

# THE SUBMINIATURE TIMES

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Supporting 110, 17.5mm, 16mm, 9.5mm, 8mm, 4mm, 1mm, Microdot, and Electronic Still Photography.



Kirk Kekatos started his camera collection in 1949. In foreground are Kodaks, and behind him are European models.

## COLLECTING

Anyone can begin camera collecting on a budget at flea markets, garage sales and rummage sales.

"You can still find lots of things for 10 or 15 bucks," says Kirk Kekatos, editor of "By Daylight," the quarterly magazine published by the Chicago Photographic Collectors Society.

The society, organized in 1971 has members as far away as Japan, and membership has doubled in the last few years to about 190 members. The group sponsors two shows each year where more than 200 collectors and independent dealers buy, sell and swap in all price ranges.

Kekatos started his collection in 1949, buying the discontinued Kodak Ektra, a stunning 35mm model that offered numerous lenses, each in its own metal canister. The camera cost \$235 with a standard lens when it came on the market in 1941—at a time when a family car sold for \$800 to \$900.

Kekatos bought the standard outfit for a simple reason: He wanted to take pictures with it. But his search for additional Ektra lenses and accessories spurred his interest in other old cameras. He spent his lunch hours haunting the Loop camera stores with a stock greeting: "What's new that's old?"

Kekatos thought of himself as a guy who just liked to buy secondhand cameras. He says he was "diagnosed" as a collector in 1971 when he wandered in on Barney Copeland, founder of the collectors society and owner of Bel-Park Photo. The store, which was at 3224 W. Bryn Mawr Ave., remained a mecca for photo buffs until it closed in 1989.

Kekatos' collection includes a special edition No. 2 Hawk-Eye box camera that Eastman Kodak offered free to 12-year-olds in 1930 for the company's 50th anniversary, and a rare Leica designed for use with a microscope.

# Lab Report

By Norman Goldberg and Michele A. Frank

## Pentax Auto 110

No. 1245144



**Camera Type:** 110-cartridge format, auto-exposure (programmed) single-lens reflex

**Normal Lens:** 24-mm Pentax-110 f/2.8

**Shutter:** Programmed electronically governed, behind-the-lens; aperture/shutter-speed range one sec at f/2.8 to 1/750 sec at f/13.5

**Viewfinder:** Fixed, eye-level type, non-interchangeable focusing screen has central rangefinder spot on frosted-Fresnel field; two LEDs for exposure indication; green, shutter speeds above 1/30 sec; yellow, below

**Exposure Meter:** Through-lens, full-aperture reading, using single silicon photocell; EV range 3-17 (ASA 100 f/2.8 lens); system uses two 1.5-volt S-76 batteries or equivalent

**Flash Synchronization:** Special synch terminal for use with AF 130P electronic-flash unit; insertion of flash unit automatically sets camera to 1/30 sec shutter speed

**Loading:** Drop-in; hinged back

**Film Transport:** 145 degrees, double-stand-off stroke lever with 60-degree pre-advance

**Film Counter:** Frame number on film shows through back-cover window

**Other Features:** Winder capability, wrist-strap hook, tripod socket

**Dimensions:** L, 99 mm (3.9 in.); H, 56 mm (2.2 in.); W, 45 mm (1.8 in.)

**Weight:** 173 grams (6 oz.)

**Price:** Camera with 24-mm lens, \$249; 18-mm f/2.8 lens, \$77; 50-mm f/2.8 lens, \$77; winder, \$77; AF 130P electronic-flash unit, \$50; full kit including camera with three lenses, winder, electronic-flash unit, filters, close-up lenses, etc., \$580.

**Distributor:** Pentax Corp., 9 Inverness Drive East, Englewood, Co. 80112

## Field Check

By Norman Rothschild

Good things come in small packages. Proof? The Pentax 110 SLR system! An historical Pentax first, the basic camera is so tiny that with its 24-mm Pentax-110 f/2.8 normal lens it may easily be carried in a shirt pocket. That's a lot smaller than the many featureless, oversize 110 pocket cameras that are so prevalent today.

Place either the bulkier 18-mm Pentax-110 f/2.8 wide-angle or the 50-mm Pentax-110 f/2.8 telephoto lens on the camera, and you still have pocketability. All have quick-bayonet interchange. (The focal lengths 18-, 24-, and 50-mm of 110 lenses are about equal to 35-, 50-, and 100-mm in 35-mm photography, respectively.)

Even more astounding than its diminutive size is the system's image-making capability. First let me air a personal prejudice. Short of a macro lens, I prefer lenses with close-focusing capability. In 110 this is a "must" since you would hardly think in terms of cropping the tiny frame when enlarging. I am pleased to note that the 24-mm lens focuses to 0.35 meter (1.2 ft.), the 18-mm to 0.25 meter (10 in.), and the 50-mm to 0.9 meter (three ft.). We are going to see lots of frame-filling flower shots and, especially with that grand 50-mm lens, intimate portraits. And, as if close focus in each

lens weren't enough, Pentax offers five close-up supplementaries to fit in front: two for the 24-mm lens, one for the 18-mm, and two for the 50-mm. A quarter-life-size image is possible with the 24-mm lens plus the S16 supplementary.

An accessory motor wind for the camera operates on two AA batteries. It advances the film to the first frame automatically, allows you to take pictures as fast as one frame per sec (without flash) and, after the last shot has been tak-



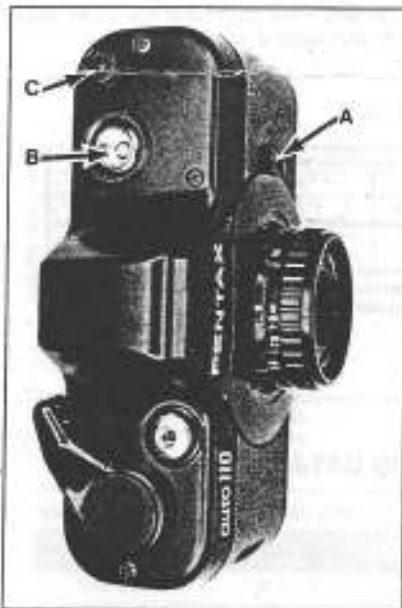
Batteries (two S-76s) are held in tiny tray that nests in compartment near the back's doorhinge.

# Lab Report

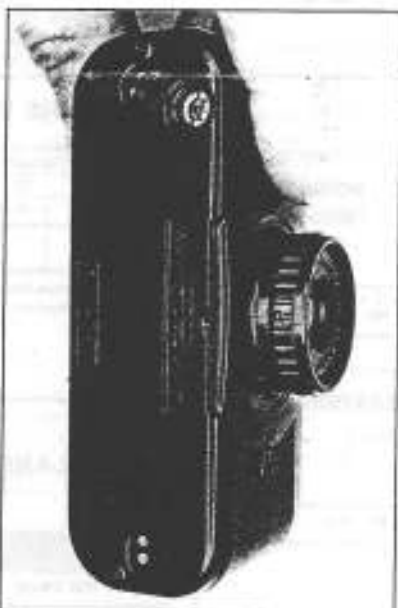
(continued)

en, winds the film off onto the take-up end of the cartridge. Its built-in grip

makes it easy to hold the camera solidly for horizontal or vertical pictures.



Nudging bayonet-latch lever (A) toward top of camera permits removal of lens with a short anticlockwise twist. Terminal (B), buttons (C) are for special flash.



Bottom has tripod socket at one end, motor-drive coupling next to it. Motor couples electrically through contacts located at the opposite end.

The ham-fisted, or those used to bulky cameras, may have a tendency to accidentally place a finger in front of the 18-mm or 24-mm lens. Solution: use a lens hood, both to reduce flare and to present an obstacle to errant fingers. The 50-mm lens should also have a lens hood, though you'll be less likely to accidentally place a finger in front of it.

While the reflex finder has a split-image rangefinder in its center, I found the groundglass area easy to use, and much appreciated when important subject matter was off to the side. Images, even the small ones from the 18-mm lens, were easy for me to focus.

The camera has fully automatic exposure control, using a silicon photodiode that meters through the lens. Inserting the film cartridge automatically keys in the film speed. The two-bladed shutter/diaphragm gives programmed exposures from 1/750 sec at  $f/13.5$  to one sec at  $f/2.8$ . The system is powered by two 1.5-volt silver-oxide batteries, S-76, in a holder; you have to open the camera's back to put them in.

You won't find any f-stop or shutter-

## Lens Test Glossary

**Aberrations:** A flawlessly manufactured lens may still exhibit residual aberrations (image faults). Often, certain aberrations are permitted by the designer to minimize others felt to be more harmful to image quality.

**Astigmatism:** Causes lines radial to the optical axis, and lines perpendicular to these, to focus in two different planes. Improved by stopping down.

**Centering:** The center of each curved surface should lie on a common line.

**Coma:** Comet- or tear-drop-shaped images of off-axis points of light. Improved by stopping down.

**Contrast test:** Contrast levels are compared electronically between the image of a coarse and fine slit, and the result is expressed as a percentage.

**Critical f-stop:** The largest opening at which the aberration being examined is considered to be under satisfactory control.

**Distortion:** Causes image of window frame (for example) to bow out (barrel type) or in (pincushion type), but does not influence sharpness. Not improved by stopping down.

**Flare:** Causes an overall loss in contrast. Sometimes called "veiling glare."

**Flare test:** The lens is presented to a target consisting of a totally black spot surrounded by a uniformly bright field of infinite dimension. The amount of light energy present in the center of the image of the black spot is measured and expressed as a percentage of the light energy in the image of the bright surround.

**Lateral chromatic aberration:** A variation of magnification with color. Not improved by stopping down.

**Longitudinal chromatic aberration:** A shift of focus with color. Not improved by stopping down.

**Spherical aberration:** Causes a focus shift as the lens is stopped down.

**Star test:** The image of a point of light is examined with a microscope. The deviation of the image from the ideal indicates the nature

and extent of the aberrations.

**Transmittance:** The percentage of light entering a lens that gets transmitted toward the image plane.

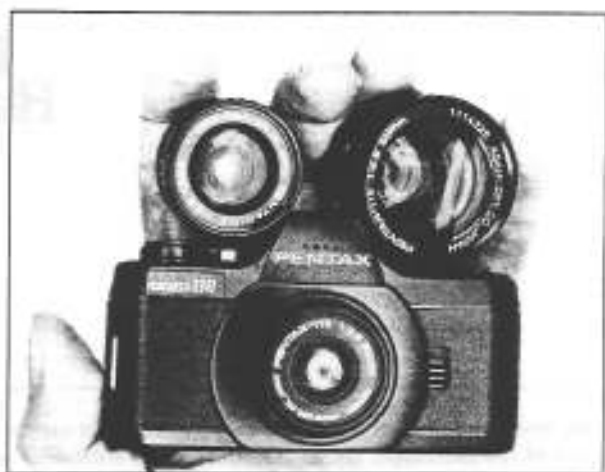
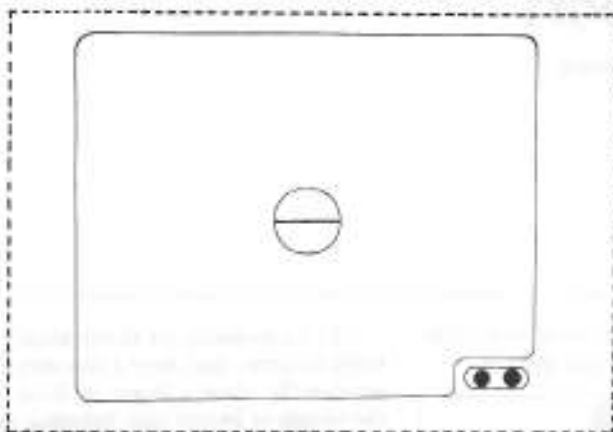
**T-number:** The actual maximum f-number divided by the square-root of the transmittance.

**Vignetting:** Causes underexposure at the corners of the film. Improved by stopping down.

**Misc. terms and practices:** *Close working limits* are measured from the target to the foremost portion of the lens when it is set to its closest focusing position. The *close-limit field size* is measured at this point. The portions of the image field examined during both the contrast and star tests are the center, 1/3 out, 2/3 out, and far edge for rectangular formats and correspond to the following positions within the 24x36-mm format of a 35-mm camera's image: the center, 6 mm off-center, 12 mm off-center, and 18 mm off-center. Square formats are examined at the center, halfway to the edge, at the edge, and at the corner.

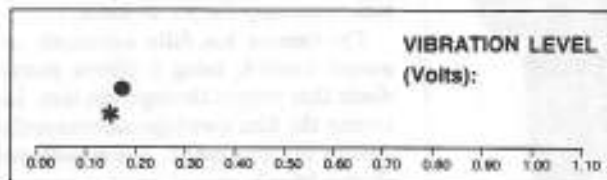
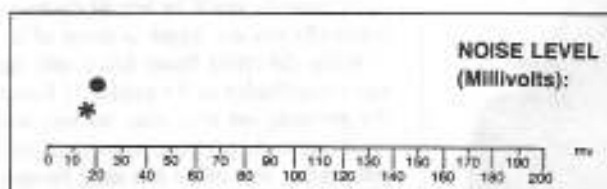
### Viewfinder display and framing accuracy

Picture area is defined in viewfinder by solid line.  
Actual picture is broken line.



With normal lens on camera, wide angle and telephoto nestled on top, the Auto 110 is still barely a handful.

### VIBRATION AND NOISE



PRE-TORTURE ● POST-TORTURE \*

Noise and vibration standards do not exist but relative levels become evident when values for several camera are compared.

### EXPOSURE SYSTEM

EV ERROR: Top figures are pre-torture, low figures post-torture.

ASA	25			100			400		
BLV	5	10	15	5	10	15	5	10	15
				-0.1	-0.0	+0.1	-0.1	-0.3	+0.4
				+0.0	+0.0	-0.3	-0.3	-0.3	+0.1

Blank spaces show limits of camera's dynamic range and/or values tested.  
BLV: scene luminance EV @ ASA 100. ANSI tolerances:  $\pm 0.5$  EV

Manual input: none

### MISCELLANEOUS DATA

FUNCTION	PRE-TORTURE	POST-TORTURE
Shutter trip force:	250 grams	265 grams
Shutter trip travel:	2.0 mm	2.0 mm
Viewfinder:		
Framing accuracy:	See illustration	See illustration
Synchronization:		
Electronic flash:	0.0 msec @ 1/30	0.0 msec @ 1/30

speed information in the finder or anywhere else on the Pentax 110 SLR. There is a warning light in the lower right of the finder: green when the shutter speed is sufficient for hand-holding, and yellow to advise use of a tripod or flash. This indicating area intrudes into the viewing field to some extent.

About flash: Pentax offers a mating AF 130 P Auto Flash that mounts on top of the camera. It locks the shutter speeds to 1/30 sec, and the lens aperture at f/2.8 with ASA 100, at f/5.6 with ASA 400 film. It therefore has a range of 0.8 to 4.6 meters (2.6 to 15 ft.) with both ASA 100 and 400 films.

Using two AA batteries, I found the unit rather slow in recycling: make sure the neon readylight is on before releasing the shutter. This is especially im-

portant when using the motor wind, as there is the temptation to keep on shooting rapidly without letting the flash unit recycle. Doing this can actually prevent it from recycling properly, leading to a whole series of underexposures after the first frame.

The Pentax 110 is wonderful for taking pictures unburdened, and just great for carrying along on vacation. It is also a great challenge to the miniature and subminiature specialist. Ample proof of 110's professional capability has already been published in POPULAR PHOTOGRAPHY several times (see Dorothea Kehaya's "Adventures in 110 Photography" in the September, 1973, issue, and my own article, "Breaking the 110 Barrier," in the May, 1977, issue). The Pentax Auto 110 system provides fur-

### Meter-sensitivity pattern Center-topweighted



### Extreme Temperature Test

-20C	Functioned
+49C	Functioned

ther evidence. All in all, I found the camera easy to handle, easy to focus, and it gave me very sharp images. ●

(Continued next issue.)



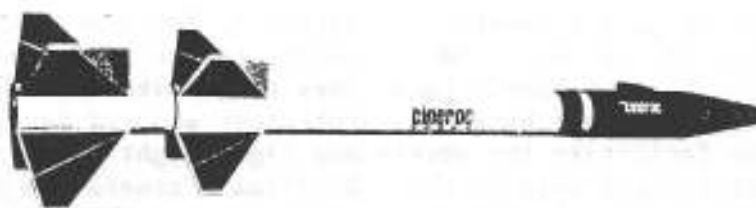


Figure 13-8: The Estes Cineroc model rocket uses Type D motors and carries in its nose a specially designed 8mm movie camera that looks back along the model body. Model is 1.6 inches in diameter.

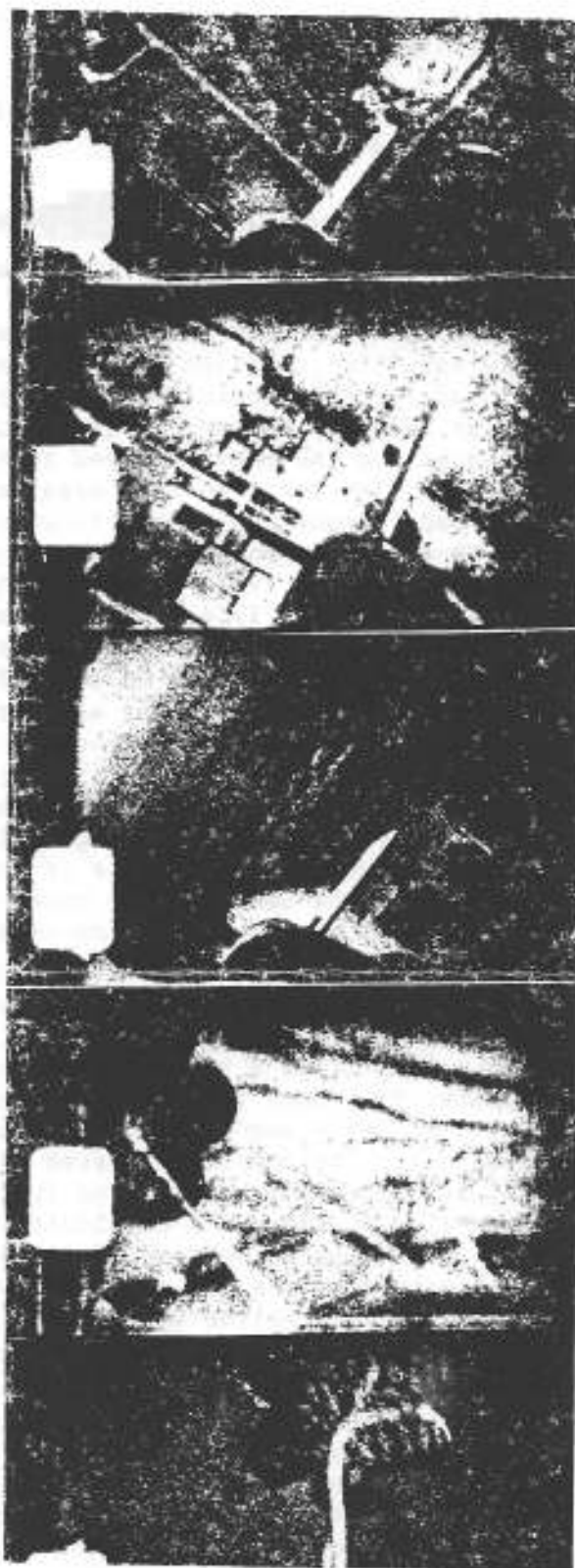
### AIRBORNE

Some of the most unique cameras in the subminiature format were designed to operate from model rockets. Still and motion picture cameras for the hobbyist have been available since 1965. The following reprint from "Handbook of Model Rocketry" by G. Harry Stine, 1976, was submitted by Joseph Rider, Goose Creek, SC.

"The first camera model on record was built and flown by Lewis Dewart, of Sunbury, Pennsylvania, in 1961. A small Japanese camera was simply strapped to the side of a model rocket. When the ejection charge popped the nose, it pulled a string that released the shutter and permitted the camera to take a photo of the ground below - or the sky and clouds, depending upon the direction the model was pointed.

Vernon D. Estes and Estes Industries, Inc., brought out the first commercial model rocket camera, the Cameroc, in 1965. The Cameroc allowed all model rocketeers to become in-flight photographers. The Cameroc lens points straight up through the tip of the nose. Therefore, the model must be over peak altitude and pointed down when the ejection charge goes off, ejecting the nose-camera and tripping the shutter. The Cameroc takes one black-and-white photograph per flight, hopefully while the nose is pointed toward the ground from a respectable altitude. The negative is a circle 1.5 inches in diameter. It is Tri-X film, which you can develop in your own darkroom (or even on

Figure 13-9: Frames from a flight of an Estes Cineroc movie camera model. The camera looks back along the body toward the fins. Sequence shows lift-off, arcing over at apogee, and ejection of parachute.



the flying field) if you are a camera buff. If you are not, you can send the film to Estes for development. Don't take it to your local film processor because they do not have the facilities for developing circular negatives and because the ASA film speed of the Tri-X film must be pushed to ASA 1200 by special processing techniques. Standard processing won't work.

Other miniature cameras have been and can be developed for model rocket work. But the Estes Cameroc is the only model rocket still camera readily available at a reasonable price.



Estes' Astrocam 110

It also occurred to a number of model rocketeers that a motion picture camera in a model rocket would produce a spectacular piece of footage as the ground fell away and the model climbed to high altitudes. The first in this area was the movie camera model built and flown by Paul Hans and Don Scott, of Port Washington, New York, in 1962. This was a big model powered by a Type F motor because the smallest motion picture camera available at that time was the Bolsey B-8, a spring-wound 8-mm camera. It was heavy. Following months of preparation, including flights of preliminary designs carrying dummy cameras, Hans and Scott committed their Bolsey B-8 to flight. The lens looked out through a hole in the side of the nose section; the nose and body sections were recovered on separate brightly colored silk parachutes.

On the first flight everything worked perfectly. The model flew beautifully. Scott had to climb a tree to get the camera back. The color film was sent to the processing lab - and promptly disappeared! It was lost. The company replaced the film, but could not replace the flight footage. Undaunted, Hans and Scott tried again at the Fourth National Model Rocket Championships at the Air Force Academy in Colorado. This time the two modelers took the film to a different processing lab with very explicit instructions.

That first in-flight piece of color motion picture film was indeed spectacular. The boys sold it to Time-Life, Inc., who never used it but left it to languish in their voluminous files.

Vernon D. Estes and Estes Industries came to the rescue of the model rocketeer again. They hired Mike Dorffler, a young model rocketeer who had developed a very small and lightweight model rocket movie camera. Dorffler's camera was refined and developed into the Estes Cineroc, one of the most elegant model rocket products ever to be put on the market. Fully loaded with its own cassette of Super-8 color film, the Cineroc weighs a mere 2 ounces (56.7 grams). It is battery-driven, has a 10-mm focal-length lens, shoots 31 frames per second at f:11 with a shutter speed of 1/500 to stop any rocket motion, and is 9.9 inches long and 1.75 inches in diameter. This tiny movie camera has taken some outstanding in-flight movies. It probably has thousands of other uses where a small, very lightweight movie camera is required."



Figure 13-6: An Estes Cameroc took this photo of the prep and launch area at the Tenth National Model Rocket Championships at NASA Wallops Station, Virginia.

#### QUICKFINDER 1/94

Kodak OSS Matchbox	\$3300 B
Micro-M	99 W
Minicord	399 W
Minolta-16 P	34 B
Minox B w/case	159 W
LX Gold	999 K
LX Black	546 K
LX Chrome	504 K
Riga 'Latvia'	1475 W
Narciss	575 B
Simplex 16mm Pockette	79 B
Stereo Mikroma w/kit	1250 B
Tasco 8000	189 W
Tessina Chrome	504 K
B Brooklyn Camera	(718) 462-2892
K KEH Camera	(404) 892-5522
W Woodmere Camera	(516) 599-3369