

Learn the best ways
to master time in your
pictures!

Time Lapse Photography, Long Exposure & Other Tricks of Time

From Snapshots to Great Shots

Get great detail in
your subjects!

John Carucci

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Long Exposure & Other Tricks of Time:

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Peachpit
Press

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www.peachpit.com

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ISBN-13: 9780134429083

ISBN-10: 0134429087

9 8 7 6 5 4 3 2 1

Printed and bound in the United States of America

Dedication

To the memory of Windee and Okee

Acknowledgments

While taking these pictures was a personal experience between some time and myself, making it into a book was a team effort.

First, I would like to give a shout-out to my teammates at Peachpit. Thanks to Valerie Witte, who had the confidence that I could put a book like this together and gave me the green light to do it. Thank you, Anne Marie Walker, for your amazing editorial guidance and gentle prodding. Danielle Foster and Lisa Brazieal gave their keen eye making the book look spectacular, and I appreciate that immensely. And finally, I want to thank everyone else who worked behind the scenes to turn words and pictures into a book.

Thanks to my agent Carol Jelen for continually getting me to the right place at the right time.

I would also like to thank everyone that appeared in the book, including Alice, Anthony, Ashley, Christine, JC, Jess, Johnny, and anyone I missed.

And finally, thanks to Jillian, Anthony, and Alice for providing a base.

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Introduction

Breaking free of the boring shutter speeds of snapshot photography will liberate your creative soul. Instead of grabbing a quick moment, you can capture something more impressive when you play with time. This includes the ultra long durations that collect a bunch of time in the same long exposure; a group of images shot in succession that imitate a quickly played movie; and the really fast moments that freeze action in the blink of an eye. These types of photography get my juices flowing, and hopefully reading about them and seeing the crisp photographs in *Time Lapse Photography, Long Exposure & Other Tricks of Time: From Snapshots to Great Shots* will do the same for you.

Although diverse, the tricks of time you'll learn about in this book come from my early influences. My first encounter with time exposure happened at age six when I saw the wall of my favorite ice cream parlor adorned with large black-and-white prints of automotive light trails. That image stayed with me for years, and when I finally figured out how it was made, I was hooked on capturing time.

My formal training began at film school where the world moves at 24 frames per second. Not long after, I dabbled in three-dimensional animation, which captured each step of action a single frame at a time. After transferring into a photography program, I became fascinated by sports and action photography, where moments are frozen in a fraction of a second.

Those influences helped me find my personal vision, and my hope is that after thumbing through the pages of this book, you'll find your personal vision too.

Q: What do you have against snapshots?

A: Nothing. They serve a purpose, although an aesthetic one escapes me at the moment. All kidding aside, the problem is that snapshots usually capture the world at 1/60 of a second, give or take, and that doesn't always produce the most captivating pictures.

Q: What's wrong with shutter speeds like 1/30 or 1/60 of a second?

A: They're fine when you're capturing live subjects that don't move. But if they do move, they'll often render a slight blur. Conversely, 1/30 or 1/60 of a second is not usually enough to expose a dark scene or show a creative use of motion. But here's the kicker: Anyone who has ever seen a shutter dial on a DSLR knows there are at least 50 time settings, not to mention the B setting (it keeps the shutter open for as long as you want). So use them to interpret the exposure and motion in the scene as you see fit.

Q: Must I read the entire book to get the information I need to take great shots?

A: Not really, unless you want to make me very happy. However, each chapter discusses techniques you can use in your photography. Chapters 1 and 7 deal with equipment and composition, respectively. Those are important for everything you do. The remaining chapters focus on more specific interests. Chapters 2 and 3 explore long exposure photography; Chapter 4 explains manipulating time in a different way using electronic flash; Chapter 5 talks about the various techniques for capturing time lapse sequences; and Chapter 6 targets high-speed photography.

Q: What should I expect from reading this book?

A: You should acquire a sense of confidence that comes from understanding how to approach a particular situation after reading succinct information and looking at sharp, illustrative photographs.

Q: What kind of camera do I need?

A: This book does not discriminate: It provides examples captured with various DSLR, point-and-shoot, GoPro, and smartphone cameras. Not every camera works in all situations, but as you'll see with the included photographs, each has special functions.

Q: Does this book tell me everything I need to know?

A: Of course not. First, it does not contain enough pages to describe every trick of time. Second, each camera requires an understanding that can be described in a book of its own. So coming to the process with an idea of how to use your camera will expedite your ability to manipulate time.

Q: Is long exposure a new thing?

A: No. In fact, it's an old thing. If you were a photographer in 1870, long exposure photography was the only game in town. And I mean very long due to incredibly slow materials that could barely register an ISO setting in the single digits; so even some brightly lit scenes could take hours to expose.

Q: Is time lapse photography a new technique?

A: It shares much in common with the infancy of motion pictures, which were created from a series of progressive images, much like a time lapse sequence.

Q: Is there anything else I should know before getting started?

A: In addition to everything you'll find in the book, I've provided a short video that illustrates how I made a cool time lapse video with a GoPro camera mounted on my car.

To access and download the bonus video:

1. Visit peachpit.com/register.
2. Log in with your Peachpit account, or if you don't have one, create an account.
3. Register using the book's ISBN, 9780134429083. This title will then appear in the Registered Products area of your account, and you can click the Access Bonus Content link to be taken to the page where the video is available for easy download.



Canon T2i • ISO 200 •
1.6 sec. • f/22 •
Canon 20-35 f/2.8L at 25mm

4

Mixing Time and Flash

Playing with Time in the Same Frame

Flash provides another way to control time in your photographs, but instead of collecting all that happens in front of the camera over a long duration, it produces a quick burst of light. Regardless of the level of brightness, flash can adequately expose a scene, as long as the subject is within range, and freeze the action too. But it does more than simply provide light: It can also override ambient illumination with a predictable color balance.

Poring Over the Picture

This warmly illuminated passage required a relatively slow shutter speed to properly expose the ambient light in the scene. Flash exposure was used for the subject on the left side of the frame. But because the unit has limited power, it covered only a limited area.

The built-in bounce card on the flash was used to avoid red eye.

Exposure time couldn't be too long, or the subject would show motion.





● The overall scene lacks sharpness, mostly because of the slight blur from handholding the camera, but that doesn't matter because the subject is in focus.

● This scene required a slightly long exposure time to expose the ambient light, but the camera was handheld because the flash would freeze the action of the main subject.

● The image has a warm and a cool tone. White Balance was set to daylight at (5500 K) so the ambient light renders warmer, and the flash exposure has a slightly cool tone. Portraits tend to need a warmer tone than normal.

Canon 6D • ISO 100 • .3 sec. •
f/6.3 • Canon 50mm lens •
Canon Speedlite 580EX Flash

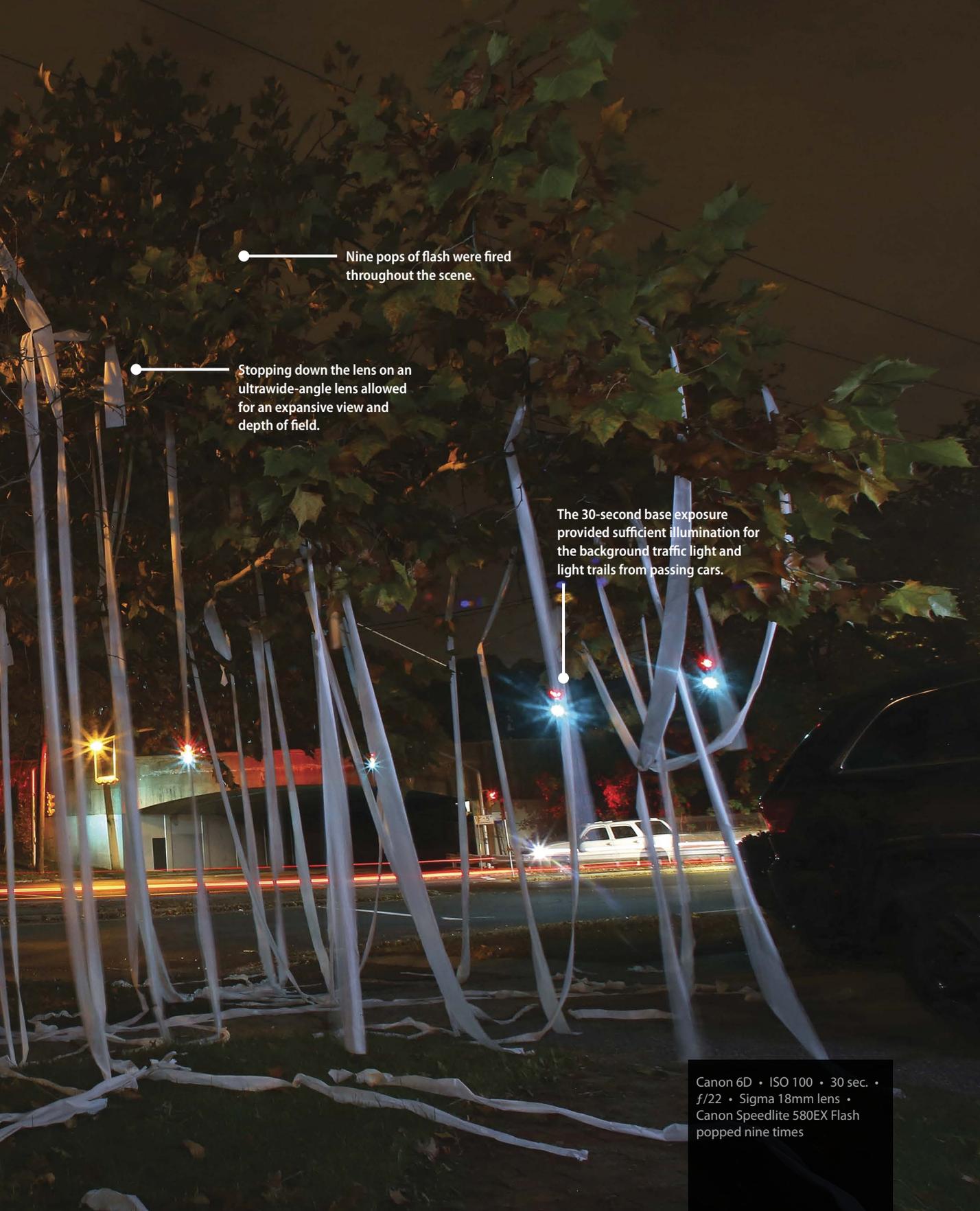
Poring Over the Picture

A Halloween prank done in the dark was transformed into a compelling image by using a long exposure and manually painting the scene with flash.

Walking around the scene with a powerful flash unit and firing off pops to cover the foreground provided illumination to an area that was otherwise dark.

Because the streams of toilet paper were white, it did not take much light to expose the trimmings.





● ————— Nine pops of flash were fired throughout the scene.

● ————— Stopping down the lens on an ultrawide-angle lens allowed for an expansive view and depth of field.

The 30-second base exposure provided sufficient illumination for the background traffic light and light trails from passing cars.

Canon 6D • ISO 100 • 30 sec. •
f/22 • Sigma 18mm lens •
Canon Speedlite 580EX Flash
popped nine times

On the creative front, you can combine flash with long exposure, both stopping and collecting time, respectively, in the same picture, which can lead to some compelling imagery. If you're feeling blue, or perhaps green or red, you can place a colored gel over the flash to change the hues in the scene. If you're thinking a bit more on the scientific side, why not set the flash to fire multiple bursts (using a unit that supports this feature) to capture the subject in several stages of motion. Or perhaps set the camera on a very long exposure and "paint" the scene with colored light.

Unfortunately, flash is not some easy-to-use magical device. Although it provides a great deal of flexibility, it's not always the most cooperative tool in your camera bag.

To help communicate more effectively with flash, this chapter gives you some information, advice, and tips on using it to your advantage in a variety of situations.

Electronic Flash Basics

In its most basic form, electronic flash provides a portable burst of light at a very quick rate. The average flash unit goes off anywhere from 1/500 of a second to a 1/35,000 of a second or faster (depending on the model and mode.) That's enough to expose a dimly lit subject and freeze the action of a moving one. The actual intensity of the burst and its subsequent range of coverage depend on the model and its strength, yet even the most basic flash units (including those built in to the camera) provide enough power to light a subject. The actual power of a flash unit in terms of coverage and range uses a unit of measurement known as the *Guide Number* (see the "Guide Number" sidebar).

Obviously, a separate unit, the kind mounted on a camera, offers more features and power, and of course, a higher Guide Number. Clearly, it's more effective than the camera's built-in flash unit. And yet, that doesn't necessarily make one easier to use than the other.

Guide Number

The power of a flash unit is determined by its Guide Number (GN). The higher this value, the more power the flash can emit. Although the GN was at one time part of a crucial formula for setting your camera to properly expose the scene, these days it's been relegated to simply differentiating each particular flash model. But back in the days of film when cameras were less electronic—and there was no way to preview the scene—flash photography required much more finesse. Sometimes you used a Polaroid to get an idea of the result, but for the most part you waited for the film to come back from the lab and hoped for the best.

Flash photography has become easier over the years because you no longer need to manually calculate its output. Currently, most flash units work in conjunction with the camera's metering system to automatically adjust the output of light (**Figure 4.1**). But even the integration of the two doesn't always ensure a perfect result for a variety of reasons, which include: the direction of light coming straight toward the subject and the flash unit sharing the same axis as the lens, which occasionally leads to red eye, either because you were too close to the subject or the unit was too strong. Sometimes the best flash photography shows the least evidence that flash was used.



Figure 4.1
WIndee Airedale was captured using the camera's pop-up flash before attending a formal kibble dinner.

Canon T2i • ISO 800 • 1/60 sec. • $f/4$ •
Canon 50mm Macro lens • Pop-up flash

Advanced Flash Unit Features

The newest models of the electronic flash unit have evolved to provide the perfect complement to today's sophisticated Digital SLR cameras. These tools have come a long way since the old days when flash exposure was independent of the camera's automated or Through-The-Lens (TTL) functions. Back then you set the power output on your flash—perhaps after doing some math with subject distance, ISO, and Guide Number—and crossed your fingers.

But flash units have greatly improved since those very technical, yet trial-and-error based days.

Here are some of the features you'll find on flash units now:

- **TTL flash metering:** Whether the manufacturer calls it iTTL, eTTL, or whatever letter precedes TTL, Through-The-Lens (TTL) flash metering produces more accurate output because it measures the light in the scene directly through the lens. Early models used a sensor on the flash, which could be fooled by elements outside the frame, as shown in **Figure 4.2**.
- **Exposure compensation:** Even with TTL, you can fine-tune flash output by increasing or decreasing output by 2–3 stops (depending on the unit). This allows you to tweak exposure more effectively, especially when combining flash with long exposure.
- **AF assist beam:** When you're shooting in low-light conditions, sometimes not enough light is available to focus the scene. But now this is not a problem. Some models provide a built-in assist beam to help determine focus in dark or low-lit areas.
- **Slave ability:** This flash unit mode lets you trigger one or more flash units positioned in the scene based on the burst of your main flash. You can even hold the camera-mounted flash with one hand and the unit set on Slave in the other to provide fill light.
- **Movable flash head:** Although a movable flash head is not a new feature, it has seen some improvements. With it, you can tilt the head upward to bounce light from a surface above the scene, and some let you swivel the head to either side to reflect light from a wall. Many also include a slide-out bounce card.
- **Filter holder:** Regardless of the lighting conditions, flash output matches the color balance of daylight, which is 5500 K. But you can match the color temperature of ambient light by using the proper filter.
- **Wireless capability:** With wireless capability, you can remotely trigger one or more flash units positioned away from the camera when you press the shutter.



Figure 4.2
The subject was in shadow under a scaffold for this portrait set against the colorful light trails of passing traffic. By setting the flash to -2 stops, I was able to make the setting appear more natural. The only giveaway is the light reflecting in the woman's sunglasses.

.....
Nikon N90s • ISO 100 •
4 sec. • *f*/8 •
Nikon 35–70mm lens •
Nikon SB-26 Flash

Reasons for Using Flash

Bringing light to situations that have none or very little of it is the most apparent reason for using flash. But it's not the only one. Numerous reasons exist that range from the necessary and the practical to the scientific and the creative. Some are serious for creating the most compelling imagery, whereas others are handy for the silly snapshots, as shown in **Figure 4.3**.

Figure 4.3

If the question of what to do with a watermelon after scooping it out arises, taking a whimsical approach and carving it into a mask is one option. This melon head was captured with the pop-up flash on a DSLR.

Canon 20D • ISO 200 •
1/60 sec. • *f*/2.5 •
Canon 50mm Macro
lens • Pop-up flash



Flash Sync Speed

Flash sync speed is the maximum shutter speed at which the camera can capture a flash exposure without one of the curtains closing fully, leading to the darkening of an area of the photograph. Many flash units sync at 1/250 of a second; others are as slow as 1/60 of a second. So if your camera is set on a high shutter speed, you'll see a dark area somewhere on the image. Many newer camera models simply override the high shutter speed to eliminate this image defect.

Consider the following as to when to use flash:

- **Bring light to dark areas:** As previously mentioned, adding light to unlit areas is the most common reason for using flash. No matter how dark the scene, as long as the flash burst reaches the distance to the subject, it can even illuminate a piece of coal in a pitch-black cave. Of course, more practical uses include exposing people in indoor situations or a stationary subject in low-light conditions.
- **Stop action of a moving subject:** If you want to freeze action and illuminate it at the same time with a bright burst of concentrated light, flash can do that for you too. Of course, the subject must be in range to reap the full stopping power. Also, make sure the shutter duration doesn't exceed the flash sync speed (see the sidebar "Flash Sync Speed").
- **Correct color balance:** More realistically, flash provides a predictable color temperature by overpowering the existing ambient illumination. Flash produces a color temperature similar to daylight, which comes in handy when you're shooting a subject in unflattering illumination (**Figure 4.4**).
- **Create special effects:** Even though you don't always need a flash unit with sophisticated features to be creative, it does provide more options. Depending on the model you use, you can produce a variety of effects, including multi-flash, which allows you to capture the subject in various stages of motion; rear curtain synchronization, which fires the flash at the end of a long exposure as opposed to the beginning (see the section "Rear Curtain Sync"); and color filtering in which you use a holder for colored gels for correction and creative purposes.
- **Mix flash with long exposure:** Use flash with a long exposure to balance a portrait with the background, mix color from flash and artificial light, and paint with flash.



Figure 4.4 This New York Giants fan celebrates his team spirit on a cool night. The artificial lighting is relatively bright, but it has a dominant reddish colorcast. Flash provides the subject with a normal color balance.

Canon T2i • ISO 1600 • 1/60 sec. • $f/4$ • Canon 24–105mm lens at 45mm (equivalent to 72mm) • Pop-up flash

On-Camera Flash

It doesn't matter if you have a pop-up flash on your DSLR, a built-in flash on a point-and-shoot camera, or whatever that burst of light coming from your smartphone is called, the direction of illumination will basically be the same. Each flash will get the job done, but it's not always perfect. Even when you're using a feature-rich unit mounted atop the camera, it still exposes the scene with direct illumination, and that's not always the most flattering light. Why?

Because the flash hits the subject head on, it creates a number of issues, including harsh light, washed-out illumination, and a disparity between the areas it doesn't reach. When the scene is rife with blown-out highlights and detail-less shadows, they create a high-contrast ratio that makes the photo lack dimension, and it's not very appealing.

Another issue occurs when the flash is too close to the axis of the lens, which increases the possibility of red eye. Still, it's hard to beat camera-mounted flash because it's easy to take advantage of, especially when you want to grab a quick snapshot (**Figure 4.5**).

Figure 4.5
On-camera flash is great for snapshots, because the moment of capture can sometimes carry as much weight as the aesthetic.

Canon T2i • ISO 800 •
1/60 sec. • *f*/4 •
Canon 24–105mm lens
at 47mm (equivalent to
75mm) • Pop-up flash



Dealing with Red Eye

That possessed look of people in some pictures has plagued photographers ever since the flash unit was introduced. Red eye is not solely a problem of on-camera flash; rather, it occurs when the flash, lens, and subject's face converge on the same axis. When that happens, light reflects from the retina in the subject's eyes, producing those darting red pupils (**Figure 4.6**). Some cameras and flash units have red-eye reduction modes. You can also correct the problem in Photoshop or another image editing application.

But you can prevent red eye from occurring by trying the following techniques:

- If you're shooting close to the subject, avoid having the subject look directly in the lens.
- Bounce the flash. (See the next section for an explanation of how to do this.)
- Use an off-camera flash.



Figure 4.6 The built-in flash on many cameras sits very close to the lens and will cause red eye when in line with the subject.

Nikon 5000 • ISO 100 • 1/60 sec. • $f/2.8$ • 28mm lens

The Effectiveness of Bounce Flash

Some camera-mounted flash units allow you to change the direction of the light source. By positioning the head away from the subject and onto an area where it can reflect and hit the subject with softer, more directional light, you're able to use the flash mounted on your camera more effectively (Figure 4.7).

Figure 4.7

This classic portrait was simply illuminated by bouncing the on-camera flash off the white ceiling at a slight angle.

Canon 20D • ISO 100 •
1/60 sec. • *f*/8 •
Canon 50mm lens
(equivalent to 80mm) •
Canon Speedlite
580EX Flash



Bouncing the flash greatly increases the quality of illumination from your on-camera flash by softening the light and spreading it out. Of course, this technique does have its limitations: one of which is not having a place to bounce that light. Bouncing prevents the flash from spewing the light as much as it redirects it for a more flattering rendering of the subject.

Bouncing flash off a ceiling or wall does require extra flash power, but the results are well worth it.

Consider the following bounce flash tips to bounce flash effectively:

- Tilt the flash at an angle that will effectively illuminate the subject.
- Make sure the color of the bounce surface is neutral (white is always best) because it will affect the color of the flash.
- Ensure that the bounce surface is not too far from the flash so you have enough power to bounce the light onto the subject.
- If a bounce surface is unavailable, you can choose optional flash attachments that redirect and spread the light. These include a bounce-dome diffuser that fits over the flash head; a mini softbox that attaches to the flash; and a light bouncer that redirects and softens output.

Where Do I Bounce Now?

You just have to face the fact that you won't always have a surface to bounce the light, especially when you're shooting outdoors. You certainly won't be able to bounce the light from a ceiling. But you can still bounce the light using a bounce card to redirect the light from the subject. Some advanced camera models include a built-in bounce card that slides out, such as the one I used in **Figure 4.8**. But don't worry if you don't have one. You can just attach a white card to the flash using a rubber band to hold the card in place.

Off-Camera Flash Works Really Well

Using flash away from the camera provides a more effective means of lighting a scene. It allows you to change the direction of light to come in from the side, which is always more flattering to the subject (**Figure 4.9**). You can use the flash in several ways, but the most basic way involves using an accessory cable that plugs into the camera's hot shoe and onto the flash. You can either use a bracket (a device for holding the flash off-camera) or simply handhold the flash to create beautiful lighting that may not resemble flash at all.

Figure 4.8
When you're shooting outdoors, it's hard to find a place to bounce the light. Fortunately, this flash unit had a slide-out card.

Canon 6D • ISO 100 •
1/13 sec. • $f/1.8$ •
Canon 85mm lens •
Canon Speedlite
580EX Flash



Figure 4.9
Holding the flash away from the camera allows you to produce a more flattering, dramatic illumination.

Canon F1 • ISO 200 •
1/30 sec. • $f/11$ •
Canon 24mm lens •
Vivitar 285 flash held
off camera



Balancing Flash and Ambient Light

Previous chapters covered the effect of long exposure to capture a dimly lit scene, and this chapter shifted gears to cover the importance of using flash for illuminating darker subjects with a quick burst of light. Now it's time to put this dynamic duo together. When done correctly, magical things can happen because the image is captured over two different time planes within the same scene: one very quick and the other slower. The trick is to get the long exposure and flash burst of light to work together in harmony. How you do it is in information you'll find in the proverbial section on "easier said than done."

Making these two techniques come together begins with understanding the factors that control each one. Flash exposure is dictated by the aperture setting with little effect from shutter speed. Conversely, ambient exposure (the natural light in the scene) is controlled by shutter speed duration. It has little impact because the flash already produces a quick burst of light, so duration doesn't play much of a part in affecting exposure.

For example, if you were shooting a portrait that was properly exposed at an aperture setting of f5.6, changing the shutter would just affect the areas not covered by the flash. One exception is if the shutter speed creates "more" exposure than the flash.

Adjusting shutter speed provides a great means for balancing exposure, as shown in **Figure 4.10**. So, find an aperture setting that works with the flash exposure, and then adjust the shutter duration to expose the ambient (natural light) part of the scene.



Figure 4.10
Although this image looks natural, this uniquely composed portrait depended on balancing the flash and ambient exposure. Once I established the aperture setting for the flash exposure, I chose a matching shutter speed for the illuminated sign in the background.

.....
Canon 6D • ISO 100 •
1/15 sec. • f/1.8 •
Canon 85mm lens •
Canon Speedlite
580EX Flash

How the Shutter Works

The focal plane shutter uses two curtains for exposure: one that begins exposure and another that ends it. Exposure begins when the first curtain comes down and ends with the second going up. How quickly that happens depends on the shutter speed setting. During a fractional exposure, they operate like the blink of an eye. But for long exposures, the first one stays open for a long duration before the second begins to close. This will affect your flash exposure and also allows you to make changes to your advanced flash unit to control the situation.

Get a Good Reading of the Scene

Understanding how to control flash and adjust for ambient light in the scene provides a good start to a successful photograph but still requires a little trial and error. Unfortunately, some situations leave little time to plan. The next time you need to balance flash and long exposure, consider the following suggestions:

- **Shoot on Manual:** You don't want any surprises affecting exposure or fluctuations from passing light, or something else that might affect exposure.
- **Test flash exposure:** Use a middle aperture setting, anywhere from f5.6 to f11, to see if that properly exposes the subject. You don't want to overexpose with flash. It's best to have a little less exposure than a little more.
- **Adjust ambient exposure:** Use the camera as a light meter to measure a middle tone in the scene. Because the aperture is already set for flash, adjust exposure by changing the duration.
- **Take a test image:** Once you have an idea of the exposure in the scene, take a test exposure and then make adjustments.

Use a Tripod or Not?

Normally, you mount your camera on a tripod to capture a long exposure; doing so and using a flash provides more flexibility. But there's nothing unusual about handholding the camera when you're using flash. It's also possible to handhold a long exposure with flash to create a sense of motion. Usually, anything but a fractional exposure time requires that you mount the camera on a tripod, unless you want to blur motion, either accidentally or intentionally. However, when you want to shoot action scenes, you can use a high shutter speed to freeze the action (along with flash), as shown in **Figure 4.11**.



Figure 4.11
When you want to freeze action, using a high shutter speed along with flash produces the scene without any motion blur. Because it was relatively dark and I handheld the camera, I also used a higher ISO setting to capture the diver in midair.

Canon 6D • ISO 1250 •
1/125 sec. • $f/11$ •
Canon 24–70mm lens
at 50mm • Canon
Speedlite 580EX Flash

Mixing flash and long exposure provides a creative alternative when the camera is handheld, allowing you to create a more exaggerated sense of motion. Of course, if you want the background to be crisp and sharp or maybe rendered as a subtle blur through selective focus, then by all means use a tripod (**Figure 4.12**).



Figure 4.12 This family photo mixed flash and long exposure by mounting the camera on a tripod and using the self-timer. Because the ambient portion of the scene needed a longer exposure time, you can see a slight motion blur around the subjects.

Canon 20D • ISO 100 • 2 sec. • $f/7.1$ • Canon 20–35mm lens at 27mm (equivalent to 43mm) • Pop-up flash

Not All Flash Exposures Are Created Equal

Even the most remedial knowledge of flash photography is rooted in understanding that the operation consists of turning on the flash unit, pressing the camera shutter, and having a burst of light illuminate the subject. It's a safe assumption that the flash will go off immediately—at least that's how it works by default. Some advanced model flash units include a mode that will fire the flash at the end of the exposure. Although when the flash goes off doesn't sound like that big of a deal, the two are noticeably different, especially during a long exposure. That's not to say one is better than the other, yet each has a special purpose. It's important to understand how each one captures the subject.

Dragged Shutter Flash

The dragged shutter flash effect blends the ambient and flash exposure in the same frame, with the burst coming at the beginning of exposure and the shutter continuing to collect light into the scene after the flash goes off. It's not the kind of thing you would normally think about, because we tend to think of the flash going off during a fractional exposure; so within a blink the entire process is complete. But when exposure duration goes on for a bit longer, the flash fires and freezes the action, but exposure continues to collect in the picture along with any motion in the scene. This is the reason the dragged shutter flash technique works best with nonmoving subjects (illuminated by flash), such as portraits or stationary objects in the scene. Even when a partially moving object is frozen with flash, the object will show a motion (as an outward motion). By no means should this dissuade you from using this technique with moving subjects—either to exaggerate the effect of motion blur (**Figure 4.13**) or create a “softer” sense of motion (**Figure 4.14**) with a slower moving subject and faster shutter speed.

Rear Curtain Sync

In rear curtain synchronization mode (also known as *second curtain synchronization*), the flash fires at the end of a long exposure just before the second curtain closes. That makes it ideal for capturing moving subjects with flash during a long exposure. By setting the flash to rear curtain sync, you can capture the ambient parts of a scene and subject movement before the flash fires, producing a more fluid rendering of motion. Flash going off at the end of exposure can eliminate the awkward blur by freezing the subject at the end of exposure after it has moved through the scene. The effect can also convey a sense of speed, as shown in **Figure 4.15**.

Figure 4.13

This rendering of the early morning commuter rush consists of both motion and frozen action. I handheld the camera while trailing behind the pack.

Olympus D-40 •
ISO 100 • .5 sec. •
 $f/3.8$ • Olympus
35mm lens • Built-in
flash



Figure 4.14

Although the exposure was too long to handhold the camera, the exposure was still relatively short, so the flash captured the color and motion of this party scene without creating an extreme motion blur.

Nikon 5000 • ISO 200 •
1/4 sec. • $f/4$ •
Nikon 28mm lens



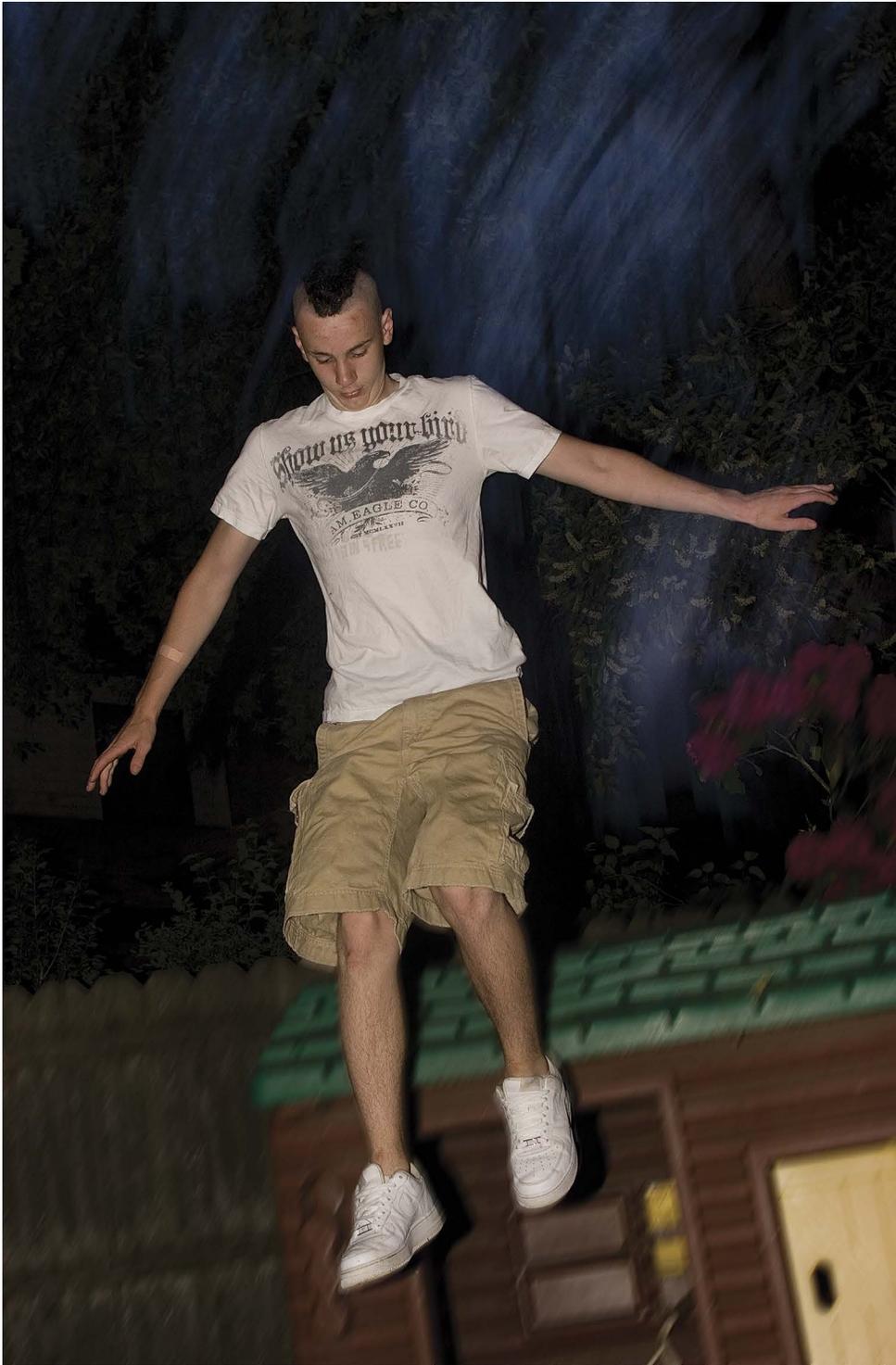


Figure 4.15
In this situation, the rear curtain synchronization works effectively by conveying a fluid sense of motion during the long exposure of Anthony jumping off a playhouse roof.

.....
Canon 20D •
ISO 1250 • 1 sec. •
f/6.3 • Canon
20–35mm lens at
56mm • Canon
Speedlite 580EX Flash

The Long Exposure Portrait

In many ways, taking a portrait at night can feel like a hybrid version of studio photography. Both offer active control when it comes to illuminating the subject. Whether portrait photography occurs in the studio or out in the field, flash illuminates the subject exactly the way you want. But unlike studio photography, photographing people over a long exposure time can also add a passive element to the image.

Although capturing the ambient portion of a scene makes the photograph more interesting, it also consists of variables out of your control. These include objects you can't move, light sources you can't control, and elements moving through the scene. But maybe the latter is not a bad thing, especially when it comes to the colorful rendering of taillights from passing traffic (Figure 4.16).

Figure 4.16
Taken on a busy street, the subject remained stationary as the shutter stayed open long enough to capture passing traffic.

Canon 20D • ISO 400 •
2 sec. • $f/9$ • Canon
20–35mm lens at
35mm (equivalent to
32mm) • Canon
Speedlite 580EX Flash



Filtering Flash

The many reasons for putting a colored filter over your flash head range from corrective to creative. Understanding why you would do this begins with understanding the basic output of flash, which produces a color temperature similar to daylight, or 5500 K.

As mentioned in the previous chapter, artificial light situations vary in color temperature, and at times you might want to override the colorcast on the subject illuminated by flash. Unfortunately, it doesn't mean the ambient part of the scene will match the color balance. For example, you can balance a tungsten scene by setting the camera's White Balance in the 3200 K range (tungsten, or indoor lighting) and using an orange gel over the flash. Not only do the setting and the gel correct the colorcast, but they also provide a uniform balance throughout the image.

You can also have some fun with colors that are not normal to the scene by placing filters over the lens. Place a green or red filter over the lens to make the subject that color. In addition, you could paint the scene with flash by using a long exposure and coloring the scene with pops of flash using different filters (**Figure 4.17**), as mentioned earlier in "Poring Over the Picture."



Figure 4.17 A lot can happen during a five-minute exposure. Not only does the long exposure "open up" the scene, but it allows you to paint the scene with flash and do it with multiple colors.

Canon EOS-1 • ISO 100 • 5 min. • $f/16$ • Canon 430EZ flash popped at least 30 times with blue, red, and orange filters

Fun with Multiple Flash Exposure

Flash units have limited power and range. We've all seen those special moments at sporting events when hundreds of flashes are going off. None of them will reach the player on the field, and few will go beyond ten feet, but when they do, the area of coverage will be fairly narrow. That works well in most situations but not when you need to cover a wide area. Sometimes you can remedy the problem by using multiple flash units; other times you can use long exposure and manually pop the flash in different parts of the scene. And if you use multiple flash pops, some flash units will fire several in succession to freeze the subject in multiple phases of motion in the same scene.

Repeating Flash in the Same Exposure

Some of the more advanced flash units enable you to create a stroboscopic effect by firing off the flash multiple times within a single exposure, allowing you to capture the subject in various stages of motion (Figure 4.18). Here's how it works: You determine the number of flashes and the duration between each burst (which range from 1 Hz to 50 Hz or more), as well as the strength of illumination.

Figure 4.18
This diving scene was captured in three stages by setting the flash at $\frac{1}{4}$ power at 3 Hz, producing three flash bursts that went off in succession during a one-second exposure.

Canon EOS-1 •
ISO 200 • 1 sec. •
 $f/5.6$ • Canon
20–35mm lens at
20mm • Canon
Speedlite 430EZ Flash



The following tips can help you repeat the flash in the same exposure:

- **Determine when the subject will begin and end the action:** This technique generally fails because multiple flash pops occur when the subject is passing through its own motion. So try to figure out where the subject's motion begins and ends, and how long it will take to get there. Doing so will lead to an effective multiple flash image.
- **Compose the subject so flash doesn't overlap:** Exposure level increases each time the flash is exposed on the same subject, so if not done evenly, part of the scene will receive more exposure.
- **Use a long exposure:** Make the exposure long enough to capture the subject's action from start to finish. For example, if the routine takes two seconds, make sure the exposure is that long.
- **Limit power:** You don't always need a lot of power to expose a scene, especially when you use flash units that have lots of power and fast recycling times. Turning the flash unit down to $\frac{1}{2}$ or $\frac{1}{4}$ power allows you to recycle fast enough for situations that require multiple bursts.
- **Be conservative:** Use the minimum number of flash pops to avoid some of the problems that would occur due to overlapping. A good measure is to use three flash pops. Sometimes, too many pops of flash create distractions in the image.

The Father of Electronic Flash

The man who invented the electronic flash, Dr. Harold Edgerton, based the foundation of his invention on stroboscopic photography. The MIT professor experimented with multiple strobe effects on a single frame of film. Current flash technology has put this multi-flash feature on many high-end units, allowing the novice to capture some very compelling effects.

Manually Popping Flash

When you take the flash off the camera, place the camera on a tripod, and set the camera on a long exposure, you can then walk through the scene and manually fire off bursts of light in all the desired places. This technique works great in wide, dimly lit areas, as well as for a few creative applications (Figure 4.19).



Figure 4.19 Although these might look like real ghosts, one person wearing a sheet was manually illuminated by a burst of flash every couple of steps. Because the image was shot as a long exposure in a relatively dark area, the ambient portion of the scene did not affect the burst.

Canon 20D • ISO 100 • 30 sec. • $f/8$ • Canon 20–35mm lens at 20mm (equivalent to 32mm) • Canon Speedlite 580EX Flash

Chapter 4 Assignments

Try Bouncing Flash

One reason flash photography can look boring is that it dominates exposure by blasting the subject head on. But it doesn't have to be that way. Instead, you can bounce the flash (using an external model with that capability) to get a unique rendering of a scene. You can bounce the flash off an overhead ceiling or pivot the head to the side and bounce the flash off a wall. If no ceiling or wall is in sight, just use a bounce card to produce a similar effect as well as add dimension to the image.

Create Random Images with Long Exposure and Flash

Combining flash with long exposure allows you to produce one-of-a-kind situations in every photograph. The reason is that you're dealing with various random elements in the scene that can work to your advantage. Take a portrait against the backdrop of moving traffic; photograph a subject on a moving vehicle to capture a blurred background; or illuminate a stationary object in front of a fireworks display. Regardless of how many frames you expose, each one will be unique due to the variables of moving objects. And when you consider facial expressions, the possibilities for originality in each frame become endless.

Capture Motion with Flash

Experiment with capturing motion with your flash unit during a long exposure. Even a one-second exposure time will freeze the subject illuminated by the flash and show some motion during the ambient part of the exposure. If you're using a more sophisticated flash, try capturing the subject with the flash set on the default setting (first curtain sync) and then switch to rear curtain sync (second curtain sync) to compare and contrast the difference.

Set the Camera on B and Pop Flash Manually

Another fun way to play with long exposure involves setting the camera on the B setting and manually "painting" the scene with flash. You can capture a subject moving through the frame in various positions. Or perhaps get creative and put different colored gels over the flash head to make a colorful rendering of the scene.

Share your results with the book's Flickr group!

Join the group here: [flickr.com/groups/timelapse_longexposure_fromsnapshotstogreatshots/](https://www.flickr.com/groups/timelapse_longexposure_fromsnapshotstogreatshots/)



Canon 20D • ISO 200 • 0.4 sec. •
f/7.1 • Canon 20–35mm at
26mm (equivalent to 41mm) •
Photo credit: Anthony Carucci

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