CHAPTER 16 Lighting Applications

Objectives
After studying this chapter, you will be able to:

- Recall the techniques and characteristics of both “classic” and “natural” lighting.
- Explain different methods and applications for lighting backgrounds.
- Identify effective solutions for common lighting problems.
- Recall effective methods to light interior and exterior night scenes.
- Identify effective techniques for lighting frequently encountered assignments.
About Lighting Applications

This chapter takes the lighting tools and design principles covered in the two preceding chapters and puts them to work in real-world situations. We will see how to light subjects, locations, and night scenes, how to solve common lighting problems, and how to approach several types of frequently encountered lighting assignments.

There is some necessary content overlap among the three lighting chapters.

Lighting Subjects

Most of your time, of course, will be spent lighting people. From the simplest production to the most elaborate, there are only two basic approaches to this task: classic studio lighting and soft “natural” lighting.

Classic Studio Lighting

Classic studio lighting uses three lights on the subject and usually one or more on the background, Figure 16-1. This is often called three-point lighting, despite the frequent use of additional instruments.

Key Light

The key light provides the main illumination, typically mimicking an actual light source like a lamp or ceiling fixture. It is often placed at about 4:30 and 15°–30° higher than the subject’s face, Figure 16-2.

The key light is typically a spotlight, so the hard-edged beam is often softened with a sheet of spun glass clipped to the barn doors. Even so, it throws distinct shadows on the subject’s cheek, upper lip, and neck.

Fill Light

The fill light literally fills in the shadows created by the key light, Figure 16-3. Placed opposite the key light, the fill is often farther to the side and not as high as the key, which helps reduce the cheek, lip, and neck shadows.

Lighting on a “Clock”

For convenience, the horizontal placement of lights is often described in terms of a clock face:

- The subject is at the center, facing the six o'clock position.
- The camcorder is at six o'clock, facing the center.
- The lights are at various “hours” around the clock face.
- The background, if shown, is at the twelve o'clock position.

Although this diagram shows the key on the right and the fill on the left, their positions are just as often reversed.
How completely the fill light moderates these shadows depends on the setting and mood of the scene. In a cheerful interior, the shadows might be slight; in an atmospheric night scene, they might be so deep as to obscure details within them. In any case, the fill light should not be bright enough to make the subject lose the “modeling” that creates the illusion of depth.

**Rim (Back) Light**

The rim light is typically behind the subject and placed quite high, Figure 16-4. If however, its light stand appears in the shot, you can move the rim light aside until it clears the frame.

Rim lights are frequently mounted overhead on clamps or on stands with lateral arms. The brightness of the rim light depends mainly on the lighting style—pronounced for pictorial realism and moderate for realism. For naturalism,
the rim light is just barely bright enough to visually separate the subject from the background. In some instances, it is omitted entirely. The brightness of key and fill lights is adjusted by moving the lights toward or away from the subject. Rim light, however, may be controlled by a dimmer, since the warming effect of dimming a light is usually acceptable in this application.

**Background Light**

Like the key light, the background light is usually “motivated”—that is, it mimics light that would naturally fall on the walls or other background, like a wall lamp, a window light, or spill from a room light (Figure 16-5). When working with just a few lights, you can usually achieve background lighting by directing spill from the key and/or fill lights.

Background light intensity should be adjusted so that subject and background seem lit by the same environment, but the subject is slightly brighter. Two or more background lights may be needed to do the job.

Background lights often produce less intense effects because the lighting instruments must be placed well away from the background to keep them out of the frame.

With the four lights in place, we can build a complete lighting setup, Figure 16-6. Though developed for classic pictorial realism, this basic scheme can be used with any of the four major lighting styles, Figure 16-7.

The basic lighting setup demonstrated here uses four lights and only covers a space about the size of a single action area. At large shooting locations, the lighting can involve many more instruments, but they tend to be deployed in multiples of these basic layouts.

An “action area” is a spot within a location that is fully lit because important activity takes place there.

**“Natural” Lighting**

Because three-point lighting can look somewhat theatrical, many situations call for

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**Figure 16-5** Background light placement.

<table>
<thead>
<tr>
<th>Horizontal placement</th>
<th>Vertical placement</th>
<th>Effect of the background light</th>
</tr>
</thead>
</table>

**Figure 16-6** Complete lighting setup.

<table>
<thead>
<tr>
<th>Horizontal placement</th>
<th>Vertical placement</th>
<th>Combined effect of the four lights</th>
</tr>
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</table>
One-Light Design

For close shots, a single soft source can deliver satisfactory lighting—especially when paired with a reflector for additional fill light. The subject should be close enough to the

a more natural, “unlit” appearance. The key to this approach is soft light. Spots and broads can be used if heavily diffused, but large sources, such as umbrellas or softboxes, are often easier to work with.

“Rugged” vs. “Glamorous” Lighting

How you position and diffuse your lighting instruments often depends on whether you wish to emphasize facial modeling for a so-called “rugged” look, or whether you prefer to de-emphasize it for “glamour.”

Rugged lighting exaggerates the planes and angles of the face and emphasizes skin texture. To do this:
- Keep the key light high for more pronounced shadows.
- Reduce or omit key light diffusion. The harder the beam, the more it emphasizes skin and other textures.
- Avoid over-filling to retain enough shadows for pronounced facial sculpting.

Glamorous lighting uses exactly the opposite approach:
- Place the key light lower for moderate shadows.
- Use considerable diffusion (or a softlight) to minimize skin texture.
- Add fill light until the shadows are relatively faint, but avoid over-filling the neck area to downplay aging skin.
- Use a generous rim light to accent hair.

The cinematographer contributes to the effect by using wide angle lens settings for rugged lighting, and telephoto lens settings for glamour.
The fill light is about three times as far as the key light from the subject. The background light is far enough to the side so that the hot spot created by the near edge of its beam and the overlapping key light spill (indicated in red) is outside the frame.

The natural style is very popular for lighting interviews because the lighting can match the location, and because the backgrounds are frequently close behind the subjects. Also, soft lighting is fast and easy to work with.

**Two-Light Design**

A second softlight provides a more versatile fill source. With this design, it often helps to place key and fill lights at the heights you would use for three-point lighting. With two lights, you can move the fill around as far as three o’clock, Figure 16-9.

Alternately, you may wish to continue to use the reflector for fill, and bring up the background with the second light.

**Three-Light Design**

A third light gives you better control over both fill and background, Figure 16-10. Studying the light plan in Figure 16-10, note that:

- The subject’s distance from the background permits the two to be lit separately.
- The fill light is about three times as far as the key light from the subject.
- The background light is far enough to the side so that the hot spot created by the near edge of its beam and the overlapping key light spill (indicated in red) is outside the frame.

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**Lighting Backgrounds**

If you have the room and the lighting resources, it is often best to move subjects away from backgrounds so that you can light them separately. Spots or floods are effective for background lighting because their longer throw allows them to be placed far enough to the sides to remain out of the frame.

As noted elsewhere, a light’s throw is the distance between the instrument and the subject or background that it is lighting.
so your interiors are likely to be locations. Every location presents challenges, and meeting them offers the satisfaction that comes from successful problem solving.

**Small Interiors**

Small interiors are usually difficult to work in, for several reasons (Figure 16-12).

**Cramped Quarters**

Lights require room, not only for the instruments and stands, but for the throws of the lights. Remember: you reduce light intensity by moving the unit away from the subject. Spots and broads are favored for cramped interiors because of their small size. Spots are especially useful in tight quarters because they can be focused to vary the light output without moving the unit. Their intensity can be further reduced by using screens.

**Lighting Backgrounds for Exposure**

When the background is too dark, the image loses apparent depth. So, you may want to wash some light on it to make it more visible. Be careful not to place too many highlights or to make the background too bright, to avoid distracting attention from the subject(s) in the foreground.

**Lighting Backgrounds for Texture**

You can often make dimensional surfaces (such as plaster or fabric) more interesting by bringing out their texture. For good cross lighting, place spots or broads as close to the backing as possible and rake the light across the surface.

**Lighting Backgrounds for Depth**

Sometimes, you can enhance depth by highlighting surfaces (like furniture) in front of the background, as well. Generally speaking, lights hung above the frame work effectively.

**Adjusting Intensity**

When lights are placed close to a background, the beam is much “hotter” near the light. To even out the light pattern, use a half or double-half screen positioned in the spotlight’s filter holder so as to reduce light output on the side near the wall.

Outdoors, background lighting is usually created using hard-surface aluminum reflectors, Figure 16-11.

**Lighting Locations**

Few video productions are shot on sound stages (except those made for cable or broadcast),
and broads can help minimize the problem. On the other hand, the gentle spill from umbrellas or softboxes often makes a very agreeable background light.

**Ceiling Bounce**

The low ceilings of many interiors can actually be a plus, because they make it easy to bounce fill light down onto subjects and background. Too much ceiling bounce, however, puts shadows under subjects’ eyes and looks like institutional grid lighting.

**Hiding Lights**

Small interiors often make it difficult to keep the lights out of the frame. Light stands work well in front and to the sides of the action area, where they are safely off screen.

Study your monitor very carefully for cables, which have a way of creeping into the shot.
Large Interiors

Large interiors are more comfortable to work in, but they present problems of their own, Figure 16-15. An area, say 50 feet square, cannot be fully lit with the instruments in a typical small production kit. To solve the problem, you need to employ a two-part strategy:

- Light the subjects, not the space (as discussed in Chapter 14).
- Break the action into parts, then light and shoot each part separately.

To hide lights placed deeper in the set, deploy units that can be clipped or taped to moldings, curtain rods, door frames, or the tops of open doors themselves. Fluorescent ceiling grids are also prime locations for clipping small lamps, Figure 16-14.

Some lighting instruments have built-in clips, others mount on posts fitted with clips or flat surfaces for recording.

Managing Barn Doors

The edges of light beams look more realistic when they conform to natural features of the background. In this example, the spotlight is set to light a subject who will appear in the open doorway. The barn doors are set so that the beam edges are hidden by the sides and top of the door.

Without the key light, the doorway is dark.

The key light spills onto the walls beside the door.

The left barn door masks the light beam to match the left edge of the doorway.

The remaining barn doors cut the beam edges at the bottom, top, and right edge of the doorway.
Start with the Wide Shots

When the camera will see most of the area, use your lights as follows:

- **Light the background fully.** Since the walls or other backings will fill much of the frame, ensure that they are fully lit. Add lights to bring up furnishings or other contents of the area.
- **Light the action areas to be included in wide shots.** Choose important places within the area for additional key lights. The closest action area also gets a rim light.
- **Add general fill light.** This will bring up the overall light level. Ceiling bounce light works well, although direct fill from broads (as in Figure 16-16) is easier to control. Check floor areas carefully to make sure they get enough light.

The idea is to plan camera setups so that each major action area will also be covered in closer angles.

Light the Close Shots

After the wide shots have been recorded, you will re-light for each action area in turn:

- **Light the subject(s).** Typically, this means fine-tuning the key and fill lights and adding some rim light for separation.
- **Light the background.** You can take some instruments away from the background lighting by lighting only the parts that will appear in the close shots.

Take care that the key, fill, and background lights match the appearance of the wide shot lighting.
Lighting Moving Subjects

If there is subject movement from one action area to another, you will need to light all of them. Typically, the setup used for the wide shots will work well (Figure 16-17).

Exteriors

Chapters 13 and 14 cover, in passing, many outdoor lighting procedures. Following are some additional suggestions for professional-looking results.

If the sky is overcast or you are shooting entirely in the shade, you cannot do much in the way of lighting, Figure 16-18. In sunny weather, however, you can use your outdoor resources.

Figure 16-16 Lighting a large area with the instruments in a typical small production kit.

A broad lights the background

Key lights positioned for each action area

Two broads provide overall fill light

Completed lighting plan

Figure 16-17 To fully light each acting area, one fill light (1) is moved closer, an extra fill light (2) provides all-over fill, and two rim lights (3 and 4) accent the first two acting areas.
Changing Light and Weather

Reflectors must be tended constantly, especially aluminum units that throw narrow beams. Between the time when a setup is begun and the moment when the shot is recorded, the sun can shift enough to misdirect the reflector light.

Reflectors vs. Screening

Sometimes, you may prefer a screen or even a silk to a reflector. On the one hand, framed screens or silks cannot be used in wide shots, so matching the close shot lighting is more difficult. On the other hand, screens preserve the natural light patterns better than reflectors, and silks can also replace white reflectors when used vertically (Figure 16-20).

Choosing Reflectors

Except for rim lighting, a rule of thumb for reflectors is “the softer the better,” for evenness of coverage and subject comfort.

Choose aluminum reflectors when a long throw is needed, for backgrounds or wide shots. Avoid using them for key lights (except when placed well back) to keep them out of subject’s eyes.

White reflectors are excellent for fill. In closeups, subjects can even hold them themselves below the frame line.

Matching Wide and Close Shots

Lighting wide shots is easier outdoors because subjects do not need as much modeling, and because aluminum reflectors can throw effective fill light up to 50’ or more, Figure 16-19.
The technique for lighting thin faces is just the opposite. Use soft key lights at or near the six o’clock and nine o’clock positions. Often, you may be able to omit the key light entirely, as in Figure 16-22.

For easier comparison, Figure 16-21 and Figure 16-22 use wide and narrow renderings of the same face.

Thin Faces
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Multiple reflectors fill a moving shot.

Lighting Moving Subjects Outdoors
The technique for lighting outdoor movement is the same as for interiors, except that your lighting instruments are reflectors. Hard aluminum surfaces work well because they throw light a long distance. Also, after traveling 50’ or so, the light beam pattern is broad enough to cover a larger area and is reduced to a more manageable intensity.

The longer reflector throw provides a wider, less intense beam.

Lighting Problems
All lighting situations have problems, but some are especially common. One of these is subjects who are hard to light pleasingly; another involves specialized light sources.

Subject Problems
Unless you are lighting characters in story videos, you generally want to make your subjects look as good as possible. The following are five of the most common subject problems, with suggestions for solving them.

Heavy Faces
You can use lighting to make heavy faces look slimmer. The trick is to highlight the center of the face and leave the sides in semi-shadow, Figure 16-21. To do this, key the lighting with a spotlight and use vertical barn doors (or flags, if necessary) to restrict the light to the center of the face. The light should be placed at or near the six o’clock position. To complete the setup, place soft fill lights at both the three o’clock and nine o’clock positions, moving them away from the subject until they deliver just enough light to reveal details in the shadows.

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If your camera light will accept filters, you can buy or make a half screen to reduce the bottom part of the light beam.

**Bald Subjects**

Balding heads are best handled by the makeup department—a little neutral powder will kill reflections and be quite invisible to the camera. If the subject refuses powder (as men sometimes do) try moving the lights up and then, if necessary, farther to one side to reduce the reflections.

**Subjects Wearing Glasses**

For reflections on eyeglasses, the solution is similar. In general, small-source spotlights are easier to move out of the incidence/reflection path (as explained in the sidebar). However, reflections from the softlights often used for interviews can be tolerable, because viewers know that the subject has been lit for video.

For brief shots, it is often enough for the subject to lift the earpieces of the eyeglasses slightly off the ears, tilting the lenses downward, and deflecting the reflection. When not overdone, this adjustment is generally invisible to the camera.

**Specialized Light Sources**

Practicals (such as table lamps) and environmental light sources (streetlights, signs,
Realism or Pictorial Realism

With these more common styles, you may want to establish the practicals and then use camera setups that exclude them, while simulating their light with video lights.

Adjusting Intensity

To balance visible light sources with the rest of your lighting, try fitting larger or smaller lamp bulbs, as needed. Halogen replacement lamps can be dimmed somewhat to reduce intensity, but ordinary lights are already too orange to permit much further color shift through dimming. On the other hand, if you light a scene entirely with household bulbs, you can simply set the camera’s white balance manually to match their 2700K–2800K color temperature.

Moving Light Sources

Subjects often carry light sources, such as flashlights or lanterns. When the practical light is not on-screen, you can simulate its light for better control.

- **Flashlight.** A small spotlight with a handle makes a good simulated flashlight. Focus the beam in the spot position to create a hard edge, Figure 16-25.
- **Lantern.** To make a convincing “lantern,” clip sheets of diffusion and orange filter material (for “candlelight”) to a broad.

**Practicals**

How you handle the lights that appear in the video frame depends on the lighting style you have chosen.

**Naturalistic or Expressionistic**

Oddly, the opposite extremes in lighting styles can use the same technique: replace bulbs in practicals with screw-base halogen lamps and use them for actual video lighting. The resulting light will be contrasty, but excess contrast is acceptable in these styles (Figure 16-24).
Electronics

Radar screens, computer monitors, and scientific instruments often bathe the faces of the subjects looking at them with light. With some units, the actual screen light may be bright enough, especially if the rest of the lighting is low key. If you cannot show the screens, however (say, because they are supposedly futuristic displays in a spaceship control cabin), place small lights low (at “screen” height) and gel them pale blue or green.

Small LED arrays are often used to simulate electronic screens because their built-in dimmers simplify adjusting brightness.

- Candle. For a candle effect, omit the diffusion for a harder light. Wearing a leather glove, wave your hand and move your fingers slowly in front of the light to create a flickering effect.

**Firelight**

Simulated firelight is created in somewhat the same way as moving light sources.

1. Place a broad very low, where a fireplace or campfire would be.
2. Gel the broad with an orange filter sheet.
3. Staple a square of heavy cloth to a stick (denim works well), and slit the cloth at 1” intervals to create a “grass skirt” effect, Figure 16-26.
4. Wave this device slowly in front of the “fire” light source to add a convincing flicker effect.

As with most such effects, you can enhance the realism with sound effects—in this case, a crackling wood fire.

**Signs**

In some night interiors, colored signs and other neon sources tint parts of the subject. If the sign is steady, simply gel a light with an appropriate color. If the sign turns on and off, have an assistant move a flag rhythmically in and out of the light path.
Lighting Night Scenes

Lighting scenes shot at night is challenging because there is little available light to help out. This section suggests some ways to create nighttime designs with relatively few instruments.

Interior Scenes

You can light indoor night scenes by using a few standard techniques.

Use low-key mode. Create a low-key look in which dark and medium values dominate in the background, with brighter accents and a well-lit subject.

Establish practicals. Since room lights are lit at night, establish practicals in the frame, and then mimic their light with video lights.

Control window light. If you can hang heavy screen or neutral density material inside or outside a window, you may be able to reduce its light to a “nighttime” level (the bluish color temperature will look like moonlight). If you do not have the resources to do this, exclude windows and their light from the frame.

Light for the highlights. In low-key lighting, you naturally use less fill light, so that shadows are deeper and show less detail.

Fake the Darkness

It is common to show a subject in bed, turning off the bedside light and going to sleep. Shot in actual light, the scene would be very contrasty, and then would go black when the light went out. Here is a procedure for lighting this scene more effectively.

1. Establish the light level. Fit a halogen lamp in the bedside light and use it to key the scene. Use soft fill from the other side, with a crew member at the light. At this point, set and lock the camcorder exposure setting.

2. Establish “night”. Next, turn off the key and fill lights and set up a very general overall fill, possibly with a pair of fluorescent light banks or large LED arrays. Without changing the camera aperture, adjust this fill light until the subject and bed are visible, though dark.

As an alternative, gel a spot or broad pale blue and place it at room-window height for a moonlight look. A window-frame cookie in front of the light will enhance the effect.

3. Synchronize the scene lights. Rehearse the shot until the crew member at the fill light switch can turn the light off exactly when the subject turns off the bed light, so that the two light sources look like a single light, Figure 16-27.

Although the remaining light (from the fluorescent or LED fill) will be somewhat too bright for perfect realism, viewers generally accept it as “darkness.”

Figure 16-27 Faking darkness. A—The scene, as fully lit with practical, fill, and pan fill lights. B—After the subject and crew member have simultaneously switched off the practical and fill lights, the pan fill lights provide a very low level of light the viewer will accept as “darkness.”
Exterior Scenes

It is impossible to light the whole outdoors for night scenes, but a few tricks will yield very satisfying results. First, light only the important action areas, as described previously. Then, try these suggestions.

Use Back-Cross Lighting

Except where the action must be seen clearly, place lights to the side and behind subjects (in the nine o’clock to three o’clock arc) to edge them with rims of light that will separate them from the background, Figure 16-28.

Rake the Background

Night scenes are supposed to be dark. So, use just a few lights to pick out features of the background. As usual with background lighting, place the lights to hit the background at oblique angles. See Figure 16-29.

Look for Motivation

Outside of urban centers, there is often little actual light. To motivate video lighting, simulate car headlights and house or shop windows with lights placed low and shooting horizontally. For streetlights, move rim lighting directly over subjects to create eye socket shadows.

Do not worry if some of your lights do not have enough motivation. This lighting problem is so common, even in big-budget productions,

Atmosphere

Outside night scenes in movies are often wet because rain or fog (real or fake) picks up and scatters light rays, Figure 16-30.

Day-for-Night Lighting

Although you can use a camcorder in very low light levels, there are good reasons for shooting exterior night scenes during the day using day-for-night lighting (Figure 16-31):

- Daytime shooting is more convenient for everyone.
Lighting at “Magic Hour”

Magic hour is the brief period before sundown. On a sunny day, magic hour provides light qualities that look especially attractive on screen. Shadows from the low sun are long, which models objects and enhances the impression of depth. The moisture in the air is often low, so everything appears exceptionally sharp and clear. The color temperature is warmer, lending a golden tone until near sundown, and then a distinctive sunset-orange tint.

Lighting for magic hour is simple because the low sun makes reflector placement easy. The problem lies in capturing all the footage required in the relatively brief time before the sun actually sets. For this reason, you may wish to preset and rehearse several different camera setups, so that you can move quickly from one to the next as you shoot.

- Daytime light levels are high enough for optimal imaging.
- Fewer lighting instruments and accessories are required.
- Though electrical power is helpful, in some cases you can shoot without it.

In video, making daytime shots look like night is easy if you follow a few simple guidelines (the lighting setup is diagramed in Figure 16-32).

Set white balance for incandescent. Using an indoor white balance setting outdoors (Figure 16-33) will lend an overall “moonlight” bluish cast to the footage, while rendering any incandescent lights as true white. You may also want to set exposure so that the natural shadows fill in as deep black.

If you will edit digitally (and no incandescent lighting is used) you can create the color, exposure, and contrast of “night” in postproduction. In this situation, it is often safer to get conventionally balanced and exposed footage and then alter it later.

Use back-cross lighting. Instead of directing the main light source at subjects from the front or part-way to one side, position your subjects and reflectors as needed to splash the brightest...
light from the rear (onto hair and shoulders), while the faces remain somewhat darker, Figure 16-34.

Frame off the sky. Unless you can darken the sky with a polarizing filter, use neutral or high angles to aim the camcorder away from the sky, which will appear much too light for a convincing night effect (Figure 16-35).

In some lighting conditions, a polarizing filter on the camcorder can turn a blue sky dark enough to pass for night, if it is not allowed to remain on screen too long.

Include incandescent light. Try to include some incandescent or halogen lighting in the shot, such as headlights, a street light, or light...
Interviews

Interviews are among the most common lighting assignments. Typically, they involve two subjects and a moderate amount of background.

One-Person Interviews

The current style of video interview has the subject on-screen all the time. The interviewer’s questions are posed as topics to be responded to, so that they can be omitted in editing. In the finished interview, the subject appears to be discussing the subject spontaneously.

Softlights are frequently used because they look natural, they generally light the background as well as the subject, and they are quick and easy to use.

Since interview subjects are rarely media professionals, lighting should be moderate and be kept out of their eyes. Because interviews rarely use angles wider than medium (waist) shots, a reflector can be used opposite the soft key for fill. Even with “natural” lighting, a small spot rigged as a rim light can add modeling and separate the subject from the background, Figure 16-37.

Two-Person Interviews

If your interviewer will appear on screen, you must light her or him as well, Figure 16-38.

In establishing shots, the back view of the narrator in the foreground can often be lit by the lights on the interview subject. The same lights provide rim light to separate the subject and interviewer from the background.

For single shots of the interviewer asking questions or listening to answers, you have two different options: light for real-time recording or re-light for a re-shoot. To light the interviewer separately for real-time recording with a second camera, position the reporter’s camera to shoot over the interviewee’s shoulder, so that both people are included in wider shots. Place the lights for both people so that they are outside the frame in both setups. If you are using only one camera or if some of the reporter’s questions and reactions need to be re-shot, you can re-light and reset the camera after the main interview to pick up this material for later editing into the sequence.
Daytime Reports

To simplify lighting, a one-person crew will often work with just two tools: an on-camera light and a stand-mounted reflector, Figure 16-41. The camera-mounted light is typically variable in light output and powered by its own substantial battery. Even in daylight, a front fill light can highlight the reporter’s face just enough to emphasize it against the background.

News camcorders are often fitted with batteries big enough to power a light as well.

In Figure 16-41, the supplementary light is a stand-mounted reflector. Because the camera person must leave the reflector unattended while shooting, it needs to be heavy and relatively small to resist the wind.

Stand-Up Reports

Segments presented by reporters standing at the scene of news, sports, or entertainment events are called “stand-ups.” Even at the broadcast TV level, reporters often go into the field with a single technician who must function as cinematographer, lighting director, and sound recordist (Figure 16-40).
When Cheating Is Legal

Cheating is the common practice of moving a subject between camera setups, usually to increase working room, separate subject and background, or find a better-looking background altogether.

Careful cheating is invisible to viewers, because the lack of true depth in video makes subject-to-background distances hard to judge, and the background “behind” a subject may not appear in earlier shots.

In this example, a subject and an interviewer are placed in the upper-left corner of a room, to keep back and side windows out of the frame for the master shot.

Because there is no room behind the subject to add a rim light for his closeup, the entire setup is “cheated” three feet out from the left wall. From the camera’s new position, the move is undetectable.

Nighttime Reports

Night shooting requires a different deployment of lighting tools, Figure 16-42. The on-camera light continues to provide much of the illumination. A second, battery-powered light on a stand can fulfill the same function as a reflector, providing more modeling on the reporter’s face. Backgrounds at night are generally dark, but look for lighted walls or windows to include in the shot, so that the image behind the reporter has some design to it.

LED lighting units are especially useful for field work because of their very low power consumption.
Lighting for Compositing

With the power of today’s postproduction software, compositing is used increasingly.

Compositing is the process of video recording subjects against flat, single-color backgrounds, and then digitally replacing the background with other visuals during postproduction.

The more even the background color, the more perfectly it can be replaced. So, the challenge is to keep the background lighting absolutely uniform. To do this, you try to light background and subjects separately, Figure 16-43.

Lighting the Background

You can achieve very even background lighting with a pair of softlights (or spots with...
Small Objects and Areas

Lighting small objects can be difficult because most professional lights are scaled to illuminate larger subjects. To overcome this problem, several techniques are available.

**Tabletop**

Tabletop cinematography involves shooting small objects and/or activities on a table, counter, or special photo stand (Figure 16-44). It is a common procedure for science experiments, product demonstrations, and how-to training sequences.

In shooting small subjects, camera and lighting problems generally arise from two causes:

- The short camera-to-subject distances (and/or telephoto lens settings) create very shallow depth of field. This makes small objects difficult to keep in sharp focus.

Lighting the Foreground

Place the subjects as far forward of the background as possible. Classic spotlight lighting is easiest to use because the light paths are controllable. To keep foreground light off the background screen, position the lights relatively high and to the side (as far as 8:00 or 8:30) to keep hot spots and shadows below and to the sides of the frame.

Be sure to look at the background footage to determine the quality and direction of its own lighting. If your setup allows, key this footage into the image in place of the composite screen. Adjust subject lighting until it matches the composit ed background.
Every situation has unique lighting requirements, of course, but Figure 16-45 illustrates a solution for a typical tabletop setup. The subject and tabletop are bracketed by very large, bright fluorescent softlights. These instruments are excellent for this application because:

- Their 4’ square shape provides an extremely large source to reduce shadows.
- Their multiple 40-watt tubes provide a bright light, permitting smaller f-stops to create greater depth of field.
- Their power requirements are low enough for use in most locations.
- Their output is cool enough for subject comfort and for delicate applications, such as food demonstrations and biology experiments.

LED arrays are even cooler and consume less power. Because their light is not as soft, however, they may need added diffusion for truly shadowless lighting.

**Tenting**

Where you want completely shadowless lighting (and do not require great depth of field), you can use **tent lighting**. By hanging a

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### Permanent Compositing Studios

Green screen backgrounds that include floors permit the use of “virtual” sets—complete digital environments into which subjects can be composited.

In this studio setup, more than 20 one-foot LED arrays on overhead pipes are used to light the upper part of the background. Large arrays, like the 16-panel floor unit pictured on the right of the studio setup figure, cover the lower walls and floor. Smaller units, like the single and four-panel arrays stored on the left of the studio setup figure, are moved into position to light subjects in the foreground.

LED arrays are very useful in compositing applications where large numbers of lights are required for uniform coverage because they emit almost no heat, they can be balanced by adjustable, remote controlled dimmers, and they consume so little power. When this studio uses 50 panels, all of the panels together draw 2,000 watts.

To achieve a comparable light output with halogen lights would demand over ten times as much power—not counting the wattage of the air conditioning needed to counteract their heat.
Due to their unique shape and mounting position, ring lights require diffusion and filters that are specifically designed for them.

**Graphic Materials**

Many programs include two-dimensional subjects—photos, paintings, graphics, letters, book pages—in place of moving subjects. With today’s quality equipment, it is often easiest to record subjects with flatbed scanners and import them into video programs during postproduction. If the flat material is larger than about 8” × 10”, however, scanning is often impractical. You will need to video record these larger subjects directly using a special lighting setup.

**Ring Lights**

Where other lighting techniques are not practical, ring lights can often achieve comparable effects (Figure 16-48). Because they surround the lens completely, these lights throw only one soft shadow, which is typically masked by the subject in front of it.
Organizing a Setup

Most often, you will work with the graphic material on a flat surface and the tripod-mounted camcorder is aimed down at it. A sheet of glass will help hold the material flat, but may create reflection problems. The lighting is simple: one unit on each side of the artwork (Figure 16-49). Clamp work lights with halogen lamps are easy to position and adjust.

For materials up to about 9” × 12”, scanning is now more common than copying.

Dealing with Reflections

With or without a glass cover plate, light reflections are often a problem. To solve them, make sure that the lights are aimed at a 45° angle.

Working Vertically

In many cases, posters, paintings, charts, and other large subjects are best handled vertically. Make sure that the camcorder is centered horizontally and vertically, at a true 90° angle to the artwork. Position the lights far enough back to wash the subject evenly, and keep them at a 45° or less angle from the wall (Figure 16-50).

Placing the camcorder far back with a telephoto lens setting will improve the quality of the image recorded.

Video Snapshots

When you capture passing events spontaneously (especially with a mobile phone, a personal media device, or a still camera), you have to use whatever light is available. Though you cannot control the lighting, you can make the most of whatever you find. To do this,

1. Make sure you have enough light. If the image on your screen looks too dark or lacks detail, see if there is any more light you can turn on. If your recorder’s sensitivity can be adjusted, increase it to handle the low-light situation—many still cameras with video capability will do this automatically. A grainy image is better than almost none at all.
• Avoid bright backgrounds and excessive backlighting. If you can change your position, move around until windows and other light sources are out of your frame.
• Look for good lighting. If you have the chance, use the most expressive lights available and, if possible, move your subject into them (Figure 16-51).

As always with video intended for e-mail or the Internet, avoid excessive panning, which can cause visible light sources to smear as they move across the screen.

Since the charm of video snapshots lies in their spontaneity, elaborate lighting defeats their purpose. Nevertheless, you can often improve the lighting without making the scene appear “lit.”

**Internet Lighting**

In addition to video snapshots posted to websites, many carefully produced videos are published on the Internet. These programs should be as fully lit as programs destined for other delivery systems. Although many sites now accept high-definition programs, streaming videos can have limitations because they are often intended for less than the full screen area. Here are some tips for lighting Internet videos:

• Use classic four-source lighting (key, fill, rim, and background lights) to model subjects and enhance their apparent depth.
• Pay special attention to rim (back) lighting to separate subjects sharply from their backgrounds.
• Aim for high (or at least “medium”) key lighting to deliver bright images. Streaming video, especially when lower quality, can turn dark areas muddy and lacking in detail.
• Keep background lighting simple to avoid shadow patterns and excessive modeling that can compete with foreground subjects. Backgrounds should be just dark enough so that well-lit foreground subjects stand out, Figure 16-52.
The representative lighting solutions in this chapter cannot cover all the situations that you may encounter, but they do demonstrate how to use the basic ideas behind all lighting designs to analyze each situation and create video lighting with style.

Other Lighting Applications

Figure 16-52 The background should not compete with foreground subjects.

Though this music video was exposed for the subject...

...the very light background may cause too much contrast when the program is streamed.
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Classic studio lighting uses three lights on a subject and usually one or more on the background.

The key to “natural” lighting is soft light.

Background light intensity should be adjusted so that subject and background seem lit by the same environment, but the subject is slightly brighter.

Lighting locations presents unique challenges, such as lighting small interiors, having sufficient power supply, adequately lighting a large interior, changing light and weather conditions outdoors.

In general, lighting should make your subjects look as good as possible.

Specialized light sources should be established by showing it on camera, and then replaced with a more controllable light.

Techniques for lighting indoor night scenes include: use low-key mode, establish practicals, control window light, and light for the highlights.

Tried-and-true techniques are regularly used for common lighting assignments.

Summary

- Classic studio lighting uses three lights on a subject and usually one or more on the background.
- The key to “natural” lighting is soft light.
- Background light intensity should be adjusted so that subject and background seem lit by the same environment, but the subject is slightly brighter.
- Lighting locations presents unique challenges, such as lighting small interiors, having sufficient power supply, adequately lighting a large interior, changing light and weather conditions outdoors.
- In general, lighting should make your subjects look as good as possible.
- Specialized light sources should be established by showing it on camera, and then replaced with a more controllable light.
- Techniques for lighting indoor night scenes include: use low-key mode, establish practicals, control window light, and light for the highlights.
- Tried-and-true techniques are regularly used for common lighting assignments.

Technical Terms

Amp (amperage): In lighting, the amount of electrical current drawn by a lighting instrument.

Day-for-night lighting: A method of shooting daylight footage so that it appears to have been taken at night.

Glamorous lighting: Lighting that emphasizes a subject’s attractive aspects and de-emphasizes defects.

Magic hour: The period of time, up to two hours before sunset, characterized by long shadows, clear air, and warm light.

Rugged lighting: Lighting technique that emphasizes three-dimensional qualities and surface characteristics of a subject.

Tabletop: Cinematography of small subjects and activities on a table or counter.

Tent lighting: A lighting arrangement in which white fabric is draped all around a subject to diffuse lighting completely for a completely shadowless effect.

Three-point lighting: Classic subject lighting technique that consists of key, fill, rim, and background lights.

Voltage: The electrical potential or “pressure” in a system—typically 110 or 220 volts in North America.

Wattage: In lighting, the power rating of a lighting instrument. 500, 750, and 1,000 watt lamps are common.

Review Questions

Answer the following questions on a separate piece of paper. Do not write in this book.

1. Classic three-point lighting uses key, _____, and rim lights on the subject, plus a background light.
2. True or False? Glamorous lighting exaggerates the planes and angles of the face and emphasizes skin texture.
3. Why are spots and floods effective instruments for lighting backgrounds?
4. A light’s _____ is the distance between the instrument and the subject or background that it is lighting.
5. Explain why spots are especially useful in tight quarters?
6. What is the simplified formula for calculating power draw? What are the benefits of using this simple calculation?
7. True or False? Reflectors that produce softer light provide even coverage.
8. When a long throw is needed, choose a(n) ____ reflector.
9. How can a heavy face be lit to look slimmer?
10. What are the standard techniques that can be used to light an indoor night scene?
11. What is magic hour? What are the qualities of available light during magic hour?
12. Using an indoor white balance setting outdoors will create a(n) ____ cast to the footage.
13. True or False? The main goal when lighting for compositing is to keep the background lighting absolutely uniform.
14. What is tent lighting?
15. Explain the setup for recording a vertically-positioned, two-dimensional graphic.

STEM and Academic Activities

1. Science. What is Ohm’s Law? How does Ohm’s Law apply to electrical circuits and power supply?
2. Technology. Identify some lighting tools or pieces of equipment that have emerged in the last 20 years. What impact have these items had on the task of lighting a scene or location?
3. Engineering. Make a sketch of a single subject on an interior set. On the sketch, draw the position of each lighting instrument for a three-point lighting arrangement. Label each instrument on the sketch.