flash.
3. Focus on the subject.
4. Read the focused distance on the lens' distance scale.
5. Look for the same distance on the 155A's calculator dial.
6. Take note of the aperture against that distance on the calculator dial and set

the lens' aperture ring manually to that same aperture. If the aperture obtained seems to fall between half click-stops, move the aperture ring to the click stop on the brighter side.

7. Once the pilot lamp glows, press the shutter release button. If it is necessary to fire the flash immediately after the



pilot lamp glows, open the lens 1/2 to a full f/stop. This correction is necessary due to the fact that the lens is not yet fully changed.

If you do not use the calculator dial, use the following guide number calculation to determine the aperture:

$$\text{aperture} = \frac{\text{guide number}}{\text{shooting distance}}$$

When doing the math, make sure both guide number and shooting distance are in the same unit, whether meters or feet. The guide number changes according to film speed. It is 17 m for ASA 100 film. If using the calculator dial, the guide number is automatically adjusted when the film speed is set on the flash.

When using the flash off-camera, use

the flash-to-subject distance instead of the focused distance in determining the aperture.

Viewfinder Displays

The A-1's digital display will include the shutter speed, "F" for flash charge and "M" for manual aperture control.

The only information in the AE-1 will be the flashing "M" signal to indicate complete cancellation of automatic flash photography. The meter needle will swing to its upper limit.

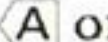
The meter needle in the AV-1's viewfinder will point to the shutter speed of 1/60 sec. for flash charge.

HOW TO USE WITH THE CANON AT-1

Since the Canon AT-1 is not an AE (Automatic Exposure) camera, it is necessary to manually set the lens aperture ring to the prescribed f/stop for automatic flash photography. However, at any shutter speed except "B" the shutter speed will be automatically set to the X synchronization speed of 1/60 sec. when the pilot lamp glows. Refer to Part II (p. 19) regarding more detailed explanation. For manual flash photography with the AT-1 refer to pp. 20-21.

HOW TO USE WITH THE CANON AV-1

Automatic flash photography with the AV-1 is briefly as follows:

1. Set the camera's selector dial to  or "A Self".
2. Set the AUTO/MANU. switch to either the green or red AUTO position and read the corresponding aperture from the calculator dial.
3. Set that same aperture on the lens aperture ring.

The shutter speed will be set automatically to the X-synchronization speed of 1/60 sec. and the meter needle in the viewfinder will point to 1/60 sec. when the pilot lamp glows. Refer to Part II (p. 19) regarding more detailed explanation. For manual flash photography with the AV-1 refer to pp. 20-21.

WHEN USING ON OTHER CAMERAS

Speedlite 155A can be used on other cameras for automatic exposure flash photography (setting the aperture on the lens manually while leaving the AUTO/MANU. switch at the back of the 155A on AUTO) and manually operated photography (setting AUTO/MANU. switch to MANU.)* using guide numbers.

1. Set the ASA film speed on the 155A (See p. 12).
2. Set the shutter speed to the X synchronization speed specified for the camera.
3. Automatic Flash (See p. 19).
Set the AUTO/MANU. switch to AUTO and manually set the lens' aperture ring to the aperture thus pre-selected on the

flash as indicated on the calculator dial. If the focused distance is within the auto working range as designated by the colored band corresponding to the chosen aperture on the dial, exposure will be correct.

4. Manual Flash (See p. 20).
Set the AUTO/MANU. switch to MANU. and manually set the aperture on the lens' aperture ring after calculating it by guide number calculation or by using the calculator dial.

* When the 155A is used on an automatic flash lens shutter camera, set the AUTO/MANU. switch at the back to MANU. and set the guide number on the camera to 17 meters (or to an approximate value in case there is no marking for 17 m on the guide number scale).