View Single Post

Thread: Focusing Questions

28th of February 2007 (Wed), 05:10 #57

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Member

Join Date: Apr 2002
Posts: 150

Re: Focusing Questions

Hey Ryan,

I appreciate your positive feedback regarding the effort I'm making to lay it out for everyone. I really enjoy teaching, but I tend to overwhelm people because I make too many assumptions about what they already know. In other words, I'm a bad teacher.

Still, I'd like to encourage you to hang in there, because there are really just a handful of things that have to be done to eliminate the factors that degrade image quality. Most of it everyone already knows: use a heavy, stable tripod, use MLU, use a cable release or wireless remote to fire the shutter without jarring the camera, select a shutter speed that's fast enough to arrest subject motion, etc.

The formulas I covered in my first post of this thread and the field method I covered later, allow you to conquer image degradation caused by defocus and diffraction. Those formulas tend to send people running off into the night, but hear this: They only have to be used once. Just grab a four-function calculator and get it over with. Then you can make your DOFMaster calculators to produce what you need for use in the field. Here's the big picture:

1) Calculate the circle of confusion diameter necessary to support your desired print resolution at your anticipated enlargement factor and viewing distance. (See the first formula discussed in my first post, this thread.)

2) Plug that circle of confusion diameter into the Properties dialog of the DOFMaster software (or into any other DoF calculator that allows you to specify your choice of circle of confusion diameter).

3) Create a DOFMaster spinning disk calculator for each focal length you intend to use (or use whatever DoF software you prefer to generate tables for each focal length). For a Canon EF 17-40mm f/4 USM L, you could make just three calculators (one at 17mm, one at 28mm, and one at 40mm) -OR- you could make a calculator for every focal length marked on the lens (17, 20, 24, 28, 35, and 40mm). The DOFMaster calculators weigh next to nothing in your camera bag and they cost next to nothing, so why not?

4) Calculate the f-Number at which diffraction will inhibit your desired print resolution and mark that value on your DOFMaster calculators (before you laminate them) as a reminder to NEVER stop down below that aperture (unless you're willing to suffer a loss of resolution or you intend to make a smaller print than originally anticipated). (This was also discussed in my first post, this thread.)

5) Consider getting the $99.00 Stanley TLM-100 laser rangefinder and use it as outlined in the post I made regarding rangefinders.

That's all there is to this. Believe me, after just a few sets shooting landscapes this way, you'll laugh at how much fun it is and just how quickly you can work. You'll always be getting just enough DoF for the subject space, without wasting valuable shutter speed stopping down further than necessary in the quest for Depth of Field. You'll be focusing far more accurately than you could otherwise, too. And if you want to do selective focus shots (where you purposely minimize depth of field to make the your most important subject stand out against a defocused background), the DoF calculator will again tell you exactly at what distance to focus and which aperture to select. (Shooting wide open might offer too little DoF for a selective focus shot.)

Remember that if the DoF calculator calls for an f-Number that you can't use (because the corresponding shutter speed would be too slow, or because that f-Number is larger than the f-Number at which diffraction will become visible, or because your lens simply

doesn't offer that f-Number), all you have to do is....

Back away from the nearest subject until you're far enough away to use a viable f-Number.

-OR-

Go to a shorter focal length without moving the camera (you'll have to switch to the appropriate DOFMaster calculator for this new focal length).

-OR-

Resign yourself to making a smaller print: Reducing the enlargement factor by 1.414x (making a 10-inch print instead of a 14-inch print) allows you to open up one stop and get the same apparent resolution. Reducing the enlargement factor by 2x (making a 7-inch print instead of a 14-inch print) allows you to open up two stops and get the same apparent resolution).

-OR-

Resign yourself to hanging the print in a location (over a piano?) where people can't examine it at your originally anticipated viewing distance: Increasing the viewing distance by a factor of 1.414x allows you to open up one stop. Increasing the viewing distance by a factor of 2x allows you to open up two stops. (This last solution is difficult to enforce, so it's not practical.)

Sometimes, in the interest of maintaining your intended composition (as defined by your original choice of camera position and focal length), it's best to just go for a smaller print (an enlargement factor lower than that specified when you calculated the Circle of Confusion diameter used to produce your DoF calculators) rather than backing away from the nearest subject or selecting a shorter focal length - both of which can change the composition drastically. But you've got to remember that you made this choice, in the field, to go with a smaller print. Don't cop out later and produce the full sized print only to suffer visible degradation caused by defocus and/or diffraction. Stay the course.

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