

### Nikkor 70-200mm f/2.8 AFS/VR-G



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(review written in 2003)

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The **Nikkor 70-200mm f/2.8 AFS/VR-G IF-ED** (that name is quite a mouthful) is an exceptional lens. Hereinafter I'll just call it the AFS/VR. The lens was announced a year ago, in February 2002, and the Nikon-shooting world has awaited the release of this lens with extreme anticipation. It looks as if it was well worth the wait.

#### Description

The lens is a significantly more compact package than the previous AFS lens, as the barrel of the lens is over much of its length quite a bit smaller in diameter than the 80-200 AFS, and feels far less bulky as a result. The weight is over 5 oz. less (with tripod foot mounted). The overall feel of the lens is still a bit heavy, of course (it does, after all, weigh three pounds), but it is balanced very well. The lens has 21 elements arranged in 15 groups (5 ED elements to control chromatic aberration), is an Internal Focus lens (the lens does not extend when zooming or focusing), has a minimum focus distance of 1.5m (5ft.) or 1.4m (55") in manual-focus mode, takes a 77mm filter, and comes with a locking scalloped hood and a newly-designed lens cap that allows clamp-retraction by pinching from the center as well as from the outsides, allowing easy removal of the lens cap from within the hood. This is a sorely-needed feature for those who tend to keep hoods on their

lenses (I've looked for something like this for my 85mm f/1.4D for a long time) and I'll be ordering an extra for that lens. It also comes with one of the ballistic-nylon CL-series cases, which are tremendously more usable in the field than the older style of hard case (which is always left at home).

The lens is designated a G-type, meaning that there is no aperture ring on the lens itself as it is designed to be controlled by the command dial on modern bodies, so there are a number of older bodies on which this lens cannot work. For full-functionality, the lens must be used on F/N 65, F/N 80, F100 and F5 film bodies or the D1/2/3-series and D100/200/300 etc. digital bodies.

The lens has three AF-lock buttons placed so they are directly in front of the manual focusing ring. Having gotten used to working with the AF-On button as the AF-activator (taking AF off of the shutter), this is not something that I personally need, but for those using the D100, for instance, in the standard mode where the AE/AF Lock button has not been changed to an AF-On button via the CSM Settings Menu, these AF-Locks allow deactivation of the AF-Activation on the shutter button, which can be extremely useful in situations where you pre-focus and wait for the action before shooting (the camera will immediately fire without re-hunting for focus). A wide, stepped focusing ring is immediately behind the AF-Lock buttons. Behind a 2/3" blank spot (where the VR logo is located) is the narrower zoom ring, which moves quite smoothly. Behind this is the gold-finished and engraved product label, the non-removable tripod-ring, and then a featureless barrel terminated by the mount, which has a rubber seal around the perimeter to reduce dust and water entry.

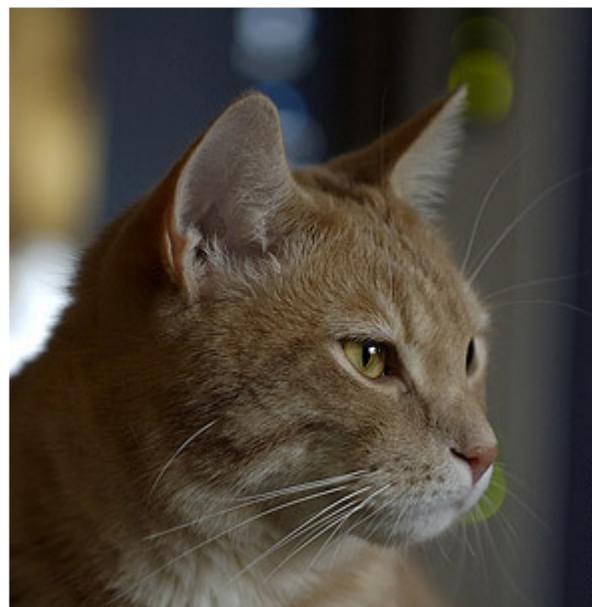
On the left side of the lens, below the gold-finished product label, is the bank of four switches that control the functions of the lens. These are the M/A-M switch that allows full-time manual over-ride of the AF system (M/A) or manual focusing (M); the focusing-range limiter (Full or infinity-to-2.5m); VR On/Off; and VR Normal/Active. VR is activated by half-pressing the shutter button. Normal VR will detect panning motion and only correct for movement in the direction perpendicular to the panning motion. Active VR will detect and correct for motion in any direction, such as on a moving car or boat, and should not be used for panning. VR should be used in conjunction with a tripod only if the head is free, as it will actually yield poorer results otherwise as the VR lens group will induce some motion on it's own. The Vibration Reduction system works exceptionally well (see the 1/6 second shot below, taken at 200mm).



The tripod collar is an ingenious design, consisting of the non-removable ring with a dovetailed connection, to which is mounted the detachable foot. The foot has a locking wheel and a safety lock that keeps the lens from being able to slip off the dovetailed connection by extending a plastic latch into a threaded insert mounted in a tapped hole in the dovetail on the lens itself. This insert allows you to mount a monopod directly to the lens without using the foot if desired (I use a machined rod with the standard thread that allows the rod to act as a quick-release for a monopod). When the foot is detached the lens has a very clean line, facilitating hand-holding (which will be the way many people will use this lens due to the Vibration Reduction). The ring can also be rotated out of the way of your hand if you need to keep the mounting foot on while hand-holding the lens.

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This lens marks the first time that the AFS Silent-Wave Motor has been mated to the VR Vibration Reduction system. The combination of the two creates a lens that acquires a focus lock with commendable speed (that can be increased further by the use of the focus-range limiter), tracks a moving subject with precision even if the subject is moving directly towards the camera, and simultaneously reduces the effects of camera shake or a vibrating platform while allowing panning motion in one direction. The two work together quite well, and in combination with the fact that this lens is a constant-aperture f/2.8, it allows for higher shutter speeds that will make shots possible in lower light (whether the subject is static or moving). The VR system really does allow sharp shots in three stops lower light than a non-VR lens, and assuming the use of good hand-holding technique this can yield a usable shot in truly ridiculous light.



The image above, taken at 1/6 sec., 200mm at f/2.8, ISO 200, illustrates what can be done with this lens in low light. Notice also the quality of the defocused region behind the subject. While VR is a truly exceptional tool, common sense still must be used -- this shot was one of four taken in sequence. Two were poor, one was marginal. This was the third shot. In extreme situations, I will take a sequence. The fact remains that a 1/6 sec. hand-held shot is genuinely impossible at 200mm without VR, even though I had to take a four-shot sequence and use my most stable holding technique to get this one. [Click here](#) or [on the image](#) for a larger version.

### Optical Tests

I tested the lens against several primes in its range, including in the extended range offered by the use of the TC-14e teleconverter, which can be used with this lens without loss of AFS or VR functionality. With the teleconverter attached, the lens becomes a 100-280mm f/4 AFS/VR. The primes I tested this with were the 85mm f/1.4D, the 135mm f/2DC, the 200mm f/4 AF Micro, and the 300mm f/4 AFS. I tested against a life-size bust of Abraham Lincoln, on a tripod, moving the tripod so that the framing at 85mm, 135mm and 200mm were identical – the 280/300mm shots were framed a little tighter than the others. Tests were conducted at f/2.8-f/8 at 85mm and 135mm, and f/4 to f/8 at 200mm and 280/300mm. These primes are exceptional lenses, and the tests were therefore an extreme challenge for the AFS/VR.

The subject bronze bust of Lincoln was shot between 3:15 and 3:45 PM on March 1<sup>st</sup>... the sun was at an angle of about 40-45 degrees over the horizon and was lighting the left side of the face, creating strong shadows on the right side of the face allowing the analysis of shadow detail retrieval. The AFS/VR held its own against the primes quite nicely, showing smooth defocused transitions at wider apertures as well as smooth defocused regions (while not quite as smooth as the 85/1.4D and 135/2DC, they were without a doubt the best I have ever seen from a zoom – better than most prime lenses). The sky was quite bright behind the bronze statue, which may explain the fact that the contrast of the AFS/VR was higher than that of the 85mm and 135mm primes, both of which are designed for use in low-light conditions and have always required contrast adjustments when used as standard telephoto lenses in brightly-lit conditions. Detail rendering of the AFS/VR was excellent – while the primes were sharper at wider apertures for the most part (there was an oddity shown that I can't explain – even though I carefully locked on the same spot for each focal-length test, the AFS/VR showed greater depth of field than the primes did), the sharpness of the zoom was nearly-equal or equal to the primes at most apertures, and shadow detail retrieval was in some cases superior, attesting to the quality of the coatings and optical design of this zoom. Considering the number of elements, the contrast and shadow-retrieval results are exceptional.

One thing that must be mentioned: the number of elements means a large number of air-to-glass interfaces. This creates a tendency for this lens to flare easily in adverse lighting conditions, where a bright light source is glancing across the frame or is directly in-frame. This can radically affect contrast, and should be taken into consideration when framing a shot. Many zooms have this problem due to the larger number of elements, and the AFS/VR is no exception... as a matter of fact it has a stronger tendency to flare than some of the other high-performance zooms. It also exhibits ghosting in these conditions. Both effects are easily visible in the viewfinder, so they are avoidable, but sometimes this can cause a problem taking a shot in adverse lighting conditions. This is not a good lens to shoot directly into bright lights, or with a bright light in the corner or just outside of the frame.

Another result of these tests, and the shooting test performed on the previous day, is the revelation that the lens performs tremendously well with the TC-14e teleconverter. I took a number of shots on both days with the TC-14e, on the first day in direct comparison with the bare lens at 200mm and at 150mm+TC (210mm), and on the second day at 200mm+TC (280mm) vs. the 300mm prime. In both cases, the quality of the zoom+TC was nearly equal or equal to either itself (without TC) or the 300mm f/4 AFS prime. While the combination is a little softer and lower in contrast at f/4-f/5 than the 300mm, it is very close. This increases the flexibility of this excellent zoom.

The AFS/VR shows excellent performance from f/4 to f/8, and this performance extends to f/11 at the short to medium end of

the zoom. The lens is totally usable at f/2.8 as some of the shots exhibited illustrate, assuming you can accept some softness and mildly lesser rendering of fine details.

### Shooting Tests

Click on the image for a larger version.



The Elephant was shot with strong side-lighting at 200mm, f/2.8 using a high shutter speed. Note the detail in the hair atop the elephant's head, in the folds of the skin, and esp. the detail retrieved in the shadows on the front leg, on the trunk, and to the right of the trunk.



The Gorilla was shot in full shade at 200mm, 1/80 second at f/4... a typically low-yield shutter speed made possible by the advantage of VR. Again, notice the detail in the heavily-shadowed rock inside the cave as well as the detail rendered in the hair.



The Kookaburra was shot in shade through closely-spaced wire at 200mm, 1/90 second at f/4. Notice the fine detail of the feathers.



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The Bear was taken at 200mm, 1/80 second at f/2.8, and was taken as a single-shot. The confidence gained by the use of VR.



The Meerkat was shot in strong low-angle light at a fairly high shutter speed at 200mm, f/8.

The lens tracked the gull at high speed directly towards me, and maintained focus flawlessly. I fired on the turn at 200mm, f/5.6 (linked shot is a 1:1 crop).





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This Cooper's Hawk was taken in heavily-shaded trees up against a bright sky with the TC-14e at 1/250, f/4. The performance with the TC-14e is good even wide open, but it is best if you can stop down one to f/5.6 (even the 300/4 improves significantly when stopping down to f/5.6). The combination is a little less sharp than the 300/4 AFS at f/4 when there is plenty of light, but in more difficult situations the AFS/VR+TC gives a higher shot-percentage.

Stability suffers when shooting handheld at about a 40 degree angle overhead. The yield was low in this shoot (about 25%), but based on experience on similar shoots with the 300/4 AFS, AFS/VR yields were higher and it was far easier to get the inevitable shots requiring 1/90 sec. or so at f/4. The TC-14e is a reliable extension to the AFS/VR's capabilities.

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This shot was taken with the 70-200 AFS/VR without teleconverter, at 200mm, f/4. The performance of the AFS/VR at f/4 is excellent, and the defocused character is quite smooth.

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### Conclusion

What Nikon has provided us with in the 70-200mm f/2.8 AFS/VR, it's first lens to use both the AFS Silent-Wave Motor and Vibration-Reduction technology, is an extremely flexible lens that offers a wide range of apertures yielding top-grade results over an extremely useful range of focal lengths with very fast focus acquisition and extremely precise tracking capabilities, that will also allow capturing sharp, handheld images at shutter speeds which would normally require a solid tripod. The lens works beautifully with the TC-14e teleconverter, increasing the flexibility of the lens to offer the user a 100mm-280mm f/4 zoom with high-speed focusing and tracking and VR. The AFS/VR + TC-14e combination is nearly-equal or equal to the 300mm f/4 AFS, with faster focusing and tracking of subjects – even those moving directly towards the camera. By stopping the lens down one stop you can be assured of excellent image quality at all focal lengths, and the performance wide open is

admirable. This is one of the few zooms I have used that I wouldn't be reluctant to use wide open, and with the capabilities of the VR to allow for sharp shots at very slow shutter speeds this lens can be used in conditions that would normally require a set of very fast primes to approach the quality it can yield with ease. Assuming the photographer uses good hand-held technique, results can be achieved that cannot be duplicated even using the fastest primes (I wouldn't dream of trying a 1/6 second shot at 200mm without VR or a tripod). While the lens is expensive, it allows the photographer to get the shot to a high standard of quality in an extremely wide variety of circumstances. This lens is highly recommended – if you can afford the price you should consider it.

— Ron Reznick —

