

# Lab Report

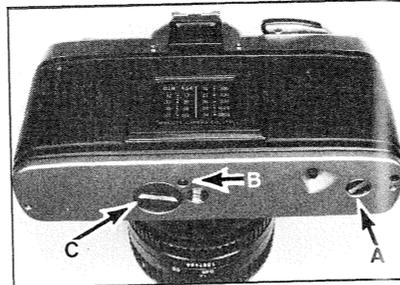
(continued)

and aperture rings permit lens operation completely by touch after you've become familiar with the controls.

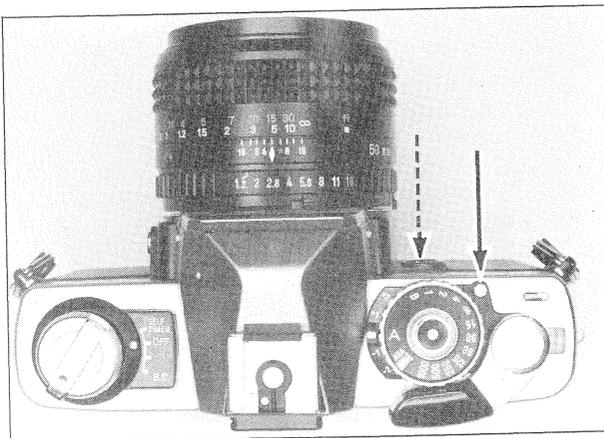
Thoughtfully grouped exposure controls are also designed for touch operation. Top right of the pentaprism is the quadri-purpose shutter-speed dial. It has speed settings of 1 to 1/1,000 sec and B, plus a yellow "A" automatic setting that selects the proper shutter speed for the chosen aperture. A window in the shutter-speed dial shows the film speed, which is set by turning the outer ring of the dial. To top it all off, a slightly rounded button in the center of

the dial performs two major functions. On finger contact it activates the exposure meter and selects the shutter speed automatically; then, with slight finger pressure, it makes the actual exposure. Finger contact on the button also lights up red LED shutter-speed readouts visible in the right side of the viewfinder.

The electronic circuitry will lock the release against under- or overexposure. You then can change the lens aperture, which will automatically change the shutter speed. For back- and forelighted situations a  $\pm 2$  EV override adjacent to the shutter-speed dial is provided.



Frame around ASA/DIN chart holds film box end as reminder. Motor drives through coupling (A), gets electrical commands from camera through contact (B). Battery chamber (C) holds two S-76 cells.



Shutter-release button at center of shutter-speed dial is combination switch. Electrical conductivity of finger switches on metering display when shutter-speed dial is set to "A" (auto-exposure, aperture-priority type). Pressing release button further completes circuit to internal electromagnet, tripping camera. Shutter speeds may be manually selected by unlocking speed dial with button (solid arrow). Narrow window to right of button displays safe-load signal, indicating correct film take-up. Self-timer is employed by turning collar surrounding rewind knob to top of four-position switch settings, shown here set to "off". Setting switch to "self-timer" starts electronic delay of 10 sec as soon as shutter release is pushed. As delay occurs, LED signal on camera's front (dashed arrow) blinks. Blinking rate increases toward end of delay. Same signal glows when switch is set to "BC" (battery check) if batteries are charged.

## 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.

## Lens Performance

See Lens Test Glossary on opposite page

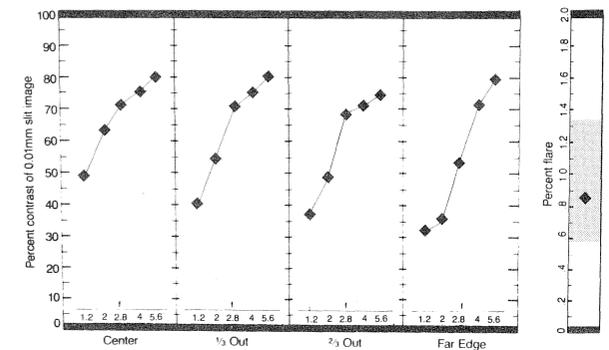
**Mechanical:** A stripdown of the three lenses included in this report showed all of them to employ all-aluminum focusing helicoids, and strong, simple

auto-diaphragm mechanisms. The baffling and blackening against flare were exceptionally good in the 50-mm f/1.2 lens.

**Minolta MD Rokkor-X 50-mm f/1.2 Ser. No. 1007463**  
Dimensions: O.D. 65.4 mm (2.57 in.), L. 46.0 mm (1.8 in.)  
Weight: 314 g (11.0 oz.) Filter size: 55-mm  
Close-working limit: 346 mm (13.62 in.)

Aberration	1/3 out	2/3 out	Far edge	Notes
Coma	2.2	2.8	4.5	Critical f-stops
Astigmatism	1.2	5.6	1.2	
Lat. chrom.	None	V. slight	None	
Long. chrom.	blue — red = 0.07 mm			Focus shift
Spherical	f/1.2 — f/4 = +0.05 mm			
Distortion	Above average barrel			
Vignetting	None beyond f/2.8			
Centering	Near-perfect			

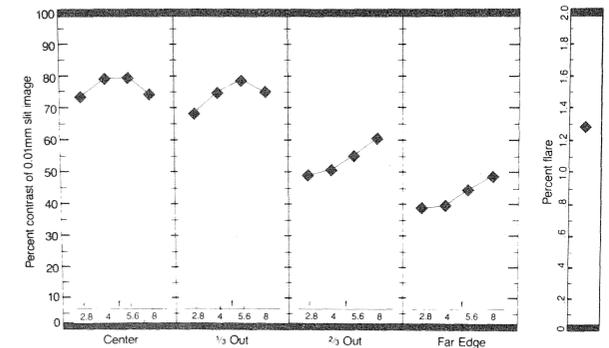
Close-limit field size: 162x248 mm (6.37x9.76 in.)  
Focal length: Marked: 50 mm Measured: 52.00 mm  
f-number: Marked: f/1.2 Measured: f/1.28  
Transmittance: 89% T-number: T-1.35



**Minolta MD Rokkor-X 28-mm f/2.8 Ser. No. 1118857**  
Dimensions: O.D. 64.3 mm (2.53 in.), L. 43.6 mm (1.72 in.)  
Weight: 185 g (6.48 oz.) Filter size: 49-mm  
Close-working limit: 200 mm (7.87 in.)

Aberration	1/3 out	2/3 out	Far edge	Notes
Coma	4	5.6	6.3	Critical f-stops
Astigmatism	2.8	2.8	8	
Lat. chrom.	V. slight	Slight	Slight	
Long. chrom.	blue — red = 0.05 mm			Focus shift
Spherical	f/2.8 — f/5.6 = +0.05 mm			
Distortion	Very slight barrel			
Vignetting	None beyond f/4.5			
Centering	Near-perfect			

Close-limit field size: 176x267 mm (6.93x10.51 in.)  
Focal length: Marked: 28 mm Measured: 28.54 mm  
f-number: Marked: f/2.8 Measured: f/2.85  
Transmittance: 83% T-number: T-3.13



**Minolta MD Tele Rokkor-X 100-mm f/2.5 Ser. No. 1201585**  
Dimensions: O.D. 64.4 mm (2.53 in.), L. 64.2 mm (2.53 in.)  
Weight: 367 g (12.8 oz.) Filter size: 55-mm  
Close-working limit: 860 mm (33.86 in.)

Aberration	1/3 out	2/3 out	Far edge	Notes
Coma	4	4.5	5.6	Critical f-stops
Astigmatism	2.5	2.5	2.5	
Lat. chrom.	None	V. slight	V. slight	
Long. chrom.	blue — red = 0.13 mm			Focus shift
Spherical	f/2.8 — f/5.6 = +0.04 mm			
Distortion	None			
Vignetting	None beyond f/4.5			
Centering	Near-perfect			

Close-limit field size: 190x286 mm (7.48x11.26 in.)  
Focal length: Marked: 100 mm Measured: 98.29 mm  
f-number: Marked: f/2.5 Measured: f/2.65  
Transmittance: 89% T-number: T-2.81

