

Digital Photography Flash



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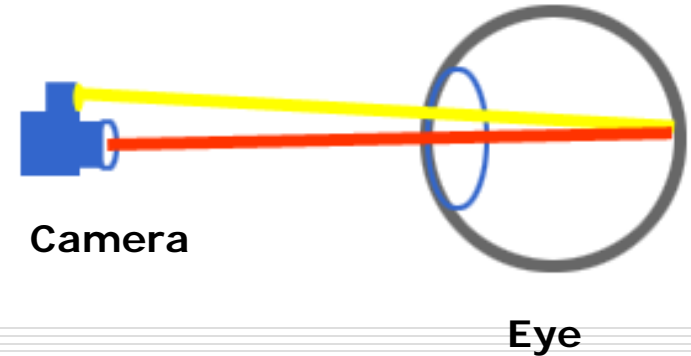
Flash

- Pop Up Flash
- On Camera Flash
 - Balancing Ambient and Flash Light
 - Manual Mode
 - Evaluative Through The Lens (ETTL)
 - Stroboscopic Mode
 - Second Curtain Sync
 - High Speed Sync
- Off Camera Flash
 - Sync cord
 - Wireless

Pop Up On Camera Flash



- ❑ Terrible Light
 - Relatively low Power
 - Fixed coverage angle. Usable Distance range 10 – 15 feet.
 - Flash is a tiny light source. Smaller light sources produce harsh light
 - Slightly above camera lens sends light into subjects eye to be reflected back into the camera producing “Red Eye.”
 - Light hits directly on face creating “flat” look – no texture, shadows, or contrast
 - Worst kind of added light you could have
 - **If at all possible, don't use it**

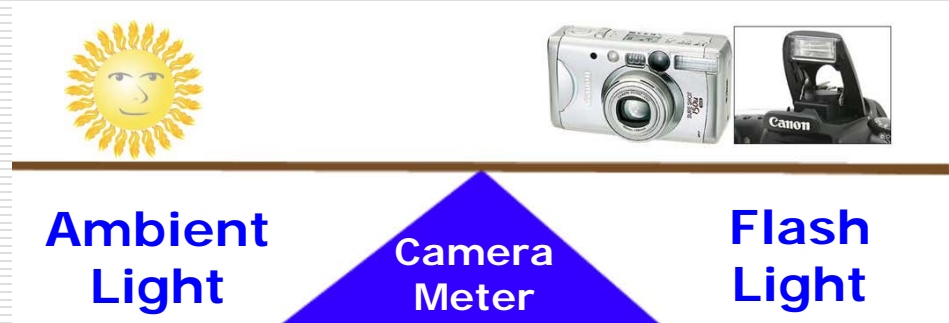


Red Eye



Pop Up On Camera Flash

- If you must use it:
 - Use a slow shutter speed to capture as much ambient light as possible



- Move away from your subject to reduce the quantity of light from the flash falling on the subject



Light falls off with distance sq



Pop Up On Camera Flash

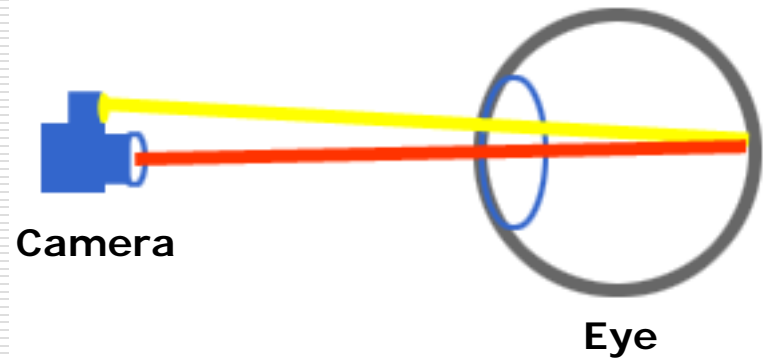
- If you must use it:
 - Use **Flash Exposure compensation** if you have it, to reduce power of flash
 - Use something over it to diffuse light & make it softer
 - Use a yellow gel to warm the light



<http://www.garyfongstore.com/flash-accessories/delta-point-and-shoot-diffuser.html>

Red Eye Reduction

- ❑ Camera fires pre-flash light to cause iris to close
- ❑ Even with Red Eye Reduction turned on you may get some red eye which can be easily removed in post processing
- ❑ With Red Eye Reduction turned on, the pre flash may cause the subject to blink and your portrait may have the eyes closed
- ❑ Have Subject look away from camera slightly
- ❑ Open windows & doors to let in outside light. Turn on more lights in room to increase the ambient light



Red Eye



What Pop Up Flash is good for

□ Fill flash

- In outdoor shots with light from behind subject, shadow falls on subject's face
- Pop Up flash can provide fill light to reduce shadows
- Use **Flash Exposure Compensation** to prevent flash from washing out subject. Achieve balance between natural light and un-natural light from flash.

□ Stopping motion

- Use when some ambient light but subject is in motion.
- Insufficient light for high shutter speed to freeze motion
- Turn Red Eye Reduction off
- Set camera to capture ambient light with slow shutter speed
- Instantaneous burst of light from Flash will freeze motion

Dedicated Flash

Learn to use this accessory effectively

- ❑ Dedicated flash offers possibility of good light anytime you want
- ❑ More power than pop up; built in power supply
- ❑ More flash/lens separation if on camera
- ❑ Can be used effectively mounted on hot shoe or can be used off camera
- ❑ Auto Zoom head (24 – 105 mm)
- ❑ Flash can be swiveled horizontally to bounce light to left and right; up & down
- ❑ Auto or Manual exposure control
- ❑ Auto focus assist beam
- ❑ If synced to Camera, Flash can be controlled from camera.



Flash Control – Through the Lens Metering (TTL)

- ❑ Most Cameras allow for Through the Lens Metering (TTL) to control the quantity of Flash light output (Canon E-TTL; Nikon i-TTL)
- ❑ Camera turns flash output on and off based on camera exposure
- ❑ Camera has Flash Exposure Compensation to allow you to manually adjust Flash output
- ❑ ISO and Aperture have no affect on balance between ambient light and light from your flash
- ❑ In manual mode however, Shutter Speed does impact that balance
- ❑ Each Camera has a shutter speed at which the Flash is synchronized called **Maximum Sync Speed**.
 - Speeds above the Maximum Sync Speed will contain a black bar which is the shutter closing
 - Speeds much below the Maximum Sync Speed will introduce Ambient light into your photos providing background illumination

Flash Control

- Additional Controls on the flash unit:
 - Power Output – Most Flash Units allow you to control the Power out with a slider
 - Flash Exposure Compensation
 - Zoom – Many Flash Units allow synchronization with the camera as to Zoom distance and vary the flash power output to match the zoom distance

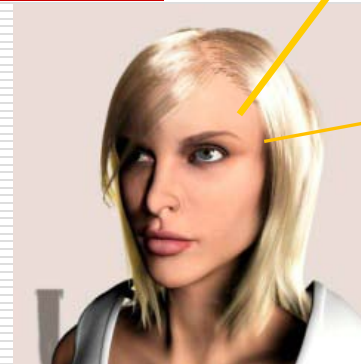
Soften the Light from your Flash

- ❑ Most Dedicated Flashes have some form of diffuser built in
- ❑ Additional diffusers can be added as accessories



Ceiling Bounce

- ❑ Flash can be tilted up to bounce flash off of ceiling
- ❑ Bounce Diffuses and spreads light creating softer light
- ❑ Issues
 - Tinted ceiling will tint light, i.e. color cast
 - Ceiling may be too high or you're outdoors
 - Light from above may put eyes in shadow. Catch Light card built in to some Flashes will reflect small percent of light into eyes.



% of flash to create catch light



Homemade Point & Shoot Bounce Flash



Swivel toward Reflector

- ❑ Add fill light by swiveling flash to side and reflecting light off of a reflector
- ❑ Reflector could be commercial or could be just a piece of white cardboard held by a friend



Off Camera Flash

- ❑ Many Professional Photographers prefer to get their cameras off of the Hot Shoe
- ❑ A remote cord and a Flash Bracket
- ❑ Flash Bracket allows for both landscape and portrait images
- ❑ Professional Event Photographers add a Flash Power Pack to shorten the Flash recovery time and extend the number of available flashes



Wireless Remote Flash

- ❑ Flash photography can approach studio lighting, yet have the convenience of portability
- ❑ Wireless remote units can provide camera TTL exposure control to the flash
- ❑ Many Camera Flash units contain wireless to control a second Flash Unit



Here is a website that specializes in Off Camera flash [Strobist](http://www.strobist.blogspot.com/)

<http://www.strobist.blogspot.com/>

Nikon Speedlight Lineup

R1C1 Wireless Close-Up Speedlight System



\$774.95

R1 Wireless Close-Up Speedlight System



\$489.95

SB-400 Speedlight Unit



\$119.95

SB-700 AF Speedlight



\$329.95

SB-900 AF Speedlight



\$494.95

Canon Speedlight Lineup



Speedlite
580EX II

\$499.99



Speedlite
430EX II

\$299.99



Speedlite
270EX II

\$169.99



Macro Twin Lite
MT-24EX

\$829.99



Macro Ring Lite
MR-14EX

\$549.99



Speedlite
Transmitter ST-
E2

\$350.00

Canon 580 EX II Flash

Catch Light Panel

Wide Panel

Flash Head



**External Power
Socket & PC Sync
connector**

Wireless Flash Transceiver

Auto Focus Assist Beam

External Metering Sensor

Canon 580 EX II Flash

**Custom Function
& Light**

Mode

**Pilot Ready
& Test Fire**

**Flash Exposure
Confirmation**

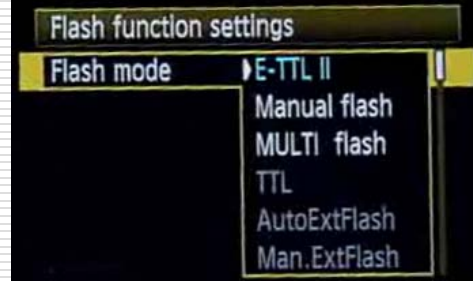


**Zoom Button; Hold
down to set Wireless
Remote – Master/Slave**

**High Speed Sync &
Shutter Curtain Sync**

Power

**Set Button &
Selector Dial**



Setting Mode in 7D

Flash Mode Button



- Evaluative Through The Lens
 - Camera communicates with Flash to control exposure of Ambient light and Flash light . Virtually every setting of flash can be set in camera

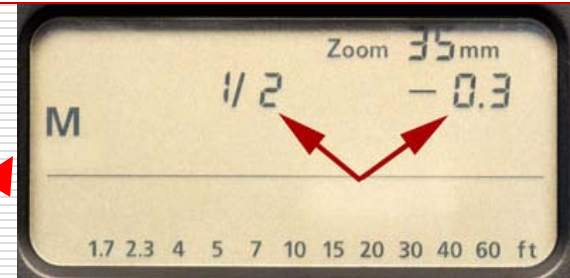
- Manual Mode
 - You set Flash Power Output and Zoom

- Multi Mode
 - Flash fires multiple times to capture moving subjects multiple times in a single image.

Manual Flash Mode

- ❑ Press Mode until “M” is displayed
- ❑ Press Set Button & dial flash power output
- ❑ Power can be set

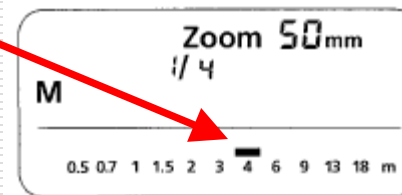
Going down	Going up
1/2	1/2
1/2 -0.3	1/4 + 0.7
1/2 -0.7	1/4 +0.3
1/4	1/4



Flash Power Output set to 1/2 Power minus 1/3

Flash Zoom set to 35 mm

- ❑ Press Set Button
- ❑ Press shutter half way to see effective range.
- ❑ Zoom can be set manually
- ❑ Camera shutter triggers Flash



Flash Power Output set to quarter Power

Range 4 meters

Manually Balance Ambient & Flash light

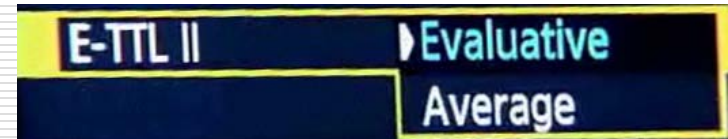
- ❑ It is important to be able to control ambient (room) and Flash light separately.
- ❑ Picture Taking Workflow
 - Take a test shot without flash and use shutter speed to control ambient light
 - ❑ Flash is faster than shutter so shutter speed makes little difference to flash
 - ❑ Slow shutter speed increases background brightness
 - ❑ Fast shutter speed decreases background brightness
 - Take a test shot with Flash and use both Flash Power Output and aperture to control Flash Exposure
 - ❑ Large aperture more Flash on subject (foreground)
 - ❑ Small aperture less Flash on subject
 - ISO affects ambient & flash equally



ETTL Flash Mode

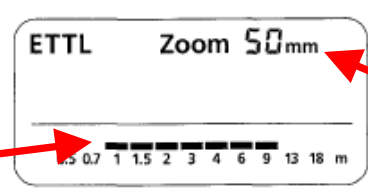
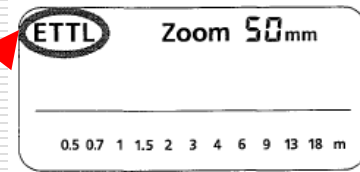


- ❑ When Shutter button is pressed half way down camera takes **Ambient** light exposure reading.
- ❑ Press shutter button all the way Flash will fire “Pre-Flash” allow camera to take **combined Flash & Ambient** light exposure reading.
- ❑ Camera can then subtract one reading from the other to create a set of exposures.
 - Ambient Exposure
 - Combined Ambient & Flash Exposure
 - Flash Exposure
- ❑ In Evaluative Algorithm Camera then combines this information with Distance information from the Lens to determine correct exposure for **Ambient** (background) and **Flash** (subject/foreground) and calculates the correct Flash Power Output needed for balanced ambient and Flash lighting
- ❑ Camera then opens the shutter and Fires the Flash.
- ❑ In ETTL Camera automatically balances Ambient & Flash Exposure



Average algorithm averages Ambient & Flash over the whole scene

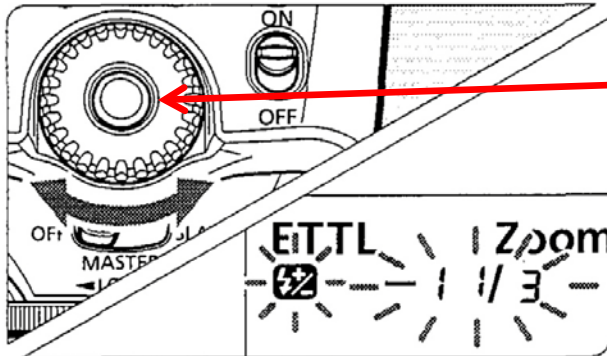
Flash Mode – Automatic Shooting



- Select ETTL Mode
- Flash & Camera communicate in Auto, P, Av, Tv, and M to set proper exposure and Flash Zoom.
- Sync speed 30 Sec – 1/X (7D is 1/250 Sec). In P sync is 1/60 sec.
- Press shutter half way to focus.
- Flash will Zoom (24 to 105 mm TO match lens. F/stop displayed.
- Check that subject is within the effective range of flash
- A pre-flash is fired right before the shot is taken, then main flash is fired.
- Flash exposure confirmation lamp lights ● for about 3 seconds

Flash Exposure Compensation

(Sometimes ETTL doesn't get it right)



In Flash ETTL:



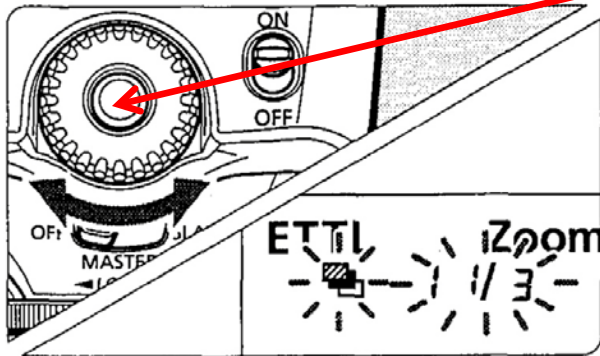
- Press the Set Button until you see
- Turn Dial to desired compensation
- Press Set Button to set the Flash Exposure Compensation.

In Camera (7D):

- Press Quick Control Button (Q) & use Multi-Controller to select Flash Exposure Compensation.
- Turn Dial to desired compensation
- Press Set Button to set the Flash Exposure Compensation.
- Compensation set in Flash overrides Camera



Flash Exposure Bracketing



- Press Set Button until you see the Flash Exposure Bracketing ICON 
- Turn Dial to compensation bracket limits (Plus & minus up to 3)
- Next 3 photos you take will have flash exposure compensation of + and - the compensation
- After 3 shots FEB cancelled



ETTL Balance Ambient & Flash Light

- Canon does not link **Exposure Compensation** and **Flash Exposure Compensation**
- Picture Taking Workflow
 - Take a test shot with zero Exposure Compensation and no flash to view exposure of background versus foreground. Get Ambient Light Correct.
 - Dial in **Exposure Compensation** so **Background** is exposed correctly
 - Take a test shot with Flash on and zero Flash Exposure Compensation
 - Dial in **Fill Flash Exposure Compensation** so fill flash on **Foreground** subject is correct.

Zoom & Wide Angle (Coverage Angle)

- ❑ In Auto Mode Zoom is set to match lens (24 – 105)
- ❑ Press Zoom to set Zoom Manually



- ❑ Pull out Wide Panel to spread light 14 mm
- ❑ Catch light panel will come out with Wide Panel. Push it back in.

Wide
Panel



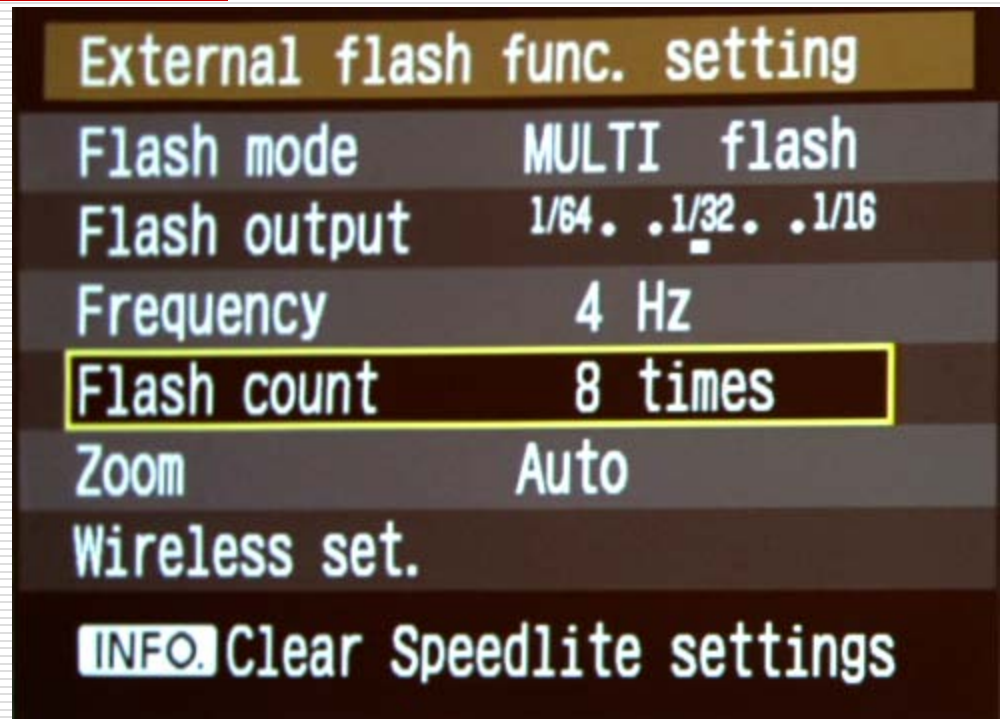
Flash Exposure Lock

- ❑ Sometimes you want to measure exposure (EC and/or FEC) and then recompose prior to taking the shot.
- ❑ Make sure ⚡ “Flash on” is visible in view finder
- ❑ Point camera at subject you want to measure
- ❑ Press “Flash Exposure Lock” button (Multi-Function button on 7D – M-Fn)
- ❑ Each time you press M-Fn button the camera fires a preflash and the required flash output is calculated and retained in memory
- ❑ Recompose the shot and press the shutter button to fire the flash and take the picture.



Multi - Stroboscopic Flash

- Sometimes you might want to capture motion on a single slide, i.e. Someone walking or water droplets
- Canon 7D Stroboscopic Flash set up
- Set Flash mode to “Multi”
- Set Flash power output
- Set Frequency
- Set number of flashes desired
- Press shutter button.



Second Curtain Sync

- ❑ Usually your flash fires when you press the shutter button
- ❑ At sync speed this usually puts the background in shadows
- ❑ You have to “drag the shutter” (slow shutter speed) to capture background
- ❑ Second Curtain Sync allows the flash to fire at end of exposure which allows the camera to expose the background properly
- ❑ Then toward the end of the exposure the flash fires to freeze your subject
- ❑ This gives the image the natural light of the background plus the additional light from the flash on your subject.
- ❑ Second Curtain Sync does not work in Wireless
- ❑ Lets review the SLR exposure sequence

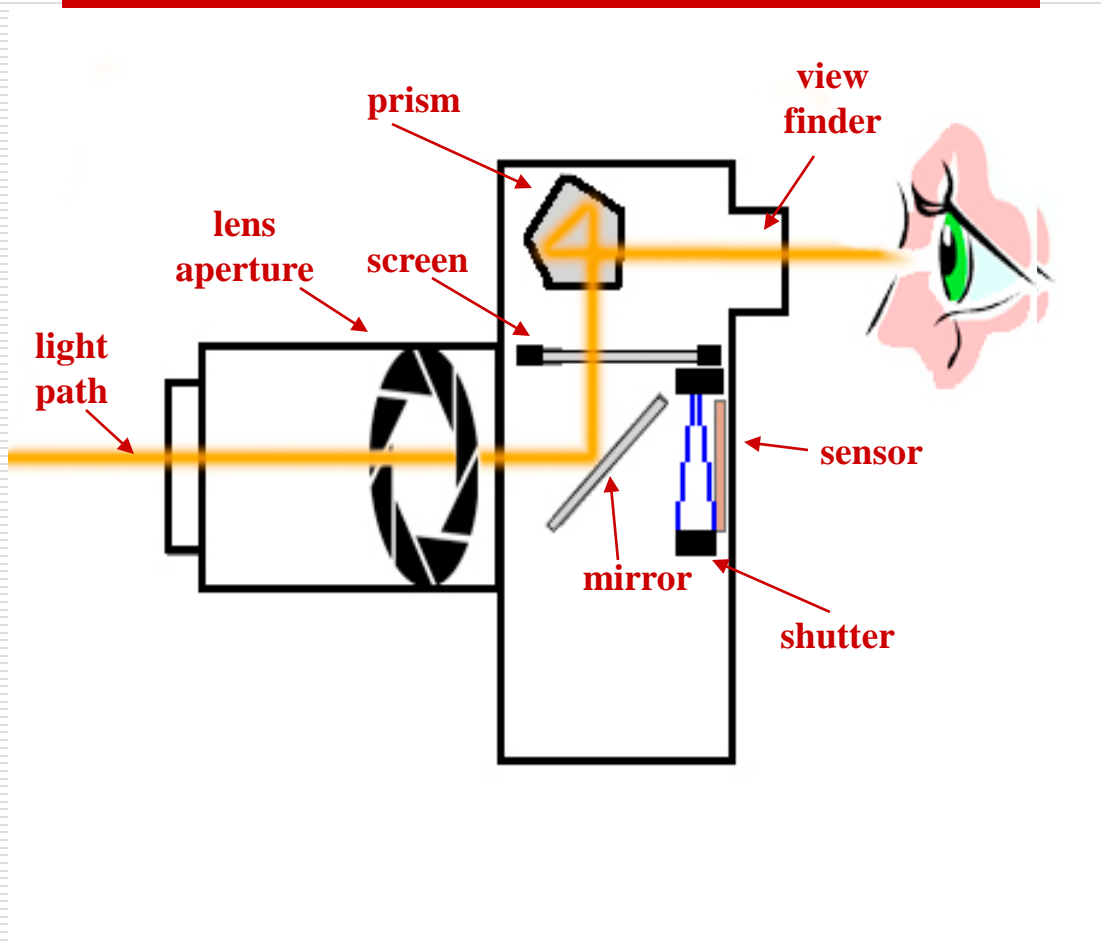


Setting Second Curtain Sync on Flash



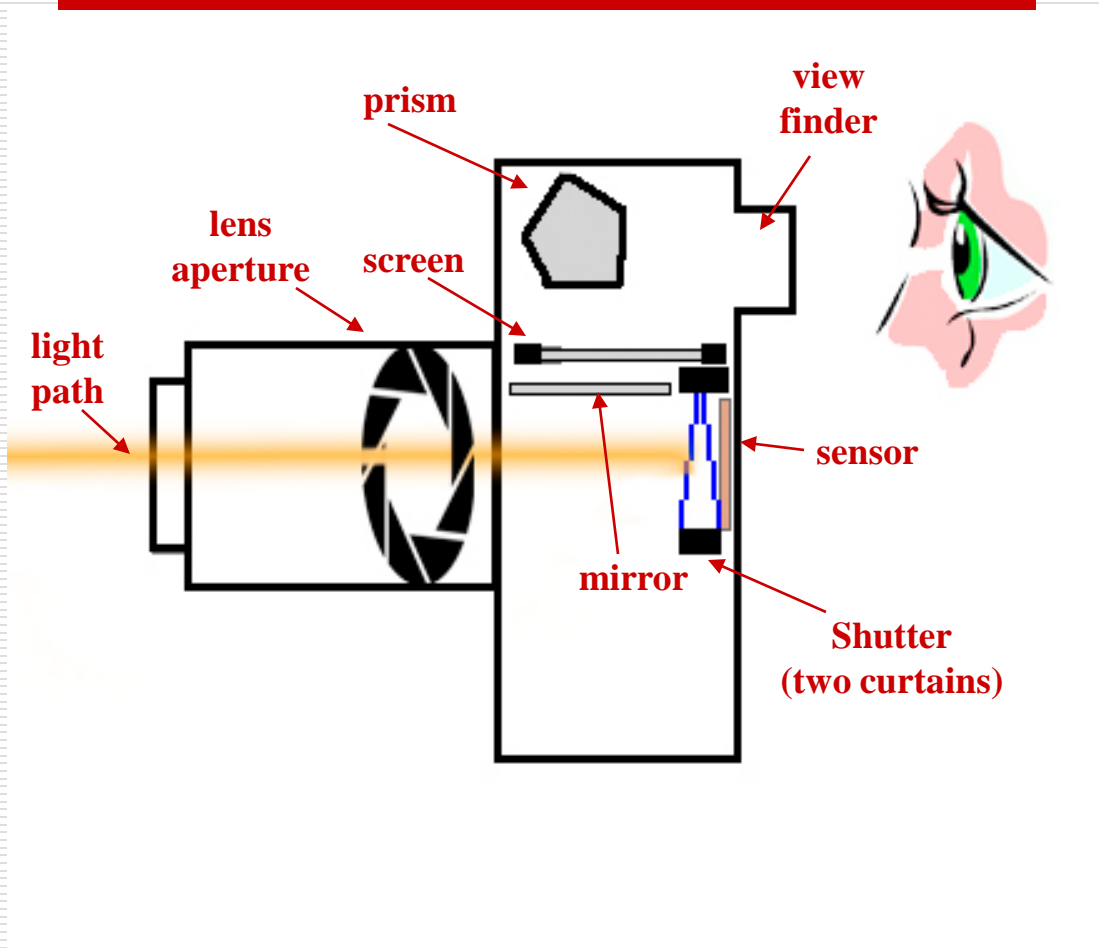
Setting Second Curtain Sync in 7D Camera

SLR Camera Firing Sequence



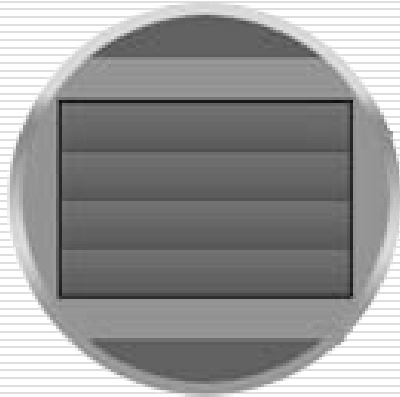
- ❑ Set Aperture (f/stop) and Shutter Speed
- ❑ Press Shutter Button Half Way
- ❑ Lens Aperture stops down
- ❑ Press Shutter Button full down
- ❑ Mirror pops up

SLR Camera Firing Sequence



- Set Aperture (f/stop) and Shutter Speed
- Press Shutter Button Half Way
- Lens Aperture stops down
- Press Shutter Button full down
- Mirror pops up
- Rear Curtain opens
- Front curtain opens
 - Exposure begins
- Rear curtain closes
 - Exposure ends
- Front curtain closes
- Mirror drops down

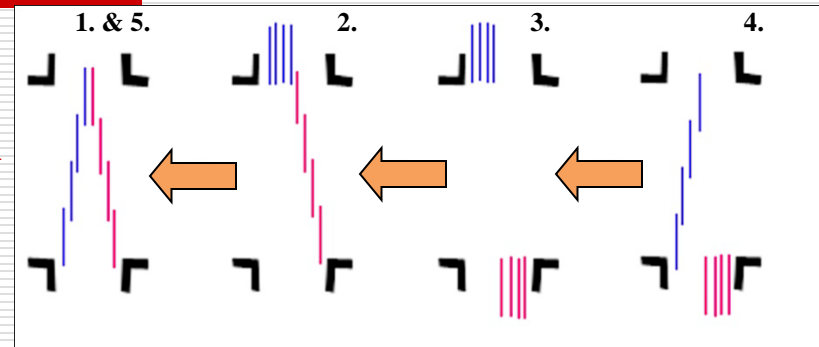
SLR Camera Shutter



Front (1st) Curtain

**Rear (2nd)
Curtain**

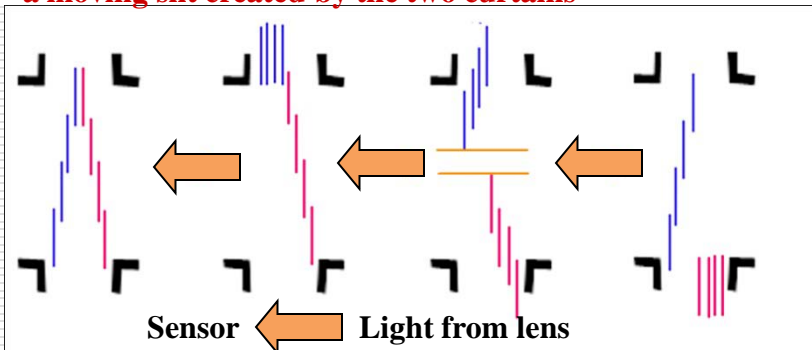
- ❑ 1. Both Curtains closed
- ❑ 2. Rear Curtain opens
- ❑ 3. Front curtain opens
 - Exposure begins
- ❑ 4. Rear curtain closes
 - Exposure ends
- ❑ 5. Front curtain closes
- ❑ 6. Mirror drops down



Shutter gives full exposure from Sync Speed and slower

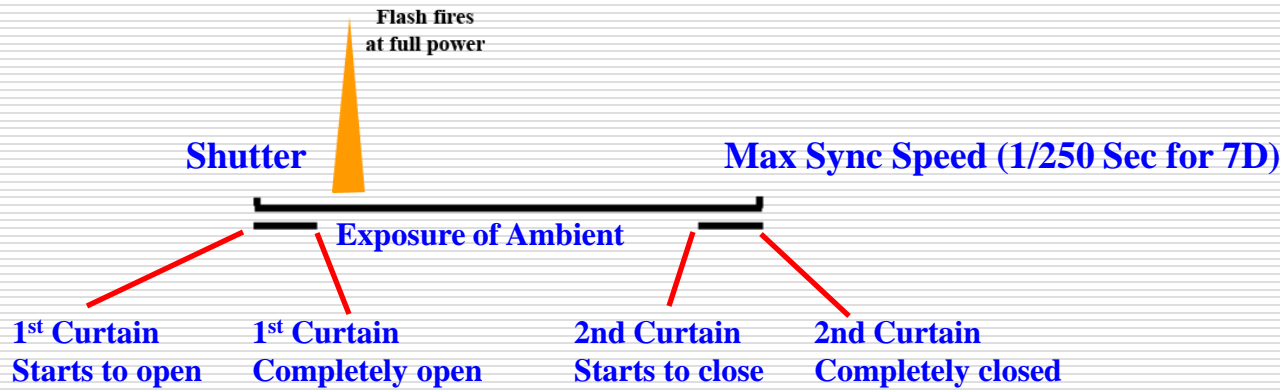
Before Shutter Release	Just Before Shutter Exposure	Exposure	After Exposure
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At shutter speeds higher than sync, exposure is through a moving slit created by the two curtains



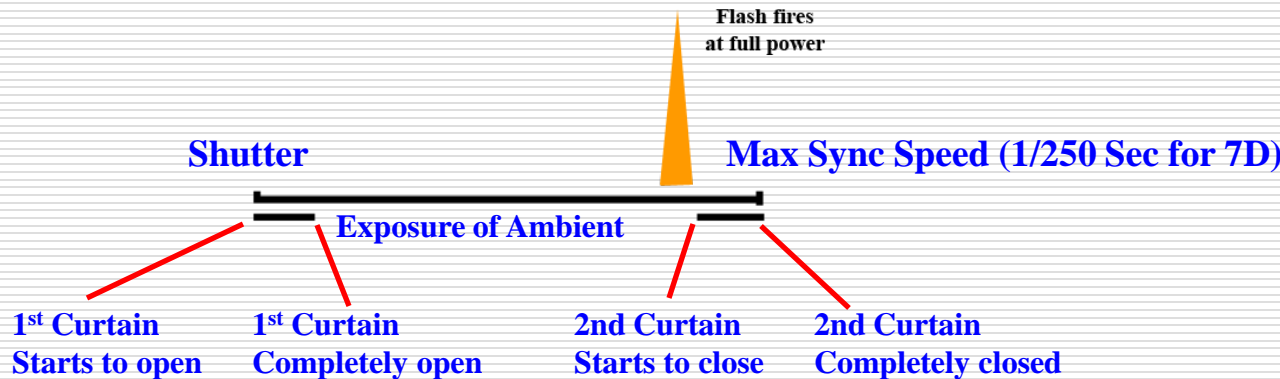
Second Curtain Sync

First Curtain Sync



1st Curtain Sync

SecondCurtain Sync



2nd Curtain Sync

High Speed Sync

- ❑ Fill flash is effective outdoors when background is bright
- ❑ Flash sync speed however cannot be faster than max sync speed
- ❑ Thus aperture must be stopped down to control background exposure
- ❑ Makes background less blurred
- ❑ Modern flashes have High Speed Sync to allow aperture to be set freely
- ❑ In High Speed Sync Mode multiple flashes are fired while shutter is open to give continuous flash

High Speed Sync

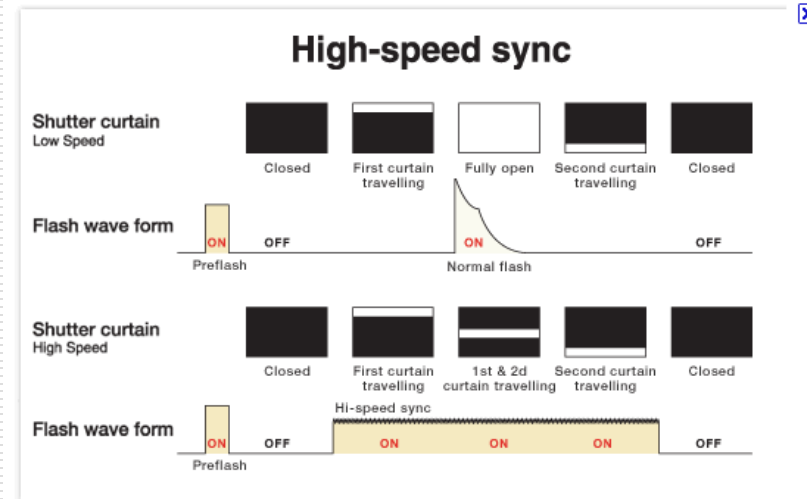
- ❑ With High Speed Sync you can use flash at all shutter speeds.
- ❑ In High Speed Sync flash reverts to Normal sync at speeds below max sync speed, allowing leaving Flash in High Speed Sync all the time.
- ❑ Faster shutter speeds, reduce flash range resulting in less ambient light
- ❑ You may lose 1-2 stops in Flash Power out in High Speed Sync



Setting High Speed Sync on Flash



Setting High Speed Sync in 7D Camera



AF Assist Beam

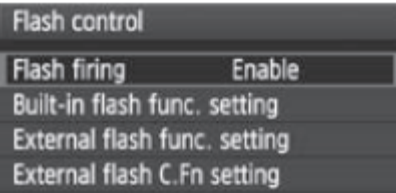
- ❑ Under low light conditions or if there is little contrast in your subject, you may have difficulty focusing
- ❑ You can overcome this by:
 - Switching to manual focus
 - Using Focus lock Technique by focusing on a subject the same distance away & then recomposing to take your subject
 - Turning off your Flash but leaving the Auto focus Assist Beam on to aid in focus.



Wireless Flash Transceiver

AF Assist Beam

External Metering Sensor



Enable/Disable – Turns off all flash both built in and external. AF Assist Beam still fires

Remote Flash

- ❑ Canon 580 EX II can act as a Master unit to control multiple Slave Flashes
- ❑ This allows for portable Studio Lighting
- ❑ Canon EOS 7D built in flash can act as a Master unit to control multiple flashes
- ❑ Master/Slave Flashes must all be set to a single channel of 4 channels (1,2,3,4)
- ❑ Slave channels can be assigned to one of three groups (A, B, C) so that power output of multiple flashes can be controlled from the camera
- ❑ Master is always in Group A
- ❑ Groups power is controlled by a ratio, i.e. A:B Groups can be set as:
 - 1:1 – Power output of both the A Group of Slaves and the B Group are the same
 - 2:1 – Power output of the A Group is twice the B Group (1 Stop)
 - 4:1 – Power Output of the A Group is four times the B Group (2 Stops)
 - 8:1 – Power output of the A Group is eight times the B Group (3 Stops)

- ❑ Hold down Zoom for 3 sec.
- ❑ Press set
- ❑ Turn selector to select:
 - Off
 - Master
 - Slave
- ❑ Press Set
- ❑ Press Zoom until CH (channel) blinks
- ❑ Turn Selector to select channel
- ❑ Press Set
- ❑ Press Zoom until Group Blinks
- ❑ Turn Selector to select Group
- ❑ Press Set.



Setting 7D built in Master Flash

Quality L

Red-eye On/Off Off

Beep On

Release shutter without card

Review time 2 sec.

Peripheral illumin. correct.

Flash control

Flash control

Flash firing Enable

Built-in flash func. setting

External flash func. setting

External flash C.Fn setting

Clear ext. flash C.Fn set.

MENU ↵

Built-in flash func. setting

Shutter sync. 1st curtain

E-TTL II Evaluative

Wireless func.

Channel 1 ch

Firing group (A+B+C)

INFO Clear flash settings

Test flash firing

Built-in flash func. setting

Wireless func. Disable

INFO Clear flash settings

Test flash firing

External Flash Ratioed with Built in Flash

External Flash

External Flash + Built in Flash

Built-in flash func. setting

Firing group (A:B)

A:B fire ratio 2:1 · 1:1 · 1:2

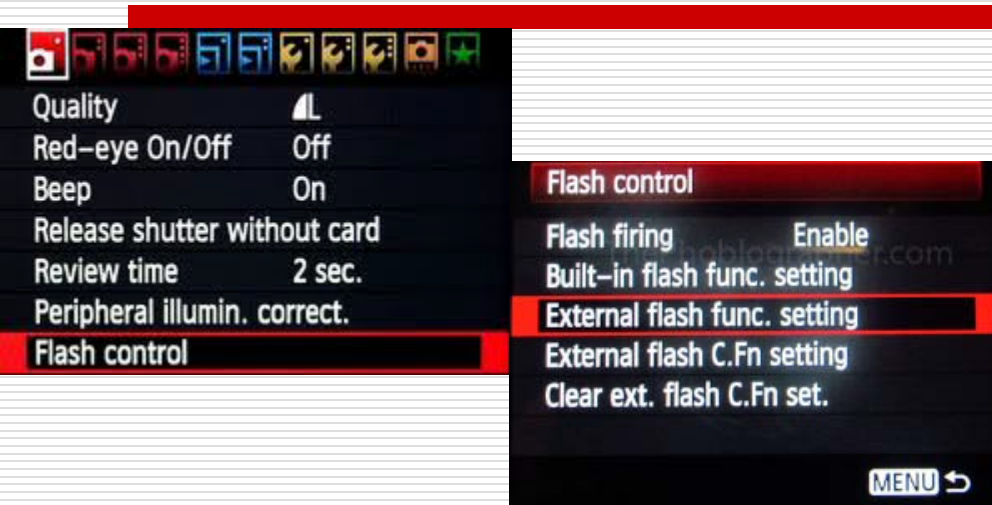
Flash exp. comp -3..2..1..0..1..2*3

exp. comp. -3..2..1..0..1..2*3

INFO Clear flash settings

Test flash firing

Setting 7D built in Master

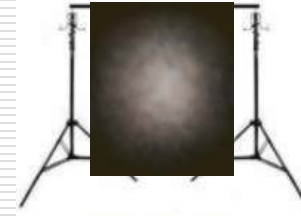


Example of Wireless Flash Use

- ❑ Pop up Flash on 7D Camera turned off, but still acting as Master Controller
- ❑ Group A and B Set at 1:1 Ratio produces Flat lighting
- ❑ Group A and B Set at 2:1 Ratio produces increasing contrast in shadows (1 stop)

Ratio	Stops difference	Description
1:1	No Difference	Flat Lighting
2:1	1 Stop	General Photography
3:1	1 1/2 Stop	General B&W Photography
4:1	2 Stops	Dramatic Low Key
8:1	3 Stops	Very Dramatic Low Key

- ❑ Pressing Depth of Field Preview Button on 7D fires all flashes continuously giving a **Modeling Light**.



Model

Key Light
Slave Flash
Chanel 1
Group A

Fill Light
Slave Flash
Chanel 1
Group B



7D Pop Up Flash
Master Flash
Chanel 1
Group A
Turned Off

Canon Remote Wireless

□ Pros

- No cost – Built into EX Series of Speed lights
- No limit on number of speedlights that can be controlled
- Exposure and Flash Exposure controlled separately

□ Cons

- Must have line of sight between master & slaves
- Bright Daylight can blind slaves
- 2nd Curtain Sync not available
- User interface on Speedlight not intuitive