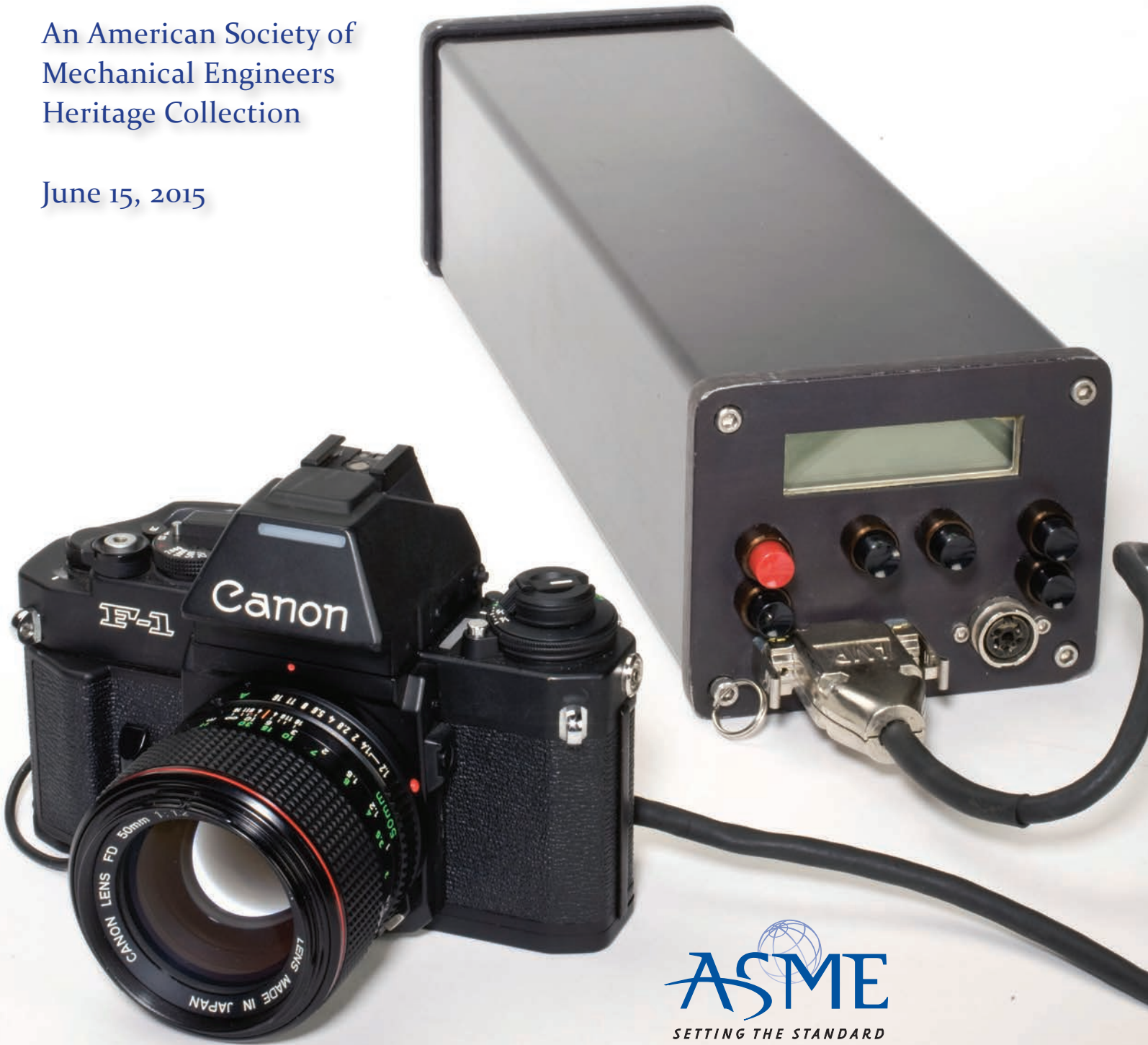


George Eastman House Technology Collection

An American Society of
Mechanical Engineers
Heritage Collection

June 15, 2015



For more information about George Eastman House and the technology collection, please visit eastman.org or call (585) 271-3361.

For more information about the American Society of Mechanical Engineers, please visit asme.org.

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Cover: Tactical Camera, 1988. Eastman Kodak Company, Rochester, New York. 2012:0185:0001.

Back cover: Detail of identification plate signed by maker. Full-plate daguerreotype camera, 1839. Alphonse Giroux. Gift of Eastman Kodak Company, ex-collection Gabriel Cromer. 1978.1631.0001.



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The History and Heritage Program of American Society of Mechanical Engineers

Since the invention of the wheel, mechanical innovation has critically influenced the development of civilization and industry as well as public welfare, safety, and comfort. Through its History and Heritage Program, the American Society of Mechanical Engineers (ASME) encourages public understanding of mechanical engineering, fosters the preservation of this heritage, and helps engineers become more involved in all aspects of history.

In 1971 ASME formed a History and Heritage Committee composed of mechanical engineers and historians of technology. This committee is charged with examining, recording, and acknowledging mechanical engineering achievements of particular significance. For further information, please visit www.asme.org

History and Heritage Landmarks Designation

There are many aspects of ASME's History and Heritage activities, one of which is the landmarks program. Since the History and Heritage Program began, 257 artifacts have been designated throughout the world as historic mechanical engineering landmarks, heritage collections, or heritage sites. Each represents a progressive step in the evolution of mechanical engineering and its significance to society in general.

The landmarks program illuminates our technological heritage and encourages the preservation of historically important works. It provides an annotated roster for engineers, students, educators, historians, and travelers. It also provides reminders of where we have been and where we are going along the divergent paths of discovery.

ASME helps the global engineering community develop solutions to real world challenges. ASME, founded in 1880, is a not-for-profit professional organization that enables collaboration, knowledge sharing, and skill development across all engineering disciplines, while promoting the vital role of the engineer in society. ASME codes and standards, publications, conferences, continuing education, and professional development programs provide a foundation for advancing technical knowledge and a safer world.



George Eastman House

Founded in 1947 as an independent nonprofit institution, George Eastman House is the world's oldest photography museum and one of the leading international film archives. The museum holds unparalleled collections—encompassing several million objects—in the fields of photography, cinema, photographic technology, and photographically illustrated books, and it is a leader in film preservation and photograph conservation. Eastman House is located in Rochester, New York, on the National Historic Landmark estate of entrepreneur and philanthropist George Eastman, the father of popular photography and motion picture film.

The Technology Collection

George Eastman House holds the world's leading collection of photographic and cinematographic technology, the most comprehensive held by any institution in North America. Consisting of more than 16,000 artifacts from the earliest days of photography to today's integrated, handheld digital devices, the collection contains all the equipment necessary for photographic image making, as well as printed documentation related to the business, manufacturing, and marketing of the photographic and motion picture industries.

From devices that predate the formal invention of photography in 1839 to the modern instruments used by both amateurs and professionals, the collection offers an unparalleled opportunity to examine and learn about photographic technology. Many of the objects are unique, representing significant scientific achievement and holding distinguished historical provenance. The collection includes cameras and equipment used by renowned photographers such as Ansel Adams, Eadweard Muybridge, Arnold Newman, Alfred Stieglitz, and Edward Weston.

The core collections are both European and American in origin; the greatest strengths are early French and American cameras. Among the collection's holdings are still and motion picture cameras and projectors, handheld mono and stereo viewers, lenses, accessories, film and paper packaging supplies, exposure measuring instruments, and objects related to darkroom developing and printing, including enlargers, timers, and trays. The collection also includes the Eastman Kodak Company Patent collection.

This booklet includes premier examples of cameras from the technology collection. They represent the superior scope of historical artifacts that informed ASME's decision in granting George Eastman House its History and Heritage Landmarks designation.

Full-plate daguerreotype camera

1839

Alphonse Giroux, Paris, France.

Gift of Eastman Kodak Company,
ex-collection Gabriel Cromer.

1978.1631.0001



Jean-Baptiste Sabatier-Blot (French, 1801–1881).
Louis Jacques Mandé Daguerre, 1844. Daguerreotype.
Gift of Eastman Kodak Company, ex-collection of
Gabriel Cromer. 1976:0168:0043.

The Giroux daguerreotype apparatus is photography's first camera manufactured in quantity. On June 22, 1839, Louis Jacques Mandé Daguerre (1787–1851) and Isidore Niépce (1805–1868) (the son of Daguerre's deceased partner, Joseph Nicéphore Niépce) signed a contract with Alphonse Giroux (a relative of Daguerre's wife) granting him the rights to sell the materials and equipment required to produce daguerreotype images. Giroux rapidly met with sales both in and outside of France; the first export of his company's cameras arrived in Berlin, Germany, on September 6, 1839.

The Giroux camera was an improved version of the apparatus used by Daguerre in his groundbreaking experiments in photography, now fitted with a landscape-type lens produced by Charles Chevalier, a renowned designer of optical systems for microscopes and other viewing devices. The camera is a fixed-bed, double-box camera with an attached 15-inch f/15 Chevalier lens, accompanied by a smaller rear box that slides inside for picture focusing. It measures 12 x 15 x 20 inches (30.5 x 38.1 x 50.8 cm) and produces an image of 6½ x 8½ inches (16.5 x 21.6 cm), a size format known as a full- or whole-plate daguerreotype. It also houses a mirror held at a forty-five degree angle from the focusing glass on which an image is composed prior to loading and exposing a sensitized plate.

The Giroux was sold as an outfit consisting of a camera, lens, plate holder, iodine box for sensitizing daguerreotype plates, mercury box for chemical development, and an assortment of other items necessary to produce the unique, mirror-like images. In a nod to product marketing in an emergent and competitive industrial age, Giroux "branded" his outfit with trademark authority when he attached a plaque to his cameras inscribed with the statement, "No apparatus is guaranteed if it does not bear the signature of Mr. Daguerre and the seal of Mr. Giroux."

Full-plate daguerreotype camera (owned by S.A. Bemis)

1840

Alphonse Giroux (attrib.),
Paris, France.

Gift of Eastman Kodak Company.

1978.1792.0001



Samuel A. Bemis (American, ca. 1793-1881).
King's Chapel Burying Ground, Tremont Street,
Boston, winter, ca. 1840. Daguerreotype.
Gift of Eastman Kodak Company, ex-Eastman
Historical Collection.1980.0788.0013.

Samuel A. Bemis (1793–1881), a Boston dentist, bought one of the first cameras sold in the United States. He and his heirs saved not only the camera but also its receipt, evidence of what is probably the earliest documented sale of an American daguerreian outfit. From the receipt, we know that on April 15, 1840, he paid \$76 to François Gouraud, Giroux's agent in the U.S., for a "daguerreotype apparatus," twelve whole plates at \$2 each, and a freight charge of \$1. The apparatus, which Gouraud advertised as consisting of sixty-two items, included the camera, lens, plate holder, iodine box for sensitizing plates, mercury box for developing plates, holding box for unused plates, and a large wooden trunk to house the entire system. Quite large, the camera weighs about thirteen pounds and can produce full-plate images, 6½ x 8½ inches in size.

Bemis made his first daguerreotype on April 19, 1840, from the window of his Boston office, and during the next several years went on to expose more than three hundred images, most of them in his beloved White Mountains of New Hampshire. The George Eastman House collection also contains a second Bemis camera and nineteen of his images.

Kodak Camera (barrel shutter)

1888

Eastman Dry Plate & Film

Company, Rochester, New York.

Gift of Eastman Kodak Company.

1990.0128.0001



Unidentified photographer. Drive—Prospect Park;
Kodak #1 snapshot, ca. 1888. Albumen print.
1981.1158.0054.

In 1888, the world first learned of the Kodak, which originally was the name of a handheld box camera rather than an entire company. The camera was manufactured by Frank Brownell of Rochester, New York, for Eastman Dry Plate & Film Company, also of Rochester. The name was coined by George Eastman, who is said to have favored the letter "K" and wanted something memorable and pronounceable in multiple languages.

Expensive for the time, the purchase of a Kodak at \$25 (\$625 in 2015 US dollars) included a factory-loaded roll of sensitized film, enough for one hundred 2½-inch circular images. After exposure, the still-loaded camera was returned to Rochester, where the film was developed, prints made and mounted on card stock, and a new film roll inserted, all for \$10. This ease of use was such a key selling point that Eastman soon promoted sales with the slogan, "You press the button, we do the rest."

An early "point-and-shoot" camera, the Kodak revolutionized the photographic market with its simplicity of use and freedom from the mess of darkroom chemistry. The first successful camera to use roll film, it stood for convenience. Some 5,200 Kodak barrel shutter cameras were made before a change was made, replacing the barrel shutter with a simpler sector shutter mechanism. The modified camera was still called a Kodak until the introduction of the larger No. 2 Kodak (with a 3½-inch diameter image) in October 1889, when the improved model was renamed the No. 1 Kodak.

Those first Kodaks marked the beginning of photography as a tool and pastime for the common person. They played an imperfect role in establishing what would become Eastman Kodak Company (in 1892) as the first international photofinishing concern. Soon, a seemingly endless line of new Kodak models offered more features and larger images, all contributing to the worldwide identification of the Kodak brand with the growing popularity of amateur photography.

Edison Kinetoscope

1894

Edison Manufacturing Company,
West Orange, New Jersey.

George Eastman House collection.

1982.1619.0003



The Kinetoscope was the world's first motion picture device to use flexible film. Patented by Thomas Edison in 1891 but not demonstrated until 1894, it did for the eye what the phonograph did for the ear. W.K.L. Dickson, an employee of Edison Manufacturing Company, was assigned the task of converting Edison's idea into a working device and making sensitized transparent film for the Kinetoscope. Eastman Dry Plate & Film Company had recently introduced 70mm-wide transparent nitro-cellulose film for their Kodak camera. Dickson purchased film from Eastman's Kodak, slit it to 35mm, and perforated it on both edges to match the advance mechanism of the Kinetoscope—a modification representing the ancestral beginning of the 35mm film used for more than a century in both still and motion picture cameras. In operation, the Kinetoscope is a continuous loop viewer for thirty-five feet of film, running at twenty frames per second, producing about thirty seconds of motion, accomplished by its unique stroboscopic single-slit spinning disc shutter. Along with designing the machine, Dickson was also assigned the task of making sensitized the transparent film the Kinetoscope needed. This proved to be rather difficult, but as it turned out, the Eastman Dry Plate and Film Company had recently introduced 70-mm wide transparent nitro-cellulose film for their Kodak camera.

Cinématographe

1895

Lumière Frères, Paris, France.

1978.1651.0005



Unidentified photographer. Francis Doublier with Lumière Cinématographe, February 13, 1895. Gelatin silver print. 1981:2904:0011. This is thought to be the camera held by Eastman House.

The Lumière Cinématographe is considered the first successful motion picture system. In 1894, Auguste and Louis Lumière began developing a machine for projecting the films used by Thomas Edison's Kinetoscope. The system the Lumières devised consisted of a camera that also functioned as projector and printer for 35mm motion pictures. Designed to be portable, it used a hand-cranked mechanism for film advance; by comparison, the Kinetoscope was built into a heavy stationary cabinet, using a battery-powered electric motor to power the film advance. The Lumières' system produced a much brighter and sharper image than the Kinetoscope as it used a pull-down claw intermittent mechanism, allowing the film to pause in the gate during exposure or projection (similar to the stop-and-go mechanism used in a sewing machine) and providing the illusion of motion. This mechanism, or a variation of it, became a standard motion picture device.

The Lumière Cinématographe was demonstrated several times in 1895, by which time the Lumière brothers were showing films of their own making. The demonstrations culminated at the Grande Café in Paris on December 28, where in a rented basement room outfitted with a hundred seats, they held the first commercialized public screening of motion pictures.

Brownie (original model)

1900

Eastman Kodak Company,
Rochester, New York.

1978.1657.0002



Introduced by Eastman Kodak Company in 1900, the Brownie camera was an immediate public sensation due to its simple-to-use design and inexpensive \$1 price. Now almost anyone, irrespective of age, could be a photographer without the specialized knowledge or cost once required for the capture and processing of images. An important aspect of the Brownie camera's rapid ascendancy in popular culture as a must-have possession was Eastman Kodak Company's innovative marketing. The company took the unusual step of advertising the Brownie in popular magazines of the day, instead of specialty photography or trade magazines with limited readership. In addition, George Eastman derived the camera's name from a character found in popular children's books by the Canadian author Palmer Cox. Eastman's astute union of inventive advertising placement and product naming with a built-in youth appeal had great consequence for the rise of modern marketing practices and mass consumerism in the twentieth century.

The Brownie was designed and manufactured for Eastman Kodak Company by Frank A. Brownell, who produced all of Kodak's cameras beginning in 1888. The use of inexpensive materials in the camera's construction, and George Eastman's insistence that all distributors sell the camera on consignment rather than allowing them to set their own price, enabled the company to control the camera's \$1 price tag and keep it within easy reach of consumers' pocketbooks. More than 150,000 Brownies were shipped in the first year of production alone, a staggering success for a company whose largest single-year production to date had been 55,000 cameras (the No. 2 Bullet, in 1896). The Brownie launched a family of nearly two hundred camera models and related accessories, which over the next sixty years helped to make "Kodak" a household name.

o-Series Leica

1923

Ernst Leitz GmbH, Wetzlar,
Germany.

1974.0084.0111



Starting about 1905, Oskar Barnack (1879–1936) of Carl Zeiss in Jena, Germany, began working on a small pocketable camera to take on outdoor excursions. At the time, cameras using the most common format of 13 x 18 cm (5 x 7 inches) were quite large and not well suited for hiking. Around 1913, Barnack, then with Ernst Leitz Optical Works in Wetzlar, designed and hand-built several prototypes of a small precision camera that produced 24 x 36-mm images on leftover ends of 35mm motion picture film. Three of these prototypes survive. The most complete one has been dubbed the “Ur-Leica,” meaning the first or “Original Leica,” and is in the museum of Leica Camera AG in Solms, Germany.

Barnack and his employer Ernst Leitz II used the small camera in 1914, but no further development of it took place until 1923, when Leitz decided to make a pilot run of twenty-five cameras, serial numbered 101 through 125. Still referred to as the Barnack camera, these prototypes were loaned to Leitz managers, distributors, and professional photographers for field testing. The evaluations were not enthusiastic, as the testers thought the format too small and the controls too difficult to manipulate. Despite its reviews, Leitz authorized the camera’s production, basing his decision largely on a desire to keep his workers employed during the post-World War I economic depression. An improved version of the “O-Series Leica,” the Leica I, or Model A, with a non-interchangeable lens was introduced at the 1925 Spring Fair in Leipzig, Germany. The name “Leica,” which derives from Leitz camera, appeared only on the lens cap.

Shown here is a O-Series Leica, serial number 109. It is one of three known examples with the original Newton viewfinder.

Super Kodak Six-20

1938

Eastman Kodak Company,
Rochester, New York.

Gift of Eastman Kodak Company.

2001.0636.0001



The Super Kodak Six-20 was the first production camera to feature automatic exposure (AE) control. Aimed at removing the exposure guesswork for photographers, the camera's shutter-preferred AE control meant that the photographer chose the shutter speed and the camera "chose" the correct lens opening. Kodak's engineers accomplished this feat by mechanically coupling a selenium photo cell light meter, located just above the top half of the camera's folding clamshell, to the lens aperture. This advancement, though groundbreaking, was not picked up by most camera manufacturers for some twenty years after the debut of the Super Six-20. These days, automatic exposure is a standard feature on almost all cameras.

Auto exposure was not the only cutting-edge feature of the Super Six-20. It was also the first Kodak camera to use a common window for both the rangefinder and viewfinder. The film advances with a single-stroke lever, which also cocks the shutter, thus preventing double exposures. Like auto exposure, these features would not become common on cameras for many years. Innovative features aside, the Super Kodak Six-20 is one of the most attractive cameras ever marketed. Its lovely clamshell exterior design was styled by legendary industrial designer Walter Dorwin Teague.

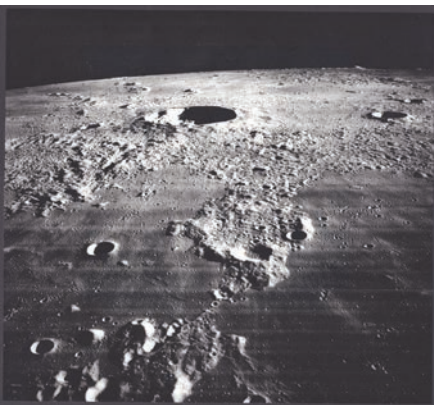
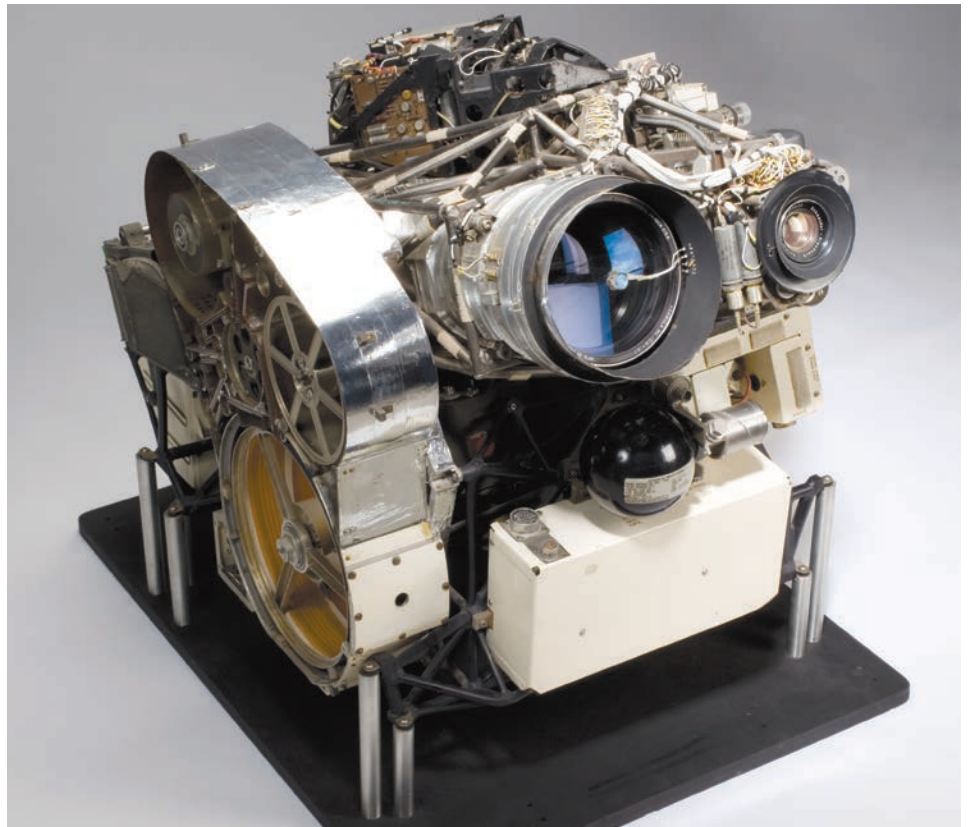
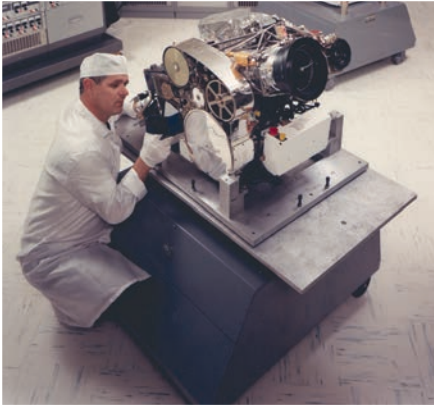
All this innovation came at a rather high price and not without some problems. The Super Kodak Six-20 retailed for \$225 in 1938 (more than \$2,000 today), and it had a reputation for being somewhat unreliable—the built-in self-timer was known to lock up the shutter. Since only 719 models were manufactured, it is one of the rarest production Kodak cameras.

Lunar Orbiter Payload

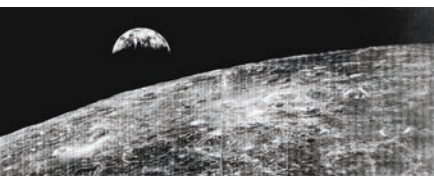
1967

Eastman Kodak Company,
Rochester, New York.

1981:0795:0001



Oblique view of the moon crater Kepler, February 5, 1967. NASA, Lunar Orbiter III. Gelatin silver print. Gift of William Vaughn. 2000:0636:0015.



First view of earth from moon, August 23, 1966. NASA, Lunar Orbiter I. Gelatin silver print. Gift of William Vaughn. 2000:0636:0001.

In a Congressional address on May 25, 1961, President John F. Kennedy asked for seven to nine billion dollars for the space program, to be used over a five-year period for the goal of “landing a man on the moon and returning him safely to earth.” To reach that end required resolving many highly technical issues, including mapping the complete lunar surface to determine a safe landing site.

To accomplish this monumental task, Eastman Kodak Company was commissioned by Boeing Aerospace to design and build the camera payload for Lunar Orbiter, the name given by NASA to its moon-mapping satellite. Employing cutting-edge camera, film, and processing technology, Lunar Orbiter produced a photographic survey of landing sites on the moon in advance of the manned Apollo flights in the late 1960s and 1970s. It used unperforated 65mm bimat film, acquired from the earth orbit SAMOS (Satellite and Missile Observation System) reconnaissance satellite, that was exposed by the Orbiter’s two lenses, then processed and scanned with a fax machine-like technology, onboard before images were transmitted by satellite to earth. The images had the highest resolution available at the time and produced detailed views of the moon that are still useful today. The survey also contained the first-ever view of the earth taken from the vicinity of the moon. In total, five Lunar Orbiters explored the earth’s moon from horizon to horizon. The example in the Eastman House collection was intended as the seventh but was never deployed due to the early success of the Lunar Orbiter program.

Tactical Camera

1988

Eastman Kodak Company,
Rochester, New York.

2012:0185:0001



Tactical camera is the earliest known digital single-lens reflex camera (DSLR); this is the only known example of the two that were built. Designed by James McGarvey, an engineer in Eastman Kodak Company's Federal Systems Division, it was a follow-up model to Electro-Optic camera (E-O), a one-of-a-kind camera built for the U.S. government. Both the E-O and Tactical cameras were built with standard production Canon New F-1 camera bodies and lenses, as specified by the customer, fitted with Kodak's M1, the company's first mono-chrome mega-pixel digital imaging sensor, designed in 1986. As the Canon New F-1 came with a removable back, a few fairly simple modifications—removing the film pressure plate and cutting an opening for the sensor and circuit board—allowed the M1 imaging sensor to reside in the place usually occupied by the film. Both the E-O and Tactical cameras used tethered image storage systems, with Tactical camera using a more robust aluminum extruded housing for its DRAM (dynamic random access memory) image storage and power source.

Tactical camera was produced both as a working sample to demonstrate Kodak's digital technology to future clients and as a means of investigating the viability of the DSLR business. The success of these demonstrations led to a number of other engineering models as the company moved toward manufacturing production digital cameras.



A view of the George Eastman House technology collection vault.

Official statement of recognition:

**Mechanical Engineering
Heritage Collection**

**Technology Collection at
George Eastman House
1949**

This collection of some 15,000 artifacts comprises still and motion picture cameras, projectors, processing equipment, and accessories illustrating the development of photographic technology from its inception in the early 1800s to the present. Advances in mechanical devices for film handling, lens and aperture adjustment, shutter operation, and other processing and projection functions have been intrinsic elements of this history.

Among this extensive collections are cameras used by well-known professional photographers, along with innovations by George Eastman and others that made photography increasingly available to the public at large.

**The American Society of
Mechanical Engineers, 2015**



garanti s'il ne porte la Sign^{ture}
DE
le Cachet de **M. Girouard**

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