FIM 1801 - FUNDAMENTALS OF CINEMATOGRAPHY

Lighting Basics

Three Point Lighting

Three point lighting is the traditional lighting setup and consists of using a key, fill and backlight. See the book for a complete description of these three lights. Below is a typical three point lighting setup.

The terms KEY, FILL and BACKLIGHT describes a lighting function, and do not refer to any particular type or brand of light fixture.

Because actors move around, a lighting set-up may have several key lights, one for each actor in the scene and for each position they move to. The same is true of fill and back lights. This is why it’s important to see a blocking of a scene before beginning to light. Although some pre-lighting of the set can be done in advance, most lighting is of people, not walls and furniture, and while it is sometimes possible to "light the set" so that actors can roam about almost anywhere, good, precise lighting is best done with a detailed knowledge of where the people and camera will be.
OTHER LIGHTS

While the above "big three" cover basic subject lighting, other fixtures are almost always used in any lighting setup more complex than an interview.

**Kicker** - similar to a back-light but works from a slightly different position. Where as a back-light is usually STRAIGHT behind the subject (relative to the camera) a kicker works opposite the key light around about three-quarters of the way back. (In fact, a kicker is sometimes called a "three-quarter back-light"). A kicker serves the same basic function as a back-light, helping to separate subject from background, but gives a more pronounced, side-on edge.

**Eye Light** or **Obie Light** - a small fixture usually mounted on the camera which is used to light up an actor's eyes. Some actors need this more than others and some camera-people use them all the time. A good eye light casts no visible shadow of its own but is an additional fill light that reaches into the eyes and gives them an added sparkle.

**Effect Light** - any light used to imply some type of action and not used primarily to illuminate the scene. A common example of this is a LIGHTNING EFFECT where a large, off camera light is flashed on the subject to produce brief moments of over-exposure and imply lightning is happening. Other examples of effects lights are those used to simulate the effects of a bonfire or a burning house, police lights, an explosion or even a flying saucer as in the film *Close Encounters of the Third Kind*. Effect lights usually do not appear directly on camera.

**Practical** - refers to any light source which appears on camera and actually gives off light. If someone sits down at a desk and clicks on a desk lamp (which is visible in the shot) then the desk lamp is practical.

**Lighting Instruments**

Many different types of lighting fixtures are in use in the motion picture industry. The general term to refer to these lighting fixtures is **instruments** and many are referred to by some unusual names. A "quick reference" list of the most commonly used fixtures and the names they are often called is listed below.

The bulb in a motion picture lighting instrument is referred to as a **lamp** or **globe**. Some of these fixtures can have lamps of different wattages put into them. The name refers to the type of housing and the wattage of lamp most often found inside.

Some years ago smaller than normal housing were introduced to hold most lamps. These smaller housings were called "baby" fixtures. The same names were used to call a fixture by its wattage but if it was in a baby housing the term "baby" was added to its name. Thus a 1K lamp in a baby housing is called a "baby-baby". A 2k in a baby housing is a "baby-junior" or "BJ". A senior is sometimes called a "5K-baby", etc...
"Zip" lights or "Softlites" are flat, bowl shaped lights which bounce their light off a built in white reflector to give a broad, soft source. These are called by their wattage such as a "two-fifty soft", "six-fifty Mini-Soft", "seven-fifty soft", "2K Baby-Zip", "4K Zip", "8K Super-Soft", etc...

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Wattage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;Pee-Wee&quot;</td>
<td>50 watt Fresnel or open face</td>
</tr>
<tr>
<td>&quot;Inkie&quot;</td>
<td>100 watt open face</td>
</tr>
<tr>
<td>&quot;Dinky&quot;</td>
<td>100 watt Fresnel</td>
</tr>
<tr>
<td>&quot;Inky-Dink&quot;</td>
<td>200 watt open face (or 100 watt Fresnel)</td>
</tr>
<tr>
<td>&quot;Mini or Midget&quot;</td>
<td>200 watt Fresnel</td>
</tr>
<tr>
<td>&quot;Weak Baby&quot; or &quot;500&quot;</td>
<td>500 watt Fresnel (in a baby housing)</td>
</tr>
<tr>
<td>&quot;Six-Fifty&quot; or &quot;Tweenie&quot;</td>
<td>650 watt Fresnel</td>
</tr>
<tr>
<td>&quot;Seven-Fifty&quot;</td>
<td>750 watt Fresnel (in baby housing)</td>
</tr>
<tr>
<td>&quot;Baby&quot; or &quot;Baby Baby&quot;</td>
<td>1000 watt (1K) Fresnel</td>
</tr>
<tr>
<td>&quot;Junior&quot; or &quot;Baby Junior&quot; or &quot;BJ&quot;</td>
<td>2000 watt (2K) Fresnel</td>
</tr>
<tr>
<td>&quot;Senior&quot;</td>
<td>5000 watt (5K) Fresnel</td>
</tr>
<tr>
<td>&quot;Tener&quot;</td>
<td>10,000 watt (10K) Fresnel</td>
</tr>
<tr>
<td>&quot;Zip&quot; lights - &quot;Softlight&quot;</td>
<td>various wattages, indirect light</td>
</tr>
</tbody>
</table>

The open face and Fresnel lights that you have on your instrument cart are commonly referred to as focusable spots because they have the ability to spot or flood the beam of light.

Many lighting instruments contain barn doors which consist of either two or four flat, metal, adjustable panels which mount directly on the front of a light and allow the amount of light hitting the subject to be controlled. An illustration of barn doors can be found on the Grip & Lighting Equipment Handout.
Lighting Control and Grip Equipment

There are many pieces of equipment that are used to control the look of your lighting. Illustrations of these will be found on the handout entitled Grip & Lighting Equipment.

Electricity and Lighting

When using motion picture lighting instruments in homes or businesses, you don’t want to be blowing fuses or circuit breakers. It is important to know and understand how many amps of electricity each electrical outlet can handle. Standard household electrical outlets are 120 volts. Watts vary according to the specific instrument you are using. The formula to determine how many amps you have is as follows:

\[
\text{watts} = \frac{\text{amps}}{\text{Volts}}
\]

A very easy way to work with this formula is to round 120 volts to 100 and use the following rule.

**RULE:** For every 100 watts, you need 1 amp of power

Planning and Thinking About Your Lighting

Before beginning to light you scene you need to think out how you want it to look and how your plan on achieving that look. Some questions you may want to ask yourself are as follows:

1. What do I want to accomplish with the image?
2. What is the source of the light?
3. What areas or objects do I want to be normally exposed, underexposed or overexposed?
4. What is the quality of light? Is it hard, soft or diffused?
5. Is each lighting instrument achieving its intended goal?

These are some basic questions to ask, but lighting is not easy by any means. You also need to consider the quality or the light, quantity of the light, continuity of the light from shot to shot and much more.

There are some of the basic guidelines that you should be aware of when lighting a scene.

1. The two basic movements in trimming lighting instruments are **panning** and **tilting**. When speaking to your electricians about positioning a light you will ask that it be panned left or right, and tilted up or down. These are the same terms we use when referring to camera movement.
2. When using a focusable spot, always find and use the center of the light. Aim a light at a wall and you will see a round pattern of light. You need to determine the center of the pattern of light because that is where it is the brightest. When lighting a person or object you want to use the brightest part of the light.

3. Lighting is very time consuming. You must be completely prepared when executing your lighting plan so that you take as little time as possible.

4. Take notes and draw diagrams that you can refer to later on. You may be in a similar situation on a future production and if you have notes and diagrams it may make your lighting setup go much faster.

**Lighting Safety**

There are many safety factors that you must consider when setting up your lighting.

**Heat** – Aiming lights at walls, bounce cards, etc., can build up heat that could cause those items to burn. Be aware of where you are aiming your light and make sure that you are using items that are heat resistant and made for use in the film industry.

**Electricity** – Be sure to turn off and unplug a light when checking for a loose bulb or connection. Don’t have too many lighting instruments plugged into the same outlet.

**Heavy Instruments** – Be aware of heavy lighting instruments on high stands. Be sure to stabilize any high stands by using sand bags whenever possible.

**Working high on ladders or lifts** – Be aware of people on ladders and lift devices when working on a set. Also be aware of lighting instruments placed on lifts in order to achieve a particular effect. It is often common to assign an electrician to stay on the lift with a lighting instrument in order to move it or secure it if necessary.

**Cords and Stingers** – When working on set be aware of the many cords and stingers from the various lighting instruments. If a cord is not long enough to reach an outlet, use a stinger to that the cord is stretched in such a way to cause someone to trip and fall. When working in public places it is common to tape down cords and stingers. When working on stages cords and stingers are not usually taped down. Be aware of where you are walking so that you do not trip over cords.
KEY TERMS FROM VOICE & VISION

Artificial Light
Natural Light
Available Light
Motivated Lighting
Intensity
Hard Light
Soft Light
Diffusion Media
Frontal Light
¾ Frontal Light
Sidelight
Rim Light
Kicker
Key Light
Fill Light
Backlight
Special Light
Three Point Lighting
Open Faced Lights
Fresnels
Inky
Midget
Soft Lights
Fluorescent
Reflectors
Light Stands
C-Stands
Gobo Head
Gobo Arm
Barn Doors
Flags
Nets
Gobo
Cookie (Cukaloris)
Gator Clamps
Mafer Clamps
Stinger
Sand Bag
Gaffer Tape
Dressing Cables
Basic Stage Lighting

Some rules of thumb
By Arledge Armenaki & Richard Clabaugh

The following are some general rules for lighting a set. They are not listed here in any specific order and this is by no means a complete list. There are exceptions to many of these rules, however, in our experience, these form a set of generally true "rules of thumb."

- **Always arrange with the AD to have the principal actors show you the scene, doing a full walk through and blocking it with the director before you start lighting the set.** It is NOT enough to have the director explain to you what the scene will be, you have to see it rehearsed, with the entire scene being run as it will be for the camera, starting from "action" and ending with "cut." All crew should watch the final run through, including boom operators, gaffers, electricians, grips, camera operators and assistants. Each has a job to do and knowing what’s happening from watching a rehearsal is the most expedient way to communicate clearly to all what they need to know to do their job.

- **Have a camera placement in mind before the final rehearsal and watch the blocking from that position, thorough camera, if possible.** If the camera is not practical a director’s viewfinder or even a still camera makes a good substitute. In any case, you must have a director approved camera placement before they leave the set. You cannot light a scene if you don’t know where the camera is going.

- **See where the director watches the rehearsal from. Chances are it’s where he’s going to want the camera to shoot the scene, even if he doesn’t know it yet.** If you have a place you think is a good spot for the camera, try to get the director to watch the rehearsal from there.

- **When blocking, try to keep the actors away from the walls, it is difficult to light them there and often impossible to make them look good.** The light you aim at the person will tend to also light up the wall, often making it much brighter, and less attractive, than you want it to be. Subjects close to walls tend to throw large, unattractive shadows when lit, shadows that can’t be cut due to the inability to place any kind flag between the actor and the wall. Also, it’s difficult to impossible to get a back light on someone next to a wall, which makes it hard to get good separation. Finally, shots almost always look better with more depth in them. The only time people are regularly framed against a flat background is during police booking photos when they’re arrested. Try to find backgrounds that are open, not closed, for your shots.

- **Lighting goes hand-in-hand with blocking.** You can pre-light a set in a general way, but you really have to see a blocking in order to truly light a scene properly. Ideally, the two should be developed together, along with any camera moves and your plans for coverage of the scene.
• **When lighting a set you usually are lighting for ACTION POINTS.** An action point is where a person DOES something, such as stops and says a line of dialog, or picks something up, or looks through a window. You do not need to light every bit of space on the stage that they just happen to pass through. Isolate out those key spots where the action occurs and focus your lighting in those areas.

• **Put marks down during blocking and rehearsal for the actor’s key positions (the action points).** These are the places where the stand-ins stand while you make lighting adjustments. These marks are also used by the first AC in getting focus reference.

• **The walls of the set are usually kept darker than the talent.** This helps keep attention focused on the subjects and lets them stand out visually from the background. One way to do this is to use “cutters,” flags placed to “cut” the light off a specific thing, so when you light the actor you don’t automatically light up the wall with them. A common method to keep the walls down are to have them painted a darker color than you would normally find in the real world. Cinematographers are often said to be “painting with light,” but we also do a lot of “lighting with paint.”

• **Shoot the WIDE SHOTS FIRST, then work into the closer shots.** This prevents many problems in lighting and makes for a very efficient way of working. General rule of thumb is to always start with the wide master, then work in.

• **Lighting in the wide shots can usually be done in fairly large strokes with distant fixtures even though they may seem somewhat harsh on the actors.** Because facial details are not clearly visible in wider shots you can get away with it.

• **As you move in for close shots more subtlety is needed in the lighting.** Lighting that was from overhead grids in the wide shot must usually be brought in, recreated or supplemented from lower, floor units in order to make nicer close ups. Generally the tighter you are the more finessing the lighting needs as close shots reveal more details and require more attention.

• **When doing coverage it is more important that you match the feeling of the lighting rather than the literal placement of units.** You do not need to (nor should you try to) keep the same exact lighting fixtures in the same exact places from wide shots to close ups to matching close ups, etc. What is important is that you match the “feeling” of the lighting as expressed through the lighting ratios and key light angle (the placement of the light relative to the camera lens).

• **Lights will often do double duty, that is, one person’s Key Light will be acting as the Back Light of the person they’re talking to.** When this happens, work with it. Do not feel you have to set a separate fixture for each function.
• **When possible, lighting should be “motivated.”** *Practical lights in the scene, such as lamps or windows, normally dictate the general direction from which you key a scene.* Knowing this, place your practicals carefully and deliberately when lighting the set.

• **Work with the boom operator during rehearsals and blockings to anticipate where they will be placing their microphone.** They have a job to do too and they need SOMEPLACE to get a boom pole into the scene, close to the talent, in order to get good sound. Make sure you leave them a place to work from that will let them do their job without throwing shadows in picture. Using a flag or cutter to "top off" a light, so that you aren’t lighting the area above an actor's head, can often go a long way to giving them a place to put a boom without throwing a shadow.

• Before you even start to light a scene you should be very clear on the overall **LOOK** of the scene. **Specifically...**
  - Time of Day – Afternoon? Morning? Night?
  - Mood and Tone – Romance? Comedy? Drama? Horror? Film Noir?

• Mood is most often related to lighting ratio, that is, comedy tends to be lit in a high key manner whereas drama and horror are often lit in a low key fashion. You should talk with the director and agree on an appropriate lighting "tone" (lighting ratio) for the scene and the film as a whole.

• When rigging and pre-lighting it’s generally a good idea to slightly over light. If you think a 1K will just do the job, then use a 2K to be safe. You can always drop a double in to take it down but it’s VERY hard to change it out if you need more once you start shooting. Also if you think you MIGHT need a light, and you have time and fixtures to do it in advance, use an extra unit or two. It’s easy to turn a light off if you don’t need it, but very time consuming to hang a light you’ve forgotten. [Apply this rule in moderation! It’s easy to get carried away, spend too much time pre-lighting, exhaust your resources unnecessarily and over light your set.]

• **Lights should be properly focused and centered** on their targets, not merely aimed in their general direction. There are two ways to center a light:
  - **1 – From the light position:** with no diffusion on the light, spot the fixture fully in until it is small and bright, then aim the light so the spot is where you need it to be centered. Lock the light in position and flood to the intensity you want for shooting.
  - **2 – From the subject position:** use a contrast viewing filter (or a pair of good, dark sunglasses) to look directly at the light and use hand signals to indicate adjustments to the lamp operator until the hot spot of the globe is centered in the middle of the Fresnel.
• Think through all the coverage of a scene, and the order you want to shoot it in, before you settle on the final lighting and blocking, otherwise you can light yourself into a corner that’s very hard to get out of.

• In doing coverage it will cut better if you maintain the same overall feeling of light and dark in the frames. For example, a shot of a person standing in front of a window, cut with someone standing in front of a dark wall, even if they actually WERE standing like that on the set, will often not cut together smoothly. Both actors should appear to be in the same “light space.” The overall percentage of the frame that is at, above or below exposure should be close to the same from shot to shot in order to cut smoothly.