Let's Flash

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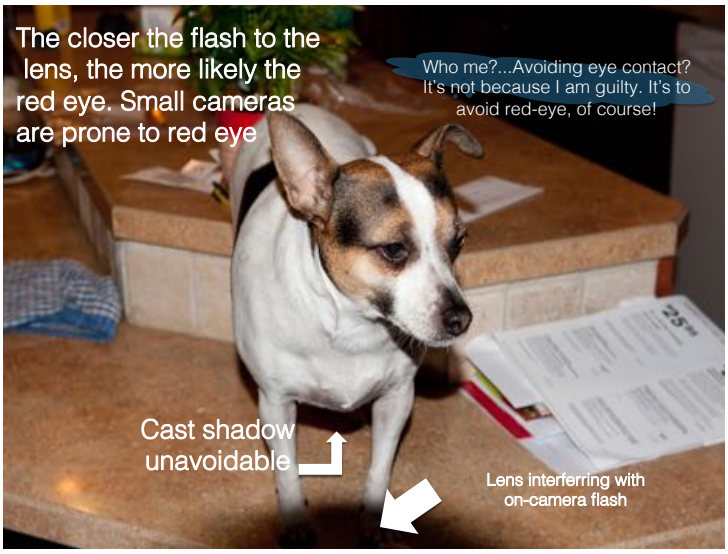
Types of flashes

Generally……

- Built-in camera flashes: Low power; Always point forward (no bounce light, cast shadows on walls, "deer in headlight"); May not clear long lenses (lens shadow on image); Cause "red eye" (camera may have "red eye reduction" option); Use the camera's battery; Can trigger optical remote flashes; Can be used for "fill light"; Do not get lost (unless camera gets lost).



- Hotshoe flashes: More powerful than camera built-in flashes; Fit onto hotshoe of cameras; Can point in more directions than forward (bounce light); Can fit onto hotshoe of a remote trigger; May have remote optical trigger ability and/ or remote wired trigger ability (alternatives to hot-shoe triggering); Do not use camera battery; Sophisticated technology not brand interchangeable (nikon flashes do not work on canon cameras); Large cost variation ($70-600).
- "Speedlights": Subset of hotshoe flashes but offer High-Speed-Sync (HSS); Often more capabilites such as automatic or manual remote adjustments (when used off camera with proper triggering equipment); Often iTTL/ eTTL (automatic adjustments),

- Studio flashes: Attach to a stand; Most powerful but MUCH less portable; Need radio, optical, or wire triggering; "Monolights" are all-in-one (light plus capacitor) and can be plugged into household outlet; Commercial set-ups use multiple large capacitors and lights; Often not brand interchangeable; Often more expensive than cost of cameras; Monolights can be cheaper than high-end speed-lights; Commercial setups can run into $10,000 plus.

- Flash light: Yes flashlight! Think of it as a very low powered but extremely maneuverable flash. Try some "lightpainting". You need a tripod and flashlight fitted with a "snoot" (easily made with cardboard).

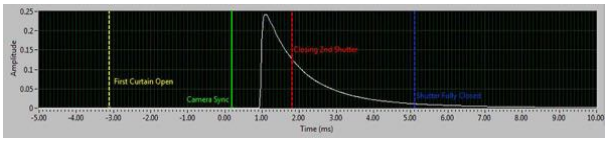
Why not use continuous light?

- Not powerful enough! One watt second= energy for 60watt incandescent bulb for one second. Imagine a 60ws speedlight at full power dispensing it's energy in 1/1000 of a second.
- No "belladonna" eyes (glamourous large pupils)
- Hot and sweaty models

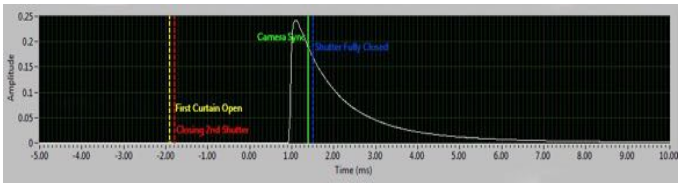
What is Sync speed and how does it affect flash photography

- Camera shutters : Camera shutters have 2 curtains. Both curtains can extend the entire distance of the sensor, so either curtain is capable of closing out all light. At rest, both curtains are stacked at one end of the sensor. When the shutter-release button is activated, the first curtain opens completely, exposing the sensor to light. After the chosen shutter speed time has elapsed, the second curtain closes, joining the first curtain at the other end of the sensor, blocking out all light. Then both curtains return to the starting position. When you choose "second curtain" on your flash setting, the flash will go off right before the second curtain starts to close, rather than right after the first curtain opens. This difference is not noticeable at faster shutter speeds, but can be used creatively at slower shutter speeds.

- Sync speed : Sync speed is a shutter speed. Each camera has its own Sync speed, nowadays around 1/200-320 seconds. Sync Speed is the fastest shutter speed at which there will be a moment in time, when the ENTIRE SENSOR is fully exposed to light. If you set the shutter speed faster than the camera's sync speed, the second curtain will start closing before the first curtain is fully open.
- http://wiki.pocketwizard.com/?title=Understanding_HyperSync_and_High_Speed_Sync



- Sync speed continued:If you use a "regular" flash at a shutter speed higher than the sync speed, the flash will only illuminate the part of the sensor exposed at the time the flash goes off. Thus the picture will have a dark bar or bars. The size of the bars depends on the shutter speed. The faster the shutter speed, the bigger the bars, and the narrower the exposed sensor.



I want to buy an external flash. What is the significance of:

http://dpanswers.com/roztr/content_show.php?id=317:

- WATT-SECOND (Ws)= JOULE:

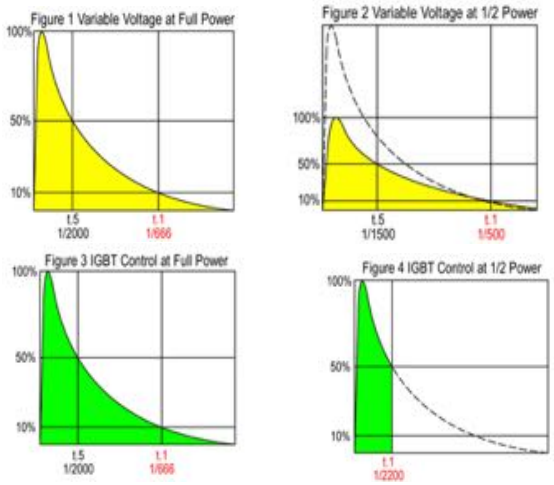
The watt second of a flash is the maximum amount of energy that can be stored in the capacitor of a flash. Think of it as the size of a gas tank in a car (or battery in the new electric cars!). Two cars can have the same size gas tanks but get different miles per gallon. One car is more efficient than the other. One car can go faster than the other. One car is lighter than the other, takes regular gas (no proprietary battery), and can fill it's tank faster (recycle time). Generally speaking, the higher the watt-second rating for a flash, the more light it can emit per flash, but as you can see, there are variables

- "In terms of energy consumption, a 60 watt tungsten bulb burning one second, a 600 watt halogen light being lit for 1/10th of a second, and a xenon tube electronic flash burst consuming 60000 watt for 1/1000 second all equals 60 Ws. However, a xenon tube is much more efficient converting energy into light than the other two, so even when fitted with the same reflector, the 60 WS electronic flash will produce more light than each of the other two. Translated into GNs, the GN of the electronic flash in this example would be greater than the GN of the tungsten bulb or the halogen light." (GN=Guide Number)

- GUIDE NUMBER (GN): How does watt-second compare to guide number?
- *"Watt-seconds* (Ws) is a unit of energy. When reading flash unit specifications, the Ws rating is the amount of energy that can be stored in its capacitors and released when the flash is fired. The *Guide Number* (GN), on the other hand, is a measure of light. It indicates how intense the light from a single flash is when falling on the subject."
- "There is no simple conversion formula between the two. While the energy that at most can be expended in a single burst of flash is proportional to the number of Ws' stored in the flash unit's capacitor, the actual intensity of light also depends on the efficiency of the light source, and any reflectors or diffusers in use….. "

- "Measuring the GN of a flash is straightfoward. Just fire the flash and measure its output with an incident flash meter set to ISO 100. Multiply the aperture reading with the distance in meters or feet, and that's the GN of the flash in meters or feet…."
- "There is no simple way to measure WS, so one have to rely on manufacturer's specifications. I suspect that some of the Ws ratings used to advertise studio flashes are not set by engineering, but by the marketing department."

- T.5 and T.1 (Flash duration): from https://www.paulcbuff.com/Flash-Duration :



- FLASH DURATION

"Figure 1 depicts the typical characteristics of a Xenon flashtube. When the tube is fired there is a rapid ionization period as the tube output rises to maximum brightness. This is followed by an exponential decline in tube current, voltage and light as the capacitors are discharged to zero. The standard engineering term for stating flash duration is "t.5". This describes the time it takes for 50% of the total flashpower to be dissipated. Whenever the simple designation "Flash Duration" is specified it can be assumed to be the t.5 spec."

- "However, the t.5 spec doesn't adequately predict the actual motion freezing capability of a flash. There is a much longer trailing edge that continues to emit the remaining 50% of the light. This causes considerably more motion blur than the t.5 spec implies. In order to better compare flash duration specs to an equivalent shutter speed, the term "t.1" was introduced by the photo industry. t.1 specifies the time it takes for 90% of the total flash to be emitted. But even following the t.1 time there is still light being emitted at sufficient intensity to cause some ghosting or motion trails."

- "VARIABLE VOLTAGE CONTROL OF FLASHPOWER

The vast majority of studio monoflash units, regardless of price, control the flashpower by varying the voltage to which the flash capacitors are charged…" (Alternatively, industrial set-ups may use fully charged banks of capacitors but only discharge a few of them for reduced power. This avoids longer T.5 at lower power)

Figure 2 depicts such a flash when the power is reduced to 50%. Notice the discharge curve is similar to the Full Power curve, but that the intensity is reduced and the discharge time is slower. Both the t.1 and t.5 flash durations are longer because of the reduced voltage and flashtube current."

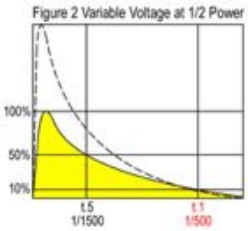
- “COLOR TEMPERATURE AND VARIABLE VOLTAGE:
  Another result of the reduced voltage and current is a lowering of color temperature that is proportional to the amount of power reduction via voltage variable means.”

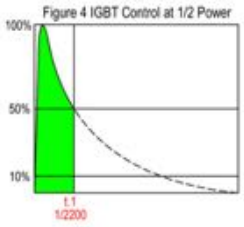
  “SUMMATION OF VARIABLE VOLTAGE FLASH CHARACTERISTICS:
  Flash units using variable voltage power control ….. typically exhibit an increase in flash duration roughly equal to 20% of the full power flash duration being added for each full f-stop in power reduction and about a 75K decrease in color temperature per f-stop of power reduction.”

- IGBT (isolated-gate bipolar transistor) CONTROL OF FLASH POWER:

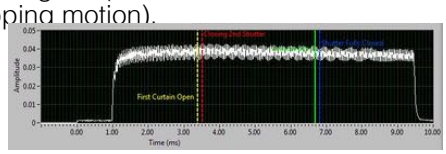
  This is a high speed electronic switch designed to turn the flash’s power on and off rapidly. Virtually all hotshoe (on- camera) flashes, including speedlights use this technology. Figure 4 depicts the flash duration curve when flash power is reduced. Speedlights have the additional ability to pulse light for shutter speeds higher than sync speed.

- “Notice in Figure 2 that a 50% power reduction in a conventional studio flash lengthens the t.1 flash duration from 1/666 second to 1/500 second while the same power reduction in an IGBT flash (**Figure 4**) shortens the t.1 duration to 1/2200 second and that the trailing edge tail is completely removed… ”





- SPEEDLIGHTS: These flashes have the ability to pulse many small flashes rapidly. (too fast for the eye to notice). Because they pulse rather than emit light all at once, the light is not as bright but can last longer. At shutter speeds higher than sync speed, a speedlight can pulse the entire time the first and seconds curtains are moving across the sensor. This prevents the dark bands. The drawback is that the flash is not as bright, so adjustments may need to be made to the ISO or aperture, OR, you may need to use multiple speedlights. (Dave Black uses 4 at once for stopping motion).



- iTTL/ eTTL: TTL stands for “through the lens”. Before the first curtain opens, the flash emits a small preflash(s) on the subject. The preflash information returns to the camera, and automatic exposure adjustments are made based on this information. It happens too fast for us to notice. This technology is useful when flashes cause alterations to the subject, such as highly reflective subjects.

- HYPERSYNC:
  http://wiki.pocketwizard.com/index.php?title=HyperSync

- It gets complicated. Hypersync is ADJUSTING the time that the flash discharges so that the flash hits the sensor at a specific time. It can involve triggering the flash before the shutter starts to open. There is often a slight gradient on the picture. It allows a long, slow, yet powerful light, the ability to freeze motion, above the camera’s sync speed.

I need to trigger my remote flashes

- Wired from camera port to flash port: Very reliable; Need compatible cables; Don’t trip on wires.

- Optical triggers: Must be in line of sight; May not be good in bright daylight; Other’s flashes may trigger your flashes!

- Radio triggers: Avoid the above problems but may have interference from other photographers’ using same frequencies; Can transmit farther distances so great for large spaces like outdoors; Can transmit iTTL/ eTTL; One needs transmitters, receivers, or “transceivers”; Should always test for interference and change frequency if needed; Great fun for unusual lighting.

- Masters and Slaves/remotes: One camera, flash or radio transmitter is the boss, and tells the remote flashes when to shoot. Smart technology can relay adjustments to remote flashes.
- Channels and groups: Remote flashes can be divided into groups and have different instructions, such as power levels.

I have an external flash and a way to trigger it. Now what?

- Fill light
- Highlight
- Turn day into night
- Second curtain flash
- High Speed Sync (freeze motion)
- Side light
- Back light
- Wipe out the backdrop
- long shutter, multiple flashes
- Accentuate transparency
- light painting

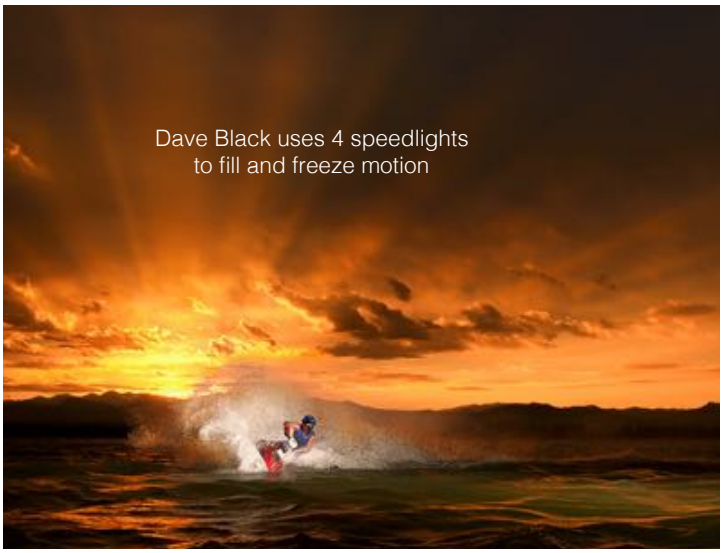
Sometimes, only a large golden reflector (and a helper to aim it) is needed.

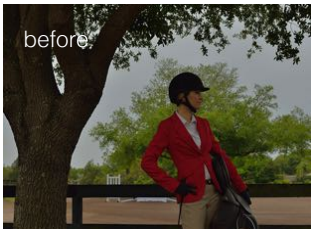
The problem was that this continous light was blinding them!!

Fill light for high contrast days may need to be projected from the side of the subject.

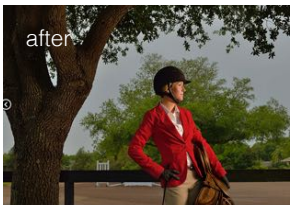
Fill light at dusk

Fill light at dusk, flash with a CTO Gel (Change to Orange)

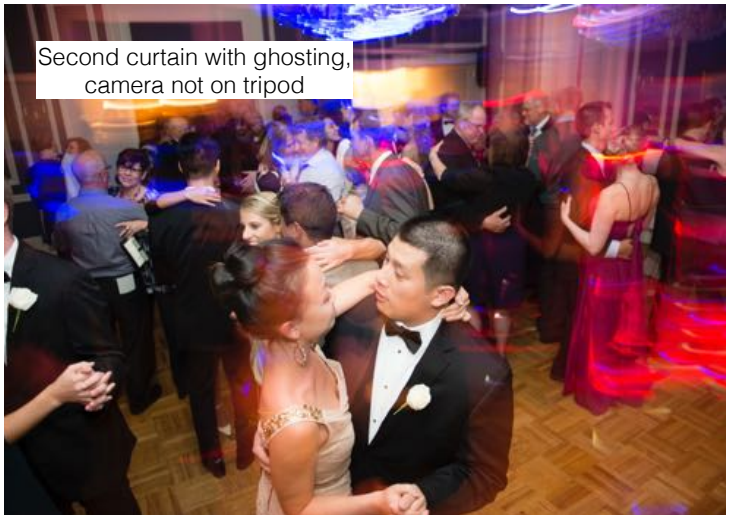




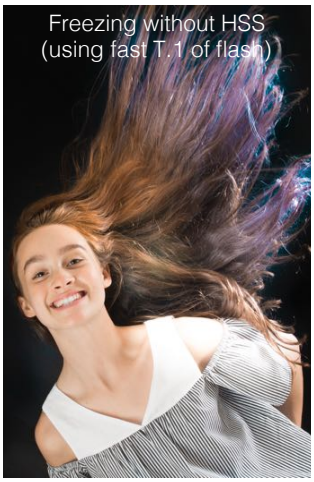
Dave Black: underexposing then highlighting with flash gel CTO

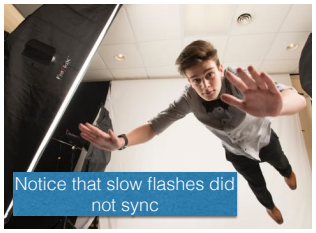


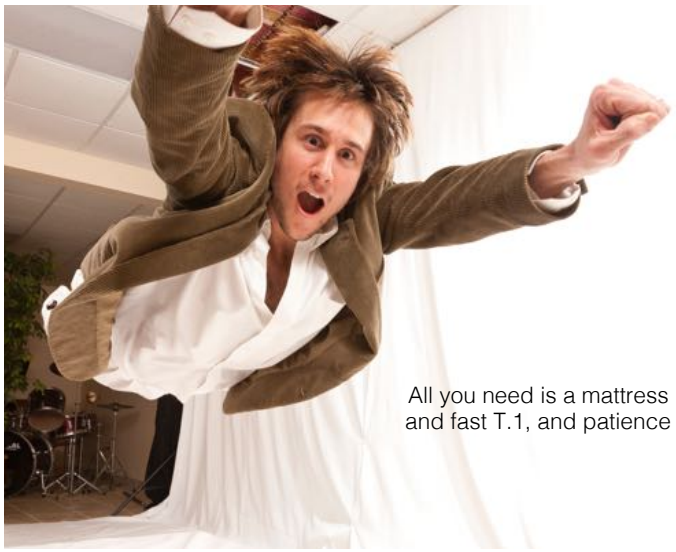
Dave Black says
if you want to make
an image interesting,
only light part of it.



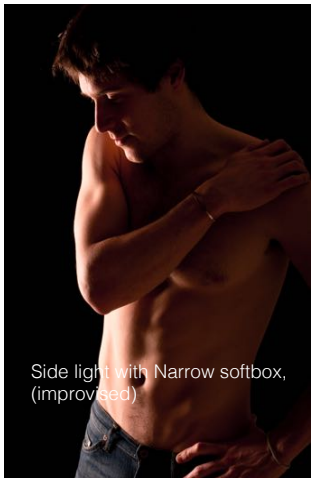
Dave Black Photography



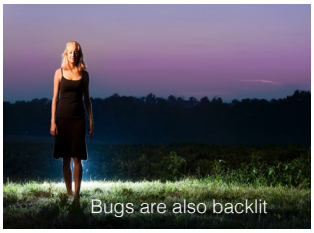




Daytime Sidelight
with gold reflector



Bounced sidelight



Backlighting for interest

Blow out the backdrop.

One exposure, multiple flashes

https://gulfphotoplus.com/blog/853/Double-exposure-Repeating-flash-and-a-ballerina

David Black does big
and small light paintings