

KODAK

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HANDBOOK NEWS

J. S. ...

KODAK INSTAMATIC CAMERAS

The new
KODAK idea that
pushes photography
years ahead



They came from the Near East, the Far East, Africa, Europe, South America—the four corners of the globe. And for those who couldn't come, Kodak Rochester went to them.

Thus goes the story of the planning that went into the *world-wide* introduction of the new KODAK INSTAMATIC Cameras—KODAPAK Film Cartridge system of still photography. Kodak representatives and distributors logged mil-

lions of miles, exchanged mounds of correspondence—much of it in several different languages—and laid out precise production, advertising, and distribution schedules in preparation for the global debut of the new INSTAMATIC picture-taking system. It marked the first time in the 83-year history of the Eastman Kodak Company that a new major Kodak product was announced on a world-wide basis.

Prices subject to change without notice.

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So what, exactly, does Kodak now offer that justifies such exceptional, "all-out" background treatment?

The big news about these compact, attractively-styled INSTAMATIC Cameras is that they entirely sweep away film-handling awkwardness for so many people. You load the camera by merely opening the back, dropping in a KODAPAK Film Cartridge and closing the back — it takes less than five seconds; and unloading is just as quick and easy. But remarkably simple Loading and Unloading is only a part of the INSTAMATIC pic-

ture. There are such additional performance and convenience features as Automatic Film Advance, New Picture Sharpness, Fastest Action Ever, to name a few.

There are four cameras in the series at the present time. They are designated as the KODAK INSTAMATIC 100, 300, 400, and 700 Cameras. Each differs in its operating features and picturing abilities (described later), but they all use the new KODAPAK Film Cartridge for easy loading and unloading, plus the other advantages described below.



In the very initial phases of the INSTAMATIC program, Kodak examined the potential of existing film packages, namely, roll films and the 35mm magazine, to determine whether they would or could be adapted to the objectives we were considering. The answer was no! So we took the best features of each, added to them, and came up with the KODAPAK Cartridge.

The KODAPAK Cartridge is a precision-molded plastic cartridge, factory-loaded with paper-backed 35mm-wide film for making negatives or transparencies 28.5mm square. The area used in making prints and slides is nominally 26.5mm square. This new film size is

called 126. Negative films contain 12 exposures per roll. Reversal films for making color slides make 20 exposures per roll. The camera is loaded simply by dropping the cartridge into the camera, requiring no threading or spools, and offering no possibility for improper loading or light fog.

One end of the cartridge contains a built-in, large-diameter take-up spool. The other end contains a free-floating roll of interleaved film and backing paper with no spool at all. This arrangement has several advantages. Most important from the user's point of view is that loading is simple, fast, and sure. It can be done in any kind of light without

danger of fogging the film. Even if the camera back should accidentally be opened in mid-roll, only a few frames would become light-fogged.

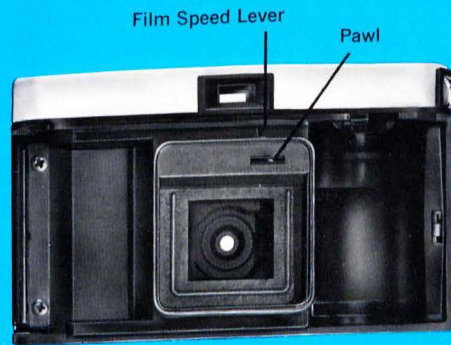
As shown in the illustration, three important facts, printed on the cartridge, are always visible through the window in the back of the camera: the type of film, the number of exposures in the cartridge, and the number of pictures that have been taken. The paper backing used on all films in this system bears printed exposure numbers. This eliminates the need for an exposure counter of the type found on 35mm cameras.

Three of the KODAK INSTAMATIC Cameras now available use automatic electric-eye exposure-control systems. To make the system fully automatic, a FILM SPEED NOTCH in the top of the cartridge is sensed by the camera, which then automatically sets the meter for the correct ASA speed of the film in the cartridge.

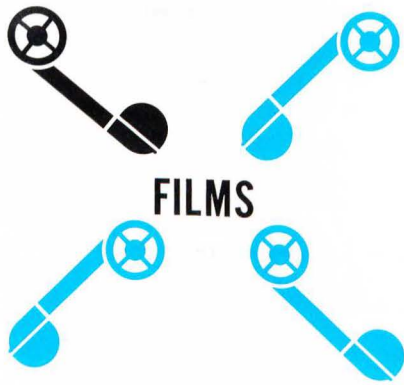
Automatic ASA Setting in the 300 and 400 Cameras—In these models, the ASA film speed can be set to either ASA 64 or ASA 160. This is done by a small FILM SPEED LEVER located above the film metering PAWL. If the cartridge depresses this lever, it opens a switch which disconnects a shunt resistor in the electrical circuit of the exposure control, adjusting it for ASA 160. When the cartridge is notched for ASA 64, it leaves the lever in the "out" position where the switch is closed.

Automatic ASA and Guide Number Setting in the 700 Camera—When the cartridge is inserted in the 700 and the back of the camera is closed, a spring-loaded lever, connected with the exposure computer, moves along the ridge until it is stopped by the notch. This sets the automatic exposure controls for any ASA speed in the range of 25 to 800.

Because Kodak has had many years of experience in manufacturing and in precision-molding plastic materials, we're able to make an expendable cartridge to the small tolerances required for holding the film flat in the film plane.



By means of an optical collimator, measurements were made across the film planes of many KODAPAK Cartridges. The average film flatness plus camera and focus tolerance compares favorably with that of 35mm cameras and exceeds that of roll-film cameras.



Four films are currently available in KODAPAK Film Cartridges: KODAK VERICHROME Pan Film, KODACOLOR-X Film, KODACHROME-X Film, and KODAK EKTACHROME-X Film. The three color films are new, and each of them has an ASA speed of 64 in daylight. KODACHROME-X and EKTACHROME-X transparencies are mounted in 2x2-inch cardboard mounts, which can be used in regular slide projectors. The slide-mount aperture is 26.5mm square.

The paper backing used with all 126 films provides several advantages. As an opaque leader, it light-seals the cartridge so that no removable slide is required. Paper between the convolutions permits the use of gel-type backing, in the case of VERICHROME Pan Film, which helps to offset the curling tendency caused by the gelatin of the light-sensitive emulsion. If gel backing is used without inter-

leaving paper, the gel and the emulsion tend to stick together.

By having the film and backing paper coiled loosely in a supply chamber with no spool, and by using a fairly large-diameter take-up spool, the engineers were able to solve the technical problem that arises because, as film is advanced, the ratio of the length of backing paper to the length of film changes as the diameter of the take-up spool changes.

Film indexing is so accurate that cross-bars separating exposures are pre-exposed on the film for the convenience of photofinishers mounting slides or making prints. There can be no overlapping or double exposures, because each frame of film contains only one perforation, engaged by the film metering pawl (pointed out on page 11).

The square picture format was selected for several reasons. Square slides always fill the screen when they're projected—there's no changing back and forth from vertical to horizontal, which always leaves part of the screen blank. The usual square color prints cost less than rectangular ones, resulting in economy to the user.

From the point of view of camera design, a square picture has advantages, too. The camera itself can be more compact in size. All lenses form a circular image, and a square picture uses the image area more efficiently. This in turn permits the use of a short focal-length lens, which increases depth of field.

KODAK INSTAMATIC Cameras

The KODAK INSTAMATIC Cameras now on the market have certain things in common. They use the new KODAPAK Film Cartridge for easy loading. They have built-in flashholders (using AG-1 bulbs), that push in, or drop out of sight when not in use. They have eye-level viewfinders, rapid film-advance mechanisms, LUMENIZED lenses, and double-exposure prevention. Each has its own special features.

KODAK INSTAMATIC 100 Camera Outfit

Available as an outfit only (as are the 300 and 400 Cameras), batteries, flashbulbs, and a KODAPAK Cartridge are included

with the INSTAMATIC 100 Camera. The simplest and least expensive of the series, this camera has a fixed-focus, single-element, 43mm LUMENIZED lens with a fixed aperture of $f/11$. The lens mount accepts No. 6A lens attachments. The

shutter is an extremely accurate pendulum type. It operates at 1/90 second when the built-in flash unit is retracted into the camera body. Raising the flash unit into operating position changes the exposure to 1/40 second, to synchronize with the flash. (This also can provide more exposure for dull days.)

A bulb may be stored in the flash unit ready for use, and won't fire until the flash unit is raised to the operating position. Power is supplied by a pair of AAA-size batteries. Manganese-alkaline cells may be used for long life.

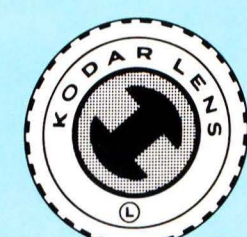
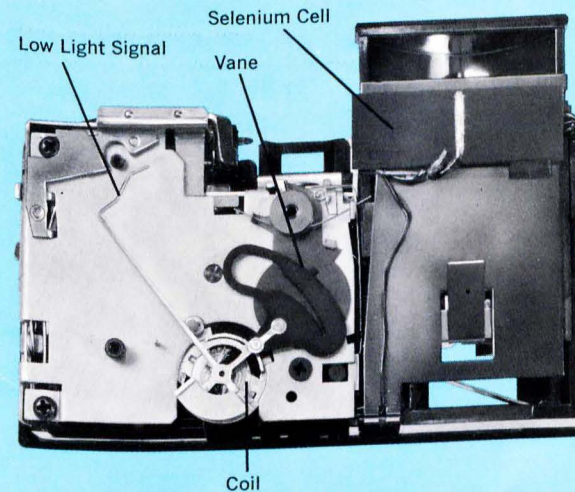
The camera measures about 4 x 2½ x 2 inches (with the flashholder retracted) and weighs 11 ounces. It has a vinyl-cov-

ered steel case. A wrist strap of woven material is supplied with the camera.

KODAK INSTAMATIC 300 Camera Outfit

This model has an electric-eye exposure-control system for completely automatic picture-taking in daylight. Inserting the cartridge sets the built-in meter to the proper film speed. The lens sets itself for the correct opening when you aim the camera. A low-light indicator appears in the viewfinder to indicate the necessity for using flash.

The lens is a 3-element, 41mm LUMENIZED KODAK with a maximum aperture of $f/8$ and a minimum aperture of



Dumbbell-shaped mask, used in front of the Vane

The automatic exposure control system of the KODAK INSTAMATIC 300 and 400 Cameras is shown by this partly-assembled model.

Light reflected by the subject is imaged by the "bee's eyes" window of the SELENIUM CELL. This creates an electric current which energizes the moving coil of the instrument, deflecting it in proportion to the brightness of the scene.

Attached to this coil is a VANE with a tapered slot which moves in an arc behind a dumbbell-shaped fixed mask. Mask and vane are located between the center and rear lens elements.

With a subject reflecting a great deal of light, the vane is deflected to its maximum, lining up the narrow end of the slot with the narrow center part of the mask, producing a very small lens opening ($f/32$). With progressively less light entering the "bee's eyes," the vane deflects progressively less. When there is just enough light to move the vane, the largest opening of the vane lines up with the full opening of the mask, providing an $f/8$ lens opening. When light levels are too low for proper exposure, the LOW LIGHT SIGNAL appears as a pointer in the viewfinder.

The lens is basically an $f/6.3$ masked down to an equivalent $f/8$ by the dumbbell-shaped mask. The shape of this mask is required to assure characteristic depth of field for performance at small apertures, which would not be the case if the smallest aperture were a long, narrow slot.

f/32. (It's interesting to note that an f/8 lens used with a 64-speed color film provides the picturetaking capabilities of an f/3.5 lens used with a 10-speed film.) The pendulum-type shutter operates at 1/60 second when the flash unit is retracted, and changes to 1/40 second when the flash unit is in firing position. Flash pictures are made at f/8 unless ambient light closes the lens slightly.

This model has a die-cast, chrome-finished front, and a vinyl-covered steel back. It measures 4 x 2½ x 2¼ inches and weighs 14 ounces. A wrist strap is supplied with the camera.

KODAK INSTAMATIC 400 Camera Outfit

The lens and shutter equipment of the 400 model are identical with the INSTA-

MATIC 300 Camera just described. The main difference between the two is that the KODAK INSTAMATIC 400 Camera has a motorized film advance. The spring-powered motor allows pictures to be taken at the rate of more than one a second, if desired. When the motor is wound and the film is inserted, closing the camera back automatically advances the film, by motor power, to the first exposure.

Details of finish and construction are the same as for the Model 300. This camera weighs approximately 15 ounces and measures 4 x 2¾ x 2¼ inches with the flashholder retracted. This is truly a remarkably compact package for a completely automatic camera, with built-in flash, power supply, and motorized film advance.

KODAK INSTAMATIC 700 Camera

The INSTAMATIC 700 Camera is different in appearance and construction from the other cameras in this series. It offers completely automatic operation for both outdoor and flash picturetaking. This, plus a choice of shutter speeds and a wide range of lens openings.

The lens is a 38mm, LUMENIZED f/2.8 KODAK EKTANAR, which stops down to f/64 for bright light conditions with high speed films. It has a focusing range of 3 feet to infinity, with footcage-scale focusing as well as zone focusing for close-ups, groups, and scenes. Symbols for the three zone-focusing positions are visible in the viewfinder. The lens accepts Series 5 lens attachments with a built-in retaining ring.

Loading the film automatically indexes the electric-eye exposure control for the correct film speed, the first step in setting up its computer. The camera can handle films with speeds ranging from ASA 25 to ASA 800. It has marked shutter speeds of 1/60, 1/125, and 1/250 second. In addition, raising the flash reflector into firing position drops

the shutter speed to 1/30 second for flash synchronization, no matter where the shutter speed dial happens to be set.

To make pictures in daylight, the user sets the shutter speed he wants, focuses, and shoots. The lens opens to the degree necessary to produce good exposure. If the lens reaches its maximum aperture of f/2.8 and there's still insufficient exposure, the shutter automatically slows to exactly the speed needed for best exposure. This shutter actually has continuous, but adjustable, speeds throughout its entire range, not just the speeds marked. If there's still not enough light to make a picture at the maximum exposure possible, 1/30 second at f/2.8, a warning signal appears in the viewfinder.

Even though it's completely automatic, the camera does offer a measure of control over exposure. In high-contrast situations, for example, it's possible to make a close-up light reading of the subject, then "trap" the meter at that point by partly depressing the shutter release. You then return to the desired picture-taking position and take the picture with the exposure which was set at the close-

up reading. In addition, a knurled wheel on the camera front lets you give one stop more or one stop less exposure than the electric eye calls for. Outdoors, this provides compensation for back-lit subjects or other unusual lighting conditions. Indoors, you can cut the flash exposure by one stop when shooting in small, light-colored rooms, or increase exposure one stop when shooting in large, dark areas.

To make flash pictures, the user inserts a flashbulb, focuses, and shoots. Changing the focus automatically adjusts the lens opening to suit the distance, via an automatic internal coupling. The film-speed notch in the KODAK Film Cartridge causes the right flash guide number to be set inside the camera. All the usual frustrations of flash

photography are banished: no guide numbers to worry about, no X-M synchronization differences to worry about, no picking the "right" shutter speeds for best synch, no loose flash cords or connections, no computing to find the right lens opening. Everything is taken care of when you aim, focus, and shoot. Flash power is provided by a pair of N-size batteries in the camera body.

The Model 700 has a die-cast metal body with vinyl-clad metal panels and a satin-chrome finish. A clip-on adjustable leather neck strap is supplied with the camera.

This is an extremely capable and versatile instrument in compact form: it weighs 24 ounces and measures approximately 4¾ x 3 x 2½ inches with the flash unit folded down.



OBJECTIVE ACCOMPLISHED

When George Eastman pioneered in photography, one of his principal objectives was to "make a camera as easy to use as a pencil."

The KODAK No. 1 Camera, which made its bow in 1888, was factory-loaded with enough film for 100 exposures. When the film was exposed, the camera was returned to Kodak where the film was developed, prints made, and the camera reloaded. Although awkward, inconvenient, and expensive by modern standards, this marked the start of a complete system of photography. It also was the inspiration for Eastman's famous slogan: "You press the button—we do the rest."

Now the KODAK INSTAMATIC Cameras and KODAPAK Film Cartridge have combined to advance photography to the

point of practical realization of the objective—the camera "as easy to use as the pencil."

However, the fact that these new cameras provide a means of getting the best pictures easily and with the least possibility of error, should not suggest that they are intended for the uninitiated only. Even advanced workers, comfortable and conversant with the language of photography, may find that they enjoy the freedom of shooting pictures without the intrusion of mechanical considerations to detract from the enjoyment of picturetaking.

You owe it to yourself to see this new Kodak system of picturetaking in action. When you do, you'll surely agree that George Eastman's objective has been fulfilled.

**WHAT'S
NEW
IN
BATTERIES**



A battery used to be a battery. It was a cylinder you put into your flashlight. It usually died when you were changing a flat tire in the rain at midnight.

Today, batteries—or dry cells, to be a little more accurate — are not only much improved, but come in a bewildering variety of shapes, sizes, and chemical mixes. They're used to power flash holders, exposure meters, camera motors, viewers, electronic flash units, and a host of other photographic gadgets. We thought a brief run-down on the various types might be in order.

Zinc Carbon—This is the common, original type of dry cell. It costs less than the other types and has a shorter life, both on the shelf and in use. It performs best with intermittent use. Storage at high temperatures shortens life considerably.

Manganese Alkaline—Costs about twice as much as a zinc-carbon cell of the

same voltage but lasts longer, recuperates fast, and its steel-shell construction prevents swelling. Shelf life is 18 months to two years at normal temperatures.

Mercury—Same price range as manganese alkaline. Mercury cells give a long useful life in applications requiring a constant low drain, such as light meters; not recommended for high drain requirements such as flash or electric-drive movie cameras at temperatures below 40 F. Recuperation is rapid, shelf life is long. Steel construction.

Nickel Cadmium—Costs about four times as much as mercury or manganese alkaline. They're rechargeable, but they don't hold recharges for a long period of time. They work well over a wide temperature range. They're used in electronic flash units and to power electric-drive movie cameras.

The names zinc carbon, manganese alkaline, mercury, and nickel cadmium refer to chemicals used in manufacturing, and provide handy names. These are not the only chemicals used, though, and differences in the amount or types of secondary chemicals can affect the characteristics of a cell, making it especially useful for a particular application.