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THE SUBMINIATURE TIMES

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CAMERAWEAR

There may be more colors in your local camera store than on your Christmas tree this year. Le Mini, Keystone's latest addition to the Le Clic line of fashion cameras, is a keyring-size 110 model. At $30, Le Mini comes in a water-resistant plastic case and is available in six colors and 17 designs.

Ansco's fashion camera line includes the Pixie 110 camera, available in four colors for $15.95, and the Pix 110 and 35 models, which are both equipped with built-in electronic flash and available in two twin-tone color combinations for $36.95 and $56.95, respectively. Each camera includes a color-coordinated carrying strap and clip. Kodak's Ektralite 110 camera with built-in flash comes in red, yellow, and black for $30.

All models are currently available at local camera stores or by contacting the following companies: Ansco Photo-Optical Products Corp., 1801 Touhy Ave., Elk Grove Village, IL 60007, (800) 323-6697; Eastman Kodak Co., 343 State St., Rochester, NY 14650, (716) 724-4000; Keystone Camera Products Corp., 468 Getty Ave., Clifton, NJ 07015, (201) 546-0104.

"Small Cameras, Honey"

In the world of undercover photography small cameras play a big part. And cameras don't come any smaller than the famous West German make, Minox. Or any better. The Minox EC on the right may only be 3.5"x1.2"x0.7" yet takes pictures worthy of an Art Kane. Or a Mata Hari. And the Minox 35ML on the left is the latest and greatest yet (figuratively speaking

OF COURSE). IT'S BRISTLING WITH HIDDEN FEATURES FROM FULL PROGRAM OR APERTURE PRIORITY CONTROL TO FLASH HOT-SHOE AND EXPOSURE MEMORY LOCK. BUT IF THERE'S ONE FEATURE OF THIS 35MM CAMERA THAT THE ENEMY WOULD GIVE THEIR TOP SECRETS FOR IT'S THE EXCLUSIVE HIGH DEFINITION FOUR-ELEMENT LENS. AND THE SENSATIONAL PICTURES THEY COULD TAKE WITH IT.

"BUT SENSATIONAL PICTURES, J. EDGAR"

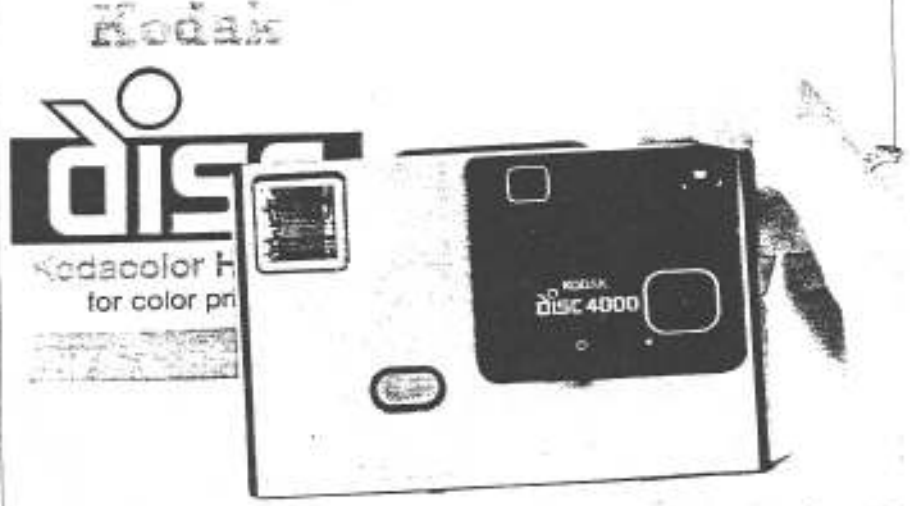
FOR MORE DETAILS ABOUT THE MINOX RANGE CONTACT VICTOR HASSELBLAD INC. 10 MADISON ROAD, FAIRFIELD, NEW JERSEY 07006, USA. TEL: 201-227-7320

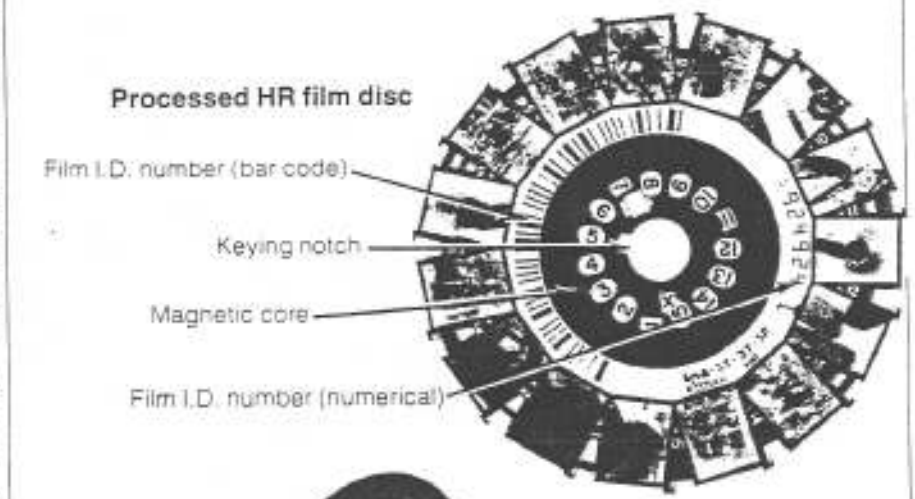
Kodak's new Disc: snapshot system of the century

The Kodak disc system, in our opinion the most significant change in the history of making snapshots, is about to burst in full cry across this nation and thence around the world. If all goes well, Kodak, with its two new Rochester factories devoted exclusively to disciana, will turn out 9 million disc cameras by year's end.

What hath Kodak wrought? Nothing to change your feelings and needs for 35mm SLRs, rangefinder cameras, medium-format or view cameras. But we will have a complete camera film processing system carefully researched for eight years to eliminate virtually every snapshot-taking problem no matter how, why or when made. Snapshot makers find focusing difficult? Even auto focus can go wrong. So thin pocket-calculator-sized cameras with 12.5mm f/2.8 lenses camera provide sharpness with no focusing. Built-in flash operates automatically when needed. There are no switches to press to ready the camera or flash. Film automatically advances by motor. The power cells need never be changed by the user. In like manner, processing has been completely changed to eliminate virtually all dust or scratch problems, and it's so automated that every film and print can bear an identification number for easy print reordering and proper automatized filtration during printing—with no need even to look at the negatives!

The Disc project really began back in the mid 70's, when Kodak commenced the monumental task of analyzing tens of thousands of amateur snapshots with the aim of uncovering the reasons that people took bad pictures. Kodak discovered that the primary reasons for picture failure were underexposure, camera shake, and focusing errors. Could a camera system be developed that would keep these and other errors to a minimum? The result: a revolutionary new photographic system based on flat, pocketable cameras with superbly corrected, ultra-short focal length, fixed-focus optics imaging onto a small, flat, motor-advanced cartridge-loading film disc, providing a tiny 8 x 10 mm format on new, faster (ASA-ISO 200) Kodacolor film which has much finer grain and edge sharpness than ever before! In addition, the three American-market





cameras include silicon-photodiode-controlled auto exposure auto flash when needed, and auto turnoff, all controlled by integrated circuits and powered by a new "ultralife" power source developed jointly by Kodak and Matsushita of Japan. All four "first generation" Kodak disc cameras use the same lens, a conventionally coated 12.5mm f/2.8 composed of four glass elements, and manufactured using a "proprietary high speed process" to maintain quality while keeping production costs down. The lens is basically a triplet type, but the rear surface of the second element is aspheric to improve correction for spherical aberration, and there's a fourth field-correcting element at the rear to improve sharpness and fine-detail contrast near the edges and corners of the format. According to Kodak test data we evaluated, the optic is capable of resolving an amazing 250 lines per millimeter on special black-and-white aerial film (ASA 3), and depth of field extends from 4 ft. to infinity at f/2.8.

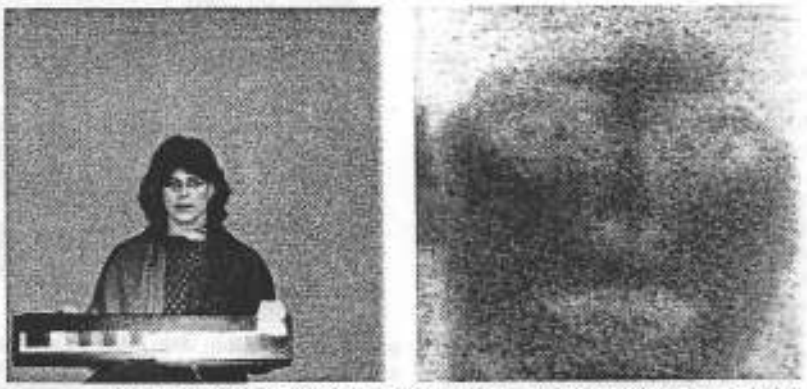
Two exposures only

The U.S. trio of disc cameras also uses the same basic auto-exposure and shutter system controlled by interconnected ICs. The SPD cell behind a small squarish window near the center and at the top of the camera front measures the reflected illumination of the scene. If it's 125 foot-Lamberts or greater (about equivalent to a gray, overcast day) the camera sets the exposure to 1/200 sec. at f/6; if it's less, the camera selects an f/2.8 at 1/100 sec. exposure and automatically fires the flash. Sliding open the lens cover (model 4000), lifting open the cover (model 6000 and 8000), taking a picture, or touching the calculator-type shutter button will *all* activate the flash and charge it for picture taking automatically, and if you fail to do any of these things, the cameras provide an automatic 0.7 sec. recycling delay for the flash to reach at least ⅓ stop below full power before the flash will fire. The shutter is a low-energy, "fall away" type with separate apertures that come into place behind the shutter blade. All U.S. models wind the film to the next frame in 0.4 sec. (permitting "rapid-finger-fire" sequences on the 4000 and 6000) and recycle the flashes in about 1½ sec.

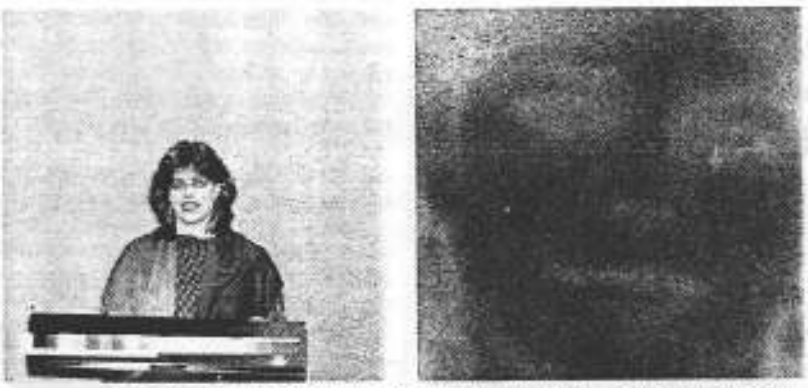
The bread-and-butter 4000 has basic features already described, silver-anodized aluminum cover panels, $67.95 suggested price. The black-finished 6000 has all of the above plus hinged cover/grip, built-in sliding close-up lens with parallax-compensating finder lens providing close-ups in the 18 in. to 5 ft. range, $89.95 suggested price. The deluxe black-and-gold-finished 8000 ($142.95) adds to the 6000's feature array a 10-sec. self-timer with front-mounted LED, rapid sequence ability up to 3 fps in bright light, and a digital alarm clock built into the hinged front panel. Ingeniously, the

Picture Quality—Disc vs. 110

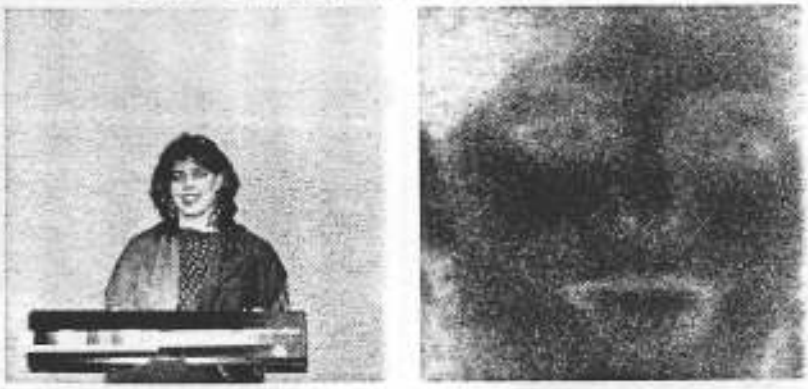
Our tests confirm Kodak's claims of finer grain and higher resolution for disc film compared to 110. However, to get the same size print from each format, the Disc requires a greater enlargement. How good are the prints?



Kodacolor HR Disc (ASA 200): Full-frame negative, shown actual size (left), is enlarged 11½ times to produce standard 3½ × 4½ in. print. 2-in. square section of print is shown actual size. Sharpness is not bad, but grain is often obvious in prints. Our 80X enlargement shows coarse grain pattern. Compare to 110 results below.



Kodacolor II, 110 (ASA 100): Made with Pentax 110 SLR with 18mm lens for comparable angle of view produced finest grain. Print is same-size section of 8X enlargement. Detail is good, about equal to disc. Our 65X photomicrograph of negative shows tightest grain pattern. Our conclusion: 110 Kodacolor II produced best overall prints.



Kodacolor 400,110 (ASA 400): Print quality is most comparable with disc. Disc image proved sharper on negative, but magnification was equalizer. Magnifications are the same as Kodacolor II (above). Grain is coarse, but at equal print sizes comes in slightly ahead of disc.

clock times the motor to prevent the camera from firing in sequence mode until the flash recycles, and the cover can be hinged back to serve as a stand.

The "international" model 2000 (not available in the U.S.) is the only one with a user-replaceable 9-v battery, and manual auto-flash-on switch. Switchover from high- to low-light setting is also manual, with warning LED in the finder. The 2000 has auto-off flash with 1-sec. recycling, and reportedly a lower price than the 4000.

The flat disc cartridge itself is quite clever, incorporating a dark slide which opens only when the camera is closed, film-speed notching (see photo) covering an ASA 100-1000 range (notch readout not being required in the present cameras), film-frame window which comes into position below a clear magnifying window next to the film-type readout window on the hinged camera backs, and film identification numbers (FID) in alpha-numeric and machine-readable bar code, which are also imprinted on the film disc inside. Extremely accurate film plane positioning and flatness are assured by a four-sided "film gate" integral with the fixed lens mount, and a platen which pushes the film against the gate a few milliseconds before the shutter fires.

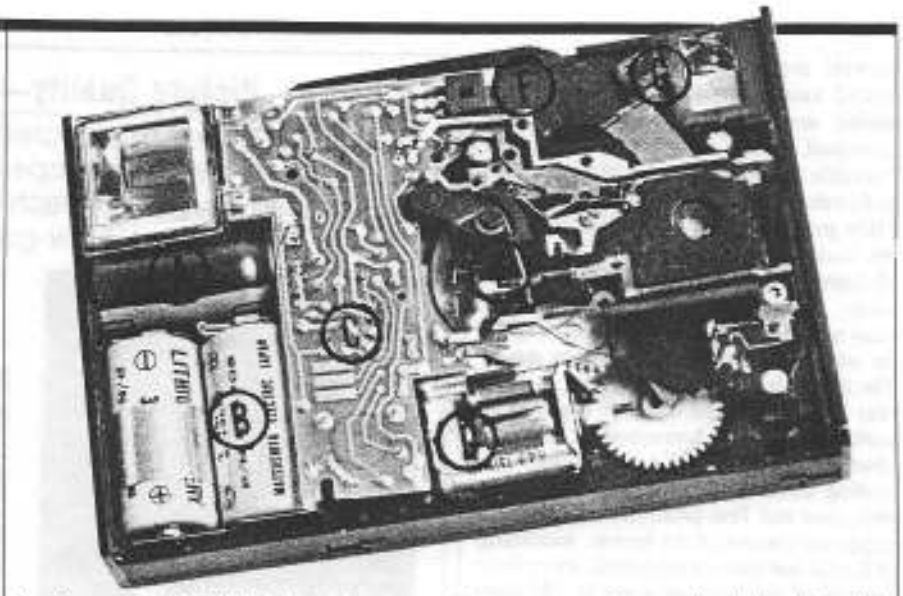
Finer, faster than K II

Inside the cartridge is yet another marvel—the 2½-in.-diameter film disc on a magnetic core with keying notch surrounded by 15 pre-flashed 8 x 10mm frames of ASA 200 Kodacolor HR disc film. The film is not only twice as fast as Kodacolor II, permitting high shutter speeds, but also much finer-grained and sharper, to meet the needs of the tiny format. Nor was Kodacolor's renowned latitude sacrificed—HR film can be exposed at 1½ stops less to 3½ stops over optimum levels with little loss in picture quality. And it's compatible with C-41 chemistry!

The secret behind HR film is that it's a much thinner emulsion than Kodacolor II and incorporates developer inhibitor releasing (DIR) couplers to "enhance edge effects which increase the contrast of image microdetails like eyelashes." The thinner emulsion minimizes light scatter, and DIRs allow increased development of silver halides at image-boundary edges, thus increasing their contrast. Both heighten perceived sharpness in the image. The underlying base support for the new emulsion is a 7-mil-thick layer of Estar, the same base used to optimize flatness with large-format sheet films. Indeed, focusing is so critical that the lens is focused precisely on the middle layer in the emulsion.

The disc system also has numerous processing advantages. Individual discs can be stacked on 35- or 100-disc reels for convenient processing without splicing them together like roll films, and discs and individual frames can be positively identified and even printed and color-corrected automatically. Film handling is kept to a minimum, agitation and drying can be accomplished by rotation, film cleaning and cartridge-opening is simplified. During printing each frame is held on four sides for optimum flatness and cooled with a special Coanda device to prevent buckling at the high light levels needed for enlargements.

Herewith our first impressions. The disc system succeeds admirably as a mass-market system for snapshot photography, and the general run of postcard-sized 3R prints is more than satisfactory in overall sharpness, color, and quality; 5 x 7 enlargements are O.K., but 8 x 10s (the largest available) are on the grainy side. Most of us prefer the slightly slimmer 4000 camera to those with hinged covers, though the 6000's built-in close-up feature is quite useful. We found the 8000's styling gaudy. The cover's thin inside edge doesn't make a comfortable handle on either the 6000 or the 8000, but the latter's self-timer and foldback perch are certainly desirable. The system is generally appealing, fun and competent. It will be a devil of a system for competitors to copy, and that's probably just as Kodak intended it.



Inside model 4000: With front plate removed you can see (A) capacitor below flash, (B) special non-user-removable 2.7 lithium power cells (2), (C) printed circuit board, (D) tiny DC motor for film and shutter winding, (E) shutter mechanism springs, (F) SPD meter cell, (G) true projected frame finder.

More discomania: Disc 6000 (above, left) has built-in sliding close-up lens with warning symbol in finder, natty all-black finish. Spartan model 2000 below it has manual flash on, auto off, wrong exposure warning in finder. Upscale model 8000 (above, right) has black and gold decor, built-in close-up lens, digital alarm clock in swing-back cover, 3-fps motor and self-timer with flashing LED.