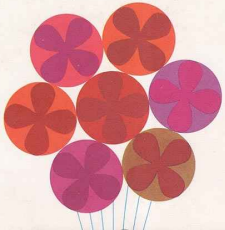
Bell & Howell / Canon

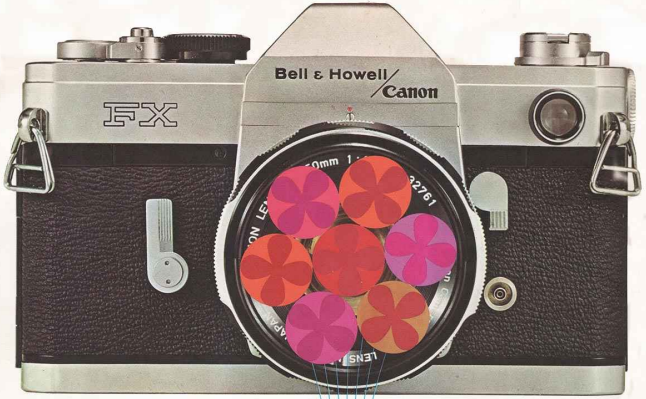
Bell & Howell • Photo Sales Company • 7100 McCormick Road • Chicago 48, Illinois

F10091

Printed in U.S.A.



A fine photographic instrument... built a little better than it really has to be



To capture the color and action of your life

a new photographic instrument and complete picture making system

The new Bell & Howell/Canon FX single lens reflex is not simply a camera. It is a compact and fast-handling photographic instrument that has the feel, the fineness, the flexibility, and the superb engineering needed for professional results. And yet, the new FX offers the simplicity and the low price that makes it much more than just practical for the serious amateur. It is ideal for either amateur or professional, offering exciting new creative horizons in photography.

Exciting color photography, especially in low-light levels, is easily within your grasp with the FX. This instrument captures the mood and the truth of any scene. The sharpness and brilliance of the image, the precise fidelity of the color as seen by the famous Canon lenses with their light-gathering power, are accurately and faithfully transferred to the film.

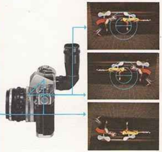
For all who love fine photography, the newcomer and the old hand alike, the lightweight FX offers both simplicity and versatility. It can delight and spur esthetic imagination. Your creative impulses, unfettered by mechanical fuss or restrictions, can happily explore light and shadow, form and composition, and pleasing color combinations.

Two single lens reflex cameras to choose from

There are two versatile Bell & Howell/Canon single lens reflex cameras to choose from the FX which is fully illustrated and described in this booklet, plus the FP. The FP, (pictured above) has all the features of the FX less meter and shutter lock. Bell & Howell/Canon single lens reflex cameras start under $20[illegible]

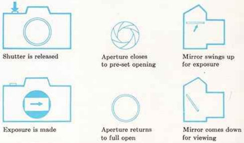
Bell & Howell/Canon FX–the ideal SLR

SLR is the abbreviation of single lens reflex photography. It enables you to view your subject matter with the taking lens. You see exactly what will be recorded on the film. This type of camera and this type of picture taking have become the favorite of amateur and professional photographers around the world. Years of exacting research have created the new, incomparable FX with an exposure synchronization system that is super fast, trouble-free and extremely easy to handle. It's quick-as-a-wink action is the result of synchronizing the shutter release with an automatic aperture and a quick-return mirror. To this is coupled an exacting range viewfinder system involving split-image precision focusing with a compact pentaprism for even, across-the-field sharpness.



The automatic diaphragm allows you to pre-set the aperture opening at any desired F stop. (A manual aperture ring. permits depth-of-field previewing.) The shock proof quick-return mirror quietly and smoothly swings up and down by synchronized signal. The shutter release, when tripped to make an exposure, actuates the system's elements simultaneously, instantly. All resume the pre-exposure position automatically, instantly ready for the next exposure.

Here's how the FX SLR system works—quick as a wink



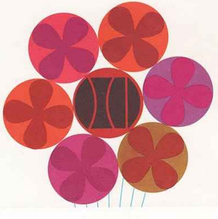
Canon lenses–heart of the FX system

The interchangeable lens, to SLR, is more than the camera's eye. It is the very heart of the camera. And, the Bell & Howell/Canon FX photographic instrument, which boasts so many exciting built-in features, has the finest interchangeable lenses in the world. They range from a super wide angle distortion-free, 19-mm, to a super fast f/1.2 normal lens, to a super telephoto 1000-mm. Included is a 55-mm—135-mm zoom lens. All up to 200-mm have automatic diaphragm control! Each Canon lens is completely free of aberrations. Each provides the fastest speed for its focal length, with superior definition and resolution. All surfaces of the lenses in the Canon optics system are Spectra coated, insuring maximum color and tone balance, greater light transmission and complete elimination of glare. Open out these facing pages and discover, with pictures, the tremendous versatility available to you with the superior FX series lenses. Read the information about a new method of testing and measuring lens performance inside the back cover. It is called Modulation Transfer Function, and is referred to as MTF. It is important to you in your selection of a lens and a camera because, in SLR, a camera is only as good as its lens, and this new method proves the superiority of Canon lenses.

Canon lens specifications

Lens	Type	Angle of View	No. Elements	Diaphragm Type	Mag. Ratio to Stan. Lens	Lens* Const.	Min. Apert.	Focusing Range		Coating	Attachment Size		Net Weight
								Meter	Foot		Cap	Filter	
FL 19mm f/3.5	Wide	96°	9	Manual	0.38	9E, 7C	16	0.5-7	1.75-20	Magenta purple	58	58	5 oz
FL 35mm f/2.5	Wide	64°	7	Auto	0.7	7E, 5C	16	0.4-3	1.5-10	Magenta	60	58	12 oz
FL 50mm f/1.8	Std.	46°	6	Auto	1	6E, 4C	16	0.6-10	2-30	Amber	50	48	8 oz
FL 58mm f/1.2	Std.	41°	7	Auto	1.2	7E, 5C	16	0.6-10	2.30	Amber	60	58	14 oz
FL 85mm f/1.8	Long focus	29°	5	Auto	1.7	5E, 4C	16	1.20-10	3.5-60	Magenta purple	60	58	16 oz
FL 100mm f/3.5	Telephoto	24°	5	Auto	2	5E, 4C	22	1.10	3.5-30	Purple	50	48	10 oz
FL 135mm f/2.5	Telephoto	18°	6	Auto	2.7	6E, 4C	16	1.5-30	5.10	Magenta	60	58	1.7 lb
FL 200mm f/3.5	Telephoto	12°	7	Auto	4	7E, 5C	22	3.50	8.1-50	Magenta	60	58	1½ lb
FL 55-135mm f/3.5	Zoom	48° 18°	13	Auto	Var.	13E, 10C	22	7.1000	2.50	Bal. am. mag.	60	58	1¾ lb
R 300mm f/4	Long Telephoto	8°	5	Manual	6	5E, 4C	22	No Dis. Scale		Magenta	Special		2.6 lb
R 400mm f/4.5	Long Telephoto	6°	5	Manual	8	5E, 4C	22	No Dis. Scale		Magenta	Special		3.3 lb
R 600mm f/5.6	Long Telephoto	4°	2	Manual	12	2E, 1C	32	No Dis. Scale		Purple	Special		4 lb
R 800mm f/8	Long Telephoto	3°	2	Manual	16	2E, 1C	32	No Dis. Scale		Purple	Special		4.2 lb
R 1000mm f/11	Long Telephoto	2°	2	Manual	20	2E, 1C	32	No Dis. Scale		Purple	Special		4 lb

*E = Number of lens elements/C = Number of lens components.



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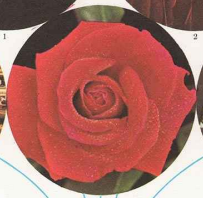

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5

Lens and exposure—1. 19mm, 1/15 at f/4; 2. 35mm, 1/15 at f/11; 3. 19mm, 1/2 at f/5.6; 4. 35mm, 1 sec. at f/16; 5. 19mm, 1/50 at f/11;

Wide angle lenses—fast and distortion free

If you've ever been caught in a tight situation, with your back to the wall with still not enough shooting room, you know the importance of super wide angle (90°) 19-mm lens. And if you're after a shot of a youngster's birthday party, you know the value of a fast wide angle lens to capture the animated group. Both lenses offer a wide depth of field but the 19mm's depth of field is unsurpassed. Canon has two to choose from. Both are completely distortion-free and fast.

FL 35-mm f/2.5 Wide angle lens

FL 19-mm f/3.5 Super wide angle lens

1

2

3

4

5

Lens and exposure—1. 85mm, bounce strobe at f/16; 2. 50mm, 1/15 at f/16; 3. 55mm, 1/50 at f/11; 4. 38mm, 1/100 at f/1.8; 5. 50mm, 1/30 at f/11;

Normal Lenses—super-speed with maximum performance

The ideal all-purpose standard lens is one particularly suited for available-light shooting. It should provide sharpness, brilliance, and superior color fidelity. These qualities are found in the normal lenses for the FX system. These lenses allow you to take pictures even at full aperture with practically no flare. They are well adapted for most picture-taking situations, day or night, with existing light, flash or sunlight. The realism of scenes using existing light is easily attained with any of the fine standard lenses available with the Bell & Howell/Canon FX camera.

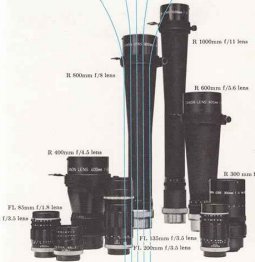
LONG FOCUS LENS—This special purpose lens is superior for portrait photography where you desire the subject clear but a hazy background. This lens provides superior central resolving power throughout the entire range from close-up to infinity at all aperture stops as a result of Canon's continuous improvement in the correction of spherical and chromatic aberration.

FL 58-mm f/1.2 Lens

FL 85-mm f/1.8 Lens

FL 50-mm f/1.8 Lens

1 2 3 4 5



Lens and exposure—1. 800mm, 1/8 at f/8; 2. 1000mm, 1/4 at f/16; 3. 400mm, 1/200 at f/5.6; 4. 200mm, 2 sec. at f/16; 5. 300mm, 1/60 at f/16;

Telephoto lenses—10 focal lengths for dramatic distance shots

When you want the precious detail of activity or subject matter beyond the scope of your normal lens, a Canon telephoto is the answer. Vivid close-ups of sports action, intriguing far distant scenes, and hard-to-reach subjects, can all be captured on film. One lens type can add more beauty to your portraiture work, another can record night shots with new clarity. The ten focal lengths give capability to the FX to cover almost any situation.

1 2 3 4 5

Lens and exposure—all zoom lens; 1. 1/250 at f/8 2. 55mm to 135mm, 1 sec. at f/8; 3. 1/30 at f/8; 4. 1/30 at f/8; 5. 1/30 at f/8;

Zoom lens—instant and variable focus

For those who like to pick their focal length instantly, the Canon zoom lens is a boon. It has a zooming ratio of 2.5x and is equipped with a fully automatic diaphragm. Result: amazing versatility. You will find sheer joy in discovering how the zoom movement smoothly and effortlessly glides to any focal length from 55-mm to 135-mm. From a single vantage point, you can frame from full scene to dramatic close up. Only 5⅝" long and very light, 1¾ lb.

Features—a little better than they really have to be

1. *automatic reset exposure counter*—Counts exposures as you shoot then returns automatically to "S" (start) when camera back is opened.
2. *shutter safety lock*—Eliminates accidental shutter release yet keeps camera cocked for instant operation with the flick of a finger.
3. *additive film advance with rapid action station*—Convenient lever advances in one smooth motion or in several short moves, whichever you prefer. Permits rapid film advance without fouling neck strap. Rapid action station, away from camera body, facilitates quick advance for quick shooting.
4. *exacting shutter mechanism*—Focal plane shutter offers accurate timing at all speed ranges from 1 second to 1/1000 of a second plus B (time) and X (electronic flash).
5. *in-line accessory shoe*—Sturdy metal shoe is located atop the compact pentaprism in line with lens for proper mounting of accessory viewfinders, flash or other accessories.
6. *reflex viewing*—Precision single-lens reflex viewfinder means fast, sure focusing. Split-image rangefinder is supplemented by ground glass collar for close-up focusing.
7. *meter window*—Highly visible aperture scales plus blue area for battery check.
8. *on-off and battery check switch*—Switch for meter doubles life of 1.3 V mercury battery to two years. Battery check switch permits check of battery by simple observation of movement of battery needle.
9. *rapid rewind crank*—Large size, easy to operate, with rotating knurled handle.
10. *meter sensitivity switch*—Change from high sensitivity LV 1 to 10 to low sensitivity LV 9 to 18 to match light conditions.
11. *highly sensitive CdS meter*—Coupled to shutter speed dial. Range from LV 18 down to LV 1 with ASA 110 film.
12. *depth-of-field preview*—Permits quick check of depth of field by simply turning ring to show scene as it will be photographed through stepped-down aperture.

13 | 15 | 17 | 19 | 21
14 | 16 | 18 | 20

More Features—to create better pictures more easily

13. *self-timer controlled by shutter release*—With self-timer lever cocked, shutter release activities timer. Time delay is adjustable to meet any picture making situation.

14. *quality Canon lenses*—Complete range of Canon lenses, with automatic diaphragm from 35-mm through 200-mm gives the photographer control of any situation. These lenses, widely known and greatly admired for their faithful color reproduction and superior definition and resolution, are available from 19-mm super wide angle to 1000-mm super-telephoto.

15. *compact pentaprism*—Precision single-lens reflex viewfinder lets you see the entire picture exactly as brightly as the FX will take it. Compact design of the prism keeps the FX among the smallest SLR cameras available. Canon's unique design allows the photographer to view over the top of the camera easily.

16. *fully automatic aperture*—You can view and adjust focus with full brightness at all times. As shutter is released, aperture closes down to pre-set opening, mirror swings up out of the way, exposure is made, aperture opens to wide position and mirror swings down for view of what has been taken. Action is so fast that no blackout of vision occurs. Gives a "follow-through insurance" view of what has been taken.

17. *quiet, shock-free operation*—Mirror swings up and down quietly and smoothly with only a discreet shutter click and no shocks to distract the picture maker.

18. *independent mirror lock*—Convenient lever locks mirror up or lowers it back into position, independent of film advance or shutter operation. (You don't waste a frame by activating shutter or film advance to release mirror.) Mirror lock permits mounting of the Bell & Howell/Canon 19-mm super wide angle lens.

19. *D ring safety lock*—Unique feature prevents neckstrap fouling because D ring will not rotate.

20. *automatic flash synchronization*—Single flash terminal with automatic time lag adjustment (sync.) to assure accuracy with FP, M or F class bulbs.

21. *small and lightweight*—Only 5⅝ x 3⅝ x 3⅝ inches. Weighs only 23 oz. (body only).

Accessories to complete the system

Bell & Howell/Canon presents a wide range of accessories to complement the FX instrument and Canon lenses. With these items Bell & Howell/Canon FX adapts to virtually any photographic assignment from the action of a football game to photomicrography.

1. *filters*—add versatility and give perfect results in any light
2. *lens hoods*—to eliminate extraneous light
3. *close-up lenses*—for 50mm normal lens through 200mm
4. *flash units*—for single or multiple flash pictures
5. *bellows*—for close-up as well as long telephoto photography
6. *right angle finder*—for low angle shots or waist level viewing
7. *lens mount converters*—adapt other lenses to FX
8. *extension tubes*—to extend lens from film for close-up work
9. *copy stands*—for recording documents and other copy work
10. *camera holder*—to cradle camera firmly
11. *cable release*—for use on tripod for time exposures or copy work
12. *diopter eyepieces*—eyesight adjustment lenses
13. *sportsfinder*—for large field viewing in action photography

Bell & Howell/Canon FX specifications

Type: 35-mm full frame single-lens reflex with focal plane shutter.
Viewfinder: Eye-level viewfinder using Pentaprism Dach Prism Waist level viewer can be attached.
Focusing: Specially processed focusing glass of high resolution power. Fresnel lens incorporated. Split-image rangefinder for accurate focusing. Ground glass color.
Mirror: Quick-return shock-free mirror may be fixed at open position.
Standard Lens: FL 50mm, f/1.8mm or FL 58mm, f/1.2.
Aperture: Fully automatic pre-set aperture diaphragm preset aperture can be released.
Shutter: Focal plane shutter with click stopped shutter speed dial. Equally spaced speeds from 1 to 1/1000 of a second plus B (time) and X for flash synchronization. Double exposure possible.
Built-in Exposure Meter: CdS meter coupled to shutter speed dial. High and low sensitivity rating. High has range LV1 to LV10 and low ranges from LV9 to 18. Powered by 1.3 volt mercury battery.
Battery Checker: Checks potency of battery by meter needle.
Flash Synchronization: FP and X terminals. Synchronize to FP, M, or F class bulbs and to speedlight. Time lag automatically adjusted.
Built-in Self-Timer: Time delay adjustable. Activated by shutter release
Film Advance: Single-stroke lever which rotates 160°. Ratchet permits additive advance with short strokes.
Film Rewind: Rapid crank rewinding after rewind button is pressed.
Film Loading: Hinged back cover opening and closing. Takes regular 35mm film cartridge.
Safety Device: Shutter button has safety and time lock lever.
Interchangeable Lenses: FL series of wide angle, normal, telephoto and long telephoto lenses. FL 19mm f/3.5, FL 35mm f/2.5, FL 50mm f/1.8, FL 58mm f/1.2, FL 85mm 4/1.8, FL 100mm f/3.5, FL 135mm f/2.5, FL 200mm f/3.5, FL Zoom Lens 55mm to 135mm f/3.5, (manual aperture) 300mm f/4, 400mm f/4.5, 600mm f/5.6, 800mm f/8, 1000mm f/11.
Film Counter: Self-resetting type.
Camera Size: 5¾ in. X 3⅝ in. X 3⅝ in.
Camera Weight: 23 oz. (body only)

Modulation transfer function

a new method of measuring lenses . . . added proof of Canon superiority

MFT is a new way of revealing lens performance measuring both resolution (the ability of a lens to reproduce an image of an object) and contrast (the ability of a lens to distinguish the degrees of brightness between adjacent light and dark area).

The previous "Resolving Power" method of measuring lenses became outmoded because it was dependent upon (1) the variable properties of photo emulsions, (2) hard-to-produce processing condition, (3) the human eye for readings, and (4) a hard-to-control method of testing.

Modulation transfer function testing. As your eye can see light of only certain wavelengths, a range of 4000 to 7000 angstroms (ultraviolet is below 4000; infrared, above 7000), so too will a lens pass only a certain range of optical information. The information transmitted is measured in terms of cycles per millimeter, or CPMM. Twenty equally spaced white lines and black spaces in one millimeter length (space) equal 20 CPMM.

The object to be reproduced by the lens being tested is referred to as INPUT. The resulting brightness pattern of adjacent light and dark areas of the image transmitted by the lens is OUTPUT. Transfer function refers to that information presented to a lens which is transferred by the lens. On an oscilloscph, the changes from high to low brightness are electronically recorded as a curve.

The X-axis of the accompanying graphs is expressed in CPMM, reading from 0 to 70 CPMM (most films resolve about 70 lines per MM). The x-axis represents resolution; the y-axis, contrast.

Figure I shows an input image. Figure II shows how a theoretically perfect lens would transfer this input information. Figure III shows how a typical real lens would transfer the input information to an oscilloscope output pattern. As the detail of input information gets smaller, observations in the lens degrade the output information, causing sharply defined lines between the bars to look like curves, contrast also degenerates as the CPMM are increased, contributing to the slope of the curve.

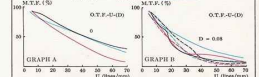
The oscilloscope reads the difference between black and white response. Because this difference becomes less at higher frequencies, the line (connecting the peaks of the individual cycles) describing the output curve slopes down in Figure III. The perfect lens in Figure II would have a horizontal line on the graph. The better a lens is the flatter the curve will be and the higher the MTF percentage.

Figure I Figure II Figure III

Graphs prove Canon superiority. Graph A compares the performances of the normal lenses of Camera N and Camera P with the FX. Readings were taken on the optical axis with the lens focused for the best image. At wide open, the FX lens has an MTF of about 30% at 70 CPMM, Camera P at 25% MTF, and Camera N 8%. At f/2.8 the FX lens leads with 55%; Camera P has 45%, Camera N only 12%.

Graph B gives MTF curves for the lens when focused .083MM in front of and beyond the best image. These defocused lines indicate depth of focus. A perfect lens would yield two parallel lines the same distance from the "0" line or the curve of the lens when focused exactly on the image.

Surprisingly, the FX f/1.8 normal lens has a better depth of focus (0% MTF at 70 CPMM), than the Camera N with its slower f/2 lens which has only 1% MTF. Generally, one would expect a slower f/2 lens to have a better depth of focus than an f/1.8 lens.



Complete lens evaluation and comparisons involved testing with measurements on axis, off axis and throughout the field. Results showed conclusively that the Bell & Howell/Canon FX normal lens significantly out-performs both the lenses of Camera P and Camera N. Write for complete test report: Dept. 0007, Bell & Howell Co., 7100 McCormick Road, Chicago, Illinois 60645.