Focal Length and APS-C Sensors

By Brian B Donaldson, 30 May 2011

Recently I was surfing the internet for Do It Yourself (DIY) flash diffusers and found a really neat one using a business card called the Party Diffuser. So I tried a few test shots with my Canon 20D and the 28mm to 105mm lens. After taking the images and discarding them, I got to looking at the lens focal length dial and told myself, this is all wrong. With an APS-C Sensor in my camera, the focal lengths listed are not correct.

I then started thinking about why Canon did not put the correct focal lengths on their lenses. I finally came to the conclusion that this particular lens, a Canon EF lens, can also be used on any Canon Auto Focus camera like my 5D, or my 1DS, or even my EOS 1N. Only leness of the type EF-S are used for APS-C Sensors like on the 10D, 20D, 30D…

The APS-C, or Advance Photo System type C Sensor is not the same size of a regular 35mm frame. The actual frame size in my Canon 20D is 22.5mm x 15mm and has a crop factor of 1.6. This means the image on the sensor will appear to be 1.6x larger than on standard 35mm frame. With this in mind, using any standard Canon lens on one of the APS-C digital cameras, one is bound to have a different perspective based on the lens one uses. In my case, the 28mm to 105mm is actually 45mm to 168mm.

Because of this 1.6 crop factor, I have to think differently when using my 20D instead of using my 5D. So to alleviate this problem I have made a simple chart based on the focal lengths of the lenses I use and their respective focal lengths when I use my 20D. Here is the chart.

Standard	Cropped
16~35	26~56
18~135	29~216
28~70	45~112
28~105	45~168
70~200	112~320
100~300	160~480

I do not always have time to look at a chart when I am in the field. So I have devised a method of marking my lens without doing any permanent damage to them. I thought of using tape and writing on the tape but I know that eventually the adhesive would eventually start to stick and possibly gum up my zoom ring. Then as I was making notes on my post-it pad I realized I had the answer right in front of me.

I cut off a strip of the post it pad that had adhesive and put it on the zoom ring. Making marks where the values on the rings were, I calculated the new value and marked the post-it strip. Then, I placed the strip on top of the zoom ring values and now I have the actual focal length with the crop factor already built in. Now when I want to take an image at 50mm, I know where to put the zoom ring.

One does not have to use the original values as marked on the ring. If one wanted standard values, say 35mm on the cropped lens, one just take 35mm and divide by 1.6, The new value is 22mm rounded. So take some images of where 22mm would be on the lens and place a label that states 35. There you have it. Simple and convenient.

This method can be used on any DSLR as long as you know the crop factor of the ASP-x sensor you are using. When you are done shooting for the day, just remove the labels and be done with it. I would not recommend keeping them on for a long time. I am not sure what the adhesive will do. There, that is my caveat and I am sticking to it.

Happy shooting.

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