EOS Immersion Seminars 2011: Class Notes

Part 2
EOS Speedlite System
Creativity & Technique
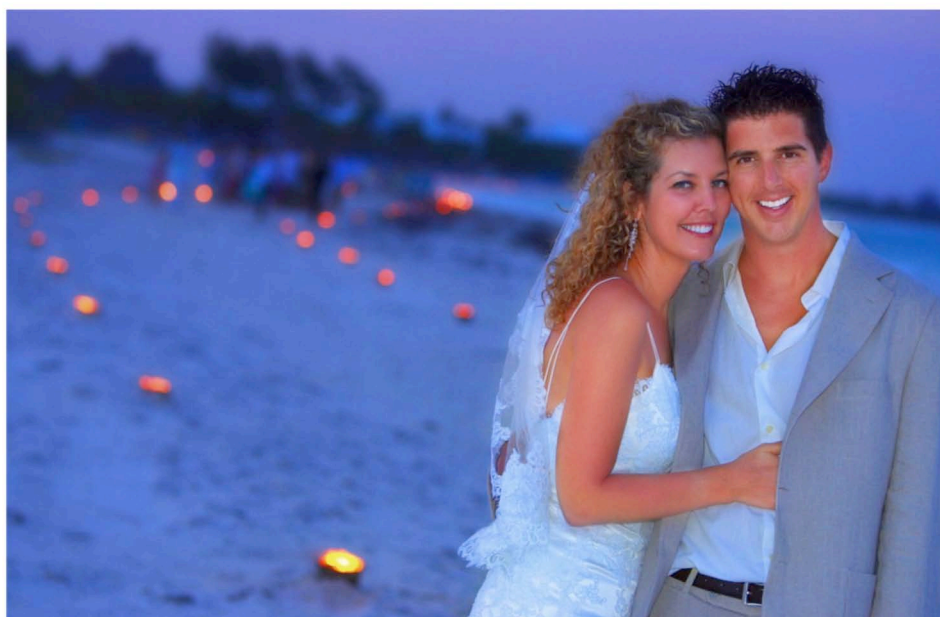

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Why Use Flash?

With modern cameras like EOS Digital SLRs, it's certainly possible to take pictures in dark places without flash. In fact, many photographers often prefer to do so in order to preserve the atmosphere provided by natural light. But flash definitely makes it easier to take pictures in low light or no light, especially with moving subjects like people. And creative photographers use flash to their advantage not only indoors but even in brightly lit outdoor environments in order to minimize harsh shadows and create photographs that are pleasing to the eye.

Why Use Canon Speedlites?

Integral to the EOS System, Canon Speedlites are the ideal flash source for EOS SLR cameras. They are technologically advanced to provide perfect exposure and illumination with just about any subject, yet operation is remarkably simple. Whether you're an amateur or an expert, Canon Speedlites make it easy to obtain professional results.

When Not To Use Flash

Let's briefly discuss several common situations where flash should not be used:

1. Flash should not be used when it's restricted, as might be the case in some museums, theaters, or other public places where even brief bursts of bright light could damage works of art, disturb performers, or distract other people attending a particular place or event.

2. Flash should not be used when the subject is so distant that the illumination produced by the flash can't possibly reach it. Think of all the flashes from point-and-shoot cameras going off in a crowded stadium during a night baseball or football game. They are a total waste of energy.

3. Flash should not be used when the quality of the available light is better. Instances might include stage lighting or candle light when a flash would take away the ambiance or mood of the lighting.

Flash Types

Let's begin our discussion of flash photography by talking about the features and benefits of various types of flash units.

Pop-up Flash

Canon offers built-in pop-up flashes on the Rebel series and the 40D/50D/7D class cameras. They are very convenient for quick snapshots, and probably at their best for fill-flash outdoors at relatively close range. But there are several drawbacks to consider:

- Relatively low power means that the usable distance range is typically limited to approximately 10 to 15 feet.

- The coverage angle of the flash is fixed, meaning that some of the light is wasted when you use a telephoto lens or zoom in on your subject.

- Pop-up flashes provide only direct illumination (i.e., they cannot be used for bounce flash), and the quality of the lighting is rather harsh due to their small size.

- The farther you get from the subject, the more likely you'll get problems with red-eye because the flash is relatively close to the lens.

- Pop-up flashes get their power from the camera battery, which cuts down on the number of shots you can take.

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Shoe-Mount Flash

Canon Speedlites address most of the limitations of pop-up flash units as follows.

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Feature	Benefit
More Power than Pop-Up	Greater usable distance range
More Flash/Lens Separation	Reduces or eliminates red-eye
AutoZoom Head (24-105mm)	Maximizes efficiency of flash coverage according to focal length
Bounce and Swivel	Softens light dramatically for pleasing effects
Diffuser, Bounce Card built-in	Extends versatility with ultra-wide lenses, bounce card useful in many situations when ceiling is too far or too dark
Auto + Manual exposure	Adds creative control
AF Assist Beam	Improves low-light AF performance
Compatible w/Wireless System	For improved lighting quality
Built-in Power Supply	Maximizes camera's shooting capacity
580EX II Accepts External Power for Faster Recycling	Faster recycling and more flashes per charge

Speedlite 430EX II offers a good balance between features and cost. It's surprisingly powerful for its size.

Studio Strobes

© Profoto AB

Studio strobes are popular with advanced amateur photographers and pros. They offer several advantages compared to shoe-mount flashes, including greater power and (with some units) bright modeling lamps for easier focusing and better pre-visualization of the lighting effect. Unlike shoe-mount flashes, studio strobes are usually AC-powered with separate power packs, and flash exposure is usually manually controlled.

Studio strobes can be preferable to shoe-mount flashes in some shooting situations, especially when modeling lamps are desired.

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Current Speedlite Line-up

Now let's take a look at Canon's current line-up of EX-series Speedlites for EOS Digital SLRs:

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- **Speedlite 580EX II** is Canon's current top-of-the line Speedlite.

- **Speedlite 430EX II** is Canon's current mid-range Speedlite.

- **Speedlite 320EX** is a new mid-range Speedlite with a built-in LED lamp.

- **Speedlite 270EX II** replaces the 270EX as Canon's entry-level Speedlite. Like the 320EX, it can be used as a slave unit in E-TTL wireless configurations.

CURRENT CANON SPEEDLITES

580EX II   430EX II   320EX   270EX II

Every EX-series Speedlite is compatible with every EOS camera as well as some select PowerShot models.

In addition to the standard flashes, Canon offers a pair of special-purpose Speedlites for macro and close-up photography:

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Macro Ring Lite MR-14EX is a compact twin-tube ring light flash with modeling lamps and ratio control. Compared to the MT-24EX, the MR-14EX's one-piece flash component is smaller and lighter.

Most Canon EF and EF-S Macro lenses have built-in attachment rings for the MR-14EX and MT-24EX.

© Rudy Winston/Canon U.S.A., Inc.

Macro Twin Lite MT-24EX is a versatile macro flash with 2 adjustable and removable flash heads. It also has modeling lamps and ratio control.
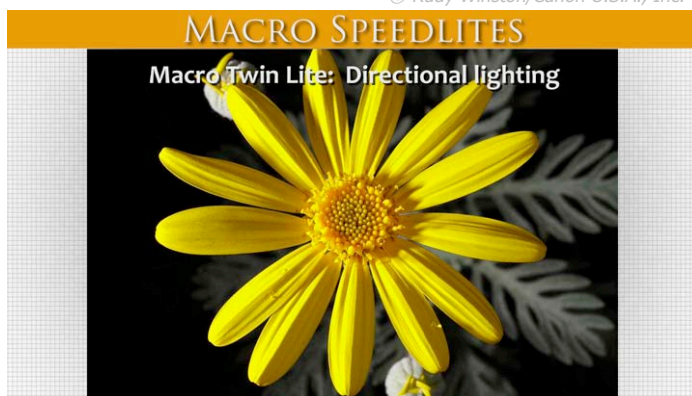
The removable flash heads of the Macro Twin Lite MT-24EX have tripod sockets for attachment to light stands.

The Macro Ring Lite provides soft, even illumination for close subjects, while the Macro Twin Lite allows more directional lighting because of its adjustable and removable flash heads.

Here are some of the most important Canon Speedlite accessories:

- Speedlite Transmitter ST-E2 can control up to two groups of compatible EX Speedlites in an E-TTL or Manual wireless flash configuration.

- Off-Camera Shoe Cord OC-E3 is handy when using a 580EX II or 430EX II on a flash bracket.

- Compact Battery Pack CP-E4 reduces full power recycling times to 2 seconds or less and increases the number of flashes per charge. It uses 8 AA batteries and is compatible with the 580EX II, MR-14EX and MT-24EX.

This chart shows the key system specifications for Canon Speedlites, pop-up flash, and the Speedlite Transmitter ST-E2.

Speedlite	Maximum Guide Number ISO 100, meters/feet	E-TTL Wireless Support	Bounce/Swivel	Accepts External Power Supply
Pop-up Flash	13 (39)	None	No/No	No
270EX II	27 (89)	Slave	Bounce only	No
320EX	32 (105)	Slave	Yes/Yes	No
430EX II	43 (142)	Slave	Yes/Yes	No
580EX II	**58 (192)**	**Master/Slave**	**Yes/Yes**	**Yes**
MR-14EX	14 (46)	Master	No/No	Yes
MT-24EX	22 (72)	Master	Yes/Yes	Yes
ST-E2 Transmitter	N/A	Master	No/No	No

- The Maximum Guide Number provides a power rating in terms of light output. The higher the guide number, the greater the power.

- E-TTL Wireless Support indicates whether the Speedlite can be used as a Master Unit, a Slave Unit, both, or neither. We'll go into more detail on wireless flash later on.

- Bounce and Swivel indicates whether the flash head can be tilted up and down or swiveled from left to right or vice versa.

- The 580EX II, MR-14EX and MT-24EX can accept external power supplies such as the Compact Battery Pack CP-E4.

- Speedlite 580EX II is the most versatile as well as the most powerful flash currently offered by Canon.
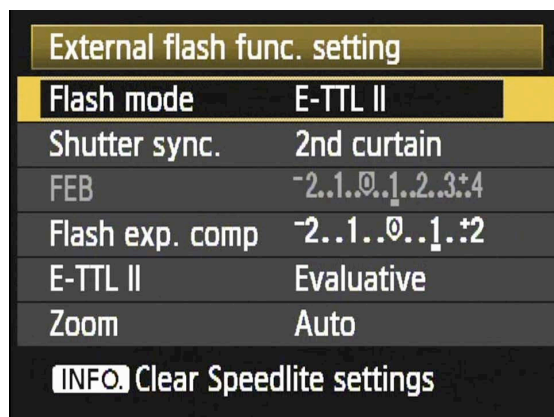
Flash Control Menu

Canon has recently improved the EOS System's support for dedicated flash photography by adding a new Flash Control Menu to the following recent and current cameras.

Current and recent cameras	Select PowerShot cameras*
• EOS-1Ds Mark III	• PowerShot G9
• EOS-1D Mark IV	• PowerShot G10
• EOS-1D Mark III (firmware 1.2.3 or higher)	• PowerShot G11
• EOS 5D Mark II	• PowerShot G12
• EOS 7D	• PowerShot SX1 IS
• EOS 60D	• PowerShot SX10 IS
• EOS 50D	• PowerShot SX20 IS
• EOS 40D	• PowerShot SX30 IS
• EOS Rebel T3i	
• EOS Rebel T3	*Note: Applicable when these cameras are used with any of the following Speedlites:
• EOS Rebel T2i	
• EOS Rebel T1i	• Speedlite 580EX II
• EOS Rebel XSi	• Speedlite 430EX II
• EOS Rebel XS	• Speedlite 320EX
	• Speedlite 270EX II
	• Speedlite 270EX

Please view the following short video clip for a demonstration of the EOS 5D Mark II's Flash Control menu, which is the same or very similar to Flash Control menus on the other Canon digital cameras listed above:

http://www.usa.canon.com/dlc/controller?act=GetArticleAct&articleID=3010

The new Flash Control menus in current EOS and PowerShot cameras make it much easier to access and control the wide range of features and functions of Canon's EOS Speedlite System.

Flash Exposure Modes

E-TTL II is Canon's most advanced automatic flash exposure system to date. "E-TTL" stands for "Evaluative Through The Lens" and II indicates the second edition. Canon introduced E-TTL in 1995, and updated to E-TTL II in 2004. Incidentally, it's the camera that determines whether E-TTL or E-TTL II is used, not the Speedlite. All EX-Series Speedlites are compatible with both, so even if you're using an older Speedlite like the 550EX or 420EX, it will do E-TTL II when it is used on any current or recent EOS Digital SLR. We'll be talking about the specific features and benefits of E-TTL II throughout the rest of this presentation.

In E-TTL II, flash exposure levels are automatically controlled by the EOS camera's metering system. It's the most convenient way to get accurate exposures for most situations.

Ambient Exposure vs. Flash Exposure

Two factors affect every flash photograph: Ambient exposure and flash exposure. Ambient exposure refers to the exposure of the existing light in the scene. It is controlled by the photographer's choice of ISO speed, shutter speed and aperture. Flash exposure, on the other hand is mainly controlled by ISO, aperture, and flash output levels.

© Bruce Dorn

The ISO, aperture and shutter speed were set for correct exposure of the ambient light, while the flash was used to provide supplementary lighting on the couple in the foreground. This image was shot in Aperture Priority mode with E-TTL II to achieve a balanced exposure automatically.

In a typical indoor flash snapshot, the ambient light is often drastically and intentionally underexposed, with the result that the overall exposure for the image is determined primarily by the illumination provided by the flash. This type of image is sometimes called an "all-flash" exposure, since most if not all of the illumination is provided by the flash.

© Bruce Dorn
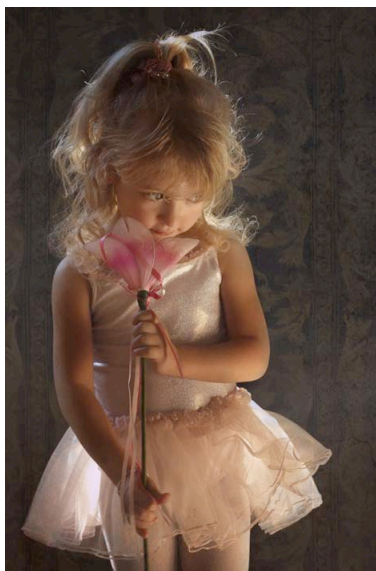
In this studio flash shot, the photographer used 3 Speedlites to create an interesting look. The camera was set to Manual mode in order to gain complete control over shutter speed and aperture, and E-TTL II provided an accurate flash exposure automatically.

In a typical outdoor flash snapshot, the ambient light is exposed correctly and the illumination provided by the flash is used to fill in, or open up shadowed areas in the composition. This type of image is usually called a "fill-flash" exposure, because the flash is primarily used to supplement the exposure for the ambient light.

With a bit of creative manipulation, it's possible to shoot fill-flash photos indoors or even all-flash photos outdoors. Part of the fun of creative flash photography is knowing how to use the camera and flash settings to achieve exactly the results the photographer wants.

Ambient Metering Patterns vs. Flash Metering Patterns

The exposure meter that's built into your EOS camera is divided into multiple segments that can be read out individually. With some current and recent models, there are 5 rows and 7 columns of metering segments for a total of 35 zones. High-end models like the EOS-1Ds Mark III, EOS-1D Mark IV and EOS 7D as well as the EOS 60D, Rebel T3i, Rebel T3 and Rebel T2i have more sophisticated metering sensors with 63 zones. There are several methods to utilize the lighting information produced by these metering zones, and each of these methods is called a metering pattern.

In the EOS System, ambient and flash exposure levels are independently controlled. An important part of that control is the photographer's choice of metering patterns for both types of illumination.

Ambient Metering Patterns

Ambient metering patterns are typically selected on top or rear of the camera, using the LCD data panel or LCD screen. Here are some brief explanations for each of them:

- **Evaluative Metering:** In this pattern, ambient metering is concentrated at the area surrounding the active focusing point selected by the photographer or the camera. The camera compares the brightness of that area to the brightness of other areas in the scene. If Evaluative metering detects uneven or unusual lighting (backlighting, spotlighting, etc.), it can apply exposure compensation automatically to maintain proper exposure on the main subject.

- **Centerweighted Average Metering:** This pattern reads all metering zones with emphasis at the center of the picture area regardless of the location of the active focusing point. Metering sensitivity gradually diminishes away from the center, and no automatic exposure compensation is applied. Many advanced photographers choose centerweighted average metering when the overall ambient lighting is relatively even, and they want to control exposure compensation rather than assigning that task to the camera.

- **Partial Metering:** This metering pattern limits its reading to approximately 10% of the picture area at the center of the image. It completely ignores metering segments outside the central area, so it's useful for scenes with uneven lighting where the photographer wants to limit the reading to a specific part of the subject.

- **Spot Metering:** Spot metering is basically the same concept as partial metering, except that it reads a smaller area of the scene, typically less than 4%. With most EOS models, spot metering is locked into the center of the image, but with EOS-1Ds Mark III and EOS-1D Mark III cameras, spot metering can be linked to the area surrounding the active focusing point even when it is off-center.

It is important to know how the EOS System treats ambient metering during flash photography.

- EOS cameras below the EOS-1Ds/EOS-1D series utilize the photographer's choice of ambient metering patterns during flash photography. With these cameras, it is possible to use the same ambient metering pattern for flash as well as non-flash photos.

- The EOS-1Ds/EOS-1D cameras automatically override the photographer's choice of ambient metering patterns during flash photography. When the Speedlite's ready light comes on, the camera switches to Evaluative metering from the center focusing point.

• One of the most important concepts to understand about **_ambient metering patterns_** is that they **_are totally independent from flash metering in the EOS System._** Since flash metering is controlled independently, flash metering patterns are set independently from ambient metering patterns.

In the EOS System, there are essentially three flash metering patterns. Here are some brief descriptions:

Evaluative Flash Metering: This is the default flash metering pattern for EOS Digital SLRs. With current models, this metering pattern is set on the camera's rear LCD screen menu. Evaluative flash metering reads light reflected back to the camera by a preflash that occurs a fraction of a second before the actual exposure takes place. The camera's metering system compares the preflash data to the ambient exposure data and attempts to determine the size, location and reflectivity of the main subject. Based on an analysis of this information and several other factors, it calculates the amount of flash illumination needed for an accurate flash exposure.
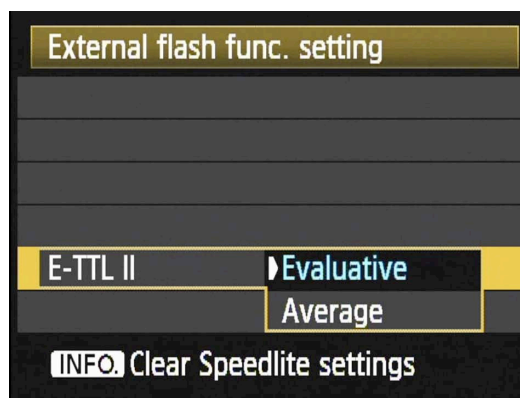
With some EOS models like the original 5D or the 30D, the E-TTL II flash metering pattern is set via Custom Function control.

Average Flash Metering: This is an optional flash metering pattern that can be selected from the camera's rear LCD screen. With average flash metering, preflash data from all metering segments is read and weighted equally.

Spot Flash Metering: It is possible to take a spot flash meter reading by using your EOS camera's Flash Exposure Lock function. In this case, the photographer manually activates a preflash by pressing a button on the camera. (AE Lock button for most models, or the FE Lock button on EOS-1Ds Mark III and EOS-1D Mark III cameras.) Once this has been done, the spot flash meter reading is held in the camera's memory for 16

You're free to recompose the image after you've locked in a spot flash meter reading with Flash Exposure Lock.

seconds (a default value that can be adjusted with EOS-1Ds/EOS-1D models). The 16 second interval provides enough time for the photographer to recompose the scene and place the subject off-center for a more pleasing composition before taking the photograph.

E-TTL II Evaluative flash metering is at its best when the primary illumination is ambient light. Here's why: In most outdoor situations, the ambient light is the primary illumination and it therefore gets more emphasis than the flash metering in terms of the overall exposure setting. In this case, E-TTL II's Evaluative flash metering is typically the better choice because it attempts to isolate its reading to the main subject, which is usually the part of the image where you want the flash illumination to be as effective as possible.

E-TTL II Average flash metering is at its best when flash is the primary illumination. Here's why: When flash is the primary illumination, the flash metering gets more emphasis in determining the exposure than the ambient metering. Under these conditions, E-TTL II's Average flash metering pattern often provides more consistent exposures because it's looking at the whole scene, not just the subject, which may be very bright or very dark.

Flash Exposure Lock is Canon's most precise method for flash metering because it allows the photographer to isolate the flash reading to a specific part of the subject. However, if you plan on using it to photograph people, it's a good idea to let them know in advance that they'll need to hold their pose between the preflash and the actual exposure. Otherwise, they may walk away or change their expression after the preflash, not realizing that you haven't taken the picture yet.

Manual Flash Exposure

Manual flash is just what it sounds like: Manually controlled flash exposure. Manual flash is particularly useful in static lighting set-ups like studio portraiture where the flash-to-subject distance never changes. It doesn't get thrown off by changes in subject brightness from shot to shot, so exposures tend to be very consistent.

In Manual flash, settings can usually be varied from full power to 1/64 or 1/128 in 1/3 stop increments as required, according to factors such as ISO speed, aperture, focal length and flash-to-subject distance. Speedlites like the 580EX II and 430EX II also display the correct distance setting for the ISO, aperture and focal length.

When using manual flash, it's a good idea to confirm exposure accuracy by firing a test shot and checking the EOS camera's histogram display.

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Manual flash settings can be controlled from the camera's Flash control menu with compatible Canon cameras and Speedlites as shown in the chart on page 8. It's usually best to use the camera's Manual exposure mode when using Manual Flash.

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MULTI Flash

MULTI flash, also known as stroboscopic flash, is a very specialized form of manual flash exposure where the flash fires several times during the exposure. Stroboscopic flash works best indoors or at night, with relatively long shutter speeds. You can use it to record multiple images of a moving subject, but it can even work with still subjects by zooming the lens during the exposure.

In both of these examples, the shutter speed was 2 seconds and the flash firing rate was set to 4 times per second.

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*MULTI flash can be used with moving subjects to create an interesting effect.*

Even stationary subjects can work with MULTI flash. In this shot, the photographer zoomed the lens during the exposure to create the desired effect.

Incidentally, MULTI flash is only available on high-end EX Speedlites like the 580EX II, MR-14EX and MT-24EX.

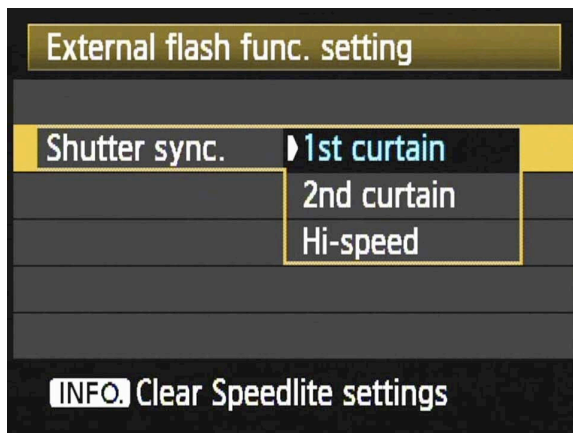Here's how to set up MULTI Flash with the 580EX II on the Camera's menu.

1. Locate the Flash Control or External Speedlite Control menu and press the SET button on the back of the camera.

2. Select External Flash Func. Setting and press SET.

3. Select Flash mode and press SET.

4. Select MULTI and press SET.

5. Select Flash Output and press SET.

6. Select the desired Flash Output setting and press SET.

7. Select Frequency and press SET.

8. Select the desired Frequency (flashes per second) and press SET.

9. Select Flash Count and press SET. (see Figure)

10. Select the desired Flash Count and press SET.

11. Press the shutter button halfway to exit the menu and prepare to shoot.
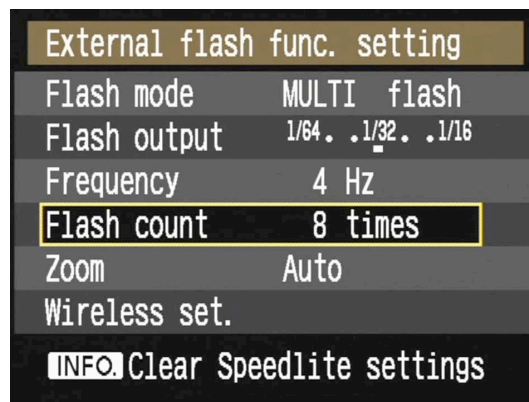
If you have Speedlite 580EX II, use the camera's flash control menu to set up MULTI flash.

Shutter Sync

With your EOS Digital SLR and built-in flash or EX Speedlite, you have the ability to control when and how the flash is fired during an exposure.

External flash func. setting

Shutter sync.	▶1st curtain
	2nd curtain
	Hi-speed

INFO. Clear Speedlite settings

Shutter sync modes can be set directly on the Speedlite if your flash is not supported by the camera's flash control menu.

1st Curtain Sync:

The standard mode is called 1st Curtain Sync. In this mode, the flash fires at the beginning of the exposure. 1st Curtain Sync works best at relatively fast shutter speeds from about 1/60 on up.

© Bob Davis

1ST-CURTAIN SYNC

In most outdoor flash photos, the camera's shutter speed is so fast that there would be no advantage to using 2nd-curtain sync. 1st-curtain sync was a good choice for this image.

2nd Curtain Sync:

© Bruce Dorn

The optional mode is called 2nd Curtain Sync. In this mode, the flash fires at the end of the exposure. With this technique, you can capture motion blur from the ambient light and combine it with a sharp, well-exposed image of the subject illuminated by the flash. 2nd Curtain Sync works best with slow shutter speeds below 1/60.
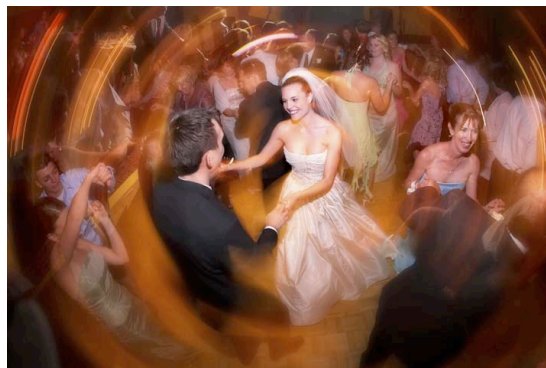
The shutter speed for this photo was ½ second, and the flash was fired at the end of the exposure via 2nd-curtain sync. Ambient light and intentional camera movement created the circular blurs.

Hi-Speed Sync:

Normally, shutter speeds for flash photography are limited to approximately 1/200, 1/250 or 1/300 sec. on the high end, because those are the fastest speeds at which the entire image sensor is exposed to light simultaneously during the exposure. To achieve higher shutter speeds, the camera's focal plane shutter forms a slit that moves across the image sensor from top to bottom at a high rate of speed. If you fired a normal flash at high shutter speeds, only part of the image would be exposed by the flash, creating an abnormal lighting effect.

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To solve this problem, Canon developed Hi-Speed Sync. In this mode, the flash is fired for multiple bursts at a very high frequency, similar to stroboscopic flash but much faster (approximately 50 kHz). When the flash is set for Hi-Speed Sync, it effectively becomes a continuous light source for the duration of the exposure, thus allowing the image to be fully illuminated, even at high shutter speeds with a focal plane shutter.

The photographer chose an aperture of f/4 to blur the background. This required a shutter speed of 1/1600 for an accurate exposure of the ambient light. Hi-Speed Sync was used to add flash illumination.

Hi-Speed Sync is effective for opening shadows when shooting at relatively close range. Hi-Speed Sync also allows the use of relatively large apertures to help throw the background out of focus. However, with Hi-Speed Sync, maximum light output is about half of what you get normally, and it decreases as you raise the shutter speed. With normal flash, as long as you are shooting at maximum sync speed or slower, the shutter speed has no effect on flash output.

One of the biggest benefits of Hi-Speed Sync is the ability to shoot at relatively wide apertures in order to blur the background for a pleasing effect. Another benefit is the ability to underexpose the ambient light even on a sunny day while achieving correct flash exposure on the main subject for a dramatic lighting effect. But keep in mind that the Speedlite must be relatively close to the subject (typically within 10 feet) for Hi-Speed Sync to be effective.

Flash Zoom Coverage

Speedlites 580EX II and 430EX II both have built-in zooming to customize the coverage angle of the flash according to the focal length of the lens. They can also compensate for focal length conversion factors caused by differences in the size of the image sensor. The zoom can be set automatically or manually. These Speedlites also have built-in Wide Panels that diffuse the light and increase the coverage angle of the flash for use with ultra-wide lenses like the EF14mm f/2.8L II USM.

AF Assist Beam

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The AF Assist beam is an LED built into the lower part of a Canon Speedlite or Speedlite Transmitter ST-E2.

Speedlites 580EX II and 430EX II are equipped with AF Assist Beams that illuminate the subject before the exposure with a near-infrared pattern to help the camera autofocus in extremely low light. The camera must be set for One-Shot AF in order to use this feature. It's also possible to use the AF Assist beam for available light photography by disabling "Flash Firing" in the camera's Flash Control menu. With some EOS cameras, there is a Custom Function for this purpose.

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Flash Exposure Methods

So far, we've mostly been discussing hardware features. Let's shift gears and start talking about taking actual photos with the Canon Speedlite System. We'll look at the differences between all-flash and fill-flash photos, and then move on to discussing the use of exposure compensation to create various effects.

All-Flash Exposures

In an "All Flash" exposure, the flash is providing most if not all of the illumination required for the exposure. It's relatively easy to do this at night or indoors by shooting in the camera's Manual mode at a combination of high shutter speeds, small apertures, and/or low ISO settings. By underexposing the ambient light, we're letting the flash do all the work of providing light for the exposure.

© Bob Davis

Photographer Bob Davis used multiple Speedlites to create the lighting for this shot. He even placed a Speedlite inside the airplane to light the cockpit.

In this example, the image was captured at night on an airport runway. Photographer Bob Davis used multiple EX Speedlites to illuminate the airplane in the background as well as the model in the foreground.

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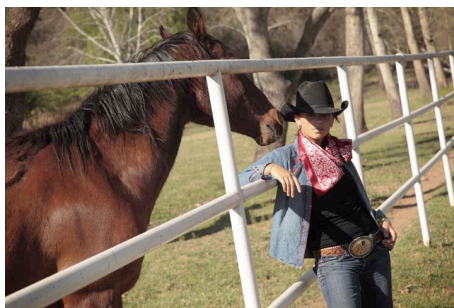## Fill-Flash Exposures

© Bruce Dorn

In a 'Fill Flash' exposure, the photographer sets the ISO, shutter speed and aperture to achieve an accurate exposure for the available light, and uses flash to highlight the main subjects.

In this example, the image was captured at dusk. Photographer Bruce Dorn used a reflector to provide soft illumination from the flash, then let the shutter stay open long enough to obtain a pleasing exposure of the available light. The reddish lights in the sand were low-power incandescent lamps.

Aperture Priority is a good mode to use for fill-flash because it attempts to expose both the flash and the ambient light correctly, even in low light.

Fill flash is also very useful in bright daylight conditions. In this case, the subject's hat created a heavy shadow that made the right side of her face difficult to see. In this example, the ISO, shutter speed and aperture remained the same, but the flash was fired to open up the shadows and improve the lighting on the face. This is fairly representative of what you would get at the camera's default flash exposure settings, but the EOS Speedlite system provides independent control over ambient and flash exposure levels.

© Bruce Dorn

No flash.

Flash fill.

Flash Exposure Compensation

Now let's take a look at a series of 3 exposures where the only variable is the level of flash exposure.
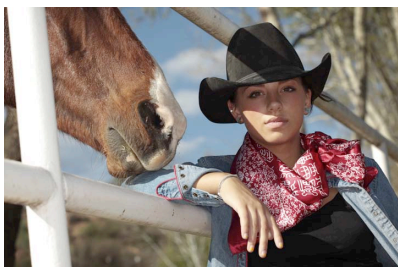
© Bruce Dorn

No flash.

Flash Exposure Compensation set to Zero.

Flash Exposure Compensation set to +1.

Note that the ISO, aperture and shutter speed remained the same for all three exposures. Flash exposure compensation can be set on the Speedlite or through the camera's flash control menu.

Flash Exposure Bracketing

If the photographer used Speedlite 580EX II, he could have produced a set of three exposures with various flash exposure compensation settings automatically using the Flash Exposure Bracketing function. This feature can be very useful with a digital SLR, since it lets the photographer quickly decide which flash exposure compensation setting provides the best quality result.

Flash Exposure Bracketing can be set directly on the Speedlite with the 550EX or the original 580EX Speedlite.

Ambient Exposure Compensation

Now let's take a look at a series of images shot with flash where the only variable was the ambient exposure compensation. (Flash exposure compensation was set to zero for all 3 photos.)
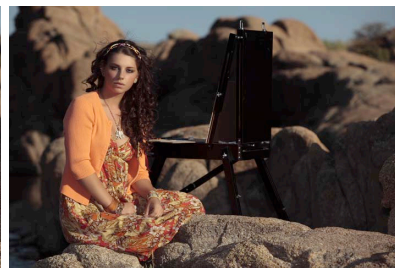
© Bruce Dorn

The first shot is at +1 ambient exposure compensation.

The second shot has no exposure compensation.

The third shot is at -1 ambient exposure compensation. In this photo, notice how the face remains properly exposed by the flash, while the background tones get darker and richer because of the slightly underexposed ambient light.

Note that ambient exposure compensation involves adjustment of ISO, aperture or shutter speed, whereas flash exposure compensation only adjusts the output of the flash itself.
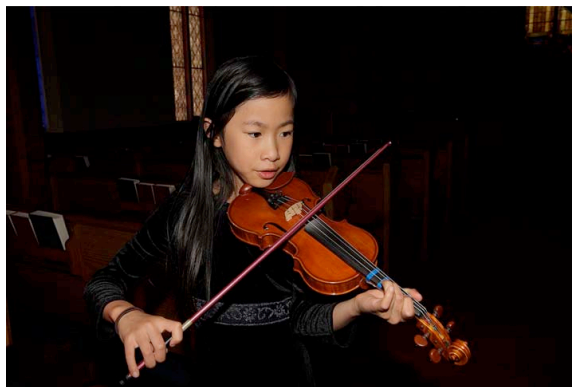
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Evolution of Light

Exposure control is very important to all kinds of photography, but it is just the beginning of good flash photography. Another important aspect is the quality of the light you're producing with your Canon Speedlite. In this section, we'll take a look at the "evolution of light" from basic direct flash on camera, to flash with light modifiers like diffusers and reflectors, and finally we'll examine wireless flash with multiple Speedlites and lighting ratio controls.

On-Camera Direct Flash

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This is the most basic method for taking flash photos in the EOS System. On the positive side, on-camera direct flash is quick and easy. It also has the potential benefit of maximizing the distance range that a single Speedlite can provide, because there is no modification to the light emitted by the flash, other than possibly narrowing the coverage angle with the flash zoom setting when using a telephoto lens.

This is a typical on-camera direct flash photo, taken indoors with the camera set to Program (P) mode.

On the negative side, however, the illumination provided by on-camera direct flash is often harsh and unflattering, especially for photographs of people. Additionally, when the flash is mounted directly on the camera, it can sometimes produce heavy shadows behind the subject, or worse yet to the side of the subject when the camera is positioned vertically, as is often the case during portraiture.

Off-Camera Direct Flash

© Bruce Dorn

A single Speedlite aimed directly at the subject without any form of light modification can be very effective when it's moved off-camera, using either an Off-Camera Shoe Cord or Canon's E-TTL wireless autoflash system. This is especially true in outdoor fill-flash situations where the bulk of the exposure is being provided by the ambient light. In such cases, the flash can be used either as a fill or an accent light, or sometimes both.

Here the photographer placed a single Speedlite to the right and slightly behind the couple to create a rim-lighting effect. In this case, direct lighting helped create a beautiful photo.
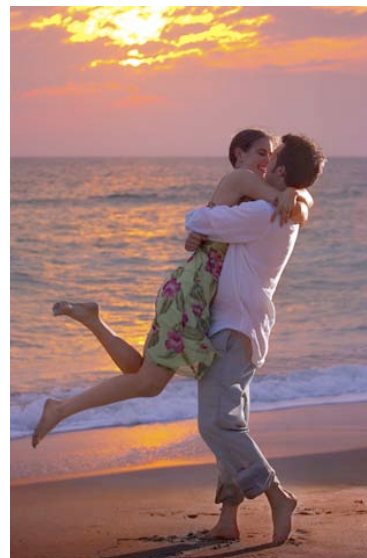
On-Camera Bounce Flash

Leaving the Speedlite on-camera but swiveling the flash head towards a reasonably close white ceiling or even a convenient wall can dramatically improve the quality of light in your photographs. This occurs because the surface area of the ceiling or wall is much larger than the flash head, and the light reaching the subject(s) becomes much softer as a result.

© Bob Davis

The flash illumination was bounced off the ceiling to create a soft lighting effect.

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Another potential benefit of bounce flash is the improvement in evenness of illumination from front to back in a group shot compared to on-camera direct flash. In this case, the distance from the ceiling to the subject is almost the same for everyone in the group, whereas distance from the flash to the last row is much further than the distance to the first row in a direct flash photo.

As wonderful as bounce flash can be, it isn't the best solution for every shooting condition. For instance, it won't work very well if at all when you're outdoors at night, or even indoors if the ceiling is dark or distant from the camera. In cases such as these, other approaches become necessary.

Diffusers and Bounce Cards

Whether you're using a Speedlite on-camera or off, the quality of light that's produced can be greatly improved through use of a diffuser or bounce card. The beauty of these accessories is that they're relatively compact and lightweight, which makes them easy to carry around when you are shooting hand-held photos.

© Paul Kennedy

Diffusers and bounce cards create much softer lighting than direct flash.

Another benefit to diffusers and bounce cards is that they can overcome the absence of a convenient ceiling or wall that would otherwise be necessary for bounce flash photography, while providing a relatively soft light source that results in pleasing photos of people or products.

Off-Camera Flash with Reflector (Umbrella or Panel)

For decades if not centuries, artists including studio photographers have relied on various forms of flat panels for use as reflectors to soften harsh light. These reflectors can be positioned almost anywhere around the subject, either above or below or to the left or right as desired. These days, lightweight collapsible reflectors are widely available through professional photo dealers and are popular with many photographers.
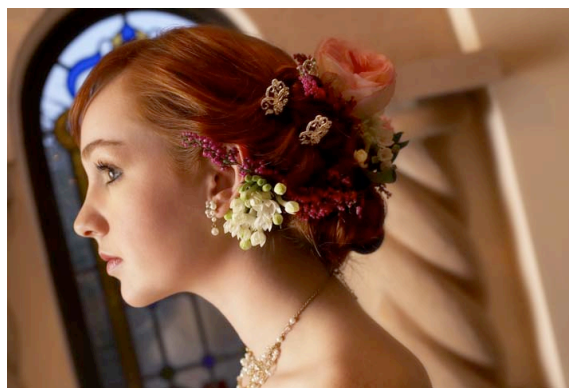
© Bruce Dorn

A light stand with a Speedlite was positioned in front of a reflector panel and placed to the left of the camera facing the model to create this soft lighting effect.

© Bruce Dorn

Umbrellas are basically nothing more than collapsible, portable reflectors that provide lighting effects similar to but not exactly the same as flat panels. They are usually mounted on light stands, which makes it easy to adjust their height and angle towards the subject.
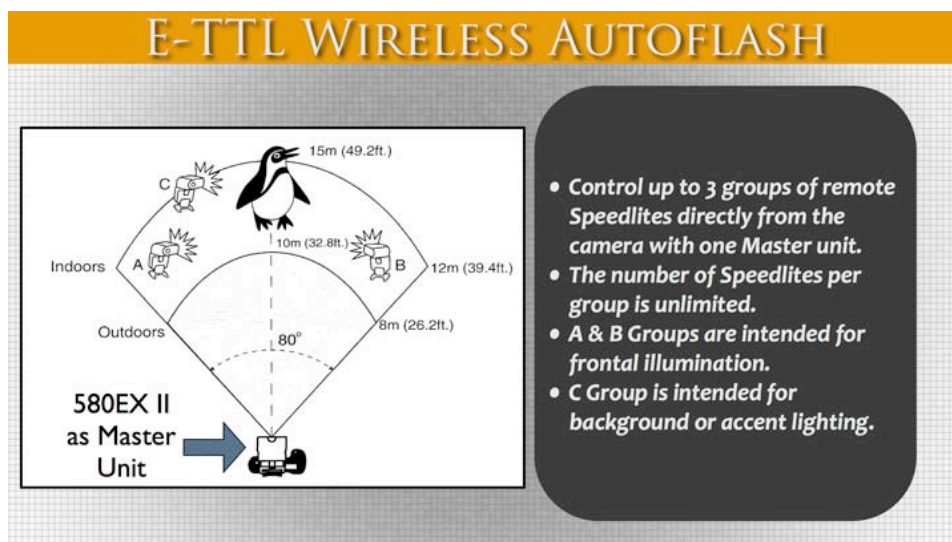
The umbrella was positioned above the subject's eyeline and pointed slightly downward to throw a shadow where desired. This technique creates soft, yet dimensional lighting.

E-TTL Wireless System

Canon's E-TTL Wireless Autoflash system is extremely powerful and versatile. With just a small bag of equipment, any EOS System owner can create beautiful photographs with professional quality lighting effects.

The basics of the system are very straightforward: One Speedlite or Speedlite Transmitter is connected to the EOS camera's hot shoe, and it acts as a Master unit to control an unlimited number of compatible off-camera Speedlites. The off-camera Speedlites in an E-TTL wireless flash configuration can be managed in up to 3 independently controlled 'Slave' groups, and there is no limit on the number of Speedlites that can be assigned to an individual group.

E-TTL WIRELESS AUTOFLASH

15m (49.2ft.)
10m (32.8ft.)
12m (39.4ft.)
8m (26.2ft.)
Indoors
Outdoors
80°
580EX II as Master Unit

- Control up to 3 groups of remote Speedlites directly from the camera with one Master unit.
- The number of Speedlites per group is unlimited.
- A & B Groups are intended for frontal illumination.
- C Group is intended for background or accent lighting.

This diagram shows the range of the E-TTL wireless system indoor and out. Note that a 550EX, 580EX, 580EX II, MR-14EX or MT-24EX must be used as the Master Unit to control Group C. Speedlite Transmitter ST-E2 controls Groups A and B only.

The E-TTL Wireless Autoflash system uses a line-of-sight optical communication system to transmit and receive preflash data. The previous diagram illustrates the maximum range of the system, depending on the angle of the off-camera Speedlites relative to the Master unit. The diagram also shows how the maximum range varies according to the ambient lighting conditions (indoors or out) and the type of Master unit that is used (Speedlite or Speedlite Transmitter).

The E-TTL Wireless Autoflash system first appeared in 1998 with the EOS 3 and Speedlite 550EX, and over the years it has become very popular. By now, at least two independent manufacturers (RadioPoppers® and PocketWizard®) have come up with accessories that are designed to extend the range of Canon's E-TTL II communication system by converting it from line of sight to radio. Although Canon does not endorse 3rd-party products, you may want to investigate one or both of these systems if you are interested in extending the functionality of your Canon Speedlites for wireless flash photography. For now, we'll concentrate on use of the E-TTL wireless system "as is."

Lighting Ratio Control

One of the most powerful features of the E-TTL Wireless Autoflash system is lighting ratio control. There is no limit to the number of compatible EX Speedlites that can be assigned to an individual Slave Group (A, B or C), so the possibilities for creative lighting are virtually endless. However, from a practical point of view, it's not so much about how many Speedlites you use as it is about how you use them.

At a bare minimum, you need at least 2 compatible Speedlites to achieve lighting ratio control. (Naturally, there is an exception to this rule, in the respect that the Macro Ring Lite MR-14EX and Macro Twin Lite MT-24EX can both be configured to provide A:B lighting ratio control without additional accessories, but for the purposes of this discussion we will stick to the standard EX Speedlites.)

© Bob Davis

In this case, the Group A flash was positioned in front of the couple, and the Group B flash was positioned behind them.

In a two-light set-up, it is possible to use both Speedlites off-camera if you control them with a Speedlite Transmitter ST-E2. Or, if you are using either a 580EX II, 580EX or 550EX, you can connect one of them to the camera's hot shoe and use it as a Master unit. If you use a Speedlite as the Master unit, it is always considered a member of Group A. If you want to achieve lighting ratio control, the other Speedlite should be set up as a Group B Slave unit. Once this has been done, you can use the controls on the back of the Master unit to set up your lighting ratio, or the Flash Control menu on the camera if you are using a 580EX II as the Master unit. The range of ratio settings is from
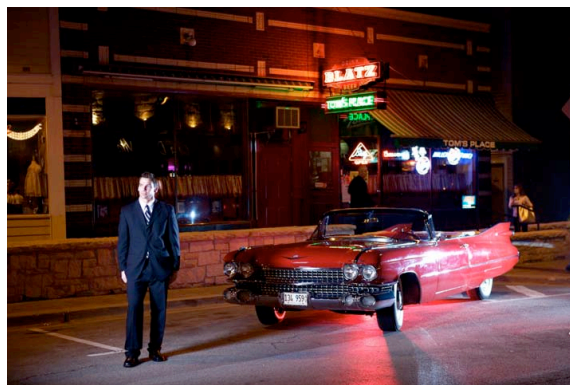
8:1 to 1:8 in half-stop increments. In a simple two-light A:B set-up, both Speedlites should be providing frontal illumination to the subject.

© Bob Davis

By shifting more light to one of the Speedlites, it becomes the main or key light, while the other Speedlite becomes the fill light. Once the ratio has been established according to your personal taste, you can experiment with other creative controls such as the angle of each flash relative to the subject. Perhaps your main light will be positioned above the subject and aimed downwards at it, while your fill light is positioned at the same level as the subject. Additionally, you may want to try using a diffuser on the fill light and

In this shot, look for the illumination provided by the Group C flash behind the car.

leaving the main light unmodified for a brighter highlight effect. The more you experiment, the easier it will become for you to settle on the lighting setup you prefer for the subject at hand.

If you want to add a 3rd Speedlite for accent (such as a hair light) or to illuminate the background of your shot, you'll need to assign it as a member of Group C and use a compatible Speedlite (not a Speedlite Transmitter ST-E2) as your Master unit. Once this configuration has been established, you can adjust the output of the Group C Speedlite through flash exposure compensation. This can be done with the camera's flash control menu if you're using Speedlite 580EX II as the Master unit with any current EOS Digital SLR, or it can be controlled from the LCD on the Master unit itself.

Please view the following video clip for more information on E-TTL Wireless Autoflash lighting ratio set-up and operation:

http://www.usa.canon.com/dlc/controller?act=GetArticleAct&articleID=3011

© Bruce Dorn

Up to this point, we've been assuming the use of E-TTL II automatic flash exposure for these wireless set-ups, but it is also possible to use manual flash exposure in a wireless configuration. In this case, the operation of the system is going to depend on whether you're using an ST-E2 or a compatible Speedlite as the Master unit.

In this shot, the Master Unit on the camera fired at low power to provide frontal illumination, while off-camera Speedlites were positioned to the left and right of the camera and behind the couple to provide rim lighting.

- If you're using an ST-E2, you'll need to set the Slave units themselves for manual flash exposure control. Once the Speedlite has been set to Slave mode, hold down the exposure mode button on the back of the flash until it changes from ETTL to M. (This step takes a few seconds.) After that, you can select the Manual power setting on the Speedlites as you wish, and thereby control the lighting ratio. Note that when using Manual flash exposure, lighting ratios are based on the output setting of the flash, whereas when using E-TTL II, lighting ratios are based on analysis of preflash data reflected from the subject. We suggest experimenting with your specific lighting setup to achieve the lighting ratio you're looking for.

- If you're using a compatible Speedlite as the Master unit, you can adjust the power setting of the Slave units directly from the Master unit, or a compatible EOS Digital SLR's flash control menu if you're using Speedlite 580EX II as a Master unit. This can be very convenient compared to setting power ratios on the Slave units themselves.

Conclusion

The bottom line is, when your EOS Digital SLR is enhanced by the EOS Speedlite System, it is your entrée to a remarkably diverse array of professional lighting effects as long as you're willing to exploit it.

Our objective has been to provide more depth on each of the topics that were covered during the live presentation, because there's obviously a limit on how much can be said within 90 minutes. Please feel free to contact us if you have further questions on these topics, or anything else that we covered during the Seminar.

http://www.usa.canon.com/dlc/controller?act=GetArticleAct&articleID=2068

Please select "Contact Us" near the bottom of this page to ensure that your questions or comments are routed correctly. Thanks for using Canon photographic equipment. We appreciate your business!

Sincerely,

Canon U.S.A., Inc.
Canon Live Learning

The Growing Demand for Imaging Education

With the democratization of personal imaging made possible by the digital revolution, many of Canon's customers have felt empowered to do more, be more expressive and communicate more effectively via Canon personal imaging products. This empowerment has stimulated an ongoing and intense demand for imaging education.

Meeting the Needs of our Customers

In 2008, we here at Canon USA set out to provide our loyal and passionate advanced amateur customers with an exclusive, Canon-centric choice in on-site photo education. From the beginning, we envisioned Canon Live Learning (CLL) as a new kind of intensive and high-quality photographic educational experience, with Canon's proven photographic expertise as the leading selling point and Canon professional imaging products as the demonstrated tools of choice throughout the workshops and seminars. Industry-leading instructors and top-grade venues are also hallmarks of the program. As CLL has evolved, we have expanded our offerings to appeal to professional photographers and videographers as well as advanced amateurs.

Growing Customer Relationships

Seeking to expand the Canon ownership experience beyond a purely product-based connection, CLL engages customers directly within their respective quests for personal growth in the imaging disciplines they love. Meeting and working together with our customers in high-context and high-quality settings has proven to be mutually beneficial: Customers obtain top-quality education, while Canon gains invaluable direct feedback resulting in new products that are ever more closely aligned with customer wants and needs. Customers value and enjoy the direct connection with Explorers of Light and other Canon experts as they learn about the subjects that mean the most to them. Our experts help them take better landscape photos and portraits; master their Canon Speedlites; create better HD video projects; and make better prints. The intimacy of those learning connections, combined with the ready availability of the Canon personal imaging products that they already love improves their ownership experience in ways that cannot be realized in even the most elite independent photo workshops.

Keeping in Touch

- Our home page on the Canon Digital Learning Center is here: http://usa.canon.com/canonlivelearning
- You can also follow us on Facebook here: http://on.fb.me/hX85ZP
- CLL welcomes feedback, comments and questions by e-mail here: canonlivelearning@cusa.canon.com
- If you are interested in more information about Canon Live Learning, or if you just want to keep up to date on Canon events and activities that may be offered in your area, we encourage you to sign up for the EOS Newsletter here: http://bit.ly/fX0xC8

Offering More Choices in More Places

As CLL enters its third full season in 2011, the program has expanded to encompass a wider range of subject matter and to reach a bigger audience than ever before. Key offerings include:

- **EOS Immersion Seminars & Workshops:** EOS Immersion Saturday Seminars are full-day events consisting of individual presentations on Creative Essentials, Speedlite Creativity & Techniques, HD Video Basics, and Travel & Landscape Photography. Professional photographers and Canon Explorers of Light perform live demos on stage and deliver inspiring multimedia presentations for up to 200 attendees. Offered separately, EOS Immersion Sunday Workshops provide a full-day hands-on educational experience for up to 16 attendees. Topics vary by city, but typically students can choose workshops on Speedlite Techniques or HD Video. Occasionally, there are EOS Immersion Sunday workshops on nature photography, urban landscapes or other topics. Ten EOS Immersion weekends are scheduled to date in 2011.

- **EOS Destination Workshops:** Unlike the EOS Immersion Seminars and Workshops which are typically offered in major metropolitan areas, EOS Destination Workshops are usually held in intriguing locations that have been chosen specifically for their natural beauty. In 2011, Canon is offering at least 9 EOS Destination Workshops in scenic locations such as Moab, UT; Bar Harbor, ME; Sedona, AZ; and Montrose, CO among others. These are 2-day hands-on shooting workshops conducted by award-winning professional photographers and Canon Explorers of Light including Bruce Dorn, George Lepp, Arthur Morris, Ken Sklute, Tyler Stableford, and Jennifer Wu. Subjects will include Tilt-Shift lenses, Environmental Portraiture, Sunrise/Sunset Photography, and even Hot-Air Balloons. Attendance is limited to 16 students, providing an exceptionally intimate learning environment.

- **Professional Track:** In 2010, Canon Live Learning offered two different series of multi-day workshops geared towards professional videographers: The 2-day Canon Cinema Caravan series developed in conjunction with *stillmotion* and the 3-day EOS Moving Image series developed in conjunction with *Createasphere*. Look for additional CLL workshops designed for professional image-makers in 2011. Details and scheduling will be announced on the Canon Digital Learning Center web site.