

24f3.5 PC-E Lens

by Moose Peterson

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Ultra Wide Panos kinda drive a lot of my landscape photography for the last couple of years (vol 12.3 of the BTJ). Up until Feb 2008, I'd created over 150 UW Panos using the 28f3.5PC lens. A very sharp lens and on the D3 a very nice perspective. I still craved for wider though. I was told about the 24PC-E long before its announcement and until I first shot with one at our Moab DLWS event in March did I know it was the cat's meow. But the 24PC-E is a whole lot more than just a ultra wide pano maker, oh yeah.

The Nikkor 24f3.5D ED PC-E lens has the ability to shift like the old PC lenses with the addition of Tilting and both working with the new Electromagnetic Diaphragm. While it looks like the older 85PC (which is getting an upgrade for fall 2008) it's really nothing like it. For example, when you take the 24PC-E out of the box for the first time, a warning in a clear wrapper is wrapped around the focusing ring. And the warning, I'm not making this up, is to tell you that attaching the lens to any other camera body other than a D3, you run the risk of pinching your fingers between the lens and camera body.

All the information I'm about to provide applies to using the 24PC-E on the D3 or D300. Any other camera body you need to consult the lens' instruction book for particulars.

What's the purpose of a Shift/Tilt lens?

This is a really good question and, one that sometimes defies logic since we are working within the small FX format. Here it is in a nutshell:

Tilt: permits you to tilt the optical path to match the film plane to dramatically increase your depth of field without the need of closing down the aperture.



Shift: permits you to keep the film plane parallel with an object such as a building so there are no inward or outward converging lines, the perspective of the building stays correct.



The 64 million dollar question (actually, it's only \$2k) is, does it work? When I first attached the lens on a D3 and looked at a checkered table cloth at a restaurant, I looked up and said, "this thing don't work." And if you're making big moves with it, it don't because Nikon did such an amazing job designing and constructing the lens, small moves make HUGE, dramatic changes. So yeah, this lens works and works beautifully! Let's look at the tilt feature first.

Tilt

I'm here to tell you, I thought I had a busted lens at first, what was busted though was my knowledge base. But the proof is not in my words but the images. Here's a simple photo set up in the studio. The photo

on the left is shot with the 24PC-E shot wide open at f3.5. The right photo is the same thing but the lens has been tilted only +4 degrees (it has as much as 8.5 degrees). At f3.5, you can see a GIANT gain in the DOF between no-tilt and tilt!



For these images, I focused on the word Lexar on the 16MB card on the right (yes, I have a Lexar CF card collection and yes, I remember all too well when the 32MB card arrived for the Coolpix 900 and how I thought that was a huge card). The camera is 18" from the 16MB card and the whole scene was lit with one SB-800 shooting through a Lastolite EZY Box on a C Stand.

In the f3.5 Tilt image, the 8GB card is not tack sharp but the focus does run from 7.5" to 30" (22.5" of DOF) on the ruler (7.5" is the start of the ruler in the frame). This is compared to the no-Tilt f3.5 image where the focus runs from 13" to 17" (that's only 4" of DOF) to the no-tilt f/22 image 7.5" to 31" on the ruler (23.5" of DOF). Now, look at f/22 with the +4 degrees of tilt

You might be thinking this is unfair, shooting wide open compared to what you might see closed down. Well, here's the same photo of the 24PC-E at +4 degrees tilt at f3.5 on the left this time and the 24PC-E with NO tilt closed down to f/22 on the right. What do you think?



Focus extends past the 36" mark, that's over 28.5" of DOF and we're only 16" from the subject! Yowza!

When I first tried the 24PC-E, I tilted all the way down to the 8.5 degree mark and at that degree, I only saw yuck (this can cause some vignetting). The engineers at Nikon did a great job designing the angle of tilt so it takes very little tilt to accomplish a big, dramatic difference. Simply put, I'm impressed.

Shift

This is what originally actually made me excited about the 24PC-E lens. It's because the shift is what I depend on for my ultra wide panos (technique can be found moosepeterson.com). It's the shift that permits the very simple taking of the lower and upper panels making the final assembly in Photoshop CS3 a snap. (at this time, I have a back log of panos to assemble, check back as I plan to have at least one example here).



24PC-E simply tilted up to compose, note converging vertical lines which in this closer view aren't attractive. (window frames on outside).

The 24PC-E has a 77mm front element so full filtration is achievable. It has a shift of +/- 11.5 degrees and a lockable rotating collar (does not rotate 360 like older PC lenses, only 90 degrees).

What it doesn't have are large knobs for the controls. There is no way on earth you can operate this lens with gloves or, in the cold bare fingered which is a major



24PC-E was Shifted to make this image. Comparing it to the image to the left you can see how the converging lines are real nasty.

Typical application of Shift lens, vertical format

The shift of the 24PC-E is pretty straight forward. You put the film plane of the camera parallel with the subject (using the built in level of the D3, it's a snap). You then simply "shift" the lens until the subject comes into the viewfinder (be aware that vignetting can occur). Typically, you have to do some fine tuning which entails changing the elevation of the tripod, moving forward or backwards, so the top of the building (typical subject for the PC-E) comes into the frame. Then, you notice that part of the bottom is cut off so you move back and start all over until finally, you have the subject all in the frame with the film plane still parallel with the building. This keeps all lines "true" and no bowing in at the top of the frame.

design flaw in my opinion. As long as you can finger them, both the tilt and shift can be locked. I prefer to leave them tight rather than locking them down since the knobs are so small.

Operation

What truly makes the 24PC-E unique (more than the tilt) is the Electromagnetic Diaphragm, the E in the name. Since the lens does break and tilt in half, there can be no mechanical linkage to couple either the aperture or focus to the camera body (yes, this is a manual focus lens only). This problem was partially solved with the Electromagnetic Diaphragm which permits some aperture automation.

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The 24PC-E has a cool feature, what the instruction book calls a Aperture stop-down button or what the rest of us call a DOF preview button. When the lens is tilted, this does work really well for fine tuning your tilt. And, you will need to practice that fine tuning because it is hair splittingly precise. As in, the slightest turn of that tilt knob can radically through the focus near to far.

So, that's it in a nutshell. To be honest with you, I was hoping the lens was more gimmick than functional because at its price tag and weight, I wanted to just keep shooting with my old, trusty

Horizontal is not the typical use of the 24PC but as you can see between these two images, there is a dramatic difference when tilting the lens up to compose rather than using the Shift to correctly compose.

Before, as in prior to, any shifting or tilting, you need to make your meter readings just like you would with any other lens but unlike other lenses, you MUST remember your aperture/shutter speed. Once you tilt/shift, you have to step back a moment. I recommend heading to Manual Exposure mode because once the lens is tilted/shifted it can no longer properly meter. Why? Because the light path has just been bent, it's not true enough for metering. You must dial in the correct shutter speed while you can leave the aperture where you set it prior to tilting/shifting. That's because the Electromagnetic Diaphragm 1) permits full aperture viewing and 2) closes down the aperture upon exposure. This is a giant leap forward for idiots like me who would forget to close the aperture down with the older models after focusing.

While some of the things the instruction book points out are obvious like "if you drop the lens in the water, it will rust," other things like metering operation are not as well spelled out. This is how I do it.

- *1 compose the image without any tilts/shifts
- *2 set the aperture to the desired f/stop, make a meter reading noting the shutter speed
- *3 tilt/shift lens and make any minor compositional changes required (if major ones are required, start over at step 1)
- *4 set the D3 to Manual mode and set the shutter speed determined in step 2
- *5 take an exposure and check for blinkies



(and paid for) 28PC. But such is not the case. The lens is wider, sharper and functionally vastly superior to the older PC lenses. I can knock out ultra wide panos much, much faster and I have the ability in low light work at faster shutter speeds with great DOF with the 24PC-E tilt. As if the new gear budget wasn't blown already for the next decade! Oh well, at least it's tons of fun.

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