4 Steps To Creating Star Trails Photos Using Stacking Software

Photo by kasi metcalfe

If you've ever seen images like the one at right and wondered how they are created, this post from Peter Carey helps explain the steps needed to produce your own star trail images.

Creating star trail images is a fun technique that can deliver a wide range of results depending on location, foreground objects and number of visible stars. While the technique can be relatively simple, proper setup and then proper post-processing are essential. To get started, let's look at the equipment and tools needed for a normal star trail image:

- Digital Camera, with or without Bulb mode
- Tripod
- Remote shutter release with timer (optional, but it helps)
- Open view of the sky
- A lack of city lights
- Image stacking software
- Patience and warm clothes if you don't live in the Tropics

Any camera will work for creating images while it should be noted cameras with exposure length control (shutter priority, manual or bulb modes) work best. The remote shutter release unit is best used to reduce camera shake from pressing the shutter release button as it is used off camera (some

are even cordless). If the remote has a timer function it is golden for use with this type of photography. A good timer will allow for setting of the shutter speed, number of shots and interval between shots. This is the best unattended setup if you wish to wait some place warm while your camera takes care of the pictures. Image stacking software allows for the overlay of multiple images while combining the details. A few options will be discussed at the end of this post as well as in the comments section.

Photo by Sam Meztli

1. Location, Location, Location

Finding a location away from city lights is an important consideration. As the stacking software will combine light areas of the picture, it's best to have as dark of a sky as possible. As you can see from the examples in this post, a lot of images are taken in deserts, as is the example at top(Arches National Park, Utah, USA). Once a good location is established check the foreground for interesting subject matter. A shot of just the sky, while cool for a few shots, looses its luster without an Earthbound object to anchor the action. Mountains, trees, mesas, even people or buildings can be used to add some interest to the shot. Make sure your tripod is set on firm ground and not in a location it'll be bumped or walked in front of.

If you wish to get the circle effect in the photo up top, just point your camera toward the North Star or the Southern Cross depending on your hemisphere.

Image by jpstanley

2. Settings

With your camera firmly in place it's time to check exposure settings before shooting. In- camera metering is not going to like how things are set up and most settings will need to manually set. If your camera can not focus in such darkness you'll need to manually set focus either on a close by object or just off of your lens' infinity setting. This depends on how close to subjects the camera is set. Having subjects further away allows for a larger aperture and better light gathering at shorter shutter speeds, which has its advantages explained in a moment.

Next set the ISO around 200, but experiment as with all settings suggested here. This depends largely on the amount of light and camera being used. If the ISO is too high and the in camera

noise reduction less than optimal you can experience a large amount of camera noise that will interfere with the star trails. At best, it means more time in post processing removing the noise.

Shutter speed can be set as low (or high, depending on your point of view) as 1 second or the shutter held open for minutes at a time. I've found my camera gets increased sensor noise on longer shots. For me, shots in pitch black over 30 seconds will show 'hot spots' on the sensor; colored points that repeat in the same location picture after picture. I've found optimal shutter lengths to be between 10 and 30 seconds, but some cameras work well with the shutter open for one or two minutes. Aperture should be as open as you can stand it based on placement of subjects and required depth of field.

3. Modus Operandi

This is where the patience and warm clothes come in. And a remote shutter release if you have one. As the Earth is always moving and those stars keep walking across the sky, you'll want to keep your shutter releases as close to the end of the last shot as possible. Large breaks will cause blank spots in the trails. This effect can actually be used to your advantage if you become real creative, just make sure it's intentional. Keep shooting until you have as many images as you desire. As a point of reference, the image at the top of this post is a combination of shots over the course of 57 minutes.

If you have an item in the foreground, there are light painting techniques that can be used to highlight them. Only one frame is needed because of the stacking method. For more on painting with light, check out DPS's post Tips on How To Light Paint. A lot of fun can be had adding effects to the foreground.

Photo by Fishtail@Taipei

4. Putting It All Together

Now it's time to let a computer take over. Kind of. The program I've found great success with is TawbaWare's Image Stacker.(http://www.tawbaware.com/imgstack.htm) It is by no means the end all be all, however I have found it very simple to use with great results. Astrophotographers have even more advanced tools they can suggest depending on needs. A quick Google search can provide other options as well.

The premise here is the program will take your batch of photos and then add them all together to render the final image. Anything reflecting light in all images in the batch will show as especially bright in the final image. Individual starts, when moving across black sky, will combine to create the lines that are so captivating. You may also average all the images of just use the brightest pixel from the batch to create an image. Each pass creates a different view of the same batch of photos, so experiment (have I mentioned that before? :)) Image Stacker will produce a jpg, bmp or tif file in the location of your choice. Those proficient in Photoshop can also stack images, but the technique is a best left for another post.

And that's it! It really can be that simple and most importantly it's usually a lot of fun. Ok, there can be some frustrations as well…..planes flying across the field of view, people shining flashlights toward the camera wondering what you're doing, small animals bumping the tripod unbeknownst to you. But the results are worth the effort so give it a try and post a link here with your successes!

Image by motionblur

Peter is an avid photographer currently traveling through South America and Japan who enjoys travel, portraiture and wildlife photography. A travel related blog of his past and current shenanigans can be found at The Carey Adventures. He also hosts a Photo of the Day RSS feed found here.