

modern tests

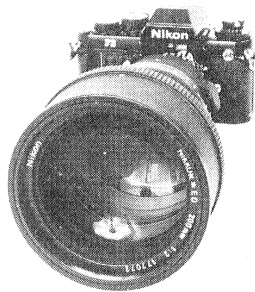
newest cameras, lenses & important accessories

TWO NIKON 200s: FAST OR CLOSE

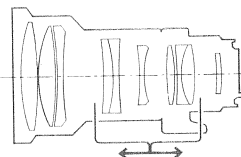
Lens: 200mm f/2 Nikkor ED
Mounts: Fixed mount for Nikon AI SLRs
Filter size: 122mm screw-in
Apertures: f/2 to f/22
Min. foc. dist.: 8ft. 2 1/2 in. (2.5 m)
Features: Internal focusing, rotating, lockable tripod mount with standard socket, heavy duty strap lugs, collapsible, locking lens hood
Serial No.: 177072
Size: 5 1/2 in. diam. x 8 3/8 in. long (135 mm x 222 mm)
Weight: 5 lbs., 6 oz. (2.45 kg)
Price: \$2470

Lens: 200mm f/4 Micro-Nikkor
Mounts: Fixed Nikon AI
Filter size: 52mm screw-in
Apertures: f/4 to f/32
Min. foc. dist.: 2 ft. 4 in. (.71 m)
Features: Internal focusing to 1:2, rotating removable tripod mount, collapsible hood
Serial No.: 190660
Size: 2 1/2 in. diam. x 6 1/4 in. long (67 mm x 180 mm)
Weight: 1 lb., 10 oz. (734 g)
Price: \$765

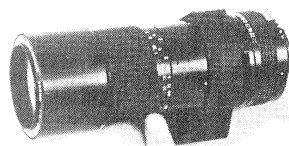
Two new 200s from Nikon? They already have both the time-tested 200 f/4 and the high speed 180mm f/2.8 in their well-stocked arsenal. Why more? These two are not intended for everyday use but for solving special problems. The hefty 200mm f/2 Nikkor ED is the fastest auto-diaphragm lens of this focal length we've seen—perhaps a dream come true for theatrical and sports photographers. In contrast, the lightweight, compact 200mm f/4 Micro-Nikkor provides exquisite optical performance in a handy package as well as convenient working distance for lighting control even in the macro range. Both feature quick and convenient, internal focusing systems, so neither lens increases in barrel length as you focus closer. This ensures that their good balance is maintained in hand-held and tripod use. Both feature rotating tripod mounts with 1/4 x 20 sockets, a great convenience though we'd have preferred a 3/8-in. socket for the stronger European tripod screw in the



High-speed 200: Nikon's f/2 ED provides high aperture, long range photography for theatrical and sports buffs.



Internal focusing effortlessly moves central six elements to focus the complex 200mm f/2 "big gun" from Nikon.



Close-focusing 200: Nikon's f/4 Micro-Nikkor provides ultra-sharp long-reach photography for the close-up enthusiast and scientific photographer.

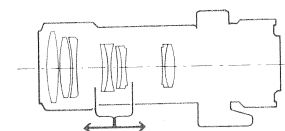
5 1/2-lb. f/2 lens. Focusing collars are broad and heavily textured as are aperture-control rings. There are detents at whole-stop intervals but we wish there were half-stop detents as well.

The compact 200 f/4 Micro-Nikkor offers continuous focusing to 1:2 (at 19 1/2 in.) for easy macro lighting, use of normal automatic strobes, and reasonable safety from hazardous subject matter. As our test readouts indicate, its high optical quality at both focusing ex-

tremes is of the highest order. However, care must be exercised in focusing since the lens goes from infinity to less than 2 ft. in one turn of the fast focusing mount. Focus with care and remove your hand from the mount gingerly—a twitch can easily throw the focus off. Reproduction ratios from 1:10 to 1:2 are engraved in orange on the focusing ring. Scientific users may want to preset to the desired ratio and then move the camera closer to or farther from the subject to obtain critical focus. Depth of field limits are marked in green for f/32 only, but in the macro ranges that may be the only stop you can use to record 3-dimensional subjects with uniform sharpness anyway.

The elegantly designed, smooth-turning, removable tripod socket ring will be appreciated by close workers on a tripod and hand-holders alike.

The big 200mm f/2 Nikkor ED is a different bird altogether. Here we have a massive (5 1/2 lb.) yet well-balanced long lens with a front element nearly 5 in. in diameter. Inside, 10 elements in eight groups deliver fine image quality for this almost unprecedentedly fast, long lens. Without internal focusing this lens would be impractical due to the huge helicoid that would be necessary to focus it. Three groups with six elements move internally with a finger touch to focus the lens from 8 ft. to infinity, consequently the lens remains well-balanced at all focusing distances. This lens can be hand-held by the physically fit, but use of a monopod would ease hand-held use and provide stability as well.



Internal focusing shifts central 4 elements to focus the 200mm f/4 Micro-Nikkor from 1:2 to infinity.

Nikon's teleconverters should add additional scope to both lenses. With the TC-300 (\$494.50), the Micro-Nikkor becomes a hand-holdable 400mm f/8 lens reaching 1:1 at 19 1/2 in. The 200 f/2 used with the TC-14 (\$524) converter becomes an only slightly larger 280 f/2.8, while the TC-200 (at \$247.50) boosts it to 400mm at f/4.

Optical bench analysis: On the bench and at maximum aperture the 200mm f/2 showed slight spherical aberration on axis and very slight red/green lateral color off axis. Performance came close to the perfect diffraction limit pattern by f/8. Slight red flare disappeared by f/5.6. The 200mm f/4 Micro-Nikkor showed secondary color

aberration down to f/8 on axis. Off-axis, slight red skew-ray flare disappeared by f/22, but slight green-red lateral color was seen at all apertures.

Field test slides: Our field test slides with the f/2 showed slight softness wide open and slight loss of contrast. Performance improved noticeably by f/8. Shooting a contrasty theatrical performance produced excellent slides on Ektachrome 400 wide open. The slight loss of contrast wide open seemed actually to help tame the high scene contrast. Our field test slides with the Micro-Nikkor produced contrasty slides, sharp from corner to corner even at f/4. Performance held up well even at f/32—very important for a close-focusing lens. The slight lateral color seen at f/4 disappeared by f/8. Slides shot at 1:4 and 1:2 ratios showed very superior performance in the close-up range.

RESOLUTION

Nikkor 200mm f/2 at 1:49 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
2	V. Good	44	Excellent	39
2.8	Excellent	55	Excellent	44
4	Excellent	62	Excellent	44
5.6	Excellent	55	Excellent	49
8	Excellent	55	Excellent	49
11	V. Good	49	Excellent	44
16	V. Good	49	Excellent	44
22	V. Good	49	V. Good	39

CONTRAST

Nikkor 200mm f/2 at 30 lines/mm				
f/no.	Center %	Corner %		
2	V. Low	20	V. Low	22
2.8	Low	33	V. Low	23
4	Low	46	V. Low	25
5.6	Low	46	V. Low	25
8	Low	50	V. Low	27
11	Low	46	V. Low	27
16	Low	43	V. Low	24
22	V. Low	34	V. Low	21

RESOLUTION

Nikkor 200mm f/4 at 1:49 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
4	V. Good	44	Excellent	39
5.6	Good	44	V. Good	39
8	V. Good	44	Excellent	39
11	V. Good	49	Excellent	44
16	V. Good	49	Excellent	44
22	V. Good	44	Excellent	44
32	V. Good	39	Excellent	35

CONTRAST

Nikkor 200mm f/4 at 30 lines/mm				
f/no.	Center %	Corner %		
4	Low	38	V. Low	21
5.6	Low	42	V. Low	22
8	Low	48	V. Low	26
11	Medium	49	V. Low	29
16	Low	46	V. Low	27
22	V. Low	40	V. Low	25
32	V. Low	30	V. Low	23

PERFORMANCE

Our Standard	Tested
Focal length: ±5% (190.00 to 210.00mm)	201.84mm
Max. aperture: ±5% (f/1.90 to f/2.10)	f/2.01
Distortion: ±2.5% less than 1% (pincushion)	
Light falloff: at f/5.6 +1 stop from theoretical limit (0-1.03 stops)	0.75 stops

PERFORMANCE

Our Standard	Tested
Focal length: ±5% (190.00 to 210.00mm)	201.23mm
Max. aperture: ±5% (f/3.80 to f/4.20)	f/4.00
Distortion: ±2.5% less than 1% (pincushion)	
Light falloff: at f/5.6 +1 stop from theoretical limit (0-60 stops)	0.35 stops

35-70mm, 85-250mm OLYMPUS ZOOMS

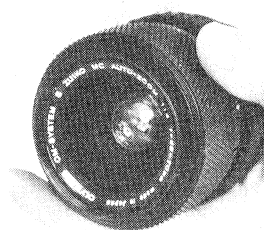
Lens: 35-70mm f/4 Olympus S Zuiko MC
Mounts: Fixed mount for Olympus OM SLRs
Filter size: 55mm screw-in
Min. foc. dist.: 2 ft., 6 in. (0.75 m)
Apertures: f/4 to f/22, click-stops at whole stop intervals
Serial No.: 105414
Features: Separate zoom and focusing control rings
Size: 2-11/16 in. diam. x 2-13/16 in. long (68 x 71 mm)
Weight: 13.4 oz. (380 g)
Price: \$330

Lens: 85-250mm f/5 Olympus Zuiko MC
Mounts: As above
Filter size: 55mm screw-in
Min. foc. dist.: 6 ft., 7 in. (2m)
Apertures: f/5-f/32, click-stops at whole stop intervals
Serial No.: 102566
Features: Separate zoom and focusing control rings, built-in sunshade and rotatable tripod platform
Size: 2 1/4 in. diam. x 7-11/16 in. long (70 x 196 mm)
Weight: 31.4 oz. (890 g)
Price: \$705

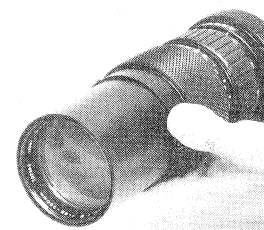
What prompts Olympus to offer a new, ever so slightly shorter and lighter 35-70mm f/4 Zuiko when there's already a very fine 35-70mm f/3.6 in their optical line? Well, price and complexity have a lot to do with it—the f/3.6 version lists for a tad over \$500 and is constructed of 10 elements in 8 groups, while the 1/2-stop slower f/4 is \$170 cheaper and has 7 elements in 7 groups. Obviously the deciding factor in choosing between these two closely matched optics is whether the optical performance of the newer lens can come close to matching the outstanding performance of the older, faster version (see Modern Tests, January, 1980, page 119). If you can't stand the

suspense, just glance at the accompanying resolution and contrast charts and you'll see that it does. As a matter of fact, in terms of lines-per-millimeter resolution the overall performance of the f/4 is a bit better!

In terms of physical operation and feel, the 35-70mm f/4 is very much in the Olympus zoom tradition, with a knurled, rubber 3/8-in. wide zooming ring toward the back of the lens and a 15/16 in. wide diamond pattern textured focusing ring up front. Both work with commendable smoothness and are well differentiated by location and feel, and the latter takes the lens down to minimum focusing distance in an approximately 160° turn. The lens's focusing image is reasonably bright and quite contrasty on our lab OM-1 and the aperture and distance



It's not very fast, and doesn't focus that close, but 35-70mm f/4 Zuiko's sharp and flare free.



Well balanced for a 3:1 tele zoom, 85-250mm Zuiko's zoom and focus rings are well differentiated by feel.

scales are legibly engraved. However, we wish the focal lengths on the zoom ring were in a brighter shade than green.

The 35-70 balances very nicely on camera and is reasonably compact for its range. Our criticisms are few—we wish it focused closer than 2 1/2 ft., enabling you to shoot close-ups at the 35mm setting and we'd prefer to have the front element more deeply recessed even at the cost of a few additional millimeters in overall length. However, the latter isn't as serious an omission as it might be since this lens is efficiently multicoated. All in all, we congratulate Olympus in achieving such a splendidly performing (and reasonably priced) wide-to-moderate tele zoom with so few elements.

Turning to the 85-250mm f/5,

here we have a lens offering a whisker less than a 3:1 zoom ratio, and giving you 50mm more than the more common 80-200mm zooms at the tele end of the spectrum. The price you pay (other than monetary) for this privilege is about 1/2 to 3/4 of a stop in lens speed and an inch or two in overall length. Olympus has kept the weight down to just under 2 lbs., a quite reasonable figure.

In typical Olympus fashion, the zoom and focus rings are rubberized and nicely differentiated by feel. The 3/8-in. wide knurled zooming ring works quite smoothly and is marked at 85, 100, 120, 150, 200, and 250mm settings. The 1 1/8 in. wide diamond pattern textured focusing ring gets you down to closest distance in a just-under-180° turn, and its action is smooth and precise. A built-in sliding lens shade at the front of the barrel extends 3/8 in., effectively minimizing glare, but it would be even better if it could lock at the extended position. At the other end of the 85-250 is a very solidly constructed rotatable tripod platform. It has no click-stop settings like some we've seen, but it can be locked firmly at any position desired with a comfortable, well designed locking knob.

Like the 35-70, this lens does not provide frame-filling head shots at its shortest focal length and closest focusing distance—chest-to-head portraits are as close as you'll get unless you select a longer focal length. However, this lens balances surprisingly well on camera, permitting hand-held shooting at slower shutter speeds (1/125 sec. and even 1/60 if you're steady) than you might expect. At the 250mm setting you'll do better mounting the lens on a tripod if you require critically sharp pictures at such speeds, but hand-held shots at 1/250 sec. and up are, nevertheless, possible.

In the scale legibility department, the 85-250 suffers the same minor problem as the 35-70—it's not easy to see the green-on-black focal length digits in dim light. However, all other scales are quite legible. In effect, what Olympus has done with this lens is to keep the specifications quite conservative and concentrate on achieving high levels of optical performance. Take a glance at the resolution readouts and other test results and you'll see that they've succeeded admirably.

Optical bench analysis: The 35-70mm f/4 Zuiko exhibited very slight flare and chromatic aberration in the center of the field at f/4, but performance improved to a nearly perfect star image pattern at f/8. Toward the edges of the field, we observed slight high order coma wide open, but it was gone by f/8.

At 50mm the results were quite similar to those above in the center of the image field, but toward the edges, we noted slight high order coma and a bit of yellow-orange flare at f/4 that was gone by f/8. A very slight amount of red-blue lateral color persisted at smaller apertures.

At 70mm, the central image showed very slight blue-violet flare, but the image had a tight, bright central core indicative of good image quality. The flare was gone by f/8. Toward the edges of the image field we noted the same minor defects described at the 50mm setting plus very slight astigmatism. Overall, this lens appears to be very well constructed and its aberrations very well controlled for a lens of this type.

Optical bench analysis: The 85-250mm f/5 Zuiko exhibited very slight yellow-orange flare centrally at maximum aperture, but it was gone by f/8. Toward the edges of the image field, we detected very slight flare at f/4 that was gone by f/8, and very slight red-blue lateral color that persisted at smaller apertures.

At 150mm, the lens exhibited central image quality characteristics similar to those at 85mm, but toward the edges of the field we noted very slight astigmatism, and very slight flare at maximum aperture that was gone by f/11.

At 250mm in the center of the field, we observed slight red-green flare and slight chromatic aberration, but both were gone by f/11. Toward the edges of the field, we noted slight red flare and very slight red-green lateral color at all apertures. Overall, construction and aberration control are above average for a lens of this focal-length range.

Field test slides: At 35mm, the 35-70mm f/4 Zuiko delivered very sharp, crisp images, both centrally and toward the corners, at all apertures except those shot at f/16 and f/27 which showed slight softness across the field. No color defects were noticeable.

At 50mm, the results were virtually identical to those at 35mm, and the pattern was quite similar at 70mm as well. However, at 70, sharpness held better at the smallest apertures. No distortion was seen at any focal length setting—an above-average performance for a lens of this type—and was well-controlled throughout. We judge this lens to be an above-average performer for a zoom of this focal-length range.

Field test slides: At 85mm, the 85-250mm f/5 Zuiko showed slight softness both centrally and toward the corners at maximum aperture, but overall definition improved to very good at f/8 and smaller apertures, with very little falloff in sharpness

modern tests

toward the edges and corners of the field. At 200mm, the results at f/5 were noticeably softer and lower in contrast, with little improvement at smaller apertures. This softness persisted at the 250mm setting at the widest apertures, but improved to good at f/11 to f/32. There was no noticeable distortion at any focal-length setting, and color defects were absent—a very good performance. Despite the aforementioned softness at longer focal-length settings, this zoom was capable of rendering good corner-to-corner detail even wide open at 200-250mm, and flare was very well-controlled throughout.

PERFORMANCE

Our Standard	Tested
Focal length: ± 5% (33.25 to 36.75mm) (66.50 to 73.50)	35.39mm 66.82mm
Max. aperture: ± 5% (f/3.80 to f/4.20) at 70mm:	f/4.06 f/4.09
Distortion: at 35mm: ± 2.5% at 70mm: ± 2.0% less than 1% (barrel)	2.5% (barrel) f/4.09
Light falloff: at f/5.6 + 1 stop from theoretical limit at 35mm: (0-1.89 stops) 0.80 stops at 70mm: (0-1.25 stops) 0.50 stops	

RESOLUTION

Zuiko 35-70mm f/4 at 35mm at 1:49 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
4	Excellent	62	Excellent	44
5.6	Excellent	62	Excellent	49
8	Excellent	55	Excellent	55
11	Excellent	62	Excellent	55
16	Excellent	55	Excellent	49
22	V. Good	49	Excellent	44

CONTRAST

Zuiko 35-70mm f/4 at 35mm at 30 lines/mm				
f/no.	Center %	Corner %		
4	High	67	Medium	31
5.6	High	69	High	47
8	High	69	High	52
11	High	65	High	56
16	High	59	High	52
22	Medium	49	High	43

RESOLUTION

Zuiko 35-70mm f/4 at 50mm at 1:51 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
4	Excellent	64	Excellent	45
5.6	Excellent	64	Excellent	51
8	Excellent	57	Excellent	51
11	Excellent	57	Excellent	57
16	Excellent	57	Excellent	51
22	V. Good	51	Excellent	45

CONTRAST

Zuiko 35-70mm f/4 at 50mm at 30 lines/mm				
f/no.	Center %	Corner %		
4	High	67	High	36
5.6	High	71	High	50
8	High	73	High	56
11	High	68	High	52
16	High	60	High	48
22	Medium	48	High	44

RESOLUTION

Zuiko 35-70mm f/4 at 70mm at 1:51 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
4	Excellent	51	Excellent	45
5.6	Excellent	57	Excellent	45
8	Excellent	51	Excellent	51
11	Excellent	57	Excellent	51
16	V. Good	51	Excellent	45
22	Good	45	V. Good	40

CONTRAST

Zuiko 35-70mm f/4 at 70mm at 30 lines/mm				
f/no.	Center %	Corner %		
4	High	68	High	48
5.6	High	72	High	56
8	High	72	High	59
11	High	69	High	56
16	High	60	High	50
22	Low	47	High	46

PERFORMANCE

Our Standard	Tested
Focal length: ± 5% (80.75 to 89.25mm) (237.50 to 262.50mm)	86.81mm 251.88mm
Max. aperture: ± 5% (f/4.75 to f/5.25) at 250mm:	f/5.03 f/5.05
Distortion: at 85mm: ± 2.0% at 250mm: ± 3.5% less than 1% (pincushion)	less than 1% (barrel) less than 1% (pincushion)
Light falloff: at f/5.6, + 1 stop from theoretical limit at 85mm: (0-1.17 stops) 0.15 stops at 250mm: (0-1.02 stops) 0.30 stops	

RESOLUTION

Zuiko 85-250mm f/5 at 85mm at 1:49 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
5	Excellent	49	Excellent	49
8	V. Good	49	Excellent	49
11	Excellent	55	Excellent	49
16	Excellent	55	Excellent	49
22	Good	44	Excellent	44
32	V. Good	39	Excellent	35

CONTRAST

Zuiko 85-250mm f/5 at 85mm at 30 lines/mm				
f/no.	Center %	Corner %		
5	High	58	High	38
8	High	75	High	43
11	High	75	High	43
16	High	66	Medium	40
22	Medium	54	Medium	34
32	Low	38	Medium	28

RESOLUTION

Zuiko 85-250mm f/5 at 150mm at 1:51 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
5	Excellent	51	Excellent	45
8	V. Good	51	Excellent	51
11	Excellent	57	Excellent	57
16	Excellent	51	Excellent	57
22	V. Good	45	Excellent	45
32	Good	36	Excellent	36

CONTRAST

Zuiko 85-250mm f/5 at 150mm at 30 lines/mm				
f/no.	Center %	Corner %		
5	High	57	High	50
8	High	64	High	56
11	High	66	High	54
16	High	60	High	51
22	Medium	52	High	42
32	Low	38	High	34

RESOLUTION

Zuiko 85-250mm f/5 at 250mm at 1:51 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
5	V. Good	45	Excellent	45
8	Good	40	Excellent	40
11	V. Good	45	Excellent	45
16	Excellent	51	Excellent	45
22	V. Good	45	Excellent	45
32	V. Good	40	Excellent	36

CONTRAST

Zuiko 85-250mm f/5 at 250mm at 30 lines/mm				
f/no.	Center %	Corner %		
5	Low	34	Medium	25
8	Low	40	Low	26
11	Low	49	Low	26
16	Low	46	Low	26
22	Low	42	Low	25
32	Low	32	Low	27

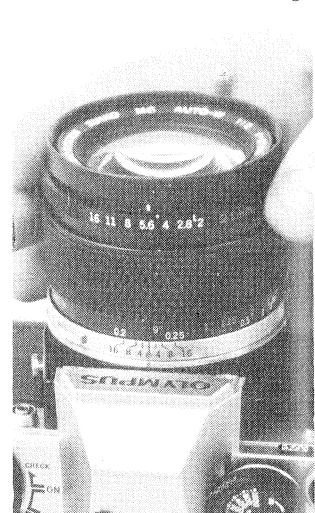
21mm f/2 ZUIKO MC AUTO-W WIDE-ANGLE

Specifications: Fixed mount for Olympus OM SLRs; Serial No. 100094; 55mm filter size; f/2 to f/16; min. foc. dist.: 0.2m (8 in.); 1.7 in. long x 2.3 in. diam.; 8% oz. (252g); \$575.

Practical comments: Fine satin black finish; clear, white numerals; easy, click-stopped controls; 1/2 in. wide diamond

pattern rubberized focusing ring; 90° turn from min. foc. to infinity; fine construction. **Optical bench analysis:** On axis—small, compact image and slight decentering of elements indicated at f/2. Slight red flare, slight overcorrected spherical aberration. Image very good. Almost diffraction limited and slight red flare at f/5.6. Off axis—some high order coma present; slight yellow-blue lateral color; slight yellow flare. Image very good at f/5.6.

Field test slides: Slight flare at f/2, no noticeable loss of image



21mm f/2 Zuiko is compact, lightweight in Olympus OM tradition.

PERFORMANCE

Our Standard	Tested
Focal length: ± 5% (19.95 to 22.05mm)	20.15mm
Max. aperture: ± 5% (f/1.90 to f/2.10)	f/1.91
Distortion: 21mm ± 4.0% Light falloff: at f/5.6, + 1 stop from theoretical limit (0-3.00 stops)	0.9% (barrel) 1.12 stops

RESOLUTION

at 1:49 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
2	V. Good	49	V. Good	31
2.8	Excellent	62	V. Good	35
4	Excellent	87	V. Good	39
5.6	Excellent	87	V. Good	39
8	Excellent	78	Excellent	44
11	Excellent	69	Excellent	44
16	Excellent	62	Excellent	49

MODERN PHOTOGRAPHY'S unbiased test reports are based on actual field work and measurements carried out in our own laboratories. Only production equipment and materials similar to those available to the reader are tested. Readers are warned, however, that our tests, particularly of lenses and cameras, are often far more critical and specific than those published elsewhere and cannot therefore be compared with them. In all lens tests, unless specifically noted, some of the sharpness falloff at the edges can be traced to curvature of field, most noticeable at close focusing distances; at distant settings, this effect would be minimized. Note too that the standards for center sharpness are higher than for edge sharpness, so that no comparison should be made between center and edge ratings. **NO MODERN TEST MAY BE REPRODUCED IN WHOLE OR IN PART FOR ANY PURPOSE IN ANY FORM WITHOUT WRITTEN PERMISSION.** Should you have difficulty locating sources for any product, write to the Readers' Service Dept. of Modern Photography. **WARNING:** Since optics and precision mechanisms may vary from unit to unit, we strongly suggest that our readers carry out their own tests on equipment they buy. **PRICES GIVEN ARE MANUFACTURER'S SUGGESTED LIST PRICES AT PRESSTIME. ITEMS ARE OFTEN AVAILABLE AT LOWER PRICES THROUGH DEALERS.**

sharpness in corners at f/2. Pretty sharp image at f/5.6, slight flare still present at f/8. Slight barrel distortion typical for 21mm lens. Overall, a very good lens.

CONTRAST

at 30 lines/mm				
f/no.	Center %	Corner %		
2	Low	40	Low	18
2.8	Low	46	Low	20
4	Low	48	Low	30
5.6	Low	56	Low	40
8	Low	58	Medium	42
11	Low	51	High	42
16	Low	46	High	42

80-210mm f/3.8-4 TAMRON ZOOM



Lens: 80-210mm f/3.8-4 Tamron CF TELE Macro Zoom
Mounts: Interchangeable Adaptall-2 for Canon, Contax/Yashica, Fujica-X, Konica, Mamiya ZE, Minolta, Nikon, Olympus, Topcon, Pentax thread and K bayonet
Filter size: 58mm screw-in
Min. foc. dist.: 2.9 ft. (8.7 m)
Apertures: f/3.8-4 to f/32
Serial No.: 5542169
Features: Close focusing to 1:2.8, single zooming/focusing control
Size: 2 1/2 in. diam. x 6 in. long (67 x 162mm)
Weight: 1 lb. 8 oz. (686 g)
Price: \$310

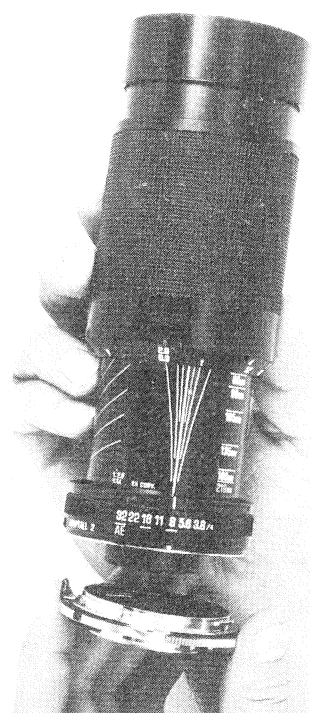
Tamron's commitment to a full-fledged family of interchangeable mount auto-diaphragm lenses is no more in evidence than with this optic that neatly fills in the medium range of the zoom focal length spectrum. In keeping with the rest of the Adaptall-2 system, it is a rather light and relatively compact lens geared for the growing number of scaled-down (in size) SLRs. Even when fully extended to its 7 in. length, it presents no handling problems, mainly due to its one-touch method of operation. The extremely wide (3 1/2 in.) single zooming/focusing band extends over so much of the barrel that it's never out of reach. Even when shooting at the 80mm setting, you can keep both thumb and forefinger on the edge of the band while maintaining contact with the knurled aperture setting ring closest to the body via your little finger. If you don't have to work that fast

use the outermost 2 in. of the band which is covered with the convenient diamond-studded rubberized surface judged to be the best type of setting ring for sure and swift gripping.

The 80-210 Tamron's built-in sliding shade extends overall length an extra 1/2 in. In order to get down to the 80mm setting you must either extend the lens shade—a minor inconvenience—or your action of pushing out the control ring will do it for you with a slight amount of resistance. All scales and apertures are in very large and clear white or green numbers, easily seen from the top.

Close focusing is continuous and variable at all focal lengths with clearly defined orange scale lines along the side of the barrel with a large color-coded index mark on the focusing scale. At the 80mm setting you can align the index with the 1:10 or 1:8 ratio lines; at 210mm you can go from 1:10 down to 1:2.8. Add a 2X converter and the corresponding values (marked in a different yellow color scheme) become 1:5 and 1:4 at 80mm and 1:5 to 1:1.4 at 210mm.

Optical bench analysis: On axis, at 80mm, we noted a tight, bright central core with very slight primary color aberration at maximum aperture. Results were near theoretical diffraction limit by f/8. Off axis, slight high-order coma and slight skew-ray flare present at f/3.8 were gone by f/11. Very slight lateral color was also noted.



One-touch Tamron adapts quickly to variety of cameras via quickchange adapter. Note close focusing lines index at left part of barrel.

At 135mm focal length results on axis were similar to those at 80mm. A weak red-orange flare was noted at f/3.8 and gone by f/5.6. Off axis, we noted slight astigmatism to f/11 and slight lateral color.

At 210mm, on axis, there was a slight primary color aberration at f/4 maximum aperture, which was eliminated by f/11. A very slight decentering was indicated. Off axis, we found slight yellow flare and slight high-order coma.

Field test slides: This lens produced sharp images from corner to corner at the 80mm focal length at all apertures, but lacked some snap in the fine details. At 105mm we noted a slightly soft image at f/3.8 which improved by f/5.6. Images at the 210mm setting were very sharp at all apertures. There was very slight barrel distortion at the 80mm length and very, very slight pincushion at the 210mm setting. Flare was very well controlled throughout.

RESOLUTION

Tamron 80-210mm f/3.8-4 at 80mm at 1:47 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
3.8	Excellent	47	V. Good	33
5.6	V. Good	53	V. Good	37
8	Excellent	59	Excellent	42
11	Excellent	53	Excellent	47
16	V. Good	47	Excellent	47
22	V. Good	47	Excellent	42
32	V. Good	42	Excellent	37

CONTRAST

Tamron 80-210mm f/3.8-4 at 80mm at 30 lines/mm				
f/no.	Center %	Corner %		
3.8	Low	36	Low	16
5.6	Medium	51	Low	18
8	Medium	56	Low	28
11	Medium	53	Medium	40
16	Medium	49	Medium	40
22	Low	42	Medium	41
32	Low	35	High	36

RESOLUTION

Tamron 80-210mm f/3.8-4 at 135mm at 1:49 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
3.8	Good	39	V. Good	31
5.6	Good	44	Good	35
8	Excellent	55	Excellent	39
11	Excellent	55	Excellent	44
16	Excellent	55	Excellent	44
22	V. Good	49	Excellent	44
32	Excellent	44	Excellent	39

CONTRAST

Tamron 80-210mm f/3.8-4 at 135mm at 30 lines/mm				
f/no.	Center %	Corner %		
3.8	Low	38	Low	22
5.6	High	54	Low	25
8	Medium	54	Low	30
11	Low	47	Low	31
16	Medium	48	Low	32
22	Medium	48	Low	32
32	Low	38	V. Low	14

RESOLUTION

Tamron 80-210mm f/3.8-4 at 210mm at 1:48 magnification				
f/no.	Center Lines/mm	Corner Lines/mm		
4	V. Good	43	Excellent	34
5.6	Good	43	Good	34
8	V. Good	48	Excellent	38
11	Excellent	54	V. Good	38
16	Excellent	54	Excellent	43
22	V. Good	48	Excellent	43
32	V. Good	43	Excellent	34

CONTRAST

Tamron 80-210mm f/3.8-4 at 210mm at 30 lines/mm				
f/no.	Center %	Corner %		
4	Low	32	V. Low	7
5.6	Medium	42	Low	17
8	Low	46	Low	25
11	Low	47	Medium	34
16	Low	43	Medium	34
22	Low	40	Medium	34
32	Low	36	High	40

PERFORMANCE

Our Standard	Tested
Focal length: ± 5% (76.00 to 84.00mm) (199.50 to 220.50mm)	82.23mm 207.94mm
Max. aperture: ± 5% (f/3.61 to f/3.99) (f/3.80 to f/4.20)	f/3.94 f/4.08
Distortion: at 80mm: ± 2.0% at 210mm: ± 3.5%	1.73% (barrell) less than 1% (pincushion)
Light falloff: at f/5.6 + 1 stop from theoretical limit 15 80mm: (0.1.19 stops) at 210mm: (0.1.03 stops)	 0.30 stops 0.30 stops