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Canon
EOS 1
REFERENCE GUIDE

Canon
EOS
1
Sales Guide

"The New Classic"

The EOS-1 is Canon's first truly professional EOS camera. As such, it represents the culmination of over 50 years of optical and mechanical innovation. The new EOS-1 has been designed to accomodate future development as well, and it will remain current far into the future.



Improved Operability

2 electronic input dials handle a wide selection of operations, including user-selectable shutter speed/aperture value combinations during metered manual operation.

Custom Function Control

8 separate functions can be easily selected by the photographer, resulting in a highly personalized camera.

Autofocus

AF performance that is faster, more precise, and more reliable even in dim lighting.

Sophisticated Metering & Exposure Control

6-zone evaluative metering offers the best automatic control.

Plus spot metering, partial metering, and center-weighted averaging.

Rugged Reliability

Designed to meet the toughest standards of working professional photographers, with selected gold-plated and dual electrical contacts.

High-quality Lenses

A growing selection of superior lenses, including very bright L series lenses.

Automatic operation plus sophisticated manual control.

The new Canon EOS-1 has been created to fulfill the requirements of the most demanding professional and advanced amateur photographers. It will become the classical standard against which other cameras must be measured, because it offers both the EOS system's highly-regarded automatic operation and a variety of "manual" options that permit fine tuning. Custom Function Control lets the photographer customize certain aspects of the camera's automatic operation to meet specific needs. Autofocus is faster and more reliable. And a selection of metering modes, AE modes, and film winding modes provides the serious photographer with total control over the entire photographic process.



Auto/Manual Control

The Main Electronic Input Dial

The EOS-1 is the first camera to incorporate two electronic input dials.

The main dial sets the shooting mode, the AF mode and the metering mode. It selects shutter speeds or aperture values during shutter-priority or aperture-priority operation. It selects the film winding mode, number of multiple exposure presets, and manual film speed settings. It sets the auto exposure bracketing values and exposure compensation. And it also selects the EOS-1's unique Custom Function Controls.



The Quick Control Dial

In the AE mode, the quick control dial can be used to set exposure compensation values. In the manual exposure mode, this dial can be used to manually set aperture value or shutter speed — depending on the custom function selected — with the main dial setting the other value. A switch allows the dial to be disengaged.



Metered Manual Control

The two electronic input dials make metered manual operation easy to control. In this mode, the shutter speed is set using the main dial while the aperture is set by the auxiliary dial. These values are displayed digitally in the viewfinder. And the metered manual exposure's deviation from the correct exposure indicator is clearly indicated by the moving marker on the exposure scale in the viewfinder for instant confirmation. The "matching-needle" feel of the system has a mechanical sense that is reliable and reassuring.

Equally reassuring is the fact that the viewfinder provides virtually 100% coverage. This, plus instant depth-of-field preview, allows the photographer to be sure of the final results.

100%



Manual Focus

All Canon EF lenses have a switch on the lens barrel that activates manual operation. But the L series lenses with ultrasonic motors also allow manual focusing in the One-Shot AF mode in conjunction with AF operation. Because the electronic focusing ring system can be used even in the AF mode, the photographer can always make the final decision on focus. The manual focusing feel is pleasingly smooth, too, without the rasping operation common to some AF lenses. The complete range of USM lenses covers focal lengths from 28mm to 600mm, including zooms, and features the extraordinarily bright 50mm f/1.0L.

■ *One-shot AF + USM lenses*



Customized Operation

Custom Function Control

1. Automatic film rewind can be canceled. This eliminates the possibility of rewind noise when shooting in very quiet areas.

2. The film leader can be left outside the film cartridge after automatic rewind is completed, making it easy to retrieve film during development. Film cartridges can also be partially used, removed then easily reloaded later.

3. Automatic DX-coded film speed setting can be canceled. This is useful for photographers who frequently adjust film speed or use non-DX cartridges.

4. Autofocus can be initiated by pressing the AE lock button. By separating focusing and metering operatins, focus-lock shooting becomes more flexible.

5. Sets the aperture value with the main electronic input dial and the shutter speed with the auxiliary dial during manual exposure mode operation. (The opposite of regular operation.) The photographer can decide the combination that's easiest for the way he or she holds the camera.

6. Sets the shutter speeds and aperture values in 1-step increments. (Normal operation is in 1/3-step increments.)

7. Prevents manual focusing after completion of one-shot AF mode operation. (The system thus offers the photographer a choice when using USM lenses, and makes it possible to select the degree of "automation" during AF operation.)

8. Switch from evaluative metering to center-weighted average metering.

Shutter "Feel" Adjustment

The shutter button height and release stroke can be easily adjusted at a Canon service facility, without disassembling the camera.

Custom Function Control Chart

Control			User-selected Operation	Regular Operation
1	Film rewind		Cancels automatic film rewind	Film rewind starts automatically at end of roll
2	Film leader positioning		Leaves film leader outside cartridge after rewind	Film leader rewound inside cartridge
3	Film speed setting		Cancels automatic film speed setting for DX-coded film	Film speed set by camera according to DX-code
4	Autofocus operation		Activates autofocus by pressing AE lock button	Autofocus starts by pressing shutter button halfway
5	Manual exposure operation	Aperture	Set by electronic input dial only	Set by manual aperture set button or EL button and electronic input dial
		Shutter	Set by manual aperture set button or EL button and electronic input dial	Set by electronic input dial only
6	Shutter/Aperture input increment		1 step	1/3 step
7	Manual focusing		Prevents manual focus changes after autofocusing for USM lenses	Allows manual focus adjustments after autofocusing for USM lenses
8	Full-frame metering		Center-weighted average metering	Evaluative metering

The control number appears in the display panel. Set control combinations as desired.

Improved Autofocus

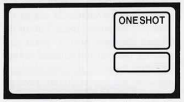
Focusing Modes

The new AF system incorporated in the EOS-1 is faster. It works better under low-light conditions, and it's more precise.

There are three focusing modes:

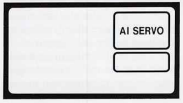
1. One-shot mode

AF operation is completed and locked once in-focus is achieved. When shooting in this mode, the shutter will not release until AF is completed. (This feature can be overridden by using Custom Function No. 4.) With evaluative metering, AF lock and AE lock occur simultaneously. Metering continues until just before the exposure is made when using spot metering or partial metering.



2. Predictive AI servo mode

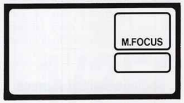
This sophisticated mode enables focus prediction control for moving subjects. The photographer initiates the first shutter release in a motor-drive sequence, subsequent exposures are made after the lens is adjusted to compensate for the subject's movement.



3. Manual mode

A switch on the lens barrel permits the change from AF to manual operation. The green LED indicator in the viewfinder still lights up to indicate that the subject is in focus.

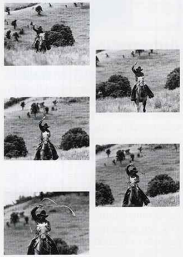
The incorporation of Custom Function Control technology makes the AF system more flexible, since it is possible to select independent operation. AF is initiated by pressing the AE lock button instead of the shutter button.



Speed

The AF system on the EOS-1 focuses even faster than the system used on the EOS 630. This higher speed enables AI servo shooting at up to 4.5 frames per second when using the Power Drive Booster E1 plus an ultrasonic motor lens or one of the newly developed L series lenses.

4.5/sec.





Ranged position

Predicted position

High-precision Focusing

Conventional AF systems can only detect vertical lines. A newly-developed cross-type BASIS solves this problem by also being able to detect horizontal lines. Use of this cross-line system greatly reduces the number of difficult subjects for AF. It also results in much more precise focusing, particularly when using lenses with maximum apertures of f/2.8 or larger.

Improved Low-light Performance

The AF system operates comfortably at low-light levels down to EV-1 (With lenses having maximum apertures of f/2.8 or larger and film speed set at ISO 100). Having accurate AF operation available even for low-light conditions creates new possibilities for sophisticated available-light photography.

EV-1

Moving Subject Predictive Control

The EOS-1's AF system is better at tracking moving subjects. When using ultrasonic motor lenses or the newly developed L series lenses, AF tracking continues until just before exposure begins. Depending on the speed of the moving subject, the camera automatically activates the focus predict system.

Metering Systems

The EOS-1's four metering modes are quickly selected by using the main electronic input dial.

1. Fine spot metering

The most selective of the metering modes, fine spot metering reads only the light within the smaller circle (5mm dia.) and thus limits the input value to 2.3% of the screen surface, allowing very precise readings of selected parts of a photographic composition.

Metering is more precise than that of competitive cameras because the spot metering sensor is located on the AF sensor.



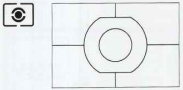
2. Partial metering

The partial metering mode limits selectivity to the area within the outer (8mm dia.) circle in the viewfinder, approximately 5.8% of the viewfinder screen. It can be used effectively when there is a strong light contrast between the main subject and the rest of the scene, such as photographs with a particularly light or particularly dark background.



3. Evaluative Metering

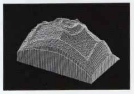
The six-zone evaluative metering mode provides exceptionally precise metering under difficult photographic conditions, making it easy to handle backlit subjects. In this mode, light is measured separately in six zones. Ambient light, subject size and subject pattern are input and "evaluated" by a microprocessor using a highly complex algorithm that determines the correct exposure.



4. Center-weighted Average Metering

By increasing the value of the light in the center of framed area — the place where the main elements are most likely to be — more selective metering can be accomplished under conventional lighting conditions.

Custom Function No. 8 replaces the default evaluative metering mode with center-weighted average metering.

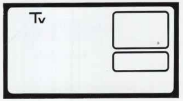


Automatic Exposure

A complete selection of AE choices provides the kind of operating flexibility the busy photographer needs. The main electronic input dial makes shifting AE modes easy.

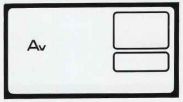
1. Shutter-priority AE

The photographer selects the shutter speed and the camera chooses the correct aperture value for existing conditions. Shutter speeds can be set in 1/3-step increments, ranging from 30 seconds to 1/8000 second.



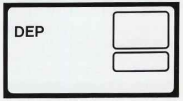
2. Aperture-priority AE

The photographer selects the aperture value and the camera sets the correct shutter speed. As with shutter speeds, aperture values can be set in 1/3-step increments that are adjustable to 1-step by Custom Function No. 6.



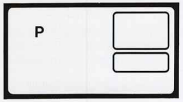
3. Depth-of-Field AE

The photographer focuses on the nearest element that is to be in focus, then to the farthest element, locking these two settings in memory. The camera then automatically selects the correct AF distance (about 7:10 of the distance between nearest point and farthest), the aperture required to keep everything between the two points in focus, and the correct shutter speed for lighting conditions.



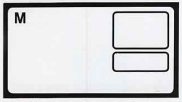
4. Intelligent Program AE

This mode calculates both shutter speed and aperture value by taking into consideration the focal length of the lens being used, which is input automatically to the main microprocessor from the lens microprocessor as soon as the lens is installed. Automatically calculating the minimum possible shutter speed for the lens in use provides reasonable protection against camera-shake. With zoom lenses, information is transferred simultaneously for any focal length selected, and the program is adjusted to match that focal length. Program shift is possible in 1 EV steps.



Manual Exposure

Metered manual using the bar dot display in the viewfinder can be operated with the main dial selecting shutter speeds and the quick control dial handling the aperture values. (Custom Function No. 5 reverses this, with the main dial handling the aperture and the quick control dial inputting shutter speeds.)



Shutter Release Time Lag

Shutter release time lag is only 55ms, regardless of the lens being used. Image loss time is also minimal.

Shutter Speeds

The EOS-1's vertical-travel metal focal-plane shutter provides a full range of electronically-controlled shutter speeds. The blazingly fast 1/8000 second shutter speed stops practically anything in mid-flight. Shutter speeds range in 1/3-step increments from 30 seconds to 1/8000 second and appear in the display panel. When shooting in the bulb mode, elapsed time is displayed up to a total of 120 seconds.

1/8000

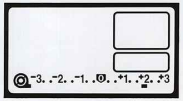
1/250 Second Flash Sync Speed

The fast flash-sync shutter speed of 1/250 broadens the possibilities of daylight fill-in flash photography and reduces ghost images from fast-moving flash subjects.

1/250

Exposure Compensation

Conventional manual exposure compensation adjustments can be set +/−3 steps in 1/3 step increments, which are confirmed on the display panel.



Auto Exposure Bracketing

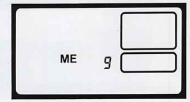
Auto exposure bracketing is a way of handling tricky exposure problems. The AEB function automatically makes three continuous exposures, shifting the exposure value up and down from the exposure determined by the camera's light meter. The function can be set within a range of +/−3 steps in 1/3-step increments. AEB is set according to the film winding mode, so photographers can control the release timing. And since it can only be canceled manually, continuous auto exposure bracketing is possible.

Corrected values are related to the exposure mode, as shown below:

Exposure mode		TV	AV
① Shutter-priority AE		—	●
② Aperture-priority AE		●	—
③ Depth-of-field AE		●	—
④ Program AE		●	●
⑤ Manual	Standard Function	●	—
	Custom Function	—	●

Multiple Exposures

The multiple exposure function presets up to nine exposures on the same frame. The number of exposures is easily set by using the main input dial and checking operation on the display panel. The function can be canceled or reset during mid-operation. Motor drive-powered continuous multiple exposures offer a great range of creative effects.



EL Illumination

An integrated EL illumination function fills the display panel with a soft blue light, making it easy to read even in the dark.

Mid-roll Rewind

Film can be easily rewound before the last exposure has been made by pressing the mid-roll rewind button. Using this feature along with Custom Function No. 2 is particularly convenient, since the film leader is left outside the cartridge for easy re-loading at a later time.



Self-timer

The self-timer provides a choice of two release times — 2 seconds or 10 seconds.



Power Drive Booster E1

The Power Drive Booster E1 raises the film advance speed to 5.5 fps, enabling very rapid-fire continuous shooting. (EOS-1 body alone advances film at 2.5 fps.) The rugged, sure-grip power drive booster has a shutter button and AE lock button positioned on the base so that operating the camera vertically feels the same as when holding it horizontally. The booster's AA battery pack replaces the standard lithium battery.



Command Back E1

The Command Back E1 provides the photographer with sophisticated timer control operations and allows various types of data imprinting to be carried out. The timer functions allow the photographer to capture periodic scenery changes over a fixed length of time. A special self-timer function releases the shutter after a predetermined period of time. The interval timer releases the shutter at fixed intervals, spaced anywhere from 1 second to 23 hours 59 minutes apart. The long release timer holds the shutter open for a preset period of time during bulb operation. And the frame counter setting stops the camera after a set number of exposures has been made.

Data imprint functions include the date, time of day, a frame counter number, or an arbitrary 6-digit number plus the letters A through F.

When the Command Back E1 is being used, functions assigned to the quick control dial are handled by the main electronic input dial in conjunction with the exposure compensation button.



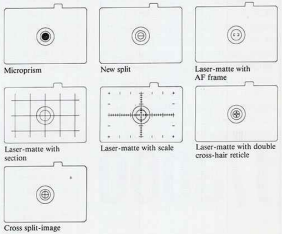
430EZ

The new Speedlite 430EZ has been designed to take advantage of the EOS-1's A-TTL auto-flash program. An AF auxiliary light enables positive autofocus even in total darkness. And a high-quality external battery pack is now available to provide power for extended photography sessions. Flash-fill ratio control is possible in 1/3-step increments, and flash charging time is less than 1.5 seconds. Second curtain sync works with slow shutter speeds, and the stroboscopic function allows the flash to fire up to 10 times a second. The flash zooms internally to match the focal length of the lens being used. The flash head can be adjusted for bounce flash, and a lock pin holds it securely. A display panel provides key data, with EL illumination making it easy to read in the dark.

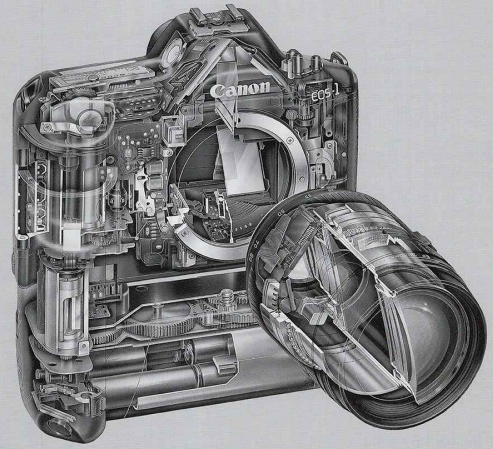


Interchangeable Focusing Screens

Seven focusing screens are available to handle a variety of specialized photography tasks.



EOS 1



"An astonishing technological achievement that brings together the world's most advanced optics, electronics and high-precision engineering skills."

Superior Reliability

The new EOS-1 has been designed specifically to handle the heavy-duty work loads of a professional photographer. Performance is ensured from −4°F (−20°C) up to 113°F (45°C) at 85% humidity.

1. Thicker Body Material

Composed of extra-tough, glass fiber-reinforced polycarbonate, the body cover is approximately 25% thicker than other models. A base plating composed of nickel and copper adds support, while a black chrome plating completes the camera body, making it tough enough to withstand rough handling. Thick sections of non-slip rubber make holding secure.

2. Moisture-resistant Design

The camera is also highly dust- and moisture-resistant, thanks to a cover sealing mechanism and the use of push buttons, levers, and revolving dials that are more effective at preventing water from entering. (Much better than conventional external slide switches.) Rubber seals and guards protect all possible moisture entry areas.

Even if moisture should enter, important electrical contacts are placed so as not to be affected. Shutter blades and important electrical-contact areas are coated with a water-repellent lubricant, too.

3. Double Electrical Contacts

All important electrical contacts have double terminals to ensure proper operation. Surfaces of data-transmitting contacts are gold plated for optimum contact.



4. Self-diagnosis Functions

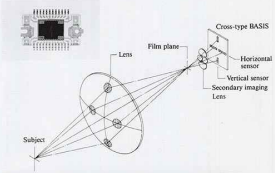
All camera sequence control operations are monitored by the main microprocessor to ensure reliability. If trouble is detected, the sequence is halted and a "be" warning appears on the display panel. (Other cameras may not offer this safety feature, which prevents improper operation.)

There's no problem with power, either. Automatic battery checks are done during sequence operation to ensure adequate power for finishing a process. Moreover, pressing the battery check button under the palm door gives an instant readout of battery power on the display panel.

Other warnings also ensure real reliability. The display panel presents a row of blinking dashes as a warning if the film is not loaded properly, for example. And a row of dashes coming out of the cartridge symbol indicates correct film advance and film rewind.

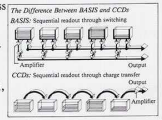
TTL-CT-SIR AF Ranging System

The TTL-CT-SIR (TTL Cross-Type Secondary Image Registration) phase detection system determines focus by driving the lens after completing a sophisticated process of signal detection and calculations. The system splits light rays into four beams — two horizontal and two vertical — that form images on the surfaces of four sensors. Focus is determined first by analyzing horizontal and vertical image data. This extra information speeds up the focus process. Once this has been completed — a matter of microseconds — the lens motor focuses the lens.



Cross Ranging Sensor BASIS

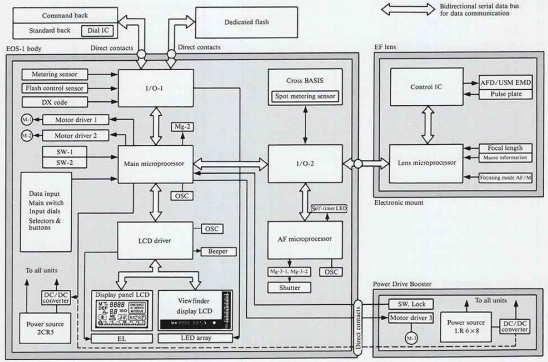
The new BASIS (Base-Stored Image Sensor) was created to be accurate enough and reliable enough to meet the standards of professional photographers. The result of extensive research, it consists of two, 47-bit horizontal line sensors and two, 29-bit vertical line sensors, plus associated amplifier circuitry that is housed in a clear-molded package. By integrating an amplifier with each individual element of the sensor instead of just having an amplifier section at the output stage as CCDs do, BASIS preserves signal integrity by amplifying the electrical signals before they are read out through switching. Signal purity is thus maintained, with minimum noise and minimum loss of information. In addition, the new BASIS is equipped with an extra circuit that boosts the signal ten times in order to improve sensitivity and S/N ratio. The sensor pitch is also 10% finer than that of previous BASIS sensors, providing improved narrow-line detection ability. Also, anti-reflection film coats the sensor's light-sensing areas in order to stabilize signal detection. Innovations like the cross ranging sensor BASIS result in improved accuracy and better efficiency, making possible reliable low-light level operation down to EV-1, light dimmer than most people can see clearly.



Two Microprocessors

The EOS-1 employs an information processing system composed of two microprocessors. One is a high-speed super-microprocessor that is dedicated to AF operation only. The other microprocessor is in charge of AE and sequence controls. The two microprocessors can handle data independently and simultaneously. As a result, overall electronic operation is highly reliable, and AF operation speed and accuracy is obviously superior.

Block Diagram of Electronic circuits



6-zone Evaluative Metering

This new evaluative metering system divides the frame into six zones. The EOS system's main microprocessor uses an algorithm which evaluates luminance in each of the six sections to determine the correct exposure by comparing differences in brightness between the various metered areas, comparing center to immediate and immediate to peripheral. This comparison estimates subject size and the conditions in which the subject is situated, considerations which are factored-in to make the final exposure decision. The system also detects variations in subject reflective luminance level. When the luminance level is high, it compensates to obtain high-lighted depiction, and when the luminance is low, it compensates to obtain shadow depiction. Since the camera automatically focuses on the object to be photographed, AE is calculated and locked automatically as soon as focusing is completed.



The EF Lenses

Canon's system of sophisticated autofocus lenses are widely recognized as setting the standards for superior optical performance. The large-aperture L series EF lenses provide an even wider choice of professional-use autofocus lenses.

EF 50mm f/1.0L
EF 85mm f/1.2L
EF 20-35mm f/2.8L

Large-aperture lenses are often essential for serious photography. With the EF 50mm f/1.0L, Canon has created a lens with brightness capabilities surpassing those of the human eye. The EF 85mm f/1.2L is also an exceptionally fast short telephoto lens that serves as an excellent portrait lens. The EF 20-35mm f/2.8L is a super wide-angle zoom lens which remains bright during zooming.

■ Aspherical Elements

These new L series lenses use aspherical elements manufactured with Canon's high-level polishing technology in order to achieve an image quality that is virtually free of the spherical aberrations that can cause diminished sharpness in large aperture lenses.

■ Floating Element construction

The optical system employs a floating element construction to compensate for curvature of field during focusing and ensure high image quality at all shooting distances. Good color balance is attained through the use of a new, exclusively-developed multi-layer coating for the high-refractive index glass. Designed for full-aperture photography, Canon's new L Series lenses offer superlative image quality, brightness and blur effect, plus great wide-angle coverage with the EF 20-35mm f/2.8L.

EF 80-200mm f/2.8L

The large aperture EF 80-200mm f/2.8L features an outstanding zoom range for high image quality and superior operability to meet the needs of professionals. During zooming the aperture does not change, making it ideal for a variety of applications — from outdoor photos to studio shots that require flexibility.

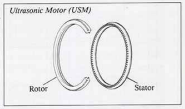
■ Three UD Glasses

The optical system consists of three elements of UD glass that maintain high image quality and compensate for the chromatic aberrations which often occur with large-aperture telephoto lenses.

Ultrasonic Motor

Some L series lenses employ an ultrasonic motor to handle AF operation within the lens. USM incorporates a ring-shaped motor that maintains the traditional lens shape. As it is a direct-drive system with no gearing units, operation is astonishingly fast, reliable and virtually silent. Greater compactness and operational simplicity are realized by using low rotational speed and high torque, thereby eliminating the need for a braking unit. And the speed and noiseless operation has to be experienced to be fully appreciated.

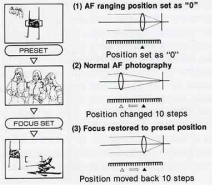
The electronic focusing rings on USM lenses work together with the AF mechanism to provide superior operability. The focusing motor is driven according to the electrically-detected rotation of the focusing ring. It's a system of power-assisted focus, since as the ring is turned, pulse signals are generated by an encoder that instructs the microprocessor in the lens to drive the USM accordingly. With the EF 200mm f/1.8L, the EF 300mm f/2.8L, and the EF 600mm f/4L, there's a 3-step variable focusing rate, making it possible to focus rapidly for quick-moving subjects or to select high-precision focusing control as the situation warrants.



Focus Preset

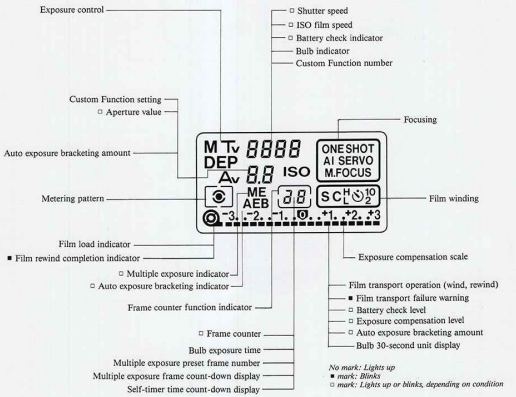
Selected large-aperture telephoto lenses — the EF 200mm f/1.8L, the EF 300mm f/2.8L, and the EF 600mm f/4L — have a focus preset function that can "lock in" a focus setting. The photographer can focus on other shots, then when necessary return immediately to the preset focus at the touch of a button.

Focus Preset Operation

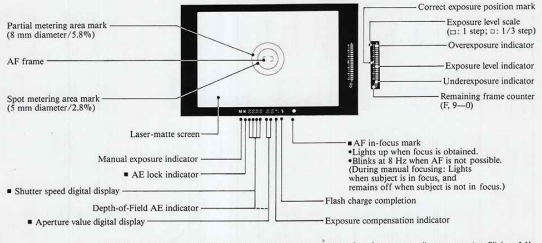


UNDERSTAND THESE DATA DISPLAYS

LCD Panel Information

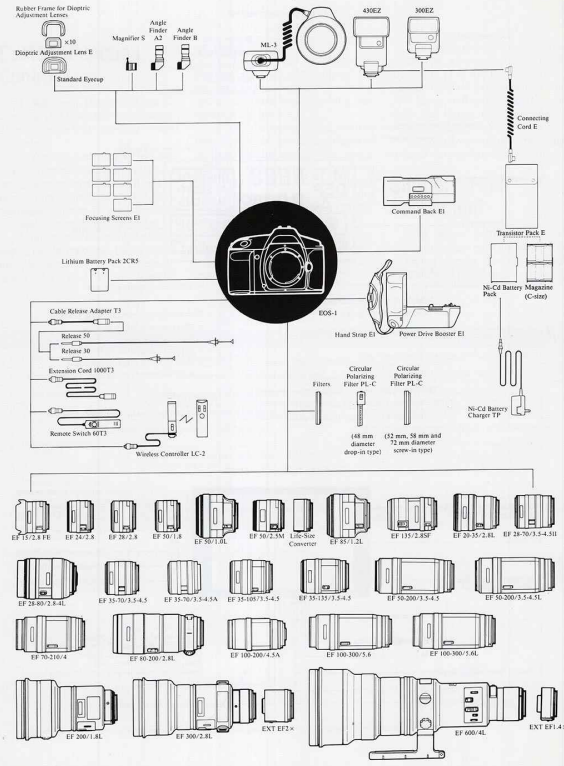


Viewfinder Information Display



No mark: Lights up; ■ mark: Lights up or blinks, depending on condition. Out of exposure coupling range warning: Blinks at 2 Hz

The EOS-1 System



EF LENS LINEUP

Lens	Focus Drive		Angle of View	Construction	Minimum Aperture	Closest Focusing Distance		Filter Size (mm)	Length		Weight	
	AFD	USM				(ft.)	(m)		(in.)	(mm)	(oz.)	(g)
Fish-eye EF 15mm f/2.8	●		180°	7-8	22	0.7	0.2	Filter Holder	2-7/16	62.2	11.6	330
EF 24mm f/2.8	●		84°	10-10	22	0.8	0.25	58	1-15/16	48.5	9.5	270
EF 28mm f/2.8	●		75°	5-5	22	1	0.3	52	1-11/16	42.5	6.5	185
EF 50mm f/1.8	●		46°	5-6	22	1.5	0.45	52	1-11/16	42.5	6.7	190
EF 50mm f/1.0L (Ultrasonic)		●	46°	9-11	16	2	0.6	72	3-3/16	81.5	2.2 lb.	985
Compact-Macro EF 50mm f/2.5	●		46°	8-9	32	0.748	0.228	52	2-1/2	63	9.9	280
EF 85mm f/1.2L (Ultrasonic)		●	28°30′	7-8	16	3.1	0.95	72	3-5/16	84	2.3 lb.	1,025
Soft-focus EF 135mm f/2.8	●		18°	6-7	32	4.3	1.3	52	3-7/8	98.4	13.8	390
EF 200mm f/1.8L (Ultrasonic)		●	12°	10-12	22	8.2	2.5	48 (drop-in type)	8-3/16	208	6.6 lb.	3,000
EF 300mm f/2.8L (Ultrasonic)		●	8°15′	7-9	32	9.8	3	48 (drop-in type)	9-9/16	253	6.3 lb.	2,855
EF 600mm f/4L (Ultrasonic)		●	4°10′	8-9	32	19.7	6	48 (drop-in type)	17-15/16	456	13.2 lb.	6,000
EF 20-35mm f/2.8L	●		94°-63°	12-15	22	1.6	0.5	72	3-1/2	89	19.1	540
EF 28-70mm f/3.5-4.5II	●		75°-34°	9-10	22-29	1.3	0.39	52	3	75.6	10.1	285
EF 28-80mm f/2.8-4L (Ultrasonic)		●	75°-30°	11-15	22	1.6	0.5	72	4-11/16	119.5	2.1 lb.	945
EF 35-70mm f/3.5-4.5	●		63°-34°	8-9	22-29	1.3	0.39	52	2-1/2	63	8.6	245
EF 35-70mm f/3.5-4.5A	●		63°-34°	8-9	22-29	1.3	0.39	52	2-1/2	63	8.1	230
EF 35-105mm f/3.5-4.5	●		63°-23°20′	11-14	22-29	3.1	0.95	58	3-1/4	81.9	14.1	400
EF 35-135mm f/3.5-4.5	●		63°-18°	12-16	22-29	3.1	0.95	58	3-3/4	94.5	16.8	475
EF 50-200mm f/3.5-4.5	●		46°-12°	13-16	22-29	3.9	1.2	58	5-3/4	146.4	24.4	690
EF 50-200mm f/3.5-4.5L	●		46°-12°	14-16	22-29	3.9	1.2	58	5-3/4	145.8	24.5	695
EF 70-210mm f/4	●		34°-11°20′	8-11	32	3.9	1.2	58	5-7/16	137.6	21.4	605
EF 80-200mm f/2.8L	●		30°-12°	13-16	32	5.9	1.8	72	7-5/16	185.7	2.9 lb.	1,330
EF 100-200mm f/4.5A	●		24°-12°	7-10	32	6.2	1.9	58	5-1/8	130.5	18.4	520
EF 100-300mm f/5.6	●		24°-8°15′	9-15	32	4.9	1.5	58	6-9/16	166.8	24.2	685
EF 100-300mm f/5.6L	●		24°-8°15′	10-15	32	4.9	1.5	58	6-9/16	166.6	24.5	695
Extender EF 2X	—	—	—	5-7	—	—	—	—	2	50.5	8.5	240
Extender EF 1.4X	—	—	—	4-5	—	—	—	—	1-1/16	27.3	7.1	200
Life-Size Converter EF	—	—	—	3-4	—	—	—	—	1-3/8	34.9	5.6	160

•Extender EF 2X is for exclusive use with EF 200mm f/1.8L and EF 300mm f/2.8L. •Extender EF 1.4X is for exclusive use with EF 200mm f/1.8L, EF 300mm f/2.8L and EF 600mm f/4L. •Life-Size Converter EF is for exclusive use with Compact-Macro EF 50mm f/2.5. •"A" series lenses are autofocus only.

Specifications

Type and Major Components

Type: 35mm focal plane shutter SLR (Single-Lens Reflex) camera with autofocus, auto exposure and built-in motor drive.
Lens Mount: Canon EF Mount (electronic signal transfer system).
Usable Lenses: Canon EF lenses.
Viewfinder: Fixed eye-level pentaprism.
Gives approx. 100% vertical and horizontal coverage of actual picture area and 0.72X magnification with 50mm lens at infinity.
Focusing Screen: Laser-matte screen with AF frame.
Six optional interchangeable screens are available.
Dioptric Adjustment: Adjustable (−3dpt — +1dpt) by turning knob
Eyepoint: 20mm
Shutter: Vertical-travel metal type focal plane shutter; all speeds electronically controlled.
Shutter Speed: 1/8000-30 sec. and bulb. X-sync is 1/250 sec. Can be set in 1/3-step increments.
Mirror: Quick return type half-mirror

Autofocus

AF Control System: TTL-CT-SIR (Cross Type-Secondary Image Registration) phase-detection type. Two modes available: One-shot and Servo AF with Focus Prediction. Manual focusing possible.
AF Working Range: EV-1 — 18 at ISO 100.
AF Auxiliary Light: Specified Canon Speedlites automatically project light through an ultra-bright LED (peak sensitivity: 700nm) when required.

Expcsure Control

Light Metering: TTL full aperture metering using SPC (Silicon Photocell).
Four metering patterns available:
1. 6-zone evaluative metering
2. Center-weighted average metering
3. Partial metering (approx. 5.8% of the picture area)
4. Spot metering (approx. 2.3% of the picture area)

Metering Range:
Spot metering: EV 2—20 at ISO 100
Other meterings: EV 0—20 with f/1.4 lens at ISO 100 or equivalent

Exposure Modes:
1. Shutter-Priority AE
2. Aperture-Priority AE
3. Depth-of-Field AE
4. Program AE with Variable Shift
5. Manual
6. Flash AE (A-TTL and TTL program flash AE with specified Canon Speedlites)

Exposure Compensation: ±3 steps in 1/3-step increments.
Auto Exposure Bracketing: ±3 steps in 1/3-step increments.
Depth-of-Field Preview: With Depth-of-Field check button

Film Transport

Film Speed Setting: ISO 25-5000; automatically set in 1/3-step increments according to DX code. ISO 6-6400 can also be set manually.
Film Loading: Automatic
Film Wind: Automatic. Two modes available: S (Single Frame) and C (Continuous at up to 2.5 frames per second).
Film Rewind: Automatic (approx. 8 sec. with 24-exp. film). Mid-roll rewind possible.

Power Source

Battery: One, six-volt lithium battery pack (2CR5). Replaced by removing grip.
For memory backup: One CR1220
Battery Check: By pressing the battery check button. Three energy levels are shown by the bar marks in the display panel.
Shooting Capacity: (with 24-exp. film)
Normal (68°F/20°C): 75 rolls
Low (−4°F/−20°C): 12 rolls

Other

Custom Function Control: 8 functions selectable
Flash Contact: Direct contact at accessory shoe and PC socket (ISO-B type)
Remote Control: By using Remote Switch 60T3.
Data Display: In the viewfinder and LCD display panel.
Multiple Exposures: Up to nine exposures can be preset.
Self-timer: Electronically controlled with a 2 or 10-sec. delay.

Dimensions

Size: 6-5/16" (W)×4-3/16" (H)×2-13/16" (D)
(161×106.6×71.8mm)
Weight: 1.9 lb. (850 g) without battery.
2 lb. (890 g) with battery.

■ The following specifications change when mounting the Power Drive Booster.

Film Wind: Three modes; S (Single Frame), CH (Continuous at up to 5.5 fps) and CL (Continuous at up to 3 fps).
Shooting Capacity: (with 24-exp. film)

Temperature	Alkaline	Ni-Cd
Normal (68°F/20°C)	100 rolls	45 rolls
Low (−4°F/−20°C)	6 rolls	30 rolls

Power Source: Eight AA-size alkaline-manganese (LR6) or Ni-Cd (KR15/51) batteries
Dimensions (EOS-1 + Power Drive Booster)
Size: 6-5/16" (W)×5-15/16" (H)×3-1/16" (D)
(160.5×150.4×78mm)
Weight: 3.3 lb. (1490 g) with battery

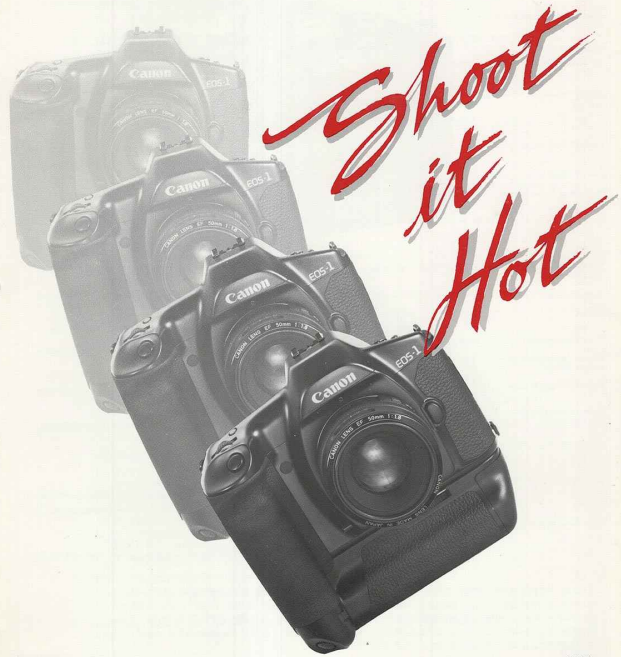
All data are based on Canon's Standard Test Method.
Subject to change without notice.

Canon

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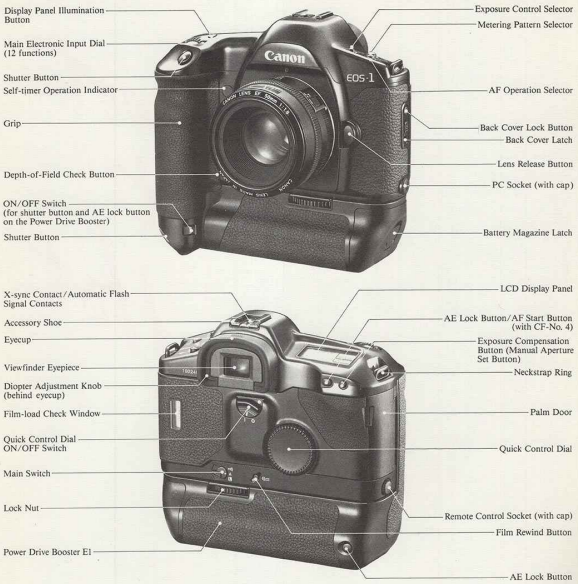
Canon CPS
PROFESSIONAL SERVICES

Update



September 1989

Automatic operation plus sophisticated manual control.

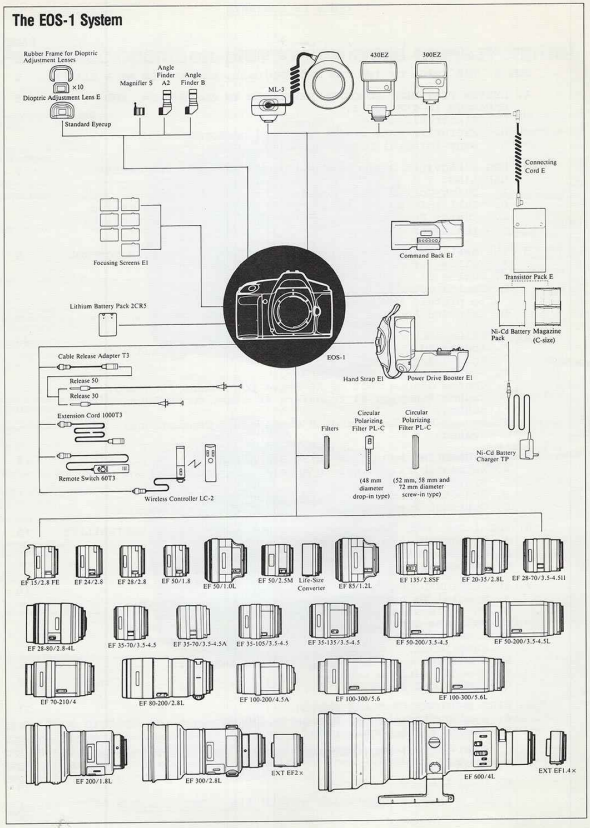


This "CPS UPDATE" has been produced by the Canon U.S.A., Inc. Camera Technical Department as a supplement to our catalogs, brochures, and instruction books. While every effort has been made to assure its accuracy, we welcome your comments and suggestions regarding its contents.

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THE EOS CONCEPT: ELECTRO-OPTICAL SYSTEMS

When Canon introduced the EOS 650 and 620 in early 1987, this new camera system represented a departure from the technology of the past, with a view toward new capabilities, accuracy and precision, and potential for system development.

While these two models were clearly designed for the amateur market, they also gave a clear indication of future possibilities. The new EF mount system, with its improved strength over the FD mount and precision of electronic aperture control was a breakthrough in lens design.

Other features such as the Evaluative metering system, A-TTL flash, and Depth of Field AE control showed how technology could be successfully used to make the photographer's job easier, and actually to take better photographs.

Even with these features, though, neither camera was appropriate for daily professional use. However, development of lenses such as the superb EF 300mm f/2.8L and 600mm f/4.0L, and later the EF 200mm f/1.8L, indicated that plans were under way within Canon's development group for a future professional camera.

In early 1989, the EOS 630 gave another indication of the direction in which Canon was heading. By upgrading its focus tracking ability with "predictive focus,"and speeding up its motor drive to 5 frames per second, it became a camera with features much more attractive to the professional.

Most significant though, were the changes incorporated into the the camera to make it work more easily in a professional environment. Based on input from CPS members here in the United States, and other pro users around the world, Canon's engineers were able to provide small touches that significantly improved performance. Particularly interesting was the Custom Function control system that lets the photographer set up basic camera functions for each particular kind of shooting situation.

But the EOS 630 was still not Canon's professional camera.

THE EOS-1: CANON'S PROFESSIONAL AUTOFOCUS CAMERA

The EOS-1 is the pinnacle of the design effort that began nearly five years ago. Created especially for the demanding professional, the EOS-1 introduces a new standard against which all other cameras will be compared.

Innovative features that combine automatic operation with sophisticated manual control put you in command. Designed for improved operability and ease of use, the EOS-1 allows you to concentrate on composition and capturing the decisive moment.

A professional camera should be intuitive; it must not get in your way, or set up a barrier between you and your subject. EOS-1 allows the photographer and the camera to work together, as a team, to make great photographs.

The EOS has an operating layout, with centralized LCD information display and a unique "Quick Control Dial" that makes photography literally a one hand operation.

A choice of four metering systems and an advanced autofocus system help you to improve your success ratio in fast-breaking situations where you don't have time to think!

1/3 step exposure accuracy and the ability to quickly bias exposures while in the automatic mode give you a precision that is simply impossible to achieve with any other camera.

Finally, the built-in feature of Auto Exposure bracketing gives you the ability to make your final decisions at the editing table, not under pressure in the field.

NEW LENSES AND FLASH JOIN EOS SYSTEM

Along with the EOS-1, Canon is introducing four new EF lenses including the high performance 50mm f/1.0L and 85mm f/1.2L with Ultrasonic (USM) motors; and the spectacular combination of the 20-35mm f/2.8L and 80-200mm f/2.8L. Both zooms feature unique optical designs, constant aperture throughout their zoom ranges, and improved Arc Form Drive (AFD) motors to increase performance and maintain reasonable pricing.

The new Speedlite 430 EZ adds the capabilities of variable fill-flash ratio and external battery pack to the previous 420 EZ unit.

AVAILABILITY FOR EARLY FALL, 1989

The EOS-1 with its Power Booster E1 motor drive unit, the 50mm 1.0, 85mm 1.2 and 80-200mm 2.8 should all be available through dealers in September; the 20-35 will follow shortly after. Suggested list prices are not yet available.

Please take the time to read over this ***CPS UPDATE*** to learn more about this exciting new camera. The next page "What's New at a Glance" will give you the highlights, while the main text will explain the subtleties of the system and its differences from other professional cameras.

We believe you'll agree that it was worth the wait!

CANON EOS-1: THE IMAGE OF THE NEW PROFESSIONAL

WHAT'S NEW AT A GLANCE

**** OUTSTANDING AUTOFOCUS PERFORMANCE***

>New CT-BASIS Sensor triples focusing precision.
>Low Light Sensitivity extended to EV -1.
>Improved Predictive Focusing increases shooting speed up to 4.5 fps with optional Power Booster E1.

**** SIMPLIFIED OPERATION & IMPROVED CAMERA HANDLING***

>New Quick Control Dial for precise, versatile exposure control.
>Built-in Custom Function Control tailors camera operation to your preference.
>Manual Focusing in AF Mode with Ultrasonic Lenses.
>Centralized Full Information Display.

**** ENHANCED CREATIVE CONTROL***

>Exposure shift in 1/3 step increments without leaving AE mode.
>Built-In Automatic Bracketing in every exposure mode.
>Full Metered Manual puts you in control.
>2.3% Spot, 5.8% Partial, Evaluative, & Center-Weighted Metering.

**** RUGGED RELIABILITY***

>All-Metal construction from lens mount to film plane.
>Increased resistance to moisture, heat, and cold.
>Electronic mount interface eliminates mechanical linkages.

**** PROFESSIONAL QUALITY LENSES***

>New 50/1.0L, 85/1.2L, 20-35/2.8L, & 80-200/2.8L join 24 existing EF lenses, with more to come!
>Extensive use of Aspherics, Fluorite, and UD glass guarantee unparalleled optical performance.
>Ultrasonic & Arc Form Drive lens-integral motors provide optimum efficiency for every EF lens.

**** FULL-FEATURED FLASH SYSTEM***

>New Speedlite 430 EZ adds valuable professional features:

-> Automatic fill-in flash (A-TTL) plus standard TTL and Manual Override
-> Selectable fill-in ratio to +/- 3 steps in 1/3 increments
-> External Battery Pack option speeds recycling for extended shooting.
-> Autozoom, Second Curtain Sync, Rapid-Fire & Stroboscopic Flash up to 10 flashes per second.

CANON EOS-1: THE IMAGE OF THE NEW PROFESSIONAL.

Professional photographers are extremely important to Canon. As "the eyes of the world," you enrich our lives with your visual skills. Because you are our most valued customers, we always do our best to provide you with the highest possible quality in photographic products. During the past 18 years, the F-1 cameras and the FD lens system have demonstrated our commitment to your excellence.

The development of a new professional SLR presents an exciting challenge. While incorporating the best features from the past, a new design must also include present-day demands. Most importantly, it must provide a platform for future developments. However, conventional camera designs are burdened with many limitations.

Canon's new professional SLR shatters the barriers of conventional design, and reaches an unprecedented level of excellence. This camera embodies many new technologies designed to improve its quality, reliability, and ease of use. EOS-1 reinforces our commitment to you, the professional photographer.

The EOS-1 is based on the following priorities:

1. Simplified operation and improved camera handling.
2. Enhanced creative control.
3. Outstanding autofocus performance.
4. Superior film handling & motor drive operation.
5. Rugged reliability under all working conditions.
6. Professional quality lenses.
7. Full-featured TTL flash system.

1. SYSTEM FEATURES: CONCEPTS DEVELOPED IN THE EOS SYSTEM AND EXPANDED IN THE EOS-1.

As a foundation, the existing EOS system already contains many improvements over conventional camera technology. EOS-1 takes full advantage of these characteristics and expands their usefulness.

Electronic Mount

Consider the fully electronic lens mount. Its most significant advantage over older designs is its improved reliability due to the elimination of mechanical linkages between body and lens. Levers, springs, and coupling pins are gone. With fewer moving parts, fewer things can go wrong.

At the same time, the amount of information exchanged between body and lens has been vastly increased and improved. When you stop to think about it, that's what all those pins, levers, and springs were for. But with the introduction of an 8-bit super-microprocessor in the camera body and a 4-bit microcomputer with control IC in each lens, every component in the EOS system achieves incredible performance without sacrificing reliability.

One example of that performance, exclusive to the Canon EOS system, is precision aperture control. It takes more than a conventional diaphragm assembly to provide consistent exposure accuracy in every exposure mode with every lens. In response, Canon's engineers came up with a better approach, the Electro-Magnetic Diaphragm, or EMD.

The EMD is perfectly matched to the needs of a professional SLR camera. Its digitally controlled accuracy is far more consistent than any analog mechanical diaphragm can ever be. Beyond unequaled reliability and precision, it also offers simple depth-of-field preview in all exposure modes, including those in which the camera calculates the aperture.

Exclusive Sensors for Improved Performance

Two other existing EOS system features made it into the EOS-1: the 6-zone Evaluative Metering sensor and the BASIS Autofocus sensor. Both of these devices, exclusively designed and manufactured by Canon for EOS, have been improved and augmented with new performance and features that exceed those of previous EOS cameras. We'll cover them in more detail later.

Lens-Integral Dedicated Motors

To complete the round-up of existing EOS technology used by the new camera, let's briefly examine the lens-integral dedicated focusing motors. Unlike other AF SLRs, we have placed a focusing motor in each EF lens, to improve performance and camera handling compared to body-integral designs, and to allow us to match motor characteristics to individual lens types.

We use two types of focusing motors: the Ultrasonic (USM) and the Arc Form Drive (AFD).

The USM is unique because of its solid-state design which provides direct drive with very high torque and superior start-stop response. Even during manual focusing, a USM lens is driven by its focusing motor. This provides a new dimension in camera handling, making it possible to provide both AF and manual focusing without the need for mechanically switching between the two. An added benefit is silent operation, unavailable in body-integral AF cameras.

Canon places the USM in a select group of L-Series professional lenses, including the new 50mm f/1.0L and 85mm f/1.2L.

The AFD is a small arc-shaped motor which maintains the size and shape of each lens. It can be manufactured in many different sizes to match the needs of each lens type. It is also less costly than the USM. Canon has upgraded the performance of the AFD in its latest EF lenses, including the EF 20-35mm f/2.8L and the EF 80-200mm f/2.8L.

2. EOS-1 PROVIDES SIMPLIFIED OPERATION AND IMPROVED CAMERA HANDLING.

Quick Control Dial Accelerates Camera Handling

Without question, the biggest design breakthrough on the EOS-1 is the new Quick Control Dial located on the back of the camera. Even though there has never been a control quite like it, you'll be amazed at how comfortable the Quick Control Dial is from the first time you pick up the camera.

This alternate input dial accelerates camera handling by making full exposure adjustment a one-hand operation. In manual mode, you can change the shutter speed with your index finger while you adjust the aperture with your

thumb. No longer are you forced to give up manual focusing on the lens while you adjust your f/stop! With 1/3 step increments in both shutter speed and aperture, you can fine-tune your exposure like never before. This is particularly important when you're shooting narrow-latitude transparency film.

But the innovation of the Quick Control dial doesn't stop there. You can also use it in AE modes, such as Intelligent Program, Shutter Priority, and Aperture Priority, to bias your exposures up or down without leaving those modes! You'll be able to take full advantage of the stepless accuracy of automation without being locked in to the camera's meter reading. Instead, just turn the Quick Control dial, and choose for yourself.

Even when shooting vertically with the EOS-1, the Quick Control dial is easy to use. When you attach the optional Power Booster, you gain an additional shutter release and AE Lock button to improve handling.

Full-Information Viewfinder Benefits Decision-Making

As you place the viewfinder of the EOS-1 to your eye, you'll start to gain even more confidence in this new professional tool. For example, all data is displayed with clearly visible LCD elements. You won't have to move your eye up and down to see critical information, as you do with some cameras.

You can easily see shutter speeds, aperture values, an exposure scale, a frame counter, focus confirmation, flash-ready, AE Lock, Exposure Compensation mark, Manual mode indicator, and a unique Auto Bracketing display. But as you've come to expect from Canon, you only see what you need when you need it.

The eyepoint has been increased to 20.2mm--that's a full 4mm increase over the current F-1. Finder magnification with a standard 50mm lens has been reduced from 80% to 72%, making the entire viewing area much easier to see, especially for eyeglass wearers.

The next two improvements answer some long-time requests from current Canon owners: Virtually 100% finder accuracy and a built-in variable diopter control. The 100% figure results from the large-diameter EOS lens mount with its longer flange-back distance. The dioptric adjustment, placed to the left of the viewfinder eyepiece, covers -3 to +1 diopters. If you need more correction than that, you can still use the 10 corrective eyepieces already available for previous Canon SLRs.

There are also 7 interchangeable focusing screens for the EOS-1. These inexpensive accessories really help to tailor the camera to your personal preferences. They include the all-matte standard screen, 2 different grid choices, 2 split-image types, a standard microprism, and a special aerial-image screen for scientific applications.

Custom Function Control Lets You Personalize the EOS-1 For Your Individual Needs.

Speaking of individual preferences, there are 8 Custom Function Controls on the EOS-1. These built-in software adjustments tailor basic camera operations to your shooting style. You can choose any or all of them as you wish. Open the palm wing, press the CF button, and dial in the feature you want. Pressing the CF button again activates the feature, or deactivates it when you decide.

1. Cancel Autorewind
2. Leader In/Out
3. Cancel DX
4. Switch AF start to AE Lock button.
5. Switch control of shutter speed and aperture settings between Main & Quick Control Dial in Manual mode
6. Change from 1/3 step settings to 1 step settings
7. Manually adjust focusing in AF Mode with USM lenses
8. Exchange evaluative metering for center-weighted

As you look over this list, you'll probably find several options which come in handy for you. Perhaps a wire-service or newspaper shooter would prefer to cancel autorewind, leave the film leader out, and cancel DX so he/she can lock in a particular film speed. A studio photographer might decide to switch aperture control to the main dial. No matter how you like to work, Custom Function Control lets you have it your way!

3. THE APPLICATION OF EOS TECHNOLOGY ENHANCES CREATIVE CONTROL.

Perhaps the biggest knock on modern SLR cameras has been the perceived loss of creative control. A new professional camera offers an opportunity to make many improvements in this area. Canon realizes that creative control is the essence of imaginative photography. Accordingly, we have endowed the EOS-1 with the most comprehensive control system ever offered in any 35mm camera.

We've emphasized simple operation and improved handling. But we've also incorporated full manual control, a wide choice of AE modes, AE Lock, 4 ambient-light metering patterns, and a totally new fine-tuning capability that allows unprecedented command. Built-in Auto Bracketing is available in every mode.

Full Metered Manual Operation

In addition to all its other features, the EOS-1 is the easiest operating manual SLR ever. Shutter speeds are normally controlled by the Main Input Dial, while apertures are set by the Quick Control Dial. With Custom Function (CF) #5, you can reverse the controls if desired.

Both the external LCD and the viewfinder show full information. In the viewfinder, the Electronic Match-Needle exposure scale displays +/- 3 full steps in 1/3 increments for superior exposure control. With a 6-second timer for data display, your fingers are free to shift exposure while you shoot.

Choice of AE Modes Adds Versatility

Naturally, you're not restricted to Manual mode with the EOS-1. You can easily select Shutter Priority, Aperture Priority, or the Intelligent Program setting that's automatically indexed to the focal length of the lens you're using. Canon's exclusive Depth-of-Field AE

lets you use the camera's AF system to set the precise zone of sharpness in your photographs. It can be particularly useful in low light, or any other time when depth-of-field control assumes importance.

What's new about the EOS-1 in these modes? For the first time ever, ***you can use the Quick Control Dial to fine-tune your exposures.*** It's quick and easy; just watch the match-needle scale (or the EOS-1's external LCD) to control the exposure your way as long as you want. If you prefer, there's conventional Exposure Compensation, which can also be set in 1/3 increments.

We've included Automatic Bracketing, too. It's built-in, not a high-cost add-on as with other SLRs--and it is unbelievably easy to use. The viewfinder and external data displays graphically indicate the degree of bracketing you've selected, for 3 exposures from 1/3 to 3 steps apart. For even further control, ***you*** decide when to shoot each individual exposure in the bracket sequence. It's perfect for portraiture or other live subjects where fleeting expressions challenge the photographer to capture the decisive moment. By the way, you can select either aperture or shutter speed as the variable in manual mode, through Custom Function #5.

Last but not least, AE Lock has been simplified and improved. EOS-1 provides full control of this valuable feature. Scan the scene in any metering pattern, and lock exposure when you're ready with a simple touch of the AE Lock button. The viewfinder exposure scale then displays the locked value in addition to the current meter reading for easy reference. AE is automatically locked upon focus completion during Evaluative metering as well.

Choice of Metering Patterns Matches Camera Operation to Picture-Making Situation

EOS-1 offers 4 available-light metering patterns for unequaled versatility.

1. Evaluative Metering: This pattern analyzes 6 individual zones in the picture area, compares brightness and contrast levels, and unlike some others, determines subject size. It is equally effective in both horizontal and vertical compositions. In the EOS-1, evaluative metering has been upgraded from older EOS models, to provide improved exposure accuracy with transparency film.

2. Spot Metering: Heavily requested by our professional customers, this new pattern measures the central 5mm circle marked in the viewfinder, covering only 2.3% of the field of view. Spot metering is invaluable whenever you need to pinpoint the precise area of interest.

3. Partial Metering: Familiar to current EOS owners, this intermediate pattern expands the metering coverage to 8mm or 5.8% of the picture area. It's particularly useful with backlit or contrasty situations since it provides a precise reading of a larger portion of the subject than spot metering.

4. Center-Weighted Averaging: Makes sense in a professional camera because it provides excellent exposure control for action photography. This pattern is selected by using Custom Function #8.

The meter coupling range at ISO 100 for all patterns except spot is EV 0 to 20. In Spot, the sensitivity is rated at EV 2 to 20.

Extended Shutter Speed Control

The quality of shutter speed control in a professional SLR is always of paramount importance. EOS-1 upholds that importance by becoming the first camera to offer discrete increments of 1/3 step value. In today's world, with transparency film being the medium of choice for so many photographic clients such as magazines and advertisers, this fine degree of control will be a most welcome addition to the pro's creative arsenal.

With Custom Function #6, the 1/3 step increment can be changed to 1 step. This will be handy for those who prefer to shoot negative film, such as newspaper and wire-service shooters.

The top shutter speed of the EOS-1 is 1/8000 second, a valuable creative tool with fast films and faster lenses. Flash Sync is good up to 1/250, for maximum performance in fill-flash.

Bulb exposure requires only a minimal amount of battery power, making extended time exposures easy. The EOS-1's LCD displays the exposure time up to 120 seconds.

Multiple Exposure is easily accomplished too, with virtually 100% registration accuracy due to the separation of shutter charging from film transport. Up to 9 exposures can be preset. This amount can be extended or cut short as you choose during operation.

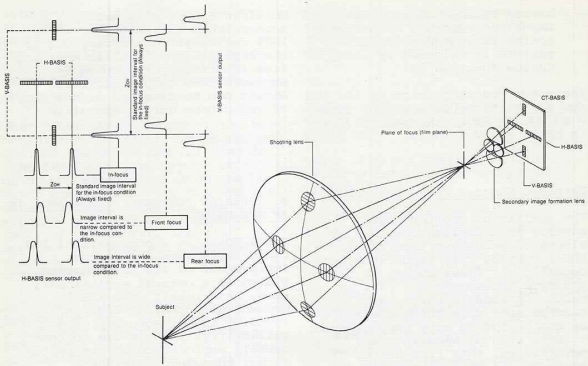
4. SUPERIOR FOCUSING PERFORMANCE IN AF AND MANUAL.

Since EOS-1 is a professional SLR, Canon feels that the further improvement of its Autofocusing system is a natural evolutionary step. As a result, the EOS-1 exceeds all other AF SLRs in focusing speed, accuracy, and reliability. This is due to the overall performance of the system rather than any individual improvement.

Increased Computational Capacity Improves Speed and Accuracy.

In previous EOS designs, the camera's main microcomputer was called on to provide a multitude of calculations and control, including AE as well as AF. However, EOS-1 is different because it dedicates an entire CPU to AF processing, and then adds a second independent chip set for AE and other camera operations.

AF calculation speed is therefore increased, if for no other reason than the specialization of the new circuitry. In addition, the 12 Mhz clock speed of the EOS-1 is faster than any other SLR except the EOS 630, 43% faster than the EOS 650 & 620.



New Cross-Type BASIS Sensor.

But there are other contributing factors to EOS-1's superior AF performance. The AF Sensor itself has been modified to provide a second set of sensing elements, aligned vertically to form a new Cross-Type array. This CT-TTL-SIR (Cross-Type, Through-The-Lens, Secondary-Image-Registration) system increases the reliability and speed of the focusing process in several ways.

Difficult AF subjects become much easier to detect since both horizontal and vertical lines in the subject are evaluated when using lenses with maximum apertures of f/2.8 or faster. Low-Light performance is extended to EV -1 because of a special circuit amplifier which improves signal clarity by a factor of 10.

Both vertical and horizontal sensors are read simultaneously. If either the vertical or horizontal information is the only available data, the focusing process moves on to the next step of driving the lens. If, on the other hand, both sets of sensors provide usable information, EOS-1 is intelligent enough to select which signal is more reliable based on a comparison of greater subject size.

Choice of One Shot or AI Servo Continuous Focusing.

Much more important than it sounds, this choice, especially when combined with the increased framing rate of the Power Booster E1 becomes a valuable creative tool. In One Shot focusing, the camera locks focus immediately and holds the initial setting until you let up on the shutter release. In this way, you can achieve up to 5.5 fps shooting speed while maintaining a single focusing position. Alternatively, you can recompose an off-center subject and hold focus in more relaxed situations.

However, the maximum AF performance of the EOS-1 is attained by selecting AI Servo and the Continuous High setting on the Power Booster. ***This combination, unavailable on other AF SLRs, provides Focus Prediction at speeds up to 4.5 fps.*** Focus Prediction drives the lens to focus exactly where the subject will be at the instant of exposure.

In this setting, the first shutter release is controlled by the photographer. Subsequent exposures in the motor-drive sequence are regulated by the EOS-1's Focus Prediction circuit.

The Focus Prediction circuit constantly checks focus to determine subject speed and direction. With USM lenses and the new 80-200/2.8L and 20-35/2.8L, the lens is driven up to the instant of exposure, even while the mirror is on the way up and the aperture blades are on their way in.

EOS-1 uses the 3 most recent readings for Focus Prediction, not just 2 as in other AF SLRs. Having 50% more information to work with, Canon then applies the data to a far more accurate quadratic equation compared to the rough linear type used by the competition. The improvement in focusing accuracy shows up when you need it most,i.e., when the subject is close to the camera and/or moving fast.

EOS-1 also provides the photographer with a significant advantage in shutter release control during motor-drive sequences. In other cameras, when focus tracking is desired, the motor drive must be set to Continuous Low operation. But the EOS-1 maintains full Focus Prediction capability at all times, even on the Continuous High setting. It easily outperforms all other AF SLRs in this crucial comparison.

Custom Function #4 Transfers AF Start to AE Lock button.

In this mode, you start and stop autofocus by pressing and releasing the AE Lock button with your thumb. In One Shot AF, you can shoot even if the subject in the center of the frame isn't completely sharp, a typical situation for a professional photographer.

Also, you don't have to worry about focus changing when you least expect it, for example when something or someone moves in front of your desired subject. Simply lift your thumb off the AE Lock button while you continue shooting. You don't have to use an extra finger to lock focus. It's a lot easier to control the EOS-1, especially when you're in a hurry.

Manual Focusing Improved Compared to Conventional Systems.

As important as Autofocusing has become in today's SLRs, there are still many times when manual focusing is more effective for professional work. In recognition of this, EOS technology provides several improvements over conventional systems.

With all EF lenses, the AF/Manual Switch is placed on the lens itself, adjacent to the focusing ring. Since your left hand is

normally on the lens while you shoot, camera handling is improved because you don't have to move back to the camera body to make this adjustment.

Additionally, EOS-1 Autofocus still works in manual focus, confirming sharpness even in low light with wide-angle lenses.

With Ultrasonic (USM) lenses, though, manual focusing takes on a completely new dimension. To begin with, it's electronic rather than mechanical. This is superior to conventional mechanical focusing in several ways. The 200, 300, and 600mm telephotos can be set for half-speed, normal, or double-speed manual focusing. The EF 28-80 automatically varies focusing speed from normal to 6 times normal, depending on focal length! This has the effect of equalizing the amount of focusing at all times. Another aspect of USM manual focusing is its incredibly smooth, light touch. It's particularly useful with otherwise heavy-focusing optics such as the 50mm f/1.0L and 85mm f/1.2L.

But by far the most intriguing benefit of USM lenses for manual focusing arises from the fact that, with EOS-1, ***they don't have to be switched out of AF mode to be manually focused.*** Simply set the USM lens to AF, EOS-1 to One Shot AF, and press the shutter release halfway.

When using Custom Function #4 with USM lenses, you'll discover that manual focus is available in both One Shot and AI Servo AF modes, not just One Shot. Also, with this feature, it's not necessary to maintain finger pressure on the shutter release to achieve manual focusing. When you want AF, simply push the AE Lock button with your thumb.

This Canon-exclusive benefit allows the photographer to overcome the problem of focusing on an off-center subject while retaining the benefits of autofocus. No other SLR even comes close to this degree of sophisticated control!

5. FILM HANDLING AND MOTOR DRIVE OPERATION.

It almost goes without saying that automatic film handling and motor drive operation are essential elements of any truly professional camera. The EOS-1 is highly advanced in this area.

Automatic Film Handling Accelerates Operation and Prevents Mistakes.

Let's start with a basic example. Film loading is not a creative aspect of photography. Therefore, it should be completely automated so you can get on with more important matters. With EOS-1, it is. As soon as you close the back, the film is automatically positioned at Frame 1. EOS-1 doesn't disrupt your concentration with additional steps.

What about setting film speed? Sure, we have DX if you want it. But we don't prevent you from checking the film speed if you use it. If you want to use non-DX cartridges, that's OK too. There's a manual override. There's even a way to turn off the DX completely, by activating Custom Function #3.

With Custom Function #1, you control autorewind. Just turn it off if necessary. If you want to leave the film leader out upon rewind completion, just activate Custom Function #2. You don't have to send your camera in to a Service Technician for this standard EOS-1 feature.

Standard EOS-1 Includes Built-in Winder.

Recommended when light weight is a consideration, the standard EOS-1 configuration includes a built-in 2.5 fps or single frame winder. It uses a high-capacity 2CR5 6-Volt Lithium battery that can maintain full operation in temperature extremes. Unlike the standard F4 with MB-20 battery pack, EOS-1 includes a remote control terminal as well. Weight including battery is 1.9 lb.

Optional Power Booster E1 for Maximum Performance.

The addition of Power Booster E1 makes the most of EOS-1's extraordinarily high performance capabilities. The Booster's comfortable grip contains a high-torque motor which augments the smaller transport motor in the camera body.

A sturdy 8-AA battery magazine compatible with either alkaline or Ni-Cd cells replaces the standard Lithium battery. The added power increases the top speed of the EOS-1 from 2.5 to 5.5 fps, with alternative settings for 3 fps or single frame operation.

Specifically designed for comfortable hand-held shooting, the Power Booster E1 also contains its own auxiliary shutter release and AE Lock button to help maintain full operational control under all shooting conditions.

6. EOS-1 DESIGNED FOR PROFESSIONAL USE, WITH RUGGED RELIABILITY.

In order to merit the distinction of being Canon's top-of-the-line professional SLR, EOS-1 must achieve far more than superior performance with simplified operation and improved camera handling. It must also be completely reliable and maintain that performance roll after roll, day after day. In short, it must stand up to whatever a professional photographer dishes out.

Consider the conditions the EOS-1 will face:

Include 5.5 frame-per-second advance, and for good measure, throw in a few environmental considerations like blazing heat or frigid cold, with high humidity or even water on the camera while you're shooting. EOS-1 has been thoroughly tested under these conditions, proving that it meets our professional standards for reliability. With conventional cameras, you may hope that you'll get consistent results; with EOS-1, you know you will.

Strengthened Body Construction.

Until EOS-1, professional SLRs such as the F-1 required metal bodies for adequate strength and durability, with the obvious disadvantage of excessive weight. This becomes quite fatiguing when the photographer must carry 2 or more cameras at once, a fact of life for photojournalists and other pros.

The Canon T90 proved that a light-weight fiberglass-reinforced polycarbonate body with a die-cast aluminum mirror box could take as much punishment as an all-metal body. For this reason, among others, the T90 has become the body

of choice for today's photojournalists, even though it is technically designed for amateur use.

Increasing the body material thickness by 25% compared to the T90 and adding layers of nickel, copper, and black chrome plating, the EOS-1 achieves superb rigidity while reducing weight compared to an all-metal body. Its aluminum mirror box ensures superior flange-to-film alignment, while the stainless steel lens mount's outer diameter has been increased from 48 to 65mm, an increase of nearly 35% compared to the F-1.

Operational Reliability.

With electronic interfaces between body, lens, and motor drive, electrical contact must be maintained at all times. On EOS-1, all body-side contact points except for flash are gold-plated and over-sized for added reliability. The DX code sensors and Power Booster contacts are doubled to ensure proper operation even if one contact fails.

EOS-1 also executes a complete self-checking sequence before each exposure. In this way, improper operation is prevented before it can cause any problems.

Increased Resistance to Hostile Environments.

By reducing the number of external dials and switches, the design of the EOS-1 becomes inherently less susceptible to water damage. But in addition to this, all possible entry points are fully gasketed for extra protection. Special water drains are built inside the input dial assemblies and Power Booster attachment area. Even the shutter blades are water repellent!

Another sensible design element is the LCD data panel itself. While providing a centralized information display, it prevents accidental changes to such key settings as metering patterns and exposure modes. It's also been angled back for easy viewing and is provided with a built-in illuminator.

7. PROFESSIONAL QUALITY EF LENSES.

Canon recognizes that any truly professional SLR system must be backed up by quality optics. For this reason, we are developing a full line of EF lenses, including four new professional L-Series formulas introduced with the EOS-1. This brings the number of EF lenses to 28, with 10 of those in the L-Series.

Special Techniques Create Unmatched Performance.

Canon's reputation for excellence in optics has been well-established for many years. With the introduction of EOS, that reputation not only remains intact, but reaches new levels.

EF lenses have the largest mount diameter ever made for 35mm cameras. This permits optical innovation while increasing the camera's overall reliability. You can feel the improvement in stability as soon as you attach a lens.

Optically, EF lenses make use of many sophisticated techniques to improve performance. Among the most impressive of these is the extensive development of aspherical lens elements. Canon is far ahead of all other SLR manufacturers in this area, with 10 lenses in the EF line alone that contain 1 or more aspherical surfaces.

An Explanation of Aspherical Elements.

Aspherical elements exhibit several characteristics which are extremely difficult to achieve using conventional spherical designs. Most importantly, they eliminate image-degrading spherical aberration, which results in reduced sharpness and low contrast in other formulas. They also minimize pincushion and barrel distortion while reducing flare. Moreover, they reduce size and weight while improving optical performance. They are most effective in moderate focal length, wide aperture, and zoom formulas. With so many inherent advantages, it's easy to see why Canon places such emphasis on the use of aspherical lenses whenever possible.

Canon's experience in aspherical lenses dates back to 1971, when we introduced the FD 55mm f/1.2 AL, the world's first large-aperture aspherical lens designed specifically for SLRs. This lens, extremely advanced in its time, far outperformed other f/1.2 SLR lenses of the era.

Realizing the potential market for high-quality aspherical lenses, Canon devoted intensive research to the development of exclusive manufacturing technologies. Unique grinding and polishing methods were perfected early on. However, production costs were very high at first, primarily due to the time required to check each finished lens for accuracy. But a computerized checking method drastically reduced the amount of time while increasing the reliability of the results. This development enabled us to expand the number of aspherical lenses in the FD line.

Eventually, 5 formulas were produced: 14mm f/2.8L, 20-35mm f/3.5L, 24mm f/1.4L, 50mm f/1.2L, and 85mm f/1.2L. Each lens offers the fastest maximum aperture available in its focal length, while exceeding the optical performance of all competitors.

In the EF line, ground and polished aspherical elements are even more important. Both the 50mm f/1.0L and the 28-80mm f/2.8-4.0L use two aspherical surfaces, while the 85mm f/1.2L shares its single aspheric optical formula with its FD counterpart. The new EF 20-35mm f/2.8L is the latest entry into this elite group.

However, despite the reductions in checking time, the ground and polished method is limited to small production runs. Therefore, research continued on a way to produce aspherical elements of sufficient quality in even less time.

In 1984, the big breakthrough finally occurred. Canon's optical designers developed a one-shot glass molding process that could produce exceptional quality in a fraction of the time needed for the ground and polished method. The first lens to contain a Canon glass-molded aspherical element was the FD 35-105mm f/3.5-4.5, which is still in the FD line.

This lens exhibited many desirable characteristics, but most impressively, when compared to the previous FD 35-105, it reduced the weight from 600 to 344 grams. Though not intended as an L-Series lens, the new 35-105 exceeded the optical performance of the lens it replaced, while lowering the retail price.

Subsequently, Canon has employed the glass-molding technique in 6 EF formulas. They include the 28mm, 135mm, 28-70mm, 35-105mm, 35-135mm, and 70-210mm lenses. These are all high-volume, heavy-production lenses that provide outstanding optical quality at moderate prices.

UD Glass & Fluorite Improve Telephoto Performance

As focal length increases, spherical aberration is replaced by chromatic aberration as the most serious image degradation factor. Chromatic aberration results from the dispersion of light wavelengths at the film plane. It shows up in color photos as a fringing effect.

Standard optical glasses can be combined to reduce chromatic aberration. However, fluorite crystal focuses all visible light wavelengths in the same plane, and can virtually eliminate chromatic aberration. It must be artificially produced for use in photographic lenses, since it is too small in its natural form for anything other than microscope objectives.

Canon leads the photographic industry in the use of calcium fluorite lens elements. Our first fluorite lens for SLRs was the FL-F 500mm f/5.6, marketed in 1969. Other early fluorite formulas included the FL-F 300mm f/5.6 and FL-F 300mm f/2.8. In the FD line, Canon's reputation for quality was further enhanced when we introduced the 500mm f/4.5L and a newer internal focusing version of the 300mm f/2.8L, each of which has a fluorite element. In 1986, Canon pioneered the use of fluorite elements in popular-priced lenses, the FD 80-200mm f/4L and FD 100-300mm f/5.6L.

Over the past 20 years, these lenses have proven themselves to be stellar optical performers. But, equally important, their durability and reliability for professional use is by now beyond reproach.

Most recently, the use of fluorite elements has been extended to the EF lens line. The 300mm f/2.8L and 100-300mm f/5.6L are optically identical to their FD counterparts, but the 600mm f/4.0L and 50-200mm f/3.5-4.5L are new formulas.

Another type of optical material used for chromatic aberration reduction is Ultra-Low Dispersion (UD) Glass. Manufactured by dousing conventional optical glass with fluorides, UD glass has the advantage of lower cost compared to fluorite. Two elements of UD glass are required to equal the effect of one fluorite element. All L-Series telephotos, including the previously mentioned fluorite lenses plus the EF 200mm f/1.8L and the new EF 80-200mm f/2.8L, use 1 or more UD glass elements.

4 New L-Series Lenses Provide Unmatched Optical Excellence.

1. **EF 50mm f/1.0L--(USM)** This is the world's fastest SLR lens, made possible by the enlarged EOS lens mount and by 2 ground and polished aspherical surfaces in its sophisticated 11-element formula. Its resolution, contrast, and color rendition are unsur- passed for this focal length. Minimum focusing distance is 2 ft.

2. **EF 85mm f/1.2L--(USM)** Uses the same proven optical formula of its FD counterpart. There is no faster or sharper lens in this focal length.

3. **EF 20-35mm f/2.8L--(AFD)** This unique constant-aperture formula has both the widest focal length and the fastest aperture ever offered in a wide-angle zoom. Its aspherical design minimizes distortion and flare, while the AFD contributes to compact size and light weight. This lens is destined to become a particular favorite of photojournalists, scenic photographers, and other wide-angle aficionados who will appreciate the accuracy of EOS Autofocus in combination with amazing optical performance. Minimum focusing distance is 1.6 ft.

4. **EF 80-200mm f/2.8L--(AFD)** In high demand for sports and journalism, Canon's entry into this elite zoom lens category features internal focusing and three UD Glass elements in its 16-element formula. With superb edge-to-edge sharpness and high contrast at all apertures, this lens covers the most popular focal length range, making it a sure bet to end up on almost every pro's wish list. Its competitive price will bring the 80-200/2.8L within reach for any serious photographer. Minimum focusing distance is 5.9 ft.

6 Current L-Series Lenses, Plus 2 Extenders.

The 4 new lenses mentioned above bring the total number of professional L-Series lenses in the Canon EF line to 10. The other 6 L lenses consist of three telephoto primes (with 2 extenders specially designed for them) plus three high-performance zooms.

The **EF 200mm f/1.8L (USM)** is the world's fastest lens in its focal length. With internal focusing and 3 UD elements, its optical performance is unmatched. Combined with Extenders EF 1.4X or 2X, the resulting 280mm f/2.5 or 400mm f/3.5 makes the 200/1.8L a multi-purpose pro-quality prime lens.

The **EF 300mm f/2.8L (USM)** was recently rated the sharpest among all 300/2.8's in a test report conducted by OUTDOOR PHOTOGRAPHER magazine. Its optical formula includes 1 fluorite and 1 UD Glass element.

The **EF 600mm f/4.0L (USM)** doubles the longest AF focal length offered by our nearest competitor. It is also unique among all 600mm lenses because it employs 1 Fluorite and 2 UD elements.

Extenders **EF 1.4X and EF 2X** are specifically dedicated to these three telephoto designs. Full Autofocus performance is maintained in every combination except when the EF 600mm is used with the EF 2X. Equally important, the optical performance and precision aperture control of the prime lenses remain undiminished.

The **EF 28-80mm f/2.8-4.0L (USM)** features exceptional sharpness and contrast compared to other zoom lenses in its focal length range. This is due to 2 aspherical elements plus an auxiliary flare suppression diaphragm.

The **EF 50-200mm f/3.5-4.5L (AFD) and EF 100-300mm f/5.6L (AFD)** provide incredible performance at moderate prices. Although not as fast as most other L-Series lenses, they combine light weight, close focusing, and superb sharpness in a compact package. Both lenses include a Fluorite plus a UD Glass element.

Special Purpose Lenses.

16 additional AFD-type EF lenses cover a wide range of focal lengths, providing flexibility and versatility without sacrificing necessary quality. 7 fixed focal length lenses from this group will be of particular interest to professional photographers:

The **15mm f/2.8** is a full frame fisheye providing a 180 degree angle of view on each diagonal. The optical performance of this new formula lens exceeds that of the FD 15mm f/2.8, providing increased resolution as well as reduced distortion.

The **EF 24mm f/2.8** and **EF28mm f/2.8** are excellent general purpose wide-angles. Both lenses have been updated with new optical formulas which deliver better performance than their FD predecessors. The 24mm lens is distinguished by rear group focusing and an exclusive scalloped hood while the 28mm lens employs a glass-molded aspherical front element for superb quality at a very pleasant price.

The **EF 50mm f/1.8** is the standard lens for the entire EOS line. With its light weight, high speed, and excellent optical performance, you won't find any other lens which offers more for your money.

The **EF 50mm f/2.5 Compact Macro** has the fastest aperture of any true macro autofocus lens, making it a very useful dual purpose optic. Its floating element design provides optimum performance at all working distances, with flat-field corner-to-corner sharpness at all apertures. The 50/2.5 focuses from infinity to 1:2 Life Size with no attachments.

The **EF Life Size Converter** is made specifically for the EF 50/2.5 Compact Macro lens. Its 4-element optical formula acts as a close-focusing 1.4X extender, converting the effective focal length of the Macro to 70mm. The focusing range of the 50/2.5 with the Life Size Converter extends from 1:4 to Full Life Size.

The Life Size Converter has the advantage of increased auto-focusing speed over other AF macros. This is particularly useful with moving subjects such as small animals or insects where even a slight change in subject distance can cause a great change in focus at the film plane.

The **EF 135mm f/2.8** is a high performance medium telephoto lens with Soft Focus capability. Its rear group focusing system is quick, smooth, and nearly silent. Tack sharp at its standard setting, the EF 135/2.8 can be adjusted for two degrees of soft focus as a special effect.

Economical Zooms.

For many beginning photographers, or even budding professionals on a tight budget, the standard EF zoom lenses represent an easy way to get started with the EOS system. 9 choices round out the list:

EF 28-70mm f/3.5-4.5 II
EF 35-70mm f/3.5-4.5
*EF-A 35-70mm f/3.5-4.5
EF 35-105mm f/3.5-4.5
EF 35-135mm f/3.5-4.5
EF 50-200mm f/3.5-4.5
EF 70-210mm f/4.0
*EF-A 100-200mm f/4.5
EF 100-300mm f/5.6

*** EF-A lenses feature AF only.**

8. HIGH PERFORMANCE FLASH SYSTEM.

When Canon introduced the T90 in 1986, its advanced through-the-lens flash system astounded the entire photo industry, offering highly sophisticated performance with simple operation. Concepts such as A-TTL, Second Curtain Sync, and auto fill-in flash with slow shutter speeds were pioneered by the 300TL, and have since been imitated (and advertised) by our competitors.

The EOS-1 flash system continues the Canon tradition, by providing even higher performance with improved reliability.

Introducing the New Speedlite 430 EZ.

The new 430 EZ, introduced along with the EOS-1, has the highest performance level of any Canon Speedlite. New features include selectable fill-in flash ratio and a heavy-duty external battery pack for extended shooting sessions. A locking pin has also been added, to guarantee secure attachment to the camera's accessory shoe.

The 430 EZ is based on the popular 420 EZ, and contains all of the features of that flash in addition to its own. Fast, internal motorized autozoom matches flash coverage to focal length in use, from 24mm to 80mm. Second Curtain Sync fires the flash at the end of the exposure rather than the beginning, producing exciting creative possibilities. An illuminated data panel shows useful information, especially in dark shooting conditions.

Canon's exclusive A-TTL flash AE mode is also provided. A-TTL's unique feature is a small pre-exposure flash burst which measures approximate subject distance and reflectivity, even in bounce flash. Unlike other systems, A-TTL can provide confirmation of correct flash exposure before the picture is taken.

A-TTL provides fully automatic fill-in flash with a special program that adjusts the fill-in flash ratio according to the level of available light. However, the 430 EZ also allows the photographer to override the automatic ratio by up to +/- 3 stops in 1/3 step increments. This feature can be used in all exposure modes for superb flexibility and control.

When Manual mode is selected on the EOS-1, the 430 EZ operates in TTL mode. The photographer can control both shutter speed and aperture settings for various effects. The flash data panel displays usable distance ranges based on aperture selection and lens focal length when used for direct flash.

When Manual Flash is selected on the 430, the photographer can select power ratios from Full to 1/32 power. The data panel displays the exact shooting distance for correct flash exposure.

Other features include Canon's exclusive Low-Voltage Rapid-Fire flash for quick recycling with A-TTL exposure accuracy, and a stroboscopic flash setting that can be set for up to 10 flashes per second for creative effects.

Useful Flash Accessories.

The external battery pack, Transistor Pack E, uses either 6 "C" size alkaline batteries or a

special sealed NiCd battery for top performance. Full-power manual recycling is under 2 seconds with this accessory. Transistor Pack E is made exclusively for the 430 EZ. To maintain TTL flash operation for off-camera or multiple flash photography, the EOS-1 is compatible with Canon's TTL Hot Shoe Adapter 2, TTL Distributor, the Off Camera Shoe Adapters, and Connecting Cords 60 (2 ft.) and 300 (9.8 ft.).

EOS-1 also features a built-in threaded PC socket for non-dedicated flash. Both the hot shoe and the PC socket can be used simultaneously for multiple flash photography.

Although 1/250 sync is guaranteed with Canon Speedlites, we recommend conducting a film test to check maximum sync speed with studio strobes and wireless remotes. The 1/3 step shutter speeds of the EOS-1 are particularly useful for this purpose, providing settings of 1/200 and 1/160 for use as needed.

9. COMMAND BACK E1 PROVIDES DATA IMPRINT AND INTERVALOMETER FUNCTIONS.

This accessory replaces the standard EOS-1 back for data imprint and/or timer controlled photography. The photographer can select any of several different imprint modes as follows:

Setting	Imprint Example
1. Day/Month/Year	15 7'89
2. Month/Day/Year	7 15'89
3. Year/Month/Day	'89 7 15
4. Day/Hour/Minute	15 16:21
5. 4-digit Frame Counter	Fc 12 34
6. User-Selected Code	00 00 00
7. Off	(No imprint)

The intervalometer supplies 3 distinct sequence-control functions plus a fourth control which defines the total number of exposures in the cycle.

The self timer sets the delay from the beginning of the sequence until the first exposure. The interval setting then regulates the length of time between exposures. The long release timer actually serves two purposes: it can either determine the duration of bulb exposures when the camera is set to bulb; or alternatively it can be used to vary the number of AE or manual exposures that are taken at the user-specified interval. All of these settings can be made up to 23 hours, 59 minutes, and 59 seconds in 1 second increments.

Data imprinting can be freely combined with timer control. Additionally, the Command Back E1 has the capability of controlling a Speedlite during time-lapse photography, activating the flash 60 seconds before each exposure. The Speedlite's Save Energy (SE) function then automatically turns the unit off.

EF LENS LINEUP

Lens	Focus Drive		Angle of View	Construction	Minimum Aperture	Closest Focusing Distance		Filter Size (mm)	Length		Weight	
	AFD	USM				(ft.)	(m)		(in.)	(mm)	(oz.)	(g)
Fish-eye EF 15mm f/2.8	•		180°	7-8	22	0.7	0.2	Filter Holder	2-7/16	62.2	11.6	330
EF 24mm f/2.8	•		84°	10-10	22	0.8	0.25	58	1-15/16	48.5	9.5	270
EF 28mm f/2.8	•		75°	5-5	22	1	0.3	52	1-11/16	42.5	6.5	185
EF 50mm f/1.8	•		46°	5-6	22	1.5	0.45	52	1-11/16	42.5	6.7	190
EF 50mm f/1.0L (Ultrasonic)		•	46°	9-11	16	2	0.6	72	3-3/16	81.5	2.2 lb.	985
Compact-Macro EF 50mm f/2.5	•		46°	8-9	32	0.748	0.228	52	2-1/2	63	9.9	280
EF 85mm f/1.2L (Ultrasonic)		•	28°30'	7-8	16	3.1	0.95	72	3-5/16	84	2.3 lb.	1,025
Soft-focus EF 135mm f/2.8	•		18°	6-7	32	4.3	1.3	52	3-7/8	98.4	13.8	390
EF 200mm f/1.8L (Ultrasonic)		•	12°	10-12	22	8.2	2.5	48 (drop-in type)	8-3/16	208	6.6 lb.	3,000
EF 300mm f/2.8L (Ultrasonic)		•	8°15'	7-9	32	9.8	3	48 (drop-in type)	9-9/16	253	6.3 lb.	2,855
EF 600mm f/4L (Ultrasonic)		•	4°10'	8-9	32	19.7	6	48 (drop-in type)	17-15/16	456	13.2 lb.	6,000
EF 20-35mm f/2.8L	•		94°-63°	12-15	22	1.6	0.5	72	3-1/2	89	19.1	540
EF 28-70mm f/3.5-4.5II	•		75°-34°	9-10	22-29	1.3	0.39	52	3	75.6	10.1	285
EF 28-80mm f/2.8-4L (Ultrasonic)		•	75°-30°	11-15	22	1.6	0.5	72	4-11/16	119.5	2.1 lb.	945
EF 35-70mm f/3.5-4.5	•		63°-34°	8-9	22-29	1.3	0.39	52	2-1/2	63	8.6	245
EF 35-70mm f/3.5-4.5A	•		63°-34°	8-9	22-29	1.3	0.39	52	2-1/2	63	8.1	230
EF 35-105mm f/3.5-4.5	•		63°-23°20'	11-14	22-29	3.1	0.95	58	3-1/4	81.9	14.1	400
EF 35-135mm f/3.5-4.5	•		63°-18°	12-16	22-29	3.1	0.95	58	3-3/4	94.5	16.8	475
EF 50-200mm f/3.5-4.5	•		46°-12°	13-16	22-29	3.9	1.2	58	5-3/4	146.4	24.4	690
EF 50-200mm f/3.5-4.5L	•		46°-12°	14-16	22-29	3.9	1.2	58	5-3/4	145.8	24.5	695
EF 70-210mm f/4	•		34°-11°20'	8-11	32	3.9	1.2	58	5-7/16	137.6	21.4	605
EF 80-200mm f/2.8L	•		30°-12°	13-16	32	5.9	1.8	72	7-5/16	185.7	2.9 lb.	1,330
EF 100-200mm f/4.5A	•		24°-12°	7-10	32	6.2	1.9	58	5-1/8	130.5	18.4	520
EF 100-300mm f/5.6	•		24°-8°15'	9-15	32	4.9	1.5	58	6-9/16	166.8	24.2	685
EF 100-300mm f/5.6L	•		24°-8°15'	10-15	32	4.9	1.5	58	6-9/16	166.6	24.5	695
Extender EF 2X	—	—	—	5-7	—	—	—	—	2	50.5	8.5	240
Extender EF 1.4X	—	—	—	4-5	—	—	—	—	1-1/16	27.3	7.1	200
Life-Size Converter EF	—	—	—	3-4	—	—	—	—	1-3/8	34.9	5.6	160

•Extender EF 2X is for exclusive use with EF 200mm f/1.8L and EF 300mm f/2.8L. •Extender EF 1.4X is for exclusive use with EF 200mm f/1.8L, EF 300mm f/2.8L and EF 600mm f/4L. •Life-Size Converter EF is for exclusive use with Compact-Macro EF 50mm f/2.5. •"A" series lenses are autofocus only.

EOS-1 Specifications

Type and Major Components

Type: 35mm focal plane shutter SLR (Single-Lens Reflex) camera with autofocus, auto exposure and built-in motor drive.
Lens Mount: Canon EF Mount (electronic signal transfer system).
Usable Lenses: Canon EF lenses.
Viewfinder: Fixed eye-level pentaprism.
Gives approx. 100% vertical and horizontal coverage of actual picture area and 0.72X magnification with 50mm lens at infinity.
Focusing Screen: Laser-matte screen with AF frame.
Six optional interchangeable screens are available.
Dioptric Adjustment: Adjustable (−3dpt — +1dpt) by turning knob
Eyepoint: 20mm
Shutter: Vertical-travel metal type focal plane shutter; all speeds electronically controlled.
Shutter Speed: 1/8000-30 sec. and bulb. X-sync is 1/250 sec. Can be set in 1/3-step increments.
Mirror: Quick return type half-mirror

Autofocus

AF Control System: TTL-CT-SIR (Cross Type-Secondary Image Registration) phase-detection type. Two modes available: One-shot and Servo AF with Focus Prediction. Manual focusing possible.
AF Working Range: EV-1 — 18 at ISO 100.
AF Auxiliary Light: Specified Canon Speedlites automatically project light through an ultra-bright LED (peak sensitivity: 700nm) when required.

Exposure Control

Light Metering: TTL full aperture metering using SPC (Silicon Photocell).
Four metering patterns available:
1. 6-zone evaluative metering
2. Center-weighted average metering
3. Partial metering (approx. 5.8% of the picture area)
4. Spot metering (approx. 2.3% of the picture area)

Metering Range:
Spot metering: EV 2—20 at ISO 100
Other meterings: EV 0—20 with f/1.4 lens at ISO 100 or equivalent

Exposure Modes:
1. Shutter-Priority AE
2. Aperture-Priority AE
3. Depth-of-Field AE
4. Program AE with Variable Shift
5. Manual
6. Flash AE (A-TTL and TTL program flash AE with specified Canon Speedlites)

Exposure Compensation: ±3 steps in 1/3-step increments.
Auto Exposure Bracketing: ±3 steps in 1/3-step increments.
Depth-of-Field Preview: With Depth-of-Field check button

Film Transport

Film Speed Setting: ISO 25-5000; automatically set in 1/3-step increments according to DX code. ISO 6-6400 can also be set manually.
Film Loading: Automatic
Film Wind: Automatic. Two modes available: S (Single Frame) and C (Continuous at up to 2.5 frames per second).
Film Rewind: Automatic (approx. 8 sec. with 24-exp. film). Mid-roll rewind possible.

Power Source

Battery: One, six-volt lithium battery pack (2CR5). Replaced by removing grip.
For memory backup: One CR1220
Battery Check: By pressing the battery check button. Three energy levels are shown by the bar marks in the display panel.
Shooting Capacity: (with 24-exp. film)
Normal (68°F/20°C): 75 rolls
Low (−4°F/−20°C): 12 rolls

Other

Custom Function Control: 8 functions selectable
Flash Contact: Direct contact at accessory shoe and PC socket (JIS-B type)
Remote Control: By using Remote Switch 60T3.
Data Display: In the viewfinder and LCD display panel.
Multiple Exposures: Up to nine exposures can be preset.
Self-timer: Electronically controlled with a 2 or 10-sec. delay.

Dimensions

Size: 6-5/16″ (W)×4-3/16″ (H)×2-13/16″ (D)
(161×106.6×71.8mm)
Weight: 1.9 lb. (850 g) without battery.
2 lb. (890 g) with battery.

■ The following specifications change when mounting the Power Drive Booster.

Film Wind: Three modes; S (Single Frame), CH (Continuous at up to 5.5 fps) and CL (Continuous at up to 3 fps).
Shooting Capacity: (with 24-exp. film)

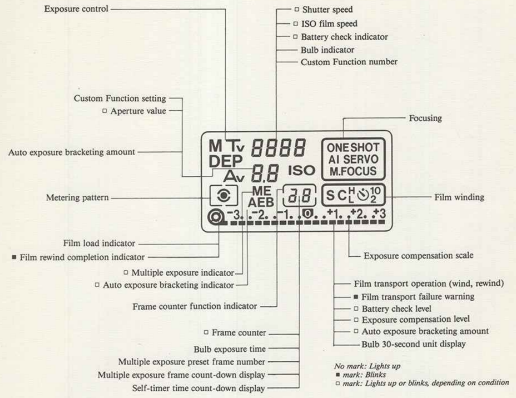
Temperature	Alkaline	Ni-Cd
Normal (68°F/20°C)	100 rolls	45 rolls
Low (−4°F/−20°C)	6 rolls	30 rolls

Power Source: Eight AA-size alkaline-manganese (LR6) or Ni-Cd (KR15/51) batteries
Dimensions (EOS-1 + Power Drive Booster)
Size: 6-5/16″ (W)×5-15/16″ (H)×3-1/16″ (D)
(160.5×150.4×78mm)
Weight: 3.3 lb. (1490 g) with battery

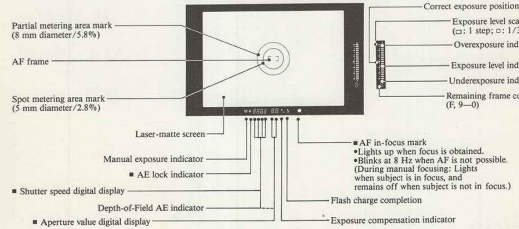
All data are based on Canon's Standard Test Method. Subject to change without notice.

ILLUMINATED LCD PANEL AND VIEWFINDER DISPLAYS SHOW ONLY NECESSARY INFORMATION

LCD Panel Information



Viewfinder Information Display



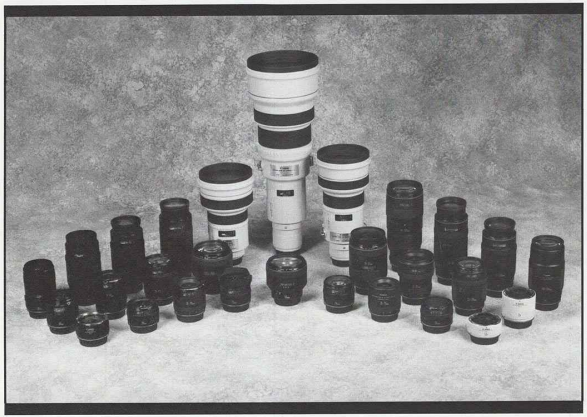
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CANON U.S.A., INC.

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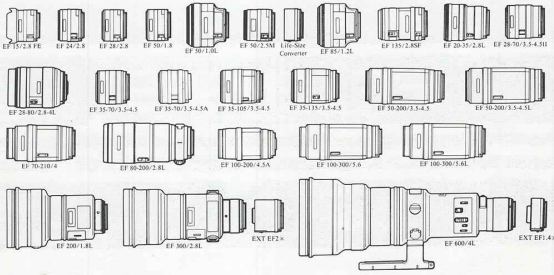


EF LENSES

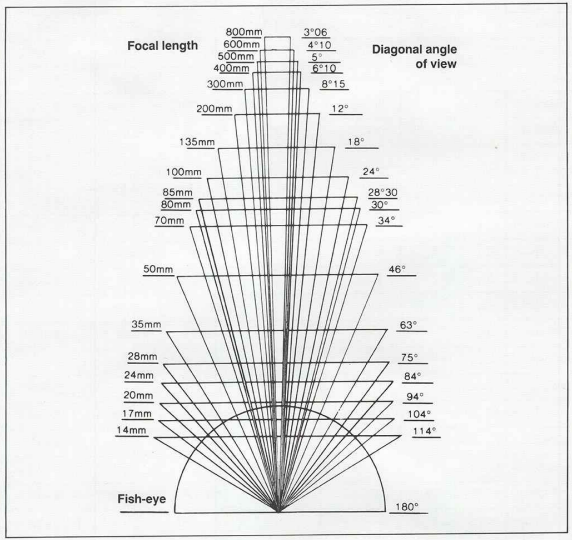
EF LENS LINEUP

Lens	Focus Drive		Angle of View	Construction	Minimum Aperture	Closest Focusing Distance		Filter Size (mm)	Length		Weight	
	AFD	USM				(ft.)	(m)		(in.)	(mm)	(oz.)	(g)
Fish-eye EF 15mm f/2.8	●		180°	7-8	22	0.7	0.2	Filter Holder	2-7/16	62.2	11.6	330
EF 24mm f/2.8	●		84°	10-10	22	0.8	0.25	58	1-15/16	48.5	9.5	270
EF 28mm f/2.8	●		75°	5-5	22	1	0.3	52	1-11/16	42.5	6.3	185
EF 50mm f/1.8	●		46°	5-6	22	1.5	0.45	52	1-11/16	42.5	6.7	190
EF 50mm f/1.0L (Ultrasonic)		●	46°	9-11	16	2	0.6	72	3-3/16	81.5	2.2 lb.	985
Compact-Macro EF 50mm f/2.5	●		46°	8-9	32	0.748	0.228	52	2-1/2	63	9.9	280
EF 85mm f/1.2L (Ultrasonic)		●	28°30'	7-8	16	3.1	0.95	72	3-5/16	84	2.3 lb.	1,025
Softfocus EF 135mm f/2.8	●		18°	6-7	32	4.3	1.3	52	3-7/8	98.4	13.8	390
EF 200mm f/1.8L (Ultrasonic)		●	12°	10-12	22	8.2	2.5	48 (drop-in type)	8-3/16	208	6.6 lb.	3,000
EF 300mm f/2.8L (Ultrasonic)		●	8°15'	7-9	32	9.8	3	48 (drop-in type)	9-9/16	253	6.3 lb.	2,855
EF 600mm f/4L (Ultrasonic)		●	4°10'	8-9	32	19.7	6	48 (drop-in type)	17-15/16	456	13.2 lb.	6,000
EF 20-35mm f/2.8L	●		94°-63°	12-15	22	1.6	0.5	72	3-1/2	89	19.1	540
EF 28-70mm f/3.5-4.5II	●		75°-34°	9-10	22-29	1.3	0.39	52	3	75.6	10.1	285
EF 28-80mm f/2.8-4L (Ultrasonic)		●	75°-30°	11-15	22	1.6	0.5	72	4-11/16	119.5	2.1 lb.	945
EF 35-70mm f/3.5-4.5	●		63°-34°	8-9	22-29	1.3	0.39	52	2-1/2	63	8.6	245
EF 35-70mm f/3.5-4.5A	●		63°-34°	8-9	22-29	1.3	0.39	52	2-1/2	63	8.1	230
EF 35-105mm f/3.5-4.5	●		63°-23°20'	11-14	22-29	3.1	0.95	58	3-1/4	81.9	14.1	400
EF 35-135mm f/3.5-4.5	●		63°-18°	12-16	22-29	3.1	0.95	58	3-3/4	94.5	16.8	475
EF 50-200mm f/3.5-4.5	●		46°-12°	13-16	22-29	3.9	1.2	58	5-3/4	146.4	24.4	690
EF 50-200mm f/3.5-4.5L	●		46°-12°	14-16	22-29	3.9	1.2	58	5-3/4	145.8	24.5	695
EF 70-210mm f/4	●		34°-11°20'	8-11	32	3.9	1.2	58	5-7/16	137.6	21.4	605
EF 80-200mm f/2.8L	●		30°-12°	13-16	32	5.9	1.8	72	7-5/16	185.7	2.9 lb.	1,330
EF 100-200mm f/4.5A	●		24°-12°	7-10	32	6.2	1.9	58	5-1/8	130.5	18.4	520
EF 100-300mm f/5.6	●		24°-8°15'	9-15	32	4.9	1.5	58	6-9/16	166.8	24.2	685
EF 100-300mm f/5.6L	●		24°-8°15'	10-15	32	4.9	1.5	58	6-9/16	166.6	24.5	695
Extender EF 2X	—	—	—	5-7	—	—	—	—	2	50.5	8.5	240
Extender EF 1.4X	—	—	—	4-5	—	—	—	—	1-1/16	27.3	7.1	200
Life-Size Converter EF	—	—	—	3-4	—	—	—	—	1-3/8	34.9	5.6	160

•Extender EF 2X is for exclusive use with EF 200mm f/1.8L and EF 300mm f/2.8L. •Extender EF 1.4X is for exclusive use with EF 200mm f/1.8L, EF 300mm f/2.8L and EF 600mm f/4L.
•Life-Size Converter EF is for exclusive use with Compact-Macro EF 50mm f/2.5. •"A" series lenses are auto(focus only).



LENS FOCAL LENGTH ANGLES OF VIEW



Angles of view for the popular focal lengths

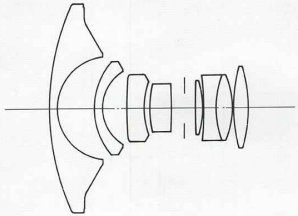
Type	Fish-eye		Super wide-angle			Wide-angle			Standard	Short-telephoto		Telephoto			Super-telephoto			
Focal length (mm)	7.5	15	14	17	20	24	28	35	50	85	100	135	200	300	400	500	600	800
Diagonal <43zmm>	180°	180°	114°	104°	94°	84°	75°	63°	46°	28°30'	24°	18°	12°	8°15'	6°10'	5°	4°10'	3°06'
Vertical <24mm>	180°		81°	70°30'	62°	53°	46°	38°	27°	16°	14°	10°	7°	4°35'	3°30'	2°45'	2°20'	1°40'
Horizontal <36mm>	180°		104°	93°	84°	74°	65°	54°	40°	24°	20°	15°	10°	6°50'	5°10'	4°	3°30'	2°35'

CANON EF LENS ACCESSORIES

LENS	HARD CASE	SOFT CASE	LENS HOOD	LENS FILTER	LENS CAP
EF 15mm f2.8	LHP-C10	ES-C9		GEL.	E-73
EF 24mm f2.8	LH-B9	ES-C9	EW-60	58mm	E-58
EF 28mm f2.8	LH-B9	ES-C9	EW-65	52mm	E-52
EF 50mm f1.0	LH-D12		ES-79	72mm	E-72
EF 50mm f1.8	LH-B9	ES-C9	ES-65	52mm	E-52
EF 50mm f2.5 Compact Macro	LH-C10	ES-C9		52mm	E-52
Life Size Converter EF	LH-B8	ES-C9			
EF 85mm f1.2	LH-D12		ES-79	72mm	E-72
EF 135mm f2.8	LH-B15	ES-C13	ET-65	52mm	E-52
EF 200mm f1.8L	Exc.		ET-123	48mm D.I	E-162
EF 300mm f2.8L	Exc.		ET-118	48mm	E-137
EF 600mm f4.0L	Exc.		ET-161	48mm D.I	E-180
Extender EF 2X	LHP-B9	ES-C9			
Extender EF 1.4X	LH-B9	ES-C9			
EF 20-35mm f2.8	LH-D13		EW-75	72mm	E-72
EF 28-70mm f3.5-4.5	LH-B12	ES-C13	EW-68A	52mm	E-52
EF 28-80mm f2.8-4.0L	LH-D16		EW-79	72mm	E-72
EF 35-70mm f3.5-4.5/A	LH-C13	ES-C9	EW-68B	52mm	E-52
EF 35-105mm f3.5-4.5	LH-C13	ES-C13	EW-68B	58mm	E-58
EF 35-135mm f3.5-4.5	LH-B15	ES-C13	EW-68B	58mm	E-58
EF 50-200mm f3.5-4.5/L	LH-C19	ES-C17	ET-62	58mm	E-58
EF 70-210mm f4.0	LH-C19	ES-C17	ET-62	58mm	E-58
EF 80-200mm f2.8	LH-D23		ES-79	72mm	E-72
EF 100-200mm f4.5A	LH-C19	ES-C17	ET-62	58mm	E-58
EF 100-300mm f5.6/L	LH-C21	ES-C20	ET-62	58mm	E-58

Rear Cap for EF Lenses = Lens Dust Cap E
Body Cap for EOS Cameras = Camera Cover R-F-3

EF 15mm f2.8 Fish Eye



The newest concept in Fish Eye lens design, the advanced Electro Focus EF 15mm f2.8 lens features low distortion, while combining improved performance with reduction in the number of lens elements. Gelatin Filters are attached to the rear of the lens, allowing a greater freedom of choice in filters, while the 7 group/8 element lens composition offers a superior optical capability.

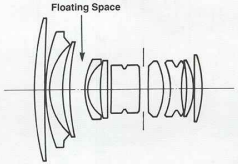
* Built-in gelatin filter holder

CONSTRUCTION: 8 Elements, 7 Groups
MINIMUM APERTURE: 22
CLOSEST FOCUSING DISTANCE: 9"
LENGTH: 2 7/16"
WEIGHT: 11.6 oz

HARD CASE: LHP-C10
SOFT CASE: ES-C9
LENS HOOD: N/A
FILTER SIZE: Gel Holder
LENS CAP: E-73

EF 24mm f2.8

- Rear Focusing
- Floating



The Canon EF 24mm f2.8 wide angle lens produces a wider perspective than a 28mm lens without the distortion associated with extreme wide angle lenses. This lens design also provides extremely fast autofocus operation: 0.3 sec. from minimum focusing distance to infinity.

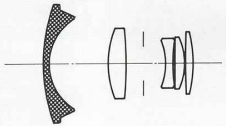
* Rear element focusing system with floating design for unsurpassed image quality, particularly at short distances.

CONSTRUCTION: 10 Elements,10 Groups
MINIMUM APERTURE: 22
CLOSEST FOCUSING DISTANCE: 10"
LENGTH: 1 15/16"
WEIGHT: 9.5 oz

HARD CASE: LH-B9
SOFT CASE: ES-C9
LENS HOOD: EW-60
FILTER SIZE: 58mm
LENS CAP: E-58

EF 28mm f2.8

- Glass Molded Aspherical Element



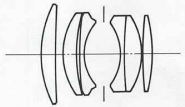
A compact, high performance wide angle lens, the Electro Focus EF 28mm f2.8 is an optically advanced lens that offers a wide angle effect with great depth-of-field. It produces snapshots and scenic pictures with high contrast. Its high performance makes it a valuable member of the EF lens line for superior communication with Canon EOS camera bodies.

* Lens compactness is achieved through the use of a molded glass aspherical lens element

CONSTRUCTION: 5 Elements,5 Groups
MINIMUM APERTURE: 22
CLOSEST FOCUSING DISTANCE: 1 ft
LENGTH: 1 11/16"
WEIGHT: 6.5 oz

HARD CASE: LH-B9
SOFT CASE: ES-C9
LENS HOOD: EW-65
FILTER SIZE: 52mm
LENS CAP: E-52

EF 50mm f1.8



The normal lens of the Electro Focus EF lens system, the EF 50mm f1.8 achieves superior optical performance, including better contrast and uniform color balance. With a minimum focusing distance of only 18" (0.45m), this lens surpasses previous lens standards for sharp focus and through the EOS electronic optical system, achieves instantaneous communication with Canon EOS bodies.

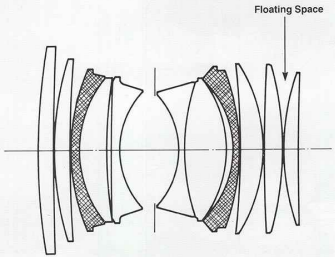
* We achieved excellent results with the 50mm lens, even wide open at f/1.8 - Modern Photography, January 1989.

CONSTRUCTION: 6 Elements, 5 Groups
MINIMUM APERTURE: 22
CLOSEST FOCUSING DISTANCE: 1.5 ft
LENGTH: 1 11/16"
WEIGHT: 6.7 oz

HARD CASE: LH-B9
SOFT CASE: ES-C9
LENS HOOD: ES-65
FILTER SIZE: 52mm
LENS CAP: E-52

EF 50mm f1.0L (Ultrasonic)

- Ground and Polished Aspherical Element
- Floating



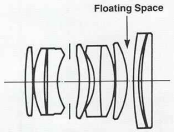
The EF 50mm f/1.0 L lens is the world's first standard lens for SLR cameras to possess the ultra-large-diameter maximum aperture of f/1.0. The lens was developed as a high-performance L-series lens to meet the needs of professional photographers, and features high optical performance at maximum aperture and high-contrast image quality.

CONSTRUCTION: 11 Elements, 9 Groups
MINIMUM APERTURE: 16
CLOSEST FOCUSING DISTANCE: 1.5 ft
LENGTH: 3 3/16"
WEIGHT: 2.2 lbs.

HARD CASE: LH-D12
SOFT CASE:
LENS HOOD: ES-79
FILTER SIZE: 72mm
LENS CAP: E-72

EF 50mm f2.5 Compact Macro

• Floating



The EF 50mm f2.5 Compact Macro, with its large f2.5 aperture, is one of the fastest autofocus macro lenses in the world. Intended primarily for macro photography over the range from infinity to 1/2 life size, it also provides outstanding optical performance at all ranges when used as an all-purpose photographic lens. Its large aperture also makes it possible to blur a background for greater effect in closeups. Despite its speed, the lens is extremely lightweight and compact.

* Floating lens element. Design maintains superior image quality at all distances.

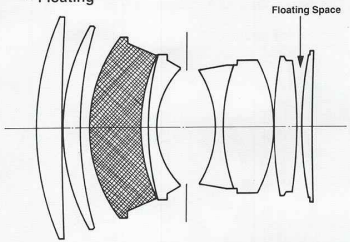
CONSTRUCTION: 9 Elements,8 Groups
MINIMUM APERTURE: 32
CLOSEST FOCUSING DISTANCE: 9"
LENGTH: 1 1/2"
WEIGHT: 9.9 oz

HARD CASE: LH-C10
SOFT CASE: ES-C9
LENS HOOD: N/A
FILTER SIZE: 52mm
LENS CAP: E-52

EF 85mm f1.2L (Ultrasonic)

• Ground and Polished Aspherical Element

• Floating



The EF 85mm f/1.2L lens is an ultra-large aperture medium telephoto lens developed to meet the high quality standards of the L lens series and the needs of professional photographers by providing high contrast image quality and superior optical performance especially at maximum aperture. With its large f/1.2 aperture, the lens meets the needs of professional photographers in special fields such as commercial and fashion photography by providing high image quality and brightness.

* Realizes low flare and high contrast despite the f/1.2 maximum aperture by using an aspherical lens element.

* Designed to provide high performance by using glass with a high refractive index to compensate curvature of field.

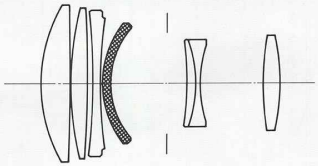
* Built-in USM (ultrasonic motor) provides superior AF performance with quiet operation.

CONSTRUCTION: 8 Elements,7 Groups
MINIMUM APERTURE: 16
CLOSEST FOCUSING DISTANCE: 3.1 ft
LENGTH: 3 15/16"
WEIGHT: 2.3 lbs.

HARD CASE: LH-D12
SOFT CASE:
LENS HOOD: ES-79
FILTER SIZE: 72mm
LENS CAP: E-72

EF 135mm f2.8 (Soft Focus)

- Glass Molded Aspherical Element
- Rear Focusing



The Electro Focus EF 135mm f2.8 takes clear, sharp images with normal use, while its soft focus feature adds variety to picture taking. By changing the spherical aberration, you can produce a soft blurring effect, a varying degree of softness and a soft focus image without variable aberration. As a normal lens, it retains high optical quality, a benefit of all the new Canon EF lenses.

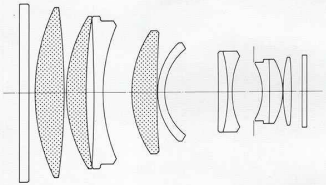
* Variable soft focus feature by changing spherical aberrations
* Glass molded aspherical lens construction

CONSTRUCTION: 7 Elements,6 Groups
MINIMUM APERTURE: 32
CLOSEST FOCUSING DISTANCE: 4.3 ft
LENGTH: 3 7/8"
WEIGHT: 13.8 oz

HARD CASE: LH-B15
SOFT CASE: ES-C13
LENS HOOD: ET-65
FILTER SIZE: 52mm
LENS CAP: E-52

EF 200mm f1.8L(Ultrasonic)

- UD Glass Element
- Rear Focusing



The Canon EF 200mm f1.8L is the fastest 200mm lens in the world. Making it the perfect lens for the professional in the areas of commercial, fashion, and indoor sports photography. The ultra-fast f/1.8 aperture also allows the photographer to isolate the subject by obtaining highly-blurred backgrounds. The lens design of the EF 200mm f1.8L also corrects various aberrations common to large aperture lenses. The EF 200mm f1.8L lens can be used with EF extenders 1.4X and 2X to achieve AF photography at 280mm f/2.5 and 400mm f/3.5, respectively.

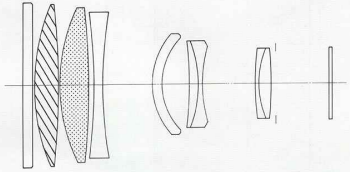
* World's fastest 200mm lens
* Three ultra low dispersion glass elements
* Built-in USM (ultrasonic motor) provides superior AF performance with quiet operation
* Electronic focus preset
* Three speed manual focusing
* 48mm drop in filter

CONSTRUCTION: 12 Elements,10 Groups
MINIMUM APERTURE: 22
CLOSEST FOCUSING DISTANCE: 8.2 ft
LENGTH: 8 3/16"
WEIGHT: 6.6 lbs

HARD CASE: Exclusive
SOFT CASE: N/A
LENS HOOD: ET-123
FILTER SIZE: 48mm Drop-in
LENS CAP: E-162

EF 300mm f2.8L (Ultrasonic)

- UD Glass Element
- Fluorite Crystal Element
- Rear Focusing



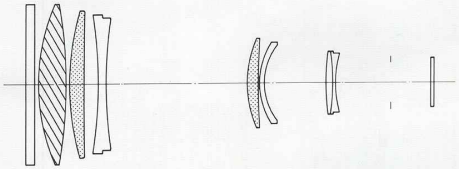
An extraordinary long lens for professional cameramen, this optically advanced telephoto lens offers the light gathering power of a super-telephoto. A leading member of the EOS Electro Focus lens system, it incorporates a combination of advanced, highly acclaimed optical performance and new electronic optical communication between the lens and Canon EOS bodies that is characteristic of all EF lenses. With a large aperture and high performance capabilities, the EF 300mm f2.8 also has superior autofocus.

* Electronic Focus Preset
* Built-in USM (ultrasonic motor) provides superior AF performance with quiet operation
* Three speed manual focusing
* Fluorite and ultra low dispersion glass construction
* 48mm drop in filter
* "Overall, this lens tested sharpest of all the 300mm f2.8's by a small margin." George Lepp, Outdoor Photographer, June 1989.

CONSTRUCTION: 9 Elements,7 Groups	HARD CASE: Exclusive
MINIMUM APERTURE: 32	SOFT CASE: N/A
CLOSEST FOCUSING DISTANCE: 9.8 ft	LENS HOOD: ET-118
LENGTH: 9 9/16"	FILTER SIZE: 48mm Drop-in
WEIGHT: 6.3 lbs	LENS CAP: E-137

EF 600mm f4.0L (Ultrasonic)

- UD Glass Element
- Fluorite Crystal Element
- Rear Focusing



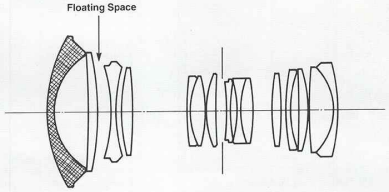
The Canon EF 600mm f4.0L is the first super telephoto EF lens and is designed for demanding professional use. It is particularly useful in nature photography, some news applications, and can be effectively used for outdoor sports. A new optical system design reduces aberration variation with respect to distance and improves picture quality at short distances. The EF 600mm f4.0L is compatible with EF 1.4X and 2X Extenders, to achieve AF photography at 840mm f5.6 and manual focusing at 1200mm f8.0, respectively.

* One fluorite and two ultra low dispersion elements
* Built-in USM (ultrasonic motor) provides superior AF performance with quiet operation
* Electronic Focus Preset
* Three speed manual focusing
* 48mm drop in filter

CONSTRUCTION: 9 Elements, 8 Groups	HARD CASE: Exclusive
MINIMUM APERTURE: 32	SOFT CASE: N/A
CLOSEST FOCUSING DISTANCE: 19.7 ft	LENS HOOD: ET-161
LENGTH: 17 15/16"	FILTER SIZE: 48mm Drop-in
WEIGHT: 13.2 lbs.	LENS CAP: E-180

EF 20-35mm f2.8L

- Ground and Polished Aspherical Element
- Floating
- Internal Focusing



The EF20-35mm f/2.8L is a large-aperture, wide-angle zoom lens which features high brightness and optical performance on a par with single focal lengths ranging from ultra-wide-angle 20mm to wide-angle 35mm. The lens was developed as a high-performance L-series lens with high image quality and superior operability to fulfill the needs of professional photographers.

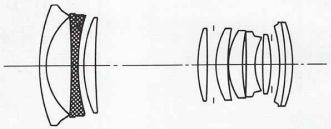
* Uses a single large-aperture aspherical lens which allows wide-angle focal lengths while providing sharp, high-resolution images with minimal distortion.

* Employs a floating system which provides improved image quality especially at close shooting distances.

CONSTRUCTION: 15 Elements,12 Groups	HARD CASE: LH-D13
MINIMUM APERTURE: 22	SOFT CASE:
CLOSEST FOCUSING DISTANCE: 1.6 ft	LENS HOOD: EW-75
LENGTH: 3 1/2"	FILTER SIZE: 72mm
WEIGHT: 19.1 oz	LENS CAP: E-72

EF 28-70mm f3.5-4.5II

- Glass Molded Aspherical Element



The EF 28-70mm f3.5-4.5II zoom lens is extremely compact and lightweight and features a molded aspherical element for nearly distortion-free image reproduction. The built-in macro mechanism allows focusing as close as 15 inches for a 0.22x magnification power at 70mm.

* Glass molded aspherical design.

* Flare suppression aperture included between groups 2 & 3.

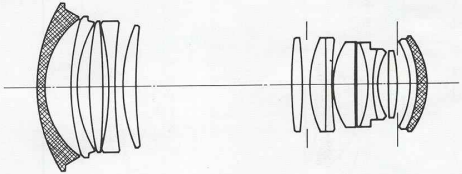
* Built-in full range macro.

* "This zoom works as my normal lens when I shoot with the EOS and it is sharp at all f/stops and zoom length." George Lepp, The Natural Image, Spring 1989.

CONSTRUCTION: 10 Elements,9 Groups	HARD CASE: LH-B12
MINIMUM APERTURE: 22-29	SOFT CASE: ES-C13
CLOSEST FOCUSING DISTANCE: 1.3 ft	LENS HOOD: EW-68A
LENGTH: 3"	FILTER SIZE: 52mm
WEIGHT: 10.1 oz	LENS CAP: E-52

EF 28-80mm f2.8-4.0L (Ultrasonic)

• Ground and Polished Aspherical Element

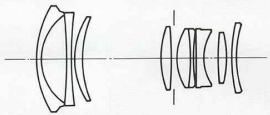


This large aperture professional zoom lens offers high image quality over the range of wide angle to medium telephoto. Using two aspherical lens surfaces, the EF 28-80mm f2.8-4.0L provides high performance despite its 3x zoom ratio. A moving flare suppression diaphragm is included between groups 2 and 3 to deliver virtually flare-free images at all focal lengths. The lens construction, made up of three groups, two of which move, suppresses distortion over the full zoom range and helps compensate for curvature of field and chromatic aberration

* Two aspherical lens elements
* Moving flare suppression aperture between groups 2 & 3
* Built-in (ultrasonic motor) provides superior AF performance with quiet operation
* Built-in full range macro

CONSTRUCTION: 15 Elements,11 Groups	HARD CASE: LH-D16
MINIMUM APERTURE: 22	SOFT CASE: N/A
CLOSEST FOCUSING DISTANCE: 1.6 ft	LENS HOOD: EW-79
LENGTH: 4 11/16"	FILTER SIZE: 72mm
WEIGHT: 2.1 lbs	LENS CAP: E-72

EF 35-70mm f3.5-4.5



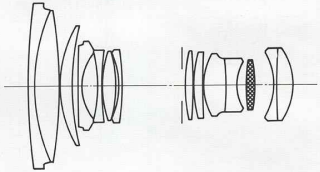
This high performance standard zoom lens was developed for precision work with autofocus operation. A highly compact lens with a three-group zoom system construction, it is easy to operate since its length doesn't change during zooming. A macrophotography feature covers the entire zoom range.

* Macro over entire zoom range.
* Described as "exceptionally sharp" by David Brooks, Petersen's Photographic.

CONSTRUCTION: 9 Elements,8 Groups	HARD CASE: LH-C13
MINIMUM APERTURE: 22-29	SOFT CASE: ES-C9
CLOSEST FOCUSING DISTANCE: 1.3 ft	LENS HOOD: EW-68B
LENGTH: 2 1/2"	FILTER SIZE: 52mm
WEIGHT: 8.6 oz	LENS CAP: E-52

EF 35-105mm f3.5-4.5

• Glass Molded Aspherical Element



Providing high performance in a compact package, the optics of this high quality zoom lens have been improved to allow macrophotography over the full zoom range. A high ranking member of the EF lens group, this is the shortest of all manufacturers' lenses with similar specifications.

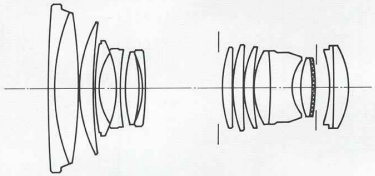
* Glass molded aspherical design for greater compactness and image sharpness.
* Macro covers entire zoom range.

CONSTRUCTION: 14 Elements,11 Groups
MINIMUM APERTURE: 22-29
CLOSEST FOCUSING DISTANCE: 3.1 ft
LENGTH: 3 1/4"
WEIGHT: 14.1 oz

HARD CASE: LH-C13
SOFT CASE: ES-C13
LENS HOOD: EW-68B
FILTER SIZE: 58mm
LENS CAP: E-58

EF 35-135mm f3.5-4.5

• Glass Molded Aspherical Element



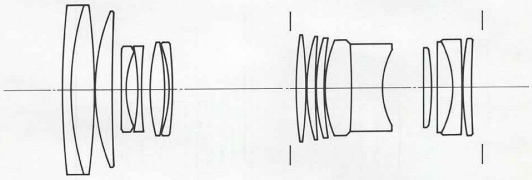
A molded aspherical glass element makes the EF 35-135mm f3.5-4.5 super sharp and compact in size, even with its nearly 4x zoom ratio. Plus it covers most popular focal lengths to serve as a perfect multi-purpose lens. A macro mode enables focusing as close as 37 inches with a magnification power of 0.18x.

* Glass molded aspherical lens design
* Built-in full range macro

CONSTRUCTION: 16 Elements,12 Groups
MINIMUM APERTURE: 22-29
CLOSEST FOCUSING DISTANCE: 3.1 ft
LENGTH: 3 3/4"
WEIGHT: 16.8 oz

HARD CASE: LH-B15
SOFT CASE: ES-C13
LENS HOOD: EW-68B
FILTER SIZE: 58mm
LENS CAP: E-58

EF 50-200mm f3.5-4.5



Featuring a 4x zoom ratio, the EF50-200mm f3.5-4.5 covers many popular focal lengths, from normal all the way up to telephoto. In addition to compact size, the lens offers full range macro capability with a minimum focusing distance of only 4 ft. (1.2m).

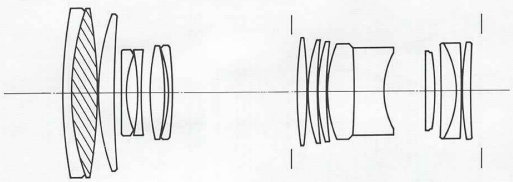
* Built-in full range macro
* A four group zoom system provides high quality optical performance over the entire focusing range, from closeup to infinity
* "Overall an excellent performer for this type of zoom lens." Modern Photography.

CONSTRUCTION: 16 Elements,13 Groups
MINIMUM APERTURE: 22-29
CLOSEST FOCUSING DISTANCE: 3.9 ft
LENGTH: 5 3/4"
WEIGHT: 24.4 oz

HARD CASE: LH-C19
SOFT CASE: ES-C17
LENS HOOD: ET-62
FILTER SIZE: 58mm
LENS CAP: E-58

EF 50-200mm f3.5-4.5L

• Fluorite Crystal Element



This high-performance zoom lens joins Canon's professional line of 'L' series lenses and features superior optical performance by utilizing two fluorite glass elements. It is compact and lightweight, with a 4x zoom ratio covering the standard to telephoto focal lengths. The full range macro mechanism allows focusing as close as 4 feet with a magnification power of 0.23x.

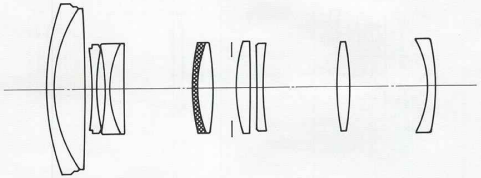
* Built-in full range macro
* Two fluorite glass elements
* "A really first class performer and an excellent choice as an all around lens." Bob Shell, Shutterbug, August 1989.

CONSTRUCTION: 16 Elements,14 Groups
MINIMUM APERTURE: 22-29
CLOSEST FOCUSING DISTANCE: 3.9 ft
LENGTH: 5 3/4"
WEIGHT: 24.5 oz

HARD CASE: LH-C19
SOFT CASE: ES-C17
LENS HOOD: ET-62
FILTER SIZE: 58mm
LENS CAP: E-58

EF 70-210mm f4.0

• Glass Molded Aspherical Element



Destined to be the most popular zoom in the EF lens system, this high level standard-to-telephoto zoom lens combines excellent optics with compactness and great versatility. High quality optic performance is achieved through use of an aspherical molded glass element. The lens has a close focus distance of 4 feet in the macro range.

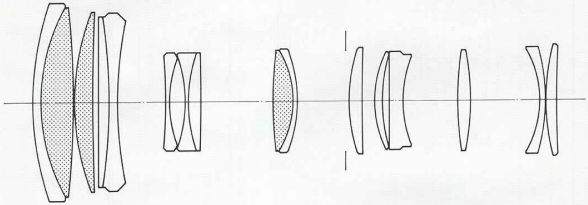
* Glass molded aspherical design
* Most popular telephoto zoom in the EF lens system

CONSTRUCTION: 11 Elements,8 Groups	HARD CASE: LH-C19
MINIMUM APERTURE: 32	SOFT CASE: ES-C17
CLOSEST FOCUSING DISTANCE: 3.9 ft	LENS HOOD: ET-62
LENGTH: 5 7/16"	FILTER SIZE: 58mm
WEIGHT: 21.4 oz	LENS CAP: E-58

EF 80-200mm f2.8L

• UD Glass Element

• Internal Focusing

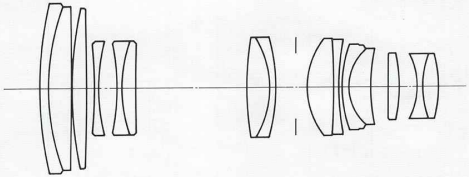


The EF 80-200mm f/2.8 L lens is the first large-aperture telephoto zoom lens in the EF lens series. The lens was developed as a high-performance L-series lens and features high image quality and superior operability to meet the needs of professional photographers. Furthermore, the f/No. of the EF 80-200mm f/2.8L does not change during zooming, providing a constant brightness on a par with single lenses. With these features, the lens is ideal for a wide variety of photographic applications, from outdoor photography requiring high maneuverability, to studio photography requiring compositional flexibility.

* Optical system uses 3 lens elements made of UD glass to attain high image quality compensate for chromatic aberrations (secondary spectrum) which often occur with large-aperture telephoto lenses.
* Employs rear focusing system to realize high-speed, high-precision AF control while providing a large maximum aperture.
* "I found that the 80-200mm handled extremely well, and was surprisingly light and well balanced for a lens of this type." Bob Shell, Shutterbug, August 1989.

CONSTRUCTION: 16 Elements,13 Groups	HARD CASE: LH-D23
MINIMUM APERTURE: 32	SOFT CASE:
CLOSEST FOCUSING DISTANCE: 5.9 ft	LENS HOOD: ES-79
LENGTH: 7 5/16"	FILTER SIZE: 72mm
WEIGHT: 2.9 lbs	LENS CAP: E-72

EF 100-300mm f5.6



A compact, optically advanced telephoto zoom lens with a 3x zoom ratio, the EF 100-300mm f5.6 lens features a built-in, full-range macro mechanism and a close focusing distance in macro range of 4.6 ft. (1.4m).

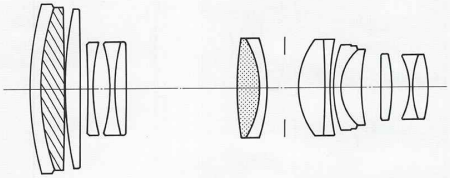
* Built-in full range macro
* Three-group moving system contributes to the compactness of the lens

CONSTRUCTION: 15 Elements,9 Groups
MINIMUM APERTURE: 32
CLOSEST FOCUSING DISTANCE: 4.9ft
LENGTH: 6 9/16"
WEIGHT: 24.2 oz

HARD CASE: LH-C21
SOFT CASE: ES-C20
LENS HOOD: ET-62
FILTER SIZE: 58mm
LENS CAP: E-58

EF 100-300mm f5.6L

- UD Glass Element
- Fluorite Crystal Element



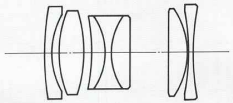
A sophisticated professional lens, the Electro Focus EF 100-300mm f5.6L offers sharp images by using one element each of fluorite and UD glass to reduce chromatic aberration. With a close focusing distance of 4.6 ft. in the macro range, the lens has excellent macro capability. It has a built-in, full-range macro feature, and a three-group moving zoom system for compactness.

* Fluorite and UD glass construction.
* Built-in full range macro.
* "This is one fantastic lens. It is as sharp as any 300mm I know of." George Lepp, The Natural Image, Spring 1989.

CONSTRUCTION: 15 Elements,10 Groups
MINIMUM APERTURE: 32
CLOSEST FOCUSING DISTANCE: 4.9 ft
LENGTH: 6 9/16"
WEIGHT: 24.5 oz

HARD CASE: LH-C21
SOFT CASE: ES-C20
LENS HOOD: ET-62
FILTER SIZE: 58mm
LENS CAP: E-58

EXTENDER EF 2x

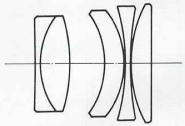


Designed for use with the EF 300mm f2.8L and the EF 200mm f1.8L, the Extender EF 2x doubles the magnification of the lens while providing superior imaging performance. The extender is also designed to be used with future Canon lenses. Image performance with this specially designed 2x extender is comparable to that of a single lens.

CONSTRUCTION: 7 Elements,5 Groups
MINIMUM APERTURE: N/A
CLOSEST FOCUSING DISTANCE: N/A
LENGTH: 2"
WEIGHT: 8.5 oz

HARD CASE: LHP-B9
SOFT CASE: ES-C9
LENS HOOD: N/A
FILTER SIZE: N/A
LENS CAP: N/A

Extender EF 1.4x

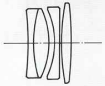


The Canon Extender EF 1.4x is designed exclusively for use with Canon EF 200mm f1.8L, EF 300mm f2.8L, and EF 600mm f4.0L lenses. By using the EF 1.4x Extender with these lenses, the photographer can increase the focal length by 1.4 times or 40% but at the cost of only one f-stop, compared to a 2 f-stop light loss when a 2x extender is used. Autofocus operation of these lenses is also maintained. The lens construction is designed to provide optimum correction of chromatic aberration while maintaining the high-performance characteristics of these professional lenses.

CONSTRUCTION: 5 Elements,4 Groups
MINIMUM APERTURE: N/A
CLOSEST FOCUSING DISTANCE: N/A
LENGTH: 1 1/16"
WEIGHT: 7.1 oz

HARD CASE: LH-B9
SOFT CASE: ES-C9
LENS HOOD: N/A
FILTER SIZE: N/A
LENS CAP: N/A

Life Size Converter EF



The Life Size Converter EF is designed exclusively for the EF 50mm f2.5 Compact Macro lens to achieve up to 1:1 magnification ratios. With the converter in place, total autofocus operation is maintained. Super Spectra coating of lens elements provides critically sharp images.

CONSTRUCTION: 4 Elements,3 Groups	HARD CASE: LH-B8
MINIMUM APERTURE: N/A	SOFT CASE: ES-C9
CLOSEST FOCUSING DISTANCE: N/A	LENS HOOD: N/A
LENGTH: 1 3/8"	FILTER SIZE: N/A
WEIGHT: 5.6 oz	LENS CAP: N/A

CANON SPEEDLITE 430EZ

Canon's new Speedlite, the 430 EZ, offers the highest performance of any EOS electronic flash unit to date. No matter what the surroundings may be, from total darkness to bright sunlight, the 430 EZ can improve the quality of your flash photography.

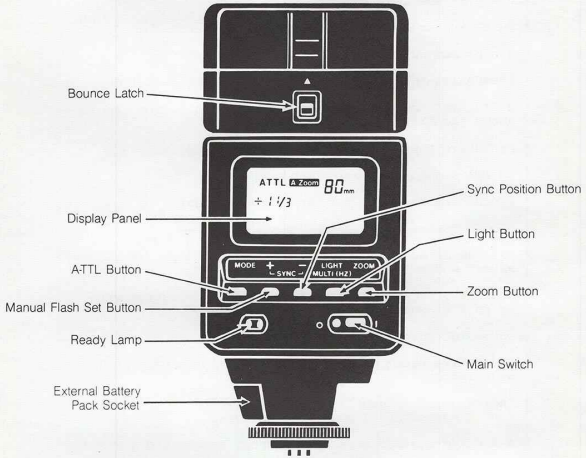
Standard 430 EZ features include:

* *Guide Number 116 [ft.] (ISO 100, 50mm lens)*
* *Bounce and Swivel Flash Head.*
* *Internal Automatic Zoom from 24-80mm with Manual Override.*
* *A-TTL, TTL, and Variable Power Manual operation (Includes automatic fill-in flash capability).*
* *Exclusive Rapid-Fire Flash for quick recycling.*
* *AF Illuminator for low-light operation.*
* *ElectroLuminescent (EL) Data Display panel.*
* *Second Curtain Sync.*
* *Display of aperture value and distance ranges in TTL and Manual Modes.*
* *Modular Off-Camera Accessories for TTL operation with up to 4 flashes.*

New features include:

* *Flash-fill ratio control up to +/- 3 full steps in 1/3 step increments.*
* *Choice of power supplies: 4-AA batteries or Transistor Pack E for extended shooting sessions.*
* *A locking pin for secure attachment to EOS 630 & EOS-1.*
* *90 second Automatic Shut Off (Save Energy {SE} Function).*
* *Mode memory: all settings memorized even when main switch is turned off.*
* *Improved Stroboscopic Flash up to 10 flashes per second.*

Canon Speedlite 430EZ



430 EZ Controls and Features



fig. 1

When the Main Switch (fig. 1) is turned ON ("I"), the 430 EZ begins charging. Charging is complete when the ready lamp glows red.

Rapid Fire Flash:

When using AA batteries in all modes except Manual 1/1, 1/2, and Stroboscopic Flash between 6 and 10 Hz, the ready lamp will glow green before it glows red. The green ready lamp indicates a usable partial charge, and is referred to as **Rapid Fire Flash.** The purpose of Rapid Fire Flash is to permit flash photography during the recycling period, normally impossible with conventional TTL flash units.

Note: *Rapid Fire Flash is only possible in Single Frame advance.*

With fresh batteries, the green ready lamp will appear within 1.5 seconds after turning on the Main Switch, or after a full power flash. Even though the 430 EZ is only partially charged during Rapid Fire Flash, usable distance range @ ISO 100 with a 50mm f/1.8 standard lens is at least 16 ft. Using the ATTL system, the camera will verify correct exposure before the picture is taken.

If the green ready lamp takes longer than 10 seconds to glow, replace or recharge the AA batteries.

Full Power Recycling Times: (Ready Lamp glows RED.)	Alkaline AA - 0.2 - 13 seconds NiCd AA - 0.2 - 6.5 seconds
Rapid Fire Recycling Times: (Ready Lamp glows GREEN.)	Alkaline AA - 0.2 - 1.5 seconds NiCd AA - 0.2 - 1.0 second
Number of Flashes:	Alkaline AA - 100 - 700 NiCd AA - 45 - 300

Save Energy Function: Automatic Shut-Off after 90 seconds of non-use. Auto-ON by pressing the camera shutter release halfway. Always turn the 430 EZ main switch OFF ("O" mark) when shooting is completed.

Display Panel Illumination:

Press the **"Light"** button (fig. 3) to illuminate the display panel. The panel will remain illuminated for approximately 8 seconds. If other buttons on the 430 EZ are pressed while the display is illuminated (to change settings, for example), the illumination will automatically shut off 8 seconds after the last button has been pressed.

The 430 EZ Internal Zoom Mechanism:

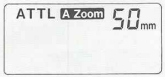


fig. 2

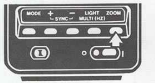


fig. 3

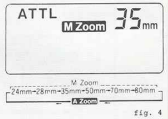


fig. 4

Automatic Zoom Setting: The flash head position automatically adjusts to lens focal length from 24mm to 80mm when the camera shutter release is pressed halfway. **"A Zoom"** (fig. 2) appears on the display panel.

Manual Zoom Setting: Press the "Zoom" button (fig. 3) and the display will change to **"M Zoom"** (fig. 4). Press the "Zoom" button again to advance through the available settings of 24, 28, 35, 50, 70, and 80mm. To return to Automatic, press the "Zoom " button until **"A Zoom"** appears on the display panel.

Note: *The **Mode Memory Function** will memorize the mode and set values as the 430 EZ is turned OFF, eliminating the need for resetting.*

430 EZ FLASH EXPOSURE MODES

A-TTL Mode: This is the standard automatic flash exposure mode of the 430 EZ. It can be used in all camera exposure modes EXCEPT Manual and Bulb. A-TTL's unique feature is a small pre-exposure flash burst which is used to measure approximate flash-subject distance. The camera uses this information in different ways depending on the exposure mode.

1. Program Mode: The camera sets both shutter speed and aperture value. Shutter speeds range from 1/60 to either 1/125 or 1/250, depending on the camera. Aperture value is set based on a comparison of subject distance vs. available light level. Automatic fill-flash occurs in this mode ONLY at light levels of EV 10 or higher.

2. Shutter Priority or Aperture Priority: The photographer sets shutter speed OR aperture value. ***IN THESE MODES, THE 430 EZ ACTS AS A FILL-IN FLASH AT ALL TIMES. IN FILL-IN FLASH, THE AVAILABLE LIGHT EXPOSURE MUST BE CORRECT. AS A RESULT, THE CAMERA SETS LONG SHUTTER SPEEDS OR WIDE APERTURES IN LOW LIGHT, TO PROVIDE CORRECT EXPOSURE OF THE AVAILABLE LIGHT.***

TTL Mode: This mode provides automatic flash exposure when the camera is used in its Manual Mode. TTL mode on the 430 EZ can be set with the EOS-1, EOS 620/630/650, and the T90 only. With all these cameras except the T90, the 430 EZ will display usable distance ranges based on aperture and focal length selection when the shutter release is pressed halfway (Direct Flash only, not Bounce Flash).

Exposure Compensation:

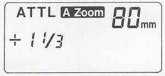


fig. 5

This feature permits the photographer to set **flash-fill ratio** independent of available light exposure, to +/- 3 steps in 1/3 step increments in A-TTL and TTL modes(fig. 5).

Press the **"+"** or **"-"** buttons below the display panel. The 430 EZ Exposure Compensation feature does not work when the flash is set to Manual mode.

Manual Flash Operation:

One of the drawbacks of using many types of manual flashes is the guide-number calculations required for setting the lens aperture. The 430 EZ performs these troublesome calculations **automatically.**

By pressing the "MODE" button (fig. 8), the 430 EZ will switch from ATTL/TTL to **"M"** at full power {"1/1"} (fig. 6). Then, by pressing the + or - buttons (fig. 8), the photographer can select any setting of 1/1, 1/2, 1/4, 1/8, 1/16, or 1/32 power.

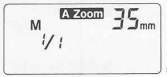


fig. 6

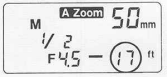


fig. 7

As the shutter release is pressed halfway, the 430 EZ's display panel will show the recommended aperture and shooting distance (fig. 7). (Direct flash only.)

Stroboscopic Flash:

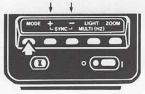


fig. 8

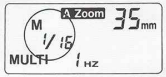


fig. 9



fig. 10

The 430 EZ has extended its Stroboscopic Flash mode to 10 flashes per second (Hz). To use this feature, press the "MODE" button (fig. 8) until "MULTI" **and** "1 Hz" are displayed on the data panel (fig. 9). Note that only manual settings of 1/4 through 1/32 can be used with this feature. Press the "MULTI (HZ)" button to set the number of flashes per second. The selection of various power ratios and flashes-per-second (Hz) will produce a distance read-out for correct exposure **after** the shutter release is pressed halfway (fig. 10).

Note:

*1/1 and 1/2 manual settings **cannot** be used for Stroboscopic Flash.*

*The green ready lamp **does not** light during settings of 6 to 10 flashes per second (Hz).*

The maximum number of flashes per second (Hz) as compared to selected power ratios is shown below (fig. 11):

Maximum Number of Flashes
(number of flashes until the ready lamp goes out)

Number of Times \ Flash Intensity	M1/4	1/8	1/16	1/32
10Hz	3	5	9	13
9Hz	3	5	9	13
8Hz	3	5	9	13
7Hz	3	5	9	13
6Hz	3	5	9	14
5Hz	4	8	17	20
4Hz	4	8	18	20
3Hz	4	9	20	20
2Hz	5	9	20	20
1Hz	5	12	20	20

fig. 11



fig. 12

Second Curtain Sync:

With focal plane shutters, flash synchronization is normally activated when the first shutter curtain is completely open. With Second Curtain Sync, the 430 EZ is fired just before the second shutter curtain starts closing at the end of the exposure. To use Second Curtain Sync, **simultaneously** press the "+" and "-" buttons (fig. 12) to display the Second Curtain Sync symbol in the display panel.

This effect is more beneficial and noticeable at shutter speeds slower than 1/60 where the blur of a moving subject is frozen at the end of the exposure rather than the beginning--thus creating a more natural-looking rendition of that moving subject.

Note:

Second Curtain Sync does not work when the camera is set to Program mode, or when the 430 EZ is used off-camera.

Bounce Flash:

Bounce flash illuminates the subject by turning or angling the flash head to reflect its light off a wall, ceiling, card, etc. Because of the A-TTL output control of the 430 EZ, there is no need for exposure calculations or measurements when the camera is used in an automatic mode.

When the flash head is rotated by releasing the "Bounce Latch" (fig. 13) or lifting the flash head up, a Bounce Flash symbol (fig. 14) will appear on the 430 EZ's display panel. Once the camera's shutter release is partially depressed, the 430 EZ will emit a 1/20 power pre-flash to determine the best shutter speed or aperture value prior to the actual exposure.

Note: *The flash coverage of the 430 EZ auto-zoom mechanism indexes to the 50mm position although this is not displayed on the data panel. The zoom feature can be set to a manual position for user-set light distribution.*

Bounce Flash (Continued):

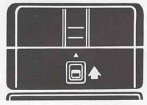


fig. 13

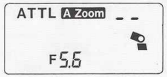


fig. 14

External Power Supplies:

Transistor Pack E (fig. 15) is an external power supply for the 430 EZ. It accepts two types of battery power--the Battery Pack TP using 6 "C"-size alkaline batteries, or the rechargeable NiCd Pack TP. The connecting cord from the Transistor Pack E to the 430 EZ plugs in at the base of the flash.



fig. 15

Transistor Pack E greatly increases the number of flashes possible from 1 set of batteries compared to AA cells. Additionally, recycling time between flashes is far shorter.

Transistor Pack E Shooting Capacity

Full Power Recycling Times: (Ready Lamp glows RED.)	Battery Pack TP -	0.2 - 8 seconds
	NiCd Pack TP -	0.2 - 2 seconds
Number of Flashes:	Battery Pack TP -	300 - 2,000
	NiCd Pack TP -	250 - 1,500

Notes:

*The Transistor Pack E **will not** power the 430 EZ if the 4 AA batteries in the flash are dead or are removed.*

The NiCd Pack TP can take up to 15 hours for a complete recharge.

The GREEN ready lamp (Rapid-Fire Flash symbol) does not appear when the Transistor Pack E is used.

The Transistor Pack E can only be used with the 430 EZ.

The Transistor Pack E does not have an ON/OFF switch. The power is supplied on demand to the 430 EZ, and controlled by the Speedlite's ON/OFF switch.

Speedlite 430 EZ Guide Numbers:

The following chart (fig. 16) shows the Guide Numbers in feet @ ISO 100 for the Speedlite 430 EZ.

Zoom Position		24mm	28mm	35mm	50mm	70mm	80mm
Normal Flash		82	89	99	116	132	142
Rapid-Fire Flash		1/2 to 1/16 of Normal Flash					
Manual Flash	1/1	82	89	99	116	132	142
	1/2	58	63	70	82	93	100
	1/4	41	45	50	58	66	71
	1/8	29	32	35	41	46	50
	1/16	20	22	25	29	33	35
	1/32	14	16	18	20	23	25

fig. 16

ADDITIONAL NOTES

Film Speed Setting automatically set by the camera through the connecting shoe.

AF Auxiliary Light automatically emits a focusing pattern in very low light or total darkness. The effective distance range is 3 to 33 feet. With EOS-1 and EOS 630, AF Auxiliary Light is only emitted during One Shot AF. AF Auxiliary Light is not emitted when the 430 EZ is used off-camera.

Slow-Sync Shooting can be achieved by setting the camera to the Aperture Priority or Shutter Priority modes. In this way, you can obtain long shutter speeds to balance the available light of the background with the 430 EZ's flash illumination of the subject.

Hot Shoe Lock Pin holds the flash securely in place on the EOS-1 and the EOS 630. This pin will retract when the 430 EZ is used on other cameras or the Off-Camera Shoe Adapter.

Off-Camera/Multiple Flash is possible in TTL (not ATTL) and manual flash modes through Canon's exclusive off-camera accessories:

TTL Hot Shoe Adapter 2 (placed in camera hot shoe)
Off-Camera Shoe Adapter (placed under off-camera flash)
Connecting Cord 60 (2 ft. coiled cord)
Connecting Cord 300 (9.8 ft. straight cord)
TTL Distributor (4-outlet junction box for multiple flash)

The following features are disabled when using the 430 EZ off-camera:

1. ATTL mode
2. Preflash
3. Second Curtain Sync
4. EOS Depth-of-Field AE
5. EOS 620/630/EOS-1 Program Shift
6. 430 EZ "A Zoom" ("M Zoom" is possible)
7. 430 EZ aperture value and coupling range not displayed.
8. AF Auxiliary Light

Compatibility with other Canon SLRs:

The 430 EZ is especially designed for use with the EOS-1 and EOS 630 cameras. With other Canon cameras, some features are not available. As an example, the hot shoe lock pin is only used with the EOS-1 and EOS 630. Other compatibility differences are as follows:

EOS 620/650: Flash-Fill Ratio Control (Exposure Compensation) is not possible.

EOS 750/850: Only Program ATTL is possible.

T90:
The following features are disabled:
1. AF Auxiliary Light
2. Aperture Value & Subject Distance Read-outs
3. Automatic Zoom

F-1 (original and current), other T-Series, all A-Series, and older model Canon SLR:
Only Manual Flash is possible. (No automatic flash exposure of any kind.) Refer to Guide Number Chart (fig. 18).

Speedlite 430 EZ Main Specifications

Type:
Energy-saving, automatic electronic flash unit. ATTL metering system measures light reflected from the film surface. Clip-on type with directly coupled contacts.

Flash Duration:
1.5 milliseconds or less

Flash Coverage Angle:
Covers more than the fields of view of 24mm, 28mm, 35mm, 50mm, 70mm, and 80mm using an auto internal zoom mechanism. Manual zooming is also possible.

Bounce Angle:
Upward: 0-90 degrees. Left: 0-180 degrees. Right: 0-90 degrees.

Flash Exposure Level Control:
Automatic: 0 to -1.5 EV based on available light, using exclusive Canon program.
Manual: +/- 3 EV in 1/3 step increments.

Out-of-Coupling-Range Warning:
If the subject is too far away, the shutter speed and aperture value blink in the viewfinder and on the camera's external data display when the shutter release is pressed halfway.

Guide Number @ ISO 100, feet:
116 (w/zoom set at 50mm)

Flash Coupling Range:
Rapid-Fire Flash (green ready lamp): 2.3 - 16.4-45.9 ft.(min-max)
Full-Power Flash (red ready lamp): 2.3 - 62.3 ft.

Speedlite 430 EZ Main Specifications(Continued):

ISO Range:
According to camera

Second Curtain Sync:
Available when used on camera in all exposure modes except Program & Depth-of-Field AE.

Dimensions:
(W x H x D) - 2 15/16" x 4 13/16" x 4 3/16" (75mm x 122mm x 106mm)

Weight:
12.7 oz. (365 grams) without batteries.

EOS Multiple Flash Accessories



C50-1632
TTL Hot Shoe Adapter 2 — makes possible automatic TTL multiple flash photography when the Speedlite EZ's is used on the EOS camera.



C50-1641
Off-Camera Shoe Adapter — facilitates using the flash separated from the camera. Used in conjunction with the TTL Hot Shoe Adapter and connecting cord.



C50-1651
TTL Distributor — is used to connect the TTL Hot Shoe Adapter to several Off-camera Shoe Adapters through several Connecting Cords.



C50-1671
Connecting Cord 300 (10 ft. long)
Connecting Cords 60 and 300 — are for connecting the above units. The cords are 60 and 300 cm long, respectively.



C50-1661
Connecting Cord 60 (2 ft. long)

EOS

TECHNICAL GLOSSARY

ARC FORM DRIVE (AFD)

The Arc Form Drive is a small but powerful electromagnetic motor used in most EF lenses as an autofocus actuator. The drive unit itself is arc-shaped to match the standard cylindrical configuration of a camera lens. The AFD is a modified Hall-type brushless stepping motor, which means that it possesses ample torque and extremely good start-stop response compared to rotary focusing motors found in body-integral AF SLRs. Also, AFD motors have superior resistance to wear and can be manufactured in a variety of sizes to custom-fit the needs of many different lens types.

The AFD drive shaft rotates at speeds from 6,000 to 12,000 rpm and transfers its power through a set of reduction gears to either a helicoid or cam attached to the focusing component of the lens. During AF operation, the AFD is disconnected from the lens's manual focusing ring, thus preventing unnecessary resistance even if the photographer's hand is touching the ring.

Changing from AF to manual focusing is accomplished with a simple switch on the lens.

ASPHERICAL LENSES

Aspherical (non-spherical) surfaces play an important role in Canon lenses. They provide maximum sharpness at all apertures because they can focus all incoming light at the focal plane (a theoretical impossibility with spherical lenses).

Another important benefit of aspherical lens elements is that they minimize flare (non-image forming light caused by internal reflections), particularly with high speed lenses.

A third benefit is that often, the number and size of lens elements in a given optical formula can be reduced. As a result, the size and weight of aspherical lenses is usually less than the equivalent spherical counterpart.

Aspherical formulas are particularly useful with short to medium focal lengths and/or wide aperture lenses. There are 10 aspherical lenses in the EF line, ranging from the 28mm f/2.8 to the 70-210mm f/4.

Canon uses two manufacturing techniques for aspherical lenses. The ground and polished method is used primarily with high speed or professional L-Series lenses including the 50mm f/1.0L and the 85mm f/1.2L.

The other method is called glass molding. In this procedure, an unfinished element is placed in a special aspherical mold. It is then rapidly heated, pressed into the mold, cooled, and polished.

Both methods produce top quality lenses. However, glass molding technology is currently limited to lens elements with diameters of 40mm or less and is most suitable for high volume production. The ground and polished method can accommodate larger diameters, and therefore is more suitable for high speed professional lenses.

A-TTL FLASH AE

A-TTL stands for Advanced-Through The Lens Flash Auto Exposure. It's the standard flash mode with the 300 EZ, 420 EZ, and 430 EZ Speedlites. A-TTL's unique feature is a small pre-exposure flash burst which measures approximate subject distance. Unlike other systems, A-TTL can provide confirmation of correct flash exposure before the picture is taken, even in bounce flash photography.

A-TTL can also provide totally automatic fill-in flash exposure if desired. However, many other options are possible, permitting the photographer to control the amount of automation according to the type of photograph he/she wishes to make.

For example, the ratio of flash exposure to available light is automatically set according to the level of available light. But when the 430 EZ is used with the EOS 630 or EOS-1, the automatic ratio can be overridden up to +/- 3 stops in 1/3 step increments.

Both shutter speed and aperture are automatically set when the camera is set to the Program Mode. But by selecting Shutter or Aperture Priority, the photographer can control either setting while achieving automatic fill-flash, even in low light.

BASIS (AF SENSOR FOR EOS CAMERAS)

The BASIS sensor is the heart of every EOS camera. Its job is to gather focusing information to be calculated by the camera's microprocessor network which then controls the focusing motor in each EF lens. BASIS stands for Base-Stored-Image-Sensor, referring to the sensor's electrical accumulation method which differs significantly from conventional CCD (Charge Coupled Device) designs used by most other AF SLRs.

Actually, due to the nature of TTL phase-detection AF, there are always at least 2 sensor arrays in every BASIS chip. In the case of the EOS-1, there are 4 arrays, 2 to detect horizontal lines and 2 for vertical lines. Each array consists of a large number of individual sensing elements.

The operational difference between BASIS and CCD designs is that BASIS contains individual amplifiers and peak-voltage monitors for each sensing element. BASIS preserves signal integrity by amplifying each electrical signal before it is read out, improving the quality of information that is provided to the AF calculation circuit. This results in unrivaled signal clarity (80 dB peak to thermal noise ratio with the original BASIS design).

Automatic Gain Control (AGC) is carried out with the aid of the peak-voltage monitors, thus providing appropriate signal amplification according to the level of incident light striking each element.

DEPTH-OF-FIELD AE

EOS provides a unique way of controlling the precise zone of sharp focus through Canon's exclusive Depth-of-Field AE. All models except the 620 have this feature, which makes use of both the AF and AE capabilities of the system.

The idea is to register the near and far points that need to be sharp in the scene, using AF. The camera then calculates the widest possible aperture that will render the zone between the two points sharply, sets the required intermediate focusing position, and finally sets the correct shutter speed using aperture priority.

This method allows complete control of depth-of-field. It permits the photographer to make the zone of sharpness shallow or deep, close to the camera or further away. If the selected zone of sharpness is too deep for the lens to handle, the camera warns the photographer with a blinking aperture display in the viewfinder. In this case, the photo can still be taken and the camera will do the best it can on depth-of-field. Otherwise, the photographer can reset the camera and start working on the next shot.

EL ILLUMINATION

EL stands for Electro-Luminescence. EOS uses EL for the external LCD (Liquid Crystal Display) data panels on top of the 620, 630, and EOS-1 cameras as well as the back panels of the 420 EZ and 430 EZ Speedlites. This allows soft, blue-tinted illumination of important information so that EOS remains easy to operate even in very poor light conditions.

Canon's EL panel consists of a transparent conductive film, a fluorescing layer, a non-conductive reflecting layer, and a back electrode, all sandwiched between 2 sheets of polyester film. The EL panel is placed underneath the LCD panel, and is activated by pressing a button. To conserve battery power, the display automatically shuts off after 6 or 8 seconds.

ELECTRO-MAGNETIC DIAPHRAGM (EMD)

Canon uses an EMD in every EF lens as an aperture control device. The EMD consists of a conventional set of aperture blades attached to a stepping motor. Ideal for aperture drive, the stepping motor has a small rotor which allows good start-stop response with high wear resistance and long life. Compared to mechanical aperture control, the EMD yields a great improvement in precision, while at the same time increasing consistency and improving reliability.

Another benefit of electronic diaphragm control is simplified depth-of-field preview in every exposure mode, including Program and Shutter Priority.

ELECTRONIC DATA COMMUNICATION IN THE EOS SYSTEM

From the start, the EOS system was designed to make full use of electronics as the best way to increase its functional capabilities. This involved some major commitments at the design level. Among them was the concept of placing intelligent circuitry in each component of the system, including lenses, accessory backs, and flash units.

Where some manufacturers have chosen to rely on ROM (Read-Only Memory) chips in their AF lenses, Canon has added a full-featured microprocessor including RAM (Random Access Memory) that is used to control the built-in focusing motors and aperture drive. Similarly, the flash microprocessor controls the automatic zoom head and many other features. By distributing the computing tasks among the various accessories, functional capabilities are increased.

Another important use of electronics resulted in Custom Function Control with the EOS 630 and EOS-1. The photographer can tailor basic camera operations to his or her personal preference. This type of control was never available in previous Canon SLRs.

Finally, the increase of "clock speed" (the rate at which computation is carried out) has produced a number of benefits. The most obvious of these is far quicker AF operation, and the previously impossible Focus Prediction capability now built into the EOS 630 and EOS-1.

ELECTRONIC FOCUS PRESET

Selected large-aperture EF telephoto lenses--the 200mm f/1.8L, the 300mm f/2.8L, and the 600mm f/4.0L--have a focus preset function that can "lock in" a focus setting. The photographer can focus on other shots, then when necessary return immediately to the preset focus with a quick turn on a special ring.

Focus preset works in manual focusing as well as Autofocus, so it can be used at all times.

EVALUATIVE METERING

Evaluative metering differs from center-weighted, partial area, or spot metering by analyzing a total of 6 zones which cover the entire picture area. The luminance (brightness level) of each zone is measured and the resulting data is "evaluated" by an exclusive algorithm (mathematical program) which sets an exposure value according to subject size, pattern, and contrast.

Particularly useful in backlit scenes, evaluative metering is equally effective in horizontal and vertical compositions. It can be used in any exposure mode (except Bulb) with any EF lens. In bright light, evaluative metering favors highlights, but in dim light, it exposes for the shadows. In the EOS 630 and the EOS-1, a newer algorithm provides improved exposure accuracy with transparency films.

FLOATING SYSTEM (CLOSE FOCUSING ABERRATION COMPENSATION MECHANISM)

When a lens is designed, the first step is to determine the focal length and speed. Next comes the closest focusing distance. In most 35mm still camera lenses, performance is optimized for intermediate to long distance, with somewhat poorer performance at close range.

The most common problem in close focusing is called "curvature of field." This means that the image projected on the flat focal plane is not flat, but instead bowl-shaped, or "concave." The result is loss of sharpness in the corners of the picture. Curvature of field is hardest to correct with large aperture and short focal length designs.

The Canon Floating System was developed to hold curvature of field to a constant minimum regardless of the focusing distance. It moves, or "floats" one of the elements independently as the rest of the lens moves during the focusing process. Another very important benefit is further reduction of spherical aberration in wide aperture formulas.

There are 2 variations on the Canon Floating System. With wide-angle lenses, the floating element is internal. The EF 24mm f/2.8 is an example of this type. With other lenses such as the close focusing 50mm f/2.5 Compact Macro and extremely large aperture formulas such as the 50mm f/1.0L and the 85mm f/1.2L, the rear element or group is fixed while the rest of the lens moves.

One other form of a "floating" element is used in the EF 135mm f/2.8 Soft Focus lens. However, in this case, the photographer controls the moving element to cause spherical aberration, resulting in a Soft Focus effect. It's important to note that without making this adjustment, the EF 135mm f/2.8 is extremely sharp.

FLUORITE & ULTRA-LOW DISPERSION (UD) GLASS

Chromatic aberration increases with focal length because of the dispersion of white light into its component wavelengths. Standard optical glasses can be combined to correct this problem for about 2/3 of the visible spectrum, resulting in what has become known as an achromatic formula.

However, fluorite crystal can correct chromatic aberration over virtually the entire spectrum, thus enabling the production of apochromatic lenses. "Apo" lenses produce spectacularly sharp images, making them highly desirable for color photography.

Canon leads the photographic industry in the use of calcium fluorite lens elements. In the EF line, they can be found in the 300mm f/2.8L, 600mm f/4.0L, 50-200mm f/3.5-4.5L, and 100-300mm f/5.6L. All of these lenses are fully corrected apochromatic formulas.

Another way of reducing chromatic aberration is by mixing fluorides with standard optical glasses, resulting in ultra low-

dispersion, or UD glass. Less expensive than fluorite elements, UD glass elements are found in all L-Series telephoto lenses. This includes the 4 fluorite lenses mentioned above plus the 80-200mm f/2.8L and the 200mm f/1.8L.

FOCUS PREDICTION

Although conventional AF systems can perform well with most still or slow moving subjects, they lose their effectiveness as the speed of motion increases. In response to this, Canon has developed a new technique called Focus Prediction, available in the EOS 630 and the EOS-1.

Instead of taking a single AF reading of a moving subject, Focus Prediction takes multiple readings at a fast rate. These readings are passed through a special calculator which uses the 3 most recent readings to determine subject speed and direction. Using this data and allowing for the inevitable time lag caused by moving the reflex mirror out of the light path before the shutter can open, Focus Prediction drives the lens to focus at the point where the subject will be during the actual exposure, ensuring maximum sharpness.

Focus Prediction is effective in both Single Frame and Continuous shooting. The maximum framing rate with Focus Prediction depends on the equipment that is used, as shown in the following list:

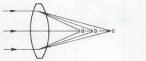
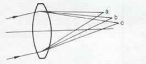
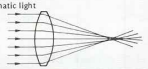
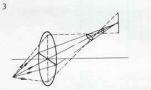
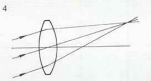
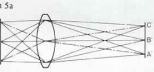
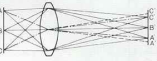
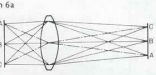
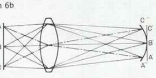
EOS-1 (Standard Body): 2.0 frames per second
EOS 630.....: 2.5 frames per second
EOS-1 (w/Booster E1).: 4.5 frames per second

INTELLIGENT PROGRAM AE

Program AE means fully automatic exposure. In other words, the camera selects both shutter speed and aperture values according to a mathematical program built into the camera's microprocessor. Canon introduced Program AE in 1978 with the A-1. Though highly advanced at the time, this initial implementation did not take lens focal length into account. As a result, photos taken with telephoto lenses could occasionally be blurred due to camera shake caused by slow shutter speeds.

Intelligent Program AE solves this problem by automatically reading the encoded focal length and maximum aperture information from the lens and setting an appropriate shutter speed/aperture combination. A special encoder for zoom lenses divides the focal length range into 32 increments, providing unequaled precision. Intelligent Program AE sets a minimum shutter speed value of 1/focal length at maximum aperture according to the light level, thus taking full advantage of both focal length and maximum aperture information. Even variable aperture zoom lenses are taken into account, with the EOS setting a constant aperture value throughout the zoom range whenever possible.

Lens Aberrations and Description

Type	Phenomenon	Optical Principle (Definition)
1. Chromatic Aberration 1-1. Longitudinal Chromatic Aberration 1-2. Lateral Chromatic Aberration	Illustration 1a white light  Illustration 1b 	1-1, An aberration that occurs from different indices of refraction, according to the color of the light, wherein each wavelength, e.g. a-wavelength, b and c, has a different focal point. 1-2, Image size differs according to wavelength. (Refer to Illustration 1-b) ● Impossible to eliminate this by changing the aperture.
2. Spherical Aberration	Illustration 2 monochromatic light 	This aberration is caused by the sphericity of the lens. The light does not focus at one point on the optical axis because of the different indices of refraction. (Illustration 2) ● This can be corrected by stopping down the aperture, but a shift in focus may result if the lens is stopped down too much.
3. Astigmatism	Illustration 3 	As the light from a point not on the optical axis passes through the lens, it is focused as an image along different tangential and sagittal focal lines. (Illustration 3) ● Though this can be slightly improved by stopping down the aperture, this cannot be very effectively compensated for.
4. Coma	Illustration 4 	The ray from a point not on the optical axis does not focus on one point of the image plane and there appears to be a comet-shape. (Illustration 4) ● This can be slightly decreased by stopping down the aperture.
5. Distortion	Illustration 5a  Illustration 5b 	 A plane is not represented as being a plane. A square is distorted either in a barrel or pin-cushion shape. The ideal image (Illustration 5a) should be an exact facsimile, like A'B'C' vis-á-vis the subject ABC but the distorted image is delineated as indicated by A'' C''. (Illustration 5b) ● Impossible to correct by changing the aperture.
6. Curvature of Field	Illustration 6a  Illustration 6b 	 With ideal image definition (Illustration 6a), the subject having points A, B, C, on the same plane corresponds to A', B', C' created on the image plane. If A' and C' do not focus on plane B', but on different points A'' or C'', only B' is in sharp focus while A'' and C'' are blurred. ● Almost impossible to compensate for by changing the aperture.

LENS ABERRATIONS

There is always a difference between the performance of an ideal lens and an actual lens. This difference is called lens aberration. There are many types of lens aberrations, but they fall into two distinct categories. Chromatic aberrations are caused by differences in the colors of light. Spherical aberration, astigmatism, coma, distortion, and curvature of field occur at all visible wavelengths.

It is very important that photographic lenses compensate for aberrations because the focused image is the key to the picture's image definition. Good lenses provide well balanced compensation for aberrations. The image quality of each lens depends on the amount of aberration remaining after compensation.

There are two kinds of chromatic aberration: longitudinal and lateral. Longitudinal chromatic aberration is also called dispersion and is caused by the different indices of refraction for each color of light. As a result, the image lacks sharpness and in color photography, there is a fringing effect. In lateral chromatic aberration, image magnification changes with wavelength, producing a blurred image similar to the type caused by longitudinal chromatic aberration. Stopping down the lens has only a limited effect on these aberrations.

Spherical aberration is caused because the lens is round and the film is flat. Light entering the edge of the lens is more severely refracted than light entering the center of the lens. This results in a blurred image, and also causes flare (non-image forming internal reflections). Stopping down the lens minimizes spherical aberration and flare, but introduces diffraction.

Astigmatism in a lens causes a point in the subject to be reproduced as a line in the image. The effect becomes worse towards the corner of the image. Stopping down the lens has very little effect.

Coma in a lens causes a circular shape in the subject to be reproduced as an oval shape in the image. Stopping down the lens has almost no effect.

Distortion, whether pincushion or barrel type, is caused by differences in magnification from the center toward the edges of the image. Stopping down the lens has no effect at all.

Curvature of Field is the inability of the lens to produce a flat image of a flat subject. The image is formed instead on a curved surface. If the center of the image is in focus, the edges are out of focus and vice versa. Stopping down the lens has a limited effect.

All Canon EF lenses are very highly corrected for these aberrations, resulting in unsurpassed image quality. In particular, we are well-known for extensive use of aspherical lenses, floating element design, Calcium Fluorite and Ultra-Low Dis sion Glass, especially in the professional L-Series.

PROGRAM SHIFT

Because there are times when even the Intelligent Program setting may be inappropriate for certain subjects, selected EOS cameras (EOS-1, 630, and 620) offer the alternative of Program Shift.

This adjustment is made by turning the main input dial while in Program mode. The exposure value remains the same, but the shutter speed and aperture settings shift up or down simultaneously in 1 step increments. The shifted settings are cleared and reset to normal 6 or 8 seconds after the last time the photographer touches the shutter release.

SECOND CURTAIN SYNC

Originally offered in 1986 with the T90 and 300TL, Second Curtain Sync is used for special effects with slow shutter speeds. By causing the flash to fire at the end of the exposure rather than at the beginning, it's easy to create artistic blur effects with moving subjects. The main difference compared to standard First Curtain Sync is that the blur trails the motion of the subject rather than preceding it.

Second Curtain Sync is most effective when used with either Shutter or Aperture Priority, and it can also be used when the camera is set to Manual mode. It's a standard feature on the 300 EZ, 420 EZ, and 430 EZ Speedlites, and is only available with the EOS 620, 630, 650, and EOS-1. Second Curtain Sync is not possible in Program mode, or when the flash is used off-camera.

STEPPING MOTORS

The advantage of a stepping motor is that the precise positioning of its rotor (the turning element) can be controlled by electrical signals. As with conventional electro-magnetic motors, stepping motor operation is based on the mutual repulsion between magnets on the rotor and the stator (a stationary component). As the name suggests, the manner in which power is applied to the coils, and subsequently the stator, causes the rotor to advance a step at a time, just like the second hand on a watch. The amount of movement can be precisely determined in steps, making it well suited to digital pulse-count control.

In the EOS system, both the Arc Form Drive (AFD) and the Electro-Magnetic Diaphragm (EMD) contain stepping motors as their drive power source.

TTL FLASH AE

When the EOS 620, 630, 650, or EOS-1 is set to Manual mode, TTL Flash AE is possible. In this mode, the photographer selects both shutter speed and aperture, and flash output is automatically controlled off the film plane. Usable distance ranges are automatically displayed on the 420 & 430 EZ data panels. The built-in flash of the EOS 750 and the 160E Speedlite operate in TTL mode only.

TTL-SIR PHASE DETECTION AF

This long acronym stands for Through The Lens-Secondary Image Registration Autofocus. It refers to the method employed by EOS (and most other AF SLRs) to detect the amount of defocus at the film plane. A simpler way of saying this is that the TTL-SIR system tells the camera how far out of focus the lens is, and in what direction.

Image-forming light first passes through the camera's main lens to the semi-transparent reflex mirror. Most of this light is passed to the camera's viewfinder for the photographer to see, but the rest of it is diverted to the AF sensor through a sub-mirror assembly.

At the bottom of the mirror chamber is the opening for the AF sensing device (for EOS, the BASIS chip). This point also represents the geometric equivalent of the film plane, so in reality the BASIS sensor is analyzing a "secondary" image which is created at this position.

As the light passes through the AF system, it hits a special prism that divides the image into two components which correspond in a limited way to the top and bottom halves of a split-image focusing aid. This type of focusing system is quite common in manual-focus SLRs. Each component image is projected onto one of the sensor arrays for electronic analysis.

As long as there is a discernible level of contrast in the analyzed portion of the image, the AF system can calculate the degree and direction of defocus almost instantly, resulting in a digital pulse-count instruction to the lens focusing motor through the control circuitry in the lens. EOS exceeds all other AF SLRs in the maximum amount of defocus that can be detected.

Upon completion of lens travel, the AF detection procedure is performed again immediately. If the resulting signal indicates that the subject is in focus, the viewfinder confirmation signal lights up, and an optional beeper is activated.

If the AF system is unable to find a discernible level of contrast after one complete search, lens movement is stopped and the AF symbol in the viewfinder blinks rapidly as an indicator.

ULTRASONIC MOTOR (USM)

Canon's ultrasonic motor is a ring-shaped direct-drive device which consists of a stator (a stationary element) bonded to a ceramic element and a rotor (moving element) attached to the focusing component of the lens and in contact with the stator. When voltage with a frequency of 20 kHz or higher is applied to the ceramic element, the vibrations generated by the ultrasonic sound produce waves which continuously advance around the stator. When the rotor is placed in contact with the stator under pressure from a washer spring, these waves apply propulsion to the rotor and make it turn.

The use of traveling waves as a source of drive power in this new motor is completely different from the principle of conventional motors which use the mutual effects of electric current and magnetic fields to produce rotary motion.

Used in selected Canon EF lenses as an autofocus actuator, this is the world's first practical implementation of ultrasonic motors in a consumer product.

Changing from AF to manual focus can be accomplished by setting a switch on the lens. However, with the EOS-1 and the EOS 630, manual focusing is possible in AF mode upon focus completion. (No external switching necessary.)

The features of Canon's ultrasonic motor include:

1. Extremely low rotation speed (Maximum speed is 40 rpm, with a control range from 0.2 to 40 rpm).
2. High torque (1.6 kg/cm.)
3. Low power consumption (maximum of 1 watt, allowing motor to be powered by camera batteries).
4. Broad range of operating temperatures (Normal operating range is -30C/-22F to 60C/140F).
5. Superior control due to unequaled start/stop response.
6. Quiet operation--almost noiseless.
7. No external electrical effects since no magnetic field is generated.

EOS 1

SALES PRESENTATION GUIDE

A GUIDE TO ASSIST THE RETAIL SALES PERSON IN THE PRESENTATION AND SALE OF THE EOS-1 CAMERA.

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QUALIFICATION GUIDE -- CHARACTERISTICS OF THE EOS-1 CUSTOMER.

While it is true that anyone could want a camera as technologically advanced as the new EOS-1, there are several characteristics to look for when qualifying a potential buyer:

1. He or she will either be an advanced amateur photographer with quite a bit of photographic knowledge or a working professional photographer.

2. We expect him or her to be an "upscale" customer who does not mind spending money to get the best and most advanced camera available today.

3. He or she will be well educated and you should have no trouble communicating or demonstrating the product.

4. He or she will be a customer that is up on the current state-of-the-art in cameras and knows a technological breakthrough when he sees one.

5. He or she may be just a customer who wants the "latest thing" in adult toys and wants the camera with the most status and "high-tech" appeal.

SOME PHRASES WHICH MAY ASSIST YOU TO DETERMINE WHETHER YOU HAVE A POTENTIAL EOS-1 BUYER:

1. State-of-the-art.
2. Top-of-the-line.
3. Twenty First Century Technology.
4. Rugged and Reliable, yet Lightweight.
5. Fully-automatic, yet user-controllable.
6. Designed with the best elements from the Canon F-1, T-90, and EOS-series cameras.
7. Sealed against hostile substances.
8. Constructed to meet the demands of heavy, professional use.

SAMPLE SALES PRESENTATION OF AN EOS-1

The following is a sample of how a typical sales presentation on a new EOS-1 should go to a customer who is not familiar with the camera but qualifies as an advanced amateur or working professional photographer. While you do not have to follow it exactly, if you do you will cover all the important features of the EOS-1 in less than ten minutes. It is also useful for simulated sales situations to train retail sales personnel.

BEFORE YOU START, PLEASE SET UP THE EOS-1 IN THE FOLLOWING CONFIGURATION:

1. SET ISO TO 3200
2. SET TO EVALUATIVE METERING
3. SET ON MANUAL MODE
4. SET TO ONE SHOT FOCUS; MAKE SURE LENS IS SET ON "AF" POSITION
5. SET SHUTTER SPEED TO 1/500
6. SET MOTOR DRIVE TO Ch (C with small grip)
7. CLEAR ALL CUSTOM FUNCTIONS; SET TO CF "F-4 0"
8. SET MAIN SWITCH TO "BEEP"
9. TURN QUICK CONTROL DIAL SWITCH ON
10. MAKE SURE THAT THE DIOPTER ADJUSTMENT KNOB UNDER THE EYECUP IS IN THE CENTER POSITION

NOTE: DEMO INSTRUCTIONS ARE IN BRACKETS [] AND THE DIRECTIONS ARE TO BE FOLLOWED LOOKING AT THE CAMERA FROM THE FRONT.

THE EOS-1 IS THE HIGH TECH COMBINATION OF THE TRADITIONAL CANON F-1, THE PROFESSIONAL CANON T-90 AND IS THE TOP OF THE LINE PRODUCT IN THE EOS SERIES WHICH WILL CARRY US INTO THE 21ST CENTURY.

[HAND THE CAMERA TO THE CUSTOMER.]

PEOPLE LIKE THE CANON F-1 BECAUSE IT'S COMFORTABLE TO HOLD AND HAS AN EASY MATCH NEEDLE MANUAL CONTROL SYSTEM. AS YOU PICK THIS CAMERA UP BY THE CONTOURED GRIP, NOTICE HOW EASILY IT FITS IN YOUR HAND. PUT THE CAMERA UP TO YOUR EYE AND DEPRESS THE SHUTTER RELEASE HALF-WAY. NOTE THE CAMERA INFORMATION IN THE BOTTOM OF THE FRAME AND THE MATCH NEEDLE INDICATOR ON THE RIGHT. NOW MOVE YOUR FINGER FROM THE BUTTON TO THE INPUT DIAL TO CHANGE THE SHUTTER SPEEDS AND MOVE YOUR THUMB TO THE QUICK CONTROL DIAL ON THE CAMERA BACK TO ADJUST THE MANUAL EXPOSURE UNTIL THE NEEDLE CENTERS.

[SWITCH THE LENS FROM "AF" TO MANUAL.]

[NOTE: IF CAMERA DISPLAY SHUTS OFF, TAP SHUTTER RELEASE TO RESTORE INFORMATION.]

ROTATE THE MANUAL FOCUS RING ON THE LENS UNTIL THE IMAGE APPEARS SHARP. NOTICE HOW IT FOCUSES JUST AS EASILY IN MANUAL AS IT DOES IN AUTOFOCUS. AS YOU CAN SEE, DESPITE IT'S ADVANCED DESIGN, THE EOS-1 FEATURES THE FULL MANUAL FOCUSING AND EXPOSURE CONTROL WE ARE ALL USED TO AND IS NOT OFTEN SEEN IN TODAY'S AUTOMATED CAMERAS.

LIKE THE F-1, THE CAMERA OFFERS YOU A CHOICE OF A HIGH SPEED MOTOR DRIVE AT UP TO 5.5 FRAMES PER SECOND OR A COMPACT WINDER AT 2.5 FRAMES PER SECOND. THE HIGH SPEED PACK RUNS ALL CAMERA FUNCTIONS FOR 65 ROLLS OF 36 EXP. FILM USING EIGHT AA BATTERIES AND ALSO HAS A VERTICAL SHUTTER RELEASE BUTTON.

ALSO LIKE THE F-1, THE CAMERA IS RUGGED AND WEATHERPROOF AND FEATURES A PC SOCKET FOR PROFESSIONAL ELECTRONIC FLASH CONNECTION.

LIKE THE PROFESSIONAL T-90, WE COMBINE A LIGHT-WEIGHT BODY, HIGH SPEED MOTOR DRIVE AND MULTIPLE METERING SYSTEMS.

[ROTATE INPUT DIAL TO LEFT AND PRESS ON VERTICAL SHUTTER RELEASE TO DEMONSTRATE MOTOR DRIVE AT HIGH SPEED.]

WHEN YOU LOOK THROUGH THE VIEWFINDER, NOTICE THE TWO CENTERED CIRCLES IN THE VIEWFINDER SCREEN. THEY INDICATE METERING AREAS FOR THE SPOT AND PARTIAL AREA METERS. TO DETERMINE WHICH METERING SYSTEM IS SELECTED, LOOK AT THE METERING PATTERN WINDOW IN DISPLAY ON TOP OF THE CAMERA. THIS COMPLETE LCD DISPLAY IS ANOTHER FEATURE TAKEN FROM THE T-90 AND SHOWS ALL OPERATING FUNCTIONS OF THE CAMERA IN A WAY THAT ONLY NECESSARY INFORMATION IS DISPLAYED. TO MAKE A CHANGE IN CAMERA FUNCTION, DEPRESS ONE OF THE LEFT HAND BUTTONS AND ROTATE THE INPUT DIAL UNTIL THE DESIRED FUNCTION PPEARS.

[PRESS MODE BUTTON, ADVANCE INPUT DIAL THREE CLICKS EITHER WAY--CAMERA NOW IN THE PROGRAM MODE.]

NOTICE THAT WHATEVER FUNCTION NEEDS TO BE CHANGED, THE CHANGE IS ALWAYS MADE BY THE INPUT DIAL. THIS IS ALSO TRUE OF THE CONTROLS UNDER THE PALM WING ON THE RIGHT SIDE OF THE CAMERA. THE SPEED AND PRECISION OF THE INPUT DIAL ALLOWS EITHER LARGE OR SMALL CHANGES TO BE MADE QUICKLY. IN ANY EXPOSURE MODE, THE SHUTTER AND/OR APERTURE CAN BE ADJUSTED IN INCREMENTS AS SMALL AS 1/3 STOPS. FOR LOW LIGHT WORK, THE LCD PANEL CAN BE ILLUMINATED.

[PRESS ILLUMINATOR BUTTON. SWITCH THE LENS FROM MANUAL TO "AF".]

BEING THE TOP OF THE EOS LINE MEANS THE EOS-1 IS THE FASTEST AUTO FOCUS CAMERA CANON MAKES. IT HAS TWO MAIN COMPUTERS INSTEAD OF ONE, WITH ONE USED ONLY FOR AUTOFOCUS AND FOUR BASIS FOCUSING SENSORS INSTEAD OF TWO, RESULTING IN LIGHTNING FAST RESPONSE. TO PROVE MY POINT, POINT THE BRACKET IN THE CENTER OF THE VIEWFINDER AT SEVERAL DIFFERENT SUBJECTS, ONE AT A TIME, AND NOTICE HOW QUICKLY THE CAMERA SNAPS INTO FOCUS WITH A GENTLE PRESS OF THE SHUTTER RELEASE. A SUBTLE CHIRPING SOUND INDICATES CORRECT FOCUS.

[WATCH CAREFULLY AND LISTEN FOR THE "CHIRP". IF THE CUSTOMER HAS DIFFICULTY FOCUSING, EXPLAIN THE NECESSITY OF FOCUSING ON LINES; TAKE THE CAMERA AND DEMONSTRATE CORRECT FOCUSING TECHNIQUES, IF NECESSARY.]

ALSO, AS YOU'VE PROBABLY NOTICED, THIS CAMERA USES THE CANON EF SERIES OF INTERCHANGEABLE LENSES. EACH LENS FEATURES A FULL COMPUTER AND TWO MOTORS - ONE TO FOCUS AND ONE TO CONTROL THE APERTURE. THIS FULLY ELECTRONIC SYSTEM ALLOWS FOR THE APERTURE TO BE MORE COMFORTABLY CONTROLLED BY THE QUICK CONTROL DIAL ON THE BACK OF THE CAMERA AND ALSO ALLOWS ELECTRONIC DEPTH OF FIELD PREVIEW IN EVERY CAMERA MODE.

[ROTATE INPUT DIAL TO THE RIGHT. DEPRESS PREVIEW BUTTON SEVERAL TIMES.]

AND SPEAKING OF MODES, THE CAMERA HAS SIX OF THEM. THE OTHER MODES ARE MANUAL CONTROL, SHUTTER PRIORITY, APERTURE PRIORITY, TIME EXPOSURE AND CANON'S UNIQUE DEPTH MODE.

[DEPRESS MODE BUTTON AND ROTATE INPUT DIAL THROUGH ALL MODES, ENDING IN THE PROGRAM MODE.]

RIGHT NOW, IT IS IN THE PROGRAM MODE WHICH SETS BOTH SHUTTER AND APERTURE BUT ALLOWS YOU TO SHIFT TO DIFFERENT COMBINATIONS WITHOUT CHANGING TOTAL EXPOSURE WITH A QUICK FLIP OF THE INPUT DIAL.

[DEMONSTRATE THIS.]

IF YOU WISH TO FINE TUNE THE EXPOSURE WHILE IN THE AUTOMATIC MODE, THE QUICK CONTROL DIAL WILL ACT AS AN EXPOSURE COMPENSATION WHEEL, GIVING YOU EASY ACCESS TO MANUAL EXPOSURE CORRECTIONS AND ENHANCING YOUR CONTROL OVER THE AUTOMATIC MODES. NOTICE THAT YOU CAN DO THIS WITHOUT REMOVING YOUR EYE FROM THE VIEWFINDER.

AUTOFOCUS MODES ARE SIMILARLY SELECTABLE.

[DEMONSTRATE AF MODE AND PUT CAMERA IN "AI SERVO" MODE.]

LIKE ALL OTHER EOS CAMERAS, THE EOS-1 FEATURES AN EVALUATIVE METERING SYSTEM. HOWEVER, THIS CAMERA CARRIES METERING CREATIVITY SEVERAL STEPS FURTHER BY ALLOWING YOU TO SELECT BETWEEN THREE ALTERNATE METERING SYSTEMS AND FEATURES A SEPARATE METER LOCK WHICH CAN BE ENGAGED IN ANY METERING MODE. LOOK, FOR EXAMPLE, AT HOW QUICKLY THE METERING SYSTEM REACTS TO A CHANGE OF LIGHT.

[DEMONSTRATE BY WAVING YOUR HAND IN FRONT OF THE LENS.]

NOW, DEPRESS THE METER LOCK BUTTON ON THE CAMERA BACK AND NOTICE THAT A STAR APPEARS IN THE LOWER VIEWFINDER DISPLAY INDICATING THE EXPOSURE VALUE IS LOCKED. NEXT, AS THE LIGHT CHANGES, THE EXPOSURE REMAINS LOCKED BUT THE DIFFERENCE BETWEEN THE NEW READING AND THE LOCKED READING APPEARS AS A SECOND INDICATOR IN THE RIGHT HAND DISPLAY. YOU CAN NOW DETERMINE IF YOU WISH TO KEEP THE LOCKED VALUE OR CHANGE TO THE NEW VALUE. IF YOU WANT TO CHANGE, PUSH THE METER LOCK BUTTON AGAIN. THE EXPOSURE CHANGES AND THE SECOND INDICATOR DISAPPEARS. THIS PRECISE METERING CONTROL IS AVAILABLE IN ALL METERING MODES.

FOR FURTHER CREATIVITY, YOU CAN BRACKET YOUR EXPOSURES USING THE EOS-1'S SOPHISTICATED AUTO EXPOSURE BRACKETING SYSTEM. TO ACTIVATE IT, PRESS THE TWO MIDDLE BUTTONS INSIDE THE PALM WING AND SELECT THE AMOUNT OF BRACKETING YOU WANT WITH THE INPUT DIAL.

[OPEN THE PALM WING. DEPRESS THE TWO BUTTONS AND DIAL IN ONE STOP EXPOSURE CONTROL.]

THE RIGHT SIDE VIEWFINDER DISPLAY NOW HAS THREE INDICATORS SHOWING THE EXPOSURE SPACING YOU HAVE SELECTED. THROUGH THE USE OF THE QUICK CONTROL DIAL, YOU MAY SHIFT THE CENTER POINT OF YOUR BRACKET TO ANY SPOT YOU WISH. PRESS THE SHUTTER RELEASE IN CONTINUOUS MODE AND THE CAMERA WILL AUTOMATICALLY SHOOT THREE SHOTS AND STOP.

[DEMONSTRATE THIS.]

THIS FUNCTION WILL REMAIN ENGAGED UNTIL THE CAMERA IS SHUT OFF OR THE BRACKETING BUTTONS ARE PUSHED AND DIALED TO ZERO. AS YOU CAN SEE, YOU HAVE TOTAL CONTROL OVER THE EOS-1 EXPOSURE SYSTEM EVEN IN THE AUTOMATIC MODES BECAUSE OF THE COMBINATION OF THE METER LOCK, AUTO EXPOSURE BRACKETING AND QUICK CONTROL DIAL.

PHOTOGRAPHING FAST ACTION APPROACHING YOU AND GOING AWAY FROM YOU IS THE MOST DIFFICULT SITUATION FOR AN AUTO FOCUS CAMERA. THE EOS-1'S SOPHISTICATED PREDICTIVE FOCUSING COMPUTER TURNS THIS DIFFICULT SITUATION INTO A SERIES OF SHARP PHOTOGRAPHS AS QUICKLY AS 4.5 FRAMES PER SECOND. PLEASE LET ME DEMONSTRATE:

[TAKE THE CAMERA YOURSELF. (NOTE:IF AEB IS STILL ENGAGED, TURN THE CAMERA OFF AND ON.) MOVE THE CAMERA UP AND DOWN WHILE PRESSING THE SHUTTER RELEASE AND POINT OUT THE FOCUSING CHANGES. HAND THE CAMERA BACK TO THE CUSTOMER.]

OW, YOU TRY IT. NOTICE THE SPEED AT WHICH THE CAMERA ADJUSTS OCUS. IT IS JUST THIS FAST WHEN THE SUBJECT IS MOVING INSTEAD OF THE CAMERA MOVING. IF YOU WANT TO KEEP THE CAMERA IN THE SERVO FOCUS E WITHOUT IT CONTINUOUSLY FOCUSING AS YOU SHOOT, YOU CAN RELOCA THE FOCUS CONTROL TO THE METERING BUTTON UTILIZING ONE OF

THE CAMERA'S EIGHT CUSTOM FUNCTIONS. THESE CONTROLS ACTUALLY REPROGRAM THE CAMERA'S MAIN COMPUTER AT ANY TIME YOU WANT FOR SPECIFIC SHOOTING SITUATIONS. TO SET UP THIS FUNCTION, PRESS THE TOP BUTTON UNDERNEATH THE PALM WING TWICE, AND NOTE THE TOP DISPLAY.

[DEMONSTRATE BY PRESSING THE CF BUTTON TWICE. THE TOP DISPLAY SHOULD SHOW "F-4 0" AFTER THE FIRST PUSH AND "F-4 1" AFTER THE SECOND PUSH. THIS MEANS CUSTOM FUNCTION #4 IS ACTIVATED.]

NOW FOCUSING AND SHOOTING CONTROLS ARE SEPARATED, FURTHER ENHANCING YOUR ABILITY TO HANDLE ANY PHOTOGRAPHIC SITUATION.

EVEN THOUGH THE EOS-1 IS COMPUTERIZED AND HIGHLY AUTOMATED, YOU CAN SEE THAT IT GIVES YOU MORE CONTROL THAN ANY OTHER EOS CAMERA. IT IS THE PERFECT MIXTURE OF AUTOMATIC MODES AND MANUAL OVERRIDES AND IS THE CAMERA THAT YOU SHOULD OWN. TONIGHT WOULD BE THE PERFECT NIGHT FOR YOU TO BE TAKING PICTURES WITH YOUR NEW EOS-1. SO LETS DESIGN THE EXACT PACKAGE OF CAMERA, LENSES AND ACCESSORIES THAT IS RIGHT FOR YOU AND YOUR TYPE OF PHOTOGRAPHY.

WOULD YOU LIKE TO PUT THAT ON YOUR CANON CREDIT CARD RIGHT NOW?

THE MOST COMMON SALES OBJECTIONS TO THE EOS-1 AND HOW TO OVERCOME THEM

1. THE PRICE IS TOO HIGH!

   This objection is often used when a customer is not really interested in buying the product or stalling for time. However, with any top-of-the-line camera, price is a factor because it is the most expensive camera we sell. Your job as a sales person is to prove to the customer that the EOS-1 is worth it. This is a concept called "perceived value." The speed and accuracy of the new autofocus system, both one shot and predictive, is one significant fact which makes the EOS-1 worth the money. The camera draws features from ALL of our previous top-of-the-line cameras (F-1, T-90 and EOS 620 & 630) and you can reiterate as many of those features as you need to convince the customer of the worth of the EOS-1. For specifics in this area, please refer to the sample sales presentation on page 2 of this section.

2. THE EOS-1 DOESN'T HAVE AN INTERCHANGEABLE PRISM SYSTEM LIKE THE CANON F-1.

   The EOS-1 was developed to provide accurate and reliable performance under extreme use conditions, such as those encountered in outdoor photography. With an interchangeable viewfinder, it is impossible to completely prevent moisture and dust from entering the camera through the rail section. We therefore opted for a fixed prism which provides superior moisture proof and dust-proof characteristics. Also, this eliminates the possibility of the prism being removed accidentally, rendering certain features of the camera useless. We also feel that the single most important reason to have an interchangeable prism is to permit the photographer to change focusing screens and that function is handled in the EOS-1 from inside the mirror box in similar fashion to the T-90.

3. THE NEW EOS-1 DOES NOT ACCEPT ANY OF THE CURRENT FD-SERIES OF CANON INTERCHANGEABLE LENSES.

   New breakthroughs in camera technology go hand in hand with new lens designs, especially in the age of computers. Today, camera body and lens actually interface with each other to transfer important data. While it would be nice to make new cameras compatible with older lenses, trying to make old lenses do new tricks compromises the entire system. Such is the case with EOS. Our EF series of lenses feature sophisticated focusing by means of miniature Arc-Form Drive or super silent Ultrasonic motors and precision aperture control by means of our innovative Electro-Magnetic Diaphragm. Add a RAM computer chip to each lens and you have a perfect intellectual match for the EOS-1 camera body. This combination is so sophisticated that, with Ultrasonic motor lenses, you can even manually adjust focus while in the AF mode after autofocusing

is completed. It is up to the salesperson to make sure that the potential customer fully comprehends what the EOS-1 can do and therefore realizes that the change was necessary.

4. THE EOS-1 DOES NOT HAVE AN ALL-METAL BODY LIKE THE F-1.

It used to be that an all-metal camera body symbolized strength and any camera that did not have one was perceived as not being able to stand up to the rigors of heavy professional use. Such is no longer the case. The fiberglass reinforced polycarbonate material used in the EOS-1 (the same material that is used to make safety helmets) is as strong as any material used in today's camera bodies. It is the same material we used to build the T-90 camera and its reliability in the field has already been proven. Further, today's materials are much lighter in weight, a fact which all photographers have learned to appreciate. In fact, the EOS-1 body is about 7 ounces lighter than a Nikon F-4.

5. THE CAMERA HAS TOO MANY MODES AND IS DIFFICULT TO USE.

The way a camera is first demonstrated to a potential customer is critical to the way the customer views the operation of that camera. It is up to the sales person to show the customer just how easy the EOS-1 is to operate. You most further convince the customer that the camera's many additional features add to the versatility of the camera and not to its being "complicated." For assistance in the proper way to demonstrate the EOS-1, please refer to the Sample Sales Presentation on Page 2 of this section.
NOTE: While the EOS-1 does not have the "GREEN ZONE" mode of the other EOS camera models for quick and simplified operation, it does have a "RESET" button located in the palm wing on the right side of the camera which performs a similar function.

6. THE EOS-1 IS MORE EXPENSIVE THAN THE EOS 630 AND YET THE 630 HAS MOST OF THE SAME FEATURES. IT'S NOT WORTH THE EXTRA MONEY.

The EOS 630 is a very sophisticated camera with a lot of the same features as the EOS-1. However, since the EOS-1 is designed with the professional photographer in mind, it is tested to withstand a greater variety of hostile environments without breaking down. The EOS-1 has superior dust and weather sealing capabilities and incorporates a stronger and more sophisticated shutter. The EOS-1 shutter is made of high-tech Super Duralumin for added strength and waterproofing. It features a higher top speed, faster flash synchronization and is controllable both automatically and manually in 1/3 stop increments (an industry exclusive). Further, the motor drive is faster and you have your choice of battery power. Add to that a more sophisticated metering system and superior manual control and it is easy to see why the EOS-1 is worth the extra money. However, all working professionals have more than one camera body and an EOS 630 should definitely be considered as a fine, compatible backup to the EOS-1.

7. I HAVE BEEN A WORKING PROFESSIONAL FOR YEARS AND I JUST DON'T LIKE AUTOFOCUS CAMERAS. I AM VERY GOOD AT FOCUSING CAMERAS.

The advanced EOS-1 autofocusing system, while quick and efficient, still cannot focus in all situations. That is why all EOS lenses (except the 'A' Series Zooms) incorporate manual focusing rings which work just like the cameras these people are used to. When you demonstrate the EOS-1 to this type of customer, please make sure you point out the easy manual focusing capability. However, autofocus is a valuable tool for the professional and there are many professional who are currently using autofocus with excellent results. Even though you may be perfectly capable of focusing, the EOS can focus faster with greater accuracy and consistency. This is especially apparent when using wide angle lenses in low light--a difficult situation. The autofocusing computer never feels bad, is never hung over and its computer eyes never get tired. It can clearly be a valuable tool for any photographer who makes a living with a camera.

8. THE EOS-1 DOESN'T HAVE THE SPOTMETER MEMORIES OR THE HIGHLIGHT/SHADOW BIASING CONTROLS OF THE HIGHLY SUCCESSFUL CANON T-90.

The T-90 camera featured the most sophisticated metering system that was possible to put in an SLR camera. After several years on the market, it became clear that not all of the high-tech metering features incorporated into the T-90 were being used by most photographers and, in fact, there was some duplication of functions. Since the EOS-1 is an eclectic design, incorporating the best features of the F-1, T-90 and other EOS cameras, the multiple metering systems and right-hand multi display from the T-90 were retained and the spotmeter memories and highlight/shadow biasing controls were dropped because the new quick control dial system incorporates all the manual override controls that any photographer would need.

9. THE EOS-1 IS A BRAND NEW PRODUCT. HOW DO I KNOW IT WILL HOLD UP LIKE YOU SAY IT WILL?

No new product has a reliability record the day it is introduced. However, the EOS-1 has been well thought-out and extensively tested in Japan before its introduction, and the cameras from which its systems are drawn (i.e., F-1, T-90, EOS 650/620) do have proven reliability records. The Canon EOS-1 carries a full one year Canon warranty. When selling a new product to a customer, emphasize the reliability and presence of the company rather than of the product. In this area, Canon is without peer in the 35mm camera business.

SUGGESTED TOTAL CAMERA/LENS/ACCESSORY PACKAGES FOR SOME OF THE MOST POPULAR PHOTOGRAPHIC PURPOSES.

1. BEGINNERS KIT -- for the photographer just starting out who wants to use his camera for a little bit of everything but really has nothing specific in mind:

   a) EOS-1 body with standard grip
   b) EF 35-70mm f/3.5-4.5 Zoom Lens
   c) EOS Ever-Ready Case L for EOS-1
   d) 300 EZ Flash
   e) 52mm 1A Skylight filter
   f) Lens Cleaning Kit & extra 2CR5 battery

2. TOURIST KIT -- for the photographer who travels a lot, travels light and is serious about bringing back more than just snapshots from his travels:

   a) EOS-1 body with standard grip
   b) EF 35-135mm f/3.5-4.5 Zoom Lens
   c) EW-68B Lens Hood
   d) 1 each 58mm 1A Skylight and Polarizing Filter
   e) 160E Electronic Flash
   f) Lens Cleaning Kit & extra 2CR5 battery
   g) Lead-lined film pouch to protect film from X-ray
   h) Compact, light-weight, folding tripod.
   i) Small Travel Bag

3. TWO-LENS AMATEUR KIT -- for the photographer who wants to cover himself for many photographic situations and be prepared for whatever excites him photographically.

   a) EOS-1 body with standard grip
   b) EF 28-70mm f/3.5-4.5 Zoom Lens
   c) EW-68A Lens Hood
   d) EF 70-210mm f/4 Zoom Lens
   e) ET-62 Lens Hood
   f) 1 each 52mm 1A Skylight and Polarizing Filter
   g) 1 each 58mm 1A Skylight and Polarizing Filter
   h) 430 EZ Flash
   i) Lens Cleaning Kit & extra 2CR5 battery
   j) EOS Deluxe Gadget Bag

4. PHOTOJOURNALIST KIT -- for the photographer who makes his/her living photographing events for newspapers and magazines and requires speed and versatility in a camera system:

   a) 2 EOS-1 bodies with standard grip
   b) 2 Power Drive Booster E-1
   c) EF 28-80mm f/2.8-4L Zoom Lens (hood incl.)
   d) EF 80-200mm f/2.8L Zoom Lens (hood incl.)
   e) 2 72mm 1A Skylight Filters
   f) EF 300mm f/2.8L Lens (hood & case incl.)
   g) 2 430 EZ Flash
   h) 2 Transistor Pack E for 430 EZ Flash
   i) Compact Monopod
   j) Full-Size Tripod
   k) Lens cleaning supplies and extra AA batteries
   l) Professional Camera Bag

5. SCENIC AND LANDSCAPE PHOTOGRAPHY KIT -- for the photographer who wants to record some of the natural beauty which surrounds us whether on vacation or near where we live. This kit includes wide angle, close-up and telephoto lenses to capture nature from every angle:

   a) EOS-1 body with standard grip
   b) EF 20-35mm f/2.8L Zoom Lens (hood incl.)
   c) EF 50mm f/2.5 Compact Macro Lens
   d) EF 100-300mm f/5.6L Zoom Lens (hood incl.)
   e) 52mm, 58mm & 72mm Polarizing Filters
   f) Lens Cleaning Kit & extra 2CR5 battery
   g) A sturdy tripod

6. SPORTS PHOTOGRAPHER'S KIT -- In the last decade, professional sports has turned into a big business and there are a lot of full-time sports photographers. The EOS-1 with its high-speed motor drive and predictive autofocus system at 4.5 fps is the perfect camera for these followers of action:

   a) 2 EOS-1 bodies with standard grip
   b) 2 Power Drive Booster E1
   c) EF 35-105mm f/3.5-4.5 Zoom Lens
   d) EW-68B Lens Hood
   e) EF 200mm f/1.8L Lens (hood & case incl.)
   f) EF 300mm f/2.8L Lens (hood & case incl.)
   g) EF 1.4X Tele-Extender
   h) EF 2X Tele-Extender
   i) 430 EZ Flash
   j) Lens cleaning supplies & extra AA batteries
   k) A sturdy monopod
   l) A photo vest for equipment storage while on the job.

7. PORTRAIT KIT -- Any photograph where a person is the central point can be called a portrait and there are many different kinds. From weddings to sittings, here is a three-lens kit that will give this EOS-1 photographer the equipment to handle any portrait situation with perfect results in daylight and with flash:

   a) EOS-1 body with standard grip
   b) EF 28-70mm f/3.5-4.5 Zoom Lens
   c) EF 85mm f/1.2L Lens (hood incl.)
   d) EF 135mm f/2.8 Softfocus Lens
   e) 2 430 EZ Flash
   f) TTL Hot Shoe Adapter 2
   g) Off-Camera Shoe Adapter
   h) Connecting Cord 300
      NOTE: Above three pieces are to allow you to use both 430 EZ flashes with TTL control
   i) Bounce-card reflectors for 430 EZ
   j) Lens Cleaning Kit & extra 2CR5 battery
   k) 2 portable light stands

8. CLOSE UP/MACRO KIT -- The wonderful world of close-up is easily accessible to the EOS-1 photographer that uses the camera with these specially designed accessories which will allow him perfectly exposed and focused photographs as close as a 1:1 reproduction ratio (a life-size image):

   a) EOS-1 body with standard grip
   b) EF 50mm f/2.5 Compact-Macro Lens
   c) Life-Size Converter EF
   d) Macro Ring Lite ML-3
   e) Lens Cleaning Kit & extra 2CR5 battery
   f) table top tripod

Name _____

Address _____

_____

Dealer _____

EOS-1 FEATURES TEST

1. What does the term "EOS" represent?

   A) Electro-Optical System.
   B) The camera of the future today.
   C) The Goddess of Dawn.
   D) All of the above.

2. Canon utilizes an electronic mount for EOS cameras in place of a mechanical mount, the type that all other autofocus manufacturers on the market today. Why?

   A) With an electronic mount, no lens microprocessor is necessary for intelligent signal transfer.
   B) The mount diameter decreased from 54mm to 48mm which eliminated mirror cut-off with long lenses.
   C) An unparalleled degree of precision is achieved with digital electrical signals, and also the mount established a highly flexible interface to the future.
   D) Decreasing the flange back provides a 100% viewfinder field of view.

3. With high torque, noiseless operation, and high start/stop response, the ultrasonic motor (USM) is key to quiet, speedy, and highly accurate autofocus drive operation. Which EF lenses utilize USM?

   A) 135mm Softfocus, 200mm f1.8L, 300mm f2.8L, 600mm f4L.
   B) 200mm f1.8L, 300mm f2.8L, 20-35mm f2.8L, 50-200mm.
   C) 50mm f1.0L, 85mm f1.2L, 200mm f1.8L, 300mm f2.8L, 600mm f4L, 28-80mm f2.8-4L.
   D) 50mm f1.0L, 85mm f1.2L, 200mm f1.8L, 300mm f2.8L, 20-35mm f2.8L, 80-200mm f2.8L.

4. Aspheric optical construction, present in L-series lenses, and now available in regular lenses through the use of glass molded optics (GMO), corrects for:

A) Chromatic aberrations.
B) Spherical aberrations.
C) Astigmatism.
D) All of the above.

5. What type of special optics does Canon utilize to correct for chromatic aberrations in telephoto lenses?

A) Aspheric optical construction.
B) Fluorite and Ultra-low dispersion (UD) glass.
C) ED glass.
D) EMD - Electro-magnetic diaphragm.
E) All of the above.

6. The EOS-1 employs which of the following information processing systems?

A) A single dedicated super-microprocessor for AF and AE.
B) A high-speed, super-microprocessor dedicated to AF, working simultaneously with a second microprocessor dedicated to AE.
C) A high-speed, super-microprocessor dedicated to AF, working sequentially with a second microprocessor dedicated to AE.
D) Two low-speed micro-processors controlling AF and AE.

7. Canon is the only manufacturer to utilize this unique auto-focusing sensor necessary for achieving speedy focusing and high-sensitivity under low-light conditions. The sensor is:

A) CCD - Charge-Coupled Device.
B) BASIS - Base-Stored Image Sensor.
C) AIA - Active Infrared Autofocus.
D) AFS - Autofocus Sensor.

8. BASIS was created to meet the autofocusing needs of professional photographers? How does BASIS accomplish this?

A) Preserves signal integrity by amplifying the electrical signals before they are read out through switching.
B) Equipped with an extra circuit, it boosts the signal ten times in order to improve sensitivity and S/N ratio.
C) Using two 47-bit horizontal and two 29-bit vertical line sensors.
D) All of the above.

9. Where is the spot metering cell located?

A) Incorporated into the evaluative metering sensor.
B) On a separate sensor near the mirror box.
C) On the BASIS sensor.
D) None of the above.

10. What is the standard focusing motor for the EF lens system?

A) USM - Ultrasonic motor.
B) AFD - Arc Form drive.
C) EMD - Electro-magnetic diaphragm.
D) CL - Coreless.

11. How many focusing screens are available for the EOS-1?

A) 0
B) 27
C) 7
D) 4

12. What are the advantages of an Electro-magnetic diaphragm (EMD)?

A) Allows depth of field preview in all modes.
B) Larger aperture lenses are possible.
C) Faster autofocusing.
D) Allows focus pre-set.

13. The EOS-1 incorporates the following metering patterns:

A) 2.3% Spot.
B) 5.8% Partial metering.
C) Evaluative metering.
D) Center-weighted metering.
E) All of the above.

14. How many zones does Canon's evaluative metering use?

A) 5
B) 6
C) 4
D) 3

15. What shutter speeds are available with the EOS-1?

A) 30 seconds - 1/4000 (1/3 step & 1/2 step increments).
B) 30 seconds - 1/8000 (1/3 step increments).
C) 30 seconds - 1/8000 (1/3 step & 1 step increments).
D) 30 seconds - 1/8000 (1/3 step & 1/2 step increments).

16. What functions are controlled with the Quick Control Dial?

A) Shutter speed in manual mode.
B) Aperture in manual mode.
C) Exposure compensation in automatic modes.
D) All of the above.

17. Which of the following statements on autoexposure bracketing (AEB) is false?

A) AEB range is +/- 3 steps in 1/3 step increments.
B) Exposure compensation can be used simultaneously.
C) AEB can be operated in all exposure modes except manual.
D) Turning off the camera deactivates AEB memory.

18. Which of the following is not controlled by the Custom Functions?

A) Leave the film leader out on rewind.
B) Change AF start to AE lock button.
C) Cancel DX coding.
D) Change self-timer from 10 seconds to 2 seconds.

19. Which statement best describes the power drive booster?

A) Uses 12 AA batteries with three film winding modes: Single, Continuous H - 5.5 fps, Continuous L - 3 fps.
B) Uses 8 AA batteries with three film winding modes: Single, Continuous H - 5.5 fps, Continuous L - 3 fps.
C) Uses Ni-Cd batteries.
D) A and C only.
E) B and C only.

20. Does the EOS-1 have a PC socket?

A) Yes.
B) No.
C) Maybe.
D) Only camera bodies with odd serial numbers.

21. What information is displayed in the viewfinder and not on the LCD?

A) Focus confirmation light.
B) Shutter speeds.
C) Frame counter.
D) Exposure compensation.

22. How many exposures are possible with the ME feature?

A) 9
B) As many as you wish.
C) 2
D) 36

23. What is the top X-sync of the EOS-1?

A) 1/500 second.
B) 1/90 second.
C) 1/125 second.
D) 1/250 second.

24. In what exposure modes can the depth-of-field preview be used?

A) Aperture-priority only.
B) Shutter speed-priority only.
C) Manual only.
D) All of the above.

25. When can a USM lens be focused manually?

A) In manual focus mode.
B) When custom function 4 is engaged.
C) When the lens is removed from camera.
D) All of the above.
E) A and B only.

26. What focus modes are available?

A) Manual.
B) Servo with focus prediction.
C) One-shot.
D) All of the above.

27. Where is the AE lock button located?

A) Next to the lens mount.
B) On the power booster.
C) Next to the exposure compensation button.
D) B and C only.
E) A and C only.

28. Which feature is found on all EOS camera except the EOS 1?

A) Predictive autofocus.
B) Green Zone.
C) Evaluative metering.
D) A-TTL auto-flash.

29. How does Canon ensure moisture-resistance in the EOS-1?

A) Underwater housing.
B) Rubber seals and gaskets.
C) Intermittent windshield wipers.
D) All of the above.

30. Which features provide the EOS-1 with superior reliability?

A) Extra tough glass fiber-reinforced polycarbonate body, 25% thicker than other models.
B) Moisture resistant seals and gaskets.
C) Double electrical contacts.
D) Self-diagnostic functions.
E) All of the above.

TECH REP:_____

TRAINING DATE:_____

DATE RECEIVED HDQ:_____

SIZE: S M L XL

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