

HDR: Changing The Rules



By Steve Traudt

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From the beginning of photography, photographers have been challenged by the camera's inability to record the scene as we see it. Who among us

has not lamented washed out skies and murky shadows? As slide shooters we were taught to "expose for the highlights". This meant we were willing to accept blocked up shadows in exchange for properly exposed highlight areas. The problem, now as then, is simple: most scenes contain a dynamic range (DR) greater than the film or digital sensor's recoding capability. Dynamic range refers to the range of luminance from the brightest areas to the darkest areas of a scene.

Consider a typical outdoor scene where a dynamic range of 100,000: 1 (17 stops) is not unusual. This means the brightest area is 100,000 times brighter than the darkest shadow. Even more startling is the human eye's ability to record a dynamic range of up to 1,000,000 to 1, representing a 20 stop difference! (assuming you were not partying the night before!) By contrast (pun intended), a digital SLR can only record a DR of about 6 f-stops.

We what we need then is a method for capturing a "high dynamic range" file, or HDR. The most common method of achieving such HDR files is first by taking at least 2 photos (often more), at different exposures and then processing them in such a way as to maximize the DR.

A suggested starting point is to shoot 3 exposures: -2EV; 0EV and +2EV. An EV is the equivalent of an f-stop. Such a 3 shot spread gives us about a 10 EV range. Many scenes will require even more shots such as 5 exposures with a 2 EV spacing. Sometimes, even 7 or 9 exposures will be needed.

Ideal Camera Setup:

- Tripod and Cable Release
- Aperture Priority Mode & AEB
- Otherwise, Manual Exposure Mode
- RAW file capability & Low ISO setting

General Procedure:

- Choose appropriate aperture via A-priority
- Enable AEB: typically 3 shots, 2 EV apart or 5 shots, 1 EV apart (depends on camera; see your manual)
- Set low ISO if possible; set to capture RAW
- Using cable release, take image set as fast as possible
- Mirror Lockup may be needed (especially around 1/8" or 1/15")
- Examine image set Histograms. The lightest exposure should not have any pixels touching the left side of histogram. The darkest exposure should not have any pixels touching the right side of histogram.

- You may need to re-shoot sequence, starting out either darker or lighter to get proper spread. Or you may need to take more images in the sequence.

Some Comments:

- Avoid noise: over-expose shadows enough
- Movement always a problem so shoot fast!
- Never vary the aperture; only the shutter speed. Otherwise, changes in depth of field are a problem
- If you don't have RAW ability, use high quality JPEG.
- If you don't have AEB, change exposures manually, via shutter speed. Count the "clicks" as you rotate the dial.
- If you get good at this, you can try hand-holding a burst
- You can even do HDR with "point & shoot" cameras
- Sensor dust will be exaggerated as will high ISO noise
- A "pseudo" HDR can be created from a single RAW file. Or...create 3 different exposures, from same RAW file, save as 16 bit TIFF and then process those in Photomatix.
- Create a Panorama HDR: I first tone-map the pano segments then stitch those together.
- For "grunge" look, repeatedly tone-map the same image.

Software... With your captured set of images, you now use software to generate the HDR files. Among the several HDR software products, most discussions come down to 2 choices. If you have Photoshop CS2, 3 or 4, you already have an HDR capability, called "Merge to HDR". Give it a try. It does produce an HDR file but does not provide much control and requires you to do quite a bit more post-processing work on the file. The new CS5 feature a greatly improved HDR Pro feature.

The favorite of most photographers working in HDR is still Photomatix Pro. This versatile and easy to learn software is available from the www.hdrsoft.com website. It runs on PC or Mac and you can download a free trial version and play with it. Notice the word, "play" for this is the best way to learn the software. There really is no right or wrong when it comes to the various sliders and options. You can go for a very subtle effect all the way to an extreme, in-your-face HDR! You can get 20% off the software purchase by using my discount code: **SteveTraudt20** on the HDR website checkout. The HDRsoft website also has some good tutorials and resources so spend some time there.

Closing Thoughts... HDR is the rage but it still comes down to basics. You have to find interesting subjects and create strong compositions. HDR is just another tool for us to consider. Not every scene will lend itself to HDR. HDR can actually help you become a better photographer since you'll be mostly working carefully and slowly from a tripod, and previsualizing a scene.

Keep in mind that HDR is a very new technology and is evolving rapidly. There really are no rules; what I discussed in this paper is just meant to get you started. But half the fun of HDR is asking, *What if?* Don't be afraid to play and experiment. Please visit my website: www.synvis.com for a gallery of HDR images. Now, get out there and make some magic!

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