Wrist strap is neat, but you must hook shutter-release finger over its top to get at button.

In keeping with the general nature of this new compact camera, the winder adds just 16 oz. to the total weight of the package, thus keeping it well within the manageable range of other camera-winder combinations of this type. The successful mating of a shutter-speed-preferred auto camera with a reliable winder is ideal for the photographer after action shots. And for those who want a little more performance (not to mention the winder capability) than that offered by the budget-oriented TC, but who aren't quite ready for the all-in-one approach offered by the recently announced auto-loading Konica FS-1 (with it's built-in auto winder), the Autoreflex T4—representing the synthesis of the T3's and TC's best features—is the obvious and logical choice.

RESOLUTION

at 1:51 magnification				
f/no.	Center Lines/mm		Corner Lines/mm	
1.4	Good	45	Good	29
2	Good	51	Good	38
2.8	Good	57	Good	45
4	V.Good	72	Good	51
5.6	Excellent	81	Excellent	64
8	Excellent	81	Excellent	64
11	Excellent	72	Excellent	64
16	Good	57	V.Good	51
22	Accept	45	Good	45

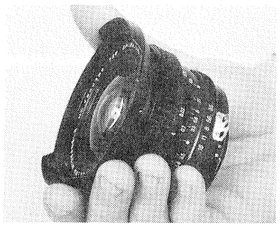
CONTRAST

at 30 lines/mm				
f/no.	Center %		Corner %	
1.4	Low	35	Low	20
2	V.Low	27	Low	21
2.8	Low	38	Low	35
4	Low	46	Medium	50
5.6	Low	54	Medium	51
8	Low	58	Medium	50
11	Low	56	Medium	47
16	Low	49	Low	40
22	V.Low	42	Low	28

18mm f/3.5 SPIRATONE GIVES YOU A BONUS

Mounts: Canon, Konica, Nikon, Olympus, Pentax Bayonet, Praktica screw thread, Minolta MD.
FILTER SIZE: 72mm
Apertures: f/3.5 to f/16
Min. focus dist.: 8 in. (20 cm)
Features: Multicoating
Serial No.: 7800166
Size: 3¼ in. diam., 2 3/16 in. long (83 x 55mm)
Weight: 13 oz. (364 g)
Price: $179.95

Practical Comments: Spiratone's famous bargain 18mm f/ 3.2 (later renamed f/3.5) was a Sigma-manufactured optic. This new 18mm is actually made by Tokina (manufacturers for Soligor and Vivitar, among others) and in truth is really the Tokina 17mm f/3.5. Does this mean you are getting a 1mm wider angle bonus compared to the older lens? An actual measurements of the focal length revealed it to be 17.54mm. We then measured our old Sigma-made Spiratone 18mm f/3.5. It came to 18.14. Given the allowed ±5% manufacturer's tolerance, either lens could be labeled a 17 or 18mm. However, the new Tokina Spiratone, when compared in actual picture taking (and through the viewfinder), does show more picture area.



18mm f/3.5 Spiratone holds down inflation, improves performance but needs a screw-in lenscap. One furnished keeps falling off dual-lip sunshade.

Why should Spiratone elect to label the lens as an 18mm when they just as legitimately could have called and promoted it as a 17mm? We judge that Spiratone's older 18mm Sigma-made lens was so highly successful in sales that the importer wished to maintain the continuity of aperture and focal length in the new lens. Our conclusion: Enjoy the bonus.

While evaluating two lenses of unlike manufacture can be a case of comparing apples and oranges, some like measurements are called for: The older 12-element lens (the new one has 11) is some 2 oz. lighter, 9/ 16 in. longer and ¼ in. smaller in overall diameter. The general shape and configuration of the two lenses are about the same. Aperture and focusing rings on the new lens are heavier and easier to control and the minimum aperture is now f/16 instead of f/22.

The most immediate visible difference is the new lens's two-lipped sun shade with the lips horizontally opposite. The older lens has a shallower 360° circumference shade. In our opinion, virtually any built-in shade for an 18mm lens is but lip service since a truly useful shade would have to be an enormous dish arrangement, only practical (if even then) as an accessory. However, the use of Spiratone's multicoating called "Pluracoat" goes far to minimize unwanted flare outside of the angle of coverage.

The second discernible difference concerns the new lens's front lens element, which is considerably greater in diameter than that in the old lens. This should help provide a more even illumination across the field with less immediate light falloff in the corners—which we did find was the case. In terms of overall resolution, we would judge both lenses approximately equal.

It's interesting to note that the non-multicoated 18mm f/3.5 Spiratone lens we tested in 1971 then cost $169.95, while the new multicoated lens seven years and much inflation later is only about $10 more. We can do no better than to repeat what we said in 1971 even if it then described an optic supplied by another manufacturer: "excellent value in addition to being a fine super-wide-angle optic."

Optical Bench Analysis: On axis, the point image was compact but showed slight overcorrected spherical aberration and slight red flare. When we stopped down to f/5.6, we found that slight flare remained, although the spherical aberration was significantly reduced.

Off axis we observed slight flare and astigmatism along with a small amount of high-order coma. Red-blue lateral color was observed (0.05 mm) and it persisted when we stopped down to f/5.6, but other aberrations were noticeably diminished.

Field test pictures: As expected, our Kodachrome slides exhibited very good central definition at medium and small apertures, showing only a slight decrease in quality at f/3.5. At the corners of the field, image quality was likewise very good at f/5.6 and f/11, and fairly good in pictures shot at maximum aperture. Light falloff was noticeable in some shots irrespective of aperture—par for the course with a lens of this type. We judged overall sharpness to be good to very good.

Not surprisingly, some barrel distortion was evident in photographs of linear subjects taken with this super-wide-angle lens. A touch of reddish fringing attributable to chromatic aberration was also visible in sharply defined white subjects, but it was not of sufficient magnitude to be objectionable. Flare was very well controlled throughout even when shooting into the sun—an excellent performance.

PERFORMANCE

Our Standard	Tested
Focal length: ±5% (17.1-18.9 mm)	17.7mm
Max. Aperture: ±5% (f/3.32-f/3.68)	f/3.32
Distortion: ±4%	3.2% (barrel)
Light falloff: at f/5.6 ±1 stop from theoretical limit (1½-3½ stops)	2½ stops

RESOLUTION

at 1:48 magnification				
f/no.	Center Lines/mm		Corner Lines/mm	
3.5	V. Good	54	Accept	25
4	Excellent	61	Accept	27
5.6	Excellent	68	Accept	30
8	Excellent	68	V. Good	34
11	Excellent	60	V. Good	34

CONTRAST

at 30 lines/mm				
f/no.	Center %		Corner %	
3.5	Low	36	Low	18
5.6	Low	33	Low	22
8	V. Low	34	Low	24
11	V. Low	38	Low	27
16	V. Low	38	Low	24

28-85mm f/4 TOKINA: QUITE INCREDIBLE

Mounts: For most 35mm SLRs
Filter size: 72mm
Apertures: f/4 to f/16
Min. Foc. Dist.: 75m (2½ ft.)
Features: Multicoating
Serial No.: 7801141
Size: 75mm diam., 92mm long (2 15/16 x 3⅝ in.)
Weight: 580 g (20½ oz.)
Price: $595.00; may be available at a discount.

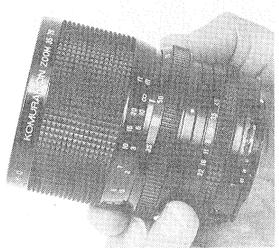
When this widest-angle-to-tele zoom was announced in 1976 to be in development and we saw rough trial models, it was evident by just looking through the viewfinder that the lens was not ready for actual production. The images, far from sharp, had little contrast, and there was marked brightness falloff in corners and edges. It was our estimate then that when the lens was perfected the most we could expect was a "usable" lens which might just pass our minimum test standards.

When we tested this, a well made satin black finished actual production lens, we simply could not believe our eyes. Despite the amazing optical problems to be solved, here was a 16-element zoom lens holding focus right from 28mm to 85mm which in every respect and millimeter could equal or surpass the quality of most single focal lengths. While the maximum aperture of the lens is limited to f/4 (and the view through the SLR finder is correspondingly less bright and easy to focus than it would be when viewed through a lens with one or two f/stops more light transmission) this lens, within its limitations, could indeed take the place of a 28mm, 35mm, 50mm and 85mm or anything in between, a virtual jack-of-all-trades lens.

Besides the f/4 aperture, the lens does have a few other limitations. It certainly is compact for what it is, but must still be considered large and bulky compared to any one of the lenses it would replace. The separate focusing and zooming controls (both operating in a 90° twist of their rings) are well positioned. The focusing ring is nicely knurled for easy gripping but the zoom ring should have better knurling with a similar rubberish finish to that of the focusing ring particularly since the zoom ring inclines have a few stiff spots (not surprising since it does have some radical element movements to control).

The lens provides its largest image when close focusing at the 85mm setting. At this point a very tight portrait is possible—a larger image than most 85mm single focal lengths can give.

Our field testers tended to put the Tokina zoom on their cameras, leave all other lenses behind and find themselves perfectly happy with this one.



A wide-ranging handful! Tokina's 28-85mm comes close to ideal of a "universal lens" in a relatively compact package.

Optical Bench Analysis: On axis we found a slight red flare at both the widest (28mm) and longest (85mm) focal lengths. Spherical abberation was undetected at the 28mm settings, but a slight overcorrected spherical abberation was seen at 50 and 85mm focal lengths. Off axis we saw slight coma at the three focal lengths examined. Slight astigmatism was observed at the longer focal lengths but was absent at the 28mm setting. A red-green lateral color was observed at the extreme focal lengths but the maximum width measured only 0.2mm and should be considered minimal.

We had a very slight focus shift of about 0.05mm in the middle range of focal lengths. We found the image quality to be very good to excellent, with its best performance at f/8.

Would you like to test your own lens? Get MODERN's Lens Test Kit, $4.95. Write to Lens Test Kit, MODERN PHOTOGRAPHY, 2160 Patterson Street, Cincinnati, Ohio 45214. Please allow 4-6 weeks for delivery.

Field Test Pictures: In transparencies shot at medium focusing distances (12-15 ft.) at the 28mm setting, image quality was moderately soft at maximum aperture, but it improved steadily as we stopped down to f/8 and was extremely crisp at f/16. No color defects were observable, but a very small, reddish, crescent-shaped "ghost" was visible in some shots taken into the sun. We believe this to be a reflection off the front element.

In terms of overall quality, the transparencies were shot at 55mm followed the same pattern, with slight softness at f/4 and contrast improving markedly as we stopped the lens down to f/8 and f/16. In medium distance shooting at 85mm this lens delivered good sharpness at f/4 which improved slightly as we stopped down. Pictures shot into the sun at the latter two focal lengths showed good saturation and flare control and no ghost images. Color aberrations were minimal, and the lens exhibited neutral color rendition at all focal lengths.

At close-up shooting distances (2-3 ft.) image quality closely parallels the results we obtained above. Images were well defined but somewhat flarey at f/4, good to very good by f/8, and very good to excellent at f/16. No fringing attributable to color aberrations were noticeable even at 50X magnification — a commendable performance.

PERFORMANCE

Our Standard	Tested
Focal length: ±5% (26.6-29.4mm)	29.4mm
(80.6-89.3mm)	83.8mm
Max. aperture: ±5% (f/3.8-f/4.2)	f/4.0-f/4.2
Distortion: at 28mm ±2.5%	less than 0.5% (pincushion)
at 85mm ±2%	0.7% (pincushion)
Light falloff: at f/5.6 ±1 stop from theoretical limit	
28mm (½-2½ stops)	2½ stops
35mm (0-1½ stops)	1½ stops

RESOLUTION

at 1:47 magnification Focal length set at 28mm				
f/no.	Center Lines/mm		Corner Lines/mm	
4	Excellent	59	V.Good	34
5.6	Excellent	66	V.Good	38
8	Excellent	66	V.Good	41
11	Excellent	75	Excellent	47
16	Excellent	66	Excellent	41