Expanding the world of photography with full-time flash.
Full-time flash photography — true harmony between light sources opens up new photo opportunities.

Old brick buildings, cobblestone streets, countless churches with clanging bells — charming Cremona in the northern Italian province of Lombardia is a town brimming with medieval relics. While small enough for ambling sightseers to explore in a single day, Cremona is world-renowned as the birthplace of Stradivarius and other master violinmakers. Even now, it is home to nearly 100 stringed instrument makers’ ateliers.

“Each instrument is unique even if crafted by the same artisan,” a proud local resident assures me. With my Speedlite and EOS DIGITAL camera in hand, I capture him and his viola with Cremona in the background all in one beautiful shot.

Light sources are not always bright enough, or where you want them to be. They may cast shadows on subjects, for example, that complicate the shooting situation. The ideal solution would be an easily controllable light source that achieves natural exposure without leaving telltale signs of its use.

Canon Speedlite flash units make this ideal a reality. Once mounted on an EOS series camera, they allow photographers to simply press the shutter button to obtain photos with an ideal balance between the background and subject. Even in daytime shots, they can help ensure that subjects are captured vividly in a wide range of environments.

Thanks to Canon Speedlites, flash units are no longer just for taking photographs in the dark. These sophisticated devices have ushered in a new world of full-time flash photography!
Professional lighting control is no longer reserved for professionals.

Automatic functions replace sophisticated lighting techniques.

Every range of photographic expression expands exponentially when using an internal flash unit as the main or auxiliary light source. For example, subjects can easily be captured against reflective backgrounds at the ideal exposure. Or you can highlight subject details without adjusting exposure to compensate for the background.

Fully automatic functions available in EX Series Speedlites flash units provide all the benefits of professional exposure and light control techniques. When mounted on an EOS camera, a Speedlite automatically receives information such as the lens focal length, exposure control mode and aperture. It then makes adjustments accordingly, working together with the camera as an integrated unit to achieve the most natural possible exposure. When photographers use a Speedlite, they reap the rewards of sophisticated flash photography with the press of a shutter button.

E-TTL II strikes a natural balance between the subject and background.

E-TTL II is Canon's latest proprietary automatic flash exposure control system. By employing multiple metering zones to measure both ambient light and preflash, then comparing the two and taking metering distances into account, this sophisticated system automatically adjusts the flash level to achieve natural reproduction with ideal exposure of both the background and subject.

In various shooting situations, even when the background is highly reflective, E-TTL II can use distance information from the lens to eliminate underexposure and achieve optimal automatic flash exposure control.

E-TTL II autoflash system operation flow

1. Shutter button pressed halfway. Autofocusing and evaluative metering (with the multi-zone sensor linked to the focusing point) are executed simultaneously. The ambient light is thereby measured.
2. Shutter button pressed completely. A preflash is fired, and the reflected flash from the subject is measured by the multi-zone evaluative metering sensor.
3. An exposure calculation is made, and the ideal main flash output is calculated and stored in memory.
4. The reflex mirror goes up, the first shutter curtain starts to open, the main flash fires, the imaging sensor is exposed, and the second shutter curtain closes, and the reflex mirror goes back down.
5. The flash exposure confirmation lamp illuminates.*

Colour temperature compensation ensures faithful colour reproduction.*

When an EX Series Speedlite is mounted on an EOS DIGITAL camera, it automatically informs the camera of the colour temperature of its illumination. This enables the camera to calculate white balance with extreme accuracy.

* Please refer to pages 29-30 for a list of models that support this function.

An atelier's good-luck charm

I photographed this angel in an atelier at Cremona's Piazza S. Antonio M. Zaccaria. Its timeworn surfaces and exquisite handiwork suggested antiquated origins and immediately caught my eye. The atelier's owner shared it with me, explaining: "This is our good-luck charm. A member of my family found it at a Christmas antique market."

Outside, the setting autumn sun shone brightly on the brickwork of a church and piazza. With the help of my Speedlite, I captured their radiant surfaces in a delicate balance with the fine details of the angel.

– Piazza S. Antonio M. Zaccaria, 4:00 pm

An atelier's good-luck charm (p. 35)

Sample photo analysis

In my first attempt at capturing the angel, I utilized a spot metering function to determine the correct exposure. The resulting image was brightly lit, but lacked the vivid detail I was striving to obtain. Moreover, I failed to capture the atmosphere of the old town, which was overexposed.

On my next attempt, I took advantage of the automatic flash exposure control of E-TTL II. I intelligently balanced the distance, exposure gap and captured both the angel and piazza with a clarity that matched my aspirations.

* Colour temperature compensation ensures faithful colour reproduction.*

Light distribution and zooming control are optimized depending on the camera's image sensor size.*

The angle of view of an EOS DIGITAL camera is different depending on the size of its image sensor (APS-C, APS-H, or 35mm full-size), regardless of the focal length of the lens being used. This factor is taken into account by EX Series Speedlites, which automatically adjust the flash zoom mechanism depending on your camera's image sensor size to deliver an ideal flash angle for the effective angle of view.

Since only necessary areas of the scene are illuminated, Speedlites are especially efficient at conserving energy.

* Please refer to pages 29-30 for a list of models that support this function.

* This feature is not for EOS-1D or EOS-1D Mark II models.
Some facial expressions demand a full aperture setting even when backlit by the sun.

High-speed sync flash achieves beautiful blurring even when shooting against the sun. When subjects are backlit by the sun, strong shadows tend to mask facial features and other details. Photographers can eliminate such shadows by repositioning the exposure, but this form of compensation is likely to overexpose the background. Another possibility is delayed SB-HL1. This technique is often effective when shooting outdoor portraits because it enhances the subject and reduces the brightness of the subject and background. However, its range of use is limited because the shutter speed cannot be set faster than the X-sync speed of the flash and the aperture must be reduced to compensate for this brightness.

A virtuoso in the making

The Caporali family has tilled this soil for many generations, and their large garden affords the perfect setting for a daughter practicing the violin. Her beautiful eyes stand out against the glaring sun, reflecting music and confidence. With the aperture fully open in high-speed sync flash mode, I capture the fleeting moment for posterity.

– Castelvetro Piacentino, 1:00 pm
Multiple flash photography can bring out every detail.

Wireless multiple flash units illuminate the subject and background.

In rooms lacking ambient light, the use of a single flash unit that directly lights the subject may result in a brightly lit subject and extremely dark background. To effectively illuminate both the subject and background with the desired amount of light, from the desired directions, a photographer may choose to employ multiple flash units.

The use of multiple flash units can complicate the setting of exposure. But with EX Series Speedlites, photographers simply press the shutter button as with single-flash photography since the flash units automatically set their own exposure. For even more convenience, slave Speedlites SB-800s and SB-600s can be wirelessly controlled from a Speedlite SB-800 or Speedlite Transmitter ST-E2 mounted on a EOS camera.

In multiple-flash photography, the master flash unit is generally set up before the slave units. Achieving the right balance of exposure settings usually requires a combination of experience and guesswork. But EOS and EOS DIGITAL cameras combined with EX Series Speedlites greatly simplify the process and heighten the enjoyment. Furthermore, results can be checked on the LCD monitor of EOS DIGITAL cameras, allowing adjustment on the spot.

Up to three groups of flash units can be used to realize your creative vision.

Simultaneous control of up to three groups of Speedlites (A, B and C) is possible. The photographer simply chooses a lighting ratio between the A and B groups, with ratios as high as 8:1 or as low as 1:8, and lets the units automatically adjust their own exposure level to maintain the lighting ratio. There is no cumbersome manual adjustment of exposure: The brightness of group C is then controlled independently of the other two groups, allowing effective illumination of the background or accentuation of key areas.

Overall lighting is easily adjusted while monitoring the results on the camera's LCD monitor. Using the master flash units, the photographer simply adjusts the lighting ratio between the A and B groups and the light level of the C group to attain desired lighting.

Avoid having obstacles between the camera and slave flash units.

Whether using a master flash unit or Speedlite Transmitter, your commands to slave flash units are transmitted by light pulses or infrared signals that are easily blocked by thick walls, large furniture and other dense objects. When deciding camera and flash locations, it is wise to take this factor into account.

Sample photo analysis

Three flash units provided illumination. The light from the master flash unit (A), a Speedlite 580EX mounted on the camera, was bounced off the wall to soften its intensity before reaching the two violins. A slave SB-800 (B) was set not enough away on a shelf to be painted directly at the strings, and another SB-800 (C) was used to light the interior of the office. Based on the results displayed on the camera's LCD monitor, the brightness of the master flash unit and light level of the slave flash unit are then fine-tuned to achieve a balanced result.

Passing on the legacy

Francesco Burdetti is known as a modern-day Stradivarius. His eldest son and apprentice, Marco, is widely regarded as the inheritor and caretaker of Cremona's violin crafting tradition. I had the privilege of capturing Marco's home office, where a series of Stradivarius is on display. The idyllic setting allowed me to capture Marco and his other masterpieces in one memorable photo.
Light and subject merge to create an unforgettable image. Freedom to reframe while maintaining ideal subject lighting.

A night at the opera
Operas are popular in the town of Cremona, where renowned opera composer Claudio Monteverdi was born. Francesco and Federica have been anticipating this evening, which marks the opening of this year’s opera season. They are bathed in the warm glow of a lamppost, which beams softly on lady’s tall bell tower. Slow-sync flash helps me capture their excitement with pleasing clarity.
- Piazza del Comune, 7:00 pm

Tips on slow-sync flash
- Primarily use Aperture Priority AE (automatic exposure) mode in the Full Automatic and Program AE (P) shooting modes. EOS cameras prioritize securing a fast shutter speed (no slower than 1/30 sec.) to prevent camera shake. Selecting the Aperture Priority AE mode automatically activates slow-sync flash, taking the background into account to achieve appropriate automatic flash exposure control.
- Beware of camera shake and subject blurring: When shooting with slow-sync flash, the slow shutter speed increases use of a tripod to prevent camera shake.

Framing readjustment without worrying about the flash
Reframing the image after locking the focus can sometimes dramatically alter the required exposure level. This problem can easily be eliminated, however, by using FE Lock to maintain the initial flash level. Similar in many ways to the AE Lock function, FE Lock uses spot (or partial) metering to determine the ideal flash level and fires the flash accordingly when the shutter button is pressed to ensure appropriate exposure of the subject even during reframing.

Slow-sync flash

The sheet music that father left behind
The music-loving violinist left this world half a century ago, but his sheet music lives on. “I was too small to remember my father playing the violin,” says his daughter, who was 5 years old at the time. But she still likes to imagine how her father would have sounded. The room is set against the windows, with golden lights as a backdrop, and gentle violin music playing in my head. I photograph this relic that links the generations.
- Via Solterino, 6:30 pm

Sample photo analysis

A sheet of music is the main subject of this image. With dark backgrounds, the act of reframing the subject often results in overexposure. The combination of FE Lock and an EX Series Speedlite enabled the sheet music to be captured with the right exposure even after reframing the scene.

FE Lock

Without FE Lock

FE Lock
A colourful collection of confections.

Established in 1836, Sperlari is one of Cremona’s favorite confectioners. The company is renowned both in Italy and abroad for its excellent Torrone nougat candy, an essential ingredient in any good Italian family meal. For me, the company’s confections with great interest in one of their shops, the shop and aromatic environment gave me spontaneous helping of samples. My close-up of these colourful confections is an attempt to capture the warmth and charm that characterize Cremona.

Shadows can be eliminated from close-up subjects.

The most basic way to evenly illuminate a subject is to fire a camera-mounted flash unit directly at the subject. With close-ups, however, a regular flash unit would illuminate the subject from an ajar angle and shadow the bottom of the image. Macro Ring Lite MR-14EX is an ideal solution for eliminating these annoying shadows. Mounted on the lens rim, its circular flash tubes evenly illuminate the entire frame from all directions, enabling high-quality, shadow-free close-ups of flowers, insects, jewelry, candies and more with ease.

Partial flash firing adds depth to close-ups.

Photographers can deliberately create shadows and emphasize dimensionality in close-ups by firing just one of Macro Ring Lite’s two flash tubes. Modeling flash may also be fired beforehand to determine how the shadows will appear. Like all EX series Speedlites, the MR-14EX supports high-speed sync flash and FE Lock. It can also serve as a master flash unit, allowing wireless control of multiple slaves.

Proof of superb craftsmanship.

According to an old saying, the expertise of a violin craftsman can be judged by the quality of his violin scrolls. That elaborately worked design clearly shows the expertise of the master craftsman. Not surprisingly, the violin scrolls crafted by professional artists are exquisite works of art. The finely hand-cut poses of a scroll are beautifully captured with the subtle assistance of Macro Twin Lite.

Subtle control of lighting in macro photography.

The flexibility to meet creative demands.

Macro Twin Lite MT-24EX is specifically designed for macro photography. Equipped with two independent, angle-adjustable flash heads, it enables more flexible control of lighting than the MR-14EX. Each of the two flash heads can be fired independently if desired and provides bright illumination with a maximum guide number of 26/0.3 (ISO 100 in m/ft). The MT-24EX supports wireless multiple flash functions, as well as high-speed sync flash and FE Lock.

Lighting ratio control for subtle shading adjustment.

The lighting ratio between the two flash tubes/head on each macro flash unit (MR-14EX or MT-24EX) can be adjusted between 8:1 and 1:8 in 13 half steps. This function is useful for creating more natural shading and a greater sense of depth. The two flash tubes/head can also be independently rotated around the lens rim to adjust the location of highlights and shadows, thus boosting the shooting situation and creative intentions of the photographer.
Speedlites help you realize your creative vision.

Relaxing before the performance.

The former residence of a noble family now serves as a multi-purpose facility for use. Under the facilities are located a party featuring the sounds of live music. I shared the moments of the musician relaxing in the waiting room before the performance and they were kind enough to pose for this photograph.

Flash exposure compensation enables subtle flash level adjustment.

When areas of a scene sharply differ in brightness, manual flash level adjustment can be fine-tuned to a setting that naturally blends the extremes. The flash level is adjustable between -3 and +3 in 1/3 or 1/2 steps, depending on the camera.

Auto flash reduction in bright environments.

When shooting in bright settings, or using daytime synchronization flash to shoot extremely bright subjects, automatic flash reduction prevents overexposed “blowout” by automatically reducing the flash level. This function, available when using E-TTL II Speedlites on EOS cameras, automatically determines whether the flash should be used as the main or auxiliary light source.

An advertisement on wheels

“After seeing a scooter with a musical instrument painted on its body,” the multi-talented violinmaker explains, “I decided to paint one of my own musical instruments on my scooter. It’s a good advertisement!” This photo of the scooter was taken at dusk with the Po River in the background.

Flash exposure bracketing with ideal exposure.

With a single press of the shutter button, the FEB (Flash Exposure Bracketing) function on EOS DIGITAL cameras automatically takes three photos with different flash levels — normal, below normal and above normal. Depending on the camera, these levels are adjustable in 1/3 to 1/2 steps in a range between -3 and +3. The exposure setting remains constant, regardless of flash level, to ensure consistently excellent results.

Learning on the job.

Maria’s part-time job serves as training for the career she’ll begin after graduation. “I’ve been gaining an insider’s perspective on planning and management,” she says with a smile. “This has been a great learning experience.” I captured her busy at work, serving refreshments and beaming with youthful optimism.

Fine-tuning of details via manual flash.

Speedlites provide manual flash mode that allows adjustment of the lighting level. Precise manual adjustments is useful for highlighting details of the subject in the shade or adding catchlight in the eyes.

Sample photo analysis

This challenging scene captures musicians conversing between a dimly lit room and bright outdoor environment. Since the automatic flash setting was ideal for the room but overexposed the yard, I lowered both the flash level and aperture by 1 stop to capture the subject area more clearly. The transition between indoors and outdoors is much more natural as a result.

Sample photo analysis

In the first shot, the subject and tree are clearly captured without using a flash. By employing a Speedlite at a reduced flash level, I was able to enhance the facial expression with catchlight in her eyes. The flash also improved the photo by bringing out the leaves.

– Palazzo Cattaneo Ala Ponzone, 10:00 am

– Via Lungo del Po Europe, 6:00 pm

– Palazzo Cattaneo Ala Ponzone, 11:00 am

– Piazza d. Pace, 2:00 pm

– Not supported by Speedlite 220EX.
Capturing motion with the aid of a flash.

Second curtain sync flash for natural light streaks.

Flashes normally fire when the first shutter curtain is fully open. Since the time lag between pressing the shutter button and firing the flash is extremely short, this method is ideal for capturing fleeting shutter opportunities. However, due to movements of light sources after the flash fires and before the exposure ends are also recorded in the image. This can be a problem at slow shutter speeds. With EX Series Speedlites, photographers have the option of firing the flash right before the second shutter curtain begins moving. This second curtain sync flash function captures moving light sources before the main subject, resulting in images that convey a more natural sense of movement.

Special stroboscopic effects.

The stroboscopic flash function fires the flash repeatedly during exposure to record multiple moments in a single photo. Users can manually set the flash interval (firing frequency) as desired to capture more or less of the subject’s motion. The number of exposures depends on the firing interval and shutter speed.

An oldie but goody.

This lovingly cared-for scooter doesn’t run like a relic of the 1960s. “I restored it myself and it runs extremely well,” boasts the proud scooter owner. Late at night, I capture him and his ride in a streak of light at a slow shutter speed.

– Parco del Po, 7:00 pm

Dancing in the dark.

20-year-old Ottavia has a winning smile. “It’s fun to play and dance,” she exclaims with glee. Her swift motion and light steps blend pleasingly in a single frame.

– Via Lungo del Po Europe, 7:30 pm

EX Series Speedlites

Lighting techniques

Basic examples
Bounce flash for soft lighting that feels warm and natural.

Direct light and indirect light

Flash placement

Bounce lighting (indirect lighting) EF 50mm f/1.4 USM, 1/15, f/4

A bounce flash enables natural lighting with soft light reflections. Direct firing of flash units at subjects in a room tends to cast unnatural shadows on the walls. Such shadows can be prevented by using a diffuser or by bouncing the flash off a ceiling or wall. This makes bounce flash technique effective in various shooting environments, especially when soft lighting is required to naturally capture the subject’s facial expression. The colour of the wall or ceiling, and its distance from the flash unit, affects the intensity of the illumination reaching the subject. But the desired light level can be easily achieved with an EX series Speedlite by using automatic flash exposure to fire a preflash and then adjusting the light level.

Direct flash tips

- Choose a white or bright-coloured surface. Bouncing the flash off a white or bright-coloured surface helps reduce the loss of light and prevent transmission of the surface colour to the subject.
- Try different bounce directions. When bouncing the flash off a ceiling or wall, the subject may create unwanted shadows on the canvas. In this case, bounce the flash off a white or bright-coloured surface to distribute the light more evenly.
- Adjust the distance between the flash and bounce surface. The further the flash unit is moved from the bounce surface, the softer the resulting flash illumination will be (as long as the flash level is not adjusted). Note that at extreme distances, the flash becomes too weak to affect the image.

The main photograph was taken by bouncing the flash diagonally off a white ceiling above the family’s heads. This spread the illumination over the entire scene and achieved an excellent balance with the incandescent room lighting. The other photo was taken with a closely aimed flash, resulting in shadows on the wall and ceiling lighting. Areas lit strongly by the flash are white, while other areas are softly illuminated by a combination of smaller flash illumination and incandescent light.

Happy birthday!

Today is a special day for violin maker Borchardt and his family. In celebration of his second son’s birthday, they are dining at Osteria Del Melgrano, a favourite among Cremona locals. The family is eating their birthday cake and enjoying the music of the local band. Everyone joins in shouting “Happy birthday!” I capture the happy family with the warm lighting of a bounce flash.

– Via Aporti, 6:00 pm
The range of possibilities is limited only by your imagination.

Wireless multiple flash lighting opens up new photo opportunities.

The use of multiple flash units significantly expands the range of possible photographic expressions. Simply by adjusting the positions and light levels of the units, a photographer can dramatically change the look of the image. For example, unwanted shadows can be eliminated, studies can be added, and the atmosphere can be vividly brought to life.

Multiple flash lighting greatly enhances the pleasure of photography by giving photographers a multitude of creative options for achieving their own unique vision. Using EX Series Speedlites in combination with an EOS or EOS DIGITAL camera enables fully automatic wireless control, as well as the grouping of flash units and the setting of light level ratios between groups. EOS DIGITAL cameras also offer the additional advantage of allowing the results of multiple flash lightings to be checked immediately on the spot. Professional results are most easily achieved by setting up the main flash unit before the slave units.

Creative illumination

At Borchardt atelier, I found a violin that had not yet been varnished. Spottedly white, with smooth contours crafted by gifted hands, the unfinished body was beautiful to behold. I posed it with a complementary backdrop and another unfinished instrument to create different angles of light and shadow. I then positioned a camera at the side of the room to capture a corner shot. The music I was playing brought out the beauty of the instruments from every angle and eliminated shadows that would have detracted from their perfection.

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Wireless Multiple Flash Lighting

Sample photo analysis

The lower photo on page 19 was taken with a single direct flash. It appears flat and contains shadows that mask the beauty of the subjects. Unnatural reflections on the central violin also spoil the photo.

In contrast, the upper photo was taken with bounced light from three flash units — a main flash unit, an auxiliary flash unit, and another flash unit for bouncing out the background. The multi-flash lighting adds depth and vividly highlights the distinctive curves of the violins.

Wireless Multiple Flash Lighting

Sample photo analysis

The lower photo on page 19 was taken with a single direct flash. It appears flat and contains shadows that mask the beauty of the subjects. Unnatural reflections on the central violin also spoil the photo.

In contrast, the upper photo was taken with bounced light from three flash units — a main flash unit, an auxiliary flash unit, and another flash unit for bouncing out the background. The multi-flash lighting adds depth and vividly highlights the distinctive curves of the violins.
Multi flash is also effective in macro photography.

The angel perfectly matches the atmosphere of the atelier. Look closely at the face and you can see the exquisite craftsmanship. “If angels are mediators between god and man, then they are the key to understanding the link between godly means and distant world.” To bring out the angel’s facial features and set them against a pleasingly blurred background, I used macro flash and a second flash aimed at the background wall.

- Piero della Francesca M. Laura, 4:00 pm

Additional lighting can greatly enhance the image.

Macro Ring Lite MR-14EX and Macro Twin Lite MT-24EX make visible, fully automatic lighting of very close subjects. With dark backgrounds, however, the resulting image may be extremely underexposed. To achieve a more pleasing composition, an auxiliary flash unit can be used to heighten the background.
Rule No.1 — make the most of the light that is already there.

Capturing the creation of a masterpiece:
"Accuracy is more important than style when creating musical instruments because we are appealing to hearts and ears, not eyes," remarks Edgar Russ. A true master craftsman who began his apprenticeship in his teens, Russ has been making violins for nineteen years. Russ carefully selects cypress and pine woods and all the wood he uses is hand selected and hand cut. He has gained a reputation for making instruments that are as beautiful as they are musical.

Enhancing the atmosphere with an auxiliary flash
Photographers always have the chance of using a flash unit as the main or auxiliary light source. When a constant incandescent light source is available, it is often best to use the flash as an auxiliary light source in order to maintain a natural, warm atmosphere. The auxiliary flash can simply be bounced off the ceiling or diffuser to soften the light and complement the lamp. Determining the best flash exposure in such situations can be difficult. But an EX Series Speedlite and E35 camera can automatically determine the ideal flash exposure level by measuring the ambient light and preflash. This automatic ease frees photographers to concentrate on their art, rather than technicalities.

Direct lighting (flash unit as main light source)

Sample photo analysis
In the small photo above, a directly aimed flash unit served as the main source of light. The skin colour of the subject was faithfully reproduced, but the incandescent lamp was overexposed and casting a shadow in the background. In addition, the background was underexposed because the large workshop was not adequately illuminated by ambient light. The large photo below, using the incident light as the main source of light, more naturally captured the intensity of the master craftsman’s expression. This closer to how the scene appears to the naked eye.

Direct lighting (flash unit as main light source)

Enhancing the atmosphere with an auxiliary flash
Photographers always have the chance of using a flash unit as the main or auxiliary light source.
Basic Flash Terminology

**Ambient exposure compensation**
A function for adjusting ambient exposure through aperture and shutter speed and without adjusting flash output. This function affects both foreground and background brightness and is useful for brightening the background during fill-in flash photography.

**Ambient light**
All light in the shooting environment from natural and artificial sources (such as tungsten light, fluorescent light and candle light), excluding light provided by the photographer via flash units.

**AutoFlash metering**
The camera’s light sensor measures the light reflected by the subject after the flash begins firing. The flash output is then controlled so that the proper flash exposure is obtained. See page 4.

**Bounce flash**
Lights bounced off a ceiling, wall or other surface to soften the light hitting a subject. A white or light-colored surface is best since the color of the reflective surface affects the color of the light. Bouncing the light also lowers its brightness in comparison to direct flash, requiring adjustments to aperture or ISO speed settings. See page 17.

**Catchlight**
Lights that reflect in a subject’s eyes and add life to the portrait. Either a flash or reflector panel is used to create catchlights. See page 14.

**Clip-on flash**
Any flash unit that can be attached to the accessory shoe of a camera.

**Diffusing**
Spreading and softening flash illumination by using a translucent material placed between the flash unit and subject or between the flash and wall. Soft diffused light naturally lightens the shadows and makes flash photography with softer contrast possible.

**Exposure compensation**
A function for adjusting ambient exposure through aperture and shutter speed. Since the flash output is automatically controlled by the aperture, no flash exposure compensation is applied. To compensate flash exposure, use the flash exposure compensation function. See page 15.

**FE (Flash Exposure) Lock**
When the photographer looks through the viewfinder, this feature locks the flash level (determined by spot or partial metering) by firing a preflash and storing the appropriate flash output level so that the flash exposure will be maintained for the main subject even if the scene is different. In flash photography, this feature is useful for obtaining the proper exposure by metering at a certain spot or subject in the frame.

**FEB (Flash Exposure Bracketing)**
A feature that automatically produces three shots with different flash output (correct exposure, underexposure, overexposure). Background exposure is unchanged since the aperture and shutter speed are not adjusted. This function only adjusts the level of illumination provided by the flash. It’s particularly effective for fine-tuning the balance between foreground and background exposure during fill-in flash, but it can also be effective as compensating for highly reflective and non-reflective subjects. See page 13.

**Flash**
A flash is a short-duration, brilliant burst of light.

**Flash exposure compensation**
This function only adjusts the level of illumination provided by the flash. It’s particularly effective for fine-tuning the balance between foreground and background exposure during fill-in flash, but it can also be effective as compensating for highly reflective and non-reflective subjects. See page 15.

**Guide Number (G No.)**
A number indicating the amount of light a flash emits. In relation to the aperture and the distance between the flash head and subject is as follows:
G No. (Aperture /F) = Distance /Flash output
G No. (Distance / Aperture /F) for optimal exposure
See page 12, 27.

**High-speed sync**
In normal flash photography, the flash is synchronized to fire at the moment when the first curtain finishes traveling and before the second curtain starts traveling. High-speed sync extends the flash duration, making flash synchronization possible when using fast shutter speeds that form a gap between the first and second curtains while traveling. EOS dedicated EX Series Speedlites offer this feature, enabling automatic high-speed sync control with E-TTL II.

**Intermittent flash**
Simulating a longer-lasting flash by separately firing the flash unit(s) at high speed. This technology is often used for high-speed sync and modeling flash.

**Main flash**
The principal flash fired after the preflash when the shot is actually taken.

**Modeling flash**
A monitoring flash that can be fired before photographs are taken to help determine light placement for desired light balance, shadows, etc.

**Multiple flash (wireless and wired)**
This is a flash setup with one or more Speedlites other than the one attached to the camera. In a wired system, multiple Speedlites are connected with a multi-Speedlite connector and extension cords. In a wireless or slave unit system, multiple Speedlites can fire without any wired connections. Speedlite 580EX is equipped with both transmitting and slave functions. With a Speedlite Transmitter ST-E2 or Speedlite 540EX, MR-14EX, or MT-24EX set as the master unit, multiple Speedlite 580EXs or 430EXs (set as slave units) can be wirelessly controlled for E-TTL II autoflash. See pages 7, 19, 21.

**Normal flash**
A normal flash is a short-duration flash of 1/200 sec. or less that illuminates the subject but leaves the background underexposed. See “ambient light” for comparison.

**Preflash**
This is the low-output flash fired before the main flash is fired in synchronization with the shutter. It is used for measuring the subject distance and evaluative metering. See page 4.

**Recycling time**
Specifies the capacitor or some electrical energy for the high voltage required by the flash. When a flash is fired, the capacitor is discharged and then recharged for the next flash. The recycling time is the time it takes the capacitor to recharge after firing. See page 27.

**Red eye**
This refers to the red dots in the eyes of the subject in a photograph taken with a flash. It is prone to occur when the person’s pupil is wide open (in low light), the flash is mounted near the camera lens, and the flash reflects off the subject’s red capillaries. With red-eye reduction, an incandescent lamp shines or a preflash is fired to shrink the pupil’s diameter and lessen the likelihood of red eye.

**Slave unit**
This is a flash unit that fires in response to the firing of a master flash unit. For example, Speedlite 550EX or 430EX can be used as slave units that fire when high-speed pulses are received from a Speedlite Transmitter ST-E2 or Speedlite 540EX, MR-14EX or MT-24EX set as a master unit.

**Synchronization**
Firing of the flash at the moment the first and second shutter curtains are fully open. See page 5.

**White balance**
A function in digital cameras that allows colors to be corrected, based on the color temperature of the light source, to ensure faithful color reproduction. Auto white balance, selectable pre-set white balance modes for different light sources, and manual white balance settings are provided. The photo daylight mode provides warm colors in incandescent lights and a bluish tint in fluorescent light or shade. The color temperature of a flash is almost the same as sunlight.

**Wide panel**
A translucent panel that extends flash coverage when fitted to the flash unit’s light-emitting component. Speedlite 580EX and 430EX include a built-in slide-type wide panel.

**X-sync**
This is an electrical contact that enables the flash to fire when the shutter is fully open. In SLR cameras equipped with a focal-plane shutter, the x-sync speed is the fastest shutter speed at which the first and second shutters are fully open.
Flash units for macro shooting

**Macro Ring Lite MR-14EX**
A versatile ring flash with wide angle lighting control (15° – 45°, 11 steps) and the ability to control the intensity by as much as 1 stop. This unit can be used as a master or as a slave flash.

Max. guide number: 24/79 (ISO100 in m/ft)  
Custom Functions: 9  
4 AA-size batteries (alkaline, lithium, or Ni-MH)

**Macro Ring Lite MT-24EX**
The flexible two-tube flash provides separate illuminating angle adjustment (left angle: 45° above – 45° below, 60° inward – 30° outward; arm angle: 50° above – 30° below). It also supports various functions including high-speed sync, FE lock, and modeling flash, and can function as a master unit for flash units. This unit can be connected to the camera via the hot shoe or Off-Camera Shoe Adapters.

Max. guide number: 24/79 (ISO100 in m/ft)  
Custom Functions: 14  
4 AA-size batteries (alkaline, lithium, or Ni-MH)

**Speedlite 580EX (including case)**
A twin-tube ring flash with ratio lighting control (1:8 – 8:1, 13 1/2 step increments) and the ability to fire a single tube. Various lighting techniques are possible, including high-speed sync, FE lock and multiple and wireless autoflash. Colour temperature data is transmitted to the camera and flash zoom coverage is automatically optimized on compatible cameras.

Max. guide number: 58/190 (ISO100 in m/ft)  
Custom Functions: 14  
4 AA-size batteries (alkaline, lithium, or Ni-MH)

**Speedlite 430EX (including case)**
The compact speedlite 430EX offers nearly the same basic functions as the 580EX, including separate illumination and broad bounce angles, as well as advanced digital features. This model supports angles as wide as 28mm and features a Save Energy (SE) function that automatically terminates power after 90 seconds of inaction.

Max. guide number: 24/79 (ISO100 in m/ft)  
Custom Functions: 6  
4 AA-size batteries (alkaline, lithium, or Ni-MH)

**Speedlite 220EX (including case)**
This model supports angles as wide as 24mm and features a Save Energy (SE) function that automatically terminates power after 90 seconds of inaction.

Max. guide number: 14/49 (ISO100 in m/ft)  
Custom Functions: 6  
8 AA-size batteries (alkaline, lithium, or Ni-MH)

**Speedlite External Power Supply**

<table>
<thead>
<tr>
<th>Battery Configuration</th>
<th>Recycling Time</th>
<th>Flashes per Charge</th>
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<tr>
<td>AA-size alkaline (4)</td>
<td>Approx. 0.1 – 4.5 sec.</td>
<td>Approx. 250-1700</td>
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**Macro Ring Lite MR-14EX**

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<th>Battery Configuration</th>
<th>Recycling Time</th>
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<td>AA-size alkaline (4)</td>
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**Speedlite Bracket SB-E1**

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**Off-Camera Shoe Cord 2**

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**TTL Distributor**

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**Connecting Cord 60**

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**Connecting Cord 300**

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### Speedlite 580EX/430EX support for EOS camera functions

#### EOS

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<th>Model</th>
<th>Highest shutter speed with flash synchronization (sec.)</th>
<th>Metering method</th>
<th>High-speed sync</th>
<th>FE lock</th>
<th>Wireless support</th>
<th>Flash Exposure compensation</th>
<th>Modeling flash</th>
<th>Second-curtain sync</th>
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<tbody>
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<td>E-TTL II E-TTL TTL</td>
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#### EOS DIGITAL

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Flash Work
Expanding the world of photography with full-time flash.

Canon