Basic Guide to Lighting for the Photo Studio

Chris Lydle

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Flash and Studio Lighting for Better Photographs

The very word “photography” means writing (or drawing) with light. Arguably light is the first great necessity for photographs, and great, controllable light is what we really want.

While the sun is a great source of light it's unavailable half of the time and isn't good at playing indoors. So from the very dawn of photography we’ve been looking for light we could use all the time, when we want it. We want to control the direction it comes from, we want to control the brightness, we want to control the duration of our light. Today we’ve got all the tools we need to do that, and many of them come from the PROMASTER design and manufacturing teams.

Even before George Eastman’s creation of flexible film made photography available to the masses in the 1880s, photographers had to cope with the extremely low sensitivity of their media. They augmented natural lights with everything from lanterns to flash powder.

Edison’s invention of the light bulb in 1879 gave a brighter, safer, more controllable light source. Even today tungsten light bulbs are a usable, if not ideal, light source for photography.

**Photoflood bulbs** are a variant on the household bulb – basically an “overcranked” bulb that burns bright and hot and dies after as little as three hours. They use lots of current – up to 500 watts per bulb - and can blow fuses. They burn hot and feel hot to subjects. You wouldn’t want to use photo floods to photograph a dish of ice cream! And of course, they need to be plugged into a power source so power cords trail all around the studio.

Glass bulbs loaded with special magnesium filament material burn extremely bright and fast; that’s a **flash bulb**. They were popular from the 1930s into the 1970s, but electronic flash has eclipsed their use. Flash bulbs had, and still have, the advantage of making huge amounts of light. Sylvania’s “Big Shot” projects included using over 6,000 Blue Dot bulbs to make night photos of areas as huge as the Horseshoe Curve at Altoona, PA., or the Pyramid at Khufu.

Dr. Harold Edgerton experimented with **electronic flash** to freeze action. That’s why the word "strobe" is casually used to refer to all electronic flash, even though we don’t use the fast repetition of true stroboscopy. Edgerton’s experiments led to portable flash units that eventually made flash bulbs obsolete.

In the 50s electronic flash units cost hundreds of dollars, while today even single use cameras sport built-in electronic flash. Whether you’ve got a big budget or not, you can put together a flash or studio lighting system that makes your photos better and brighter.
What’s “real” and what’s “artificial”

Photographers make an arbitrary distinction between “artificial light” and “ambient” or “existing light” or “available light.” The light that is there when the photographer arrives on the scene is “ambient” or “existing light” or “available light.” The light he or she adds is “artificial light.”

Some photographers actually feel that natural light has a moral or ethical superiority. We don’t.

In reality, whatever light you can take advantage of is “available” to you, and it’s great to have control.

There are five big variations among lighting sources:

**Point of origin:** where is the light coming from? This controls where the shadows fall, and a mixture of light and shadow gives a 3rd dimension to the image. Light coming from near the lens makes subjects look flat and uninteresting.

**Amount of light:** a lot or a little

**Color of light:**
- Daylight and most flash are seen as normal
- Shadows and high noon tend toward the blue
- Tungsten (incandescent) lights are more red
- Traditional fluorescent lights are sickly green/blue

**Relative Distance** from light source to everything in the photo. If the only light is close to subject but a long way from the background, the background will be much darker.

**Relative size** of light source (relative to subject)
- Small (point source) light is contrasty. At its great distance, even the sun is a small source.
- A relatively big light source has lower contrast. On an overcast day, the cloud cover becomes the big, diffused source.

Artificial lighting – the stuff you control yourself – is broken down into Continuous Lighting versus non-continuous light.

**Continuous lights:**
- Don’t have to be synchronized to the shutter.
- You can always see where the shadows are falling.
- The camera’s light meter can see continuous light, making it easy to adjust exposure.
- You can set any shutter speed on your camera from the very slowest to the very fastest.
- They cost less.
- Are hotter on the subject (CFLs are not very hot)
- You can take pictures in a continuous sequence.
- They draw more power, so you might pop fuses or circuit breakers if you plug in too many. CFL lights use less power than photofloods.
- Photo floods burn out quickly.
• Color of the light varies by type, so you must match the color temperature of the units.

• Although they seem bright to the eye, continuous lights are usually not as bright as daylight. That means you need larger lens opening and longer exposures to make pictures.

• Camera motion and subject motion can result in blurred photos

Strobe (flash) lights:

• If they have modeling lights you can see where the shadows are falling.

• Very short duration of the flash means they freeze action – the duration of the flash is the effective shutter speed.

• Color of the light is about the same as daylight

• Cooler on the subjects than photo flood bulbs

• They don’t use much power – won’t pop circuit breakers

• You can’t set higher shutter speeds on the camera to minimize the effect of ambient light. Almost all cameras have a maximum shutter speed at which flash can be used.

Umbrella vs. Soft Box

Umbrella:

• Easier to carry and to set up

• Cheaper.

• Many sizes, colors and surfaces available

• Is strongest in the center, light diffuses around edges so there is a “hot spot”

• Provides better ventilation for a bulb since air flow is not blocked

• Light spills around the edges so you may get light where you don’t want it.

Softbox:

• Light is more efficient – none gets lost

• No scattering of light around the room

• All the light comes out the front

• Reflections in the eyes of the model are rectangular instead of doughnut shape

• Lighting is more even, with fewer hot spots

• Not as easy to carry from place to place

• Does not provide air flow, so hot bulbs can be hazardous in the confined air space.
Compact Fluorescent (CFL) vs. Photo Flood

- CFL is cooler, so they’re easier to work with and won’t annoy the subject
- CFL bulbs draw less power. You can use more without blowing fuses
- CFL bulbs last much longer. Many photofloods last only about 3 hours!
- CFL Color is closer to daylight *if you choose the right bulb*
- CFL bulbs cost a little more, but that’s quickly recovered by longer life
- Photoflood bulbs are cheaper
- Photoflood bulbs are brighter
- Photoflood bulbs are available with different temperatures
- Photoflood bulbs can be used with a dimmer, CFLs usually can not
- If you use a dimmer with a photo flood, the color of the light changes. As you reduce the percentage of brightness, the color becomes more red.
- Some reflector housings don’t have the physical room to screw in a CFL bulb, which has a larger diameter base
- Household CFL bulbs do not have the same color characteristics as ones designed for photo us.

Every light source casts a shadow behind each subject. Better lighting techniques allow you to control a shadow.

The larger the relative size of the light source, the softer and more diffuse the shadow will be.

You can’t get rid of a shadow by adding more light sources. All you can do is create additional shadows or boost the total amount of light on the background. When the light on the background is so overpowering that the entire background – including those original shadows – is brighter than the camera’s ability to record detail, you won’t see any shadows. However, the background will be pure white. Usually that’s not acceptable.

The key to keeping shadows where you want them is light placement and the space between the subject and the background. If there’s adequate space between the subject and the background you can light the background separately. That lets you control the background’s brightness and color.

With small point sources of light, shadows are always crisp. Larger sources, such as a diffuser or a soft box, produce softer shadows that soften still more as the distance between subject and background increases.

**Strobe or electronic flash – is there a distinction?** Technically, “stroboscopic” lights blink repeatedly and very frequently. When they have a very short duration they have the effect of “freezing” action.

But with the word contracted to “strobe” it’s basically any flash source that can be used more than once, as opposed to the old flash bulbs. So from here on I’ll use the terms strobe and electronic flash interchangeably.

**How does an electronic flash work?** The light is created by a flash tube, filled with xenon gas. High voltage electricity (often around 500 volts) creates an arc emitting a short burst of light. The
duration of this flash of light is very short, ranging from about $1/500^{th}$ of a second to $1/50,000^{th}$ of a second.

A **power supply** takes the incoming source of power – be it batteries or line current – and boosts it up to the required voltage of the flash tube.

The power supply charges a **capacitor** which stores the energy until it’s discharged to the flash tube, creating a powerful burst strong enough to emit light.

**Triggering mechanisms** tell the flash when to discharge, and **control mechanisms** turn the flow of power from the capacitor when enough light has been generated.

In recent years, the **thyristor** has been used to cut the flow of electricity to the flash tube so quickly that very small amounts of light can be portioned out.

Years ago it was necessary to calculate the f-stop needed for a photo, based upon the known power of the flash and the distance from the flash to the subject.

**Automatic** flash guns measure the amount of light that has gone from the flash to the subject and when enough has come back for a proper exposure, turn off the flash. That way the photographer could set the f-stop once and not have to worry. As he moves closer or farther, he still gets the right amount of exposure.

**TTL** or **Through The Lens** metering takes automation one step farther. Now the camera measures the light generated by the flash during the actual exposure, through the lens. This can provide for very precise control that compensates for lens extension and the fact that many zoom lenses actually change their effective aperture as they are zoomed.

**More details:**

**Triggering mechanisms** tell the flash when to fire. Modern cameras almost always are equipped with a **hot shoe** which both supports a flash unit and makes and breaks a connection to tell the camera when to fire. The flash may also be fired by a connecting cord or synchronization cord, which usually is called a **PC** cord. **PC** stands for the old Pronto/Compur shutter works, not Politically Correct or Personal Computer.

Trigger mechanisms in some older strobe units actually used high voltage, high enough to damage the electronics in modern cameras. Modern flash units have mechanisms which prevent the dangerous high voltages from getting to the camera. Be very cautious when using older flash units or garage sale bargains – they could fry your camera’s electronics.

Devices such as the Wein Safe Synch are intended to prevent such damage. Using a wireless flash trigger provides total safety, because there is no way the trigger voltage gets to the camera.

**Specifications of a strobe:**

Power or brightness is usually expressed in two ways: Watt Seconds and Guide Numbers.

Watt Seconds are a measure of how much electrical power is available to pump through the flash tube. It’s a description of stored energy – the energy to produce one watt for one second. So 100 watt seconds would light a 100 watt bulb for 1 second. Doesn’t seem like a lot of light, does it? But when all that power is discharged through an electronic flash tube in a $500^{th}$ of a second it makes a pretty bright flash.

All other things being equal, a unit with more watt seconds will produce more light – but all other things are rarely equal.
Manufacturers often incorporate the watt second rating of their flash units into the model name. For example, a PROMASTER 160 has a 160 watt second power rating. A PROMASTER 300C has a 300 watt second power rating.

**Guide number** is a way of describing the actual usable light output of a strobe, taking into account the flash tube itself, the reflector and the angle of coverage.

Guide Number or **GN** is the result of multiplying the distance from flash to the subject times the f-stop (aperture) setting which gives a perfect exposure at a given film speed/sensitivity/ISO setting.

Case in point: if my camera is set to ISO 100 (or if my film is ISO 100) and I get a properly exposed image at f11 when the flash is 10 feet from the subject, the guide number for that flash is 110.

To compare the output of one flash with another, compare the GNs. Note that the GN must be in the same system: for example, GN in feet at 100 ISO.

That very same flash could be said to have the following GN, and all of them would be right:

- GN in meters, ISO 100 = 34
- GN in feet, ISO 400 = 220

In rating a flash which has a **Zoom Head** the GN changes as you zoom

**Angle of coverage** – how much does the light from the flash spread out as it is emitted?

If you are using a lens with a narrow angle of coverage, you don’t need your flash to have a wide angle of coverage. Matching the flash’s angle to the lens means your flash remains bright out to a greater distance from the flash.

On the other hand, if you are using a wide-angle lens you need a flash whose angle of coverage is **at least** as wide. Otherwise the edges of the picture will be dark.

Consider a popular flash like the PROMASTER 7400EDF. This model has a zoom head so that you can match your light pattern to the coverage of your lens. In fact, it even has a motor to power the zoom head of the flash gun so that it can adjust cover as you zoom the lens. Pretty smart, eh?

But as the light spreads out the intensity goes down. (more space to fill, same amount of light)

Here’s what happens to the Guide Number as the flash head zooms to cover a particular lens size. For the sake of consistency, the lenses listed are lenses used on a 35mm SLR or a digital SLR with a 24x36mm sensor.

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Even though a flash gun gives perfectly even illumination all across its field of coverage, the edges may look darker than the center. Why? Because the edges are actually farther away.

Consider these examples when taking a group photo of 9 people in a nice, if boring, straight row.

If you are using a long lens – say a 100mm lens – you’ll stand 30 feet from the group to get everybody in. You’re 30 feet from Joe in the center and 31 feet from Julie and Jill on the edges. The lighting is almost exactly the same on both subjects.

If you are using a shorter 50mm lens you’ll stand 15 feet from the group to get everybody in. You’re 15 feet from Joe in the center and 18 feet from Julie and Jill on the edges. The girls are going to look somewhat darker.

But when you put on your 28mm wide angle, you’ll stand 8 feet from the group to get everybody in. You’re 8 feet from Joe in the center and 12 feet from Julie and Jill on the edges. The light has fallen off much more at the edges. Julie and Jill have lost more than a full f-stop of exposure and they look really, really dark compared to Joe. And that’s with a flash unit that has perfectly even lighting distribution, doing its job just the way it was designed to.

Wow, we just can’t get a break!

Recycling time

After you take a photo, the flash unit has to refill the capacitor to a certain level before it’s ready to fire again. Several factors contribute to this actual time:

- How big was the previous flash? Low power flash settings – fractional power – don’t drain the capacitor all the way.
- How far away was the subject? At close distances, most flash guns don’t use full power so they are ready again more rapidly.
- How’s the power holding out? When the batteries weaken it takes long to recycle.
- What are the design specifications? Some flashguns recycle faster than others. Bigger power supplies and other factors enter into this.

Continuous light sources, such as photo flood and CFL bulbs, don’t have a recycling time. They are on all the time.

Why do we want a separate flash, other than the one built into the camera body?

The built-in camera flash is weak. On the Nikon D3100, for example, using ISO 100 you can take properly exposed photos using f4 to only about 9 feet. Anything beyond that distance will look dark and muddy.

Even a small, modestly-priced flash like the PROMASTER 2500EDF has about 3 times the power and therefore, far more “reach”. At a setting of ISO 100 you can take properly exposed photos using f4 at 16 feet.

A bigger flash like the PROMASTER 7500EDF boosts that range to 25 feet.

(operating ranges are much greater when using higher ISO, faster lenses or longer lenses with flash units that zoom)
**Studio flash units** have much greater output. The PROMASTER 300C mono light has a Guide Number of 177, so at a setting of ISO 100 you can take properly exposed photos using f4 at 45 feet. (That’s with the standard reflector in place)

The built-in camera flash gives that “deer in the headlights” look. Flesh tones look oily, the background looks dark, and the subjects look washed out.

The built-in camera flash gives your subject red eyes. Because the flash is close to the lens, the light bounces off the retina of the subjects eye – which is soaked with blood and therefore red. It bounces right back to the lens and your adorable models look like demons.

Getting the flash farther away from the lens reduces that effect dramatically.

The built-in camera flash is doesn’t give a modeled 3-dimensional look to your subjects. By being more distant, the light washes across the subject and it doesn’t look so flat.

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**An introduction to continuous lights for photography**

Our oldest continuous light source is the sun. It’s been around for a long time and it’s plenty powerful. And it’s free.

Those are the good points.

On the other hand, it’s not available about half of the time. And it’s never coming from the direction you want it to, and it’s harsh, and it doesn’t want to come indoors for your convenience. In short, you just can’t count on it.

Photographers in the 19th century experimented with various lanterns to boost inside lighting, and in 1879 Thomas Edison invented the incandescent light bulb. That made artificial light more consistent and more controllable.

**Photoflood** bulbs are better still for photographic purposes. To start with, they have greater light output because they consume 250, 500 or even 1,000 watts apiece. And they are electrically overcranked. Their optimum voltage would be under 100 volts, so when used in typical 120 volt circuits they are extremely bright and have a short lifespan. Typically, they burn out in about 3 hours and the color of their light changes as they age.

Photoflood bulbs are available in both white and blue varieties, with the blue ones being closer in color temperature to daylight than are the white ones.

Even the blue bulbs are not truly the same color as daylight, although they are close enough to be used as fill-in lighting for photos taken primarily with sunlight.

When used with film cameras, color correction filters are advised if using photoflood bulbs. 3200º bulbs require a 81 series filter. Blue bulbs, which are only about 4,800º, use an 82 series filter. Digital cameras can have the **white balance** adjusted instead. As long as all the light sources are the same color, it’s not difficult to adjust your camera to the light.

Disadvantages to photoflood bulbs: they’re cheap but because they don’t last very long, they are more expensive in the long run. They create a high electrical load – putting several on the same circuit can easily blow a circuit breaker or a fuse. And they get very hot and create so much heat that the subject may wilt or melt.

Quart-halogen bulbs create a cleaner white light and last longer, but are still very hot.
Enter the **Compact Fluorescent Bulb.** (CFL)

CFL bulbs were originally intended as an ecologically sound replacement for household incandescent bulbs.

Bulbs designed for the photographic market are especially color balanced to have a color temperature of 5,500º Kelvin. That’s about the same as daylight.

CFL bulbs give much more light for every watt of electricity consumed, because they don’t waste it in the form of heat. That means an 85 watt CFL bulb makes about as much light as a 300 watt incandescent photo flood and less than a tenth of the heat. The initial cost is higher but they last much longer.

**PROMASTER Continuous Lighting Components**

PROMASTER Cool Light reflectors can be used with either incandescent or CFL photo flood bulbs. When used with CFL photo bulbs they give the best results and all these advantages

- They are powerful and yet they don’t overheat your subject
- You don’t have to synchronize continuous light (make sure it goes off at the same time as the shutter) as you do with strobes.
- The color is about the same as daylight, so you don’t have to reset your white balance.
- With continuous lighting, “What you see is what you get.”
  You see where the shadows will fall so you can control them.
- Cool Lites are energy efficient so you won’t blow all the fuses
- The power cords are long so you don’t need extension cords.
- Less light gets “lost” than with an umbrella
- Continuous light is excellent for movies (in fact, it’s absolutely essential)

Two models: SPRO 10” Cool Light is 10 inches in diameter and uses one CFL bulb. SPRO 16” Cool Light is 16” in diameter and uses up to 3 CFL bulbs. It comes with a cloth diffuser to soften the light.

Both models have a rugged tilt mount that fits the most popular light stands.
Another continuous light product is the PROMASTER SystemPro QLight 250 Kit. It uses a 250 watt quartz light bulb to give continuous exp exposure. The flash head has a built-in reflector with 3.75” diameter that ensures even lighting throughout and a wide lighting angle. There’s a thermostatic controller and a quiet mini-fan to prevent overheating.

Because the head is the same diameter as the PROMASTER 160A electronic flash you can use the same barn doors, snoots and other accessories. *Use of closed soft boxes is not recommended because of the high heat of the halogen bulb.*

This product provides excellent light for YouTube movies.

Product #6846 comes complete with a 6’ 5” light stand, bulb and white umbrella.

**Photographers have always liked the cool soft light of a light box, and wished they could be used with continuous light sources. Now they can.**

PROMASTER has created two new softboxes designed expressly for use with the newest CFL bulbs. Unlike incandescent photo flood bulbs, CFLs won’t set the cloth of a soft box on fire. And because they don’t draw as much current, they won’t make circuit breakers pop as often.

Available as either a 50 cm x 70 cm rectangle or a hexagonal model, both models have sockets for as many as 4 bulbs from 22 watts to 85 watts each.

Bulbs fit into a lamp holder allowing you to control the lamps in 2 lamp arrays allowing for the use of either 2 lamps or 4.
That lamp holder has sockets to mount a soft box (included) or an umbrella (optional). There’s a sturdy mount that fits onto standard light stands.

Why are they called “3-in-1”? Because they can be used as an open source, or with the bulb holder and an optional umbrella, or with the soft box diffusers which make it a consistent light system. As long as all the CFL bulbs come from the same family the color will match.

Central Power Pack or Mono Light?

Electronic flashguns designed for the studio come in two categories. Some have a central power pack with cords running to one or more flash heads.

The central power pack converts AC power – the mains current – to the high voltage needed to power the flash tube. A large condenser or bank of condensers holds the charge which is transmitted along a cable to the flash heads.

The heads usually have removable reflectors and need only one cable to go to the power pack.

A flash trigger cord or wireless connector goes to the power pack and hooks to the camera.

Power packs tend to be bulky and of course, if the power pack breaks the entire system is down until it is repaired or replaced. Cords have to run from the power pack to each of the heads. For that reason, the central power pack category of flash is better suited to a fixed studio location than to mobile operations.

Modern central power pack systems are equipped with voltage controllers to make sure that high voltage never gets to the internal electronics of a camera. Older units may not be as safe. If you buy a used system be very careful not to burn out your expensive camera.

Mono Lights have a power pack in each flash head and are therefore totally independent of each other. Each head requires that one power cord go to the AC supply or in some cases, a battery pack.

Each head has its own connection for synchronization via either cord or wireless trigger. Almost all mono lights also have a built-in slave trigger so that whenever they get struck by the light from another flash they fire.

An advantage to the mono light is that you can use them in a studio but take just one or two with you when you shoot on location. If that baby elephant you’re photographing knocks one over or steps on it, you’re not out of business the way you would be if the elephant crushed a central power pack.
You can buy one unit at a time to get started, or choose a kit that includes two or more heads.

PRO Member stores offer two PROMASTER monolights.

PROMASTER 160A weighs less than 2 pounds but has a 160 watt/second power capacity. It features a removable flash tube (so you can replace it if you wear it out), variable power halogen modeling lamp, audible flash ready indicator, and a built in slave. With its guide number of 120 it’s good for the small studio and the mounting bracket plus umbrella adapter are included.

The PROMASTER SystemPRO 300C Studio Flash is a more rugged and powerful but not overly large Monolight.

It weighs less than five pounds per head.

The strobe output is 300ws at full power. There’s a Guide Number of 177 (in feet) at ISO 100. That means you could shoot at f16 when the flash is about 11 feet from the subject.

Like most larger mono lights it has variable power and a built-in slave trigger.

Near the end of the book you’ll find complete specifications of this and other model flash units.

Mono lights can be used with a conventional parabolic reflectors but give more versatile performance when fitted with umbrellas or soft boxes. Sometimes they are used with no reflector – just a bare bulb – which turns the entire shooting room into a giant reflector.
**PROMASTER STUDIO FLASH (STROBE) LIGHTING**

**Strobe lights** (studio flash) have the advantage of being very cool so your subjects don’t flinch. They also do not require as much power from the wall outlet as a continuous flood light.

Because the exposure is very short and powerful, subject movement is not a problem. They freeze the action of even restless children and pets.

The disadvantage of strobe lights is that you can’t see where the shadows are falling, but our StudioPRO flash units incorporate **modeling lamps** – low power continuous lights that let you preview the effect.

Direct lighting from flash tends to be harsh, so **umbrellas** and **soft boxes** are used to increase the size of the light source and soften it. The advantage of umbrellas is that they fold easily and they are inexpensive. Soft boxes keep stray light from escaping around the sides and are more efficient, putting more of the light on the subject.

Soft boxes also make a rectangular reflection in the subject’s eyes, like the reflection of a window pane. Umbrellas make a round reflection, not often seen in nature.

Our **best** studio flash system features **300 watt-second** monolights with continuously variable power. Each unit has its own AC cord and features a built-in slave trigger, so only one has to be tripped by the camera.

**2 Light Deluxe Studio Lighting Kit, Our price $699**

*Includes:*

- 2 – 300 watt/second studio flash units (variable power)
- 2 – light stands
- 2 – 24” x 36” softbox
- 1 – studio carry bag
- 1 – carry bag for light stands

**3 Light Set includes everything above, plus**

- 1 – 300 watt/second studio flash units (variable power)
- 1 – light stands
- 1 – umbrella
Perfect for the aspiring photographer – strong enough for the PRO!

Our basic studio flash system features 160 watt-second monolights with variable power. Each unit has its own AC cord and features a built-in slave trigger, so only one has to be tripped by the camera.

2 Light Basic Studio Lighting Kit, Our price $349.99

Includes:
2 – 160 watt/second studio flash units (variable power)
2 – light stands
1 white umbrella and 1 silver umbrella
1 – carry bag for entire system

3-light system just $429.99

Move freely without a cord connecting you to the camera with our PRO 4-channel wireless control trigger set. Featherweight transmitter fits your camera’s hot shoe and receiver fits most types of flash. No worries about high voltage damaging your expensive camera’s electronics. You can select one of four working channels (radio frequencies) so that other photographers using similar units won’t set off your flash guns.

Why would you want an extra receiver? After all, each of your flash heads has a slave trigger built right into it.

When one flash goes off, so will all the others. That’s fine if you’re in a studio all by your self.

However, if other photographers are working near you, your flash units will fire when theirs do. That’s annoying. Solve the problem by getting additional radio receivers that respond only to your camera’s trigger.
Stands and Backgrounds

Light stands: Ruggedness and a wide stance are important when choosing a stand for your light equipment. Our SPRO light stands are rugged and finished in black for less reflectance in the studio.

Our light stands have a standard 5/8” diameter stud and also a threaded ¼” x 20 mount.

When using a heavy light system make sure that one of the three legs is directly aligned with the length of the light to minimize the chance of tipping.

**LS-1** is 78” high and has 3 sections. Tube diameter 23.5mm

**LS-2** goes up to 108” and is even sturdier, with wide-spread 34.5mm diameter legs. The center tube is spring loaded to keep your lamp heads from crashing down.

**LS-3** Air Cushioned Center Column for easy height adjustment. It’s got quick release flip style locks to make setup fast. Maximum Height: 9 1/2’, Tube Diameter: 34.5mm

**LS-4** is our largest stand and can handle any lighting requirement. It goes to a huge 13.5’ height and of course the legs have a wide stance to prevent tripping.

Backgrounds:

A simple painted background lets the eye go to the subject, not what happens to be behind him.

We recommend dyed muslin backdrops. They are intentionally irregular in pattern, and easy to use.

Available in several colors. 10’ x 12’, $99.99

One special case is the Chromakey Green background. Stand your subject in front of it. With the finished photograph opened in Adobe Photoshop, you can select the green background and remove it, to place your subject against some other background. Doesn’t work if your subject happens to be wearing a green shirt of a similar color!

**Seamless background paper** is a large roll of heavy paper. 12 yards (36 feet) long. Available in 53” width or 107” width. Roll it out, let the subject stand right on it. When it gets shabby, cut some off and roll out some more.

53” x 12 yard, $39.99
107” x 12 yard, $74.00

You’ll probably need a convertible car or SUV to get the 107” paper background home!
**Background supports:**

Go anywhere with the **SystemPRO deluxe background set**. Complete set includes:

- 2- Heavy duty stand (maximum height 10’ 6”)
- 4 – horizontal support bar components (minimum width 6’3”, maximum 12’ 6”)
- 2 – stand adapters
- Deluxe carrying case

$149.99

The **PROMASTER SystemPRO Multi-Background stand** is the perfect solution for backgrounds “on the go.”

Holds pop-up, muslin or paper with ease.

It’s also usable as a lighting boom mount for small lights, allowing you to place the light over your subject (as a hair light, for example)

Only $99.99
useful accessories:
The **light stand and umbrella adapter** lets you mount most small shoe mount flash units atop a light stand. Umbrellas slip into a hole and rotate along with the flash unit.

Ideal for using a camera flash with an umbrella. Includes a flash shoe for mounting standard flash guns. There’s also a ¼-20 thread for putting other devices on the mount. Angle the flash up and down to aim it where you want.

Flash for Professional Photographers

Professional equipment not only works better and gives better results, it makes you look like a professional.

Built-in flash units
- usually only reach about 10-14 feet
- run down the battery in the camera
- give flash lighting with that “deer in the headlight” look
- produce more red eye because the flash is so close to the lens.

External flash units like our PROMASTER 7200EDF
- Have greater range – up to 40 feet
- Run on their own AA batteries, either disposable or (recommended) rechargeable
- Put flash head farther from the lens, creating more 3-dimensional modeling of your subject
- Can be bounced off the ceiling or a white wall for a more “available light” look without the dimness of available light. Exposure sensors still work through the lens.
- **Differentiate you from the amateur photographer** – the bride’s Uncle Harry may use the same model camera you use, which makes it difficult for you to seem professional.

The powerful PROMASTER 7500EDF has a second flash head, which acts as a fill light when the main head is bounced. It’s got a metal foot – much stronger. And there’s even a wireless trigger so you can use it as a “slave strobe.”
A professional flip bracket like our PRO unit
• Puts the flash even farther above lens
• When you rotate the camera for vertical photos, the flash is still above the lens
• Maintains total flash control with the accessory Off Camera Shoe Cord.

**PRO 7200EDF** flash $139.99 - $20 mail-in rebate
**PRO 7500EDF** flash $249.99 - $30 mail-in rebate
PRO flash bracket $59.99 Off Camera Shoe Cord $49.99

*In stock to fit Nikon, Canon, Pentax, Olympus and Sony/Minolta*

**Devices that make your flash go off**

*Sync cords*: Wires that go from your flash units to your camera. Most cameras today do not have a place to plug in a cord using the standard PC connector.

**Standard Hotshoe Adaptor STR-115** fits on the top of the camera hotshoe.

Only one Sync cable is required as the other flash units will pick up the infra red sync cell enabling all units to work together.

Digital cameras cannot be used safely with strobes that have a high trigger voltage. If you don’t know for certain that your flash has a sync voltage low enough for your camera, invest in the **Wein Safe Sync** trigger device. This protects your camera from high voltages.

**Minolta** Maxxum 35mm cameras, **Minolta digital cameras**, and **Sony digital cameras** use a different hot shoe design than just about every other SLR camera.

Use the **Sony/Minolta to Standard Hotshoe Adapter Sync Jack STR-114** to adapt
**Go wireless:**
If you don’t have a wire going from your flash units to your camera, you can’t burn out your camera with high voltage.

You’re also freed from the cord so you don’t trip or have the cord show up in an occasional photograph.

To trigger a shoe-mount flash remotely, our **PROMASTER Remote Flash Trigger System** allows you to use your camera based flash in a remote location and have it triggered by your camera. Perfect for off camera flash photography. Our model is 4 channel selectable and is available in a one and two flash kit with additional transmitters and receivers.

Why choose a multi-channel radio trigger system? That way if there are several photographers working in the same region, the transmitter from one camera won’t set off somebody else’s flash unit.

The working range is as great as 30 meters under ideal conditions.

For use with a studio flash system you’ll want the **PROMASTER SystemPRO Studio Flash Trigger System.** It’s designed for use in photographic studios and on-location to trigger studio flash and strobes.

Units can be used as stand alone or combined with other PROMASTER flash triggers. Perfect for use with PROMASTER Studio Flashes and all other manufacturers. The receiver has a 3.5mm mini plug and also comes with a 6.35mm (1/4”) plug adapter for use with other strobes such as Bogen or White Lighting.

Available in either a single channel version or a 4-channel version.

Because PROMASTER flash trigger systems are designed for maximum compatibility, you can buy extra triggers and receivers separately.

**Slave Triggers**
Slave triggers use an electric eye to complete a circuit when they see the light from another flash. Some flash guns, such as the PROMASTER 7500EDF, have a built-in slave trigger. Other slave triggers might fasten to the foot of the flash or plug into a socket on the flash.

**Cautionary notes:**
The small flash units built into many cameras sometimes emit a preliminary flash ("pre-pulse") to set white balance before the actual flash that takes the photo. This flash is so brief and so closely-followed by the "real" flash that you may not even notice it. However, a slave trigger will make the slave flash go off too soon, so it doesn’t actually add any light to the photograph.

A very few slave flashguns have a selector switch that lets you tell the flash to fire, not upon the first pre-pulse, but on the "real" flash. Be sure to read your instructions to figure this out.