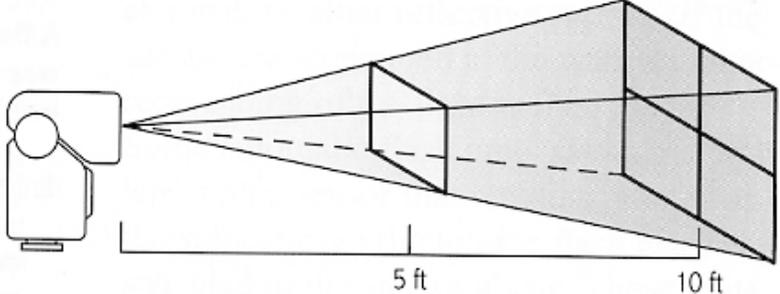


Flash Notes: Direct, Bounce, Fill, & Slow Sync

Before working with flash, realize that the camera's built-in meter will inform you only about the ambient light metering, not the flash.

Flash Photography Terminology

Automatic Flash	Determines exposure for you. This is a common for built in flash units. Other flash units have automatic ranges that help do some of the work for you.
Built In Flash	Common on Point and Shoot Cameras and some 35mm SLR's. This flash is typically not adjustable and presents some problems such as over exposure on a subject and dark shadows behind the subject even if there isn't a wall up close.
Manual Flash Mode	Default Flash mode on non-dedicated flashes. Most Dedicated Flashes also have this feature. You control the output power of the flash.
Color Temperature	Most electronic flash units are rated between 5000 and 5800 Kelvin. This mimics a cloudless day between 10:00am-3:00pm. However, some flashes can look slightly cool when using auto white balance setting.
Dedicated Flash	Designed to go with a specific camera. Mixing dedicated flashes with the wrong camera can result in short circuiting the equipment!
Flash Duration	Flash durations can range from several hundredths of a second to several hundred thousandths of a second. <ul style="list-style-type: none"> • Rather than changing the amount of power dispensed into the flash tube, usually the duration of the flash is adjusted while the output level of the flash remains constant. • Reciprocity Law failure should be considered in these cases. When using an automatic or TTL flash close to a subject with a large aperture and a relatively fast ISO/EI, flash durations can be extremely short. • This can be very helpful in stopping very rapidly moving subjects. If the light from the flash is the only source illuminating the subject some spectacular results can be obtained
Flash Meter	This is an electronic meter that measures the exposure in a specific area given by flash. These units are extremely precise and nice, but also expensive.
Fill Flash	Adding light with flash to the subject to separate the subject from the background, compensate for backlit scenes, or filling in dark shadows on the subject. Also known as Balancing Flash & Ambient Light .
Hot Shoe Mounted Flash	These include basic flash units, dedicated flash units, automatic flash units, and TTL flash units.
Recycle Time	Refers to how long the flash will take to charge up and be ready for the next flash. This can be instantaneous to several seconds depending on several factors including freshness of batteries.
Inverse Square Law	Light intensity falls off with the square of the distance. <ul style="list-style-type: none"> • As the distance from the flash doubled, the exposure of the flash is 1/4 it's original amount. • As an object is placed further away from the flash, less possible light can hit the object. • Thus, distance determines power or intensity from a flash source.

<p>Inverse Square Law continued</p>	 <p>At 5 feet from the flash, the light fully illuminates the square. At 10 feet from the flash, the light spreads across 4 times the original area. Any given square at 10 feet receives only 1/4 the light received by the original square.</p>
<p>Guide Number</p>	<p>GN= f-stop X distance <i>Guide Number</i> is a tool to determine exposure of direct flash with manual flash power levels, to automatically deal with the Inverse Square Law, thus making the math trivial. The <i>guide number</i> is the product of the maximum flash-to-subject distance and the <i>f-number</i> of the aperture that will correctly expose film or a digital sensor with the specified sensitivity.</p>
<p>Flash Calculator Dial</p>	<p>Common on Non-Dedicated flashes. This will help determine guide numbers and flash output power in Manual Flash Mode. You must set the ISO on the flash to match the ISO on your camera. The Calculator will show combinations of Distance for each available aperture. You would choose the correct aperture to match the distance to your subject. This feature is on the Vivitar 285, Vivitar 283, and Metz flashes for checkout.</p>
<p>Slave Unit / Slave Flash</p>	<p>These include flash sensitive, infrared sensitive, and radio controlled units. You can have separate slave triggers that are used to trigger a flash not directly connected to the camera. It can also be built directly into a flash unit.</p>
<p>Sync Cord</p>	<p>Connects an off-camera flash to the camera so that the flash will be triggered by the shutter release.</p>
<p>Sync Speed</p>	<p>The fastest shutter speed your camera can use with flash. A more technical way to say this is: The fastest shutter speed in which the first curtain is completely open before the second curtain starts to close is the sync speed.</p> <ul style="list-style-type: none"> • focal plane camera (most 35mm, DSLRs, some medium format) can only synchronize with flash at their “synch speed” or any shutter speed open for a longer duration. On modern multi-segment titanium shutters than can be as fast as 1/250 of a second but on others it might be as slow as 1/60 of a second (some focal plane medium format cameras could only synch at 1/30 of a second). You need to read your manual to discover the correct synch speed for it. Remember you can shoot at that synch speed or any slower speed. If the shutter is set to a faster (shorter duration) speed, parts or all of the photo will be blocked off.

Sync Speed Continued	<ul style="list-style-type: none"> On a 35mm SLR camera this is usually 1/60 or 1/125. On cheaper digital SLR's it is usually 1/125. On higher end digital SLR's it is 1/250. The number is usually red or has a lightning symbol next to it (on film cameras). Wireless transmitters may delay signal causing a need for a slightly slower "flash speed". For example, your true sync speed might be 1/250, but shooting with wireless transmitter might require you to use 1/200 because of delay. You will have to test your equipment to find out if you need to compensate. The Alien Bee strobes need compensation.
TTL: Through The Lens Metering	<p>A sensor inside the camera automatically reads the burst of light's reflection of the subject. This system is not perfect...usually go for simple subject scenes and subjects that are not highly reflective. Also, cheaper TTL units do not balance ambient light with flash. TTL sensor meter reflected light and have similar problems to light meters that are built into your camera.</p>
HSS: High Speed Sync	<p>HSS, also called "focal plane sync" or "FP-sync" is available with certain dedicated flashes. If you want to use flash with a shutter speed faster than the x-sync speed, you have to set this flash mode. This causes the flash to fire several bursts, effectively making it behave like a continuous light source.</p> <ul style="list-style-type: none"> Aperture Priority shooting mode works well with HSS. This mode will consume a lot of power and is hard on the strobe unit inside your flash.
Flash Exposure Compensation	<p>When shooting with auto flash or TTL, FEC allows you to adjust the amount of flash output.</p> <ul style="list-style-type: none"> With no FEC dialed in, the flash will fire with enough output to expose the main subject with a medium tone. If you want to cut the output determined by the camera in half, dial in -1 stop of FEC--to cut it to 1/4th as much, dial in -2 FEC. To cause the flash to emit twice as much light, dial in +1 FEC.

Methods of using more versatile flash:

- Scotch Tape as a diffuser on built in flash units
- Off camera flash with either a sync cord, slave, or bracket system
- Professional light modifiers (usually diffusers)
- Homemade light modifiers

General Considerations for Flash:

1. Regardless of your flash, it is recommended that you test it and get to know its accuracy. Also, it is recommended that you do a bracket to give you a varying amount of fill flash on the subject.
2. Keep in mind that flash exposure is controlled by aperture, not shutter-speed.
3. Flashes are only as powerful as their guide number and distance to subject.
4. Non-dedicated flashes on digital cameras tend to underexpose when using the flash's recommend settings. For direct on camera flash with a non-dedicated flash, consider opening up your aperture one stop over whatever the flash tells you to use. At SWC photo, we have found this to be common for the Vivitar, Metz, and Sunpack flashes.

METERING WITH FLASH (Direct On Camera Flash)

Operating a Flash with a manual calculator dial like the Vivitar 285 HV:

1. Set the ISO on the flash unit to match the ISO of your camera.
2. Set camera to Manual exposure mode.
3. Set your shutter speed for the flash sync speed.
4. Start with flash at full power.
5. Determine the distance from flash to subject.
6. Set the aperture on the lens to match the aperture that is opposite the distance you chose above on the calculator dial.

Operating a Flash with semi-automatic exposure settings:

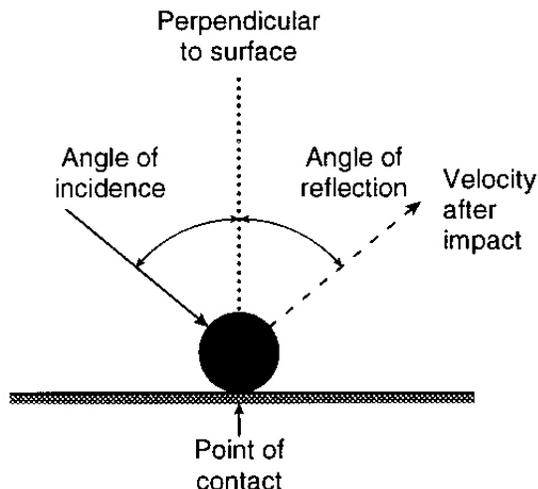
1. Set the ISO on the flash unit to match the ISO of your camera.
 2. Set camera to Manual exposure mode.
 3. Set your shutter speed for the flash sync speed.
 4. Set the automatic mode based on the range of distance that you will have between your flash and subject.
-

Section 1: Bounce Flash

Goal: *Get more diffusion than straight on flash, create a larger light source, light backgrounds to some degree as well as subject.*

This is an effective technique when you want to light your subject and surroundings with a more diffused light source than a straight on flash. As with most situations, it has its limitations.

Angle of Incidence & Angle of Reflection



Directions for Manual Bounce Flash:

1. Make sure that your camera ISO and Flash ISO match.
2. Unless you have a fancier dedicated flash, then set both your camera and flash to manual mode.
3. Make sure your shutter-speed is your sync speed for your camera.

4. Use the flash exposure dial on the back of the flash to figure out the necessary aperture. Your distance to subject is based on the distance to bounce surface plus the distance from bounce surface to your subject.
5. You will need to compensate for the exposure loss from the bounce. Here are some general guidelines for your compensation adjustments.
 - If your surface is shiny and within six feet of your subject, compensate by adding two stops exposure over the flashes listed exposure. In other words, open up your aperture by two stops.
 - If your surface is dull and within six feet of your subject, compensate by adding three stops exposure over the flashes listed exposure. In other words, open up your aperture by three stops.
 - If your bounce distance is less than six feet away, then add less exposure than listed above.
 - Realistically, it is hard to bounce off of surfaces more than six feet away from your subject.
6. Bracket your exposures.

Example:

ISO is 200.

Sync speed is 1/125.

Distance from flash to ceiling is 6 feet.

Distance from ceiling to subject is 6 feet.

Total distance for flash is 12 feet.

Flash calculator dial says that at this ISO and distance, I should use an aperture of f-11.

My ceiling is shiny, so I compensate by opening up the aperture two stops to f-5.6.

My bracket of exposures would be the following: 1/125 @ f-4, 1/125 @ f-5.6, 1/125 @ f-8.

Note: Fancier Dedicated flashes such as the Nikon SB800 & 900 can actually compensate for bounce, and usually have better results when you keep the camera in an automatic mode instead of manual mode.

Section 2: Fill Flash (Balancing Ambient Light And Flash)

Goal: You want to fill in shadows, balance ambient light and flash, and most folks would never have known that you used a flash.

This scenario is typically a scene where the background has more light than the subject in the foreground. You want to use normal exposure to capture the background, and flash to fill in the shadows of the foreground subject.

The following procedures work best with a flash that has adjustable power settings. Fill Flash is typically done in outdoor daylight situations. For low light situations or interiors, see the section called Long Sync Speeds.

Manual Flash Mode Directions:

1. Use your Camera in Manual Metering Mode
2. Set your Flash to manual mode.
3. Set the Flash ISO to match your Camera ISO.
4. Know your Camera's Sync Speed. Set your shutter-speed to the sync speed.
5. Point your camera at the background and meter the scene. Ideally, you would meter off a graycard. Look at your Camera's lightmeter and find the aperture that matches your shutter-speed for correct exposure without flash. Keep those settings on your camera.

6. Measure the distance between flash and subject.
7. On your Flash, look at the find the aperture that is across from the distance measured. Usually, it will not be the same as the aperture you got when metering the background.
8. Lower the power settings until the distance does match the aperture you set from the background exposure.
9. Take a test shot.
 - If the flash is too strong, then lower the flash power if possible.
 - If not possible, then you will need to increase your distance between Flash and subject.
 - If you can't do either option above, then place a diffusion device in front of the flash to lower the intensity of the flash.
 - If the flash is not strong enough, increase power on the flash.
10. I recommend bracketing exposures.

Example:

ISO is 100.

Sync speed is 1/125

Background exposure is f-8 @ 1/125

Distance between Flash and subject is 5 feet.

Aperture that matches your distance is f-11 at full power.

Reduce Flash power to 1/2. This allows the aperture to match your distance at f-8 instead.

Take the picture.

TTL Flash Mode with Camera Dedicated Flash Directions:

TTL flash (with the camera in manual metering), will make the necessary adjustments mentioned above. If using a Nikon Speedlight such as the SB-800, you will want to use TTL-BL in most cases.

Nikon has I-TTL, Canon has E-TTL

If photographing a scene outdoors as mentioned above, be aware of how much light is hitting the subject. The more your subject is in the shadow, the more you rely on the TTL-BL to do the work. If your subject is just slightly darker than the background, then you may find that you want to lower your flash exposure compensation by about -1 to -1.7 stops while still exposing properly for ambient light.

Section 3: Dragging The Shutter (Front Curtain Slow Sync, 1st)

Goal: Increase ambient light exposure.

Note: Can result in motion blur.

Note: Flash fires first followed by blur if captured.

1. Meter the scene for flash (distance to subject).
2. If you have the option on your camera, keep your camera on the regular flash setting. This is also the default setting.
3. To increase ambient light exposure, use a slower sync speed. Typically, as long as you don't go below 1/15 of sec with a still subject and tripod, you can avoid motion blur.
4. If you want to play with motion blur, try not using a tripod, and even slower shutter speeds (probably 1/8 sec or slower depending on conditions).
5. Adjust apertures to help with exposure issues.
6. Not possible in bright light. Do this in early morning, evening, interiors, or nighttime but with available light.

Section 4: Rear Curtain Slow Sync (2nd)

Goal: Use motion blur with flash for creative results.

Note: Motion blur comes first. Flash fires last, resulting in frozen action at the end of movement.

1. To achieve motion blur, delay the flash to the end of the exposure with settings such as slow sync if you have this possibility.
2. Put your camera on Rear Curtain sync in the flash menu (if you have this option).
3. Try 1/15 of a sec or slower. This is experimental, so try.
4. Adjust apertures to help with exposure issues.
5. Not possible in bright light. Do this in early morning, evening, interiors, or nighttime but with available light.