Lightning Photography

Photo by Stacy Fleenor

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Photo by Mike Leuthold

Introduction

Lightning is one of the most stunning displays of nature. A lightning flash can happen in the blink of eye, making it tricky to capture on a photograph. Yet several photographers are able to capture lightning photographs.

Good lightning photographs can happen on accident. However, to take great lightning shots consistently you have to learn specialized techniques and become familiar with your camera equipment. This guidebook will help you do that.

So grab a camera and a tripod. Get ready to take some striking photos and shock your friends with them!

Photo by Stacy Fleenor

Photo by Mike Leuthold

What is Lightning?

Before learning how to photograph lightning it is important to have a general background of what lightning is. Lightning is an electric current that is produced during a thunderstorm. Have you ever gotten shocked getting out of your car, or by touching a metal object after rubbing your feet on the carpet? This is the same process that creates lightning!

In a thunderstorm, very tiny bits of ice and water droplets are moving around and bump into each other. These collisions are believed to create an electrical charge, just like the charge you build up when rubbing your feet on the carpet. The main charge created is negative charge, and as the storm grows so does the amount of negative charge. Since opposites attract, positive charge is created on the ground. The positive charge concentrates on tall objects such as trees, radio towers, mountains, and people. The negative charge will move towards the ground and eventually makes contact with the positive charge moving upwards. This contact creates a return stroke, or the lightning strike you see! Each lightning flash can contain multiple return strokes, and this is why lightning appears to flicker. This process occurs in less than 1 second!

Safety

Lightning is **DANGEROUS**! It kills approximately 100 people in the United States each year, and injures about 400 more. Lightning injuries include nerve damage, memory loss, headaches, and superficial burns.

No place outside is safe when a thunderstorm is nearby. If you hear thunder, or see lightning, seek shelter immediately. Houses and hard-topped vehicles are both safe locations to be during a thunderstorm. You should remain indoors for 30 minutes after the last thunder has been heard.

When you are photographing lightning ALWAYS shoot pictures out a house window or from inside your car.

For more detailed lightning safety information, please visit the following websites:

1. NWS Lightning Safety: http://www.lightningsafety.noaa.gov/
2. National Lightning Safety Institute: http://www.lightningsafety.com/

Photo by Mike Leuthold

Part 1: Equipment

Digital Cameras

* There are two types of digital cameras that can be used for lightning photography: an SLR (single-lens reflex) or a compact camera. Regardless of the type you use it is important to become familiar with the parts and settings available on your camera.

Digital cameras allow you to immediately see the result of your shots so you can make adjustment to your settings if necessary. You also don't need to mess around with getting film developed. On the downside, digital cameras are expensive and have lower resolution than film. Also, since lightning is extremely bright, the digital CCD sensor can show unnatural abrupt changes in brightness due to over-saturation of the pixels.

Note the abrupt change in brightness in the digital image where the lightning exits the cloud base. This is an artifact of the digital sensor.
Photos from WeatherScapes:
http://www.weatherscapes.com/techniques.php?cat=general&page=digital

SLR Cameras

Digital SLR cameras will give you much more flexibility than compact cameras. The camera should have a Bulb, or B, setting, and allow you to manually adjust the focus, exposure, aperture, and film speed (or ISO).

Compact Cameras (or point-and-shoot cameras)

While these cameras are not recommended for lightning photography, it is still possible to take good lightning photographs with them. In order to do this, your camera must be able to do 2 things: force the focus to infinity, and keep the shutter open for at least 10 seconds, or preferably 30 seconds. Most compact cameras will do this with a night-time setting. This is typically indicated with a half-moon or stars on the dial. Read your camera manual for additional information.

Film Cameras

Film cameras are typically cheaper and will produce better quality images than a digital camera. On the downside, you will have to wait to see your images until you get the film developed.

Make sure to use a 35mm SLR with a Bulb, or B, setting. It is very helpful to have an all-manual setting. This will allow you to manually adjust the focus, exposure and aperture.

Photos by Stacy Fleenor

Older model 35 mm SLR all-manual cameras are relatively inexpensive to purchase and are great for lightning photography. Examples of these are the Canon AE-1, Pentax K1000, and the Minolta SRT201. These cameras are also more resistant to rain and wind than newer models since they have less computerized part.

Photo by Stacy Fleenor

Photo by Stacy Fleenor

What film to use:
Slow speed film is necessary for lightning photography. Use 100 ISO print or slide film. Slide film produces better quality images than print film, but is much more expensive.

Photo by Stacy Fleenor

TIPS:

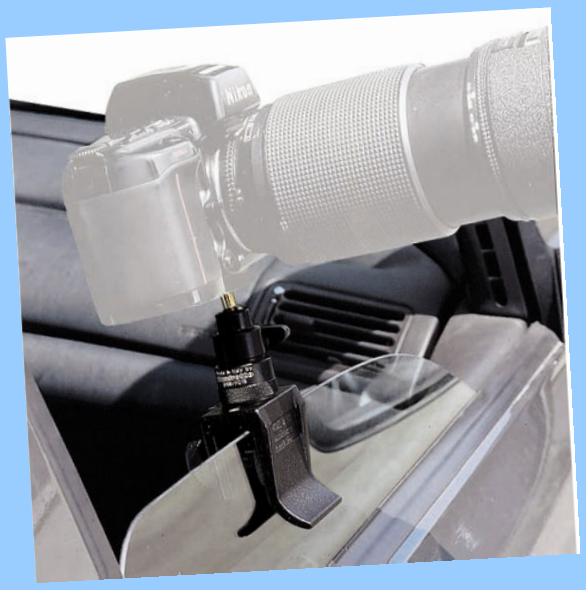
- **Always carry several roles of film during a lightning shoot.**
- **Always carry extra batteries. Long exposures drain battery life quicker than normal shots.**
- **Have your film developed by professionals and tell them they are night-time lightning shots.**

Keep it Steady

Lightning photography requires long exposure times and it can happen in the blink of an eye. It is important to keep your camera steady using a tripod in order to avoid blurred photographs.

Tripods can be set up inside your car. This setup will keep you safe and keep your camera dry if it is raining.

Photo from http://wvlightning.com/ptips.shtml



When photographing from inside your car, a window mount can be used in place of a tripod.

These are inexpensive and are much more convenient.

A cable release is another helpful piece of equipment for lightning photography. This device can screw into your camera's shutter. It will allow you to open and close the shutter without bumping the camera. Digital cameras may have a remote instead of a cable release cord.

Photos by Stacy Fleenor

Part 2: Technique

Focus

Always set your focus on infinity when photographing lightning. If left on auto-focus, the camera will continually search for focus. This will result in blurred images of the lightning.

How to focus on infinity:

Compact digital cameras: Most have an option to force the focus to infinity. Check your manual or the menu for this option. Many times the landscape picture setting forces the focus to infinity.

Film or Digital SLR: There are two ways to set infinity focus. Having your camera on a tripod will make this easier.

1. If your camera has auto-focus zoom in on a far away light source since you will be photographing at night. Once the light comes into sharp focus switch to manual focus. Zoom back out for infinity focus!
2. The other option is to manually focus on infinity. Turn the focus ring on your lens until a distant light source (or object if doing this during the day) comes into sharp focus. If your camera lens has an infinity symbol marker on the focus ring (sideways eight), keep in mind that it is not always accurate. Use trial and error to determine where infinity focus is on your camera.

Photo by Michael Garay

Exposure

There is no one particular correct exposure for lightning photography. Common exposure times range from 10 seconds to 1 minute. These long exposure times can be accomplished by setting your shutter speed to the B-setting on your camera. This is the bulb-setting, and will keep your shutter open as long as you would like. On this setting, the shutter is open when the shutter button is held down, and will close when you release it.

NOTE:

Digital compact cameras, typically do not have a B-setting. Most will have a nighttime setting to keep the shutter open for 10 or 30 seconds.

Read your camera manual for additional details.

Photo by Michael Garay

There is no rule-of-thumb for exposure. Distance and lightning brightness are important.

Note that the above photo is overexposed and the photo on the right is not. Keep a photo journal

Both of these photos have the same settings: 13.5 seconds at F4.5

Photo by Michael Garay

Aperture

The aperture controls the amount of light that is allowed to reach your film or digital sensor. SLR cameras allow you to change the aperture by changing the f-stop. A low f-stop opens the aperture and lets in more light, while a high f-stop shrinks the aperture and reduces the amount of light let into the camera.

For lightning photography, the aperture should be set between f2.8 and f8. The f-stop you choose depends on how distant the lightning is, how bright the lightning is, and your personal preference. The higher f-stops should be used for distant lightning (>40 km away), and if used on closer lightning will result in a thinner channel than the lower f-stops. Keep a log journal and use trial and error to determine which you like best. Compact digital cameras will not allow you to manually change the aperture.

Recap of Steps:

1. Attach camera to a tripod and attach cable release. REMEMBER: Always photograph through a house or car window for safety!
2. Set focus to infinity.
3. If possible, change exposure to B-setting and aperture between f2.8 to f8.
4. Open shutter, lock cable release.
5. Wait for lightning flash then release cable lock.

Photo by Bill Scheftic

Part 3: Composition

Sky's the Limit

The horizon should always be included in a lightning shot. However, the Rule-of-Thirds is not always desirable when photographing lightning. While lightning is bright, it is not bright enough to light up the foreground of a picture. Thus, the foreground will remain dark and not add much to the photo. For this reason, many lightning photos have the horizon at the bottom of the photo and include as much sky as possible.

The dark foreground in this photo results in unused and unattractive space.

Photo by Michael Garay

Having the horizon at the bottom of the photo opens up the sky and doesn't distract from the lightning channel.

TIPS:

- **Watch the storm for a few minutes before starting**
- **Frame your shot in the region with the most lightning**

Location, Location

The best places for lightning photography have unbroken views of the sky and low ambient light levels. Power lines and other objects can be distracting. Always seek out your location prior to a storm. This way you will know where to go and not end up in a potentially dangerous location. **REMEMBER**: Safety First!! Stay in a house or a car, and photograph through a window.

TIPS

- Protect your camera equipment by choosing a dry location!
- A location far from city lights will allow you to have longer exposure times without overexposing your image!

Photo by Mike Leuthold

Photo by Michael Garay

Taking lightning photos at dusk provide great opportunities for silhouettes in the foreground. The saguaro cactus is backlit, creating a dramatic outline along with the lightning in the photograph.

Part 4: Advanced Lightning Photography Skills

Ribbon Lightning

Slowly moving your camera horizontally on your tripod can produce different types of lightning photographs. Remember a lightning flash is composed of multiple strokes. Thus, by moving your camera you can separate out the different strokes and end up with a photograph similar to the one below. This effect is known as ribbon lightning. Ribbon lightning can also occur if the wind blows the strokes in one direction.

This technique is much more advanced and requires a lot of patience and practice.

Photo from Disaster Strikes: http://www.virtualsciencefair.org/2005/schu5s0/public_html/lightning.html

Daytime Lightning

Taking lightning photographs during the day is much harder than taking them at night. The B-setting cannot be used since all shots will be overexposed by the sunlight. The exposure must be set according to what your camera's light meter advises. Have your finger on the shutter and has soon as you see a lightning strike trip the trigger. For this method to be successful your reaction time must be VERY quick, on the order of 0.2 seconds.

Photographing lightning during the day can be quite challenging.

[Photo from Apogee Photo: http://www.apogeephoto.com/mag3-6/mag3-7l_trig.shtml]

There is one other technique that can be used for daytime lightning photography. If your camera has a fast continuous shooting mode you can just do a continuous shoot. Then hope to get lucky and get lightning in one of the shots. This method requires discarding several photos, but you may be rewarded with a fabulous branched daytime image! This option is available on most digital SLR cameras.

Know the Lingo

B-Shutter Speed – A shutter speed setting on some cameras. This setting will leave the shutter open for as long as you want.

Cable Release – An extension cable that can be connected to the shutter release button on some cameras. The switch on the end of the cable allows you to take a picture without touching the camera, reducing camera shake.

Electrons – Particles with a negative charge.

F-Stop – A measure of the size of the aperture. The smaller the f-stop number, the larger the aperture.

Leaders – A channel of charged air created by electrons in a thundercloud. Leaders reach from the cloud to the ground looking for positively charged items, such as trees, towers, and the ground.

Protons – Particles with a positive charge.

Return Stroke – An electrical charge that travels from the ground to a thundercloud. A return stroke releases a large amount of energy and produces a bright flash of light. Each lightning flash can have 1 or more return strokes.

Severe Thunderstorm – A thunderstorm with winds in excess of 58 mph, or hail having a diameter of ¾" or more.

Severe Thunderstorm Watch – A severe thunderstorm is likely to occur in your area.

Severe Thunderstorm Warning – A severe thunderstorm is occurring in your area.

SLR Camera – Single lens reflex cameras allow the photographer to manually change features such as the lens, shutter speed, aperture, and ISO value.

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