

On-Camera Flash Techniques

Getting the Best From Your
On-Camera Speedlight

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Why TTL Flash?

- TTL flash systems make getting the perfect exposure a lot easier and faster than ever before
- The photographer is not required to perform complex calculations for proper flash output/exposure
- The computer is going to out guess you most of the time, so take advantage of it

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When you want to adjust the exposure using TTL flash, remember that the CAMERA's exposure compensation adjusts the ambient light exposure and the FLASH's exposure compensation is used to adjust the exposure on the subject.

On-Camera Flash and TTL Disadvantages

- When you move around while you shoot, the direction of your light source will change as you move
- Off-Camera lighting on manual from a set location gives you much more consistency in exposure, light direction and hard/soft quality.
- TTL systems may be "fooled" by very bright or very dark subjects, resulting in an incorrect exposure.

Gear you need...

- A hot-shoe mounted flash that is compatible with your brand of camera, supports TTL functionality, and swivels and rotates
 - If you don't purchase a flash made by your camera manufacturer, get one from a good 3rd party such as Metz that supports your flavor of TTL/Automatic functionality.
 - Do not use an incompatible flash directly on your camera's hot shoe. The flash could damage the camera, or vice versa.

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I strongly recommend that you purchase the top of the line flash made by your camera manufacturer if you intend to do a good amount of on-camera flash photography. The range of features, the extra power, faster recycle time between flash bursts, and the assured compatibility in TTL mode will be of great benefit to you.

What do I do now?

- Now that you have a flash, how do you put it to best use? Briefly, your decisions are:
 - What direction do I want my light - and why?
 - What will the quality of the light be: Hard or soft?
 - How will I balance the strobe's intensity with the ambient light?
 - How will I balance the strobe's color with the ambient light?

Look at the Available Light

- Ask yourself: Do I even need to use flash?
- Recognize when the available light is perfect
- When the existing light is ideal – there is no need for flash!

A Few Essential Concepts

Large Light Source = Soft Light
Direction, Intensity and Color Balance

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The 5 Characteristics of Light:

Quantity

Contrast

Quality

Color

Direction

The 5 Characteristics of Light

- Intensity
 - Contrast
 - Quality
 - Color
 - Direction
- These characteristics can be utilized and/or changed without inherently altering the others.

Quality of Light

- Quality of light is referred to as “specularity”
 - specular light is **hard** light
 - non-specular light is **soft** light
- The larger the light source, the softer the light
- Quality judged by observing: shadow edges, density of shadows, reflection of light source on subject (specular highlight)

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The quality of light helps define the mood of an image and shapes the viewer's emotional response to an image. Soft light evokes a more gentle or romantic effect. Hard light is usually more edgy, more dramatic. Hard light can emphasize and define texture while soft light smooths and flattens.

A simple way to change the quality of a light source is with distance. Rule of thumb: the closer the light source, the softer the light because moving any light source closer to your subject will make the light source larger in relation to the subject. If the light source is not movable, move the subject in relation to the light source.

Bouncing a speedlight softens its quality by increasing the size of its light spread relative to the subject. A speedlight can easily be converted into a 20 foot soft box by bouncing it into a wall or ceiling.

Diffusion also softens quality when the diffusion screen is larger than the light source and large relative to the subject.

Quality (continued)

- To produce a harder light:
 - use a smaller light source
 - a more direct light source
 - increase the source-to-subject distance
- To produce a softer light:
 - use a larger light source
 - diffuse or bounce (reflect) the light source
 - decrease the source-to-subject distance

Large Light Source = Soft Light

- Larger light sources (relative to your subject), give softer light
- The size of the front of the flash is small, hence the direct light from it is hard
- Direct on-axis light from the camera will also be flat and unflattering
- Bouncing flash off a surface (a wall, ceiling or reflector) produces a larger light source and softer light
- Consider the light source to be the area we bounce the flash onto rather than the flash itself
- Bouncing flash creates softer light AND it can make our light directional
- There is nothing inherently wrong with hard light
 - The problems with our bad early experiences were largely the result of bad light direction and bad lighting ratios (as in "nuke 'em 'till they glow.")

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When bouncing flash off a nearby surface in order to obtain soft, directional light on your subject, it is important that no direct light from the flash falls on your subject. This can be accomplished by 'flagging' your flash with your hand or a light modifier such as a bounce card or half-snoot.

Ref: <http://www.planetneil.com/tangents/2007/12/13/my-choice-of-flash-modifiers/>

Direction

- Directional lighting: light comes from an angle other than directly from the camera's viewpoint.
 - Provides interplay between light and shadow
 - Gives form, shape and dimension to our subjects
 - Reveals texture

Intensity

- How much flash to use?
- Depends on the existing lighting (available light).
- We usually have at least two choices
 - Balance flash with the available light (enhancing available light)
 - Make flash the dominant light source (overpower available light)

Contrast

- **Contrast** is defined as the measured difference between the quantity of light in the highlights compared to the quantity of light in the shadows
- Introducing a brighter, directional light will increase contrast, highlight and shadow, and light direction.
 - The new main light can be actually brighter than the existing light or the existing light can be underexposed to make the main light virtually brighter. That way the existing light can be used as fill for the new main light.
- Using “subtractive lighting” and eliminating unwanted light from a subject also elevates contrast and provides a more dominant direction of light.
- **Fill light** can produce open, low-contrast shadow density

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Excessive contrast can be corrected in the following ways:

1. Use flash to add light to the subject, bringing illumination and tonal values closer together, thereby reducing contrast, i.e., fill flash.
2. Use a reflector to add fill, reduce contrast.
3. Change the contrast response of the digital sensor by accessing the following adjustments in the Menu:
 - Canon: Processing Parameters or Picture Style
 - Nikon: Image Adjustments
- i. This is a way to expand or compress the histogram by changing the contrast setting
4. Change the available light on the scene.
5. Change the tonal values included in the scene.
6. Make a few identical image files varying the exposures, some exposed for the highlights, some exposed for the shadows, combine in Photoshop.
 - i. This can lead to using **high dynamic range** (HDR) technique.

Color Balance

- Flash light is approximately the same color as daylight (5400K)
- Typical indoor lighting is incandescent a.k.a. tungsten (2800K)
- Mixing flash and tungsten light will result in cooler blue toned flash light and warmer orange/red toned tungsten
- Gel filters can be used to match flash with tungsten (or florescent which is greenish)

Gel Filters

- Full CTO or CTS – converts flash to 2900K (tungsten)
- ½ CTO or CTS – converts flash to 3800K
- CTS gels have less red than CTO and are often more pleasing with skin tones and can help provide a full range of color in your image
- Try full CTS and set camera white balance to 2900K or tungsten – or try ½ CTS and 3800K camera white balance setting

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The choice between full CTS or ½ CTS gel when working indoors with incandescent (tungsten) light dominant is based on your preference for neutral background (full CTS with camera white balance set to tungsten or 2900K), or if you prefer foreground and background subjects neutral with a background that is pleasantly warm (1/2 CTS gel with camera white balance set to 3800K).

With mild tungsten light and fair amount of daylight from windows, try using ½ CTS instead of full CTS.

Which Gel?

- The choice between full CTS or ½ CTS gel when working indoors where incandescent (tungsten) light dominates is based on your preference for neutral background (full CTS with camera white balance set to tungsten or 2900K), or if you prefer foreground and subjects neutral with a background that is pleasantly warm (½ CTS gel with camera white balance set to 3800K).
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Gels:

The Full CTS will bring your flash WB down to around 2900K, more or less neutralizing Tungsten light. The 1/2 CTS will bring your flash WB to around 3800K, which will leave your backgrounds with a touch of the warmth of Tungsten lighting.

Best Results with Flash

- The best results with flash are always achieved by looking at the quality, direction, and color of your available light .. and then adding flash to it.
- Add your flash by considering:
 - the level (ie, exposure) of flash that is needed (whether fill-flash or flash as main source of light)
 - the direction that you're adding your flash
 - the color of your flash. (And for this reason I often gel my flash for tungsten light)

TTL Flash

- Three controls affect ambient exposure:
 - Aperture
 - Shutter Speed
 - ISO
- The only way to control TTL flash metering, is with **Flash Exposure Compensation (FEC)**
- We can now use **aperture** and **ISO** to affect our **ambient exposure**.
 - We couldn't do this with manual flash, because it would've affected our flash exposure as well, and not just our ambient exposure.

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A common scenario: If you need more ambient light, but you require a specific f-stop, then you have to adjust the other two controls – shutter speed & ISO.

A good method would be to figure out what your highest ISO is that you're comfortable using. This will depend on how you want to use the image (ie big print, small print, web post), and also your own preference. Then that leaves your shutter speed as the best way to control how much ambient light you want to allow in.

Adjusting the FEC won't help you. This will just cause your flash to give MORE light and lead to over-exposure. FEC doesn't do anything for your ambient exposure itself.

So we have to consider those two components separately – ambient exposure and flash exposure.

TTL Flash

- With TTL flash, our chosen aperture or ISO (within a certain usable range), doesn't affect our exposure – and in a sense becomes transparent to our exposure metering.
- What does affect our exposure, is the reflectivity of our subject, and how large our subject appears within our frame.
- The only way to control TTL flash metering, is with **Flash Exposure Compensation (FEC)**.

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Manual flash

a constant amount of light that is emitted from the flashgun. In the case of manual flash, there is NO control by the flashgun or camera, over the intensity or duration of the pulse of light from the flash unit.

Photographers can control the output of their flashguns by adjusting the settings in fractions of the maximum possible output, eg, ¼ power, 1/16th power. The absolute value of ¼ power will vary from flashgun to flashgun, as each model and make of flashgun has a different maximum power.

With manual flash, four things control the exposure metering of our subject:

- the actual output level from the flashgun, (ie the ratio of the full power),
- distance from our light source to the subject,
- aperture,
- ISO.

Any of these four things can be used to control the amount of light falling on your subject.

TTL flash

Another way to control flash exposure, is as **an automatically controlled flash burst**. This flash output can either be controlled by the flashgun itself (usually called Auto mode), or by the camera in conjunction with the camera's metering system (usually called TTL flash). When the flash is controlled by the camera, as then measured as the amount of light coming through the camera's lens, it is called Through-The-Lens flash metering, (hence, TTL flash.)

The only way to control TTL flash metering, is with **flash exposure compensation**.

This is something that is difficult to comprehend at first, but is easily verifiable with your D-SLR. There, at home, you can photograph any subject in your immediate surroundings using a TTL capable flashgun. You can change your aperture from f4 to f5.6 to f8 ... and your exposures should look the same. Similarly if you changed your ISO, your TTL flash exposures should look the same. The reason for this is that your camera and flashgun's TTL flash metering system takes care of the basic flash exposure ... and can do this within a certain range of chosen apertures and ISO settings. Your flashgun will emit more or less light as required for correct exposure, dependent on your settings ... but your exposures should appear similar.

Manual Flash

- **Four things control exposure metering:**
 - **Power** output of the flash
 - **Distance** from light source to the subject
 - **Aperture**
 - **ISO**
- Any of these four things can be used to control the amount of light falling on your **subject**.
- **Shutter speed** controls **ambient** exposure

Bounce Flash

- Bounce flash is a technique where the main light is redirected at a nearby surface such as a wall, ceiling or reflector to broaden and diffuse the light falling on your subject.
- TTL flash mode enables you to easily create soft, directional light via bounce
- Bounce flash makes a small on-camera flash look like a large directional off-camera light
- *Bounce surfaces absorb some light, may reflect some light in different directions away from the subject, may impart color casts on reflected light and may reduce the quantity of light falling on your subject*

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When bouncing flash off a nearby surface in order to obtain soft, directional light on your subject, it is important that no direct light from the flash falls on your subject. This can be accomplished by 'flagging' your flash with your hand or a light modifier such as a bounce card or half-snoot.

Bounce Flash

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Flash Modifiers

Throw away your Tupperware

- HonlPhoto speed snoot (5")
- <http://www.honlphoto.com/servlet/the-10/strobist-speedlight-strobe-flash/Detail>
- Fun Foam sheets from craft stores
 - The piece of black foam is about 7" x 6"
 - Secure to flash with rubber band or hair scrunchie
- <http://www.planetneil.com/tangents/2009/12/22/black-light-modifier/>
- DIY Diffusor: <http://super.nova.org/DPR/DIY01/>
- Stofen omnibounce

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<http://www.honlphoto.com/servlet/the-10/strobist-speedlight-strobe-flash/Detail>

<http://www.planetneil.com/tangents/2009/11/21/the-black-foamie-thing/>

<http://www.abetterbouncecard.com/>

<http://super.nova.org/DPR/DIY01/>

...A Galaxy Far, Far Away...

- Using a “Tupperware” diffuser outside where there is no ceiling uselessly sends flash to a galaxy far, far away
- “Tupperware” diffusers used outside are useless because:
 - they require a surface to bounce their light
 - They do not increase the apparent size of the flash light source
 - waste flash batteries

A Starting Point

- Manual Camera Exposure Mode/TTL Flash Mode
- ISO 400-800 (don't be afraid to go higher)
- Shutter Speed: 1/60-1/250 sec
- Aperture: f/2.8 - f/4
- Adjust the available light exposure (via **aperture/shutter/ISO**) to obtain the desired brightness of the **ambient/background**
- Adjust **FEC** to obtain the desired amount of flash on the **subject**

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This allows a good amount of available light in the image, makes TTL flash the main light source, provides moderate depth of field and helps reduce camera shake.

When attempting to bounce flash into a big room with high ceilings, try starting at f/2.8 and ISO 800 or higher to let the light register in the image.

More about Settings

- The maximum flash sync lets you
 1. gain better control of the available light, since below the max flash sync speed, shutter speed has no effect on the flash exposure
 2. indirectly, get better range on your flash (which translates to getting more power out of your flash for a specific scenario)
- **max flash sync speed** is the most efficient setting since this provides the **widest aperture** I can use with flash **and** thus maximum output from my flash

Max it out (your sync speed)

- When the **ambient light levels are low**, then your **shutter speed can vary appropriately**, depending on what you want to achieve.
- But once you work **in bright conditions**, or have your **subject against a bright background**, then most often it just makes the best sense to **work at maximum flash sync speed**

Manual Exposure Mode

- Shoot in **Manual Exposure Mode**:
 - I want to control the accuracy of exposures
 - I want to control the consistency of exposures
 - I want to control the depth of field
 - I want to control subject / camera movement
- None of the other exposure modes give me this
- Give up the quest for a camera that will do it all and stop blaming the camera

Limitations of Auto Metering

- Your camera's meter relies on the reflectivity of the subject and assumes mid-tone grey. Even with matrix / evaluative metering your camera can only guess at what you're trying to achieve.
- Using Program or Aperture Priority while using TTL flash as your main source of light, your camera will vary your shutter speed between shots, and your ambient light will therefore vary

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Because the reflectivity and tonality of the scene that my camera's meter is reading changes all the time, I have to manipulate my TTL flash exposure compensation all the time.

Metering

- An iterative process of:
 - Checking my camera's meter
 - Checking the histogram
 - Checking blinking highlights display
 - Checking the image on the LCD, (although this isn't an accurate assessment of exposure)
 - experience
- There is no fixed recipe in approaching metering in all kinds of situations

Manualmodeaphobia

- In Program, Aperture Priority, or Shutter Priority Mode try camera exposure compensation of “-1” to “-2” EV
- Adjust FEC to obtain the desired amount of flash on the subject
- Be prepared for wider variations in shot-to-shot exposures even if nothing obviously changes in your composition or light levels

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When you want to adjust the exposure using TTL flash, remember that the CAMERA's exposure compensation adjusts the ambient light exposure and the FLASH's exposure compensation is used to adjust the exposure on the subject.

Directional Light is the Key

- If you want **to achieve the best results** from your on-camera speedlight, **be aware of the direction of light from your flash.**
- The key is not to think of your speedlight as being your light-source anymore, but of **the area that you're bouncing flash from, as your light source.**

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when there are surfaces to bounce your flash off :

- **throw the tupperware away,**

and then

- **consider the direction you want your light to come from.**

Balancing Flash with Ambient

- Use flash as the main light, with ambient as fill
- Typical interior lighting is about 1/60th, f/4, ISO 400
- Use a CTO, CTS or Green gel to obtain color-consistent light sources: flash and ambient
- You use a shoe-mount flash with a half-snoot and bounce it over your left shoulder and up at a 30-degree angle to your subject (adjust direction to taste)
- Your goal is to drop the ambient down about two stops. This will create your shadows - but with detail.

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CTO and CTS will balance ambient tungsten/incandescent with flash

Green (sometimes called tough green or tough plus green) will help balance florescent ambient light with flash

CTS will impart less red into the light source and usually works better with skin tones

A half-snoot is recommended to flag or shield your flash so that no direct flash falls on your subject. You only want indirect light to fall on the subject to get the best effect of directional light

Balancing Flash with Ambient

- The idea is to build an ambient light-only exposure that would result in an underexposure of 2 stops. That will be your lighting ratio
- You have several choices assuming 1/250th sec synch:
 - You can stay at 1/60th and go to f/8, for depth of field.
 - You can keep the aperture at f/4 and go to 1/250th sec., which might be a good choice for a better chance at stopping action.
 - You could split the difference and go to 1/125th at f/5.6.
 - You can choose another ratio (and you should experiment) but 2 stops is a good starting point.
- Adjust FEC until the subject looks well lit.
- This can be used to great effect outdoors to get dramatic skies as background or turn day to night
- This can be used indoors to make subjects 'pop' and to overcome mixed background light sources

Another Example

- A back-lit subject, a shaded subject with a sun-lit background, or a subject in front of bright windows may require the TTL flash as Main light, not Fill.
 - Adjust the available light exposure to obtain the desired look of the brighter background. Adjust the Flash Exposure Compensation (FEC) to provide the desired amount of flash on the shaded subject.
 - In all cases of flash-as-Main, adjust the Flash Exposure Compensation as needed for subject reflectance and to obtain a satisfactory highlight value.

Fill Flash

- The idea here is to just use the flash to lift the shadows, and avoid shadows under the subject's eyebrows. The flash should ideally be imperceptible
- Meter for the available light, and then shoot with flash straight on – but flash exposure compensation (FEC) is dialed way down (in the minus FEC direction).
- Use shutter speed, aperture and iso for ambient exp
- Dial Canon speedlights down to around -2 to -3 stops.
- Dial Nikon speedlights down around -1.3 or -1.7 ... and use the Nikon speedlights in TTL BL mode, which balances flash automatically with ambient light.

Horseshoes and Hand Grenades

- One the one hand, lighting is a little like horseshoes and hand grenades. Close enough is good enough if it looks good.
- You will quickly start to learn to judge what your LCD display (and histograms) are showing you. But the advantage to working this way is that it is fast and intuitive.

Parting Thoughts...

- Use light with imagination.
- Use light for effect, not just exposure.
- Bounce flash does not have to be flat, dull, or uninteresting.
- Look for every opportunity to do the unexpected or the dramatic.
- Take more risk with your lighting.
- Most of all, remember to have fun!

References and Resources

- <http://www.planetneil.com/tangents/>
 - <http://www.planetneil.com/tangents/flash-photography-techniques/further-pages/>
 - <http://www.planetneil.com/tangents/flash-photography-techniques/flash-photography-tips/>
- <http://www.daveblackphotography.com/workshop/index.htm>
- <http://super.nova.org/DPR/>
- **Books:**
 - On-Camera Flash Techniques for Digital Wedding and Portrait Photography (ISBN-10: 1584282584)
 - Speedlights & Speedlites: Creative Flash Photography at the Speed of Light (ISBN-10: 0240812077)
- <http://www.dq28.com/technique/>
- FlashFrog: <http://zetson.blogspot.com/>
- <http://www.lighting-essentials.com/>
- FlashZebra: <http://www.flashzebra.com/>
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- <http://www.bhphotovideo.com/c/search?Ntt=rosco+swatchbook&N=0&InitialSearch=yes>
- <http://www.honlphoto.com/servlet/StoreFront>
- Google search for "fun foam sheets": <http://tinyurl.com/y/mvvh8>
- Darice Foamies 2mm fun foam sheets @ Joann Fabric and other craft supply stores
- HonlPhoto 5" speed snoot and speed strap

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<http://www.planetneil.com/tangents/about/book/>

On-Camera Flash Techniques for Digital Wedding and Portrait Photography

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