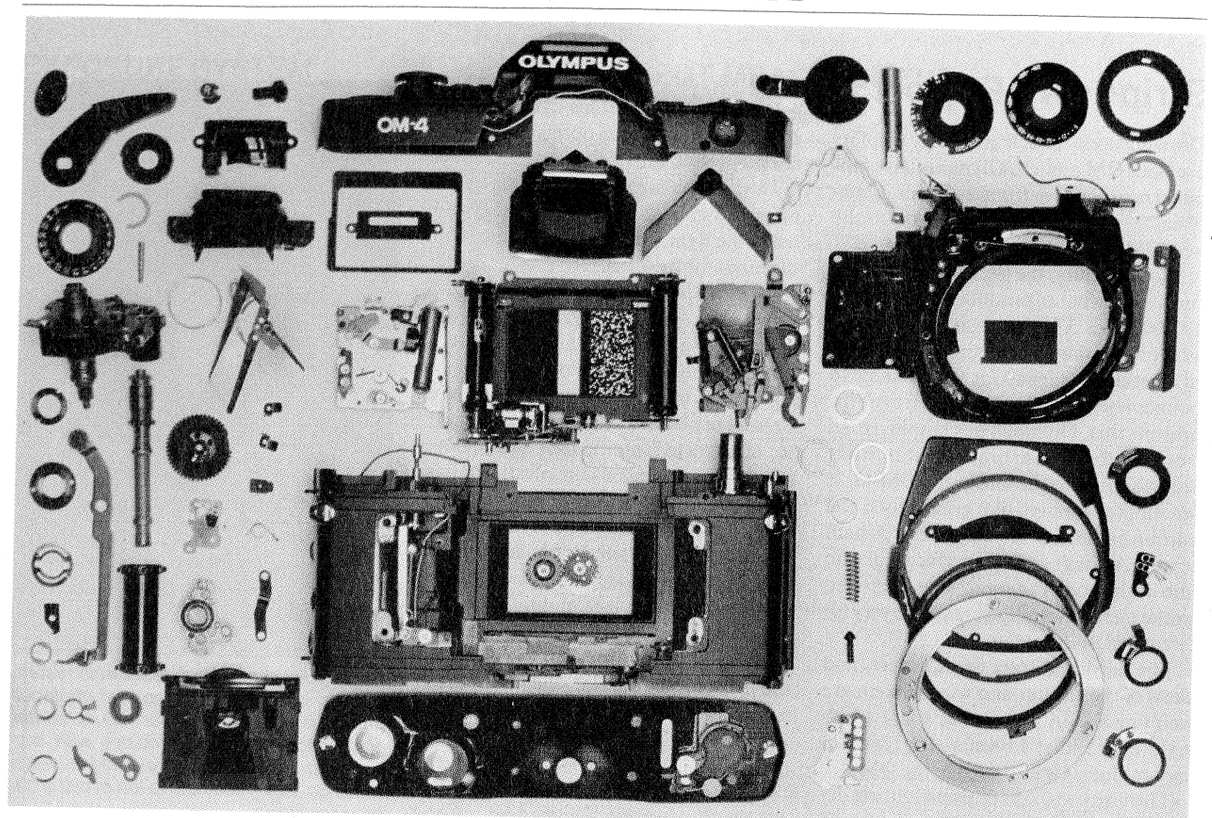
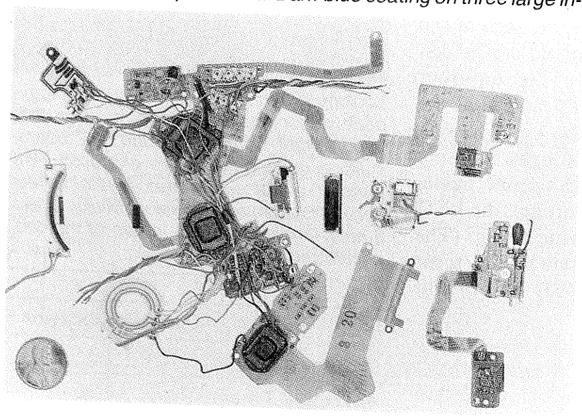
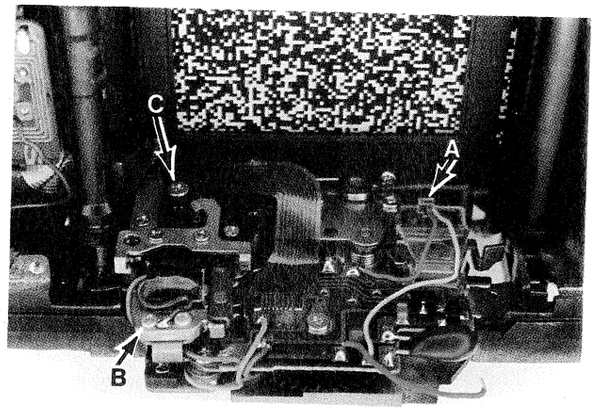


Above: *Mechanical and optical parts of OM-4. Shutter is shown with curtains trapped to form slit for 1/250 sec. Note speckled pattern on opening curtain. Shutter is flanked by sides of mirror box. Brass pneumatic cyclinder on left side is used to govern mirror action. Wind parts at left side of photo are large and strong.* **Below left:** *Penny in corner shows scale of OM-4's electronic components. Small black rectangle near center is LCD. Combination magnet next to it trips camera. Dark-blue coating on three large integrated circuits is vapor barrier that protects against short circuits.* **Below right:** *Shutter's speckled opening curtain has nearly the same reflectance as film, permitting meter readings from (almost) film plane just as exposure starts. Tripping sequence begins when combination magnet (A) is energized, tripping mirror, which trips shutter. Conventional electromagnet (B) arrests closing curtain until timing circuit cuts power to it. Just visible are two ball bearings in main shutter control stack (C).*





moves more than the negative one. It's all done within just a bit more space than a conventional, nonfocusing ocular. The system provides a continuous correction range from plus-one through minus-three diopters.

Electronically, the camera is certainly the most elaborate and ambitious model yet seen from Olympus. They, like nearly every other firm making 35-mm SLRs, have yet to perfect a design that eliminates all loose wires. (The more wires, the greater the chance for failure from poor contact or shorting.) To make the deep stripdown of the OM-4 that was necessary for this report, I had to desolder 54 wires, a number that is discouragingly large from such an otherwise innovative manufacturer.

The wires are the expensive heat-resistant type, with a tough surface. This is welcome, since so many of them are packed into such a small space that many of them are under steady mechanical pressure once the close-fitting top cover is secured.

Soldering workmanship throughout most of the camera was excellent, but some isolated regions exhibited poor technique, with */continued on page 108*

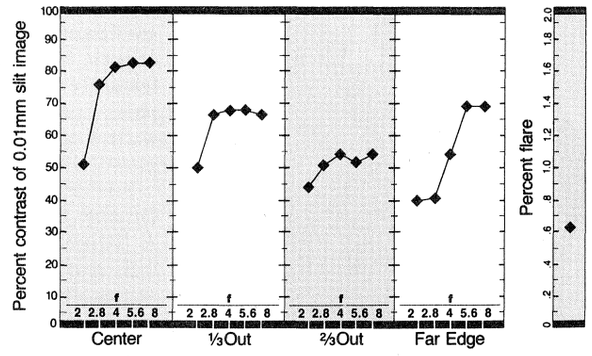
Lens Performance

(See Lens Test Glossary, page 109)

Zuiko Auto-W 24-mm f/2 Ser. No. 111496

Dimensions: O.D. 60 mm (2.36 in.) **L.** 48.3 mm (1.90 in.) **Weight:** 276 g (9.73 oz.) **Filter size:** 55-mm
Close-working limit: 142 mm (5.59 in.) **Close-limit field size:** 152x234 mm (5.98x9.21 in.)
Focal length: Marked: 24-mm **Measured:** 24.73-mm **f-number: Marked:** f/2 **Measured:** f/2.06 **T-number:** T-2.19

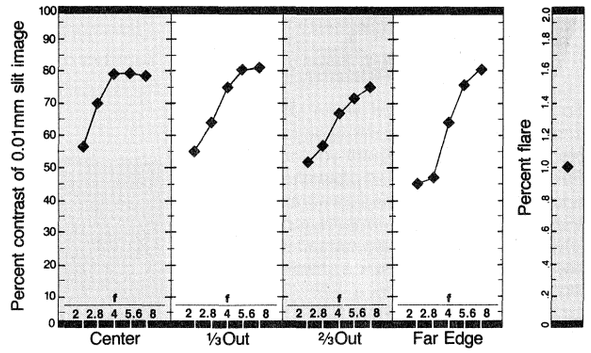
Aberration	1/3 out	2/3 out	Far-edge	Notes
Coma	2.8	3.5	5.6	Critical
Astigmatism	2	2	2	f-stops
Lat. chrom.	Slight	Moderate	Very slight	
Long. chrom.	blue-green-red = 0.05 mm			Focus
Spherical	f/2 — f/5.6 = +0.02 mm			shift
Distortion	Above-average barrel			
Vignetting	None beyond f/5.6			
Centering	Near-perfect			



Zuiko Auto-S 40-mm f/2 Ser. No. 102862

Dimensions: O.D. 60.5 mm (2.38 in.) **L.** 25.3 mm (0.99 in.) **Weight:** 144 g (5.08 oz.) **Filter size:** 49-mm
Close-working limit: 214 mm (8.43 in.) **Close-limit field size:** 119x182 mm (4.69x7.17 in.)
Focal length: Marked: 40-mm **Measured:** 41.85-mm **f-number: Marked:** f/2 **Measured:** f/2.09 **T-number:** T-2.20

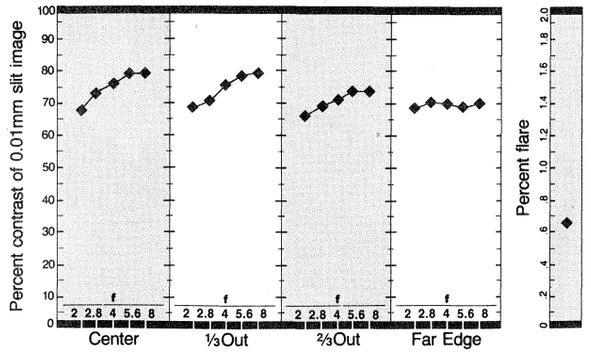
Aberration	1/3 out	2/3 out	Far-edge	Notes
Coma	4	4	6.3	Critical
Astigmatism	2	6.3	2	f-stops
Lat. chrom.	None	V. slight	Very slight	
Long. chrom.	blue-green-red = 0.07 mm			Focus
Spherical	f/2 — f/5.6 = +0.06 mm			shift
Distortion	Moderate barrel			
Vignetting	None beyond f/4			
Centering	Near-perfect			



Zuiko Auto-T 100-mm f/2 Ser. No. 101083

Dimensions: O.D. 70.4 mm (2.77 in.) **L.** 71.7 mm (2.82 in.) **Weight:** 502 g (17.71 oz.) **Filter size:** 55-mm
Close-working limit: 553 mm (21.77 in.) **Close-limit field size:** 117x176 mm (4.61x6.93 in.)
Focal length: Marked: 100-mm **Measured:** 100.83-mm **f-number: Marked:** f/2 **Measured:** f/2.10 **T-number:** T-2.21

Aberration	1/3 out	2/3 out	Far-edge	Notes
Coma	2	4.5	4.5	Critical
Astigmatism	2	4.5	5.6	f-stops
Lat. chrom.	None	V. slight	Moderate	
Long. chrom.	blue-green-red = 0.08 mm			Focus
Spherical	f/2 — f/5.6 = +0.04 mm			shift
Distortion	None			
Vignetting	None beyond f/3.5			
Centering	Perfect			



Mechanical: Like most other Olympus lenses for the OM series, these three have aluminum-alloy focusing helicoids and well-anchored mounting flanges made of chromed brass. The little 40-mm f/2 lens uses six elements in an air-spaced construction (no cemented elements). Despite its compactness, the autodiaphragm mechanism appears capable of reliable service. All three lenses are multilayer-coated.

The other two lenses employ floating-element designs that are said to correct the usual variation in performance with subject distance. The 24-mm f/2 uses 10 elements in eight groups. As the lens is focused, some of the elements in its rear section shift in the same direction as the rest */continued on page 108*

Field Check: Olympus OM-4

continued from page 107

until the new setting is reached. It is done more quickly and easily than it sounds, but it is still not as simple as most other ISO-setting systems I've encountered.

An unusual and welcome feature of the OM-4 is its diopter-adjustment control. This corrects for some of the user's visual shortcomings (if any), so that the viewfinder image and information appears clear and sharp without the need to wear glasses. It is conveniently placed on the prism housing and adjusts from plus-one to minus-three diopters.

Another valuable asset of the OM-4 is its mechanical shutter speed of 1/60 sec. Thus, should batteries go dead far from replacements, you can continue shooting within the limits of that shutter speed until full operation can be restored. A time-exposure setting ("B") is also available without battery power.

To prevent accidental setting of the mechanical mode, you must release a small lock alongside the shutter-speed control ring to be able to set the mechanical 1/60 sec or B. This setting is separate from the electronically controlled shutter speeds, but on the same control ring.

Of course, in this batteryless mode, you must get along without a built-in exposure meter. So skill, experience, a hand-held meter, or the multilingual suggestions wrapped with your film must be called on for suggestions.

The OM-4 certainly offers many highly sophisticated features to help with your picture taking. I've tried to cover the most useful and unusual ones. More conventional features such as a self-timer, beep-cancellation switch, and PC flash-cord socket, are provided as well.

The top-plate area to the right of the prism housing (with camera to eye) holds the film-advance lever, exposure-counter window, rewind release, exposure-memory indicator lamp, and spot, highlight, and shadow-control buttons.

But working quickly, with camera to eye, I sometimes made mistakes in the button pushing, since only a few millimeters separate them. And working with gloves on ranged from difficult to impossible (depending on the thickness of the gloves), except for the shutter-release itself, which was easily used.

The lever on the left side of the top plate which controls manual, auto, and battery-check operations, is also easy to set into each of these positions.

The sophistication of the OM-4 is such that *two* instruction books are provided to cover its operation—one (mostly instructional photos) is 66 pages long; the second, 53 pages of illustrated text.

To sum up, I would say the OM-4 seems to be the most quickly controllable, most "intelligent" and complex model of the Olympus line to date. There is little in the way of normal exposure control that you cannot apply at the press of a button. My trial shots with it were "right on" in each variation of mode, and the test results were a good lesson in exposure control, and why and how to make different kinds of readings.

One man's opinion: the OM-4 offers more automatic exposure control than many may ever need, but it is a wish-fulfilling camera for anyone who knows what all those buttons are for and will use them often.

Lens Performance: OM-4

continued from page 65

of the lens, but faster. Its autodiaphragm is strong and simple. This lens, along with the 100-mm f/2, had impressively low flare levels, thanks to the very effective baffling and blackening of internal surfaces and edges.

The 100-mm f/2 uses seven elements in six groups. Its floating-element system is more complex than most; it approaches a zoom lens in the way it operates. Elements within the rear section move in a compound fashion as the rest of the lens moves conventionally during the focusing action.

This arrangement requires a slightly more complex autodiaphragm system, but not at the expense of ruggedness. The entire system looks like a worthy part of a lens whose impressive optical performance is reported elsewhere in this report. Pay particular attention to the contrast-test figures—they are unusually high and even across the image field.

Norman Goldberg

Stripdown: Olympus OM-4

continued from page 64

splattered solder droplets nearby. This is uncharacteristic of Olympus, as was the presence of some metal chips, mostly in the lower section of the camera. To speculate, perhaps this is one of the first production series, which had to be set aside during manufacturing for a re-do of some assembly work. In any case, the camera functions properly, and (based on similar examinations of Olympus cameras through the years) the few signs of poor workmanship seen here are not typical.

On the praiseworthy side, no wires or other solder joints are involved in replacing the LCD panel; it lifts off its mounting with the removal of two clamping screws. Electrical contact is by means of pressure, through a resilient plastic strip containing conductive segments.

Throughout the camera, switches and other electrical contact points are gold-plated or otherwise treated against oxidation. Sections of the flexible circuit are coated with a vapor-barrier substance to prevent shorting out in high humidity.

Two electromagnets are used: one to trip the camera, the other to arrest the closing curtain, thus controlling exposure times. The actual timing is done by a quartz crystal.

In the mechanical "dead-battery" mode, where 1/60-sec and B settings are provided, a cam shifts the camera-tripping duties from the electromagnet to mechanical pressure from the user's finger. A notable aspect of this feature in the OM-4 is that there is no discernible difference in the feel of the trip button's action in either mode.

Several points around the camera have been protected against dust and moisture by the use of rubber or foam-plastic gaskets. Olympus wisely refrains from any claims that this makes the camera weatherproof, because even where the gasketing is at its best, it is not intended to be a perfect seal. But it does offer protection against the grime and grit present in the routine working environment of most photographers.

One of the OM-4's neatest touches is the built-in cover for the bottom of the film-supply chamber. The camera's motor-drive accessory features motorized rewind through this port. When the motor is attached, the cover swings aside automatically, permitting the motor's rewind fork to enter the chamber. This system permits attaching and removing the motor in midroll.

Just as important, there are no tiny cover plates to remove and possibly lose. Nice going, Olympus. Now I wish they would do the same for the other side of the camera, where the motor-coupling cover for the take-up side must be removed before the motor can be attached.

Physically, this is a rugged little camera. Its die-cast aluminum-alloy body and front plate are bolstered by formed-brass top and bottom covers. You have to look hard to find the few plastic parts used for knobs and buttons. Here it is the best choice of materials, especially for cold-weather use. The steel-bushed strap lugs and die-cast tripod socket are all well anchored to the main casting, and the back, simple as it may look, gets its desirable stiffness from a composite construction of seven panels.

Norman Goldberg

LENS TEST GLOSSARY

(See Lab Report on page 60)

Aberrations: A flawlessly manfactured 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 curvature of each lens 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 aberrations: A shift of focus with color. Not improved by stopping down.

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

T-number: The actual maximum f-number divided by the square-root of the percentage of transmitted light.

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 24 × 35-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.