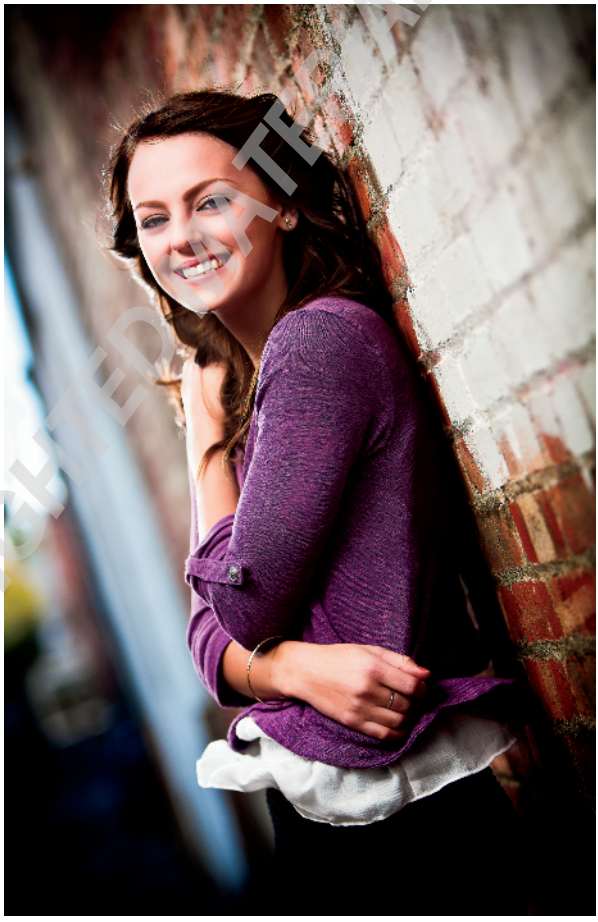
CHAPTER 1

Exploring the Canon Speedlite System

The 600EX, 600EX-RT, and 580EX II are the flagship models in the Canon Speedlite System and, combined with the E-TTL II metering system and a wide variety of lighting modifiers, they enable you to create extraordinary light in any situation.

This chapter acquaints you with the main features of the four major flash units in the Canon Speedlite System: the 600EX, 600EX-RT, 580EX II, and 430EX II. It also briefly touches on the 270EX II and 320EX. Sections covering the 600EX and radio-enabled 600EX-RT have been combined throughout the book because they are identical in all respects except for built-in radio wireless. Differences are noted where appropriate. I also cover all the functions of the other parts of the Canon Speedlite System, including the Speedlite transmitter ST-E3-RT and the ST-E2 wireless transmitter, along with an overview of a smaller entry-level Speedlite and the two macro Speedlite options.



In this image of model Taylor Anderson, I had one 580EX II Speedlite positioned camera left and one positioned behind her and to the left to provide an accent light. Speedlites are triggered in High-speed sync mode using the RadioPopper PX system. Exposure: ISO 100, f/2.8, 1/320 second with an EF 70-200mm f/2.8L USM lens.

Features of the Canon Speedlite System

The main components of the Canon Speedlite System are any Canon dSLR camera and a compatible Speedlite such as the feature-rich 600EX/600EX-RT, 580EX II, and 430EX II Speedlites, which replace the 580EX and 430EX, respectively. Additional components include the OC-E3 Off-Camera Shoe Cord, the Speedlite transmitter ST-E3-RT and ST-E2, the Macro Twin Lite MT-24EX, the MR-14EX Ring Lite, the 270EX Speedlite (which replaces the 220EX flash), the 270EX II, and the 320EX. All Canon EOS dSLRs can be used with the Canon Speedlite System.

Here are some of the powerful features in the Canon Speedlite System:

- **E-TTL II.** Canon's most advanced flash metering system uses preflashes and flash metering algorithms to determine the proper flash exposure. The E-TTL II system reads information from all metering zones before and after the preflash. Areas with little change in brightness are then weighted for flash metering. This is done to prevent a highly reflective surface or overly bright area from creating a false reading, thereby causing underexposure. When you use certain EF lenses, distance information is also reported back to the flash and entered into the algorithm.
- **Flash Exposure Lock (FEL).** FEL enables you to fire the flash to meter the subject, get a reading for the proper flash exposure, and lock in that information. Pressing the FEL button allows you to meter the subject via a test flash and then recompose the shot while maintaining the proper flash exposure for that subject.

NOTE Some Canon camera bodies have a separate FEL button (ϟ*), while others have buttons that can be assigned to the FEL function.

- **Wireless lighting.** This feature allows you to use your Speedlites wirelessly using built-in optical or radio transmission. When using wireless lighting, you need to have either a 600EX, 600EX-RT (built-in radio), 580EX II, either of the Macro Speedlites, or a Speedlite transmitter ST-E3-RT (built-in radio) or ST-E2 wireless transmitter set as a master unit. A master unit fires a preflash, which then transmits information back and forth between the camera and any flashes set to Slave mode. The master unit can wirelessly control multiple Speedlites that are set as slaves, allowing really creative lighting setups. Many of the newer dSLRs in Canon's lineup have pop-up flashes that can be used as master flashes.
- **High-speed sync.** This feature allows you to use your flash at shutter sync speeds above those rated for your camera body. This setting is often used to freeze action or allow wider apertures (via higher shutter speeds) when shooting outdoor portraits.

- **AF-assist beam.** The 580EX II and 430EX II have a built-in red LED that projects a gridded light pattern onto a subject to aid the camera's autofocus (AF) system in very dark or low-contrast situations. This beam typically offers coverage for up to a specific number of AF points.
- **Flash color information communication.** As flash duration becomes longer, the color temperature changes slightly. The Canon Speedlites transmit this change to the camera body, ensuring a more accurate white balance.

600EX/600EX-RT

The 600EX and 600EX-RT, released in mid-2012, are the new flagship models of Canon's Speedlite lineup. Canon engineers and designers have been busy — these new Speedlites are a major leap forward. There are many significant improvements on both models, including a completely redesigned, context-sensitive menu/navigation system based on a 40-percent larger LCD panel and four Function buttons, a dedicated wireless button (no more digging through menus and holding multiple buttons), bigger and more legible dot matrix text on the LCD panel, Custom Function menus that are clear and understandable, a broader 20mm–200mm zoom range for more creative control, increased power output, beefed up weather sealing to match pro-series bodies like the 1D X, and an included gel filter set and carrying case. The redesigned menu/navigation system is straightforward, intuitive, and worth the upgrade alone. However, the real game changer is the 600EX-RT's built-in wireless radio capabilities. A non-radio-enabled version, the 600EX, is available exclusively in Europe where some countries prohibit use of the 600EX-RT's 2.4 GHz radio frequency.

Because the 600EX and 600EX-RT have many of the same components, inputs, and basic form factor as the 580EX II, I've pointed out the differences where necessary and kept figures to a minimum in this section to save space. Please refer to Figure 1.4–1.10 in the 580EX II section. Unless otherwise noted, these example figures are basically the same for the 580EX II and 600EX/600EX-RT.

600EX/600EX-RT specifications and features

This section covers some of the features available on the 600EX/600EX-RT Speedlites:

- **Guide number (GN).** The 600EX/600EX-RT's guide number is used to determine the proper exposure when shooting in Manual flash without a flash meter. With today's advanced flash systems, guide numbers are most often used to compare power output between flashes. Guide numbers are usually given for both feet and meters, so be sure that you use the right one in your calculations. The guide number varies with the zoom settings, from GN 26/85

(meters/feet) at 20mm to GN 60/197 (meters/feet) at 200mm. See your owner's manual for more information on GNs for specific zoom ranges.

- **Automatic zooming flash head.** This provides lens coverage from 20mm to 200mm. It supports up to 14mm coverage with the built-in wide-angle lens panel.
- **E-TTL.** The 600EX/600EX-RT supports E-TTL II, E-TTL, and TTL, along with full Manual flash output operation.
- **Wireless lighting.** Control up to three firing groups using ratio groups A, B, and C with the 600EX/600EX-RT in Optical Transmission Wireless Shooting mode or using a 600EX-RT set to Optical or Radio Transmission Wireless Shooting. Using a 600EX-RT in Radio Transmission Wireless Shooting mode with Group mode selected enables you to control Group mode (Gr). Control up to five different firing groups containing up to 15 Speedlites in either E-TTL II, Manual mode, or Auto external flash metering (Ext.A).
- **Group mode (Gr).** This is an exciting new feature available exclusively on the 600EX-RT Speedlite and Speedlite transmitter ST-E3-RT when used with 2012 or later EOS model cameras such as the 1D X and 5D Mark III. This feature not only allows radio-enabled wireless control of up to five groups containing up to 15 Speedlites but also permits use of mixed flash modes (E-TTL II/E-TTL, Manual, or Ext.A) for individual groups/Speedlites at the same time.

Understanding the Guide Number

The guide number (GN) is simply a measure of how powerful a flash is. In other words, a flash with a GN of 90 is more powerful than one with a GN of 40.

The GN is a number assigned by the manufacturer to assist you in obtaining the correct exposure. It is also a means of comparing light output among different Speedlites. Refer to your owner's manual for a table with the GN of the Speedlite at specific zoom ranges.

Although the actual power of the flash is fixed, the guide number (GN) of the flash changes with the ISO setting of the camera and also varies with the zoom setting of the flash. This is due to the increased sensitivity of the sensor and the actual dispersion of the light when set to a specific zoom range. When the ISO is at a higher setting, the sensor is more sensitive to light, in effect making the flash more powerful, hence a higher GN.

Also, when the zoom is set to a wide angle, the flash tube is positioned farther back in the flash head, spreading the light and giving it wider coverage. This makes the flash somewhat less bright, thereby warranting a lower GN.

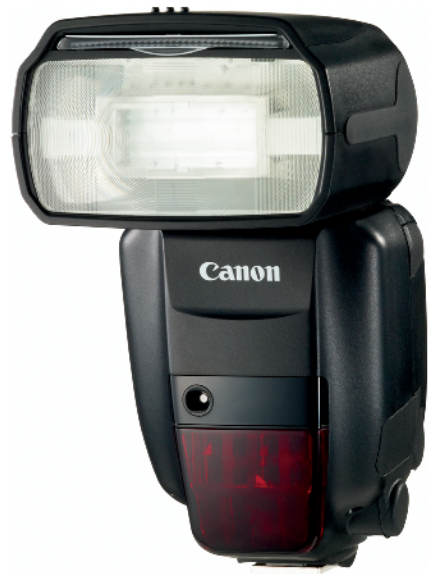
- **Second-curtain sync (▷▷▶).** This function fires the flash at the end of the exposure, rather than the beginning. This helps you capture more natural images when shooting long exposures because it causes a trail to appear behind a moving subject and not in front of it, which occurs when the flash is fired at the beginning of the exposure.
- **AF-assist beam.** To assist while focusing in low-light situations, the 600EX/600EX-RT emits a grid pattern of red light from its LED sensor.
- **High-speed sync (FP flash) (H).** This function enables you to shoot with a shutter speed higher than the top-rated sync speed of the camera. This feature is useful when shooting portraits in bright light using a wide aperture with fast shutter speeds.
- **Flash Exposure Lock (FEL).** You can use this feature to get a reading from your subject and then recompose the shot while retaining the original exposure.
- **Flash Exposure Compensation (±).** Similar to the way Exposure Compensation is set on the camera, this function allows you to adjust the light output up or down in 1/3-stop increments over a +/–3-stop range while still enjoying all the benefits of E-TTL II flash metering.
- **Modeling flash.** The 600EX/600EX-RT fires a short burst of flashes, allowing you to see what the light falling on your subject will look like. This is a battery drain and something I rarely use.
- **Multi-stroboscopic flash mode (MULTI).** The 600EX/600EX-RT fires a user-specified number of flashes per second, like a strobe light, for creative effect.
- **Tilting/rotating flash head for bouncing flash.** This allows you to tilt the flash head up to bounce light from the ceiling, or to the side to bounce light off a wall. The 600EX/600EX-RT also enables you to tilt the flash head downward –7 degrees for close-up subjects.
- **Wide panel.** A pull-out wide panel is included to extend flash output to 14mm lens coverage. This is a huge plus when doing group photography in tight quarters or using a wide-angle lens for flash work.
- **Catch-light panel.** Just above the wide panel is a retractable white panel. When it is extended, you can reflect light back into your subject's eyes, creating catch-lights and adding sparkle and vitality to the portrait.
- **PC terminal.** The 600EX/600EX-RT includes a receive-only PC sync terminal for triggering the Speedlite with radio frequency remotes like RadioPoppers, PocketWizards, or optical slave attachments.

- **External power supply socket.** For faster recycling times and longer flash shooting sessions, an external power supply socket is provided for use with the Canon CP-E4 Compact Battery Pack or third-party power supplies, such as those from Quantum.
- **External Speedlite control.** The latest Canon cameras include a menu option that enables you to set some or all of your Speedlites' controls directly from the camera depending on the model of Speedlite and camera. The benefit of this capability is that the camera's External Speedlite control menu provides more detail for the settings than the Speedlite's LCD.

Main components

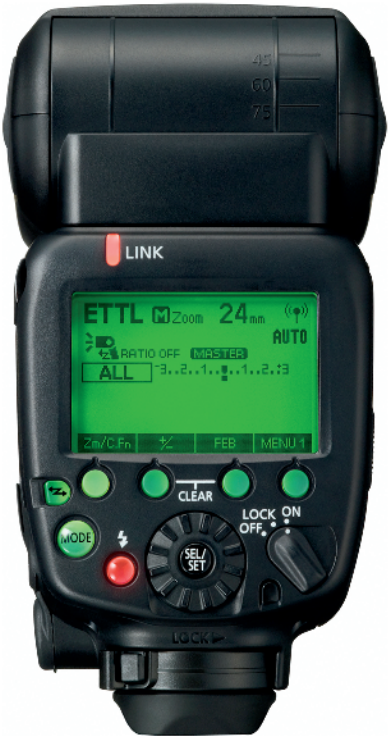
The 600EX and, to a larger extent, the 600EX-RT Speedlite are a quantum leap forward in handheld flash technology. The 600EX-RT's built-in wireless radio as well as optical-transmission capabilities open up a whole new world of creative possibilities. These are fantastic tools for creating beautiful lighting with a new level of control and freedom. With so much amazing technology and so many options now literally at your fingertips, it's easy to be a little overwhelmed at first, but grasping how to use it gets easier. I start by covering the buttons and controls and describing what each does. In later chapters, I look at when to use certain settings for the best results.

- **Flash head/Wireless transmitter.** This is where the flash tube is housed. Inside is a mechanism that zooms the flash bulb forward and back to provide flash coverage for lenses of different focal lengths. The flash head is adjustable; it can be tilted upward to a full 90 degrees and downward to –7 degrees. It can also be adjusted horizontally 180 degrees to the left or to the right. Manual zoom adjustments can also be made independently of the lens's focal-length position when a narrower, more focused beam of light is desired for creative effects.



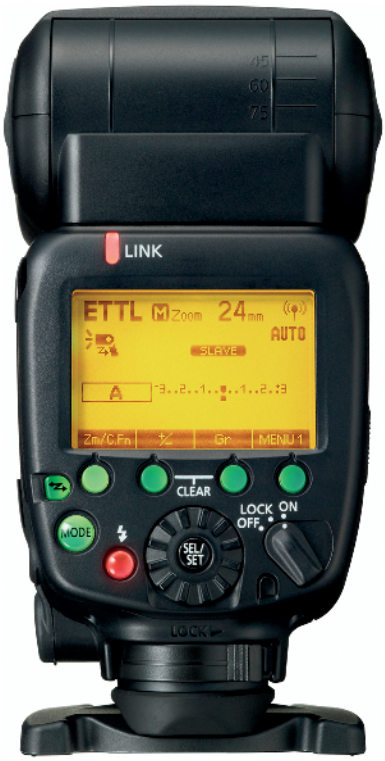
Courtesy of Canon

1.1 The front of the 600EX/600EX-RT Speedlite



Courtesy of Canon

1.2 The back of the 600EX-RT Speedlite. Here the LCD panel shows the Speedlite in Radio Transmission Wireless Shooting mode and designated as a master.



Courtesy of Canon

1.3 The back of the 600EX-RT Speedlite. Here the LCD panel shows the Speedlite in Radio Transmission Wireless Shooting mode set up as a slave. The optional orange LCD background color has been selected for use when the Speedlite is used as a slave.

- **Color filter holder attachment.** Located at the top of the flash head just behind the catch-light panel are three plastic nubs used to attach the included filter gel holder to the Speedlite.
- **Battery compartment cover.** Slide the center button left and then downward to open the spring-loaded battery compartment to load or change the batteries.
- **Wireless sensor for E-TTL and E-TTL II wireless flash.** This sensor reads signals from the master unit, enabling wireless flash operation.

- **External metering sensor.** The external metering sensor allows the flash to calculate its own light output without relying on the camera's metering system. The flash has to know camera settings (ISO, shutter speed, and aperture) to calculate the correct amount of output. External metering has to be set to Manual mode, and all the camera settings must be entered into the flash manually.
- **AF-assist beam emitter.** The 600EX/600EX-RT projects a red LED light grid onto the subject to allow the camera's autofocus system to operate successfully in low-light or low-contrast situations. The AF-assist beam is compatible with 28mm and longer lenses.
- **LINK (Radio transmission confirmation) lamp.** This lamp, located on the left side above the 600EX-RT LCD panel, changes from red to green when positive wireless radio communication has been confirmed between master and slave Speedlites.
- **Bounce angle scale.** This feature allows you to tilt the flash head from normal (0) to 45, 60, 75, or 90 degrees and to –7 degrees for close-ups. Although the flash head has detents at the values indicated on the scale, you can operate the flash at any angle between the detents.
- **Bounce Lock Release button.** This button releases the flash head lock, enabling you to adjust the angle of the flash head for bounce flash.
- **Flash head rotating-angle scale.** This feature denotes the horizontal rotation of the flash head from 0 to 60, 75, 90, 120, 150, and 180 degrees from the left. Although the flash head has detents at the values indicated on the scale, you can operate the flash at any angle between the detents.
- **LCD panel.** This is a display panel where you view and operate all the Speedlite settings, Custom Functions, and controls.
- **Function buttons.** Used in conjunction with the context-sensitive menu system, Function buttons specify settings and Custom Functions on the Speedlite.
- **Flash-ready lamp/Test flash button (ϟ).** This light indicates that the Speedlite is ready to fire and can also be used to test-fire the master and any slaves. When you're working with 600EX-RT in Radio Transmission Wireless Shooting and using off-camera slaves, a red light confirms that all slaves are ready to fire. After the Speedlite is fired, this light glows green for Quick flash, then red when the Speedlite is fully recycled and ready to fire again. Quick flash allows the flash to be fired again before it has totally recycled to its full power capacity once the lamp glows green. Quick flash is limited to between 1/6 and 1/2 of the full light output and is ideal for close subjects and when you want a shorter recycling time. Quick flash does not operate in Continuous shooting (🖵), Flash Exposure Bracketing (FEB), Manual flash, or Multi-stroboscopic flash modes.

- **Flash exposure confirmation lamp.** This lamp glows green for about 3 seconds when standard flash exposure is attained.
- **Mounting foot lock lever.** This lever locks the Speedlite with a click into the camera's hot shoe or the included Speedlite stand.
- **Wide panel.** This built-in diffuser enables you to use the Speedlite with a lens as wide as 14mm without having light fall off at the edges of the image.
- **Catch-light panel.** This white plastic card reflects light back into the eyes, providing a catch-light when the flash is used in the bounced position.
- **External power source socket.** Canon's optional CP-E4 Compact Battery Pack external power source or a third-party power supply can be plugged into this socket.
- **Bracket mounting hole.** This is used to attach the Speedlite to the Canon SB-E2 Speedlite bracket. The SB-E2 allows the Speedlite to be attached to the side of the camera rather than to the hot shoe.
- **Hot shoe mounting foot.** Picking up on improvements made on the 580EX II, the 600EX/600RT has improved contacts, is made of metal, and has a lock lever that securely connects the flash with the camera. This connector slides into the hot shoe on your camera body, locks the Speedlite to the camera with the lock lever, and is the important electrical communication connection between the flash and the camera.

Function buttons, dedicated buttons, and Select dial

The 600EX/600EX-RT's redesigned user interface of buttons and menus provides a much easier, quicker, and more intuitive way to find what you're looking for. There are now four Function buttons that work in conjunction with the context-sensitive LCD panel readout. Button functions change depending on the flash mode being used and menu screen being viewed. The new navigation system is heads and shoulders above older models. Other improvements and additions include a larger flash mode button (Mode), a dedicated wireless/Linked shooting button (⇆) that makes switching to wireless shooting a one-button operation, and a LOCK position on the ON/OFF switch to help safeguard user settings. The Select dial and center Select/Set button function as they did previously, only now within the updated menu system. I describe the controls and how to use them in this and subsequent chapters. After reading through each section, I encourage you to spend time getting acquainted with the topics covered. This way, in the future you'll be able to quickly and easily make the adjustments you want.

- **Mode button.** The Mode button is used to cycle among the different flash exposure modes of the 600EX/600EX-RT Speedlite and during wireless operation to manually adjust flash output. These are the modes:
  - **E-TTL.** The exposure is determined by a brief preflash before the main flash to obtain a more correct exposure and measure the light coming through the lens. The camera then uses this information to blend the flash output with the ambient light.
  - **M (Full Manual mode).** You can use guide numbers or determine the flash output power by taking test shots and then reviewing them on the camera's LCD monitor. Output is adjustable in 1/3-stop power settings, allowing you to fine-tune your lighting or dial in each Speedlite individually in multi-flash lighting setups. You can also use a handheld flash meter to determine the flash and camera settings.
  - **Group mode (Gr).** Group mode is available exclusively on the 600EX-RT Speedlite and Speedlite transmitter ST-E3-RT when used with 2012 or later EOS model cameras such as the 1D X and 5D Mark III. This feature allows radio-enabled wireless control of up to five groups containing up to 15 Speedlites and the use of mixed flash modes (E-TTL II/E-TTL, Manual, or Ext.A) for individual groups/Speedlites at the same time.
  - **Multi-stroboscopic flash.** This mode allows you to fire the flash multiple times during a single exposure for creative effect.
- **Wireless button/Linked shooting button ( ).** New on the 600EX/600EX-RT is a dedicated button for selecting the desired wireless mode. The 600EX permits Optical Transmission Wireless Shooting ( ) with a master and slave flashes, and the 600EX-RT allows Optical or Radio Transmission Wireless Shooting ( ) with a master and slave flashes.
- **Function button 1 – LCD Panel illumination, Zoom and Custom Functions (Zm/C.Fn).** Press this button once while in Menu screen 1 (the default screen) to manually change the flash head zoom by using the Select dial/Set button. Press and hold this button to enter the Custom Functions menus, and press again to enter Personal Functions menus. Pressing this button once also turns the LCD light on for about 10 seconds, useful for viewing settings in dim light.

CROSS REF See Chapter 2 for more on Custom Functions and their applications.

- **Function button 4 – FP flash (SYNC)/Second-curtain sync ( ).** In E-TTL flash mode, pressing Function button 4 (SYNC) sets the Speedlite to

High-speed sync (H). Pressing this button once enables you to set the flash to High-speed sync. A digital camera shutter is comprised of two *curtains,* one that opens the shutter to begin the exposure and one that closes it to end the exposure. At shutter speeds above the camera's top flash sync speed, the curtain that's closing starts moving before the curtain that's opening is fully open. This causes light from the flash to reach only a small portion of the sensor, resulting in an underexposed strip across the image. High-speed sync allows you to make flash exposures at higher-than-normal sync speeds by causing the Speedlite to repeatedly and perfectly pulse bursts of light as the shutter curtains move across the sensor instead of just one pop when the shutter first opens.

Pressing Function button 4 (SYNC) again turns on the Second-curtain sync feature. In standard flash photography, the normal operation sequence is the shutter opens and the flash fires immediately. In this mode, the flash fires at the very end of the exposure, just before the second curtain closes. To return to standard flash, push the button once again.

Both of these features work only in E-TTL and Manual flash modes, and not in the Multi-stroboscopic mode (MULTI).

- **Flash-ready lamp/Test flash button (ϟ).** Press this button when lit to test-fire the 600EX/600EX-RT and any slaves to ensure they are functioning properly or to take a test reading using a handheld flash meter. This button also lets you know when the flash is fully charged and ready to fire. When the lamp glows green, the unit is ready for Quick flash; when it glows red, the flash is ready to fire at full power.
- **Select dial and Select/Set button.** Rotate the Select dial left and right, and confirm the settings by pressing the center Select/Set button.
  - **Left and right.** When scrolling left or right, you use this button to change the zoom of the flash, select Custom Functions settings, Flash Exposure Compensation, Manual flash output, wireless status, master/slave settings, multi-stroboscopic frequencies, or flash bracketing settings.
  - **Select.** After turning the Select dial to choose the desired settings, press the Select/Set button to commit to those settings.
- **ON/OFF/LOCK switch.** This switch controls whether the Speedlite is on or off and now includes a new Lock position to help safeguard user settings.

600EX/600EX-RT accessories

The 600EX/600EX-RT ships with a soft, ballistic nylon case for storing and carrying it, and it includes a tabletop Speedlite stand that enables you to mount your flash to a

light stand or tripod. This new iteration of the case is more robust than the version included with the 580EX II. A color filter kit with two gel filters, filter wallet, filter holder and a carrying case is also included.

CROSS REF Third-party manufacturers, such as Honl Photo, ExpoImaging, and Lastolite, market many must-have Speedlite accessories discussed in detail in Chapter 5.

580EX II

The previous flagship of the Speedlite lineup, the 580EX II, debuted in May 2007 and has many improvements over its predecessor, the 580EX. It also includes many features that offer a great deal of versatility. These upgrades include a 20-percent-faster recycle time, metal mounting foot, mounting lock lever, power switch design, receive-only external PC terminal, and dust and water-resistant seals (a blessing for sports and photojournalism photographers). This is Canon's first weather-resistant flash.

580EX II specifications and features

This section covers some of the features available on the 580EX II Speedlite:

- **Guide number (GN).** A flash unit's guide number is used to determine the proper exposure when shooting Manual flash without a flash meter. With today's advanced flash systems, guide numbers are most often used to compare power output between flashes. Guide numbers are usually given for both feet and meters, so be sure that you use the right one in your calculations. The guide number varies with the zoom settings, from GN 28/92 (meters/feet) at 24mm to GN 58/190 (meters/feet) at 105mm. See your owner's manual for more information on GNs for specific zoom ranges.
- **Automatic zooming flash head.** This provides lens coverage from 24mm to 105mm. It supports up to 14mm coverage with the built-in wide-angle lens panel.
- **E-TTL.** The 580EX II supports E-TTL II, E-TTL, and TTL, along with full Manual flash output operation.
- **Wireless lighting.** You can control up to three different groups of Speedlites in E-TTL II or Manual mode.

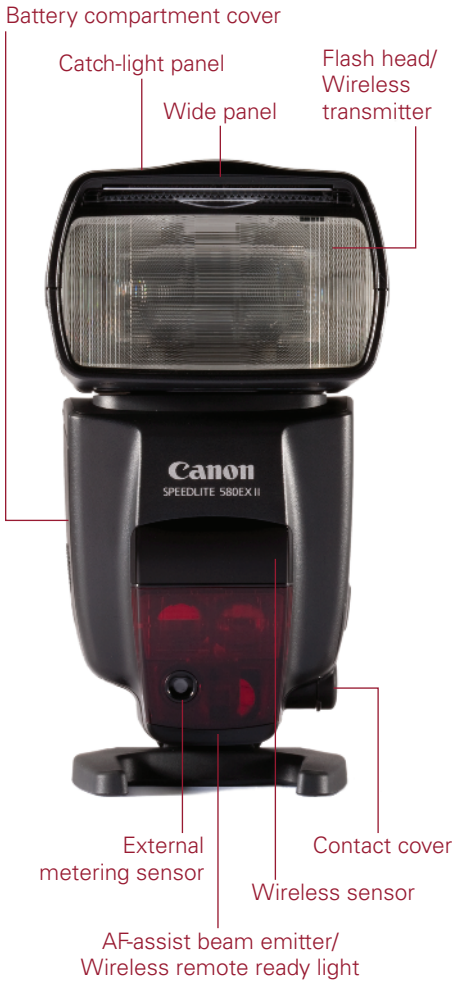
- **Second-curtain sync.** This function fires the flash at the end of the exposure, rather than the beginning. This helps you capture more natural images when shooting long exposures, because it causes a trail to appear behind a moving subject and not in front of it, which occurs when the flash is fired at the beginning of the exposure.
- **AF-assist beam.** To assist while focusing in low-light situations, the 580EX II emits a grid pattern of red light from its LED sensor.
- **High-speed sync (FP flash).** This function allows you to shoot with a shutter speed higher than the rated sync speed of the camera. This feature is useful when shooting portraits in bright light using a wide aperture with fast shutter speeds.
- **Flash Exposure Lock (FEL).** You can use this feature to get a reading from your subject and then recompose the shot while retaining the original exposure.
- **Flash Exposure Compensation.** Similar to the way Exposure Compensation is set on the camera, this function allows you to adjust the light output up or down in 1/3-stop increments over a +/–3-stop range while still enjoying all the benefits of E-TTL II flash metering.
- **Modeling flash.** The 580EX II fires a short burst of flashes, allowing you to see what the light falling on your subject will look like. This is a battery drain and something I rarely use.
- **Multi-stroboscopic flash mode.** The 580EX II fires a user-specified number of flashes per second, like a strobe light, for creative effects.
- **Tilting/rotating flash head for bouncing flash.** This allows you to tilt the flash head up to bounce light from the ceiling, or to the side to bounce light off a wall. The 580EX II also allows you to tilt the flash head downward –7 degrees for close-up subjects.
- **Wide panel.** A pull-out wide panel is included to extend flash output to 14mm lens coverage. This is a huge plus when doing group photography in tight quarters or using a wide-angle lens for flash work.
- **Catch-light panel.** Just above the wide panel is a retractable white panel. When it is extended, you can reflect light back into your subject's eyes, creating catch-lights and adding sparkle and vitality to the portrait.
- **PC terminal.** The 580EX II includes a receive-only PC sync terminal for triggering the Speedlite with radio frequency remotes like RadioPoppers, PocketWizards, or optical slave attachments.

- **External power supply socket.** For faster recycling times and longer flash shooting sessions, an external power supply socket is provided for use with the Canon CP-E4 Compact Battery Pack or third-party power supplies, such as those from Quantum.
- **External Speedlite control.** The latest Canon cameras include a menu option that allows you to set some or all of your Speedlites' controls directly from the camera depending on the model of Speedlite. The benefit of this capability is that the camera's External Speedlite control menu provides more detail for the settings than the Speedlite's LCD.

Main components

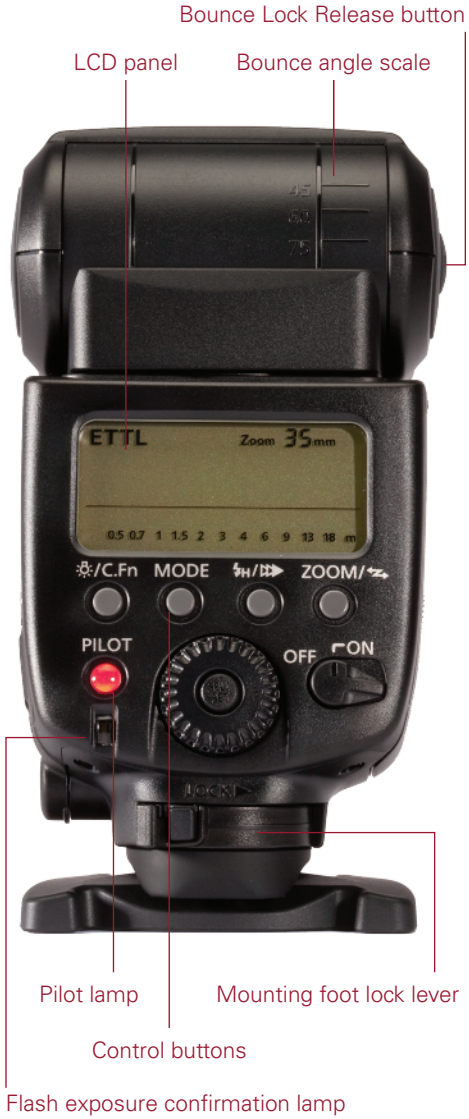
The 580EX II Speedlite is a fantastic tool for creating beautiful lighting and to start you on your way to *making* pictures instead of *taking* them. This is all the more reason why this flash can at first seem a little overwhelming at first, but grasping how to use it gets easier. I'll start by going over all the buttons and controls and describing what each does. I'll get to the "why" in later chapters.

- **Flash head/Wireless transmitter.** This is where the flashtube is housed. Inside is a mechanism that zooms the flashbulb forward and back to provide flash coverage for lenses of different focal lengths. The flash head is adjustable; it can be tilted upward to a full 90 degrees and downward to –7 degrees. It can also be adjusted horizontally 180 degrees to the left or to the right. Zoom adjustments can also be made independently of the lens's focal-length position when a more narrow, focused beam of light is desired for creative effects.



1.4 The front of the 580EX II Speedlite

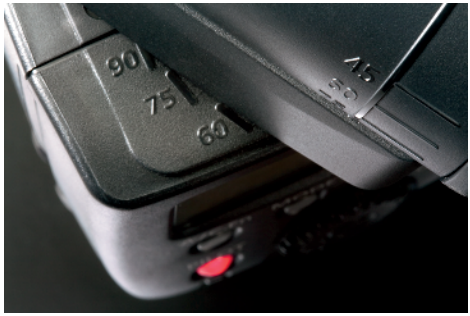
- **Battery compartment cover.** This cover is a vast improvement over the old 580EX. Slide the center button left and then downward to open the spring-loaded battery compartment to load or change the batteries.
- **Wireless sensor for E-TTL and E-TTL II wireless flash.** This sensor reads signals from the master unit, enabling wireless flash operation.
- **External metering sensor.** The external metering sensor allows the flash to calculate its own light output without relying on the camera's metering system. The flash has to know camera settings (ISO, shutter speed, and aperture) to calculate the correct amount of output. External metering has to be set to Manual mode, and all the camera settings must be entered into the flash manually.
- **AF-assist beam emitter.** The 580EX II projects a red LED light-grid onto the subject to allow the camera's autofocus system to operate successfully in low-light or low-contrast situations. The AF-assist beam is compatible with 28mm and longer lenses.



1.5 The back of the 580EX II Speedlite

- **Wireless remote ready light.** This operates as a ready light when the Speedlite is being used as a remote flash.
- **Bounce angle scale.** This feature allows you to tilt the flash head from normal (0) to 45, 60, 75, or 90 degrees and to –7 degrees for close-ups. Although the flash head has detents at the values indicated on the scale, you can operate the flash at any angle between the detents.

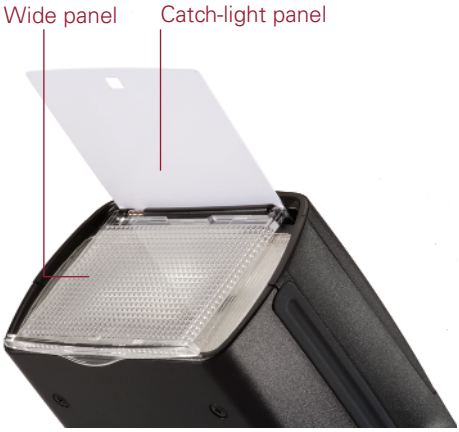
- **Bounce Lock Release button.** This button releases the flash-head lock, allowing you to adjust the angle of the flash head for bounce flash.
- **Flash head rotating-angle scale.** This feature denotes the horizontal rotation of the flash head from 0 to 60, 75, 90, 120, 150, and 180 degrees from the left. Although the flash head has detents at the values indicated on the scale, you can operate the flash at any angle between the detents.



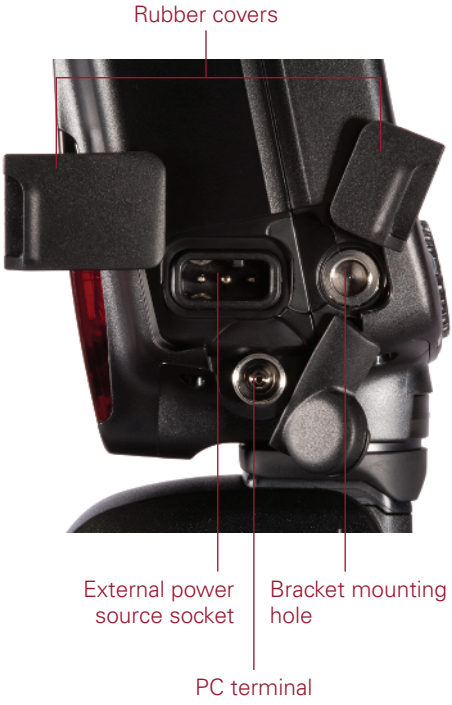
1.6 Bounce angle scale and flash head rotating-angle scale for bounce or creative flash

- **LCD panel.** This is a display panel where you view and operate all the Speedlite settings, Custom Functions, and controls.
- **Control buttons.** You can use the control buttons to specify settings and Custom Functions on the Speedlite.
- **Pilot lamp.** This light indicates that the Speedlite is ready to fire. After the Speedlite is fired, this light glows green for Quick flash, then red when the Speedlite is fully recycled and ready to fire again. Quick flash allows the flash to be fired again before it has totally recycled to its full power capacity once the lamp glows green. Quick flash is limited to between 1/6 and 1/2 of the full light output and is ideal for close subjects and when you want a shorter recycling time. Quick flash does not operate in Continuous shooting (□), FEB, Manual flash, or Multi-stroboscopic flash modes.
- **Flash exposure confirmation lamp.** This indicator glows green for about three seconds when standard flash exposure is attained.
- **Mounting foot lock lever.** This is a huge improvement over the old 580EX. This lever locks the Speedlite with a click into the camera's hot shoe or the included Speedlite stand.
- **Wide panel.** This built-in diffuser enables you to use the Speedlite with a lens as wide as 14mm without having light fall off at the edges of the image.
- **Catch-light panel.** This white plastic card reflects light back into the eyes, providing a catch-light when the flash is used in the bounced position.
- **External power source socket.** Canon's optional CP-E4 Compact Battery Pack external power source or a third-party power supply can be plugged into this socket.

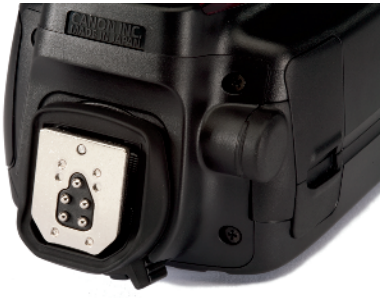
- **Bracket mounting hole.** This is used to attach the Speedlite to the Canon SB-E2 Speedlite bracket. The SB-E2 allows the Speedlite to be attached to the side of the camera rather than to the hot shoe.
- **Hot shoe mounting foot.** A major improvement over the mounting foot of the old 580EX, this new one is now made of metal and coupled with the new lock lever that securely connects the flash with the camera. This connector slides into the hot shoe on your camera body, locks the Speedlite to the camera with the lock lever, and is the important electrical communication connection between the flash and the camera.



1.7 The wide panel and the built-in catch-light panel



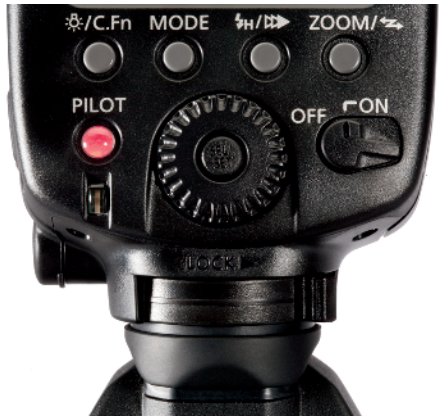
1.8 The side view of the flash



1.9 The hot shoe mounting foot

Control buttons and Select dial

There are several control buttons, a dial, and a switch on the back of the 580EX II, so I'll describe how each one operates in order to get the best results from your new Speedlite. Some of them are obvious, such as the On/Off switch, but others control the menus and settings that you select. Spend time getting acquainted with these controls; this way, in the future you'll be able to quickly and easily make the adjustments you want.



1.10 The 580EX II's main panel, showing the control buttons and Select dial

- **LCD Panel Illumination/Custom Functions (C.Fn) button.** Pressing this button once turns the LCD light on for about 10 seconds for viewing settings in dim light. Pressing and holding this button brings you to the Custom Functions menu. You can scroll through the Custom Functions by using the Select dial and choose them by pressing the Select/Set button.

CROSS REF See the tables in Chapter 2 for more on Custom Functions and their applications.

- **Mode button.** The Mode button is used to cycle among the different flash exposure modes of the 580EX II Speedlite and during wireless operation to manually adjust flash output. It has three modes:
  - **E-TTL.** The exposure is determined by a brief preflash before the main flash in order to obtain a more correct exposure and measures the light coming through the lens. The camera then uses this information to blend the flash output with the ambient light.
  - **M (full Manual mode).** You can use guide numbers or determine the flash output power by taking test shots and then reviewing them on the camera's LCD monitor. Output is adjustable in 1/3-stop power settings, allowing you to fine-tune your lighting or dial in each Speedlite individually in multi-flash lighting setups. You can also use a handheld flash meter to determine the flash and camera settings.
  - **Multi-stroboscopic flash.** This mode allows you to fire the flash multiple times during a single exposure for creative effect.

- **High-speed sync (FP flash)/Second-curtain sync button.** Pressing this button once allows you to set the flash to High-speed sync. Pressing the High-speed sync (FP flash)/Second-curtain sync button a second time turns on the Second-curtain sync feature. In standard flash photography, the normal operation sequence is the shutter opens and the flash fires immediately. In this mode, the flash fires at the very end of the exposure, just before the second curtain closes. To return to standard flash, push the button once again.

  Both of these features work only in E-TTL and Manual flash modes, and not in the Multi-stroboscopic mode.

- **Zoom/Wireless Select/Set button.** Press this button to manually change the flash head zoom by using the Select dial/Set button. Press and hold this button to enter the wireless control menu, where you set master/slave status, channel number, group designations, and slave ratios.

- **Pilot Lamp button.** Press this button when lit to test-fire the 580EX II to ensure it is functioning properly or to take a test reading using a handheld flash meter. This button also lets you know when the flash is fully charged and ready to fire. When the lamp glows green, the unit is ready for Quick flash; when it glows red, the flash is ready to fire at full power.

- **Select dial and Select/Set button.** You rotate the Select dial left and right, and confirm the settings by pressing the center Select/Set button.

  - **Left and right.** When scrolling left or right, you use this button to change the zoom of the flash, select Custom Functions settings, Flash Exposure Compensation, Manual flash output, wireless status, master/slave settings, multi-stroboscopic frequencies, or flash bracketing settings.

  - **Select.** After turning the Select dial to choose the desired settings, press the Select/Set button to commit to those settings.

580EX II accessories

The 580EX II ships with a soft, ballistic nylon case for storing and carrying it, and includes a tabletop Speedlite stand that enables you to mount your flash to a light stand or tripod.

CROSS REF Third-party manufacturers, such as Honl Photo and ExpoImaging, market other accessories for your 580EX II, and these accessories are discussed in detail in Chapter 5.

430EX II

Introduced in the fall of 2008, the 430EX II is the middle child in the Canon Speedlite System; it includes many of the improvements built into the 580EX II, such as wireless control, a built-in wide-angle lens panel, and the very popular metal mounting foot and quick lock/quick release lever to securely mount it to your camera. The 430EX II is a step up for photographers accustomed to shooting with their camera's built-in flash, and offers more power, a higher guide number, and a tilting/rotating flash head for bounce-flash lighting techniques, which is not possible with the pop-up flashes.

430EX II specifications and features

As the intermediate flash in the Canon line, the 430EX II has less power, fewer features, a lower guide number range, and about 35-percent less reach than the 580EX II. Its major limitation for advanced use is that it cannot be used as a wireless controller in a multiple flash system. However, it can operate as a slave when combined with a Speedlite capable of master control, such as the 550EX, 580EX, or 580EX II, either of the Macro Speedlites, or the ST-E2 Speedlite transmitter. In all cases, the master controller must be mounted on the camera's hot shoe in order to use a 430EX II wirelessly off camera as a fill flash.

The 430EX II also cannot run from an external power source, which may be required to extend flash capacity and shorten recycle time in high-use situations, such as weddings.

This section provides a brief look at different features that are available on the 430EX II Speedlite. It is important to note, however, that some of its features may not be available, depending on the camera body you are using.

- **Guide number (GN).** The guide number varies with the zoom settings of the flash head, from GN 25/82 (meters/feet) at 24mm to GN 43/141 (meters/feet) at 105mm. See your owner's manual for more information on GNs for specific zoom ranges.
- **Automatic zooming flash head.** The 430EX II provides lens coverage from 24mm up to 105mm. It provides 14mm with the included wide panel.
- **E-TTL.** The 430EX II supports E-TTL II, E-TTL, TTL, and full manual operation.
- **AF-assist beam.** The 430EX II emits a grid of light from a red LED to assist in focusing in low-light situations.
- **High-speed sync (FP flash).** This function allows you to shoot with a shutter speed higher than the rated sync speed of the camera. This feature is useful when shooting portraits in bright light using a wide aperture with fast shutter speeds.

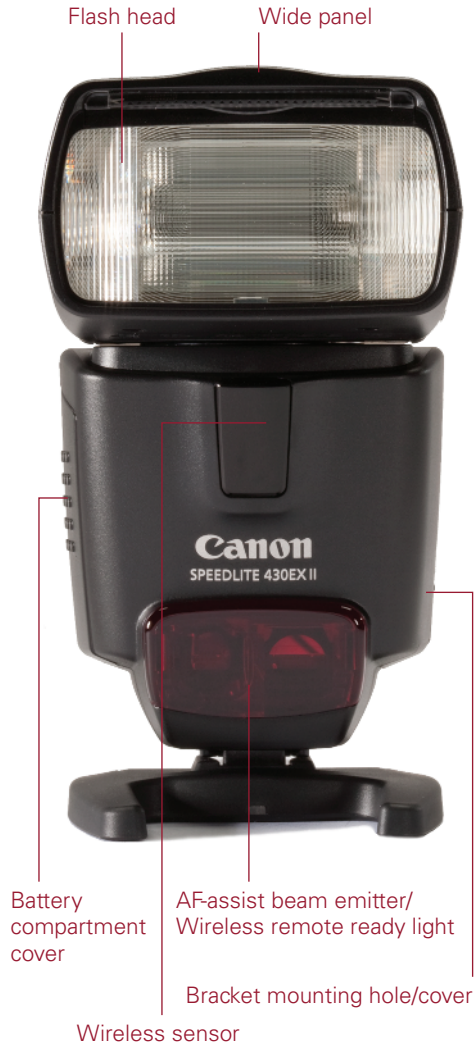
- **Flash Exposure Lock (FEL).** You can use this feature to get a reading from your subject and then recompose the shot while retaining the original exposure.
- **Flash Exposure Compensation.** Similar to the way Exposure Compensation is set on the camera, this function allows you to adjust the light output up or down in 1/3-stop increments over a +/– 3-stop range and still enjoy all the benefits of E-TTL II flash metering.
- **Modeling flash.** The 430EX II releases a short burst of flashes, allowing you to see what the light falling on your subject looks like.
- **Tilting/rotating flash head for bouncing flash.** This allows you to tilt the flash head up to bounce light from the ceiling, or to the side to bounce light off the wall.
- **Wireless sensor for E-TTL II wireless flash.** This sensor reads signals from the master unit, enabling wireless flash operation. The 430EX II can only be used as a slave unit in wireless flash operation.

Main components

The main controls of the 430EX II are located in the same configuration as the 580EX II with the exception of the Select/Set dial, which has been replaced with +/– buttons to the left and right of the Set button.

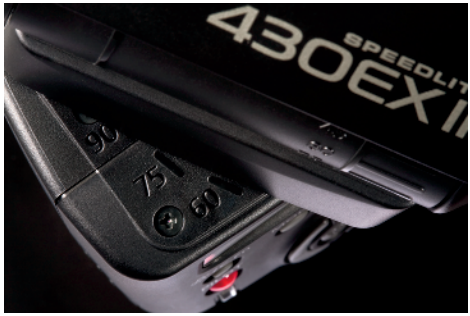
- **Flash head.** This is where the flashtube is housed. Inside is a mechanism that zooms the flashbulb forward and back to provide flash coverage for lenses of different focal lengths. The flash head is adjustable; it can be tilted upward to a full 90 degrees. It can also be adjusted horizontally 180 degrees to the left or 90 degrees to the right. Zoom adjustments can also be used independently of the lens's focal length position when a more narrow, focused beam of light is desired for creative effects.
- **Bounce Lock Release button.** This button releases the flash-head lock, allowing you to adjust the angle of the flash head for bounce flash.
- **Battery compartment cover.** You slide the cover downward to open the battery compartment to load or change the batteries.
- **Wireless sensor for E-TTL II wireless flash.** This sensor reads signals from the master unit, enabling wireless flash operation.
- **AF-assist beam emitter.** The 430EX II projects a red LED light-grid onto the subject to aid the camera's autofocus system to operate successfully in low-light or low-contrast situations. The AF-assist beam is compatible with 28mm and longer lenses.

- **Wireless remote ready light.** This operates as a ready light when the Speedlite is being used as a remote flash.
- **Bounce angle scale.** This feature allows you to tilt the flash head up from 0 (normal) to 45, 60, 75, or 90 degrees. While the flash head has detents at the values indicated on the scale, you can operate the flash at any angle between the detents.
- **Flash head rotating-angle scale.** This feature denotes the horizontal rotation of the flash head from 0 (normal) to 60, 75, 90, 120, 150, and 180 degrees from the left. To the right, it can be adjusted to 60, 75, and 90 degrees. While the flash head has detents at the values indicated on the scale, you can operate the flash at any angle between the detents.
- **LCD panel.** This is a display panel where you view and control all of the Speedlite settings, Custom Functions, and controls.
- **Control buttons.** You can use these buttons to specify settings and Custom Functions on the Speedlite.

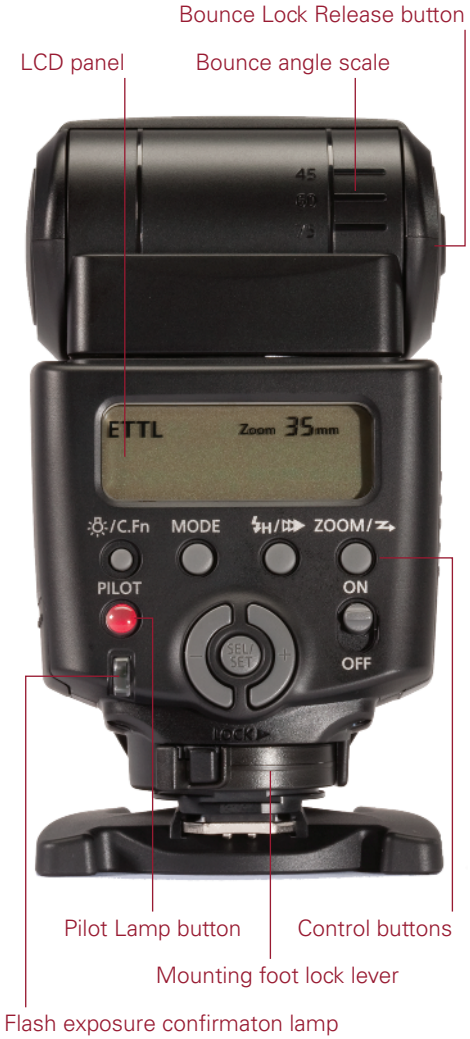


1.11 The front of the 430EX II Speedlite

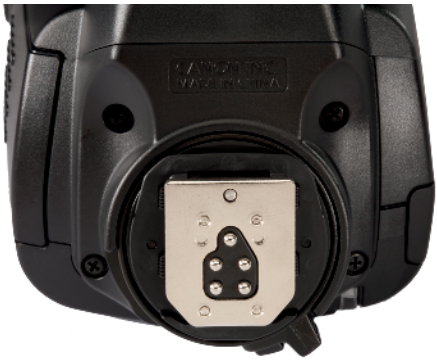
- **Pilot Lamp button.** Press this button when illuminated to test-fire the 430EX II to ensure it is functioning properly or to take a test reading using a handheld flash meter. This button also lets you know when the flash is fully charged and ready to fire. When the lamp glows green, the unit is ready for Quick flash; when it glows red, the flash is ready to fire at full power.
- **Flash exposure confirmation lamp.** This indicator glows green for about three seconds when standard flash exposure is attained.
- **Hot shoe mounting foot.** A major improvement over the mounting foot of the old 430EX, this new one is made of metal and coupled with the new mounting lock lever that securely connects the flash with the camera. This connector slides into the hot shoe on your camera body and locks the Speedlite to the camera with the lock lever. It is the important electrical communication connection between the flash and the camera.
- **Wide panel.** This built-in diffuser enables you to use the Speedlite with a lens as wide as 14mm without having light fall off at the edges of the image.



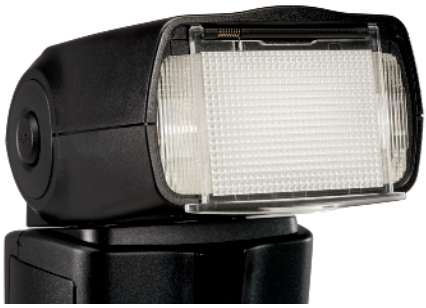
1.12 Flash head tilting/rotating-angle scale



1.13 The back of the 430EX II Speedlite



1.14 Hot shoe mounting foot and lock lever



1.15 Wide panel

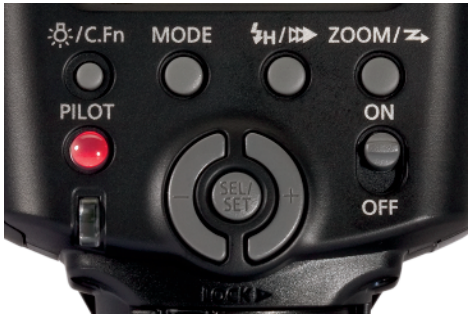
Control buttons

There are several control buttons and a switch on the back of the 430EX II, so I'll describe how each one operates so that you can get the best results from your new Speedlite. Some of them are obvious, such as the On/Off switch, but others control the menus and settings that you select. Spend time getting acquainted with these controls, this way in future you'll be able to quickly and easier make the adjustments you want.

- **LCD Panel Illumination/Custom Functions (C.Fn) button.** Pressing this button once turns the LCD light on for about 10 seconds for viewing settings in dim light. Pressing and holding this button brings you to the Custom Functions menu. You can access the Custom Functions by using the +/– buttons, and choose them by pressing the Select/Set button.

CROSS REF See the table in Chapter 2 for more on Custom Functions and their applications.

- **Mode button.** The Mode button is used to switch between the different flash exposure modes of the 430EX II Speedlite and in wireless operation is used to manually set flash output. The two modes are:



1.16 The 430EX II control panel

- **E-TTL.** The exposure is determined by a brief preflash before the main flash in order to obtain a more correct exposure and measures the light coming through the lens. The camera then uses this information to blend the flash output with the ambient light.
- **M (full Manual mode).** You determine the flash power by guide numbers or taking test shots and then reviewing on the camera's LCD monitor. Output is adjustable from 1/1 (full) to 1/64 power in 1/3-stop intervals, allowing you can fine-tune your lighting or dial in each Speedlite individually in multi-flash lighting setups. You can also use a handheld flash meter to determine the flash and camera settings.

- **High-speed sync (FP flash)/Second-curtain sync button.** Pressing this button once allows you to set the flash to High-speed sync. Pressing it a second time turns on the second-curtain sync feature. In standard flash photography, the normal operation sequence is the shutter opens and the flash fires immediately. In this mode, the flash fires at the very end of the exposure, just before the second curtain closes. To return to standard flash, push the button once again.
- **Zoom/Wireless Selection/Set button.** Press this button to manually change the flash head zoom using the +/– buttons. Press and hold this button to enter the wireless control menu, where you set slave status, channel number, and slave groups.
- **Pilot Lamp button.** Press this button when lit to test-fire the 430EX II to ensure it is functioning properly or to take a test reading using a handheld flash meter. This button also lets you know when the flash is fully charged and ready to fire. When the lamp glows green, the unit is ready for Quick flash; when it glows red, the flash is ready to fire at full power.
- **Select/Set and +/– buttons.** You press the right and left +/– buttons to change the settings, and confirm them by pressing the center Select/Set button.
  - **+/– buttons.** You use these buttons to change the zoom of the flash, Flash Exposure Compensation, Manual flash output, wireless status, slave settings, flash bracketing settings, or Custom Functions.
  - **Select/Set.** The center button is the Select/Set button. You use this button to confirm the flash settings that you have selected by turning the Select dial.

430EX II accessories

The 430EX II ships with a soft case for storing and carrying it, and includes a tabletop Speedlite stand that enables you to mount your flash to a light stand or tripod.

CROSS REF Third-party manufacturers such as Honl Photo and ExpoImaging market other accessories for your 580EX II, and these accessories are discussed in detail in Chapter 5.

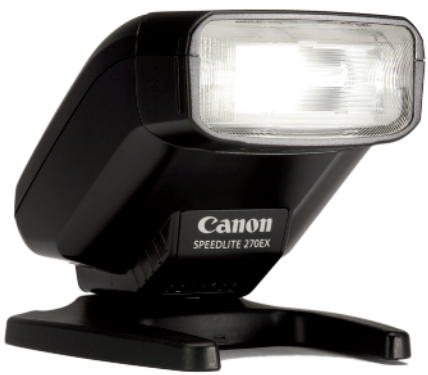
Other Components of the Speedlite System

Becoming familiar with your new flash equipment is the first step in learning about lighting and understanding the creative possibilities of wireless flash. As exciting as that might seem, it's only the first phase of the complete Canon Speedlite System. There are additional items that round out the system, each designed for specific lighting tasks.

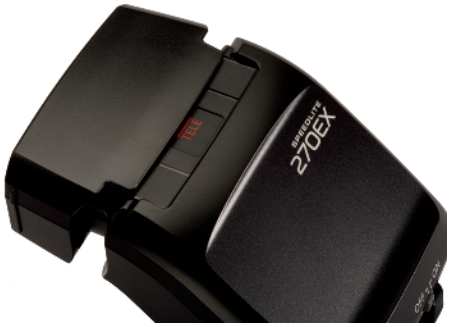
270EX

Released in May 2009, the Speedlite 270EX replaced the 220EX. Compact and lightweight, the 270EX expands your camera's capabilities over the on-board pop-up flash in a highly portable unit that fits in your shirt pocket. The 270EX is powered by two AA batteries instead of four, like most other Speedlites, seriously lightening the weight of this flash.

The biggest improvement over the 220EX is the bounce-capable flash head. Although the adjustment range is limited (90 degrees tilt, no rotation), the bounce capability is a big plus compared to a fixed flash head like the 220EX. Also important is the new two-position manual Tele-zoom option, which allows the 270EX to concentrate its light on



1.17 The Canon Speedlite 270EX



1.18 The Canon Speedlite 270EX Tele-zoom/bounce head

the subject, allowing creative choices not previously available with this model, making more efficient use of its power, and extending its useful distance.

Several features incorporated in Canon's newer flashes are inherited by the 270EX. These include the ability to control flash settings from a compatible camera's menu (including Manual flash mode settings), the communication of color temperature information with a compatible camera (for optimal white balance), and silent recycling. The lack of a slave function on this model may be a drawback for some.

270EX II

The 270EX II replaces the 270EX as Canon's entry-level, inexpensive, and lightweight flash. Compatible with all EOS and PowerShot cameras, its small size makes it a perfect mate for the PowerShot line.

One big difference between the 270EX and the upgraded 270EX II is that you can use this flash wirelessly off camera. The back of the Speedlite now has a slave switch. Being able to use this flash off camera, controlled by a line-of-sight master such as a 580EX II, ST-E2 Speedlite transmitter, or an integrated Speedlite controller included on some camera models (7D, 60D and Rebel T3i/600D) make the 270EX II a very useful little Speedlite. Add to that the bounce-capable tilting flash head (a carryover from the 270EX), and the benefits of this small, inexpensive flash are clear.

A cold shoe flash stand is now included as well, making it easy to position the Speedlite off camera where desired.

NOTE A cold shoe is a receptacle for the flash's hot shoe foot that does not have a provide a wired connection between the camera and the Speedlite.

One interesting new feature on this model is its ability to remotely trigger the camera with a 2-second delay using the small Remote button on the side of the flash head. This feature works with all EOS model cameras compatible with the RC-6 Remote Controller.

A few of the things lacking on the 270EX II are the ability to use it as a master, a way to change settings from the flash itself (you have to use the camera's menu system on compatible models), and a flash head that swivels.

320EX

The 320EX is a newer model in the Canon Speedlite lineup. It fills the gap between the 270EX II and 430EX II. It is most similar to the 430EX II; however, it's smaller and

slightly less powerful. Because it's so close in size, power, and price to the 430EX II, it's worth comparing the two and seeing which one meets your needs.

The 320EX and 430EX II are both midrange flashes, both medium priced, both medium power, both good starter flashes, and both function as remote slaves. One big difference between the two is the 320EX's LED light intended for video capture. The big difference between the 430EX II and 320EX is that the 320EX is not only a flash but also a continuous light source. Having the ability for continuous light sounds like a useful feature; however, there are some real drawbacks in its current iteration. The LED isn't very strong, and its small size is also an issue. You can only get a small amount of light from an LED the size of the one included on the 320EX. It's certainly not strong enough to overpower the sun in backlit situations. For practical purposes, any real-world video applications would require a much larger video light. In very dark situations, with the camera's ISO rating set to 800 or above and your widest available aperture selected, the LED does a fair job of illuminating subjects that are very close to the Speedlite.

When it comes to still photography, the 430EX II outshines the 320EX in the following areas: It's slightly more powerful (important for bounce flash where you need the power you can get) and the 430EX II can have manual power settings dialed in from the back of the flash while the 320EX lacks this ability. This means it can only be used in E-TTL mode or changed via the menu system on certain Canon dSLRs. One of the other big downsides of this flash is that you can't use it in full Manual (**M**) mode triggered wirelessly with radio triggers such as PocketWizards.

Another important difference between the 430EX II and 320EX is that the 320EX lacks a focus assist beam emitter that helps you focus in low-light situations. Instead, the 320EX uses a burst of preflashes from the flash head. Because this is annoying for subjects, it restricts my applications for this flash. For example, I wouldn't use it for event photography.

The 320EX lacks an automatic zoom head. When using a zoom lens, you have to manually adjust the flash head by pulling it out. This is easy to forget. Also absent from the 320EX is a pop-out wide panel diffuser and white bounce card.

Unfortunately, it seems like the 320EX tries to do too many things and ends up doing none of them well. I think the 430EX II is a better and more useful investment.

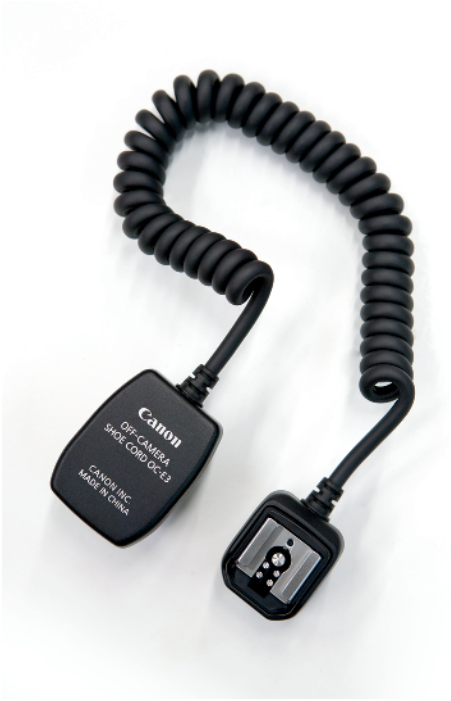
OC-E3 Off-Camera Shoe Cord

The Canon OC-E3 Off-Camera Shoe Cord supports all Speedlites and maintains all on-camera flash functions, including E-TTL II for Canon Speedlites used off-camera at distances up to 2 feet. It is compatible with all Canon EOS cameras, except for the 630 and RT.

One end of the cord mounts in the camera hot shoe, and the Speedlite mounts in the hot shoe foot at the other end of the cord. The foot is threaded so that it can be mounted on a tripod.

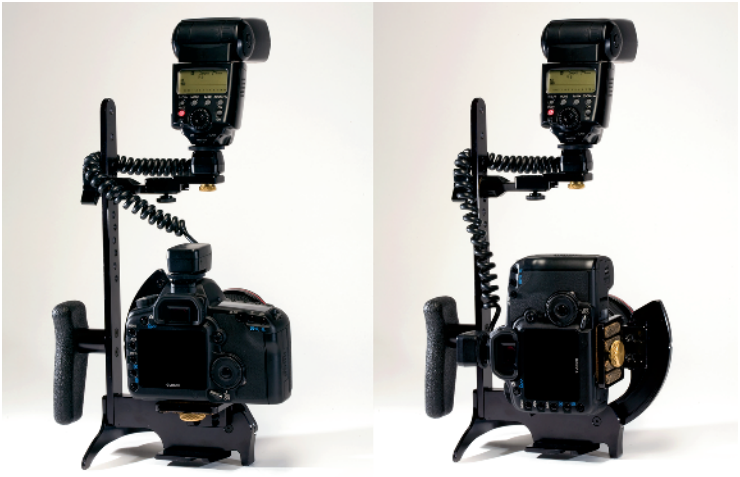
The OC-E3 has been improved with better sealing against dust and moisture, similar to the weather-resistant design of the EOS 1D Mark III and the 580EX II flash. It also now features a sturdier metal foot.

The Off-Camera Shoe Cord allows you to use your flash either handheld or with a flash bracket. Using the cord with a flash bracket allows the flash to stay above the lens axis and communicate with the camera whether in a horizontal or vertical position.



1.19 The Canon OC-E3 Off-Camera Shoe Cord

Shooting flash off axis from the lens allows you to light your subject directionally and adds three-dimensionality and modeling to your flash photos by having the light come from the side, thus creating highlights and shadows.

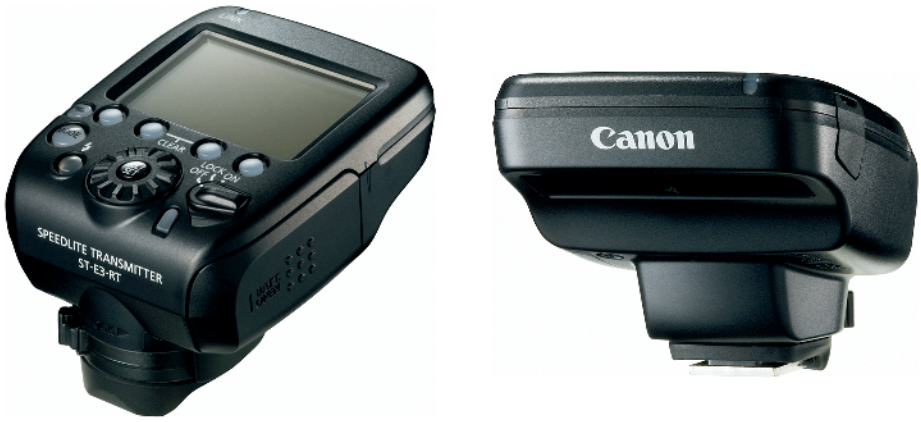


1.20 The Canon OC-E3 Off-Camera Shoe Cord used with a flash bracket

Speedlite transmitter ST-E3-RT

The radio-enabled Speedlite transmitter ST-E3-RT is a wireless controller that currently works exclusively with 600EX-RT Speedlites. This 2.4-GHz radio transmitter is exclusively radio based and therefore not backward compatible with Speedlites that communicate wirelessly using optical transmitters. In addition to built-in radio communication, the ST-E3-RT is lightweight, slimmer, and much lower in profile than the ST-E2. In a stroke of genius, the designers and engineers at Canon made the ST-E3-RT an almost exact duplicate of the 600EX-RT only without the flash head and an AF-assist beam. This makes learning how to use it a snap because once you've learned how to operate the 600EX-RT you've essentially learned how to use the ST-E3-RT, and vice versa.

When attached to your camera's hot shoe, the ST-E3-RT becomes the control center (master) for your radio-based wireless Speedlite use. Keep in mind that 2012 or later EOS camera models are required for full access to the camera's onboard external Speedlite menus and full radio-based functionality. However, everything you need is easily accessible using the improved interface and navigation on the new LCD panel located on top of the Speedlite transmitter ST-E3-RT.



Courtesy of Canon

1.21 The Canon Speedlite transmitter ST-E3-RT

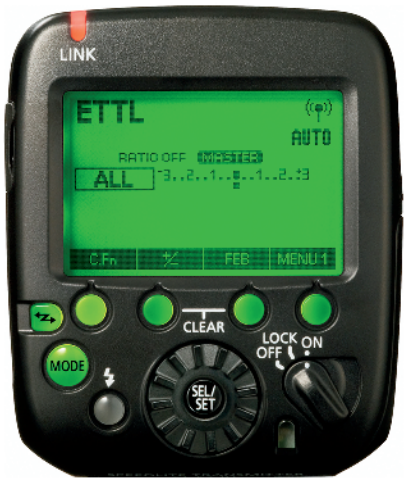
In E-TTL mode, using ratios, the ST-E3-RT can trigger three groups of flashes, A:B and C groups. One of the really exciting new features of the ST-E3-RT and 600EX-RT is Group mode (Gr). Using this mode, you can fire up to five slave groups containing up to 15 slave Speedlites. Each one of these groups can be independently controlled, their power output can be adjusted, they can be remotely powered on and off, and mixed flash modes can be assigned to each group. This a great feature because it

allows you to shoot with a mixture of Speedlites in different flash modes, some in E-TTL and some in Manual, all at the same time and all controlled right from the ST-E3-RT. Having this capability provides tremendous flexibility, enabling you to leverage the best aspects of each flash mode in one exposure. The ST-E2's ratio, Flash Exposure Compensation, Flash Exposure Bracketing, and High-speed sync capabilities have been carried over to this model with a much improved navigation system for accessing and controlling them.

The ST-E3-RT's built-in radio-enabled transmitter is rated for a wireless radio communication range of up to 98 feet when used with 600EX-RT Speedlites. Because it is radio based, it suffers none of the limitations common with optically based communication systems such as limited distance and the necessity for an unobstructed line of sight between master and slave wireless sensors. Two-way radio communication between master and slaves is another first for the ST-E3-RT and 600EX-RT. This feature provides feedback on the master about whether slave units are communicating with the master and ready to fire. The master and each slave have a Link lamp above the LCD panel that switches from red to green when successful communication has been established. The Flash Test button (ϟ) below the LCD displays a red light when all slaves are ready to fire. When shooting with slaves and using Group mode (Gr) or shooting using Speedlites in ratio groups, a lightning bolt symbol also appears next to each slave represented on LCD when it's ready to fire.

As mentioned previously, the ST-E3-RT is almost an exact duplicate of the 600EX-RT and therefore shares all its great new features such as a large LCD panel, optional LCD background colors, legible dot matrix LCD text, understandable language for Custom Functions (C.Fn) and Personal Functions (P.Fn), consistent menu item placement, intuitive navigation, and four Function buttons that work in conjunction with the context-sensitive LCD menu system.

For radio control of one or more off-camera Speedlites, the Speedlite transmitter ST-E3-RT is an indispensable tool that provides 98 feet of cable-free range without the limitations of optical systems. It's powered by 2 AA lithium batteries, a better choice than the less common and sometimes harder to find CR123 battery used in



Courtesy of Canon

1.22 The ST-E3-RT LCD panel

the ST-E2. I prefer to use rechargeable AAs for the ST-E3-RT. The lack of an AF-assist beam is the one unfortunate omission on the ST-E3-RT and something Canon will hopefully address in the next version. At this point, low-light shooters will probably also want an additional 600EX-RT to help lock focus via the built-in AF-assist beam as well as communicate exposure information to the slaves.

Table 1.1 describes the ST-E3-RT Custom Functions and Table 1.2 reviews the ST-E3-RT Personal Functions.

Table 1.1 Speedlite Transmitter ST-E3-RT Custom Functions

Custom Function Number	Function	Settings and Description
C.Fn-01 (z)	Auto power off	0–Enabled/1–Disabled. Auto power off turns the flash off automatically after a certain period of inactivity (not user-specified, but between 1.5 minutes to 15 minutes) to save battery power. Press the shutter button or Pilot Lamp button to reactivate the Speedlite. I choose 1 to disable this function whenever I'm working with off-camera Speedlites.
C.Fn-02 (MODELING)	Modeling flash	0–Enabled (DOF preview button)/1–Enabled (Test-firing button)/2–Enabled (both buttons)/3–Disabled.
C.Fn-03 (AUTO CANCEL)	Flash exposure bracketing (FEB) auto cancel	0–Enabled/1–Disabled. This controls the FEB auto cancel feature. After three shots are taken, FEB is automatically canceled. Set to 1 to continue taking FEB photos in sets of three.
C.Fn-04	Flash exposure bracketing (FEB) sequence	0–minus exposure, plus exposure/1–minus exposure, on stop, plus exposure. I set this to 1 because on my computer, I like to see the pictures in exposure order sequence to pick the best one.
C.Fn-07 (TEST)	Test-firing with autoflash	0–1/32 power/1–full power. This allows the user to set the power level of the test flash. I use 0 to save battery life when I just want to check if the flash is working, and 1 when I'm metering the flash output with a handheld light meter.
C.Fn-13	Flash exposure metering setting	0–Speedlite button and dial/1–Speedlite dial only. Setting 1 saves you a step and time by not having to press the Select/Set button on the Speedlite to access FEC settings. You simply turn the dial to the desired FEC setting and shoot.

Custom Function Number	Function	Settings and Description
C.Fn-20 (🔊)	Beep	0–OFF (disable)/1–ON (enable). Setting 1 enables a beep to sound when a Speedlite or slave in Radio Transmission Wireless Shooting is fully charged. The beep also sounds when the Speedlite is restricted from firing due to excessive heat in the flash head. I keep this set to 0 to be less intrusive when shooting.
C.Fn-22 (☀)	LCD panel illumination	0–On for 12 sec./1–OFF (Disable illumination)/2–On (Illumination always on). Change the amount of time the LCD illuminates when the dial or buttons are operated. I use 0–On for 12 sec.

Table 1.2 Speedlite Transmitter ST-E3-RT Personal Functions

Personal Function Number	Function	Settings and Description
P.Fn-01 (◐)	LCD panel display contrast	Five levels of LCD panel contrast adjustment
P.Fn-03 (☀)	LCD panel illumination color: Master	0–GREEN (green)/1–ORANGE (orange). Select an LCD panel illumination color for the master Speedlite used during radio or optical transmission linked shooting.
P.Fn-04 (☀)	LCD panel illumination color: Slave	0–GREEN (green)/1–ORANGE (orange). Select an LCD panel illumination color for the slave Speedlite(s) used during radio or optical transmission linked shooting. I set the LCD panel color for slaves to 1–ORANGE (orange) to help more easily distinguish them as slaves.

Custom and Personal Functions can be cleared using the menu system on compatible digital cameras and by pressing Function button 2 (CLEAR) and then Function button 1 (OK) on the 600EX/600EX-RT and Speedlite transmitter ST-E3-RT. Custom Functions that have been set are cleared.

ST-E2 wireless transmitter

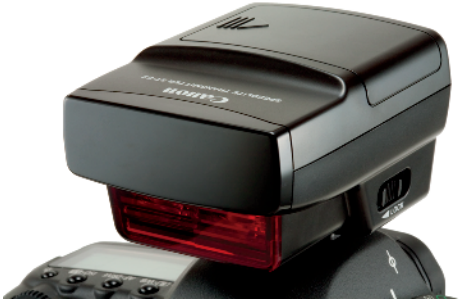
For the ease of controlling multiple wireless Speedlites, or when the OC-E3 Off-Camera Shoe Cord is just not long enough, the Speedlite transmitter ST-E2 is an

attractive option. Attached to the camera's hot shoe, the ST-E2 is an infrared wireless master control unit for the Canon Speedlite System. It functions in much the same way as the 580EX II does in master mode. This wireless flash controller transmits an infrared trigger, exposure information, and flash ratios to all EX-series Speedlites. The ST-E2 also includes a powerful infrared AF-assist beam, a welcome feature in nighttime shooting or for EOS cameras that lack one.

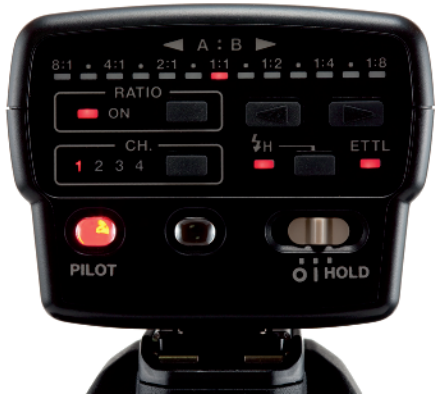
The ST-E2 transmitter slides into the hot shoe of your camera like any other Speedlite and is used to wirelessly control the Speedlites. It is smaller and lighter than any Speedlite, and its power source is a 2CR5 lithium battery, common in older EOS film cameras. It attaches to the camera with a plastic mounting foot much like older Speedlites, but it includes a very secure shoe lock slider switch instead of a mounting lock wheel.

Each channel can be used to control any number of flashes in two groups. From the ST-E2, you can control the output of each group individually in a ratio of up to a 3-stop range in 1/2-stop increments. The wireless range is greater indoors than outdoors, but I have achieved good communication results by turning the Speedlite's base to face the camera/transmitter and repositioning the flash head toward the subject.

The ST-E2 transmitter also has four independent channels, for those rare situations where you may be working near other photographers using ST-E2 wireless transmitters. You can change your wireless setup to a different channel so that someone else's transmitter won't fire your flashes and your transmitter won't fire theirs. I have never been in this situation, but it's nice to know the technology is there when you need it.



1.23 The Canon ST-E2 wireless transmitter



1.24 The rear control panel of the Canon ST-E2 wireless transmitter

The ST-E2 transmitter is a great tool for wireless control of Canon Speedlites, but it does have a few limitations. The main one for me is that it only allows you to shoot in E-TTL mode. This is fine for those setups where I'm only using a few Speedlites off camera and I want to control the flash output ratio of the flashes right from the camera. But when things really get creative out in the field, I switch to Manual exposure and replace the ST-E2 with PocketWizards for wireless control and full manual output. Secondly, the ST-E2 has a much shorter range and effectiveness outdoors. This is because the triggering signal is light based (infrared) rather than the radio frequency technology utilized by remotes, such as RadioPoppers or PocketWizards. It also only controls two groups of flashes, A + B, while the 580EX II set as the master can control three, A + B + C. One of the benefits of using the ST-E2 is not having to sacrifice one of your Speedlites for use on camera as a master controller.

Macro Twin Lite MT-24EX

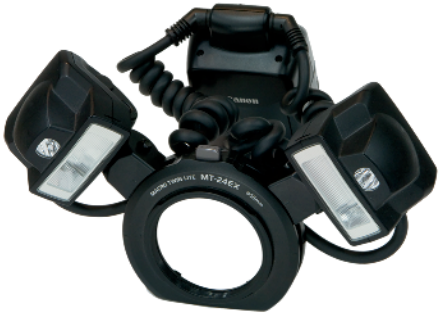
Macro photography presents the photographer with specific problems to overcome. Often, the close subject distances of macro photography require smaller aperture openings to obtain adequate depth of field. Smaller f-stops require a lot of light or very slow shutter speeds, which is not always possible with subjects, such as swaying flowers or flying bees. Slower shutter speeds usually necessitate the use of a tripod and a stationary subject.

The Macro Twin Lite MT-24EX addresses these concerns in a compact and balanced unit. Its two small flash heads connect to a mounting ring that attaches directly to the front ring of the Canon EF 50mm f/2.5 Macro lens, Canon EF 100mm f/2.8 Macro USM lens, MP-E 65mm 1–5x f/2.8 Macro lens, or Canon's EF 100mm f/2.8L Image Stabilized USM lens.

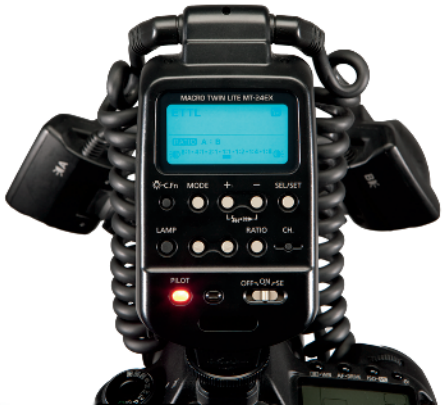
To mount the Canon Macro Twin Lite on the Canon EF 180mm f/3.5 L USM Macro lens, you need the optional Canon Macro Lite Adapter 72C. These flash heads can be positioned, locked in place, individually turned on or off, or even removed from the mount ring and repositioned for greater creative control.

Two features are included to make focusing and illuminating your subject easy. On-board focusing lamps in each of the flash heads light up for 20 seconds or until you depress the shutter button. Modeling flash releases a short burst of flashes, allowing you to see what the light falling on your subject looks like.

The MT-24EX incorporates many of the features of the top-of-the-line Canon flashes, such as Flash Exposure Compensation, Flash Exposure Bracketing, High-speed sync, and adjustable output ratios between the two flashes by a 3-stop range in 1/2-stop increments.



1.25 The Canon Macro Twin Lite MT-24EX



1.26 Control panel of the Macro Twin Lite MT-24EX

The MT-24EX supports wireless operation and can act as a master to trigger other compatible Speedlites for full E-TTL flash metering. It can also be set to work in conjunction with any number of other Speedlites on the same or different channels. To further fine-tune your macro lighting, you can set flash IDs A and B for the built-in flash heads and set any additional slave units to A, B, or C. Other convenient features include full E-TTL exposure, as well as M (Manual) for full control, incandescent focusing lamps, modeling flash operation via camera buttons, and many user-set Custom Functions.

The Macro Twin Lite MT-24EX is powered by four AA lithium, alkaline, or NiMH rechargeable batteries and includes a socket for Canon's optional CP-E4 Compact Battery Pack external power source or a third-party power supply.

For general macro photography, you may find the flash illumination to be a little harsh. To resolve this situation, you can change the ratios so that one flash is stronger than the other; Sto-Fen also makes a nice little set of frosted diffusers specifically for the MT-24EX to soften the light for a more natural look.

Macro Ring Lite MR-14EX

Similar in design to the Macro Twin Lite MT-24EX, the Macro Ring Lite MR-14EX is a Speedlite flash that is geared toward macro and close-up photography but yields a different look due to its unique construction. Two output-adjustable flash tubes encircle the lens and produce shadowless lighting of small subjects.

To make focusing and illuminating your subject easier, the Macro Ring Lite includes on-board focusing lamps between the flashtubes. These focusing lamps light up for

20 seconds or until you depress the shutter button. The modeling lamps release a series of short bursts of light, allowing you to preview what the light falling on your subject looks like.

Long a staple in the medical and dental industries for producing detailed before-and-after images of procedures, the ring light creates the most uniform lighting of small subjects. Because the light is emitted from all around the lens, shadows are eliminated and any reflective surfaces on your subject, such as an insect's covering or eyes, may reveal a round highlight similar to a lifesaver, an easy indicator of ring light use.

With an identical hot shoe–mounted control unit and similar features to the MT-24EX, the MR-14EX incorporates many of the functions of the top-of-the-line Canon flashes, such as Flash Exposure Compensation, Flash Exposure Bracketing, High-speed sync, and adjustable output ratios between the two flash tubes by a 3-stop range in 1/2-stop increments.

Like the ST-E2 and the MT-24EX, the MR-14EX can be used to trigger off-camera slave flashes, such as the 580EX II or the 430EX II, in multiple channels and groups. This feature is great if you need to illuminate the background separately from the subject to prevent the background from going completely black.

The Canon Speedlite System offers a variety of solutions for simple to complex lighting situations. The next chapter examines the different ways you can set up your Speedlites for different applications, explaining the techniques needed to take your flash photography to the next level.

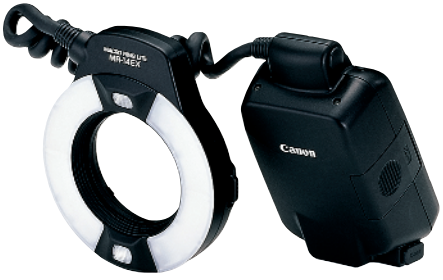
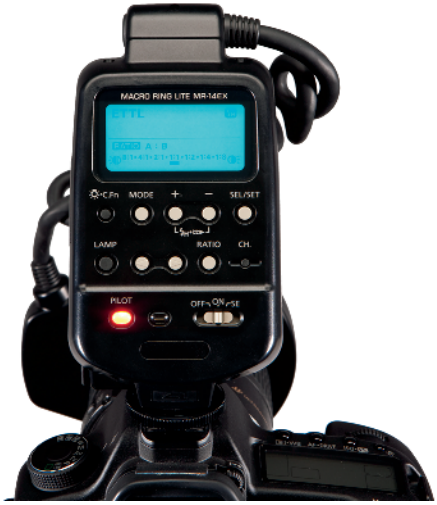


Image courtesy of Canon, Inc.

1.27 The Canon Macro Ring Lite MR-14EX



1.28 Control panel of the MR-14EX