

Simulating Large Format Photography with a Digital SLR

Scott Hendershot

For most of my life I have been in love with the rich potential of large format photography. Compared to other methods, well-executed large format images seem more real, detailed, subtle, textured, delicate and more alive. Sadly, it seems that the natural evolution of photography, combined with the evolution of technology, marched large format photography in the direction of obsolescence, or at least, through increased costs and diminished availability of supplies, has made it much more challenging to pursue.

With the advent of digital photography, I heard a lot of wailing and gnashing of teeth over the “death of photography,” and I too had my doubts about using digital technology to create images of the quality I required. But after an initial mourning period, I began to wonder if it were possible to adapt the new technology to approximate the large format experience. To bring my digital images up to the level of my large format work, I first had to identify my requirements. Some of the qualities I want in my images are:

- Large output size (30x40 inches)
- Orthogonal lines and perspective control
- Fine detail
- Shadow/highlight separation

With lots of experimentation and some really wonderful tools, I have found a workflow that produces stunning large prints that have all the exquisite detail and shadow/highlight separation I could ask for. In short: a digital SLR with a panorama head, stitching software and HDR processing.



Final Image

Software

- Oloneo PhotoEngine
- Autopano Giga
- Photoshop
- Lightroom

Hardware

- Nikon D300
- PC
- Tripod

The Workflow:

- Shoot in RAW to preserve more detail and sharpness in the post-conversion image.
- Take 9 overlapping frames with three exposures at each (-2stops, Normal, + 2stops). I do this using a spherical panorama head.
- Convert RAW to TIFF.
- Stitch 3 mosaics in Autopano Giga (one for each exposure set).
- Process the three resulting mosaics in Oloneo PhotoEngine.
- Edit the resulting image in Photoshop blended with the normal exposure mosaic.

Figure 1. Spherical **Pan Head**

This workflow relies on using a Spherical Panorama Head to capture the images. A Spherical Panorama Head is a specialized tripod head that allows the camera to be rotated vertically and horizontally around the entrance pupil or what is often called the no parallax point. This allows capturing adjacent images with no shift in perspective or parallax. These can then be stitched together to form a larger seamless image (Figure 1).

Compose your image with the desired focal length lens. Then switch to a focal length 3 times longer. Divide the scene into 3 rows by 3 columns and shoot a higher resolution frame of each of the 9 segments. (Figure 2).

The lens I use most is a 17-50mm f/2.8 zoom. The beauty of this focal length range is that it's about a 3 to 1 ratio. That means that I can compose at 17mm then zoom to 50mm and capture my 9 overlapping frames with the same resulting angle of view. This nearly triples the number of pixels captured in each dimension.

The dynamic range is increased by shooting three exposures of each segment, one at two stops under, one right on and one at two stops over. This is a general rule of thumb because every scene could have an entirely different dynamic range. Some scenes will require more bracketed exposures.

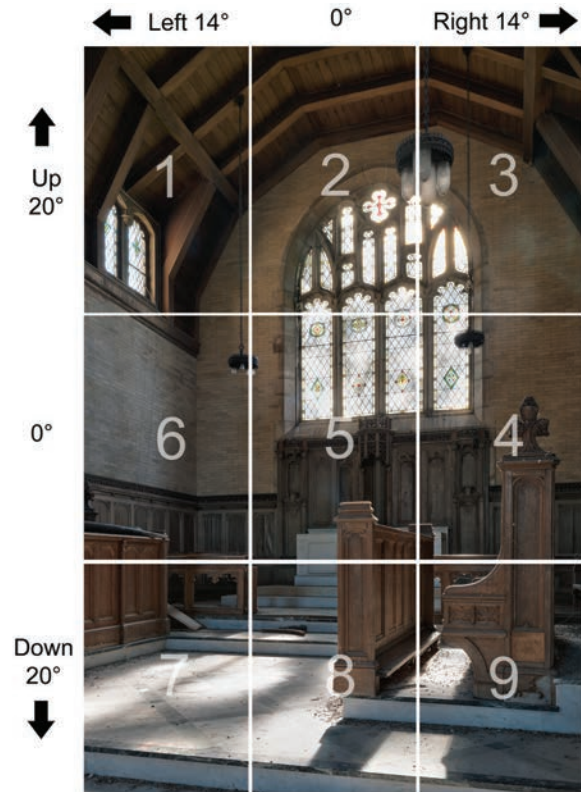


Figure 2. Divide image into sections.

The RAW files are processed in Lightroom for the desired sharpness, noise suppression and lens corrections. Although Autopano can use RAW files I have found that processing in Lightroom first and exporting to TIFF produces superior results. The 27 frames are then exported to their own directory to keep things organized.



Next create three stitched images from **our** 27 exposures, one image for each of the three exposure sets. This would be nearly impossible without a tool like Autopano Giga, which will automatically take all 27 image files and group them by exposure then align them, warp them and blend them into three larger images of the original scene (Figure 3).

Load the source images into Autopano Giga and let it auto-detect the panoramas.

Autopano should automatically detect the projection as planar. If required you can manually select the appropriate projection type. If Autopano does not automatically detect the bracketed exposures then I manually create the additional layers by clicking on the speed button to create new layers grouped by exposure (Figure 4).

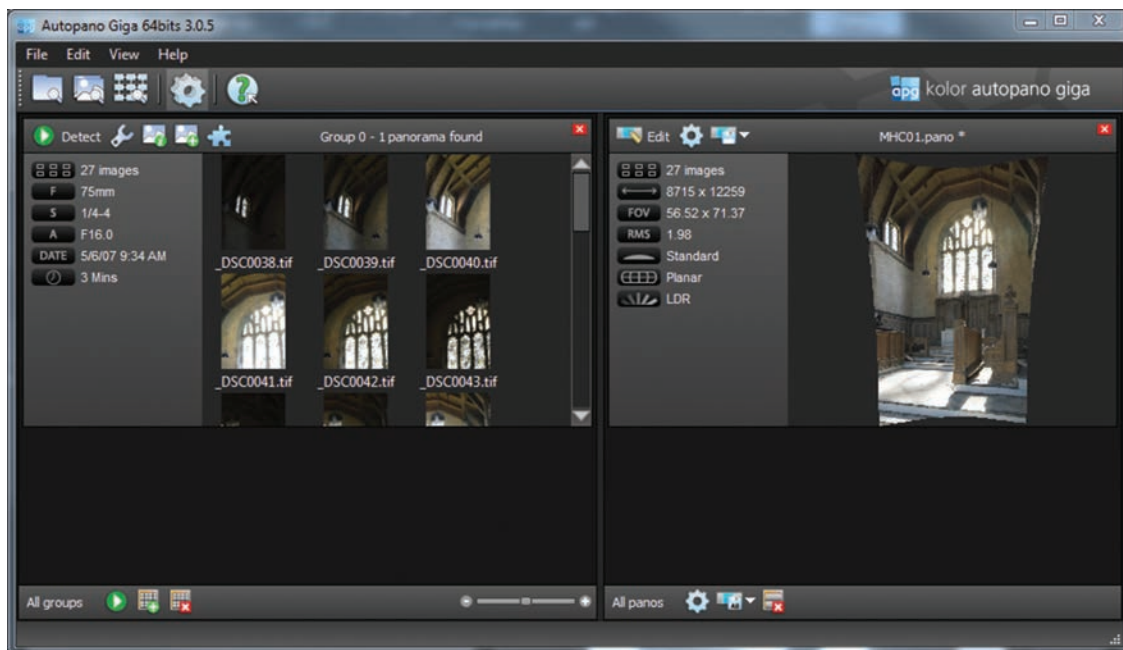


Figure 3. Autopano Giga

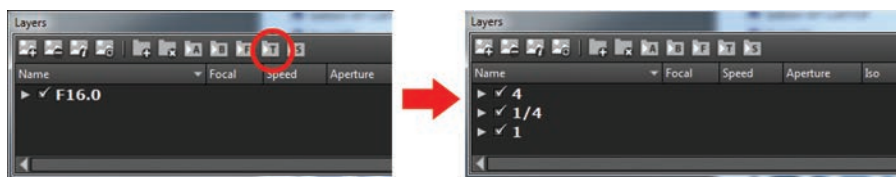


Figure 4. Clicking the icon with the "T" will separate the source images by shutter speed.



WORKSHOPS 2014



JANUARY: SUN 1/19 – FRI 1/24
Spirit of Structure
Alabama Revisited

MARCH: FRI 3/7 – SUN 3/9
Portfolio Weekend
Camden, ME

APRIL: FRI 4/11 – SUN 4/13
Photographers' Retreat
Johnstown, NY

MAY: SUN 5/11 – FRI 5/16
Spirit of Structure
Abandoned Farms of North Dakota

JUNE: SUN 6/15 – FRI 6/20
Spirit of Structure
Orkney Islands, Scotland

JULY: FRI 7/18 – TUES 7/22
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SEPTEMBER: SUN 9/7 – FRI 9/12
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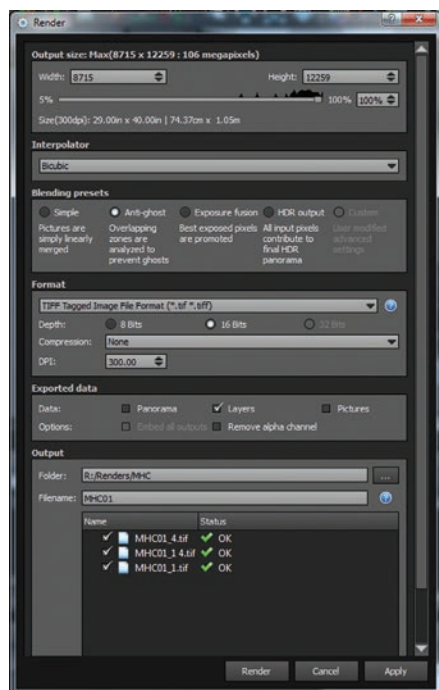


Figure 5. AutoPano Giga Rendering Options

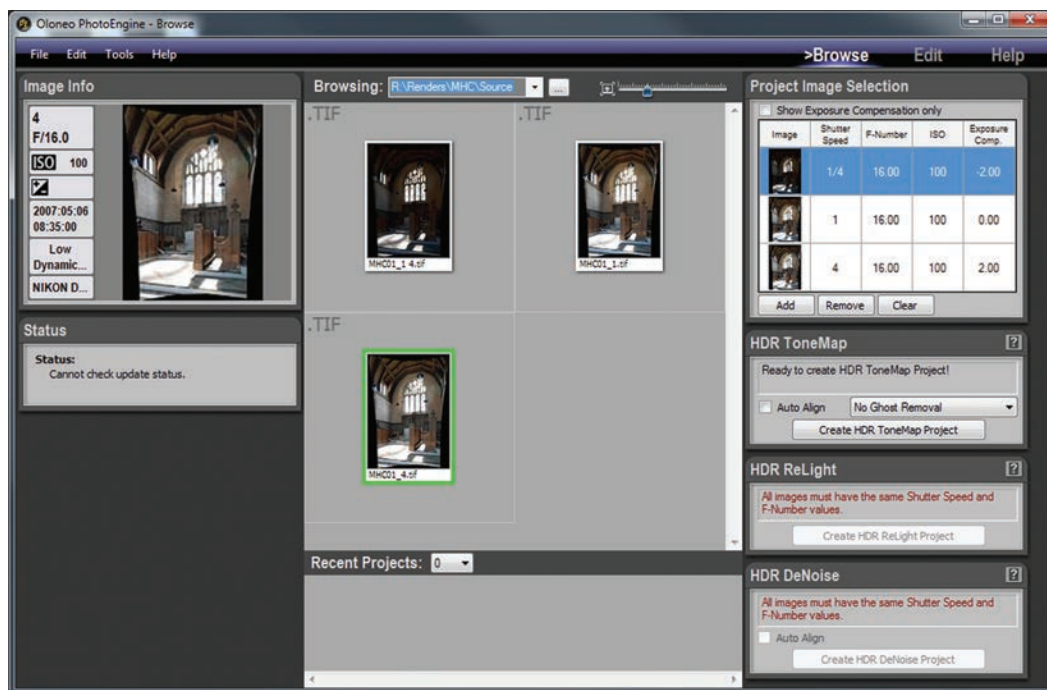


Figure 6. Oloneo PhotoEngine

The default settings of Autopano will create a single output image. The goal is to have more control over the process so I make sure to have Autopano output the separate layers that will be blended later in Oloneo PhotoEngine. Checking the Layers box will instruct Autopano to create the three separate images (Figure 5).

After the three separate panoramas are rendered, I use Oloneo PhotoEngine to tone map the image. Tone mapping is the process that combines the different exposures into a single image with apparent extended dynamic range. Oloneo PhotoEngine handles large files easily so there is no need to tone map the individual source files prior to stitching (Figure 6).

The tone mapping options are dependent on your personal preferences and each image will require different settings. I do however have a set of defaults that I start with. My goal is to produce a natural looking image while preserving the shadow and highlight detail. I start with **settings Figure 7.**

The tone-mapped image is saved to a 16 bit TIFF file and opened in Photoshop for final editing. Since tone mapping can distort the global tonal characteristics as well as the local relationships I often import one of the original stitched images generated by Autopano as a layer and use this to help blend and define global

tonal relationships. This can really help to preserve the emotion of the original scene (Figure 8).

When shooting large format, there was always a certain satisfaction with clicking the shutter and knowing that I had captured my image. Shooting mosaics is not quite like that. After you determine your final composition you need to change your focal length and refocus the camera. Then you must divide your image into sections and be sure to capture all 27 frames. If you aren't paying attention and you miss even a single frame then you pretty much lost the shot.

Shooting with a view camera I am very used to spending a fair amount of time composing each image. The ground glass and preliminary Polaroids give a pretty good idea of the resulting image. Shooting with a DSLR and a panorama head you must learn to rely more on your artistic vision because what you see through the viewfinder will not reflect your final image. You have to take into consideration that perspective and converging lines will have to be dealt with post capture and that means you may be throwing away a lot of image. It's important to capture enough information that your image will still be intact even if you have to crop or distort. And some corrections simply cannot be made post capture.



Example of a black and white photograph using this technique.

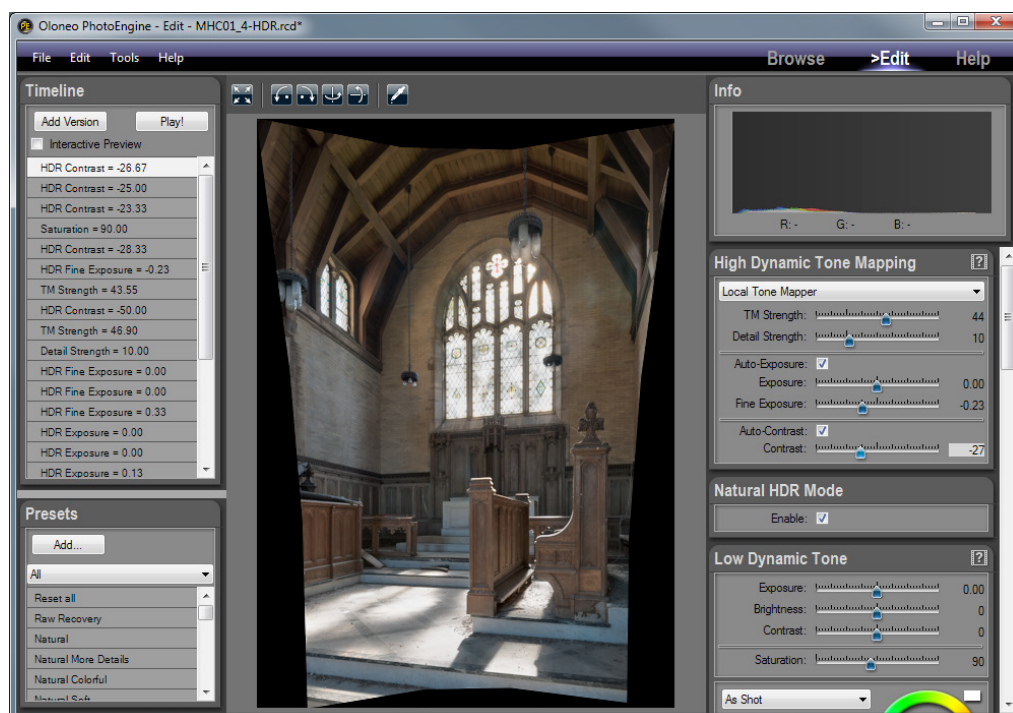


Figure 7. Oloneo PhotoEngine Tone Mapping Settings

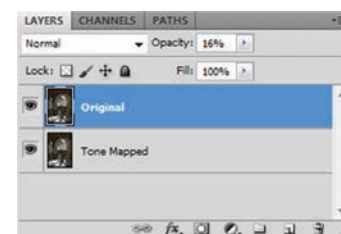


Figure 8. Original image blended to preserve tonal relationships.

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Capturing 27 RAW images takes up much more space on your media than a single JPEG. On my D300 a single JPEG uses about 1.4 megabytes where each RAW image is about 14 MB. So on an 8 GB compact flash card I can only capture enough frames for roughly 19 images with a little space left over. Of course with the increase in effort to capture each image I can only make one or two images every hour.

This method requires ample hard drive space. For each image there are 27 RAW files (378 MB), 27 TIFF files (1.84 GB), 3 stitched mosaics (1.9 GB), one tone mapped image (640 GB) and then my final PSD file (1 to 2 GB). This takes up roughly 6 GB on my hard drive. You can delete all the intermediate files but it's important to know that you will be generating this much data before you reach the final image.

One of the things I like about this approach is that it forces me to slow down and shoot methodically, much the same way I would if I were using my view camera. Slowing down helps me remember that photography is about visualization, not equipment.

In this example I used a Nikon D300 but the process works equally well with non-DSLR cameras. I first started developing this workflow using my Canon

A620. The first big prints I created were of such a quality that I recognized the potential for using a camera with RAW capture and finer controls, and it was the final push I needed to invest in a DSLR.

If the final image quality **was** mediocre or not significantly different from single shot images it would be really silly to go to all this trouble. The bottom line is that following this workflow produces images with biting clarity and beautiful highlight and shadow separation—*more than I ever got with film*. The results are simply stunning and well worth the effort.



Scott Hendershot started in photography in the 8th Grade, when a substitute shop teacher offered to teach the class how to develop film. He has been immersed in photography ever since. Scott worked as a medical photographer, commercial photographer and a custom black and white printer.

With a formal background in Electrical Engineering, Scott currently works for a software company. Using 4x5 view cameras for more than 30 years, Scott made the transition to digital with much experimentation. See more at: scotthendershot.com

Resources

Photoshop, [Lightroom-adobe.com](http://lightroom-adobe.com); [AutoPano Giga-kolor.com](http://autopano-giga-kolor.com); [OloNeo PhotoEngine-oloneo.com](http://oloneo-photoengine-oloneo.com)