

## CANON L 20-35mm WIDE-ANGLE ZOOM

**Specifications:** 20-35mm f/3.5 Canon L Zoom, no. 10319, in FD mount; accepts 72 mm filters; f/3.5 to f/22 plus "A," detents at 1/2 stop intervals; min. foc. dist.: 20 in. (.5 m); 3 3/8 in. long, 2 1/8 in. diameter (86 x 73 mm); 1 lb. (454 g); \$860.

**Practical comments:** Compact and lightweight; superbly finished and well-balanced on camera body. "Two-touch" controls: zoom ring travels 45° from 20 to 35mm, focus ring 90° from infinity to closest distance. Both have well-knurled, 5/8 in. rubberized surfaces. Zoom calibrated at 20, 24, 28 and 35mm focal lengths, corresponding to commonly available wide-angle lenses. Apertures, focal lengths and distance in meters legibly marked in white; footage scale in green. "A" setting provides for shutter-preferred auto operation (camera sets aperture). Solid, well-constructed feel.

**Field test slides:** Slides were crisp and snappy at all focal lengths, with detail well rendered. At 20mm both center and corner sharpness improved by f/8 but were still above average wide open and at f/5.6. At 28mm and 35mm center and corner sharpness again improved at

f/8. Fall-off could be seen in corners wide open at 20mm and 28mm but was completely gone by f/8. Flare well controlled throughout. Above average for wide-angle zoom of this range.

**Optical bench analysis** (for optical experts only): At 20mm, on axis, slight undercorrected spherical aberration, very slight red flare gone by f/5.6, diffraction limited pattern by f/8. Off axis, slight skew-ray flare mixed with astigmatism; lateral color throughout.

At 28mm, on axis, slight undercorrected spherical aberration again present, diffraction limited by f/8. Off axis, same as at 20mm. At 35mm, on-axis results same as at 20mm and 28mm. Off axis at 35mm, slight skew-ray flare mixed with slight coma; lateral color throughout.

### PERFORMANCE

Our Standard	as Tested
<b>Focal length:</b> ±5% (19.00-21.00mm)	20.13mm (33.25-36.75mm)
<b>Aperture:</b> ±5% (f/3.33-3.68)	f/3.54 at 35mm: (f/3.33-3.68)
<b>Distortion:</b> 20mm: (±4%) 1.34% (barrel) 35mm: (±2.5%) under 1% (barrel)	
<b>Light fall-off:</b> at f/5.6 +1 stop from theoretical limit	
20mm: (0-3.0 stops)	1.5 stops
35mm: (0-1.9 stops)	1.2 stops

### RESOLUTION

CANON L 20-35mm f/3.5  
at 20mm  
at 1: 49

f/	Center (l/mm)	Corner (l/mm)
3.5	V. Good	49
5.6	V. Good	49
8	V. Good	55
11	Excellent	62
16	Excellent	62
22	Excellent	55

### RESOLUTION

CANON L 20-35mm f/3.5  
at 28mm  
at 1: 49

f/	Center (l/mm)	Corner (l/mm)
3.5	V. Good	49
5.6	V. Good	49
8	V. Good	55
11	Excellent	62
16	Excellent	62
22	Excellent	55

### RESOLUTION

CANON L 20-35mm f/3.5  
at 35mm  
at 1: 49

f/	Center (l/mm)	Corner (l/mm)
3.5	V. Good	49
5.6	V. Good	49
8	V. Good	55
11	Excellent	62
16	Excellent	62
22	Excellent	55

### CONTRAST

CANON L 20-35mm f/3.5  
at 20mm  
at 30 lines/mm

f/	Center (%)	Corner (%)
3.5	High	50
5.6	High	52
8	High	59
11	High	63
16	High	57
22	High	45

### CONTRAST

CANON L 20-35mm f/3.5  
at 28mm  
at 30 lines/mm

f/	Center (%)	Corner (%)
3.5	High	53
5.6	High	56
8	High	60
11	High	63
16	High	56
22	High	44

### CONTRAST

CANON L 20-35mm f/3.5  
at 35mm  
at 30 lines/mm

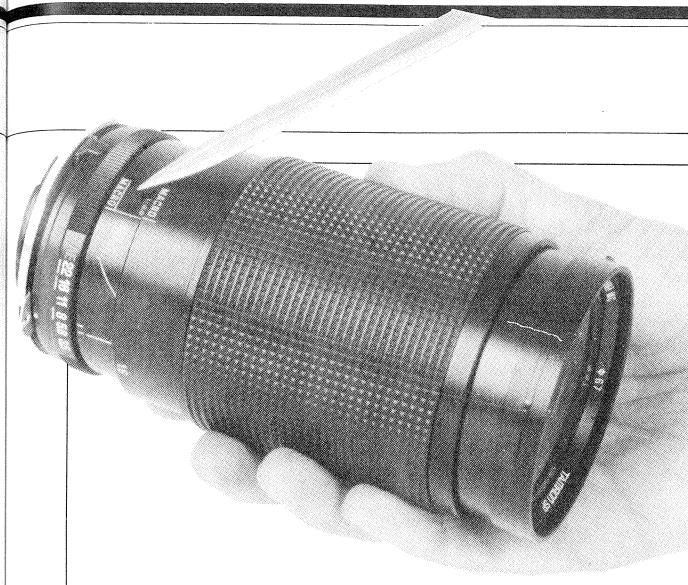
f/	Center (%)	Corner (%)
3.5	High	51
5.6	High	53
8	High	57
11	High	60
16	High	56
22	High	48

## TAMRON 35-210mm MACRO ZOOM

**Specifications:** 35-210mm f/3.5-4.2 Tamron SP Zoom; No. 407211; interchangeable Adaptall-2 mounts for Nikon, Canon, Minolta, Fuji AX, Fuji ST, Mamiya ZE, Rollei SL, Topcon RE, Pentax ES, K, M-42 thread, Olympus, Konica, Yashica/Contax; accepts 67mm screw-in filters; f/3.5 (4.2) to f/22 plus AE setting; detents at half stops to f/22; push-pull zoom action; marked for 35, 50, 80, 135, and 210mm; color-coded apertures match depth-of-field scale on barrel; infrared focus index; min. foc. dist.: 5 ft. in normal range, to 1:3.8X (at 35mm setting only) in macro range; 150° clockwise

turn from normal range close focus to infinity; 4 7/8 in. long, 2 1/8 in. diam. (125.5x73mm) 30 1/16 oz. (875g); \$474.00 with case and shade (adapters \$31 ea.)

**Practical comments:** About the size and weight of a 200mm f/3.5, this lens balances nicely on average-to-large sized SLRs, is very well finished in traditional Tamron glossy black enamel, and has large, legible white-on-black aperture and metric distance scales with footages in pale green. Minimum and maximum focal lengths are in orange and blue respectively, matching dual aperture indices on barrel, with remaining focal lengths in white. On either side of white focus index line are color-coded depth-of-field lines matching color bars under f/8, 16, and 22



To select 35-210mm Tamron's macro range, set lens to 35mm, turn focus ring to line up Macro marks as shown (at pointer), focus by short push-pull on barrel. It's not super convenient but macro performance is good.

apertures. However, these are neither convenient nor legible when shooting at focal lengths below about 50mm.

Both zooming and focusing are controlled by a very wide (slightly over 2 1/2 in.) rubberized textured collar, judged very convenient. Focusing action is smooth, zooming a bit stiff, but all settings are held without slippage regardless of lens-holding position. To select macro range, zoom lens back to 35mm setting and turn focusing ring clockwise until macro detent is engaged and orange "macro" indications line up, then push-pull barrel over 1/2 in. macro range to focus. System is workable but continuous macro focus by turning barrel is preferable, and macro at longest focal length would be more convenient.

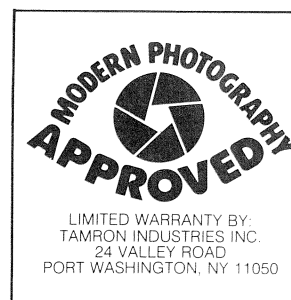
**Field test slides:** In general, slides were crisp and snappy. Some softness at 35mm wide open improved noticeably by f/8 with sharpness maintained at smaller apertures. Corner sharpness equal to center at all apertures and focal lengths but some barrel distortion was observed at 35mm setting. At 80mm, slides were somewhat soft at the widest aperture but improved at f/5.6 on down. At 210mm, sharpness was maintained across the field at all apertures, but some pincushion distortion was noticeable. Flare was well controlled throughout, but may affect contrast when shooting wide open under adverse conditions. Overall performance aver-

age to above average with macro performance, above average for a lens of this type.

**Optical bench analysis:** (for optical experts only): At 35mm, on axis overcorrected spherical aberration with slight axial color were observed, but pattern was diffraction limited by f/8. Off axis, at 35mm, we noted slight skew-ray flare and slight coma, with lateral color throughout.

At 80mm, on axis, we observed overcorrected spherical aberration with slight yellow flare, but the pattern was diffraction limited by f/8. At 80mm, off axis, we noted slight skew-ray flare mixed with slight astigmatism, and lateral color was present throughout.

At 210mm, on axis, we found secondary chromatic aberration and astigmatism, but both were gone by f/8, at which point the pattern was diffraction limited. At 210mm, off axis we noted skew-ray flare mixed with slight astigmatism, and lateral color throughout.



LIMITED WARRANTY BY:  
TAMRON INDUSTRIES INC.  
24 VALLEY ROAD  
PORT WASHINGTON, NY 11050

### PERFORMANCE

Our Standard	as Tested
<b>Focal length:</b> ±5% (33.25-36.75mm)	36.14mm (199.50-220.50mm)
<b>Aperture:</b> ±5% (f/3.33-3.68)	f/3.41 at 210mm: (f/3.99-4.41)
<b>Distortion:</b> 35mm: (±2.5%) under 1% (barrel) 210mm: (±3.5%) 2.06% (pincushn)	
<b>Light falloff:</b> at f/5.6 +1 stop from theoretical limit	
35mm: (0-1.9 stops)	1.5 stops
210mm: (0-1.0 stops)	0.7 stops

### RESOLUTION

TAMRON 35-210mm f/3.5-4.2  
at 35mm  
at 1:49

f/	Center (l/mm)	Corner (l/mm)
3.5	V. Good	49
5.6	V. Good	49
8	V. Good	55
11	Excellent	55
16	Excellent	55
22	V. Good	49

### RESOLUTION

TAMRON 35-210mm f/3.5-4.2  
at 80mm  
at 1:49

f/	Center (l/mm)	Corner (l/mm)
3.9	V. Good	49
5.6	V. Good	55
8	V. Good	55
11	V. Good	55
16	Good	49
22	Good	49

### RESOLUTION

TAMRON 35-210mm f/3.5-4.2  
at 210mm  
at 1:50

f/	Center (l/mm)	Corner (l/mm)
4.2	Excellent	50
5.6	Excellent	50
8	Excellent	56
11	Excellent	50
16	Excellent	50
22	Excellent	45

### MACRO RESOLUTION

Tamron 35-210mm f/3.5-4.2  
at 35mm  
at 1:4

f/	Center (l/mm)	Corner (l/mm)
3.5	Accept	38
5.6	Excellent	60
8	Excellent	60
11	Excellent	60
16	Excellent	60
22	Excellent	54

### CONTRAST

TAMRON 35-210mm f/3.5-4.2  
at 35mm  
at 30 lines/mm

f/	Center (%)	Corner (%)
3.5	High	44
5.6	High	63
8	High	66
11	High	64
16	High	61
22	High	54

### CONTRAST

TAMRON 35-210mm f/3.5-4.2  
at 80mm  
at 30 lines/mm

f/	Center (%)	Corner (%)
3.9	High	47
5.6	High	57
8	High	60
11	High	62
16	High	64
22	High	44

### CONTRAST

TAMRON 35-210mm f/3.5-4.2  
at 210mm  
at 30 lines/mm

f/	Center (%)	Corner (%)
4.2	High	43
5.6	High	58
8	High	63
11	High	64
16	High	60
22	High	45

## TWO WIDE-TO-TELE ZOOM NIKKORS

**Specifications:** 35-70mm f/3.5 Zoom-Nikkor, No. 966894 in Nikon AI-S mount, accepts 62mm accessories; f/3.5 to f/22 with full stop detents; min. foc. dist. 2 1/2 ft. (13 1/4 in. in macro) (0.7m and 0.35m), max. mag 1:4 in macro mode; 3 3/8 in. long, 2 1/8 in. diam. (97mm x 66mm), 18 1/4 oz. (520g) \$675.00.

**Specifications:** 35-105mm f/3.5-4.5 Zoom-Nikkor, No. 1939949 in Nikon AI-S mount, accepts 52mm accessories; f/3.5 to f/22 with full f/stop detents; min. foc. dist. 5 ft. (10 1/8 in. in macro) (1.4m and 0.27m), max. mag 1:4 in macro mode; 3 3/8 in. long, 2 1/2 in. diam. (86.5mm x 64mm), 18 oz. (510g) \$325.50.



Canon's "L" (for luxury) series 20-35mm zoom (look for the red ring around end of barrel) is top-notch performer with pricetag to match. Two-touch controls are well-differentiated by feel.