Canon

A-1


CANON
LENS MADE
5
3.5
7
2
10
3
15
5
30
10
ft
m
1.2 2 2.8 4 5.6 8 11 16 A
Canon
ASA
1000
500
Av
Tv
A
L
2
10

Light Years Ahead of Its Time... The Canon A-1

Since the first automatic exposure camera was developed, Canon has been setting the pace in technological innovations in its search after the ideal instrument for taking pictures.
The development of automatic exposure control was brought to a new dimension with a remarkable breakthrough in electronic control: the world-renowned Canon AE-1. Now, against this background of achievement, comes forth a camera that goes even farther into the future of photographic technology, offering the same command performance in all of the five available methods of exposure control and, of course, when you take command on your own, with the manual override.
For the first time ever – as a practically undreamt of feature – the hexamodal A-1 can perform automatic exposure with shutter-priority, aperture priority, in photography with flash, and with stopped-down metering, followed by a programmed AE mode in which both shutter speed and aperture settings are left to the camera's command unit to determine. The same optical precision and overall functionality applies to manual control, too.
A high-density digital micro-computer system was built around the processor unit, and includes such sophisticated technologies as programmable logic array, decoder driver, bipolar IC oscillator, sequencer, and diode chip on board. Besides, dual ramp integration was adopted for converting the only analog input, that of brightness into digital. These, however, are a mere random handful of the A-1's space-age innovations. If you look back through 30 years of SLR crafting, you may end up feeling that every effort, every dream, comes to a collected realization in the Canon A-1.
Changing from one AE mode to the other only requires the flick of a finger, and the camera will follow the choice you dial. No lens adjustment is necessary except, of course, in the case of stopped-down AE, thanks to the continuity of Canon's design planning that issues forth the FD lenses, one after another, all with provisions for future uses with developments foreseen years ahead.
The viewfinder is such that even the most experienced professional photographer will look into it with wonder and amazement at first. No scales, no needles, nothing superfluous, and all information in alphanumeric LED display.

Holdability is even further improved with the A-1's larger, contoured grip support affording perfect one-hand portability in a lightweight, compact camera designed to fit in your hands like a custom-made glove.

Of course, system photography conceived around the A-1 also had to involve new accessories specially designed and perfectly compatible with Canon's past developments. The new Motor Drive MA is capable of advancing film at 5 frames per second, the Speedlite 199A provides new advantages in flash photography, and various other accessories for close-up photography such as the new Auto Bellows are placed now before you.

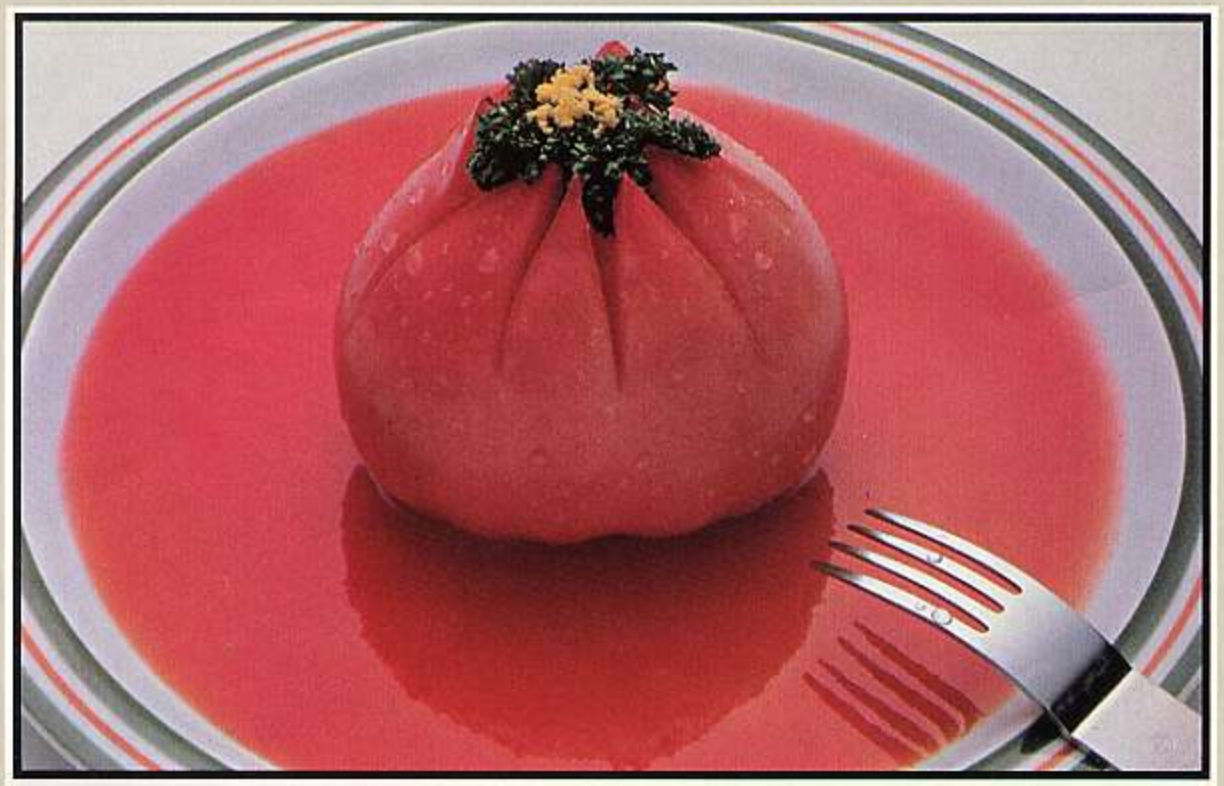
Here is, as you will go on to see in more detailed explanations to follow, a camera that represents a turning point in the art of photography, one that will increase the expert's mastery and will place in the beginner's hands the marksman's assurance of the seasoned professional.

Stopped-down AE

Electronic Flash AE

Manual Control of Exposure

Shutter-speed priority AE
FD 300 mm f/5.6 S.S.C., f8, 1/1000 sec., ASA 50



Aperture priority AE
FD 100 mm f/2.8 S.C. Macro, f22, ASA 50

Programmed AE
FD 135 mm f/2.5 S.C., ASA 64

Programmed AE
FD 15 mm f/2.8 S.S.C., ASA 50

Electronic flash AE
FD 35 – 70 mm f/2.8 – 3.5 S.S.C., f16, 2 sec.
Speedlite 199A, ASA 200

Stopped down AE
Photomicrounit F attached to microscope, 1/4 sec., ASA 160

Manual control of exposure
FD 35 mm f/2 S.S.C., f/8, 1/500 sec., ASA 64


Canon
A-1
LENS MADE IN JAPAN
CANON LENS FD
CANON

A Roll Call of Achievements

Five automatic exposure modes besides manual

* Shutter-speed priority AE
* Aperture priority AE
* Programmed AE
* Stopped-down AE
* Electronic flash AE
* Manual control of exposure
  Operation made extremely easy by the AT dial and the AE mode selector

Viewfinder showing unobstructed view of image

* Photographic information in dynamic digital display posing no obstruction to viewing
* On/off viewfinder display switch

Further expansion of photographic possibilities

* Metering range from EV −2 to EV 18
* Shutter speeds from 1/1000 of a second to 30 seconds
* Usable film sensitivity range from ASA 6 to ASA 12800
* Exposure compensation in 12 different settings
* Exposure memory based on storage of the amount of light itself
* Multiple exposures
* Two-speed self-timer
* Reliability and high-quality performance ensured by the incorporation of the most recent developments in optics and electronics
* Complete digital computing process to make possible a remarkably compact and lightweight camera, which is also extremely easy to operate

Extended system photography

* Motor Drive MA for automatic film advance at up to 5 frames per second
* Power Winder A also usable with the AE-1
* Acceptability of both the Speedlite 199A and the Speedlite 155A for automatic exposure with flash
* Data Back A also acceptable for classifying photographs as in the AE-1 system
* A fully comprehensive assortment of system accessories and attachments for all conceivable photographic purposes

Full use of the potentialities of the FD lens series

* Perfect acceptability of all the Canon FD lenses without any adjustment

1

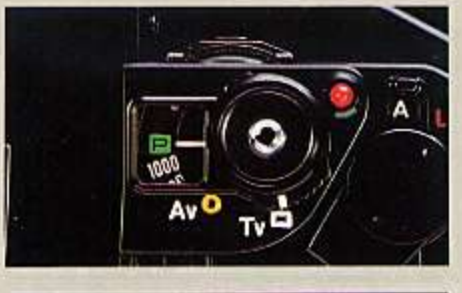
Shutter-speed Priority AE

All-out digital computerization has made possible the automation of five exposure control modes in the Canon A-1, while simplifying their use, beginning with shutter-speed priority AE.
In this mode, the camera's micro-computer circuitry, with the input of a given shutter speed, appraises light values, processes them on the basis of other factors such as film speed and the maximum aperture of a lens in use, and automatically determines the aperture needed for correct exposure.
Shutter-speed priority is ideal for photography of fast moving subjects, facial expressions, sports, dramatic instants of life, from a racing car down to a toddler's first fumbling steps.
Knowing which shutter speed is most appropriate for the different conditions is a simple matter, and from there on the camera takes over.
A flick of the mode selector toward the position marked "Tv", positioning the shutter speed value estimated on the basis of the photographic situation, and everything is set. The A-1 is, then, in point-and-shoot readiness.

2

Aperture Priority AE

Setting the aperture as the basis, and letting the camera decide the shutter speed does offer evident advantages at times.
After a given aperture value is set on the AT dial, the camera's processing unit analyzes light and other factors to determine automatically the exact shutter speed for correct exposure, and the command is issued to the electromagnetic release for just the shot you want.
While composing, moving from one place to the other or slightly changing the position of the subject, or of the lights if there were any, the photographer can follow through the viewfinder the different shutter speeds that the camera is computing. You will always be able to know at exactly what speed the shutter will be released.
Canon has brought to a glorious end the traditional dispute between shutter-speed priority and aperture priority supporters by offering both, easily switchable with the AE mode selector, and with a degree of accuracy that sets new standards.



3

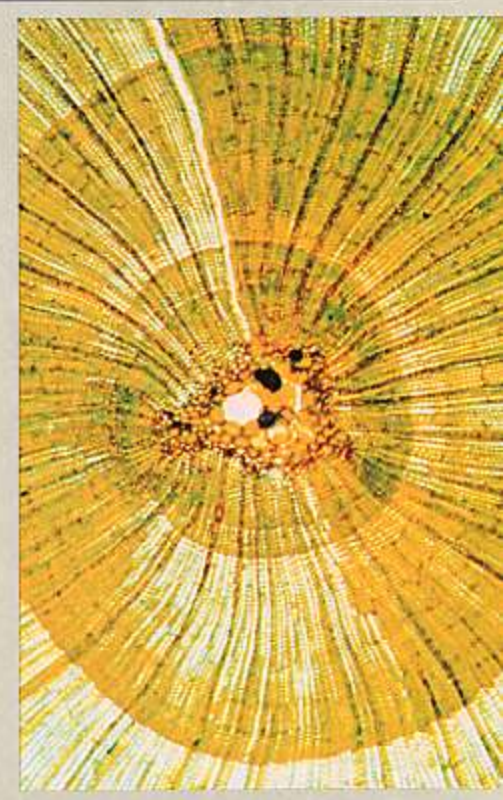
Programmed AE

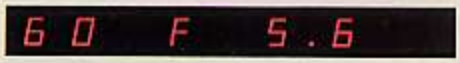
The Canon A-1, besides incorporating the most comprehensive range of functions among SLR cameras, and with the capability of extending the command of its processing unit to an entire system of photography, also offers a programmed AE mode for the easiest conceivable snapshots ever. The very beginner can profit, too, from its electronic marvels simply by setting the AT dial at "P". Then, the camera takes over the arithmetic of exposure both with respect to shutter speed and to aperture, and sets both these values exactly for a correct exposure.
It is an unforgettable experience to set the camera at "P" and then look into the viewfinder while you point it here and there. The LED dynamic display begins showing different apertures and shutter speeds as the lens moves from one point to another, in the way a tote board at a racetrack changes the figures of the odds as the betting goes this way or the other.
For the beginner, or the once-in-a-blue-moon photographer, the Canon A-1 opens the doors to the use of interchangeable lenses and the many other advantages of SLR photography.

4

Stopped-down AE

Close-ups, macrophotography, and photomicrography are the most fascinating applications of a camera, but usually they require great expertise if the results are to be of real quality.
The Canon A-1 is again an outstanding SLR camera in that it provides automatic exposure control even with stopped-down metering.
All you have to do is disengage the lens from the "A" mark and push the stop-down metering lever on the front of the camera body. No matter what the position of the AT dial is, the effective procedure for the AE is set, and the camera's computer circuitry determines the correct shutter speed. With this remarkable feature, the photographer – professional or amateur – can rely on computerized accuracy when using an FL lens in which there is no full aperture signal pin, or using accessories for close-ups or macrophotography.
Laboratory slides or tiny insects as well as dramatic facial expressions are vividly portrayed in detail with increased delineation in the edges, and the effect to be obtained can be verified in advance.
Depending on the metered values of light, the viewfinder display indicates the results of the computing process to show that the desired image will be splendidly captured.
When using a bellows attachment, or extension tubes for performing high-magnification photography, the stopped-down AE mode works at its best to warrant that the work shall be well done whether it be for scientific research or commercial use.





5

Electronic Flash AE

Flash photography is another of the fields in which the automation featured by the Canon A-1 shines as an effective procedure for taking splendid pictures at all times. Though other electronic flash units are acceptable, use of the specially designed Speedlite 199A or the 155A does away with the need for previous adjustments of the camera. The PLA circuitry couples the A-1's processing circuitry to the adjustments made on the flash and to light requirements.
The amount of light emitted by the flash and its duration are regulated automatically on the basis of the photographic conditions regardless of whether the mode selector has been set to "Av" or "Tv". The viewfinder joins the action immediately with a red "F" LED signal indicating completion of battery charge. Anyone can proceed to photograph with as much assurance as the professional for whom guide numbers and calculations are an everyday affair.
With the lens set as it is, with the A mark set as it is, the signal from the electronic flash unit changes the shutter speed to the X synchronization at 1/60 of a second, and the aperture is determined according to the aperture range adjusted on the electronic flash unit.
There are three automatic aperture settings whose ranges cover most conceivable photographic situations.
The viewfinder's display legibility is not affected by the more or less illumination there might be in the surroundings, so you can always see how exposure is being determined even in such darkness that your eyes cannot see through.
In manual flash photography, the letter "M" is displayed on the far right.
With the lens set at the "A" mark (for automatic use), both the Speedlite 199A and 155A require no other lens adjustment for electronic flash AE with the Canon A-1.

M

Manual Control of Exposure

Even though the 5 AE modes can assist the photographer in any application conceivable, and provide the backing of electronic precision, there may be times when you may prefer to take over completely and pursue some particular effect.
The Canon A-1's circuitry can easily be shifted to manual control of exposure and the chance will be there for whatever fancy dictates.

Automatic exposure control is cancelled and the metered aperture value is displayed in the viewfinder set for manual aperture control by releasing the lens from the A mark. Therefore, the degree of compensation is easy to decide and can be freely selected. This proves most convenient when a large compensation is desired, such as when taking pictures of a subject against the sun or with a strong light behind.

Dial Your Choice of Automatic Exposure

When the AT dial is set to a given AE mode, the built-in PLA immediately detects it and controls camera operation according to the program designated. Incorporation of the PLA makes this available in such a way as to simplify operation while packing a host of other functions into the A-1.

With camera gripped in position for taking pictures, the command post of the A-1's five modes of automatic exposure control is found within thumb's reach. The fate of a lifetime shot can depend on the operational ease of any part requiring the intervention of the photographer's hands. Therefore, Canon's design engineers conceived the AT dial in the place and with the shape that best conform to natural, effortless motion.

To make use of the AT dial even simpler, "Av" settings are marked in black over a yellow field to indicate aperture priority AE; "Tv" settings, for shutter-speed priority, are marked in white from 1/1000 of a second down to 1 second, and from 2 to 30 seconds in yellow, both over a black field; and a green "P" inside a square clearly identifies programmed AE. Input of aperture or shutter speed by means of digital pulse signals to the camera's think-tank circuitry is performed with this one dial to simplify operation and further enhance both accuracy and immediate response.

There is no room for error since the indicator window of the AT dial only shows one scale or the other, and the stopped-down metering AE works regardless of the dial setting.

The Canon A-1 is now here not only to put an end to the traditional dispute among photographers over which, aperture priority or shutter-speed priority, leads to better picture taking, but also to provide even further flexibility in SLR photography.

As befits automation of exposure, if both shutter-speed priority and aperture priority are offered simultaneously, it should be done the A-1 way, with automatic shifting from one to the other requiring one simple movement and no more.

Because the A-1's pulse inputs employ a Gray code, if the controls are intermediately set between click-stops, it will not lead to incorrect exposures because the sequential numbers represented in the Gray code differ from the preceding or the following one

in only one place. This, of course, means more reliability and accuracy. Even if the ASA film speed, shutter speed, and aperture are not set at an exact click-stop position, the actual pictures will be properly exposed at either one of the settings next to it. For example, when the shutter speed is set between 1/250 and 1/125, either 1/250 or 1/125 of a second will be effectively used for the picture, and the effective one will appear in the viewfinder display.

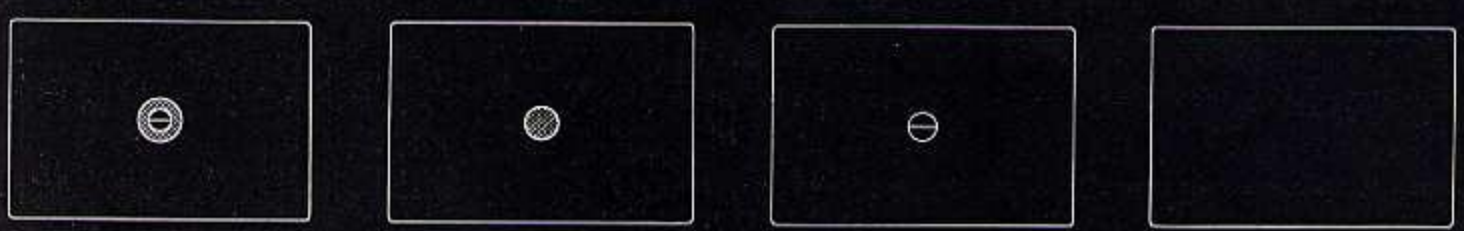
When the AT dial is adjusted to either "Tv" or to "Av", no lens adjustment is required for the shift from one priority to the other, for programmed AE or for Speedlite flash AE. Only the stopped-down metering mode, since the lens must be stopped down, involves moving the lens' aperture ring away from the "A" mark.

Unique in every sense, the AT dial is the external, visible expression of the resourcefulness of the camera, otherwise hidden to the eyes except for the evidence that surfaces in the developing tank in the darkroom.

1000 5.6

Focusing screens

In addition to the standard focusing screen with split-image/microprism rangefinder, three optional screens will become available by the end of 1978. A screen with microprism spot for high-speed lenses, another one with a split-image rangefinder and a plain ground-glass version without any focusing aids. It should be noted, however, that focusing screens can only be exchanged by an authorized Canon Service Center in order to ensure perfect focusing accuracy.



The Breakthrough Viewfinder: Alphanumeric LED Display

A spanning view of what one wants to photograph, clearly showing in every detail what the naked eye would see and what the effect of light on the film will portray. That is what every photographer looks for first in appraising the value of a viewfinder's design. And that is precisely what the A-1 offers with the unique advantage of dynamic display of all photographic information in alphanumeric form, below the image field, where it is never in the way.

With the first light pressure on the shutter release button or, in its stead, by pressing either the exposure preview switch or the exposure memory switch, thereupon the seven segmented LED characters are activated. You will find clearly shown the priority settings and the changing values, flash readiness, manual override, and all the possible errors in exposure.

Since all information is digital and pulse-controlled, no external illumination is necessary, thus eliminating the need of an optical system for that purpose, and of an information window. The amount of light will not affect legibility of the display, because the LED maintains practically the same degree of illumination to the human eye in its ready, accurate readout of the camera's settings and behavior. If so desired, a viewfinder display lever is available for turning everything off.

Accurate focusing is made extremely easy by this viewfinder design. The split-image microprism rangefinder is divided just under the centerline for more precise overall focusing, and the matte screen is extremely clear and bright.

Shutter-speed priority AE mode

Lightning action in sports or a precious journalistic instant that must be snatched right then and there dictate the choice of the shutter-speed priority mode, and then the A-1's viewfinder, while keeping the selected speed on display, shows continually every aperture change that varying light conditions will require.

Shutter speed once set remains unchanged, but the corresponding aperture value indicated changes to show the aperture automatically computed according to subject brightness. Underexposure and overexposure warnings are also flashed.

Aperture priority AE mode

Other occasions may point to a given fixed aperture when depth of field is of particular importance because of the photographic situation or the purpose in mind. Then, when the change of mode is completely accomplished simply by moving the mode selector, the aperture, once set, remains the same. Next to it the display shows the shutter speeds computed against the selected aperture and the brightness of the subject that is aimed at.

Whenever a given exposure value goes beyond the meter's coupling range of EV –2 to EV 18, due warning is displayed.

Electronic flash AE

Many people hesitate before entering the vast realm of flash photography because they do not know about the necessary calculations. Now, the A-1 with one of the available Speedlite flashes attached provides in its viewfinder a real guide book for anyone to find his way clearly through the dark.

To begin with, when the specially designed Speedlite 155A or the Speedlite 199A is used, an "F" flashes to indicate battery charge completion.

With the lens adjusted for manual operation and the Speedlite set for automatic control, an "M" is illuminated in the display to indicate that the aperture of the lens must be of the same aperture value indicated in the viewfinder.

Programmed AE mode

Now, even the fresh beginner is able to fully exploit the A-1's state-of-the-art advantages. Here, too, the available programmed AE mode shines as it sets the viewfinder to work wonders, mirroring what the camera is doing when it takes upon itself the task of producing splendid photographs.

Stopped-down AE

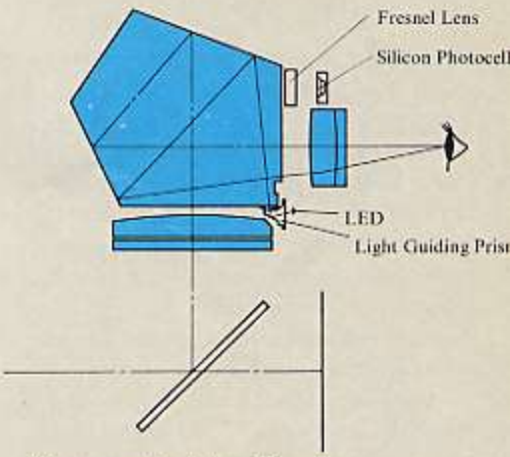
For more definition at the edges of the image field, or using depth of field for a particular effect makes the convenience of the stopped-down metering AE mode stand out. Even then, the viewfinder provides the necessary information.

Manual Control

When the lens is set for manual control you can see in the viewfinder the information you may want for deciding exposure compensation, and the "M" mark.

Error mark display

An error mark (EEEE EE) appears and the shutter button is locked when correct procedure for setting the Canon A-1 for one of the AE modes has not been followed. It remains lit even if the viewfinder blind is switched to shut off the display, until the circuits are restored by means of the multiple exposure lever. Besides, when the photographic situation is beyond the exposure meter's coupling range, due warnings are displayed.

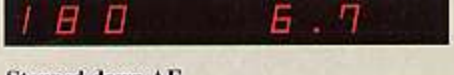


Shutter-speed priority AE mode

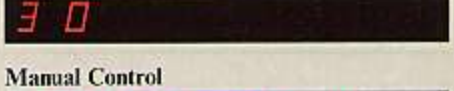
Aperture priority AE mode

Electronic flash AE

Programmed AE mode



Stopped-down AE

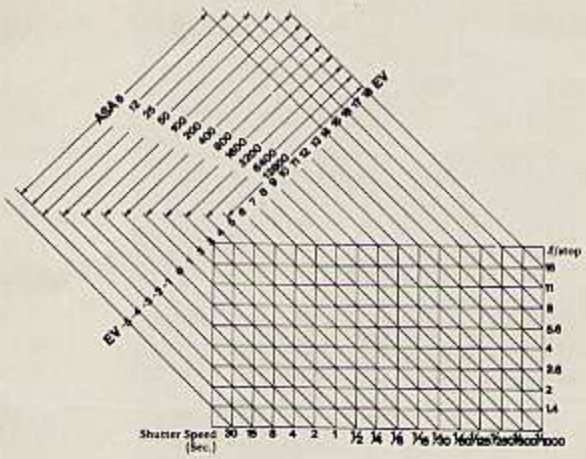


Manual Control

Error mark display

Further Expansion of Photographic Possibilities

Metering Range of Silicon Photocell at Various ASAs with FD 50 mm f/1.4 S.S.C. Lens



The Canon A-1 is based on the same revolutionary design principle of the AE-1 as far as handiness, convenience, operability, reliability and accuracy are concerned. However, by incorporating new technologies and new manufacturing techniques, a more ambitious objective has been fulfilled.

The A-1's internal mechanism comprises five main modular units and 31 sub-units. The entire design, processing, assembly, and inspection are the result of extensive reliance on computers. Thus, the five AE modes and the various other new features are perfectly organized within the most compact size.

Apart from the remarkable feat of comprising automatic exposure control in five different automatic modes plus manual, the A-1 is filled with all sorts of convenient features and refinements. Even hand-held operation has been made easier and surer by the addition of a large action grip, truly unique in functionality.

In order to allow the photographer to waste no time in acquiring familiarity with all of the controls and their functions, logic and the study of actual handling have led to the ideal arrangement of levers and dials. Safety features such as warnings and locks have also been extensively provided.

Furthermore, the light metering system employs an extremely sensitive silicon photocell with superior linearity and response characteristics. The Central Emphasis average measurement method stresses accuracy especially in the central portion where the subject is most likely to be placed, but the actual metering center has been placed slightly below the middle line of the picture to allow the inclusion of skylight in photographs without any negative effects on exposure.

The silicon photocell is reinforced by a logarithmic amplifier with integrated circuitry for signal amplification and a discharge circuitry for improving response. Sealed and placed above the viewfinder eyepiece, this photocell remains stable in changes of temperature, and is protected against humidity and electric disturbances.

Usable film speeds: ASA 6 to 12800

The Canon A-1 accepts films with speeds ranging from ASA 6 to ASA 12800.

The ASA dial has calibrated markings for the various ASA values in one-third step increments. This dial is below the rewind knob and the film speed is set by turning the outer ring until the appropriate figure is opposite the index mark. The dial is provided with a lock to prevent unintentional movement.

No matter what film speed is used, the setting is immediately transmitted as digital input for the micro-processor to include in its exposure computations, the five AE modes couple completely, and data display is perfect so that every shot can count as a great one. Besides, the intermediate positions of the ASA dial make fine exposure adjustments easy.

Three methods of exposure compensation

Exposure compensation is an effective technique for such special effects as high and low key, and often it becomes necessary when there is noticeable contrast between the brightness of the subject and its background.

In ordinary photography, the AE mechanism takes care of the task with fully satisfactory results but under certain light conditions, and for creative effects, the metered exposure may not be what you desire. Then, by freely selecting compensation for more or less exposure, the conditions are laid for the picture you want.

The A-1 is equipped with a three-way compensation system. Two exposure compensation mechanisms and compensation by manual aperture control.

The ASA speed dial shows the various degrees of compensation, from 1/4 to 4 times the metered value, up to ±2 gradations of the aperture scale. Intermediate values of 1/3 increments are provided for fine adjustment. This compensating mechanism is also convenient for multiple exposure applications.

The available compensation range is sufficient for photography against the light, taking pictures of snow-capped mountains, or with blue skies in the background, or a person within the frame of an open window, as well as for studio photography with artificial illumination.

The exposure memory switch expands the versatility of the metering system and the exposure compensation procedures. By keeping this switch depressed, the exact metered exposure value is stored in the memory. You can use the exposure memory for exposure compensation of subjects with a strong light behind.

Manual aperture adjustments afford as much compensation as you can require, since the metered value can be read even when set to manually operated aperture.

Wide metering range

The A-1 offers a wide, dynamic metering range in 21 steps from EV −2 to EV 18.

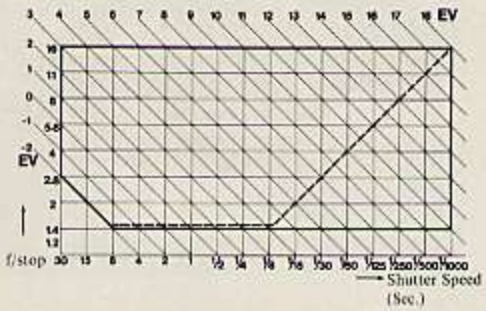
The log amplifier, for amplifying the signals, and the discharge circuit, for improving response, employ an IC and are sealed together with the photocell. Located above the eyepiece, the photocell provides highly accurate metering following the TTL Central Emphasis method.

In order to enable the A-1 to perform its automatic exposure functions, the metering range has been extended by employing the digital input system and an IC of great capacity for the metering circuit.

Photography in extremely dim light
The Canon A-1 can meter accurately all the way down to as dark as EV −2, which is approximately the limit of dim light under which focusing can be performed by looking at the subject through the viewfinder. This feature acquires even more value in macrophotography, photomicrography, and photography at night.

In ordinary photography, the AE mechanism functions, of course, with full aperture metering. But in the case of high-magnification macrophotography using a bellows, or in photomicrography, when it is necessary to operate manually, the A-1 still performs AE metering and the display data can also be read as under normal conditions. This camera will, no doubt, be a boon for these fields of photography.

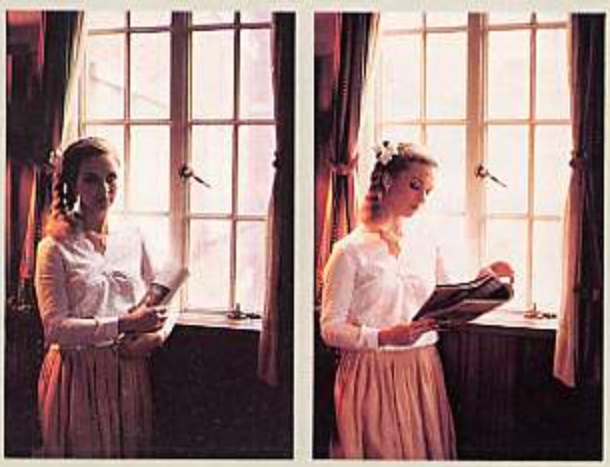
Exposure program used in programmed AE mode



Because of the AE's coupling range, programmed AE photography is possible even at very low light levels. Here the A-1's remarkable adaptability works so that when the subject is so dark that an aperture wider than the lens maximum aperture would be required, it automatically switches to slower shutter speeds until the shutter speed is balanced against the maximum aperture for correct exposure.

Self-Timer Setting Positions

Multiple Exposure Lever



Multiple exposures at will
The technique of multiple exposure, of exposing the same frame many times, using the same object or superimposing different ones according to the imagination of the photographer, can now be very easily performed. By sliding the lever located below the winding lever, film will not advance when the winding lever is activated in order to cock the shutter. Film remains stationary for the next exposure and the frame counter will not move. By repeating this procedure as many times as you want you can expose as many subjects as desired on the same frame.

Two-speed electronic self-timer
The A-1's self-timer affords a choice of a 10-second or a 2-second time lag. When the self-timer starts functioning, it sets a red LED lamp blinking. Two seconds before shutter release takes place, the LED lamp starts blinking at a faster pace to announce that shutter release is about to take place.

The 2-second lag can be used instead of a cable release for photography in which vibration must be avoided.
Exposure is determined an instant before shutter release, and the A-1 offers a viewfinder blind to prevent extraneous light from affecting the meter readings.
The accuracy and reliability of the A-1's self-timer is incomparable in any of its two settings, warranted by the marvellous electronic circuitry.

For Hunting Down the Fastest Game

Motor Drive MA with Ni-Cd Pack MA

Motor Drive MA
The Motor Drive MA was developed specially for use with the Canon A-1 to extend its photographic capabilities to fast sequence shooting at up to 5 frames per second without limiting the camera's highly advanced automation, ease of handling and portability.

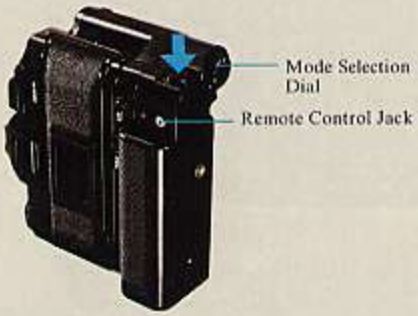
Two optional power sources
The Motor Drive MA is small and lightweight thanks to the use of only mechanical parts in the film drive device itself, while the electrical control circuit and the power source are built into the Battery Pack MA, or the Ni-Cd Pack MA. Its circuitry includes an I^2L type LSI, the first time ever such integration is incorporated into a motor drive unit for use with a camera.
Perfectly coupled to the A-1, it makes continuous photography at 5 frames per second possible (when using the Battery Pack MA). In truly fast action, you can easily follow the subject no matter what the pace might be. It is a real must when you don't want a single shutter chance to pass you by.

Single frames and 2-speed continuous shooting
There is a choice of three speeds, H (5 frames/second), L (3.5 frames/second), and S (single frames). Manual film winding is restored by turning the mode selection dial to "OFF", if so desired.

Instant high speed
No matter which speed the Motor Drive MA is adjusted for, the instant high-speed button immediately sets it for the fastest shooting. It is possible to perform continuous shooting as long as you keep pressing the button.

Three shutter buttons
The Motor Drive MA has two release buttons, one for ordinary positions and another for a vertical position, while the release signal from the camera's shutter button can also be utilized.
A safety timer (0.6 seconds) connected with the automatic stopping circuit is adopted and an LED warning signal is provided.

Wireless Controller LC-1
When the Motor Drive MA is attached to the Canon A-1, remote control shooting of sequences or single frames is possible from a distance of up to 60 m, on a straight line, by means of this Wireless Controller LC-1. If receivers are placed on a number of cameras, simultaneous remote control of these cameras is also possible. Because it has



three separate channels, the LC-1 is capable of operating up to three cameras in succession. Since it uses a double-emitting type light, its operation is not affected by electric waves or other light sources.

Other Characteristics
The film winding system is composed of a motor, an electromagnetic clutch, a slip mechanism and a set of gears. It is designed for simple, stable operation.

Motor Drive MA with Battery Pack MA

An electromagnetic clutch provides film winding at about 120 ms. and it has the advantage that the motor does not have to be started again after each frame advance, and winding time is reduced.
Among the many other advantages of the Motor Drive MA, it is worth mentioning that it allows interval timer photography by using the camera's self-timer together with a cable release set at the lock position, override for manual winding is provided, and a set of new batteries lasts for 60 rolls or more in normal temperature.

Power Winder A
The Canon Power Winder A was developed for the Canon AE-1 but is perfectly interchangeable with the A-1, too. It is quickly attached to the body and can continuously advance film automatically at a rate of approximately two frames per second with full advantage of the automatic exposure control afforded by the A-1's electronic circuitry. Shutter speeds from 1/60 to 1/1000 second are AE coupled during continuous shooting.

Specifications

Motor Drive MA Unit

Motor Drive MA
Structure: Grip type, composed of a motor for film winding, an electromagnetic clutch, a set of gears and a shutter release button.
Dimensions and Weight: 151 × 67 × 80 mm (5-15/16" × 2-5/8" × 3-1/8"), 200 g (7 ozs.).

Ni-Cd Pack MA
Structure: Consists of a motor control circuit with an automatic stop circuit, Ni-Cd battery, a vertical position shutter release button and a selector switch.
Shooting Modes: Three changeable modes. H (4 frames/sec.), L (3 frames/sec.) and S (single frames).
Battery Life: (H mode with 36 exposure film)
Normal Temperatures: 60 rolls or more.
Low temperatures (–10 °C): 15 rolls or more.
Operable Temperature Range: –20 °C +40 °C.
Power Source: Built-in Ni-Cd batteries, 14.4 V. Rechargeable.
Dimensions and Weight: 151 × 61 × 29 mm (5-15/16" × 2-3/8" × 1-1/8"), 205 g (7 ozs.).

Battery Pack MA
Structure: Consists of a motor control circuit with an automatic stop circuit, a battery magazine for penlight (size AA) batteries, a vertical position shutter release button, an instant high speed mode button and a selector switch.
Shooting Modes: Three changeable modes. H (5 frames/sec.), L (3.5 frames/sec.) and S (single frames).
Battery Life: (H mode with 36 exposure film)
Normal Temperatures: 60 rolls or more.
Low temperatures (–10 °C): 5 rolls or more.
Operable Temperature Range: –10 °C +45 °C.
Power Source: 18 volts (12 penlight size AA batteries).
Dimensions and Weight: 151 × 67 × 40 mm (5-15/16" × 2-5/8" × 1-9/16"), 395 g (13 ozs.) including batteries.

Wireless Controller LC-1

Transmitter
Power Source: Two penlight alkaline manganese batteries.
Recycling Time: One second or less.
Number of Channels: Three. Indications for CH1, CH2, and CH3.
Light Wavelength: Approx. 700 nm or more.
Receiver
Power Source: One 006P battery (DC 9 V).
Recycling Time: 0.5 sec. or less.
Wavelength of Receiving Light: Approx. 900 nm (peak value).
Number of Channels: Three. CH1, CH2, CH3.
Switch: S, C. Sliding type. (S: single. C: continuous).
Attachment: Onto the camera's accessory shoe.

Power Winder A
Winding Speed: About 0.5 second.
Operation: Activated by the shutter release button of the camera.
Shutter Speed Coupling Range: 1/60 to 1/1000 second for continuous photography. "B" to 1/1000 second for single frame photography.
Frame Counting: By the frame counter of the camera.
Automatic Cut-off Circuit: At the time of completion of a roll of film, or when battery power is insufficient, the Power Winder A automatically stops and its LED glows.
Mounting: Attached via the tripod socket after the winder coupler cover has been removed.
Power Source: Four penlight batteries (size AA); good for more than 20 rolls of 36-exposure film under normal temperatures.
Size: 141 × 42 × 34 mm (5-9/16" × 1-5/8" × 1-5/16").
Weight: 300 g (10-9/16 ozs.) including batteries.

Subject to change without notice.

The Flash That Goes with the Think-Tank

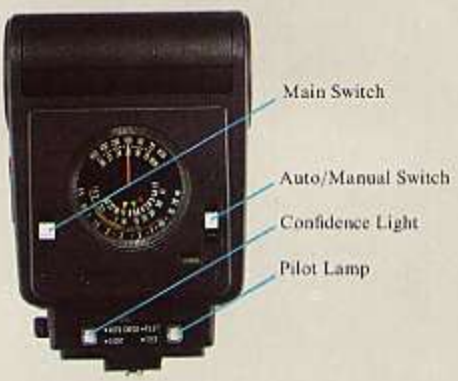
Speedlite 199A

The Canon Speedlite 199A is an automatic electronic flash unit in which, for the first time in a Speedlite, an I^2L type LSI was employed. When coupled to the camera, this Speedlite 199A becomes a particularly versatile flash unit with adjustable light volume and three aperture settings covering a comprehensive range of possible requirements. It can provide bounce flash and background light to obtain softening effects or to bring out what is behind the subject in order to give more life to night and indoor scenes, for a greater freedom in flash photography. The Speedlite 199A has a full charge indicator, a flash control check lamp for test flashing to determine if sufficient light is reflected from the subject, an illumination mechanism for the control dials, safety features to guarantee foolproof flash photography, and a single touch attachment and lock mechanism. The pilot lamp glows to indicate that the unit is ready for use, and it blinks upon charge completion. Operational parts and displays have been logically arranged on the back for more convenience in operation.

With a guide number of 30 (m), it suits most conceivable situations requiring the use of a flash and it recycles in up to 1/5 second. The charge signal of the 199A automatically transmits the preset aperture to the A-1's circuitry and automatically adjusts the shutter speed at 1/60 of a second. The "B" setting and lower shutter speeds can also be adjusted manually so that the subject's background can have more illumination. Automatic flash control of reflected light is available by measuring the amount of light reflected by the subject and, when coupled to the Motor Drive MA, five flashes per second are possible at a close range. A

regulator circuit stabilizes exposure and average metering control avoids excessive concentration of light in the center of the picture.

By tilting the flash back, upward bounce light at 90° (with 60° and 75° intermediate click-stops) is easily obtained.



Furthermore, the 199A's sensing pattern is based on average distribution which means that the dark, hazy backgrounds obtained with conventional flashes can be easily avoided. For exposure compensation or special creative effects, by setting the auto/manual switch accordingly, its operation will be in your hands.

The illumination angle is 45° or more vertically and 60° or more horizontally, which is quite sufficient for the 35 mm format, and with the wide adapter it affords coverage for a 24 mm wide-angle lens.

Speedlite 155A

The Speedlite 155A was specially designed for the A-1, yet it is perfectly interchangeable with the Canon A-1 and couples to the camera's micro-computer circuitry. The Speedlite 155A automatically adjusts shutter at the synchronization value of 1/60 second, and sets the preselected aperture to ensure correct exposure. Through an exchange of signals with the camera, flash duration is decided by the CPU.

The Speedlite 155A offers the choice of two aperture ranges for accuracy in exposure and intended depth of field. Just as the 199A, the Speedlite 155A actually takes an instant to mount and all couplings are made. With the A-1, or with the AE-1, this computerized unit makes great results in flash photography possible even for beginners.

Specifications

Speedlite 199A
Type: Computer thyristor (energy-saving) flash with series control and direct contact connection.
Guide Number: 50 (ft) at ASA 25 and 30 (m) at ASA 100.
Recycling Time: Less than 10 sec. with AM-3 batteries and 0.2–10 sec. on automatic; less than 6 sec. with Ni-Cd batteries and 0.2–6 sec. on automatic.
Number of Flashes: More than 100 with AM-3 batteries and 100–1,000 on automatic; more than 50 with Ni-Cd batteries and 50–500 on automatic.
Aperture Choices: f/2.8, f/5.6 and f/11 at ASA 100.
Auto Coupling Ranges: 1.5 m to 10.6 m at the red position (f/2.8, ASA 100) and, with wide adapter, 1.5 m to 6.3 m. At the green position, 1 m to 5.3 m (f/5.6, ASA 100) and, with wide adapter, 1 m to 3.2 m. At the yellow position, 0.5 m to 2.6 m (f/11, ASA 100) and, with wide adapter, 0.5 m to 1.6 m.
Flash Coverage: Adequate for 35 mm lens on a 35 mm format. With wide adapter, adequate coverage for 24 mm lens.
Auto/Manual Switch: This switch cancels the automatic aperture control (red/green/yellow positions) for switchover to manual setting of the aperture after releasing the aperture ring from the "A" position on the lens.
Shutter Speed Selector Switch: Automatically sets the camera's shutter speed to 1/60 when at AUTO; automatically sets speed to 1/60 in case of shutter settings faster than 1/60; and for settings slower than 1/60, shutter will be released at the speed set on the camera, when the selector switch on the back of the flash is at the MANU 1/60-30S position.
Usable Film Speeds: ASA 25 to 800.
Power Source: Four AA size batteries.
Pilot Lamp: Lights up and flashes on and off when fully charged; also serves as a flash test button.
Confidence Light: Momentarily lights up in green after actual or test firing to determine if flash-to-subject distance was sufficient for the mode selected in automatic. The same light also serves as a button to illuminate the calculator dial.
Bounce: Bounce features with click stops at 90, 75, and 60 degrees.
Size: 79 mm (W) × 83 mm (D) × 116 mm (H).
Weight: 490 g (including batteries).
Accessories: Case, Wide Adapter, and optional Synchro Cord A.

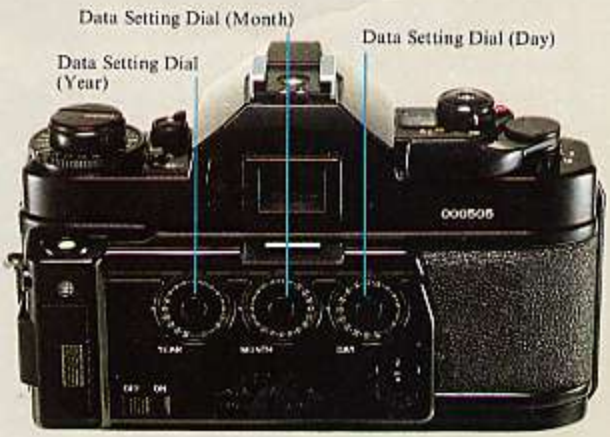
Subject to change without notice.

Speedlite 155A
Type: Computer thyristor (energy-saving) flash with series control and direct contact connection.
Guide Number: 28 (ft) at ASA 25 and 17 (m) at ASA 100.
Recycling Time: Less than seven seconds with alkaline batteries; or less than five seconds when using Ni-Cd batteries. Pilot lamp glows when flash is ready.
Number of Flashes: More than 300 using alkaline batteries. More than 90 using Ni-Cd batteries.
Aperture Selection Switch: Three settings: Red (f/2.8 at ASA 100), MANU, and Green (f/5.6 at ASA 100).
Effective Distance Range: 0.5 m to 6 m at f/2.8 (ASA 100), 0.5 m to 3 m at f/5.6 (ASA 100).
Illumination Angle: More than 45° vertically. More than 60° horizontally (adequate for a 35 mm lens).
Power Source: Four AA size batteries.
Usable Film Speeds: ASA 25 to ASA 800.
Size: 70 mm (W) × 51 mm (D) × 105 mm (H). (2-3/4" × 2" × 4-1/8").
Weight: 300 g (10-9/16 ozs.) including batteries.
Accessories: Case, and optional Synchro Cord A.

Subject to change without notice.

Data Back A

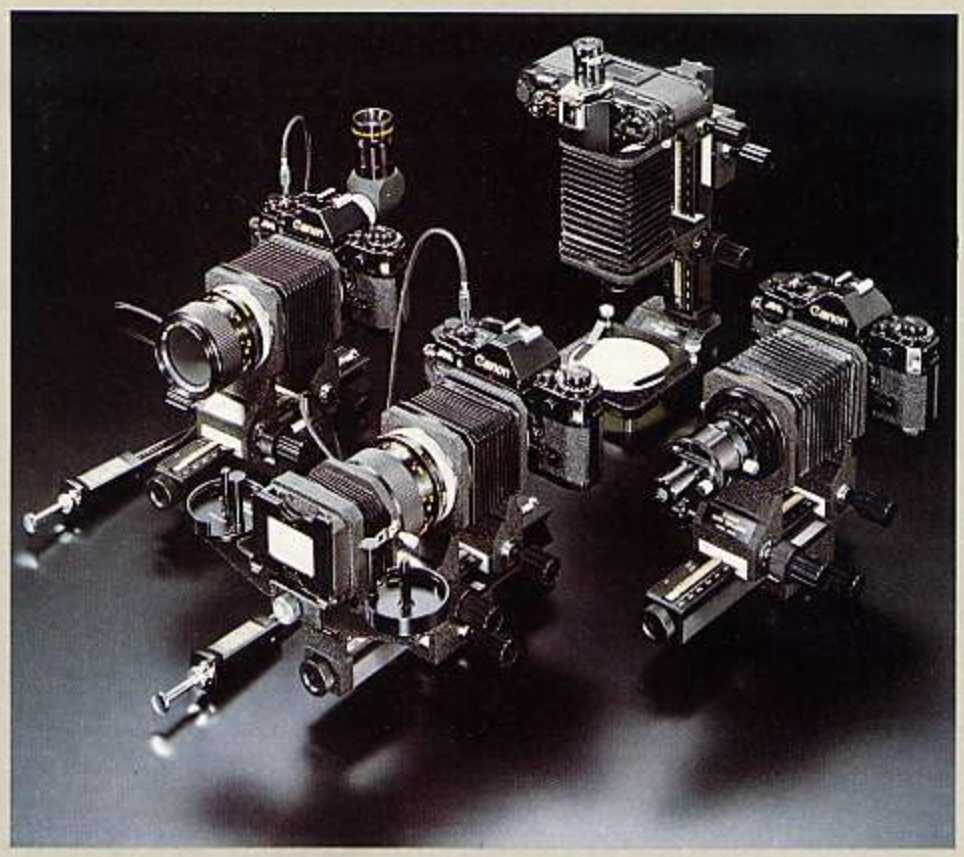
Canon pioneered the process of imprinting data on film at the very moment the picture is taken. This remarkable technological innovation was hailed all over the world by snapshot souvenir photographers as well as by those applying the possibilities of this device to scientific purposes. This process is indeed a true system of classifying photographs since the Data Back A imprints dates, letters of the alphabet and Roman numerals and offers three sets of data arrangements to choose from. Imprinting is perfectly synchronized with the exposure of the film and can also be performed manually or cancelled when so desired.



Specifications
Attachment: In place of the back cover of the A-1, AE-1, and AT-1.
Data Setting Dials:
Right dial: 32 figures (0 to 31) and two blanks.
Central dial: 39 figures (0 to 31; A to G) and a blank.
Left dial: 39 figures (0 to 9; 78 to 89; I to X; a to g) and a blank.
Data Imprinting: Special synchronization cord connection. The built-in lamp imprints the necessary data on the film from the back. By pressing the manual button, the data can be also imprinted.
Exposure Adjustment: Three different positions to choose from according to the film type and its ASA sensitivity.
Indicator Lamp: An LED indicates data imprinting.
Power Source: One 6 V silver oxide battery (Eveready or UCAR No. 544 or Mallory PX28) or alkaline battery (Eveready or UCAR No. 537 or Mallory 7K13) which is good for more than 8,000 exposures.
Size: 100 mm (W) × 48.5 mm (D) × 14.5 mm (H). (3-15/16" × 1-15/16" × 9/16").
Weight: 160 g (5-5/8 ozs.) including battery.
Accessories: Special synchronization cord and case.

Subject to change without notice.

Closing in on New Photographic Fields



Close-up Photography
Before going into the A-1's system accessories for close-up photography, the fact that it offers stopped-down automatic exposure must be mentioned as a prime advantage. Canon developed a series of new accessories together with the A-1 so as to fully exploit this advantage, particularly the Auto Bellows and slide duplicators in three different formats. These accessories perfectly couple with the A-1's stopped-down AE, a feature that photographers will welcome as an extremely valuable aid.

Close-up lenses
These lenses are available for altering the focusing point and have no effect on the speed of the lens, and can be used in combination with extension tubes.

Extension Tube M Set
These tubes increase the distance between the lens and the focal plane to allow the lens to focus on very close objects.
When the desired length is not achieved with only one tube, three different lengths of tube are provided for a total length of 55 mm.

Auto Bellows
Canon's system of close-up and high-magnification photography finds its cornerstone in the Canon Auto Bellows which can be used with Canon's SLR cameras using either an FD or an FL lens. The new Canon Macrophoto lenses can also be used. Lenses not specially designed for high-magnification photography can be mounted in reverse by means of the Auto Bellows' detachable lens mount plate. More than 3× life-size magnification is possible with a 50 mm standard lens.

Slide Duplicator 35
This slide duplicator is attached to the front end of the Auto Bellows for duplicating slides in their original size and other sizes. It has a tilt and shift device for trimming slides, and can also trim 110 size film and duplicate in the 35 mm slide format. There are also the Slide Duplicators 16 and 8 designed to enlarge single frames from 16 mm and 8 mm film and make 35 mm format duplicates.

Copy Stand 5
With a 475× 595 mm baseboard, this precision accessory makes copying extremely easy. An iron plate in the base acts in conjunction with built-in magnets to keep the subjects firmly in place.

Angle Finders A2 and B
Mounted on the viewfinder eyepiece, both can easily be rotated for vertical, horizontal or lateral viewing.

More new accessories
A host of other accessories are available for close-up photography. The Canon 20 mm f/3.5 and 35 mm f/2.8 lenses for macrophotography afford high magnification ratios with the Auto Bellows. The Macro Stage holds the subject in place, and the Macro Auto Ring, mounted on the rear of the lens, preserves the automatic couplings even when using accessories not having this coupling feature. The Canon Focusing Rail allows variations in the distance between the film plane and the subject to be made very easily when attached to either the Copy Stand 5 or 4. The Double Cable Release affords automatic aperture control when accessories without couplings are used between the camera body and an FD or an FL lens.

Lenses for Every Photographic Purpose

FD Series (For Full-Aperture Metering or AE Operation)

Type	Lens	Construction		Angle of View	Min. Aperture	Closest Focusing Distance		Filter Size (mm)	Hood	Length		Weight		
		Elements	Groups			(m)	(ft.)			(mm)	(in.)	(g)	(lbs.)	(ozs.)
Full-Frame Fish-Eye	Fish-Eye FD 15 mm f/2.8 S.S.C.	10	9	180°	f/16	.3	1	Built-in	Built-in	60.5	2-3/8	485	1	1
Super Wide Angle Lenses	FD 17 mm f/4 S.S.C.	11	9	104°	f/22	.25	.9	72	–	56	2-3/16	450	1	
	FD 20 mm f/2.8 S.S.C.	10	9	94°	f/22	.25	.9	72	–	58	2-5/16	345		12
Wide Angle Lenses	FD 24 mm f/2.8 S.S.C.	9	8	84°	f/16	.3	1	55	BW-55B†	52.5	2-1/16	330		12
	FD 28 mm f/2 S.S.C.	9	8	75°	f/22	.3	1	55	BW-55B†	61	2-3/8	343		12
	FD 28 mm f/2.8 S.C.	7	7	75°	f/22	.3	1	55	BW-55B†	49	1-15/16	280		10
	FD 35 mm f/2 S.S.C.*	9	8	63°	f/22	.3	1	55	BW-55A†	60	2-3/8	345		12
	FD 35 mm f/3.5 S.C.*	5	5	63°	f/22	.4	1.5	55	BW-55A†	49	1-15/16	236		8
Standard Lenses	FD 50 mm f/1.4 S.S.C.*	7	6	46°	f/16	.45	1.5	55	BS-55†	49	1-15/16	305		11
	FD 50 mm f/1.8 S.C.*	6	4	46°	f/16	.6	2	55	BS-55†	38.5	1-1/2	200		7
	FD 55 mm f/1.2 S.S.C.	7	5	43°	f/16	.6	2	58	BS-58†	52.5	2-1/16	510	1	2
Telephoto Lenses	FD 85 mm f/1.8 S.S.C.	6	4	28°30'	f/16	.9	3	55	BT-55†	57	2-1/4	425		15
	FD 100 mm f/2.8 S.S.C.	5	5	24°	f/22	1	3.5	55	BT-55†	57	2-1/4	360		13
	FD 135 mm f/2.5 S.C.	6	5	18°	f/22	1.5	5	58	Built-in	91	3-9/16	630	1	6
	FD 135 mm f/3.5 S.C.	4	4	18°	f/22	1.5	5	55	BT-55†	85	3-3/8	385		14
	FD 200 mm f/2.8 S.S.C.	5	5	12°	f/22	1.8	6	72	Built-in	140.5	5-9/16	700	1	9
	FD 200 mm f/4 S.S.C.	6	5	12°	f/22	2.5	8	55	Built-in	133	5-1/4	675	1	8
	FD 300 mm f/5.6 S.S.C.	6	5	8°15'	f/22	3	10	55	Built-in	198.3	7-13/16	685	1	8
Super Telephoto Lenses	FD 400 mm f/4.5 S.S.C.	6	5	6°10'	f/22	4	13	Excl.††	Built-in	282	11-1/8	1,300	2	14
	FD 600 mm f/4.5 S.S.C.	6	5	4°10'	f/22	8	27	48	Built-in	455	1'5-15/16	4,300	9	8
	FD 800 mm f/5.6 S.S.C.	6	5	3°06'	f/22	14	45	48	Built-in	567	1'10-5/16	4,300	9	8
Macro Lenses	FD 50 mm f/3.5 S.S.C. Macro with Extension Tube FD 25	6	4	46°	f/22	20.5 (cm)	8.1 (in.)	55	None Necessary	59.5	2-5/16	310		11
	FD 100 mm f/4 S.C. Macro with Extension Tube FD 50	5	3	24°	f/32	.4	1.31	55	None Necessary	112	4-7/16	530	1	3
Zoom Lenses	FD 24–35 mm f/3.5 S.S.C. ASPHERICAL***	12	9	84°–63°	f/22	.4	1.31	72	W-75	86.3	3-3/8	515	1	2
	FD 28–50 mm f/3.5 S.S.C.	10	9	75°–46°	f/22	1†††	3.5	58	W-69B	105	4-1/8	470	1	1
	FD 35–70 mm f/2.8–3.5 S.S.C.	10	10	63°–34°	f/22	1†††	3.5	58	W-69	120	4-3/4	575	1	4
	FD 100–200 mm f/5.6 S.C.	8	5	24°–12°	f/22	2.5	8	55	Built-in	173	6-13/16	765	1	11
	FD 80–200 mm f/4 S.S.C.	15	11	30°–12°	f/32	1	3.5	55	Built-in	161	6-5/16	750	1	10
	FD 85–300 mm f/4.5 S.S.C.	15	11	28°30'–8°15'	f/22	2.5	8	Series IX	Built-in	243.5	9-9/16	1,695	3	12
Aspherical Lenses	FD 24 mm f/1.4 S.S.C. ASPHERICAL	10	8	84°	f/16	.3	1	72	–	68	2-11/16	500	1	2
	FD 55 mm f/1.2 S.S.C. ASPHERICAL	8	6	43°	f/16	.6	2	58	BS-58†	55	2-3/16	575	1	4
	FD 85 mm f/1.2 S.S.C. ASPHERICAL	8	6	28°30'	f/16	1	3.5	72	–	71	2-13/16	756	1	11
Fluorite Lens	FD 300 mm f/2.8 S.S.C. FLUORITE with Extender FD 2X	6	5	8°15'	f/22	3.5	12	Excl.††	Built-in	230	9-1/16	1,900	4	3

FL and Manual Series (For Stopped-Down Metering and Stopped-Down AE)

Type	Lens	Construction		Angle of View	Min. Aperture	Closest Focusing Distance		Filter Size (mm)	Hood	Length		Weight		
		Elements	Groups			(m)	(ft.)			(mm)	(in.)	(g)	(lbs.)	(ozs.)
Circular Fish-Eye	Fish-Eye 7.5 mm f/5.6 S.S.C.	11	8	180°	f/22	Fixed Focus		Built-in	–	62	2-7/16	380		13
Tilt and Shift	TS 35 mm f/2.8 S.S.C.	9	8	63°/79°	f/22	.3	1	58	BW-58B†	74.5	2-15/16	545	1	3
Super Telephoto	FL 400 mm f/5.6**	7	5	6°10'	f/32	4.5	15	48††	Exclusive	338	1'1-5/16	3,890	8	9
	FL 600 mm f/5.6**	6	5	4°10'	f/32	10	35	48††	Built-in	448	1'5-5/8	5,000	11	
	FL 800 mm f/8**	7	5	3°06'	f/32	18	60	48††	Built-in	508	1'8	5,360	11	13
	FL 1200 mm f/11 S.S.C.**	7	5	2°05'	f/64	40	130	48††	Built-in	853	2'9-9/16	6,200	13	11
Artificial Fluorite Telephoto	FL 300 mm f/5.6 FLUORITE	7	6	8°15'	f/22	4	13	58	Built-in	168	6-5/8	850	1	14
	FL 500 mm f/5.6 FLUORITE	6	5	5°	f/22	10	33	95	Built-in	300	11-13/16	2,700	5	15

S.S.C. Super Spectra Coating
S.C. Spectra Coating
* Equipped with a coupling pin for Canon Auto Tuning System
** Front component interchangeable type. Focusing Unit (2 elements, 1 group, FL automatic diaphragm, with A-M ring)
*** New lens

† FD lens hoods are of bayonet type.
†† Filter is of insertion type with holder.
††† Macro focusing capability.

Subject to change without notice.

Fish-Eye 7.5 mm f/5.6 S.S.C.

Fish-Eye FD 15 mm f/2.8 S.S.C.

FD 17 mm f/4 S.S.C.

FD 20 mm f/2.8 S.S.C.

FD 24 mm f/1.4 S.S.C. ASPHERICAL

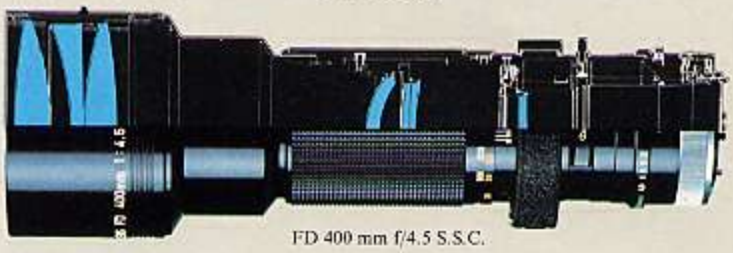
FD 50 mm f/1.4 S.S.C.

FD 50 mm f/1.8 S.C.

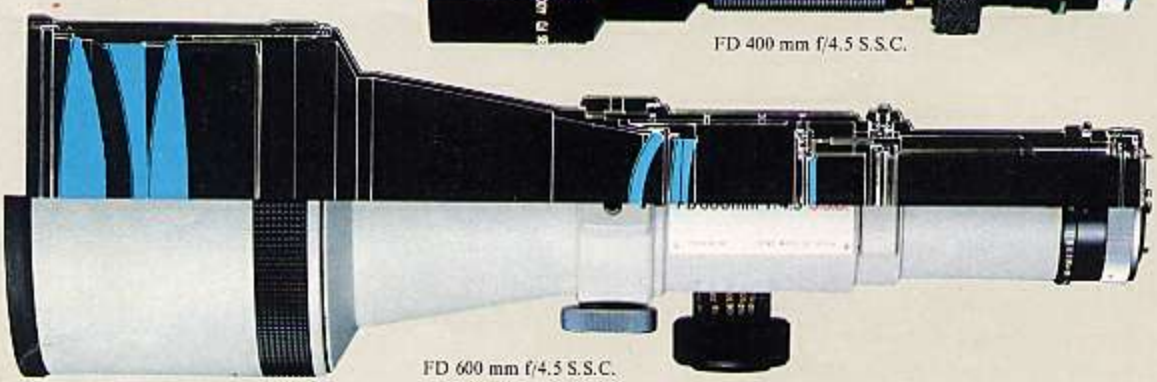
FD 50 mm f/3.5 S.S.C. Macro with Extension Tube FD 25

FD 55 mm f/1.2 S.S.C. ASPHERICAL

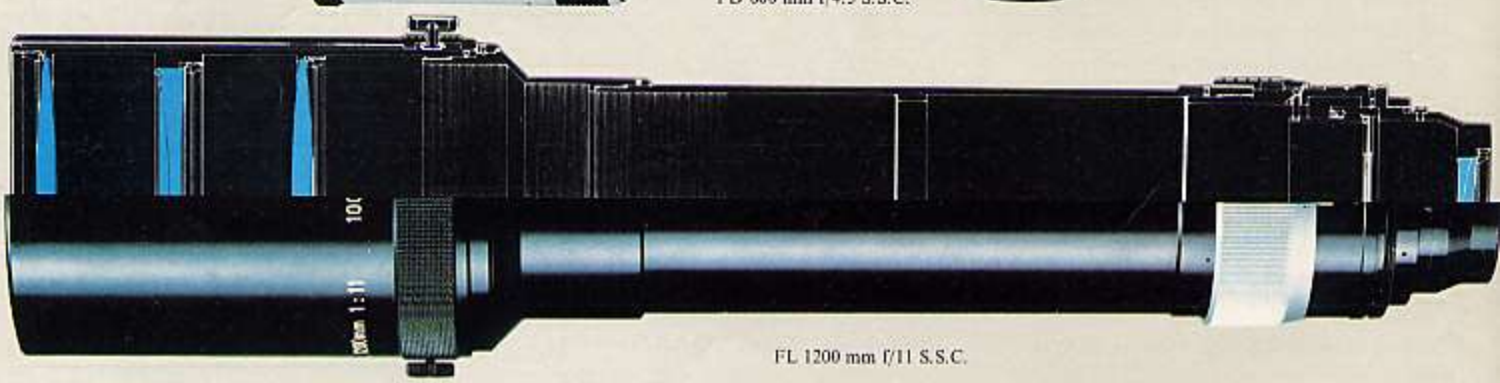
FD 55 mm f/1.2 S.S.C.



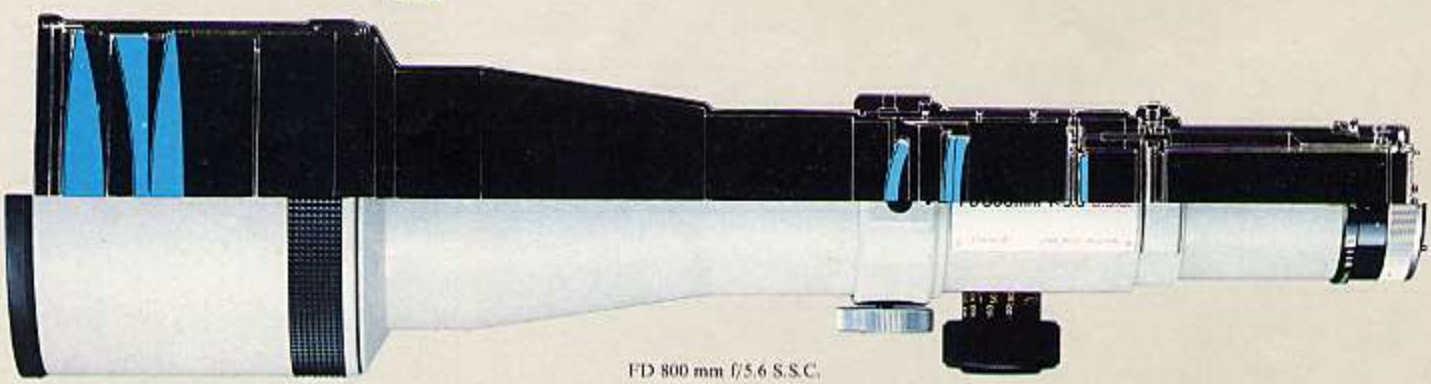
FD 400 mm f/4.5 S.S.C.



FD 600 mm f/4.5 S.S.C.



FL 1200 mm f/11 S.S.C.



FD 800 mm f/5.6 S.S.C.

FD 24 mm f/2.8 S.S.C.

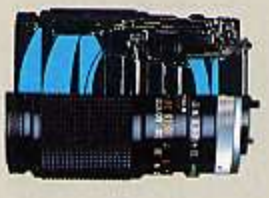
FD 28 mm f/2 S.S.C.

FD 28 mm f/2.8 S.C.

FD 35 mm f/2 S.S.C.

FD 35 mm f/3.5 S.C.

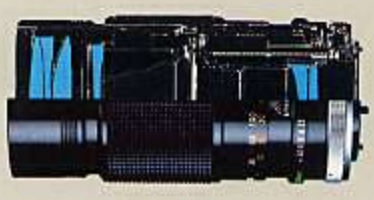
TS 35 mm f/2.8 S.S.C.



FD 135 mm f/2.5 S.C.

FD 135 mm f/3.5 S.C.

FD 200 mm f/2.8 S.S.C.

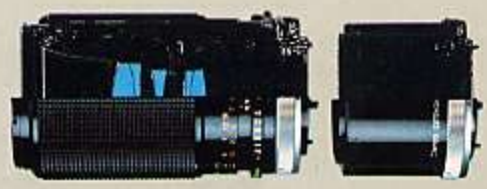


FD 200 mm f/4 S.S.C.

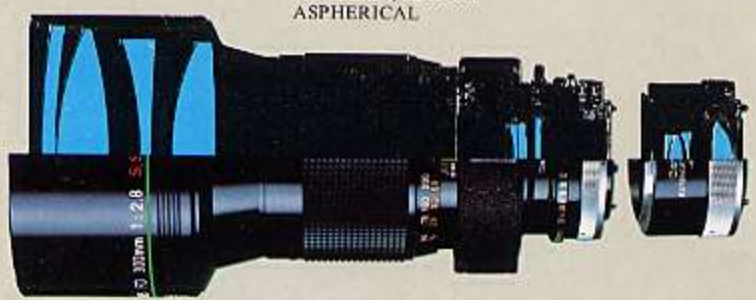
FD 85 mm f/1.8 S.S.C.

FD 85 mm f/1.2 S.S.C.
ASPHERICAL

FD 100 mm f/2.8 S.S.C.

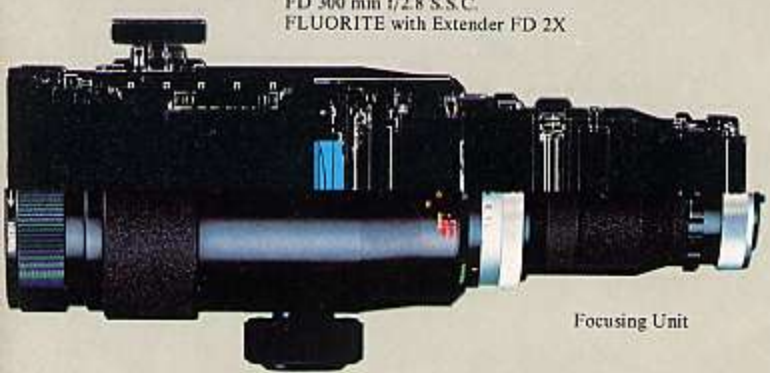


FD 100 mm f/4 S.C. Macro
with Extension Tube FD 50



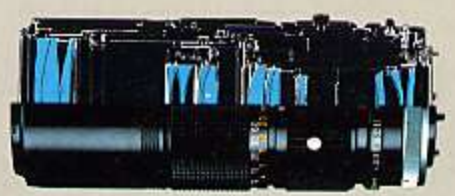
FD 300 mm f/2.8 S.S.C.
FLUORITE with Extender FD 2X

FD 300 mm f/5.6 S.S.C.



Focusing Unit

FD 28 – 50 mm f/3.5 S.S.C.

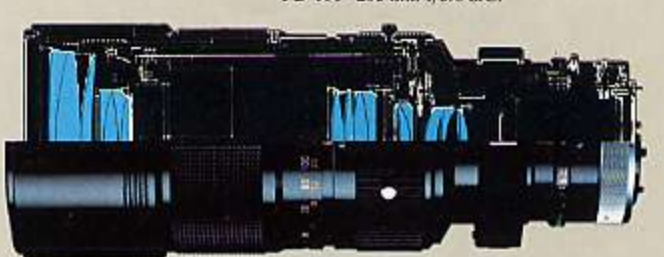


FD 80 – 200 mm f/4 S.S.C.

FD 100 – 200 mm f/5.6 S.C.

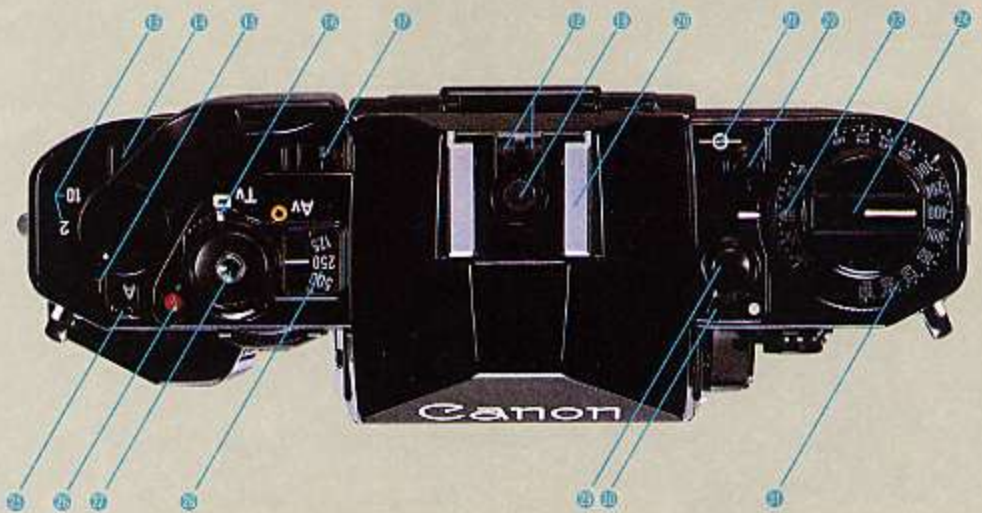
FD 24 – 35 mm f/3.5 S.S.C.
ASPHERICAL

FD 35 – 70 mm f/2.8 – 3.5 S.S.C.

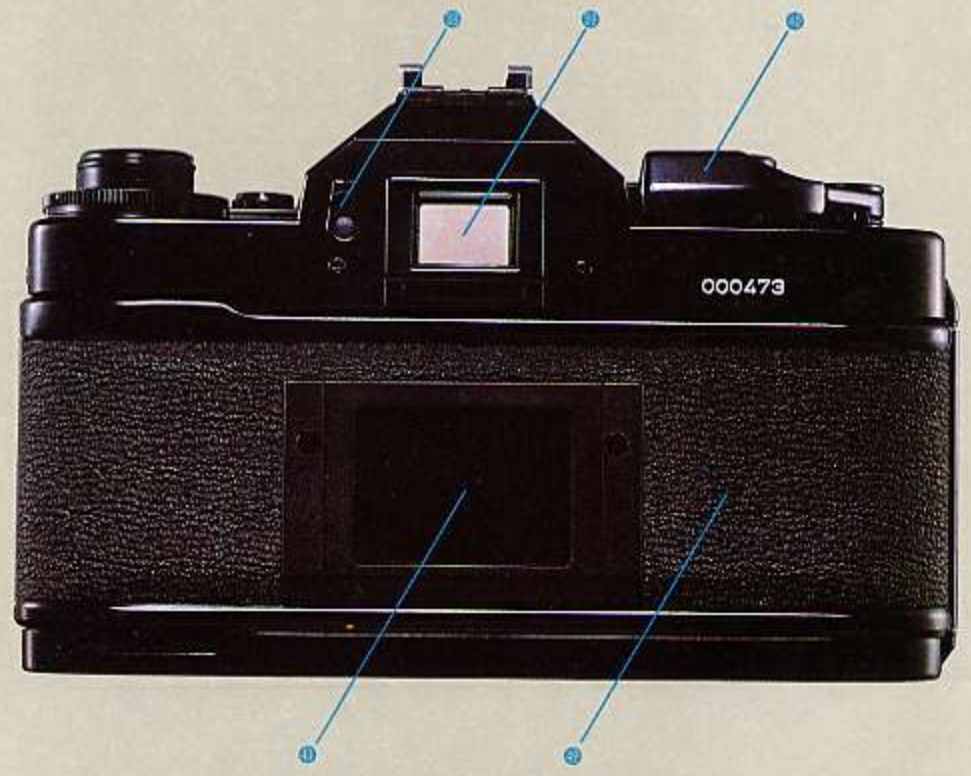


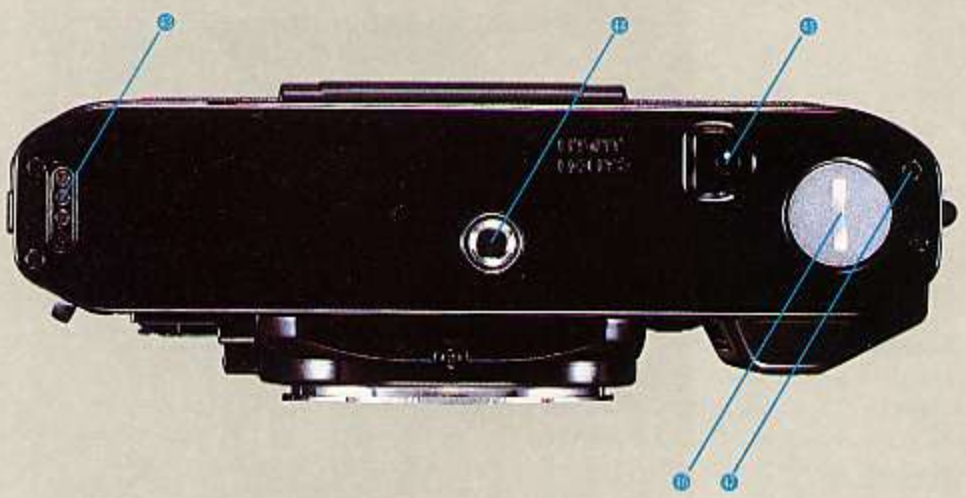
FD 85 – 300 mm f/4.5 S.S.C.

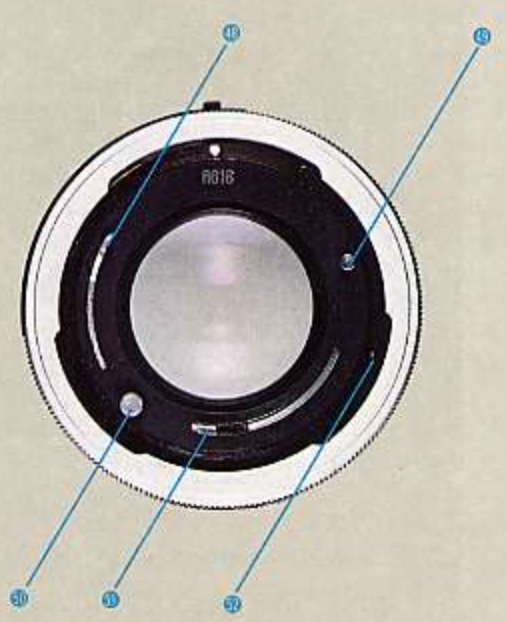
The Points That Make the Difference



1 AT Dial
2 AT Dial Guard
Designed to prevent the AT dial from being unintentionally moved.
3 Aperture Signal Coupling Lever
4 PC Socket
For attaching flash units without hot-shoe using a synchronization cord.
5 Exposure Memory Switch
6 Action Grip
Provides a perfect grip and finger support for steady camera hold.
7 Battery Chamber Cover/Finger Grip
Houses a 6V silver oxide battery to power all camera circuits.
8 Alignment Hole for the EE Switch Pin
9 Stopped-down Coupling Lever
10 Lens Speed Adjustment Pin
11 Exposure Preview Switch
Can also be used for confirmation of the viewfinder display.
12 Stop-down Lever
13 Self-timer Settings
14 Multiple Exposure Lever
15 Lock Position
With the main switch in this position power is cut off from all camera circuits.
16 AE Mode Selector
17 Frame Counter
Additive type counter. Does not count multiple exposures and counts down when film is rewound.
18 Automatic Flash Contacts
19 Flash Synchronization Contact
20 Accessory Shoe
21 Film Plane Indicator
Provides the exact reference for measuring subject distance with precision when necessary, such as in macro-photography.
22 Exposure Compensation Lock Button
When pressed, it allows free setting of the exposure compensation dial.
23 Exposure Compensation Scale
24 Film Rewind Knob with Crank
25 Main Switch
26 Battery Check LED
Lights on and off rapidly when battery charge is sufficient, and at longer intervals when it is not. Also indicates self-timer operation.
27 Shutter Release Button (with Cable Release Socket)
28 AE Mode Peep Window







29 Battery Check Button
Activates the battery charge LED indication and can also be used to cancel self-timer operation.

30 Viewfinder Display Lever
By setting this lever at the position of the white dot, the viewfinder display is cancelled even when the shutter button is pressed.

31 ASA Film Speed Scale

32 Breech-lock Mount Ring

33 EE Lock Pin
By pressing the pin, the lens can be set at the "A" mark, or disengaged from it.

34 "A" Mark on the Aperture Ring

35 Depth-of-field Scale

36 Distance Scale

37 Focusing Ring

38 Eyepiece Shutter Lever
Activates the viewfinder blind to shut out all light that may affect the exposure.

39 Eyepiece

40 Film Advance Lever
With a 120° stroke and 30° stand-off angle for quick film advance. Film can also be wound in short strokes.

41 Memo Holder
Convenient for keeping information such as film type always at hand.

42 Back Cover

43 Winder and Motor Drive Terminals

44 Tripod Socket

45 Film Rewind Button

46 Winder and Motor Drive Coupler Cover

47 Winder and Motor Drive Guide Hole

48 Aperture Signal Lever

49 Reserved Pin

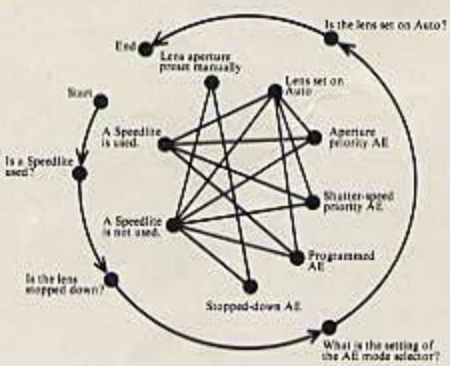
50 Full Aperture Signal Pin

51 Automatic/Manual Aperture Lever

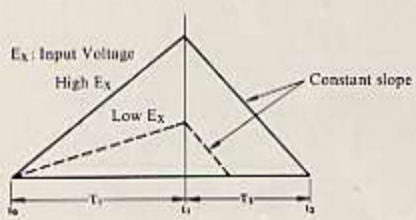
52 EE Switch Pin

The A-1's Technological Leap Forward

The basis of the many various functions of the A-1 is a high density micro-computer system centered around the CPU, introducing the world's most advanced technology ever employed in a camera.
All data had to be in digital form for the micro-computer to analyze and calculate in order to achieve a compact camera design capable of processing such large volumes of information.
Everything is digital, including film speed, shutter speed, aperture, program setting, full aperture f/stop, meter compensation, self-timer setting, and stop-down lever setting.
The only remaining analog data, that of brightness, is converted into digital, too.
The Gray code is used for the first time in a camera for utmost accuracy in the various inputs.



Programmable logic array
Calculation and control procedures are all performed according to instructions from



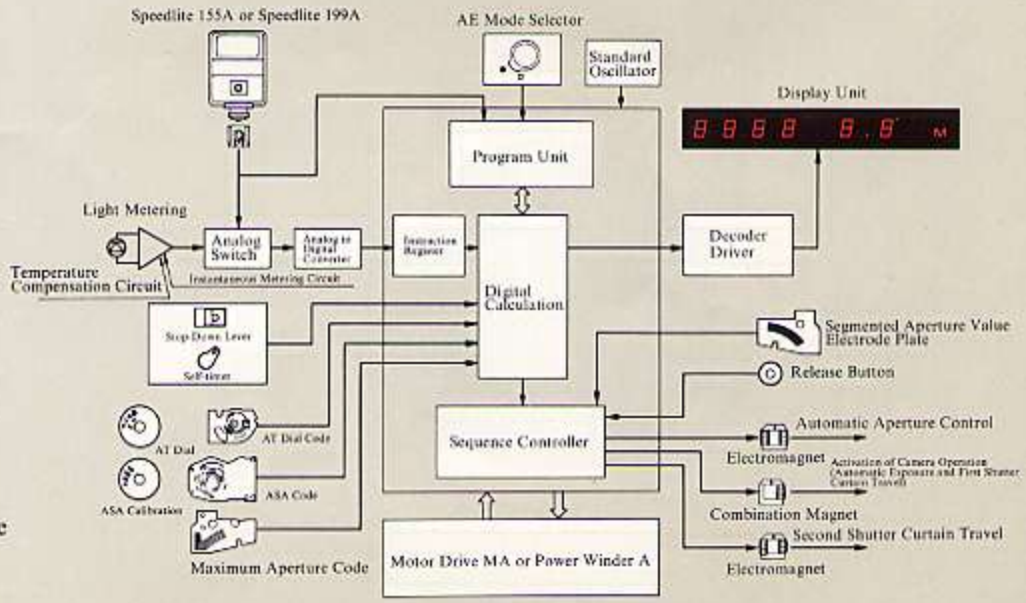
the program unit.
This program unit employs a programmable logic array (PLA) on which are based the multifunctional characteristics of this camera, as well as the one-dial, one-switch design.
When the shutter button is pressed, sequential control is performed in accordance with the program unit. In other words, by activating the electromagnetic release, the aperture starts closing down. At the same time, the AE mechanism, which is coupled to the aperture signal, functions and the precious metal wire brush slides at high speed across the segmented aperture value electrode plate. According to the pulse count generated at this time, aperture is decided.
On the other hand, the shutter speed is counted digitally by the micro-computer. Then, a signal is transmitted to the magnet holding the second shutter curtain and an accurate exposure is performed.
The segmented aperture value electrode plate has a very high precision finish.

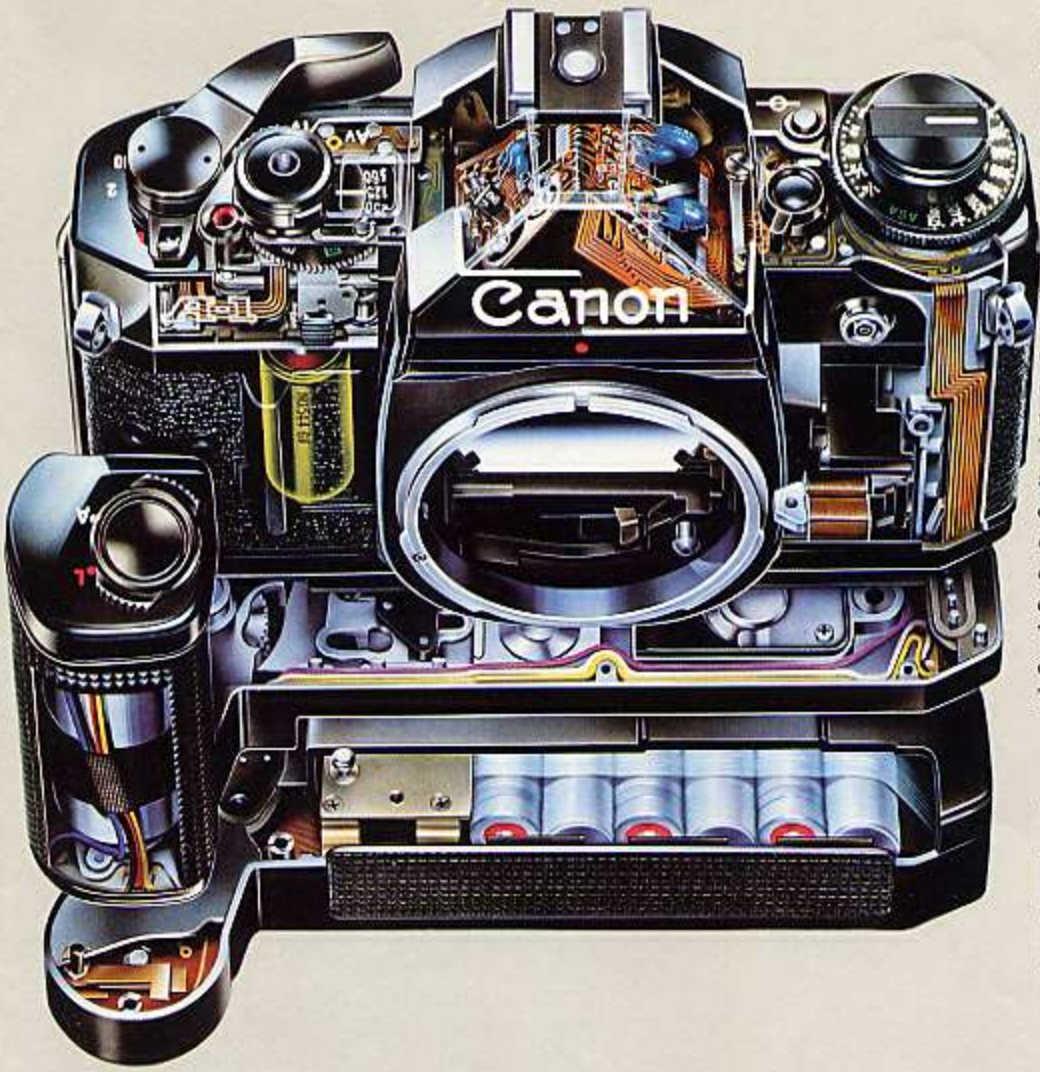
Dual ramp integration analog-to-digital converter
The dual ramp integration analog-to-digital converter system is used for the first time in a camera for converting analog brightness information into digital. Two functions are performed simultaneously, accurate measurement of the input signal and its conversion into digital.

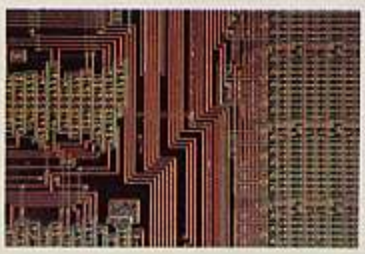
The miracle of Pure I^2L
The reason why five AE photographic modes are possible is solely due to the fact that a high-density I^2L is employed. This, as well as continuous shooting at five frames per second with the Motor Drive MA would have been impossible with analog data processing.
The main features of a digital system are that it is hardly affected by changes in temperature and humidity, or by wear of parts such as resistors, or by changes due to long years of service.
Low cost and compact design are possible, and the solid state indicator is stronger against shocks and environmental effects.
The volume of information that can be displayed is greatly increased, and readout is easier and highly accurate. Besides, the number of adjustable points and necessary parts are much fewer than when analog is used, and monolithic ICs are made possible.

One IC and four LSIs are woven into the A-1's electronic circuit. First, an IC in the component used for metering is woven into the Bi-MOS log amplifier construction.
This IC is integrated with the photocell and sealed into a single package.
An I^2L with an internal layer is used in the information input. This is part of the LSI design where the analog and digital circuits are on the same chip as isolated I^2L, and the converter is built in. The LSI used here has one and a half times the capacity of the LSI used in the AE-1.
Another LSI consisting of pure I^2L and implementing the CPU is used. It is composed of only digital circuitry, and greater circuit density is achieved, while insulation between the analog and digital circuits is not necessary. The increase in the power is equivalent to that of around 300 IC packages of the standard gate under previously employed technology. And compared to the I^2L logic of the AE-1's LSI, the increase in power is three to four times.
Then, a bipolar IC consisting of an oscillator and interface block is used.
Finally, there is an I^2L with internal insulated layer used in the decoder section.
The LSI used here has two to three times more power compared to the LSI in the AE-1.
The A-1 employs a frequency divider composed of a 20-step flip-flop circuit which performs all controls concerning time. It divides a 32 kHz standard frequency up to 32 seconds. Furthermore, it combines the intermediate frequencies and calculates various time factors such as shutter speed, self-timer time lag and flashing, information display and warning flashings in the viewfinder, electric flow of the various magnets, and timing when the Motor Drive MA is used.

Bus line system
A common bus line system is adopted for transmitting information. It decides time by







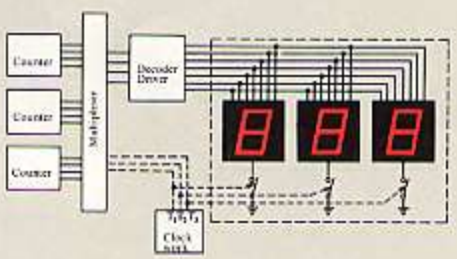
240 μs per cycle and transmits various information in consecutive order to their destinations by means of bit signals.
This bus line system is used for such purposes as transmitting brightness inputs already converted into digital, various other data inputs, and calculated results to the display circuit.
This system, too, has been adopted in a camera for the first time in the world.

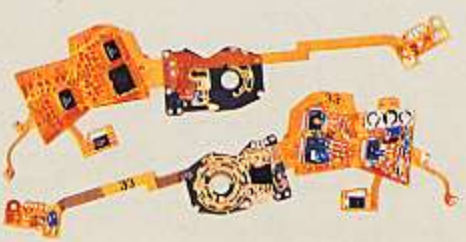
Ultra smooth flush plate
The aperture control signals are generated when the sliding brush slides over the segmented aperture value electrode plate and chattering, which obstructs pulses, had to be absolutely avoided.
It is for this reason that such smooth finish is applied to the copper foil substrate employed. In the case of the ordinary 35 μ thick copper foil print board, the degree of smoothness is not enough. The A-1's is a 23 μ thick copper foil plated with a special epoxy board. This board is then heated and pressed in order to keep the smoothness of the embedded pattern to within 5 μ.

Dynamic display
All calculated results are displayed by means of red LED's inside the viewfinder through a decoder driver. A special control of the dynamic display system is employed so that wirings and electric power consumption are reduced, and the display is tuned to the metering. The lighting circuit is composed of a counter for each digit, a multiplexer and a decoder driver.
If a static display were the case, the same number of counters and decoder drivers as the number of display digits would become necessary.

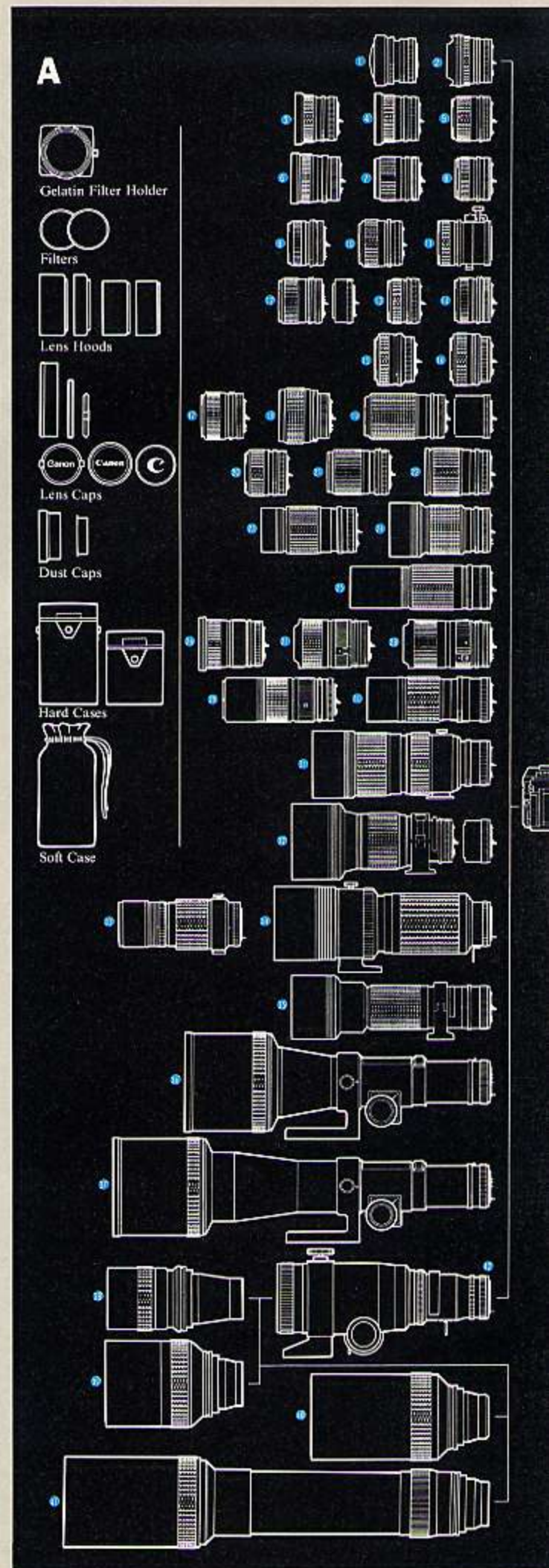
The latest component packaging technology
Micro-patterned two-side flexible substrate
The A-1 employs a new type of board, composed of multi-layer flexible print boards with patterns printed on both sides because of the complication of circuits and their high-level contents.
The layouts are of high-density, with space between the lines and line widths both being 0.2 mm, close to the limit achievable by present technology.

Diode chip on board
According to the conditions of the circuits, a diode is necessary for each switch for separating signals. This camera has 20 diodes. If these were to be wired one by one in the conventional manner, it would require a lot of space and be very wasteful. Therefore, the method was adopted whereby a set of four diodes is made into one diode chip and then these diode chips are bonded onto a single board. This is called "chip on board" in which wiring and space are drastically reduced.
This technique is also employed in the LED of the indicator.
There may have been instances of chip on board of diodes but never chip on board of diode arrays.
The A-1, indeed, goes all the way to the front in pioneering electronic technology for the purpose of making the act of taking pictures easier, and the picture taken one worthy of the flashing instant it captured forever.





System Photography with a New Meaning



CANON A-1 SYSTEM

A Lenses
1 Fisheye 7.5 mm f/5.6 S.S.C.
2 Fisheye FD 15 mm f/2.8 S.S.C.
3 FD 17 mm f/4 S.S.C.
4 FD 20 mm f/2.8 S.S.C.
5 FD 24 mm f/2.8 S.S.C.
6 FD 24 mm f/1.4 S.S.C. ASPHERICAL
7 FD 28 mm f/2 S.S.C.
8 FD 28 mm f/2.8 S.C.
9 FD 35 mm f/3.5 S.C.
10 FD 35 mm f/2 S.S.C.
11 TS 35 mm f/2.8 S.S.C.
12 Macro FD 50 mm f/3.5 S.S.C. with Extension Tube FD 25
13 FD 50 mm f/1.8 S.C.
14 FD 50 mm f/1.4 S.S.C.
15 FD 55 mm f/1.2 S.S.C.
16 FD 55 mm f/1.2 S.S.C. ASPHERICAL
17 FD 85 mm f/1.8 S.S.C.
18 FD 85 mm f/1.2 S.S.C. ASPHERICAL
19 Macro FD 100 mm f/4 S.C. with Extension Tube FD 50
20 FD 100 mm f/2.8 S.S.C.
21 FD 135 mm f/3.5 S.C.
22 FD 135 mm f/2.5 S.C.
23 FD 200 mm f/4 S.S.C.
24 FD 200 mm f/2.8 S.S.C.
25 FD 300 mm f/5.6 S.S.C.
26 FD 24–35 mm f/3.5 S.S.C. ASPHERICAL
27 FD 28–50 mm f/3.5 S.S.C.
28 FD 35–70 mm f/2.8–3.5 S.S.C.
29 FD 80–200 mm f/4 S.S.C.
30 FD 100–200 mm f/5.6 S.C.
31 FD 85–300 mm f/4.5 S.S.C.
32 FD 300 mm f/2.8 S.S.C. FLUORITE with Extender FD 2X
33 FL 300 mm f/5.6 FLUORITE
34 FL 500 mm f/5.6 FLUORITE
35 FD 400 mm f/4.5 S.S.C.
36 FD 600 mm f/4.5 S.S.C.
37 FD 800 mm f/5.6 S.S.C.
38 FL 400 mm f/5.6
39 FL 600 mm f/5.6
40 FL 800 mm f/8
41 FL 1200 mm f/11 S.S.C.
42 Focusing Unit

B Close-up, Macrophotography and Photomicrography
1 Camera Body
2 Macro FD Lens 50 mm, 100 mm
3 FD Lens (including Macro FD Lenses)
4 Macrophoto Lens
4a Macrophoto Lens 20 mm f/3.5
4b Macrophoto Lens 35 mm f/2.8
5 Auto Bellows
6 Bellows M
6a Bellows
7 Extension Tube FD 25, 50
8 Extension Tube M Set
8a Extension Tube M5
9 Close-up Lens
10 Macro Auto Ring
11 Macrophoto Coupler FL
12 Macro Hood
13 Macrophoto Lens Adapter
14 Duplicator 35
15 Duplicator 16
16 Duplicator 8
17 Roll Film Stage
18 Macro Stage
19 Attachment Ring
20 Copy Stand 5
21 Copy Stand 4
22 Camera Holder F3
23 Focusing Rail
24 Lens Mount Converter A
25 Macrophoto Hood
26 Photomicro Unit F
27 Microscope
28 Handy Stand F
29 F Ring
30 Magnifier S
31 Angle Finder A2
32 Angle Finder B
33 Focusing Screen
34 Double Cable Release
35 Canon Release 50
36 Canon Release 30

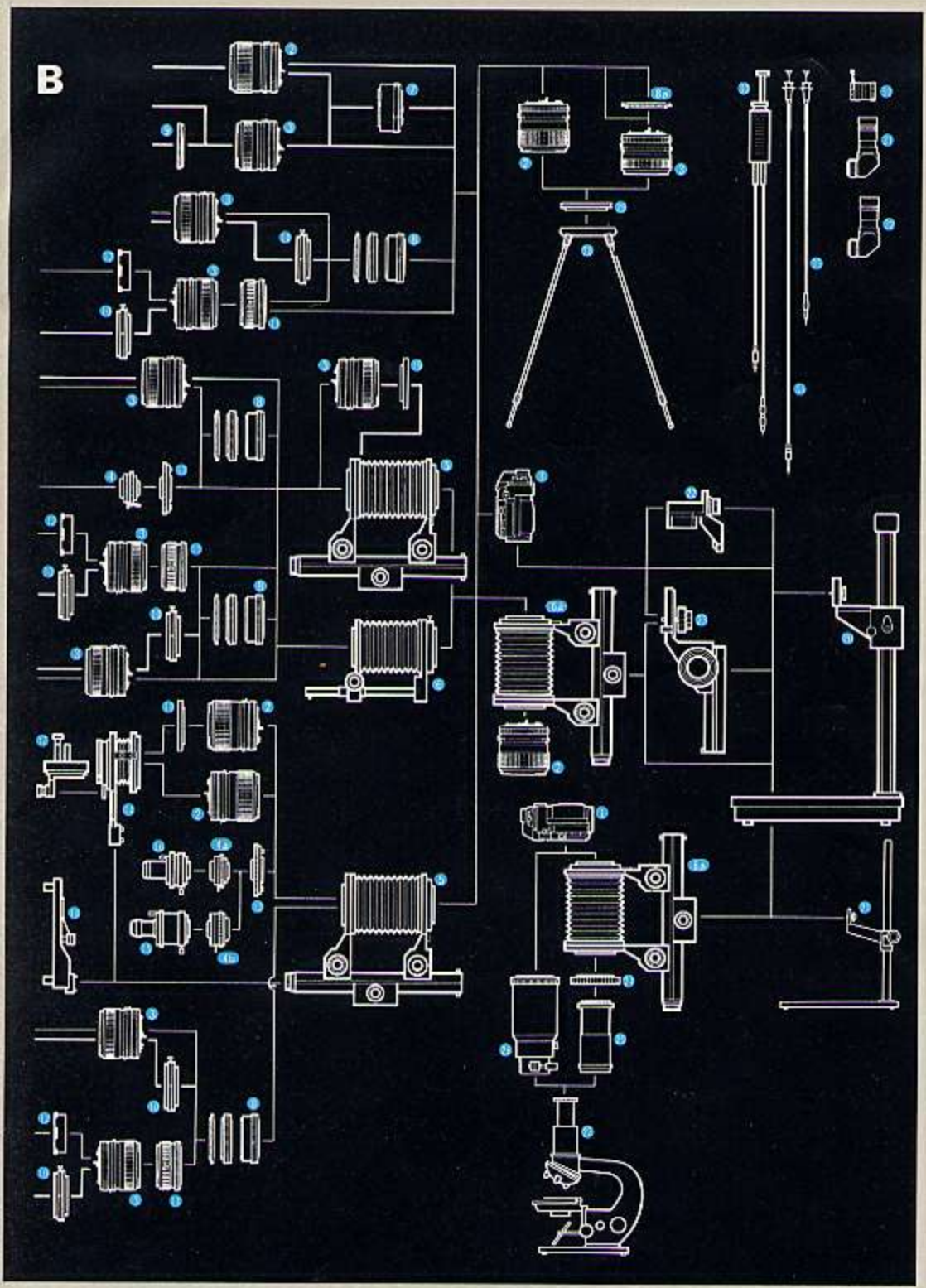
C Flash Photography
1 Speedlite 155A
2 Speedlite 199A

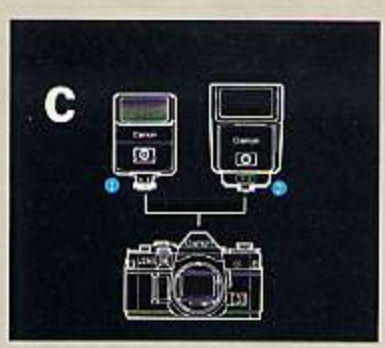
D Data Imprinting System
1 Data Back A

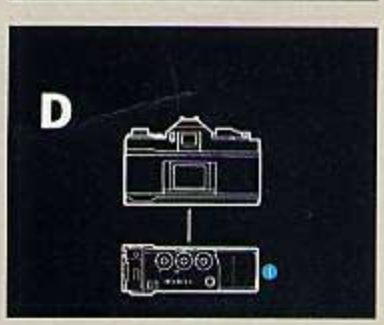
E Viewfinder System
1 Eyecup 4S
2 Angle Finder A2
3 Angle Finder B
4 Magnifier S
5 Dioptric Adjustment Lenses S
6 Focusing Screen Options

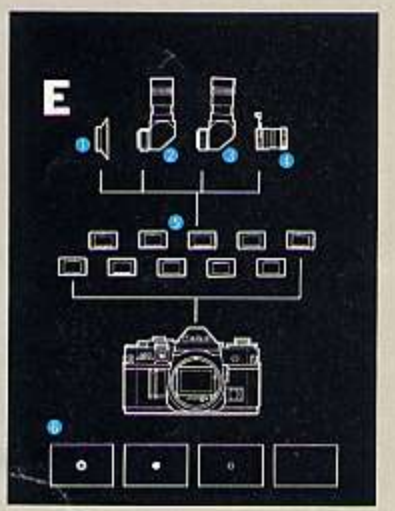
F Cases and Bags
1 Action Case A
2 Cases
3 Neck Strap
4 Gadget Bag 4
5 Gadget Bag G-1

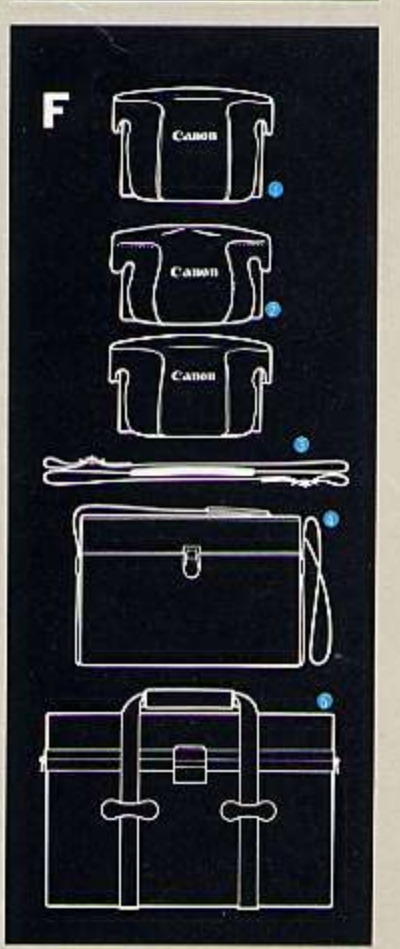
G Electronic Film Drive and Unmanned Photography
1 Motor Drive MA
2 Power Winder A
3 Ni-Cd Charger MA
4 Ni-Cd Pack MA
5 Battery Pack MA
6 Battery Magazine MA
7 Extension Cord E1000
8 Time Lapse Programmer A Unit
9 Time Lapse Programmer B Unit
10 Wireless Controller LC-1
11 Remote Switch 3
12 Remote Switch 60
13 Remote Switch 60 MF

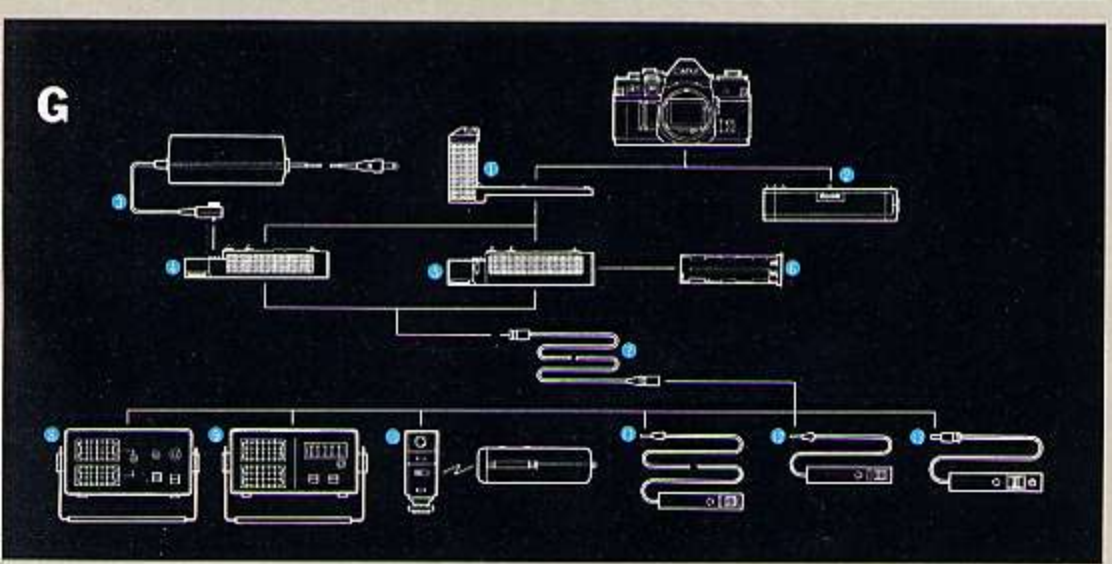

B


C


D


E


F
Canon
Canon
Canon


G

Specifications

Type: 35 mm SLR (Single-Lens-Reflex) camera with electronically controlled, multiple-mode AE (automatic exposure) and focal plane shutter.
Format: 24 × 36 mm.
Photographic Modes: Six modes, including 5 AE modes: shutter-speed priority AE, aperture priority AE, programmed AE, full AE flash photography with specified Canon electronic flashes, and stopped-down AE, as well as manual override.
Interchangeable Lenses: Canon FD lenses (usable with 4 full aperture metering AE modes and with stopped-down AE); Canon FL lenses (usable with stopped-down AE).
Standard Lenses: Canon FD 55 mm and 50 mm lenses.
Lens Mount: Canon Breech-lock mount. Accepts Canon FD, FL and R lenses.
Viewfinder: Fixed eye-level pentaprism.
Field of View: 93.5% vertical and 95.3% horizontal coverage of the actual picture area.
Magnification: 0.83 × at infinity with a standard 50 mm lens.
Focusing Screen: Standard split-image microprism rangefinder.
Viewfinder Information: Displayed in the form of LED digital readout below the visual field. Includes shutter speed, aperture, flashing warning of incorrect exposures and settings, bulb indication, charge completion indicator with specified Canon flash units, manual aperture control signal, error indication for incorrect stopping-down operation. Shutter speed and aperture data displayed in 1/2 step increments. Viewfinder information can be cancelled by turning off the viewfinder display switch.
Dioptric Adjustment: Built-in eyepiece is adjusted to standard −1 diopter.
Eyepiece Attachments: Angle Finders A2 and B, Magnifier S, 10 different Dioptric Adjustment Lenses S for eyesight correction and Eyecup 4S.
Eyepiece Shutter: Built-in. Keeps out extraneous light self-timer or remote control operation.
Mirror: Instant-return type with shock-absorbing mechanism. No image cut-off in the viewfinder even with the FD 400 mm telephoto.
AE Mechanism: Electronically controlled. Employs 3 LSIs with I²L, one Linear LSI and one Bi-MOS IC for light metering.
AE mode Selection: By means of the AE mode selector. Two main settings: Tv for shutter-speed priority AE, Av for aperture priority AE.
Light Metering System: Through-the-lens (TTL) Central Emphasis metering by silicon photocell located just above eyepiece lens. Light reaches the silicon photocell after passing through a Fresnel lens condenser.
ASA Film Speed Setting: ASA 6 to ASA 12800 in 1/3 step increments. With lock.
Meter Coupling Range: EV −2 to EV 18 at ASA 100 with FD 50 mm f/1.4 S.S.C. lens. In the programmed AE mode, meter coupling range depends on the programmed shutter speed and aperture combinations.
Exposure Compensation: ± 2 f/stop scale gradations in increments of 1/3 of a gradation, with 1/4, 1/2, 1, 2, and 4 markings.
Exposure Memory: EV is stored and locked when the exposure memory switch is pressed. When pressed, the shutter-speed/aperture combination can be changed for the same EV stored in the memory.
Exposure Preview: Viewfinder digital readout activated by pressing the shutter button halfway, or by pressing the exposure preview switch or the exposure memory switch.
Stop-down Lever: Operates when pushed in. Stopping-down an FD lens is possible only when the aperture ring is disengaged from the "A" mark.
Manual Override: Possible by disengaging the FD lens from the "A" mark and setting the AE mode selector to Tv. Aperture manually controlled with aperture ring; shutter speed with AT dial.
Shutter: Cloth focal plane shutter with four spindles. Electronically controlled, stepless, from 30 sec. to 1/1000 sec. Shock and noise damper mechanisms are incorporated.
Shutter Speed Scale: B, 30, 15, 8, 4, 2, 1, 2, 4, 8, 15, 30, 60, 125, 250, 500, 1000 plus P (with the AE mode selector at Tv). "P" setting is required for programmed AE mode. Intermediate speeds not on the scale cannot be set.
Aperture Scale: 1.4 · 2 · 2.8 · 4 · 5.6 · 8 · 11 · 16 · 22 (with the AE mode selector at Av).
Shutter Release Button: Oversized, 2-step button with electromagnetic shutter release. Pressing it halfway activates meter circuit; pressing it all the way sets shutter in operation. Can be locked by setting the main switch to "L" to prevent accidental shutter release. With cable release socket.
Power Source: One 6 V silver oxide battery (Eveready No. 544, UCAR No. 544, JIS 4G13, Mallory PX28) or alkaline manganese battery (Eveready No. 537, UCAR No. 537, Mallory 7K34). The battery lasts approximately one year under normal use. Battery is loaded into the battery chamber on the front of the camera body.
Battery Check: A red LED on top of the camera flashes on and off to indicate power level when the battery check button is pressed. Flashing frequency decreases with power level.
Main Switch: 2 positions: "A" and "L". At "L" all circuits are off and the shutter button is locked as a safety feature. Doubles as self-timer lever.
Cancellation of Camera Circuit: Shutter and self-timer operation cancelled by setting main switch to "L" or by pressing battery check button.
Multiple Exposure: Possible by setting multiple exposure lever before winding film advance lever to recock shutter. Frame counter does not advance. Unlimited.
Self-timer: Electronically controlled. Activated by pressing shutter button. A choice of 2 or 10 seconds time lag is available. Red LED flashes on and off to indicate its operation. Flashing frequency increases 2 sec. before shutter release.
Flash Synchronization: X-synch at 1/60 sec., FP- and M-synch at 1/30 sec. and slower.
Flash Coupling: Accessory shoe has contacts for directly coupled flash units and automatic flash control contacts for automatic exposure. JIS-B (PC) type flash terminal with shock preventive rim on front of the body.
Automatic Flash: Full AE flash photography with Canon Speedlites 155A and 199A. Shutter speed automatically set. Aperture automatically controlled according to the flash settings.
Back Cover: Opened by pulling up rewind knob. Removable for attaching Data Back A. With memo holder.
Film Loading: Easy film loading with multi-slot take-up spool.
Film Advance Lever: Single-stroke 120° throw with 30° stand-off. Winding with several short strokes is possible. Automatic winding possible by mounting Canon Motor Drive MA or Power Winder A.
Frame Counter: Additive type. Counts back frames as film is rewound. Automatically resets to "S" upon opening back cover. Does not advance during multiple exposure.
Film Rewinding: By pressing the rewind button and cranking the rewind knob. Rewind button automatically resets when the film advance lever is turned.
Other Safety Devices: Camera will not function when power level is insufficient. Use of self-timer is impossible with shutter speed set at "B". Film winding is impossible while shutter is in operation. Lockable controls.
Size: 141 × 91.5 × 47.5 mm (5-1/2" × 3-5/8" × 1-7/8") body only.
Weight: 620 g (1 lb. 6 oz.) body only, including battery.
With the 50 mm f/1.8 S.C. lens: 820 g (28-15/16 ozs.).
With the 50 mm f/1.4 S.S.C. lens: 925 g (32-5/8 ozs.).

Subject to change without notice.

Canon

Canon Inc.
11-28, Mita 3-chome, Minato-ku, Tokyo 108, Japan

Europe, Africa and Middle East
Canon Amsterdam nv
Van Leijenberghlaan 221, 1082 GG Amsterdam, Netherlands

USA
Canon USA, Inc.
10 Nevada Drive, Lake Success, Long Island, N.Y. 11040, USA

Central & South America
Canon Latin America, Inc.
Apartado 7022, Panama 5, Panama

Printed in Switzerland by Colour Printing Wber Ltd., Bienne

English Edition ZC100.01.114.0678