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)
  ■ Strobacopic 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
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 squared.
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

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
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

JKM 9/12/2011 Enhanced Images 7
Dedicated Flash

- 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.

Learn to use this accessory effectively
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.

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/
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
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
  
<table>
<thead>
<tr>
<th>Going down</th>
<th>Going up</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>1/2</td>
</tr>
<tr>
<td>1/2 -0.3</td>
<td>1/4 + 0.7</td>
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<tr>
<td>1/2 -0.7</td>
<td>1/4 +0.3</td>
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<tr>
<td>1/4</td>
<td>1/4</td>
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</tbody>
</table>

- 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 ½
- Power minus 1/3

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.
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 in 7D Camera
Setting Second Curtain Sync on Flash
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
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

Front (1st) Curtain

Rear (2nd) Curtain

Shutter gives full exposure from Sync Speed and slower

At shutter speeds higher than sync, exposure is through a moving slit created by the two curtains

1. & 5. 2. 3. 4.

Before Shutter Just Before Shutter Exposure After Exposure
Release Exposure

Sensor Light from lens

1. & 5. 2. 3. 4.
Second Curtain Sync

First Curtain Sync
- Flash fires at full power
- Shutter
- Max Sync Speed (1/250 Sec for 7D)
- Exposure of Ambient
- 1st Curtain Sync
  - 1st Curtain starts to open
  - 1st Curtain completely open
  - 2nd Curtain starts to close
  - 2nd Curtain completely closed

Second Curtain Sync
- Flash fires at full power
- Shutter
- Max Sync Speed (1/250 Sec for 7D)
- Exposure of Ambient
- 2nd Curtain Sync
  - 1st Curtain starts to open
  - 1st Curtain completely open
  - 2nd Curtain starts to close
  - 2nd Curtain completely closed
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**

**High-speed sync**

- **Shutter curtain Low Speed**
  - Closed
  - First curtain travelling
  - Fully open
  - Second curtain travelling
  - Closed

- **Flash wave form**
  - Proflash
  - Normal flash
  - Off

- **Shutter curtain High Speed**
  - Closed
  - First curtain travelling
  - 1st & 2nd curtain travelling
  - Second curtain travelling
  - Closed

- **Flash wave form**
  - Proflash
  - Hi-speed sync
  - Off
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.

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

External Flash Ratioed with Built in Flash

External Flash

External Flash + Built in Flash
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)
- Pressing Depth of Field Preview Button on 7D fires all flashes continuously giving a **Modeling Light**.

<table>
<thead>
<tr>
<th>Ratio</th>
<th>Stops difference</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>1:1</td>
<td>No Difference</td>
<td>Flat Lighting</td>
</tr>
<tr>
<td>2:1</td>
<td>1 Stop</td>
<td>General Photography</td>
</tr>
<tr>
<td>3:1</td>
<td>1 1/2 Stop</td>
<td>General B&amp;W Photography</td>
</tr>
<tr>
<td>4:1</td>
<td>2 Stops</td>
<td>Dramatic Low Key</td>
</tr>
<tr>
<td>8:1</td>
<td>3 Stops</td>
<td>Very Dramatic Low Key</td>
</tr>
</tbody>
</table>

**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