Field Tests: Nikon's 70-200mm f2.8 VRII

This much-anticipated and highly sought-after lens is similar to its precursor EXCEPT it was designed to cover the larger image sensor of the "full-frame" (FX) Nikon bodies. The previous version was NOT a DX lens, but in practice did not sufficiently cover the larger image sensor of the FX cameras to produce good edge-to-edge image sharpness, particularly when shot at 200mm. Besides offering improved performance for the FX bodies, this lens also has the new "VR II" designation, which means it is designed to offer image stabilization equivalent to shooting at shutter speeds 4 full stops "faster" than a non-VR lens (the previous lens 70-200 mm offered a 3-stop advantage over non-stabilized lenses). The lens is very similar in appearance to the previous version but lacks the multi-function buttons (AF-ON/AF-Lock) found near the distal end of the barrel found on its precursor. And, the new lens has Nikon's "N" designation - meaning it has Nikon's "Nano-crystal" coating to improve contrast (and colour) particularly in situations of backlighting. To my mind (and experience with other N lenses), this is not a trivial thing. This lens is destined to be very popular, and many will be considering purchasing it - thus the field test.

A few words about my field testing protocols:

I test my gear quite extensively in an effort to discover how it will perform for ME (using my own shooting style) in a field situation. I'm not paid to test equipment, nor do I receive my gear for free. I test them under field conditions ONLY (no lab work) and use the same techniques I'm likely to use when I'm shooting the particular item in the field. While I do some of my testing very methodically, much of it is pure "field shooting". I do NOT shoot images of targets under rigidly controlled lab conditions - I shoot images of wildlife (or "proxies", such as my Portuguese Water Dogs) in the field. It's not critical to me to produce results that are generalizable or that are rigorous enough to be published in a peer-reviewed journal - I care about how I can use the gear in the field and how to get the results I need to sell images! While some "lab tests" have a real-world correlate that translates into a limitation in the field, I find an increasing number of tests quite esoteric and the "differences" between two products is real only in a statistical sense (and has no real correlate in producing a quality image, which is NOT a pure science). There ARE tests I rely on - for instance, I find dxomark.com's published values for "Low-Light ISO" performance are almost always close to what I consider "acceptable image quality" (in terms of noise), and thus they have a real-world correlate for me.

So, when it comes to testing lenses, some of my tests are performed while hand-holding lenses, while others (things like assessment of the effect of stopping the host lens down) are done mounted on a tripod. What I want to discover from my tests are things like: "Is the AF fast enough to hold focus on a grizzly charging directly at me?" or "How does edge-to-edge sharpness of this lens at 70 mm compare to that of my 24-70mm f2.8 at 70mm?" (so if I'm carrying both I know which one to pull out of my bag), etc. I make no claim for generalizability of my results - they simply tell me how MY COPY of the lens works for ME in the field. All my tests on the 70-200mm VRII were performed using FX bodies (Nikon D3 and D700). I would guess that performance (especially edge-to-edge sharpness) would be as good or better on DX bodies. It would not surprise me if the same general findings apply to the D3x, but the D3x is known to be particularly demanding on lenses so it's possible that certain characteristics (likely edge-to-edge sharpness) will differ when this lens is mounted on the D3x.

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First the Executive Summary, followed by Way More Detail

The Executive Summary:

This lens is a very, very solid performer that I will be using a LOT! It is VERY sharp at all normally-used apertures (which means f2.8 thru f11 for me) though not quite as sharp when shot wide open. The bokeh (quality of the out-of-focus zones) is superb and at f2.8 rivals that of the venerable (and amazing) Nikon AFS 200mm f2 VR. The autofocus is blazingly fast. The VR works as advertised (which means very, very well!). Teleconverter performance (with the 1.4x TC-14EII) exceeded my expectations dramatically. BUT, the lens is NOT completely perfect - edge-to-edge sharpness is not stellar at 200 mm at larger apertures, though this limitation can be overcome by stopping down to only "reasonably small" apertures. Plus, some users will find the reduction in focal length when focusing the lens on very close subjects troublesome. But, in my opinion there are enough subtle improvements (and some not-so-subtle improvements) in this lens that combine to make the "whole package" markedly better than its precursor. For me, and I suspect many FX body owners, this lens is as close to a "must-have" lens as any on the market. DX body owners who don't already own the previous iteration of this lens will love it (and I highly recommend it for them). For DX body owners who already own the previous version - you know, that "old" (but nearly legendary) lens works so well on DX bodies already that I couldn't really recommend swapping your current lens for this one (unless, of course, you have money to burn).

Way More Detail - And Sample Images

1. Overall Image Quality: I tend to think of image quality in terms of sharpness, bokeh (smoothness of out-of-focus zones AND the quality of the transition from sharp regions to out-of-focus zones), colour, and contrast. Simply put, this lens excels in image quality. Sharpness is good at f2.8, but even better by f4 and continues to be bitingly sharp through to at least f11. But the slight setback in sharpness at f2.8 (and it's only very slight) is more than offset by the beauty of the out-of-focus zones when shot wide open. Colour and contrast? Excellent. How does the new 70-200 compare to the 70-300 VR over the same focal range? The 70-200 is somewhat sharper (tho' at f8 the 70-300 is very close), but there's just no comparison in colour and contrast. This image of our youngest Portuguese Water Dog (shot at f2.8) typifies that look/feel of the images of this lens shot at 200 mm - and the look is very reminiscent of output from the Nikon 200 f2 VR - a lens many (including me) consider to be one Nikon's best lenses (ever). Oh, and by the way - Obama copied US when he added "Bo" the Portuguese Water Dog to his family!

2. Edge-to-Edge Sharpness: I tested this characteristic by shooting landscape shots (of distant scenes to effectively remove any influence of depth-of-field) at various focal lengths and apertures (all images shot from a tripod and with VR OFF). I also shot series of comparison images of the 70-200mm VRII vs. the AF-S NIKKOR 24-70mm f2.8G ED (at 70mm) and a series of comparison images of the 70-200mm VRII vs. the super sharp AF-S VR NIKKOR 200mm f/2G IF-ED (at 200mm of course). The most significant result? Up to 105 mm sharpness fall-off in the corners is only slightly noticeable at f2.8, less so by f4, and virtually gone by f5.6. At 135 mm there is slightly more fall-off in sharpness in the corners - it's still slightly noticeable at f8 but virtually gone at f11. At 200 mm the corners are very noticeably soft but by stopping down to f8 most of the problem goes away and by f11 is pretty much negligible. How does the 70-200mm VRII compare to the other lenses in my collection that overlap its focal range? Interestingly, at 70mm the edge-to-edge sharpness on the 70-200mm VRII was noticeably BETTER (at ALL apertures) than on the 24-70mm. At 200mm the 200mm f2 VR absolutely kicked the butt of the 70-200mm VRII - one has to stop down to f11 on the 70-200mm to even approach the edge-to-edge sharpness of the 200mm f2 SHOT WIDE OPEN AT F2.

What does this mean in day-to-day use? Well, if I'm carrying both my 24-70mm lens and my 70-200mm VRII and want to shoot a landscape scene (and one requiring edge-to-edge sharpness) at 70mm, I'll grab my 70-200 VRII first. And, if I'm carrying both the 70-200mm VRII and the 200 f2 VR and want to shoot a landscape scene at 200mm (and, again, one requiring edge-to-edge sharpness), I'll DEFINITELY grab my 200 f2 VR. And, if all I have with me is my 70-200mm VRII, then I'll be OK if I just remember to stop down to f8 or smaller. Consequences of this slight weakness in edge-to-edge sharpness for wildlife photography? *Almost* nil - other than in the odd "animalscape", in most cases edge-to-edge sharpness isn't too critical in most wildlife shots. And it's important to put this reduced edge sharpness at longer focal lengths in perspective - the reduction in sharpness is far less than on the previous version of the lens, where others found (and I agree with them!) that "For landscapes at 200 mm, you need to stop down way too far to get the corners just barely acceptable, even to f/22 in some cases." (from Bjorn Rorslett's review of the original 70-200mm VR).

3. Autofocus Performance: Excellent - blazingly fast (but then again, the precursor was pretty darned good at this too). As mentioned above, when it comes to autofocus performance I like to know little things like if the autofocus system is fast enough to keep a grizzly bear that charging right at me in focus. Despite rumours to the contrary, I don't have a pet grizzly in my backyard to test this with and most zoos tend to frown upon photographers leaping into the grizzly enclosures to perform these sort of tests. So, I used my most convenient available resources as proxies - my Portuguese Water Dogs sprinting directly at me at full tilt. To make any miss of the autofocus system readily apparent, I zoomed to 200mm and shot wide open (i.e., with minimum depth-of-field). The result? Check out this image - the Poncho Attack! Note that this isn't a case of 1 in 10 being sharp - over 90% of the shots in the sequence were spot on sharpness wise. Test passed. And, by the way, when I test my 70-300mm VR this way I invariably get a much poorer result - usually only 1 in 10 (or less) is acceptably sharp. So...if you're looking to capture flight shots of birds or any other action, this lens is completely up to the task.

4. VR Performance: As advertised or, in other words, just excellent. The VR on the previous version of this lens worked well, but I do have the perception that the new lens does do it better. Is it one full stop better? Can't say - but I found I was able to hand-hold the lens (at 200mm) down to 1/30 sec (and even slightly slower) and still get what I consider to be tack sharp images.

5. Build Quality: Top notch. From the minute you take this lens out of its box it's clear that this is a totally professional lens built for rugged use. Nothing is loose, nothing rattles, and there's just no "play" anywhere on the lens. I have no idea of how this lens could be built better!

6. Performance with Teleconverters: Now here's a nice surprise - this lens works GREAT with both the 1.4x TC-14EII teleconverter and the 2.0x TC-20EIII teleconverter. I've always agreed with Bjorn Rorslett that the first rule with Nikon teleconverters was to keep them away from zooms - ANY zooms. And, I was almost never able to get acceptably sharp images with my "old" 70-200mm f2.8 VR in a field setting with any of Nikon's teleconverters (mind you, I am quite anal about image sharpness - others may feel quite differently about this point). Well, the time has come to change my view...

A. With the 1.4x TC-14EII: This lens produces very sharp, very high quality images with the 1.4x TC (providing you stop down by one stop - or more - from shooting wide open). So, in this case this means very sharp images starting at f5.6. Just check out this Red-breasted Nuthatch or this Mountain Chickadee (these are cropped images to show image detail - both represent about 40% of the original image. What a great bonus!

B. With the 2.0x TC-20EIII: After using the 70-200mm VRII with the "new" (as of February 2010) 2x TC-20EIII teleconverter, one has to wonder if Nikon "co-designed" these two parts to work together. While there is *some* image softness when this lens/teleconverter combination is shot wide open (which translates to f5.6), stopping down just one stop returns almost all image sharpness. There is a slight decrease in image contrast and colour, but with careful processing these parameters can be returned to the "non-teleconverter" state. Autofocus speed does seem to be slightly impaired (i.e., slightly slower) when the TC is used and focus-tracking on rapidly moving subjects lags slightly compared to when no TC is used, but for MOST shooting the difference would be virtually unnoticeable.

7. And About that Mysterious Shrinking Focal Length: This lens shares a characteristic with some other internal focusing zooms (e.g., the AF-S DX NIKKOR 18-200mm f/3.5-5.6G ED VR II) - when one focuses the lens at very close distances the focal length of the lens shortens. I first noticed this when shooting images of birds at close range (at 200mm) while testing tele-converter performance - when I compared the images to those shot with my fixed focal length 200mm f2 VR it was obvious that the 70-200 VRII had "backed off" the 200 mm focal length. Interestingly, when this happens with the 18-200mm zoom the metadata in the image reflects the shortened focal length, but with the 70-200mm it doesn't. So I have to guess about how much my focal length was shortening (when focused very close and thus when the focal length is shortened the most) - I'm thinking it's around 20% (but please note that this is a guess - I'm sure someone else will quantify it). Anyway - the more important question is this: is this simply a "lens characteristic" or a problem for the user? The answer to this question will vary with how one uses the lens. Instances where this characteristic will show itself include situations where one is shooting a relatively small subject (think small mammal or bird or flower or butterfly, etc.) from a close distance (near the

short edge of the focusing range). In my case I will RARELY (if ever) be using this lens for this purprose - I will more likely be using my 200-400mm f4 VR (for small mammals) or my 200mm f4 Micro (for butterflies or flowers). So, FOR ME, this lens characteristic simply isn't a problem. However, there are many users who would likely purchase this lens with this type of shooting (small, close subject) being a major part of what they do. For these users this "mysterious shrinking focal length" MAY be a real problem. Potential purchasers should factor this lens characteristic into their purchasing decision.

The final word? Just this: If there was ever a single "must-have" lens for ME (and I think MANY other Nikon-using nature photographers) this is it!

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