PATRICK WINTERS

THE DOS AND DON'TS OF
SUCCESSFUL
FILMMAKING

COMMON MISTAKES AND HOW TO AVOID THEM

A **Focal Press** Book

ROUTLEDGE

SUPPORT MATERIAL

The Dos and Don'ts of Successful Filmmaking

Mistakes are easy to make, but often difficult to undo. The greater the knowledge and experience a filmmaker has, the fewer mistakes are made by them. This introductory-level guide to filmmaking teaches effective preproduction, production and postproduction with a focus on many of the common mistakes made and how to avoid them.

Filled with practical advice and information on the process of successfully making a film, Patrick Winters guides you through the whole process from preproduction to postproduction, teaching how to plan a shoot, accomplish that shoot and then follow the steps needed to edit and mix your film, highlighting key considerations and potential pitfalls to avoid along the way. The book covers everything from getting your story production ready, securing funding and budgeting appropriately, casting actors, assigning crew members, developing production design, shooting efficiently and effectively, technical and aesthetic camera and lighting choices, sound considerations, picture and sound editing and mixing, to the final stages of distribution and exhibition. Drawing on Winters' years of filmmaking and teaching experience, this book provides you with all the technical and aesthetic knowledge required to make a film, highlights common mistakes to avoid, and explains where to put your time and money into where it shows, resulting in a successfully made film that will stand out from the crowd.

A combination of what to do and what not to do, this is ideal for introductory-level filmmaking students, as well as independents just starting out.

The online support material includes deal memo templates, walkie-talkie lingo, camera and sound reports, first AD roll call, distribution and exhibition and additional information on booming.

Patrick Winters has worked in the film business for 25 years and has taught filmmaking for the last 13 years in New Zealand and the United States. He has experience working on short films, documentaries and major motion pictures including *Good Will Hunting*, *Psycho* (remake), *Finding Forrester*, *To Die For* and *Far from Heaven*. He especially likes the challenge of stretching film budgets to achieve the highest production value possible. He is currently operating his own postproduction studio and is the author of *Sound Design for Low & No Budget Films*.

The Dos and Don'ts of Successful Filmmaking

Common Mistakes and How to Avoid Them

Patrick Winters

To my life partner, Patti Winters,
whose support and encouragement
have made it possible for me to write this book.
Also, to Garrett Winters and Teresa Winters and
the many students that I have had the
pleasure to teach and to learn from.

Contents

Preface

As a teacher for aspiring filmmakers, there were several books that I wanted for my students. One was on sound for film and the other on how to common avoid mistakes in filmmaking. I had a hard time finding books that covered the material I thought would be useful, so I set about writing them. In 2017, my book on sound, *Sound Design for Low & No Budget Films*, was published. In 2021, this book on common mistakes was published. These are the books I would have liked to have had to teach some of the filmmaking classes that I taught. I am positive that they will be of value to film students, teachers and independent filmmakers.

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PREPRODUCTION

1 Introduction

The biggest mistake someone can make when they are making a film is to assume they know what to do when they don't. Do NOT assume. Find out what you need to know. Ask before you do and you will avoid a lot of problems.

PURPOSE: What This Book Is About

Most of us have seen student films and low-budget independent films that are not very good. They may have an underdeveloped story or even no discernible story. They may have poor lighting or camerawork. They may have poorly recorded sound. The acting may be stilted and unconvincing. The production design may be nonexistent or unrealistic. The editing may be choppy and have no continuity. Whatever the issues, these films probably have problems that distract from the story as a whole and may have taken the viewer out of their suspension of disbelief, thus destroying the world the filmmaker has attempted to create.

The information in this book is intended to be helpful and supportive as you continue in your pursuit of filmmaking and advance in your career. Some information is basic, while other times there is greater detail. All the information is based upon industry standards.

I wrote this book because, after teaching filmmaking for 13 years, I have seen many of the same mistakes made by students far too often. I have even made some of the mistakes in my own productions. These mistakes can damage the quality of a film and yet can easily be avoided, if you are aware of them.

In a sense, this book is about how to do proper planning for a film so you can hopefully avoid pitfalls. There are so many facets to making a film that planning is essential. I've seen many disappointed filmmakers because their film did not turn out the way they envisioned. This is often due to poor planning, underfunding or in some cases an overly ambitious script.

The four main reasons for reading this book are:

- To avoid many filmmaking mistakes
- To better understand how to effectively make a film
- To save time and money
- To learn industry standard approaches to filmmaking

AUDIENCE: Who This Book Is For

The motivation for writing this book is to help filmmakers, especially students and independent filmmakers, become aware of potential mistakes and some of the options for avoiding them, whether they are in preproduction, production or postproduction. You might say this book is about how to make a film and how not to make a film or at least how to avoid some of those typical mistakes.

This book is designed for people who are either starting out or are advancing their career and want to do the best job they can. We often do not know what knowledge we are missing when we take on a task. To have knowledge of common mistakes along with effective procedures will allow filmmakers to come closer to their vision.

Each chapter of the book highlights specific mistakes and ways to avoid them. For example, in the chapter on lighting, one of the biggest mistakes is using too little light or no light at all. Camera sensors require enough light to effectively capture an image. Many of the low-budget and student films I have seen have the issue of too little light. This can make the image either difficult to see or appear very muddy. It is better to capture a good strong image and then darken it when you edit or color grade.

OUTCOME: What You Can Expect to Learn

Remember, no film is perfect, so do not pressure yourself to achieve that goal, but do the best you can with the tools you have available. The information in this book is designed to help you create more effectively and efficiently, and thereby make a much better film that will stand out from

the crowd. As you progress from film to film you will learn many lessons on what to do and not to do next time. Do not stop making films. You will get to be the great filmmaker you imagine as long as you do not give up.

I have worked on and made my own feature films, short films and documentaries. More importantly, I have taught and worked with hundreds of students who are making their own short films, as well as a few feature-length films. This book is a collection of lessons learned and applied to filmmaking. Start reading, learn from the mistakes of others and make great films.

CONSIDERATIONS: How to Approach a Project

Filmmaking is storytelling. All decisions need to be focused on what is best for the story. There are thousands of decisions that need to be made to make a film. One of the biggest questions is about budget size. If you have a fixed budget, then scale your story, schedule and production to match the funds. If you have a story and you are seeking funds, then make sure you have a large enough budget to complete the film. Once you have a schedule, which is based on what needs to be done to achieve the story, then you can determine the budget.

When the "quality triangle" is applied to filmmaking it looks like Figure 1.1. The idea being that if you want something done fast and cheap, it will probably not be good. If you want something done fast and good, it will probably not be cheap. If you want good and cheap, then it will probably not be very fast. The quality triangle only allows you to choose two, not all three. The "Good" corner of the triangle would be the story and the production. The "Fast" corner is the schedule. The "Cheap" corner is the budget. The idea is that a change made to any of the corners will always affect the other two corners.

Figure 1.1 Quality triangle

PROJECTS: What Stories Are Worth Telling

Cinema is about the relatable stories of other people. We can relate to others as we experience their journey on screen. We empathize with them and learn from their experiences. Cinema is empathy.

In order to create a film project, an idea develops in the mind of the writer and a screenplay is written. At some point actors are cast and crew hired. Eventually, sets are built, props acquired, wardrobe made or found, and scenes are lit and recorded. After production, the picture and sound are edited, visual effects created, color grading achieved, sound and music mixed, and the film distributed.

LAYOUT: How This Book Is Organized

The chapters are organized in chronological order from the beginning to the end of the filmmaking process. There is an online "Appendix" for this book that contains a lot of useful information such as walkie-talkie codes, blood recipes and how to call for a take. There is also a chapter on "Distribution and Exhibition", which is online so that it can be periodically updated.

Throughout this book you will see boxes like the example "MISTAKE" box below. These are the don'ts and the material outside the boxes are the dos. Some of the mistake boxes are about bad ideas, others are warnings and the others are about disastrous actions. These mistakes are beyond the basic ones like forgetting to take the lens cap off, forgetting to charge all of the batteries or not getting proper white balance.

MISTAKE

Lighting is a hassle that takes time. I'll just shoot with available light at the location. My camera does 25,600 ISO, so no problem.

Remember: Mistakes are easy to make. Doing a good job properly takes work, knowledge and planning. Reading this book will give you many of the tools you need to avoid some of the mistakes you might encounter on your first or next project.

2 Story & Script

MISTAKE

I'm making an experimental film, I don't need a script or even a story. It's cinéma vérité. It's real life, like reality TV, only better.

INTRODUCTION

Some filmmakers may work without a script or even a story, but that can be a recipe for disaster. It is better to learn about how to create a story and how to write a script. A properly structured script acts as a blueprint for telling a story and it provides a road map for producing that story from beginning to end. Screenwriting is like other art forms in that it is best to learn the rules and work with them before you creatively break them.

RIGHTS

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MISTAKE

I'm shooting a short story I found in a book. I don't have to worry about copyright because I'm changing the title and the character's names.

</div>

Current United States of America copyright laws say that if you create something, it is immediately copyrighted and only you have "the right to copy" your creation, unless you assign that right on to another party.

However, it is a good idea to register your screenplay with the copyright office in your country, just to be sure it is protected. You will fill out a form, either online or hard copy, and probably pay a fee. Copyright does not protect ideas, as anyone can have an idea, but if you turn that idea into a literary or written creation, which is an expression of the idea, then it is protected for your lifetime and possibly a period beyond.

Screenplays can be registered with organizations in various countries, such as the Writers Guild of America East in New York City, Writers Guild of America West in Los Angeles, The Script Vault in the UK, New Zealand Writers Guild, Writers Guild of Canada and the Australian Writers' Guild. It is a fairly simple process. You fill out the form, upload the story and pay the fee. You get a registration number and you are protected for five years or more. If someone steals your story, then you have proof that you created it first. By registering you will have a dated record of your claim to authorship of your screenplay or literary work.

In the United States, it is good practice to register with both the Writers Guild and the Library of Congress. Register first with the Writers Guild as that only takes a few weeks, while the Library of Congress may take months.

Motion picture stories have been adapted from many sources. For example, plays, operas, short stories, novels, newspaper articles, magazine articles and blogs are possible sources. Once you have attained the rights to create a screenplay based on a story, you can adapt it for the screen.

Remakes are very common in the film industry. I worked on the 1998 remake of *Psycho.* It was not just a remake, but a nearly shot-for-shot copy of the original, though it was shot in color and updated, so it was different. It is fairly common to remake a foreign film into another language. A great example of this is Martin Scorsese's *The Departed* (2006). It won the Oscars for best director and for best picture in 2007. It is a remake of the film *Infernal Affairs* (2002), which was directed by the Hong Kong duo of Andrew Lau and Alan Mak.

Using a true story as the plot for your screenplay is acceptable, if you have the rights. Also, you must be sure not to cast anyone in a bad light. That could cause legal issues. In some countries, if the story is about a public figure or someone who is dead, you do not need their permission, but for any other story based on a living person, you do.

Fair use is when you use the creation of someone else without needing their permission. Some of the uses are teaching, news reporting, criticism and parody.

A work made for hire is when you are hired to create something, like a screenplay. Even though you wrote it, since you were hired, you probably do not own the copyright. If it is an original work that you wrote on your own, then you will usually possess the copyright.

Using a story you found in a publication is copyright infringement, even if you change the names of the characters. The only way you can do it is if you acquire the rights or the story is in the public domain, which means it is no longer copyright protected.

THE CONCEPT

A concept is defined as something conceived in the mind. You may already have a story idea, be searching for one or you may be in a class that demands you come up with a story. No matter what your situation, every story starts with a concept. Even the most classic love story, such as "person meets person, persons loses person and person finds person," starts as a concept.

Ideally, you will be able to write a story about something you know well. If you know skateboarding, salsa dancing, firefighting or some other personal interest really well, then use it as a foundation for your story.

MISTAKE

I've got a great story, but I don't know how to end it. Maybe I'll just kill off the bad guy or the hero will walk into the sunset. I don't know. I'll figure some way to end it.

Once you have the concept that you want to explore, you can start developing a story around that concept. But do not start writing the story until you know the ending. The story is a road map and you need to know where it is going before you begin or you will wind up driving in circles. When you develop your story based on how it will end, the story will make sense and it will come together more easily.

There are many genres to choose from and you can combine genres, such as romantic-comedy, historical-horror or perhaps sci-fi-romance. Below are a few examples of genres. Each genre has certain conventions that make it what it is.

GENRE

Genre is a style in the arts that has a common set of characteristics or conventions. The experimental genre may not fall into this definition as it may not have a story at all. Musicals are not so much a genre as a combination of genres with singing. Below are a few examples of story genre:

Action: These stories usually have a clear hero and villain. Some of the conventions may include explosions, stunts, races, car chases, fights and weapons. The stakes are usually high; for example, to save the world or stop a catastrophe.

Comedy: These stories can be straightforward or they may be spoofs. They can be dark or light in tone; either way they will contain material to make an audience laugh. The plot is usually about relationships or some simple goal.

Crime: These stories often center on an illegal act or crime and the people who are trying to solve the crime. Some conventions include guns, gangsters, detectives, robbers, getaway cars and stolen items.

Drama: A dramatic story can stand on its own, but they are commonly combined with other genres. Dramas are reality-based and character-driven stories that usually have the hero grow and change over the course of the story.

Fantasy: This genre is about magical things or events. Some of the conventions that make up this genre are witches, wizards, magic swords and unusual creatures. There is often a hero's journey of self-discovery and transformation.

Horror: These stories are an emotional roller-coaster ride of adrenaline-pumping fright. The antagonist may be a ghost, demented person, terrible creature or blade-wielding killer. Some conventions are blood, knives, monsters, zombies, demented killer, isolated locations and nighttime.

Romance: These stories are typically about love lost and love regained. The body of the story is about all of the hurdles that the lovers face in coming together again.

Science fiction (Sci-fi): These are stories about the future that are relatable in that they might happen, if not here, then on a planet far, far away. Common conventions include alien beings, futuristic weapons, tools, vehicles, gadgets and spacecraft.

MISTAKE

I don't want to be limited by a genre. I'm going to make a romantic horror film shot in daytime exteriors and with upbeat singing.

The multi-genre idea of a romantic horror film shot during the daytime and as a musical might work if it is entertaining and believable. Most distributors want to know what genre a film is before they sign it and if it does not fit into a genre, they may decide not to distribute it. A genre film is easier to market as the audience knows what type of film they will be seeing. Do some research on the different types of film genres and see which ones appeal to you.

THEME

Before you start writing try to determine what the theme of the film is. The theme is commonly the central message, philosophy, worldview, subject matter or the main topic of the story. The theme is central to the story and may be found in the dialogue and actions of the characters.

For example, a couple of possible themes might be: Love is more important than money or humanity is more important than technology. Sometimes a central story idea can be summed up in one word, such as loneliness, revenge, trust, sacrifice, greed or survival.

You may intentionally have a theme for your story or you may discover that your story has a theme that will evolve as you write it. As you do rewrites you can strengthen the theme or themes that are inherent in the story.

THREE-ACT STRUCTURE

MISTAKE

I don't know if my script has a three-act structure, but it has a great ending where everybody is dead.

A great ending may not be enough to have a great film. The ending does not mean much in terms of story unless there is a buildup to that exciting moment. The buildup consists of a number of steps. These steps are the different sequences that are mini-movies within the whole movie. Not all movies follow the same steps in telling a story, but the following are some common steps.

The *hook* comes first. You have to have some event that gets the audience paying attention.

Act one is the setup for the story. It is where the audience learns about the normal life of the hero. In the setup the audience learns the year or era, the geographic location, the theme and most of the characters. They also decide to either like or dislike the hero.

At the end of act one there will be a dramatic turning point for the hero. They will have a decision to make about pursuing some new goal or not. The audience will need to know what is at stake if the hero chooses or does not choose to attempt to achieve their goal.

Act two is about conflict and the difficulties in achieving the hero's goal. These difficulties will tell the audience about the emotions and the character of the hero.

There will be a point in the second act where the B-story affects the main story. This typically raises the stakes on achieving the goal.

There is almost always a subplot or B-story, which could be about a mentor or guide, but it is often the romantic interest of the protagonist. This secondary story is about the difficulties the lovers face during the A-story and at some point both stories cross paths and the B-story has an effect on the A-story. For example, the protagonist may have to make a decision to save his lover or kill the antagonist, but they cannot do both.

There is often a *mid-point* where some difficulty has occurred and the hero has to decide to reaffirm their desire to achieve their goal or give up.

At the end of act two it will look like the antagonist or nemesis is about to win and the hero lose.

Act three starts with the hero being at their lowest point. They feel that they have lost, but then they dig deep inside and revise their goal and double their efforts to achieve it once and for all.

This is the act in which the *climax* occurs. It is the point where either the protagonist or the antagonist will win and the other lose. The hero or protagonist usually has an emotional or character arc that results in them overcoming some personal shortcoming and becoming a better person. There is usually a lesson learned or skill developed during their journey that they are able to call upon in order to overcome the antagonist and win.

The *resolution* is where all of the plot and the subplots are tied up into a neatly packaged conclusion. It is a common convention to leave the audience with hope.

CHARACTERS

Once you have come up with character names and their descriptions, you need to delve into their strengths and weaknesses, personalities, emotional issues, motivations, visions, goals, values, plans and history. A character's history is their backstory. It is everything known about them prior to the beginning of the story.

The protagonist is usually the character that changes over the course of the story. They may also be the hero, but that is not necessary. In the movie *Shawshank Redemption* (1994), the character Red is the protagonist as he changes during the story, while Andy is the innocent hero we want to see gain his freedom. Andy succeeds, as does Red, in getting out of prison, but Andy is not changed, while Red has learned to accept his situation and work with it to gain his freedom.

It is important to have a protagonist with whom the viewers can connect. Once empathy is established the viewer will be ready to follow the protagonist's journey and actually relate to the hero as they overcome obstacles to achieve their goal. This is accomplished by creating three-dimensional characters.

You need to be able to answer questions about your character from the point of view of the character:

- What do I believe?
- What are my values?
- What am I afraid of?
- What do I dislike?
- What is important to me?
- What do I want?
- Who is important to me?
- What lessons have I learned in life?
- What are my values?
- What is my backstory?

Here are several examples of various types of characters:

The Leader: The leader possesses great knowledge and they have a strategy for ending chaos and war and bringing peace and organization to the world. They may become angry if they don't get their way as they ultimately seek power. Saruman in *The Lord of the Rings* (2001) is a prime example of this character type.

The Mentor: They are passing on their knowledge and wisdom to the next generation. They calmly guide their students to solve problems and learn from their mistakes. In the *Harry Potter* stories, Albus Dumbledore is an example of a mentor.

The Rebel: The rebel sees life as unfair and wants to make changes and shake up the world. They are inspired people who never give up. They

can gather a following simply by trying to make changes that will ben-
efit those who have little power, such as the rebel. Katniss Everdeen in
The Hunger Games (2012) is an example of this type.

The Visionary: They put their creative genius and vision to work in order to
create a better world. They are perfectionists who are driven to create a
legacy. Willy Wonka is an example of a visionary.

The Warrior: They are strong, confident and ready to take on the world.
Although they may be overconfident, they have a plan and are ready to
save the day. Black Panther and Wonder Woman are prime examples
of this character type.

It is common for a character to exhibit multiple archetypes. Otherwise, a
character can become one-dimensional and thereby boring.

CHARACTER ARC

Through the course of your story it is important that your main charac-
ter experiences some sort of change that shows they have developed as a
person. It is by going through conflict both internal and external that the
character is changed.

A character arc, which is the basis of the story, is quite clear in *A Christ-
mas Carol* by Charles Dickens. His main character Ebenezer Scrooge is a
miserable, stingy and uncaring man at the beginning of the story. Once
faced with his past, present and future by visiting ghosts, he is able to see
himself in a different light. By the end he has turned into a generous and
caring person.

DIALOGUE

MISTAKE

I'm going to use voice-over narration to tell my story. That way I
can use people who don't act very well, but look the part of the
character they play.

Dialogue has become important ever since *The Jazz Singer* was released in
1927. It was this movie that created the need for written dialogue. It was
the first full-length feature film with synchronous dialogue and singing.
People loved hearing the actor Al Jolson adlib a few lines after he sang
a song in the movie. At one point in the movie, he says to his audience,
"You ain't heard nothin' yet," which were prophetic words for the movie

industry as it began making "talkies." If you watch this movie, please note that it contains negative stereotypes of people of color.

Make sure that each of the characters speak with their own voice. Even if all the characters in a film come from the same family, they will see the world differently and what they say will reflect their perspective. For example, one brother may be easygoing, while the other brother may be aggressive and conniving. A third brother may be the quiet peacekeeper between the other two. When the characters are not related, they too will have different world perspectives and experiences and this will come out in their word choice, actions, tone and emotional state.

Movie dialogue needs to accomplish two main things. It must provide exposition or information and it must give context to the inner emotions of the characters. It is through the subtext of the dialogue that the viewer learns more about the characters.

To write dialogue for the sake of having the characters say something is almost meaningless. To use dialogue when an actor can instead give a certain look, such as disdain or love, is to take away from the abilities of the actor. Learn to write visually and try to reduce the amount of dialogue to a minimum.

The characters in a film need to seem real, so the meaning of the words they say to each other are often obscured. People generally do not say exactly what they mean. They tend to soften their true thoughts and to withhold some of their inner emotions. This is one of the reasons why it is important to choose the right words when using dialogue. Even the tone of a single word can add meaning when spoken.

The standard rule for writing dialogue is to limit each character's lines to three or less. If you have them speaking more than three lines, then they are nearing a monologue, which has its uses, but can also slow down the pacing and overstate the purpose of the dialogue. It is almost always better to show than it is to tell in movies, unless the telling adds more to a scene than we can get from the visuals.

Do not have actors say what the audience can already see. That is a waste of words.

CHECKLIST

Here are some questions to ask about your dialogue:

- Instead of telling, can something be shown?
- Do all of the characters have unique voices or do they sound the same?
- Use open-ended questions, since "Yes" or "No" answers can stop a conversation and provide little information. However, a character could speak with single-word answers.
- Is there some subtext to the dialogue that will be conveyed to the audience?
- Does the dialogue fit the movie or does it compete with the tone, era and genre?

- Do the last lines of a scene set up what's to come or neatly wrap up the conversation?
- Exposition, which is informative dialogue should ideally accompany relevant actions.
- Do you have any unnecessary monologues?
- Have you chosen your words carefully and with intention?
- Have you edited down all dialogue to its minimum?

VOICE-OVER

Voice-over is when a character in the story is speaking over picture or an unseen narrator is speaking. This technique is used to convey information to the audience. It is similar to having a storyteller speak to the audience.

Although a film could be made with all voice-over narration and thereby no dialogue, it might be a mistake, as it would be a challenge for an audience that is used to hearing dialogue when the actors interact.

Sometimes this works in independent and student films, but often it is a last resort used to tell the story because the script fails to accomplish that.

LOGLINES & SYNOPSIS

A logline is a brief two to three sentences that excites the reader about your project. It needs to include a description of the protagonist, their goal, the antagonist and how they will impede the protagonist. To keep the logline concise, it is useful to use adjectives instead of long descriptions. It should inspire people to read the entire script to see what happens.

For example, the movie *A Star Is Born* (1976) could have a logline that states: A cynical male music star falls in love with a struggling female singer. He guides her to stardom while his personal demons drag him down in his career and in his life.

A synopsis can be only a few sentences, but is usually several paragraphs or even several pages in length. It is a more step-by-step or beat-by-beat detailed telling of the story and not just a teaser like a logline is. Loglines and synopses are commonly used for promotional material, especially for film festivals.

A synopsis will tell what happens, in what order and the events that propel the story forward to a conclusion. Usually the synopsis of a movie is written after the movie is made since it is for promotional purposes. However, it could be a companion to a script in order to get someone to read the script and fund the production.

Even though the synopsis tells the important points in the story, it is not a treatment.

TREATMENT (THREE-ACT STRUCTURE, PLOT POINTS, SUBPLOTS)

A treatment is a kind of novelized version of the story prior to writing the screenplay. It is written in prose style and not in screenplay format. It reads like a short story. It is useful in letting the writer get their vision down in story form before having to deal with the limitations of the screenplay format. However, there are the rare times when a script is written and then a treatment is needed.

For example, in script format you might write:

EXT. FARM SHED—DAY

Kneeling under his tractor in a pool of oil. He puts a finger over the bullet hole in the oil pan. He drops his head into his hands and cries. The roll of THUNDER is heard in the distance.

DURAND

Who did this to me?

In a treatment this might read as:

Durand kneels down under his tractor. There is oil puddling on the ground. He puts a finger over a bullet hole in the oil pan. He drops his head into his hands and cries. Through clenched teeth he cries, "Who did this to me?"

In the filmmaking industry the terms "treatment", "outline" and "beat sheet" are somewhat interchangeable even though they are different. These documents range in length from being less than a page, like a logline, to being several pages, which tell the entire story, to being dozens of pages, which covers every scene in the story.

Some people write outlines more like a list of events and not as detailed or story-like as a treatment might be.

OUTLINE OR STEP OUTLINE

This is a step-by-step progression of the events of the story and the main character's attempt to reach their goal. There is no established format that is the standard. The purpose of the outline is to let the writer see what scenes are included in the story and in what order. They can be very detailed or just a list of beats or scenes, whichever works better for the writer. It is essentially an expanded synopsis.

An outline can be written on pages in a document or another established technique is to write out the beats or scenes on 3 × 5 inch (8 × 16cm) cards

and then put them in various orders until the story flows well. Taping them to the wall or a whiteboard can help with holding them up in plain view.

In order to keep your script outline well organized, you may want to include scene numbers, scene headings and acts. There are no specific rules, so create an outline in a format that works for you. Generally speaking, try to break down your story into individual steps. A step or event may take several scenes to accomplish. This does not mean you need to include every scene. The basic purpose is to have a road map or plan for creating the structure of the story.

BEAT SHEET

Story beats are the progressive points of action that happen during the story. Each beat builds on the previous one. A happens and then B happens and B causes C to happen. Once all of the events happen, the story concludes.

A beat sheet is a list of emotional or physical events that move the protagonist from plot point to plot point. Once the beat sheet is organized it can be used to create an outline and then the outline to create the script. It can also be created from an outline and then used to write the script.

The opening scene where we learn about the world in which the story occurs is the first beat. The second beat establishes the theme of the story. The third beat is the setup where we get to know the protagonist and learn why we should believe in them. The next beat is the catalyst that will set the story in motion. It is what gets the protagonist to act. The beats continue until the ending which is the new world or changed character that has resulted from the journey.

SCRIPTMENT

A scriptment is basically the story with a little dialogue. It is called a scriptment because it combines elements of both a script and a treatment. Any dialogue is formatted the same as is in a screenplay; however, most of it is included in the description of actions. Usually only the important scenes are given slug lines, which include the information, such as INT/EXT, DAY/NIGHT and location.

Some scriptments include every scene and others include every shot. These are closer to a script than a treatment. It is usually written single spaced with a space between paragraphs. Each page is numbered in the upper-right corner, like a screenplay. They may begin with a FADE IN and end with a FADE OUT just like a screenplay.

SCRIPT

> **MISTAKE**
>
> I'm going to shoot my story in an improvisational style, so I don't need a script, just a story line. The real story will come from what the actors say to each other. I'll find the story as I edit.

The three-act structure is the format for nearly every feature-length movie made. Short films can also have a three-act structure; however, they may not have three acts, but instead are a simple joke or a more detailed slice of life with a twist ending. There can be more than three acts, but three-act stories are the commonly accepted structure and it works well. It consists of setup, conflict and resolution.

There is no set length for a movie script. They usually range from 85 to 120 pages, but it really depends on how long it takes to effectively tell the story.

Cinéma vérité films are shot with the action being continuous and the dialogue being unscripted. A film could appear to be cinéma vérité in style, but in actuality it could be a scripted three-act structure.

Shooting a story without a script can be done, but it will be very demanding on the actors, director and editor. Improv or improvisation is a great form of entertainment, but it would be difficult to achieve the unfolding of a clear and structured story. For example, a director may have two actors in a scene and tell each of them what their "want" is for the scene. A want is what any given character wants to accomplish in a scene. It could be something like breaking up with a partner or getting another character to pay back the money they owe. Unless the director has a clear idea of how the story will proceed and the actors are highly capable, this approach could end poorly.

There are many different script-writing software programs available, such as Final Draft, Movie Magic Screenwriter and Fade In. There are free script-writing software programs such as DramaQueen and Highland, but some of them have a watermark on each page, so they are not for professional use unless you pay for the non-watermarked version.

SCRIPT FORMAT

The format of a movie script is written in a specific manner that can quickly tell anyone in the cast and crew what they need to know about a scene.

5. INT. DINING TABLE - MORNING ←————————— **Slug Line**

Butch is putting breakfast on the table. Angie enters in
her robe, still half asleep.

               ANGIE ←————————— **Character**
            (noticing food)
    Wow!

               BUTCH
          (scratching lightly) ←————————— **Parenthetical**
    This is just my way of saying thank
    you—you were worth waiting for.

               ANGIE
    Thank you love. You certainly made
    up for lost time. ←————————— **Dialogue**

               BUTCH
    No time to waste Ange—we've got a
    family to start. Tuck in.

               ANGIE
    Say Butch. When was that ring going
    to be ready.

               BUTCH
    I'll call the jeweler today, OK?

Angie nods her head and begins eating.

6. INT. BEDROOM - NIGHT

In the darkness there is a grunting noise and the SQUEAKING
of bedsprings. Butch is writhing under the covers. Angie
sits up in bed and elbows Butch. ←—————————
                                     Action

               ANGIE
           (Agitated)
    Will you stop fidgeting?

               BUTCH
    I'm sorry Angie, I can't stop
    itching. I must be allergic to
    something.

Figure 2.1 Script page

Basic script formatting follows these rules:

12-point Courier Font
1 inch (2.5cm) top and bottom margins
1 inch (2.5cm) right margin (within 1/4 inch (1.3cm))
1.5 inch (3.8cm) left margin
Approximately 55 lines per page

Slug Lines: This "where and when" information will start 1.5 inches (3.8cm) from the left side of the page and is written in all capitals. Each slug line gives information about the scene being an interior or exterior, the location and the time of day. For example: INT. JARED'S KITCHEN—NIGHT or EXT. JARED'S GARDEN—DAY; or for a scene taking place in two locations write: INT. ELEVATOR/BANK LOBBY—DAY. If a scene moves between and interior and an exterior then write: INT./EXT. = Both.

Character Names: Names that appear above the dialogue start 3.7 inches (9.4cm) from the left side of the page and are written as all capitals. The first time a character's name appears in the script it is written in all capitals and their age follows in parentheticals, like this: MEGAN (33). If the character's dialogue is to be said as a voice-over, then the character name appears like MEGAN (VO) above the dialogue lines.

Character Parenthetical (Wrylies): Parentheticals start 3.0 inch (7.6cm) from the left side of the page. They are not centered below the character's name, but positioned toward the left. They are commonly used to tell the emotional state of the character, such as (confused), or to describe a significant action, such as (kicks door open), or to tell how a character needs to delivers the dialogue, such as (whispered). Common wrylies are (pause) and (beat), which are often used to build drama. They all appear within parentheses.

Character Dialogue: Dialogue sits 2.5 inches (6.4cm) from the left side of the page. It is placed on the next line just below the character's name.

Action: These descriptions start 1.5 inches (3.8cm) from the left side of the page. This is a description of what is seen and heard. When a character's name appears in the action it is not in all capitals, but the first letter is still capitalized.

Page Numbering: All other pages are numbered in the upper-right corner at the margin and 1/2 inch (1.3cm) from the top. The title page is not numbered. The first page is not numbered. The second page is numbered as 2 and the third as 3, and so on.

The general rule is that one page of script equals one minute of screen time. The title page has specific formatting which is shown in the example in Figure 2.2.

1" TOP MARGIN

20 LINES DOWN

1.5" LEFT MARGIN

1" RIGHT MARGIN

TITLE

" MY SCREENPLAY"

BYLINE → written by

My Name

26 LINES DOWN

12-point Courier Font

YOUR CONTACT INFORMATION

100 Main Street
Ferndale, CA 98000
707-555-1212
screenwriter@writerpersons.com

1" BOTTOM MARGIN
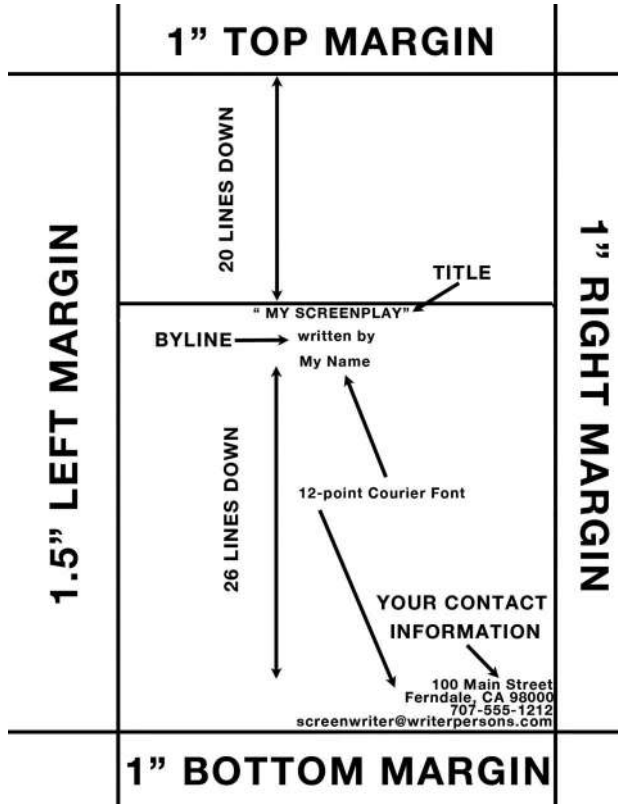
Figure 2.2 Title page

FEEDBACK & REVISIONS

Ideally, have someone who is knowledgeable about storytelling and script-writing read your script. It is very easy to think that you have conveyed some information or shown something, but in fact it is not in the script, but only in your head. As a writer you have more information than the reader about your story. Unfortunately, sometimes that information does not make it from your head to the page. That is when you need the feedback of others.

Once you have feedback from the many readers of your script, you can sit down and analyze their comments and then decide how you are going to revise your script to take into consideration the appropriate ideas and comments you received.

Ideally, the revisions for your script will all occur before production so that there are no last-minute changes in such critical areas as the schedule, locations or production design. Every time a change or revision is made in the script, the changed pages are produced in a different color.

The order of colored pages for script changes, as recommended by the Writers Guild of America, are:

- White Draft (original)
- Blue Revision
- Pink Revision
- Yellow Revision
- Green Revision
- Goldenrod Revision
- Buff Revision
- Salmon Revision
- Cherry Revision
- Second Blue Revision
- Second Pink Revision
- Second Yellow Revision
- Second Green Revision
- Second Goldenrod Revision
- Second Buff Revision
- Second Salmon Revision
- Second Cherry Revision

A script with four revisions might have this typed on the front page:

Rev. 02/07/21 Blue Pages 23, 44, 67–69
Rev. 02/28/21 Pink Pages 10–12
Rev. 03/15/21 Yellow Pages, 29, 34, 55–56
Rev. 03/27/21 Green Pages, 6, 33, 41, 59

In many countries outside of the United States the dates are written in this format:

Rev. 17/02/21 Blue Pages 23, 44, 67–69
Rev. 28/02/21 Pink Pages 10–12
Rev. 15/03/21 Yellow Pages, 29, 34, 55–56
Rev. 27/03/21 Green Pages, 6, 33, 41, 59

If the script is in PDF form, a Word document or in a scriptwriting software like Final Draft, then the background color can be changed for each page or a range of pages for each revision.

This color scheme may also apply to call sheets, one-liners and other such documents.

A beginning filmmaker may not bother with the color coding, but as they progress in their career and make bigger-budget productions, they will need to adapt to an industry standards such as the one given above.

KILL YOUR DARLINGS

MISTAKE

I know that the scene with the main character being pushed into the swimming pool doesn't fit the rest of the scene, but the shot from underwater is going to be so cool that I have to leave it in my film.

It is not the nicest term, but it does make you stop and consider the fact that you may not need your favorite scene, character, shot, location or other personal favorite element in your film. In writing the script, it is easy to have a favorite scene, amazing shot or perhaps a section of dialogue that seems magical to you. You may feel that it contains your highest level of creativity or some other personal accomplishment, but then you need to ask if it serves the film. If it does not, then it needs to be removed and you need to be able to let it go.

SHOOTING SCRIPT & CONFORMED SCRIPT

The shooting script is close to the original script but there are often changes in dialogue, locations, effects, characters and other aspects of the story. Often the shooting script will be a version that has been written to meet the budget for the production or for equipment limitations. It is common for the shooting script to be the first version to have scene numbers included.

At the end of production a conformed script will be created, which will achieve its final stage once the editing is done. This script will reflect the actual film. All changes are reflected in this version of the script.

Tips

- Have a good solid story with a beginning, middle and an ending.
- Start with the protagonist's everyday life and then throw them into a quest.
- Create believable characters that are relatable and have human flaws.
- Write a story that is within your budget and timeframe.
- Cast with believable actors who are right for the part.
- Make the conflicts the protagonist encounters increasingly more difficult to overcome.

- Give the protagonist a character arc so that they learn or gain something by the end.
- Only include meaningful dialogue that moves the story forward.
- Alternate between action scenes and exposition scenes to create a roller-coaster ride.
- Delete a scene if it does not add anything to the story, even if it is your favorite.
- Make the goal seem hopeless just before the successful climax.

3 Funding & Budgeting

MISTAKE

I don't need a budget or a grant to make my film, I've got a credit card!

FUNDING

There are many ways to fund a film. Most films made in film school are self-funded by the filmmaker or their family and friends. It is a nice idea to think that your credit card with a $1,000 limit will be enough to make your film, but how will you know unless you have a budget? Also, what happens when you have charged $1,000 on your card and you still need more money to finish your film?

You need to know approximately what your budget is before you know how much money to acquire. If your funds match your budget, you are

ready to go. If you do not have enough funds, but you want to proceed anyway, then you need to look at ways of cutting costs. One way to cut costs is to eliminate or reduce the number of special effects in the film. Another way is to simplify scenes and locations. You can also go through the script and find scenes that really are not necessary and omit them. Maybe you can reduce the number of characters, extras or crew members. Ideally, with some of these cuts, you can reduce the number of shooting days. Each day of shooting will have costs for at least food and transportation. If you have hired the crew and cast, then they too will add to daily costs. Be realistic in scheduling the shoot. Do not try to work everyone more than ten hours as they need to be fresh for the next day of shooting.

If you do not have anywhere near the funds you need to make your film, then either rewrite the script, so it is affordable, or come up with a new budget-oriented idea that is producible and write a script based on it. If you have more money than you need to shoot your film, then you are in a rare and enviable position.

Crowdfunding is one way to get the money you need for your film. There is a lot of competition for funds, but if you have an engaging project, you may get the funds you need. There are companies that will help you get crowdfunding, such as See&Spark or Wefunder. They give you all of the necessary tools, so you can focus on getting people to learn about your campaign and, hopefully, give you money.

In some countries there are film grants and arts awards that are a great source of funds.

Getting investors through your contacts is another way to get funding. Send emails to everyone you know. Call the people you emailed and try to get them involved financially. You can even do some advertising on YouTube, Facebook or some other social media outlet.

If you want investors for a higher-budget feature film, you will need to have a production company step in with the funds. This could be a studio, independent production company, television broadcaster, streaming service, investment group or a high-profile crowdfunding group. In order to get such a large amount of funding, you will need to have a great script, an extensive production budget, probably a known star and a great marketing plan. Creating a pitch will help secure this level of funding.

PITCH

A pitch will need to develop to present the script idea to the investors. Aim for a pitch of 5–10 minutes, but no more than 20 minutes, and make it as interesting as possible.

A pitch should express the world in which the story takes place, a description of the characters that inhabit that world, the conflicts and

risks the characters encounter, and the storyline for the film, but not the entire story.

Get the financiers engaged and play to their emotions. Tell the story as concisely as possible, but always include some of the juicy parts to capture their attention. Talk about the characters as though they are your friends. Remember that you are trying to get the financiers to feel some positive emotion that will make them say, "I want to see this movie." So, get them hooked and leave them wanting to know more. It is a basic sales technique.

After you have told your great story to the producers be ready to provide them with suggestions for actors to play the key roles, estimated cost of the production, ideas for marketing and a clear idea as to which genre or genres the film fits into. Be careful about saying what other movies it might be like. You do not know what they think of the comparable movies. They may hate them or the movie may have been a financial failure or a critical flop.

Once the investors are hooked, share your market research to let them know how viable the film will be.

You may want to do a "write-up," beforehand, which is a written version of your pitch. You can then hand the written version to the financiers at the end.

BEG, BORROW & ACQUIRE

> **MISTAKE**
>
> I want to make a historic war film. I'll need some cannons, guns, swords, costumes and horses. How hard could it be to get these things in Idaho?

On really low-budget films, you may have to resort to the beg, borrow and acquire strategy to get what you need to make your film. It is very common for people to help you if they can see that you are passionate about your film. Remember, it never hurts to ask. Whatever you may need may be made available to you, just by asking. Also, you may be able get something by offering a film credit. People often contribute in return for having their business name or an exterior sign in a shot or having a product or location seen and credited.

If you have a limited budget, there are some things to avoid. Do not make a period piece, such as one set during a historic war or anything with visual effects. In order to limit some of the challenges do some of the following:

- Set the film in present day.
- Use real locations, so you do not have to rent any spaces or build any sets.
- Use wardrobe and props from your own closet or buy clothes from a thrift store.

- Use your own vehicle or borrow them from friends and family, if you need them.
- Have as many day exterior scenes as possible to reduce the need for lights.
- Keep your cast down to just a few people.
- Try to shoot with a core crew you can rely on.
- Do as much of the postproduction as you are able to do on your own.
- Pay the cast and crew, if you can.

When you request help from your friends, family and community, such as acquiring props, clothing, food, locations and vehicles, be honest and upfront about what you need and why. Also, find out if they want an item back and let them know that if the item is damaged, you will replace it.

Transparency is critical when borrowing a location. You need to let the owners know what scenes their location will be used for, the size of the cast and crew, when you will arrive and depart, how many vehicles there will be and if any items or furnishings of theirs might get used. Also, ask if you can use their electricity and bathrooms. Compensate them something for their inconveniences. It does not have to be much, but make a goodwill gesture. Show them your insurance policy covering liability and damage. Get a signed agreement that states all of the location costs, requirements and conditions, so that there is no question about what is expect from each other.

I funded my first short film mostly with the tips I made as a waiter. My cast and crew of eight people all worked for minimum wage. It was not much money, but it was a way of saying I valued them and did not want them to have to pay for gas or wardrobe or whatever costs they may have had for being a part of the film.

I found free locations where I did not have to pay for electricity. The wardrobe and props either came from my house or from a second-hand store. I acquired some props from family and friends. I made sure to return them when I was done with the shoot.

PROOF OF CONCEPT

It may help to have a promotional video for your film. A proof of concept is a way of showing what a feature film might be like without spending much money. Either a section or sequence from the proposed film may be shot or a short film version might be made. The idea is to show the financiers that your idea or concept will work.

Put lots of production value into the proof of concept video. The better it looks and sounds the more investors will view your project as being professional.

TALENT & CREW—PAID OR VOLUNTEER

MISTAKE

I have lots of friends and classmates that can help on my film and they don't need to be paid. I know they will show up for me.

Having a volunteer cast and crew is good to a point. Yes, you save money, but what you may give up is their commitment. Ideally, they will stay for the entire film, but it is very common for volunteers not to show up or to leave for other opportunities or not to take their involvement seriously.

I have had many student filmmakers come to me and say that they had a cast and crew lined up, but not everyone showed up for the shoot. They have had some people show up, but they were so hungover that they were useless. Some student crew members have told me that another student filmmaker was paying minimum wage, so the people took that job instead. If you can find a way to pay your cast and crew, then do it. People feel a sense of responsibility when they are being paid for work.

I believe it is better to have an experienced and talented cast and crew than it is to have a famous actor in your film, if you have a limited budget. However, if you can afford a name talent, it may help you get distribution. If you can afford to pay a decent amount to the key crew members, then do it. It will pay to have a good and experienced cinematographer, gaffer, editor, production designer, sound mixer, first assistant director and any other crew member you can afford.

Every filmmaker's goal is to become better and better at making films. Ideally, the development of skills in making films will go along with making money from them. When budgeting for a film, make sure that you include a salary for yourself as the director or filmmaker. This could be a single dollar, euro, pound or much more. It is a fact that your time and work have value too.

Percentage, Flat Rate, Weekly, Daily, Hourly or Deferred

Paying someone a percentage of the net or the gross is usually reserved for some high-end screenwriters, directors, producers and lead actors. Sometimes the director of photography is included in this list. Essentially, they are all above-the-line people. They are often referred to as the creative people or the essential people as they oversee the production. Sometimes they are hired as a "package." For example, the director and the writer may require that a production company hire them together.

When the above-the-line people are not given a percentage they are usually hired for a flat rate. For example, a director may be paid 1 million dollars to make a movie, no matter how long it takes. An example for a

below-the-line cost is the composer. They may be paid a flat rate for the score to the movie. They may be required to hire and pay the people that work for them along with the musicians and recording session.

Other below-the-line people, like a sound editor, would usually be paid on a weekly basis. However, a specialist sound editor that edits only gunfire might be hired for a few days and then be paid a daily rate.

Hourly rates are the least common, but you may hire a specialist that charges by the hour for a minimum amount of hours.

Deferred payment is fairly common in low-budget films. It means that you will pay someone for their work when the film makes some money or when it turns a profit. This is not ideal for the crew or cast members that agree to it, because they may never see any money. It is better to pay the crew and cast a token amount and then agree to a deferment of the remainder. At least they get something for their efforts.

BUDGETING

MISTAKE

I just found out that the stock footage of Mount St. Helens erupting is going to cost half of my budget. I'll have to find places in my budget to cut costs.

A simple horror movie shot in a big house by a lake with unknown actors costs much less to produce than an action adventure movie shot on the side of Mount St. Helens with established stars.

Many new filmmakers find budgeting as exciting as watching paint dry or they may just be intimidated by what appears to be a complicated process. To keep it simple, you can think of a budget as a shopping list for everything you need for your film. The big difference is that instead of having all of the items together, they are separated into categories in the budget.

Before you get started with creating a budget, you need to break down the script. You will need to make a schedule based upon the locations in the script and the number of night and day shoots. The primary decision is to determine how many pages of the script you can realistically shoot on any given day. You also need to take into consideration the availability of the talent. If you are able to get a name actor for one week, then you need to shoot all of their scenes in that week.

On average a major Hollywood film will shoot one to two pages a day. An independent film with a reasonable budget will typically shoot four to five pages a day. If the film is a lower-budget production or even a micro-budget one, it will shoot seven or more pages per day.

BUDGET BREAKDOWN

Once you have your script breakdown, you will be able to create a reasonable budget that will accomplish the making of your film. You will know how many days it should take to shoot the film and you will have an idea of what the expenses should be. Script breakdown is covered in Chapter 8 "Producing".

If you are shooting a short film or an independent feature, then you need to determine what your greatest expenses are. It may be talent, it may be crew, it may be location or it is whatever gives the film greater production value.

Higher-costing films with extensive budgets often use a software application to determine expenses. There are accounting codes to go with each budget item or line item. They run from 0000 to 1900 for above-the-line costs and from 2000 to 8000 or higher for below-the-line costs. For example, a production manager is line 2001 and a stunt player is 1305.

Major above-the-line categories of a budget include: development, story and screenplay, producers' unit, directors' unit, cast and stars, travel and living, and benefits and payroll taxes. In simple terms, the above-the-line expenses are the ones that are not based upon union wages, but are generally based upon a negotiated amount. However, there are minimums for the producers' and directors' units.

Now, imagine a line being drawn across a budget page under these costs. Everything else below that line is considered to be below-the-line costs. Below-the-line categories include: production, extras, art, set, props, vehicles, special effects, camera, sound, grip, lighting, wardrobe, makeup, locations and stages, transportation, animals, miniatures, insurance, benefits and payroll taxes and contingencies.

These are fairly predictable costs. However, a cinematographer or production designer or some other heads of departments may have higher than union or guild-level fees and are paid a fixed amount for their work. Most of the below-the-line workers are all considered to be somewhat expendable for a production.

BUDGET TOPSHEET

A topsheet is a summary of all of the costs of the various categories that are within the budget. These total costs are not the line items that are for each cost within the body of the budget. For example, one of the topsheet costs will be for a camera. Within the budget that is broken down into the camera rental package, director of photography, camera operator, first assistant camera, second assistant camera, still photographer, video assist and village, expendables, second camera crew, special camera operator, second unit camera crew and any other items that would come under this category.

Below are some of the categories commonly found in a topsheet. More categories can be found in the online appendices. The four-digit numbers before each named category are used for both the topsheet and the complete budget to differentiate categories.

Production Company: Timeshare Films	Production Title: Best Friends				Date: 2/12/2020
Executive Producer: Margo Sneed	Producer: Lawrence Barnaby		Director: Robin Redbird	Production Manager: Clive Brown	Production Number: 2385
Start Date: 6/20/2020	Finish Date: 7/20/2020		Production Script Date: 6/1/2020	Script Page Count: 95	Crew Daily Hours: 14
Account Number	Description		Page Number	Account Budget	
0000	Development		3	$75,089.00	
1000	Story & Screenplay		4	$106,040.00	
1100	Producer's Unit		5	$750,045.00	
1200	Director's Unit		6	$2,036,059.00	
1300	Cast Unit		7	$4,247,806.00	
1400	Travel & Living		8	$250,480.00	
1900	Fringe Benefits & Payroll Taxes		9	$253,073.00	
TOTAL Above the Line					$7,718,592.00
2000	Production Department		10	$592,178.00	
2100	Extra Talent		11	$155,050.00	
2200	Art Department		12	$236,550.00	
2300	Set Construction		13	$358,500.00	
2400	Set Dressing		14	$372,000.00	
2500	Property		15	$425,550.00	
2600	Picture Vehicles		16	$325,425.00	
2700	Special Effects		17	$165,775.00	
TOTAL Below the Line					$25,493,224.00
2800 - 4900	and so on for Below the Line		--	------	
5000 - 8000	Includes post production costs and Direct Costs like Contingencies at 10%				
TOTAL Budget					

Figure 3.1 Budget top sheet

DELIVERABLES

If your film already has a distribution deal, there will be various deliverables required by the distributor. If there will be a cinema release, there will be special hard drives required. There are technical choices for streaming. There are very defined requirements for television broadcasting. A film may need to have a surround sound audio track along with a stereo track or other format. Learn what deliverables you will need, so you can budget for them in advance.

If you do not have a distribution deal, then you do not need to include costs beyond a basic release format that will be seen by distributors and agents.

MEALS & TRANSPORTATION

> **MISTAKE**
>
> I plan on buying pizza for every meal on my five-day shoot. Everybody loves pizza.

It is possible to make a no-budget movie, but even the most limited crew and cast need to eat and they need to get to the set. Even if we are talking about bus fare and pizza, there is a cost. You need to know how many people will eat and travel for how many days. Once that is calculated along with the cost of the pizza and the bus, you will then have your budget.

It is customary (and for union cast and crew it is required) that there are hot meals and snacks. The go-to meal for student films and other low-budget films is often pizza.

Pizza is fun to eat and tasty, but it does not give the cast and crew all of the energy they need to be at the top of their game.

Just like the idiom "An army travels on its stomach," a film production's morale is dependent upon the quantity and quality of the food it is served. Do not skimp on this very important aspect of the budget. It is particularly important to provide good food if the crew and cast are not being paid. It is the production's way of saying thank you and it shows the workers that you care about them. Feeding them pizza for five straight days does not show respect.

No one should have to pay to get to a location. This is especially true if the cast and crew are working for free. If people are using their own vehicles to get to a location, then reimburse them for their fuel. If they are taking a bus, train, airplane, boat or any other form of transportation that will cost them money, then they need to have their expenses covered by the production.

PRODUCTION EQUIPMENT

Figure 3.2 Film gear (by Jakob Owens)

If the gear is owned by the production company or is being provided to a student filmmaker by the school they attend, then these can be no-cost or low-cost budget items.

If you are renting the gear from a rental house, you might get a deal where you pay a three- to four-day rate and get to have the gear for a week. If you are only doing a two- or three-day shoot, then you can usually get a deal if you rent over the weekend. Make sure that the gear is insured. You may need to get your own insurance or some rental houses will sell you insurance.

Low-budget film costs are commonly found in camera rental or purchase, location sound equipment, lighting and grip gear, crew costs, cast costs, location costs, craft services/meals, insurance, picture, sound editing and sound mixing. The challenge is to find ways to reduce or eliminate any of these costs, but never cut meals from the budget.

If you need to raise money for your film, then you need to create a budget that is accurate and shows the cost for everything if you want people to provide funding. You can do the budget or you can hire someone to do it for you, but it is essential for getting funding.

4 CAST

Figure 4.1 Director with actors (by Kal Visuals)

> ### MISTAKE
>
> I don't need to audition any of the actors, I just need them to look right for the part. That's half of acting anyway.

Casting is almost as important as story. It is better to learn how to find a cast that will play the characters well, than it is to have just anybody in a role.

CASTING DIRECTOR

It does not matter if you are a director making their first film or if you are a well-known director, it is always good to have another perspective when selecting talent. A casting director or casting consultant can give you valuable insight into casting the right person for each part. Often a producer or director will have a list of actors that they would like to have as leads in the production and the casting director will contact those people to see if they are interested in the film. If your production cannot afford a casting director, then enlist your producer or a trusted friend who knows the script and the characters. Working together you are more likely to make good choices.

Casting directors do more that help select the talent. They can write character breakdowns and casting notices, as well as make contact with the agents or managers of the actors.

CASTING CALL

A filmmaker needs to get the word out that they are looking for talent. If they do not already have talent lined up, they could have a casting call. They can also send out notices to local theater groups, drama schools and through the internet, using sites like Craigslist and Mandy. There may even be responses from talent agents and managers who are trying to get their actors roles in your film.

A casting call can be open to anyone or only to actors that meet specific requirements. When setting up auditions, schedule calls during a specific time period at a specific location.

If you are in Los Angeles, New York City, London, Sydney, Wellington, Toronto or some other larger city, you should be able to sign up with a casting agency either as an actor, casting director or as a producer. If you are looking for an actor, you can search the website and find résumés, head shots, video

clips and other information about the different talent that is available. A great source in the USA and the UK for finding actors is Backstage.com.

Breakdowns or Briefs

When a call is put out for actors, make sure to include a "breakdown" of the roles. The breakdown will include: project name, role, gender, lead or supporting, age range, ethnicity, type of project, pay rate, union or non-union, shoot locations, shoot dates, posting date, description of character, and résumé and headshot requirements. See Figure 4.2 for an example. This guide is effective in getting you appropriate actors to your auditions.

Slam Dunk, Basketball Coach, Male, Lead, 30-45, Open Ethnicity

Student Short Film, $125 per day, Non-union,

Phoenix, AZ Locations

Shooting March 1, 2020 - March 8, 2020

Posted January 1, 2020

This short, heavyset and easily confused basketball coach, who speaks broken English, has a warm heart and can not say no to anyone who wants to play on his team. Even though his team is shorter than any of the other teams they play, he pushes them to do their best, even if they don't win any games.

Provide: Headshot, Resume and Video Clips, if any.

Figure 4.2 Role breakdown

Actors do not typically care about what camera is being used or how many lights there are. They care about having an interesting character to play, the screenplay and how much exposure the film and their acting will receive. It is also a good idea not to get too specific about the character's description, unless it is critical to the story. You may eliminate some really good talent, if you ask for a 5 foot 2 inch (160cm), red-haired, blue-eyed and stocky actor.

Along with the breakdown, you can include the logline and synopsis of the film, if you want to provide more information. The logline should be no more than two lines and the synopsis should be no more than four lines. The logline will give an idea of what the story is about without giving away the plot. The synopsis is a more detailed description of the story.

Casting Notice

A casting notice is similar to a breakdown, except you would include the names of the director, producer, casting director, writer and other creative

roles. You would also include a list of all of the characters and their description. The logline and a synopsis would be included too.

You need to provide your contact details, the dates for the auditions and when you will inform them of your decision. Remember, they may be waiting to hear from you before accepting another job, so you do not want to keep them waiting to find out if you are going to hire them.

Once a casting notice has been created, get it out every way possible. If there is a film website, post it there. Send it to drama schools, local theaters, online casting services and even consider putting up flyers in your area.

CASTING & AUDITIONS

MISTAKE

My brother doesn't have any acting experience, but he's good at telling jokes. I'm sure he'll be able to play the bad guy.

Your film may be boring if your story is weak, but it will be painful if the acting is weak. Remember, a great script is an incentive for attracting great actors.

Casting is one of the most important aspects of any film. If the actors are not right for the parts or are not experienced enough, they will not be able to bring the story to life and will thereby fail the film. Many student productions do not put enough emphasis on auditioning the actors and getting the casting right.

When you are auditioning for the lead roles, determine which emotions are critical to the film and then provide the actors with "sides," which are two to four pages of the script that allow the actor to express those chosen emotions. When auditioning the supporting roles, supply these actors with one to one and a half pages of the script which include critical emotions.

At the audition there needs to be a "reader" to read the other parts, so that the actor doing the audition is able to play off the reader. The director and the casting director should not be the reader as they need to focus on the performance of the actor being auditioned.

Hold your auditions in a room that is not your house or apartment, but somewhere that is more public, such as a school classroom, library conference room or community hall. This will make the experience less personal and more objective.

If an actor does not live anywhere near the city you are in, you can ask them to use a software like Skype or Zoom to do the audition in real time.

The auditions should be held far enough in advance of the production to be able to replace someone if they are not working out in rehearsals.

Below are excerpts from an article courtesy of the Lights Film School, which give some useful advice for casting.

Important Points to Consider When Casting for a Film

1. The majority of people who show up for your casting will not be able to fill any of the character profiles you're trying to fit. Don't be mean, but don't make false promises or give actors a false sense of hope if you don't think you'll be calling them for a call back.
2. A great way to meet actors as an independent filmmaker is to hold open casting sessions. When you do this you're inviting a mixture of talented and untalented people into your casting space, but you might find a few acting gems. One great resource to use is meetup.com (a professional networking site).
3. Don't cast someone simply based on their looks. If the actor can't make a genuine connection with your character then the script will sound contrived and you'll jeopardize your entire production.
4. Film the casting session. Don't rely on your memory or quickly scribbled notes.
5. Make the actors feel comfortable. By default an audition is a competitive process and actors tense up because of this. A good rule of thumb is to allow the actor to do at least one take where you let them know it's "risk free." They can do whatever they want with the interpretation of the lines.
6. Especially at first, allow actors to use the space however they feel comfortable. If they feel more comfortable in a stationary position or sitting down, then allow them to do a reading like that in order for them to get comfortable first. Remember, you want to hire someone for the part. Intimidating the actors or making them feel uncomfortable will only work against you.
7. Try to compliment at least one part of the actor's performance. If they feel they are doing a good job, that could help them build momentum for the second take.
8. Ask the actor if they have any questions about the script, story or interpretation.
9. Don't forget to let them know what the process is for callbacks and how you'll go about letting people know if they got the part or if they didn't get the part.
10. Always bring copies of the script or sides for the actors to read from.
11. Try to see each actor for 15–30 minutes. This gives you enough time to talk about your production, make the actor feel relaxed, run through the lines a couple of times and even give the actor a bonus read for another character. (lightsfilmschool.com)

ACTORS AUDITIONING

When you arrive for an audition, you will need to sign in and when you are done you will sign out. Union rules in the United States only allow for a

certain amount of time for the audition and the signing sheet is the record of that time.

You will likely meet the casting director, director and possibly the producer. The casting director will probably run the audition.

If you have just received the script, then you can ask for a couple of minutes to go over it before your audition. This will give you time to get familiar with the scene and the character.

It is acceptable to read directly from the script. It is more important that you show your acting talent and your interpretation of the part than it is to have memorized the script. It is acceptable to mispronounce a word or two and to start over if you mess up a line.

Be prepared to read the script over several times with different emotions, should that be requested of you.

Be prepared to do some improvising too. This shows how well you act without the limits of a script.

If you are auditioning with a reader and they are not actors, ignore their lack of engagement and focus on your role.

When you have finished the read, do not ask if you got the part. They will contact you if you got the part. Hand back the script and thank everyone in the room.

Warning: There are audition scams designed to take advantage of aspiring actors. If there is ever a charge for an audition, then do not go as this is likely a scam. Another warning sign is if the audition is at a hotel in a suite instead of a hotel conference room. Also, avoid one-on-one meetings unless they are during normal business hours and at an established place of business. Research the producers and the production company online to try to determine if they are legitimate.

CALLBACKS

A callback is like a second audition that allows the casting director and or the director to have a second look at actors who did well in the original audition. At this time, there may be some short scene work to see how an actor takes direction. They are usually teamed up with an actor that has already been cast. This will show how the two look and relate together in a scene.

There may not be any need to have callbacks, if the audition provided actors that will work best for the film.

MINORS

When auditioning minors, make sure that the parent or guardian is included in the conversation you have with the minor actor. There are no

specific rules about auditioning a minor, but there are for working with a minor on set.

In the United States, there are federal minor employment laws and state laws too. For example, California has child labor laws such as:

> Older minors in the entertainment industry are limited to eight hours per day of work. Their workday starts when they leave their home and end when they return. Under certain circumstances they must have a production provided teacher. A welfare worker and or a parent or guardian must accompany the minor during production time. An infant, for example, is only allowed to work for twenty minutes a day. The amount of time allowed to work increases as the child gets older.
>
> (Labor Commissioner's child labor law booklet:
> https://www.dir.ca.gov/dlse/DLSE-CL.htm)

Make sure you know the national or federal minor labor laws and the ones in your state, region or province, so that you can legally hire minors. In the United States, the Department of Labor has a guide for each state on their website under Child Entertainment Laws.

EXTRAS

Figure 4.3 Extras on set (by David Condrey)

Extras, which are also called background actors, background talent, background and atmosphere, are essential to making a scene appear realistic.

If you cannot round up enough of your family and friends to be extras, then if you are in Los Angeles, New York City, New Orleans or Atlanta

areas, you will find Central Casting offices. If you are in Chicago you can register with Atmosphere Casting. In London you could contact Uni-versal Extras or Ray Knight Casting. In Sydney you could contact MCTV, Screen-talent or McGregor Casting. Nearly every major city has some agency that handles background actors.

Casting directors want to see what the background actors normally look like. They are usually looking for real people, not some glamour head-shots, but everyday photographs.

If the production cannot afford a casting director, find someone with some knowledge of film or theater acting to handle finding the extras. It can be a lot of work that could be handled by someone other than the director.

If the production cannot afford to pay the extra scale, which is about $175.00 per eight-hour day, then pay the background actors a low but reasonable amount, such as $45–$75 dollars per day—they will then treat their acting as a job. You may be required to pay the federal or national minimum wage or state minimum wage. If you cannot afford to pay the background actors at all, then find another way, such as having a valuable prize that can be won. Getting extras to come to a filming for no compensation is a difficult task.

During production, extras are overseen by the assistant directors. They will tell the extras where to go, what to do and when to do it. The background actors will be given a verbal cue to action, such as "background action," or there will be a visual cue. It is most important that they do exactly as they are told, repeatedly, until told otherwise. They are also told never to look at the camera.

On bigger productions, sometimes a background actor may be given specific directions, such as handing a restaurant menu to the lead actor, but without saying a line. In this case they would be referred to as a "featured extra." If they are given a line to say, then they are not a background actor anymore, they are a day actor or bit player. If they volunteer a line, then that is considered "interjected dialogue" and they do not get a bump to day player unless the director agrees. If they are hired because they can do something special, like ride a horse or juggle, then they are considered a "special ability" background actor and they will get a bump in pay.

When a group of background actors are asked to make speaking sounds like you would hear in a restaurant or a party, then they would not be paid extra for these "omnies." When the group is asked to speak in unison, they may become "principal performers," but that depends on how many of them are speaking.

In the United States, on a union production, after the first 85 background actors are hired, then non-union actors can be hired for the rest of the extras needed.

Background actors must be ready at all times and they must not be checking their cell phones or wandering off. Even the simplest production costs money and any delay will add to the expense.

Figure 4.4 shows an example of a casting call for background actors.

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UNION AND NON-UNION
Movie shooting Thursday 7/29, Friday 7/30 and Saturday 7/31

Looking for athletic, short haired Males that appear ages 18 to 22 to portray
college basketball players.  Must have prior experience on a basketball team. In
the winners locker room scene you will be shirtless and may be wearing only a
towel, but with a swim suit underneath.  You must be OK with all of this.

MUST BE AVAILABLE ALL THREE DAYS

NO TATTOOS

If you qualify, please submit your name and phone number along with a
snapshot of shirtless self.  Send to:  123@starcasting.com. Subject line:
Basketball
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Figure 4.4 Casting call notice

CASTING NAME ACTORS

MISTAKE

I can't afford a name actor. It's not even worth asking one to be in my film.
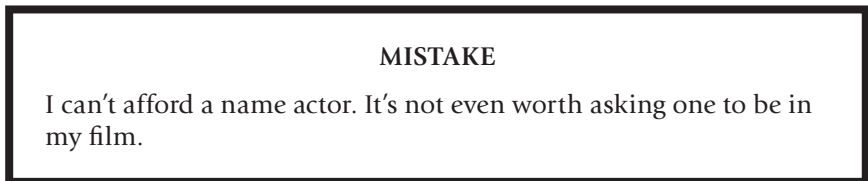
If you have a great story and your screenplay has a role that is perfect for a given actor, you may have a chance of getting them in your low-budget production. Actors love to act and if they can play a role that excites them, then given availability they may sign on to the film. Do not assume that you cannot get a name actor in your film. You may have to send your script to a number of them, but you might find one that is excited about your story and a specific character.

If your production has a casting director, then they can contact the actor's agent or manager to let them know that you have a project that the actor might be interested in working on. Otherwise, you can contact the actor's agent.

You may need to provide the following:

1. A copy of the script.
2. The logline and synopsis.
3. The role or roles you want the actor to consider.

4. The names of the writer, director and producers. For the director, you could include a link to some work examples.
5. The location and date of filming.
6. The amount of the budget.

In the United States, the budget will determine if a production has to be union or can be non-union. The SAG-AFTRA rules change often, so check their website for current information.

In negotiating pay for a big name actor, you will have to follow SAG-AFTRA rules. Also, an actor may require a "pay or play" agreement as part of the contract. That means that if the production doesn't happen or is postponed, then the actor can pull out of the deal and the production still has to pay them what they would have received had they been in the film.

If you have any name talent in your film, it is advisable that you hire an attorney to oversee the contracts.

STAND-INS

Once a scene is roughly lit, the director will run the actors through a rehearsal of the scene. The director of photography (DP) will watch the blocking and then when the director and actors are done, the DP will fine-tune the lighting. The fine-tuning of the lighting is done with "stand-ins," who are people who are not the actors, but who are the same size, height, skin color, hair color and general features of the actual actors. They also wear nearly the same clothing as the actor will wear for that scene. These people are standing in place for the actors so the actors can rest while the lighting crew do their work.

A low-budget film may not be able to afford stand-ins, but if you can or if you can find volunteers, then it is better to use them than the actual actors for lighting.

ACTOR RESPONSIBILITIES

Above all else, actors need to show up, be well rested, know their lines and be ready to work. Showing up means being at the set at the scheduled time. Being well rested means having had a normal night of sleep and thereby not having stayed out until the early hours of the morning. It also means coming in sober and not hungover. Knowing your lines means having them memorized and being able to express the proper emotions for the scenes to be shot that day. Being ready to work means approaching your job seriously and not acting up or acting out in a manner that is disrespectful or is a disturbance to the production.

The main focus of an actor is to bring their character to life by communicating their emotions and thoughts through movement, actions, voice, behaviors and expressions.

Actors must be in the moment and be able to respond and react to the other characters while maintaining their character. By doing this, the actor will come across as authentic to the audience.

Actors must work under the direction of a director, who oversees how a scene will play out and how the actors will interact with each other.

An actor must have an understanding of what will happen in every scene they are in. They also need to know about the other characters and what those characters' purposes are in each scene. This is commonly known as the other characters' "want"; that is, what they want from your character.

An actor needs to avoid looking at the camera as this will usually ruin a take. An actor should know where the camera is at all times and have a good idea what is in the camera's frame. If the director is shooting a close-up, then the actor needs to not move their head too much or they risk moving out of the frame. It is acceptable for an actor to ask the camera operator how much of their body, head or hands are in frame, so they know how far they can move in any direction.

If the camera is shooting a wide shot, then subtle facial gestures will not be easy to see, but if it is a close-up, then an actor can let those subtle facial gestures work for them.

Once the establishing shot has been done for a scene, each actor must remember what they physically did in the shot, so that they can repeat the same actions for all of the other takes, unless the director asks them to change their performance.

Maintaining the same energy and emotional state is a difficult thing to do when there are repeated takes being shot. An actor must be consistent from take to take and scene to scene. Continuity includes the actor's appearance, acting and the physical movements during the numerous take of a scene. An actor might get away with altering the way they act a scene, but changing the actions will cause headaches with picture-editing continuity.

Movies are shot out of order for the purpose of saving money by shooting all of the scenes that occur in a particular location at the same time. This way they do not need to come back to that location later, unless there is an issue such as a script-required change of seasons. An actor may shoot the last scene of a film one day and then shoot the opening scene the next day. Because of this out-of-sequence style, an actor needs to know what emotional state they are in for every scene. It is common to make notes on the script so an actor knows what emotions their character is feeling in a given scene.

Performance is really being the character and acting and reacting in accordance with the story and the character. Once a character is established, they should not act out of character. In other words, they should stay true to their character and only do whatever would be right for that character.

If a chosen actor only has experience in theater, then they need to adjust to film. Performance for film is typically much more subtle than for theater. For example, an actor's voice does not have to project, but can be

natural and their facial expressions are typical and not exaggerated. The camera is much closer than the back rows of a theater, so less is more.

Many characters, especially the main characters, may have a character arc. They need to be able to demonstrate that they achieve some sort of significant change as the story progresses or even at the very end of the story. Actors need to be aware of the arc and integrate it into their characterization.

Most experienced actors will be able to tell a lot about their character from the script, but they will probably still have questions for the director to answer. Once an actor has all the information they need, they can then create their character and bring them to life in the film using whatever technique works best for them.

CONTINUITY

The script supervisor will pay attention to all of the actor's movements, prop handling and clothing along with making sure that the script was followed as written and if not then noting what the line changes are. If an actor forgets a line, the scripty will be the one to provide it.

Even though there is a script supervisor or continuity person taking notes and photographs of the actors as they perform, it is important for the actors to try to replicate their motions from take to take, so that there are no noticeable differences in the cutting from angle to angle. When an actor is holding a drink cup in their left hand and they place it on the table in front of them as they say the line, "I think I know who stole it," they need to remember to do it exactly the same each take. Without continuity, the film would be difficult to cut and may even have blaring jump cuts where an action, actor or object jumps through space or time between two shots.

I am sure we have all noticed when an actor on screen has a continuity issue, such as hair in the wrong place or the wrong shoes from one take to another.

CONTRACTS/DEAL MEMOS

Every cast and crew member needs to have a contract or deal memo that spells out the work, dates, pay rate and other pertinent details. An example of a cast member deal memo is included in the online Appendix for this book.

Union
If you are a union signatory, then you signed an agreement to use union actors and follow union rules. If you are a non-signatory and have reached an agreement to use union actors, you will have to follow SAG-AFTRA rules.

That will mean paying union rates and scheduling the working hours, meals and break times. There are penalties for not following proper timing of breaks and meals.

If you are making a short film that has a budget of no more than $50,000 and a maximum running time of 40 minutes, then you can have a SAG-AFTRA Short Project Agreement. The minimum pay in 2021 is $125 per day.

SAG-AFTRA requires different pay scales for their actors dependent upon the budget of the production. For example, if you have a budget of less than $250,000, you would have to pay a minimum of $125 per day. A film to be only shown over the internet would come under new media rules, which allow for the actor and producer to negotiate a rate.

Check with the appropriate union to make sure you have up-to-date rates and rules.

Non-Union

If you are using non-union talent, then be equally respectful and schedule shoot times, breaks and meals similarly to the union cast. Make it your policy to apply the same standards and procedures to all of the cast members, even if you are shooting a very low-budget film.

CONFIDENTIALITY

It is common practice to sign a confidentiality or non-disclosure agreement with the production company. This is to prevent any cast or crew member from leaking information or photographs regarding the film to the media or social media before the release of the film. It is common for talent to sign a basic agreement at the audition for some films.

An agreement may not be needed for a student film, but it is worthwhile to consider. I have never signed a confidentiality agreement on a short film. The first time I signed one was for the movie *E.T. the Extra-Terrestrial* (1982) because I was working on the studio lot at the time. I was not even working on the film. The producers wanted to make sure no one gave out any information on the film before its release.

ACTOR TIPS

The following tips are for actors, so they can make the filmmaker's job easier:

- Make sure you have the call time and location for the next day you are needed. If you need to talk with the director, let the second assistant director know and they will get the word to the director.

- If there is no rehearsal, practice by having someone else read the other parts, so you can respond to them with your lines.
- You were hired to play a particular role, so work to develop that role, but do not significantly change it. You were hired for a reason, so do not stray far from that.
- Always know your lines. Know them so you can say them naturally as the character you are playing. If you do forget them the script supervisor will shout them out to you, so you can continue acting until you hear "Cut."
- When acting, stay in the moment and keep your eyes on the other character.
- Know your marks and hit them without looking down. Know your blocking so the camera can follow you.
- Learn what the framing of the shot is so you know how much room you have in the frame to move.
- Do not move or make any noise when the sound people call for "Quiet" as they are either recording a take or room tone.
- Act like a professional and not a diva if you want to work again. Complaining makes it harder for others to do their job.
- Thank anyone that does something for you and thank the entire cast and crew when shooting has wrapped.
- Read your contract, so there are no surprises.

5 CREW

MISTAKE

I can direct, act, light and run camera all at the same time. How hard can it be?

INTRODUCTION

Serving the story is of paramount importance for every person working on a film.

There are many positions on a movie crew. Unless you have a decent budget, you will have to be very selective of the crew positions that you need. In a bare bones production, there has to be a director to oversee the creation of the story, someone to operate the camera, lights and sound, and there has to be someone to edit the picture and sound. All of these jobs could be performed by just one person, but that brings up the question that if you are so busy doing everything, how can you do anything well? It takes a team to really do justice to the filmmaking process and the story.

Some of the more essential crew members are: writer, producer, director, cinematographer, gaffer, key grip, location sound mixer, boom operator,

first assistant director, production manager, production designer, hair/makeup/wardrobe, props, set dresser, craft services, script/continuity, editor/colorist, sound editor and sound rerecording mixer. You can get by with fewer than these crew members, but the fewer people there are working on the production the more each person has to do. This will create more stress and will increase the chances for mistakes.

TEAM

Some directors make the mistake of thinking they are rulers of the set and everyone must bow to them. The best way to relate to your crew is with respect and a sense of collaboration, since it takes a team to make a film. When people feel respected and appreciated, they will sense that they are contributing something worthwhile and will work hard to do the best they can.

INTERVIEWS, RÉSUMÉS & WORK SAMPLES

MISTAKE

I don't care if someone is a jerk as long as they can do the work I want.

Just because someone records music in a studio does not mean they know how to record dialogue on a set. Just because someone is a great nature still photographer does not mean they know much about filmmaking. The key is to interview people for the position that you need them to fill. If you have worked on other films and know which people are good at what they do, then those are the people that you want to interview. Ever since *Schindler's List* in 1993, Steven Spielberg has primarily used one cinematographer, Janusz Kaminski. That is collaboration and trust.

When you do an interview, you not only want to know what they have done, but what they are like. It is important that you feel comfortable with the chemistry between you and each of the crew members as you want it to be a good experience and not a hassle to work with everyone.

It's a good idea to tell the potential crew members what the story is and what your vision is for that story. The crew needs to understand your vision. You will want to give them enough information so that they can tell you how they might approach the story from their crew position.

It is very common to request a sample reel showing some of the work performed by the crew member you are interviewing, should their position have anything to show. You should be able to tell the quality of someone's work within two or three minutes of viewing their sample reel. Ideally, each sample will be about a minute in length and there are at least three samples to view.

POSITIONS

It is important that you determine what crew members you need for your film and to understand what their responsibilities are. On a low-budget film it is common to have one crew member perform the activities and responsibilities that would normally be performed by two or more crew members. For example, you may have just one crew member doing hair, makeup and even wardrobe or a one-person art department doing set dressing, props, furniture and even set building.

Depending on your script and budget, you may not need all of the crew members listed below. If you are making a big-budget movie, you will probably need a hundred or more crew members, depending on the genre of the movie. An action movie with lots of stunts, SFX (special effects) and CGI (computer-generated imagery) will raise the crew number very high.

If you cannot afford many crew members or you are a film student and you only have your classmates available for crew members, then a minimum crew might consist of a director, camera person, sound person and a production assistant. However, if you are the director, ideally that is your only job. Doing anything else will be a distraction from your main purpose and the film will likely suffer for it.

Below are descriptions of many of the crew members, but not all possible ones.

PRODUCTION CREW

The Producer's Team is covered in Chapter 8 "Producing."

Production Coordinator: They oversee the crew, cast and equipment logistics, making sure everything is where it needs to be when it needs to be there.
First Assistant Director (AD): They create the schedule and make sure the schedule is kept. They wield a lot of power on the set as it is their job to keep everything moving.
Second Assistant Director: They create and distribute the call sheet and any updated script pages. They are also vital for directing background extras.
Production Assistant (PA): This is a general duty position. They are often sent on errands and to pick up items for the production.

> **MISTAKE**
>
> We don't need anyone doing continuity. I can edit around any mistakes, if there are any.

Script Supervisor/Continuity: They keep records pertaining to what has been shot and what is left to shoot. They note exactly what was said by each actor, which may vary from the script. They may also do continuity, which is to ensure that actions, blocking, prop handling and lines are consistent throughout the various takes in a scene.

Location Manager: They are responsible for obtaining all the permits and clearances needed for permission to film at a particular location.

Location Scout: The location scout works with the producer and director to find locations that meet their needs and the needs of the story.

Camera Department

Figure 5.1 Camera and operator (by Chris Murray)

Director of Photography (DP)/Cinematographer: They are in charge of what gets recorded on the camera. They work with the director to frame the shot and determine what if any camera movements are needed. They do lighting design and work with other departments to get the right look. They recommend cameras, lenses and related equipment for the production.

Camera Operator: They operate the camera as directed by the DP. They actually control the framing of each shot and thereby, how the camera moves.

First Assistant Camera (AC): The 1st AC is the assistant to the camera operator. They take measurements and pull focus or maintain focus based upon their measurements. They are responsible for setting up the camera and keeping the camera and lenses clean and protected. They may set up the video village, if there is no video assist person.

Second Assistant Camera (AC): The 2nd AC is primarily responsible for loading new media and unloading the used media, as well as maintaining and filling out all the camera reports. This person also operates the slate. They get the scene and take numbers from the script supervisor.

Video Assist: This is the person that oversees the video village, which has a monitor set up for crew members that need to be able to see what is being shot by the camera. There are systems that will send the audio and video to individual iPads too. The people who normally need to see a monitor are:

> Director
> Script Supervisor
> Production Designer
> Cinematographer
> Gaffer
> Assistant Directors
> Stunt Coordinator
> Producer

Data Wrangler or Loader: They are responsible for the media the film is shot upon. They organize, transfer and reformat media for use on set and in postproduction.

Digital Imaging Technician (DIT): They provide support to the cinematographer by ensuring the highest image quality and chosen artistic look throughout the digital shooting process. They adjust the internal setting of the camera to maintain that look.

Production Stills: This is the photographer that takes still shots to be used in marketing the film.

Lighting & Grip Department

> **MISTAKE**
>
> Lighting is a hassle. I'm going for a gritty realistic look with just available light. I'll shoot at a high ISO, if I need more light.

Camera sensors need light to be able to record an image. Typically the more light, the better the image recording, which will allow for image manipulation in postproduction. When there is not enough light the image will look grainy and muddy, which are not always good looks. However, too much light and the image will look blown-out.

Gaffer: They are the head electrician and are also referred to as the chief lighting technician. They develop lighting plans for each set in accordance with instructions from the DP. The gaffer often recommends the light fixtures that will be used to achieve the look the DP wants. The gaffer oversees the best boy and key grip on what lights are to be used, where they are to be placed and how they are to be powered, adjusted and filtered. They make sure the lighting on each shot and angle match the master shot. They also oversee the power supply and determine rigging for the lights when necessary.

Best Boy Electrics: The best boy is under the gaffer and oversees the other electricians on a set, and usually operates and adjusts the generator to supply adequate power to the lights. They also are responsible for running the electrical cabling to provide power to the lights.

Electricians or Electrics: The electricians (juicers or sparkies) essentially set up and operate all the lighting instruments and cables according to direction from either the best boy or the gaffer.

Generator "Genny" Operator: They maintain and operate the generators used on location shoots. They constantly monitor the electrical output to maintain consistency.

Key Grip: The key grip is in charge of all the other grips. The key grip and best boy collaborate with the gaffer and DP to formulate the best tactic for accomplishing a given shot. They oversee the camera movement and its rigging equipment as well as the light blocking and diffusing tools for the lights.

Best Boy Grip: They perform tasks assigned by the key grip and oversee the operation and organization of the grip truck.

Grip: Grips utilize various tools, like flags, nets and filters around the lights to create the look that the gaffer has requested. They also operate camera cranes, dollies and other such platforms as directed by the DP. If a dolly is used, they lay the tracks for it to run on. If a tripod is used they will move it to where it is needed and set it up. In some countries the grips do not work with lighting.

Dolly Grip: They place the dolly track and level it. They also operate the camera dolly. If the dolly has a boom, they operate it too. If the camera operator is working handheld or with a stabilizer, the dolly grip safely directs their movements away from obstacles.

Sound Department

MISTAKE

I'll get my best friend to do sound. They sing in a band so they know all about sound.

Knowing how to sing or plug a guitar into an amplifier or even mix a band live does not qualify someone to be able to do location film sound. They each require a different set of skills.

Sound Mixer: They are the head of the sound department and are responsible for monitoring the sound, setting audio levels, mixing audio for a picture edit and recording the audio during production. They also provide an audio mix for the video village to go with the video. They select the audio equipment and microphones and determine which microphones to use for a specific setup. They usually provide the walkie-talkies (two-way handheld radio transceivers) for the production.

Boom Operator or Swinger: They are responsible for properly positioning the microphone, which is attached to a boom pole. They must be able to follow the actors' movements with the microphone and avoid the camera and lights during filming.

Utility Person or Second Assistant: They power up the sound equipment, run cables, check the batteries and the wireless microphone frequencies. They place sound-dampening material when and where needed. They attach wireless microphones to talent and act as a second boom operator, if one is needed for a specific setup.

Art Department

Figure 5.2 Downed airplane set (by Jakob Owens)

Production Designer: Along with the director and DP they determine the "look" or visual appearance of the film world. They work with the costume department, makeup, property manager, set designer, and everyone else who affects what is seen on screen.

Art Directors: They look after the design of the sets and the planning for the construction of them. They assist the production designer in helping to create the "look" of the film by overseeing the artists and craftspeople who build and create the sets and any other visual elements.

Concept Artist (Previsualization Artist): They either hand draw a representation of how a set will look or they create 3D computer-generated models of the sets. Their visualizations help the director and other creative departments to understand what look needs to be created for each set. They will include lighting concepts, set designs and costumes in their renderings.

Storyboard Artist: They create a chronological series of sketches for each scene based upon the director's vision for the film. Each sketch provides a visual aid for each camera setup. The sketches show camera angles, characters and set design for each scene. They are very useful to the creative departments to help them prepare for all of the scenes in the film.

Set Construction Coordinator: They oversee the building of the various sets by the carpenters. They follow the design specifications of the production designer and art director. This person is also in charge of budgeting and ordering building materials for the sets.

Scenic Artist: They design and treat all of the various surfaces on a set. They might apply paint, plaster, color, texturing or whatever material is required to create a specific look. Some of the looks include imitation wood, brick and stone.

Set Decorator: They oversee the acquisition and placement of all set dressings. They work with the production designer and art director to realize the proper set look.

Set Dresser: They place the furniture, props and decorative items on the sets. They work with the set decorator, production designer and art director to actualize the desired look for the sets. They might also add paintings, fabrics and other decorative items to the set.

Props (Property) Master: They research the script and then acquire, organize, maintain and provide all of the props needed for the film. A prop is any item on a set that is moved or touched by an actor. This might include items such as tools, books, telephones, guns, dishes, food, musical instruments or similar items.

Props (Property) Maker or Builder: They build props from concept to completion using various materials, like wood, plastic, metal and Styrofoam. They are often skilled in various techniques, such as building, sculpting and machine operation.

Wardrobe Department

Costume Designer: Working with the director, they decide what wardrobe and costumes actors will wear based on the descriptions of the characters in the script. They create or purchase clothing that fits the colors, sizes and accessories needed for each outfit.

Wardrobe Stylist: They maintain all of the wardrobes worn by the various actors. They also assist in helping to organize, distribute and account for all the costumes used on set.

Costume Standby: They are on set at all times to monitor the continuity of each actor's wardrobe and to make sure there are no problems with the garments.

Hair & Makeup Department

Hairdresser or Stylist: They are responsible for keeping the talent's hair properly styled and thereby maintaining the desired look for each the actor.

Makeup Artist: Their job is to create and apply the proper makeup to the actors, in accordance with the director's preferences. They may have to create makeup for a period piece, science-fiction story or an everyday look. Body makeup artists do makeup below the breastbone and above the elbow on the arms.

Special Effects (SFX) Makeup: They use different techniques to apply and adhere different materials to the face and skin of the actors. They attach prosthetics, which are fake body parts and make everything from cuts, scars and burns to creatures, elf ears and aging effects. They use materials such as latex, silicone, rubber, gelatin and wax to create the effects.

Stunts & Effects (FX) Department

Stunt Coordinator: They oversee all of the dangerous action scenes in a movie that require a stuntperson. They determine how best to perform a stunt and how to do it safely. Stunts may include such actions as falls, dives, jumps, fights, driving, car crashes, being shot and catching on fire. They are often acting as stunt doubles for the actors, so that the actors do not get injured.

Special Effects Coordinator: They oversee and produce the physically created visual elements needed for the film. They provide effects such as rain, snow, wind, fog, smoke and explosions.

Special Effects Technician: They work for the special effects coordinator and help to physically create the visual elements. They may also work with the props department to make things break, fall apart or explode.

Pyro Technician: They are trained and certified to handle, maintain and prepare firearms, non-explosive weapons and the various pyrotechnics that may be required for the film. They are the people who provide battle scene explosions and gunfire.

Craft Service & Catering Department

> **MISTAKE**
>
> I don't need any catering; I'll ask everyone to bring their own lunch. That way we can keep shooting and it will keep costs low too.

Craft Service (Crafty): They set up and maintain a snack and beverage station near production. The concept is that crew members have little time to eat or drink, so they can get snacks on the go. Craft services are not to be confused with catering; however, on smaller-budget productions craft services may provide meals such as salads and sandwiches.

Catering: Provides meals to the cast and crew. These are scheduled sit-down cooked meals that generally occur six hours into the day and then six hours later.

Transportation Department

Transportation Coordinator: They obtain, manage and provide a variety of vehicles and transportation needed for all crew members, equipment and actors. They ensure the drivers are at the right place and at the right time. They help with acquiring parking permits and determining parking locations for all vehicles, which might include big rig trucks, mobile offices, honeywagons, picture cars, crew trailers and motorhomes.

Transport Captain: They are in charge of the travel arrangements for the cast and crew. They ensures that cast and crew arrive at the right place and on time to support the filming schedule.

Transportation Driver: They are supervised by the transportation captain. They operate all the production vehicles to and from the filming locations. Some of the production vehicles they drive may include limousines and cars, passenger vans, busses and various types of delivery trucks. They also make sure that the trailers are set up for the day and that they all have power.

Picture Car Coordinator: A picture car is any vehicle that appears on screen in a film. The coordinator will make, locate, modify, provide and repair all of the film vehicles. They may oversee all types of vehicles, including modern and vintage cars, stunt vehicles and specialty vehicles. They may also oversee camera vehicles, which are generally pickup trucks especially equip to pull picture cars and hold the director and camera crew.

POSTPRODUCTION CREW

MISTAKE

I spent my entire budget on production. I'll have to see if I can get the postproduction crew to work for free in their spare time.

Picture Editor: The picture editor pieces together each scene and eventually the entire film. They select the different camera angles, takes and performances, and create the best version of the story that matches the director's vision.

Colorist: The colorist will work with the highest resolution of the film as it is likely this version that will be shown in cinemas. Color correcting is the technical process of adjusting the colors until they appear natural and reflect the real world in which the film was shot. Correcting can include adjusting the white balance, white and black levels, contrast and even exposure until the images look correct and match throughout a given scene. This is the foundation for doing color grading. Color grading is the technical process of adjusting images in a more creative manner, which might mean giving some shots different colored tints or tones in order to evoke emotions or an atmosphere. It is common for the colorist to create all of the versions or masters of the film needed for distribution.

Sound Supervisor or Supervising Sound Editor: The sound supervisor oversees the entire postproduction audio team. Some will help create the sound design elements. They develop the timeline to complete the sound mix, manage the budget and communicate with the director and producer regarding the progress.

Sound Designers: They create sounds that are otherworldly. They make a dinosaur roar, a spaceship land or strange creatures talk. The sound designer's job is to create sounds that are believable and will connect with the audiences.

Sound Editors: There are several types of sound editors, sound effects, ADR, dialogue, music and Foley:

Sound effects editors edit in the various hard synchronized sounds, like car doors, glass breaks and gunshots, which were not recorded during production, and they add backgrounds such as wind, city noise and birds.

ADR editors make sure that all of the replacement dialogue is in lip-synchronization with the picture.

Dialogue editors make sure that the best dialogue is used and they clean up the production track by removing unwanted noise.

Music editors make sure that the music maintains continuity with each scene and with the emotional arc of the story. They may have to make intricate edits in the score to maintain proper placement with the scene.

Foley editors make sure that the footsteps, hand and body noises, props sounds and custom-created sound effects are all in synchronization.

Foley Artists: These are people who make the custom sound effects for a film. They act out the movements of each actor, which includes footsteps, handling props, clothing rustle and other sounds as needed. Production sound is focused on the dialogue, so many of the other sounds have to be created by the Foley artists.

Composer: The composer writes the original musical score that heightens the emotional journey of the film. Their music enhances the mood of each scene that has a score in it. Some work with the director to create a score and others will produce a score on their own.

Musicians: A composer may choose to create the score on a computer using instrument samples, but they may want to use all live musicians to play and record the score. They may even record live musicians and add their music to a sample-based score.

Sound Re-recording Mixer or Dubbing Mixer: Once all of the music and sounds are edited into place, a re-recording mixer will mix them down into the proper format for distribution. They adjust the volume levels, add needed effects and balance out the dialogue, sound effects and music in order to make a consistent sound track that fits the film and is technically perfect.

VFX Artists (Visual Effects): There are a number of roles in the creation of computer-generated imagery or CGI. The most common ones are the VFX artists who create the imagery, the animators who add motion and the compositors who combine the digital images with the live action shots. These artists may create things like other worlds, non-existent creatures, sets and objects.

It is very common for production to eat up some of the postproduction budget, which often means the quality of the film suffers for lack of time and money needed in postproduction. Always try to avoid using postproduction funds for production.

CONTRACTS

It is always a good idea to have a deal memo that states, at the least, their name, their position, their pay, if any, and the dates they are needed for work. In the online Appendix there is an example of a crew member deal memo with commonly included items.

In regards to paying crew members, if they are in a union or guild, there will be set minimum amounts you need to pay. Be aware that some crew members will try to negotiate a higher rate for their services. If you are working with a low-pay or no-pay crew you want to make sure that it is clear what your expectations are for their position.

Paying something will help the production because people feel more responsible to show up when they are being paid.

If you are working on a higher-budget film, you will probably be paying your crew members their going rate or a union rate. They may also have in their contracts stipulations regarding overtime, travel costs, rates for their equipment usage and screen credit.

Legal disclaimer: The author is not a lawyer and is not providing legal advice so assumes no responsibility for any contract that you may enter into or neglect to enter into.

6 PRODUCTION DESIGN

Figure 6.1 Otherworldly set (by Nicolas Lobos)

MISTAKE

I can use any house and any restaurant to shoot my short film. It doesn't matter what either of them look like. It's all about the story anyway.

INTRODUCTION

Most student productions do not pay attention to the design of their film and it shows in the final product. Any film will gain by having someone be in charge of the design element, which is key to achieving a higher production value. Production value is a combination of attributes, such as good acting, exotic locations, stylized lighting, interesting camera movement, quality sound recordings and realistic special visual effects.

Production design is what we might call the "world" of the film. It includes, but is not limited to, lighting, wardrobe, makeup, props (properties), furniture, sets, visual effects, graphics and locations. It is anything that gives a film its "look." The people who do production design are called production designers and they are in charge of the entire art department, which includes art directors, set designers, set decorators and concept artists.

The first known use of the term "production designer," was by William Cameron Menzies, when describing his work on the movie *Gone with the Wind* (1939). It was his visual concept that worked its magic in that monumental motion picture. Since then, the production designer has played an important role in filmmaking.

On a low-budget film or short film, there may not be a production designer. That job may be done by the director or some other crew member. On one of my first short films, I had to do the production design myself. The film was set in the 1950s, which meant finding locations, furniture, wardrobe and props that fit the era. I do not recommend doing a period piece film for your first endeavor. I suggest that you keep to modern times. It will probably keep the production design a lot simpler.

You might say that the production design is more than the film's look. It could be considered a character in the story. It is a character that adds information and supports the other characters along with the story. It could be considered another mode of storytelling. It supports the narrative by adding context and meaning to the scripted characters and events.

The production designer and director create the aesthetic of the film. When that aesthetic is based solely upon a character, many decisions will need to be made on wardrobe for the character, furnishings, artwork displayed and the character's likes and dislikes. The character may be depressed and the design might reflect that emotional state by having dull colors, dimly lit scenes, nearly empty refrigerator, lifeless artwork, or other visual

representations that might demonstrate a depression. If you have a happy character in your story, they may be surrounded by a colorful and interesting environment along with cheerful clothing, furniture and artwork. It really does matter what a house, cafe or some other set or location looks like.

LOCATION, LOCATION, LOCATION

> **MISTAKE**
>
> I've seen pictures of the lake and dock online. I don't need to go there to know it will work for the love scene. My film is all about the characters anyway.

It's really important for the audience to believe that the story is taking place in a world that fits each scene in general and the story overall. You wouldn't normally have a religious service take place in a bar, although your script may call for just that. Normally, a religious service would take place in a church, temple, mosque or similar structure. If a film has an establishing shot of a church and there is music such as Wagner's "Bridal Chorus" ("Here Comes the Bride"), then the audience will have a clue as to where the scene is taking place and what it's about, without seeing the actual event until a subsequent shot shows the wedding.

Once you've broken down the script into locations, you can start searching for the ones that will work for your story. Do not assume that some photographs of a lake and dock that you have only seen on the internet will work for you. There may be a busy highway or noisy schoolyard that is not in the picture. It's always recommended that you scout all of your locations before you lock into any one of them.

It is common to have to pay for the rental of a location. For example, renting a mansion could cost thousands of dollars per day. If you are lucky, you may find locations that are free.

You may find a location that meets all of the needs for the movie, but make sure it fits the needs of the crew. Is there enough parking? Where can the departments set up? Where can you place a video village, if you have one? Is the location within close driving distance or is it hours away so much of the day is spent in transit? If you have any of these issues or others, consider finding another location that works for everyone and everything.

Always look to take advantage of any location. See what aspects of the location can be used to make a scene more poignant and dynamic. For each location, you should know where the sun will be at any time during the day and how it creates shadows. You can then decide the best time of day to shoot in that location to give you the look that you want. Check out what camera angles will work best in the location. Do not be afraid to

experiment with spontaneous ideas while you are location scouting. Use your cellphone camera to take pictures of framing that you like and use that as a reference when it's time to shoot.

When I worked on the movie *Far from Heaven* (2002), I learned that one of the scenes took place near a pond, which was surrounded by trees covered in autumn colors. Unfortunately, the day before the scene was shot, the trees began dropping leaves, so that night the design crew glued back on as many of the leaves as they could. The scene looks great in the movie and the leaves support the beautiful relationship developing between the two characters in the scene.

COLOR OR BLACK & WHITE

MISTAKE

I'll shoot in color and if it doesn't look good, I'll make my film black and white.

Not many films are shot in black and white these days, but it is an option. If you choose to shoot in black and white, you need to be aware of the grey (or gray) scale. Otherwise, you may have one character dressed in a light-blue color and another character dressed in a light green, or some other colors, but both characters' clothing have the same gray scale, so they look the same in black and white. You have to look at colors not as colors but as where they sit on the gray scale.

When you shoot in black and white, you are really shooting from black to white, which thereby includes many shades of gray. An 8-bit display can show 256 distinct shades of gray. Some studies say that humans can see more than 256 and others say that humans can only see about 30 shades of gray.

| 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | 0 |
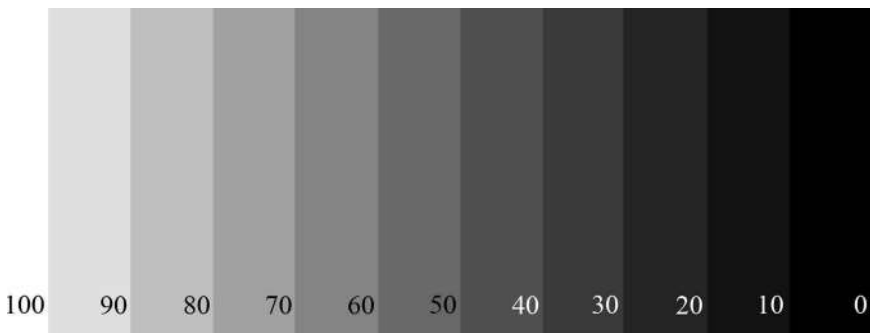
Figure 6.2 Ten-step gray scale

It should be noted that many lists of the ten best films of all times include four or five that were shot in black and white. The lists often include *Schindler's List* (1993), *Raging Bull* (1980), *Casablanca* (1942), and *Citizen Kane* (1941).

You can always shoot your film in color and change it to black and white in postproduction. If that is your intent, then you might be able to change your camera or field monitor to black and white. That will allow you to make sure the production design works.

COLOR PSYCHOLOGY

The director often works with the production designer and the cinematographer to determine how to light a set, how to compose a shot and what colors to use.

Color has an unconscious and emotional effect on us, so you can use that to your benefit. How a person reacts to a color will vary somewhat from person to person. The key is to use a broad-brush stroke in selecting your colors. A sense of serenity can come from the softer earthy side of the color spectrum. Blues along with greens, turquoise, gray and white are considered to be cool colors. The warm side of the color spectrum includes red, orange and yellow. These warmer colors can be used to signify passion, danger, rage or excitement.

When you decide on the color palette for your film, you may want to consider some of the above information. You may choose colors for some of the following visual elements:

Wardrobe and accessories
Vehicles
Furniture
Walls, doors and trim
Buildings and houses
Props (properties)
Makeup and hair
Artwork

COSTUMES/WARDROBE

> **MISTAKE**
>
> It doesn't matter what clothes the actors wear, so long as they dress warmly for the snowball fight scene.

The director, cinematographer, production designer, costume designer, prop master and even the actors may have valuable input into the best colors, textures and clothing styles for the film.

The wardrobe that is selected for a film can tell the audience a lot about the character, time period, location and much more. The wardrobe does not have to follow any convention, but it is a common cliché to have the protagonist in white and the antagonist in black. Take a look at the clothing for Luke Skywalker and Darth Vader in the movie *Star Wars - A New Hope* (1977).

You may have a character in your film that is afraid of the world and is only able to function by hiding behind dark sunglasses and loose clothing in layers. You may have a character that is prim and proper and they may wear pressed clothing with a high collar line. You want the wardrobe that a character wears to tell the audience something about that character.

Think about how the stereotypical FBI agent or a powerful attorney dresses. They don't usually wear pastel colors or shorts and T-shirts when they are at work, although your story might put a twist on that convention.

If you decide to do a period piece, you'll need to do your research. For example, if you are doing a Western film that takes place in the 1860s, you might have a character wearing blue denim pants, but it will not have a zipper or rivets. They were not used on denim pants at that time. Rivets would start to be used in the 1870s and pants zippers sometime in the 1930s. Before zippers, the more common form of clothing closure was buttons or hooks and eyes. It's this type of research that adds authenticity to your story.

It is common practice to have more than one set of wardrobe for an actor. Accidents happen and that Hawaiian shirt that was just right for a character gets red wine on it or tears. No problem as there is a backup identical shirt to replace it.

Sometimes it is decided not to have certain clothing. In the movie *Black Panther* (2018), three out of every five people are barefoot. It is a subtle choice, but an effective one.

It is a common practice to add wardrobe items to the breakdown sheets, especially costumes, uniforms and any items that are made by the wardrobe department. Each item is given a "script day number" so that the actor is properly dressed for each scene being shot on a specific production day.

MAKEUP & HAIR

MISTAKE

The actors don't need makeup. They're suppose to look natural anyway.

Basic Makeup

Makeup is a valuable tool. It can work in unison with the lighting and the camera in order to create the desired look. Cameras have very high definition and are able to see the slightest blemish on an actor. That's why it's essential to use makeup on all of your actors, unless you have a character that is supposed to have natural blemishes.

Character (Stylized)

Suicide Squad (2016) has a number of characters that have very stylized makeup. Their makeup was created by makeup artist Alessandro Bertolazzi.

If you were making a film that was set in a galaxy far, far away and you had a character who was a princess, how would you design her hair? Yes, Princess Leia Organa had an unusual hairstyle. You might do what George Lucas and his production designer, John Barry, chose to do, which was to copy a Hopi Indian maiden hairstyle.

You may need to age a character in your film. One of the best and most detailed examples is demonstrated by makeup artist Stan Edmonds on YouTube. He uses Ben Nye products to show how a person can be aged. A great tool to use for aging are "Bondo" transfers. They are Pros-Aide water-based acrylic adhesives that have been thickened, frozen, thawed and then dried. They are created using a silicon mold.

Makeup can be used to cover blemishes on actors as well as cover unwanted tattoos. The key is to mix the colors until you get a match with the actor's real skin color.

Since the audience is often seeing the face of an actor, the makeup and hair are of great importance.

Figure 6.3 Hairstyle on actor (Jackie Coogan)

Child actor Jackie Coogan wore a "page boy" style haircut in the Charlie Chaplin movie *The Kid* (1921). In the movie *No Country for Old Men* (2007), Javier Bardem's character Anton Chigurh wears a similar hairstyle. Hair stylist Paul LeBlanc was given instructions by the directors to create a style for Anton that would be odd and unsettling for the audience. Bardem acknowledge that the haircut did help him get into his deadly character each day of the shoot.

Special Makeup Effects

Star Trek Beyond (2016) has fascinating special effects makeup. It was created by makeup artists Joel Harlow and Richie Alonzo. They coordinated the creation of some 50 alien races for the film. If there are going to be a lot of special effects in your film, it can be helpful to have a special effects supervisor on the production to oversee them.

Prosthetics

If you really want to make a character stand out, you can change their body physically. Demon eyes, devil's horns and alien foreheads are great for giving a character or monster a non-human look. Many of these special effects are created using prosthetics.

In intimate or full-nudity scenes male actors will typically wear a penis prosthetic. The actual penis is concealed in a cloth bag. This is done so the actor is more comfortable on set.

You can buy pre-made appliances, like scars, cuts and bullet holes, or you can try to make them yourself. Making a prosthetic is a multiple-steps process that can be a challenge; if you do not have experience sculpting, making molds and castings or working with various materials, like latex, silicon and gelatin, then I suggest that you buy whatever prosthetic you will need for your film.

You can get away with a prosthetic not looking perfect, if it will only be seen briefly, in a long shot or in a dark scene, but if there is a close-up, you need to have it look real.

Wounds, Broken Bones & Bullet Holes

You can age people. You can change their nose, their chins, their foreheads, their ears and more. You can buy pre-made wounds, gouges, bullet holes, impalements and broken bones. There are bald caps, contact lenses and artificial teeth. You can get crepe hair and create beards, mustaches and hair. You can buy or make mucus, pus and blood.

Blood, Cuts, Wrinkles & Scars

I have used a modeling wax material for creating some scars and for other scars I have used rigid collodion, which is a scarring liquid that you brush on.

The more layers you brush on, the deeper the scar looks. As the liquid dries, it causes the skin to pucker. Some materials require a fixative to seal the makeup.

If you want a scar that you can use a number of times, then I suggest that you create a liquid latex one. You can build the scar on a piece of glass one layer at a time and then adhere it to the skin using spirit gum or liquid latex. Once you have the scar built to your needs, you can add makeup to get it to look just right.

If blood is what you need and you need lots of it, I suggest that you use a simple recipe and make your own blood. It will cost less and you can adjust it to your tastes. If you don't need much blood, just a spattering, then you could buy a blood liquid or gel.

There are many recipes for fake blood. The most common ones include corn syrup, red food coloring, blue or green food coloring, a little water and usually corn starch. There is a recipe for blood and blood gel in the online Appendix for this book.

Body Painting

In the movie *300* (2007), the actors that portrayed the Spartans had very defined abs (abdominal muscles). This was partly from bodybuilding workouts and partly from the use of dark skin colored spray on the indentations between the muscles. The darkened area caused the muscles to stand out even more.

SETS

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MISTAKE

We don't need a set. We'll shoot in a real bathroom to give authenticity. We can fix the sound in post.

</div>

Sets are built so that all elements of the shoot can be controlled. The sound will be better. The lighting will be easier and quicker. The camera can move around easier. The set design will be exactly what you want it to be instead of being limited by a location.

On a major motion picture, the art director will work with draft technicians, who will use CAD (computer-aided design) software to create 3D visuals and blueprints that can be used by a construction manager to build the sets. The construction manager will hire carpenters, painters, model makers, scenic artists and anyone else required to create the director's vision.

You may choose to film in existing structures or locations or you may build a set to shoot in. I have seen college electronics labs turned into spacecraft and I've seen sets built using different pieces of electronic equipment.

Production designer Grant Major has worked on such movies as *The Lord of the Rings* (2001, 2003, 2005), *Green Lantern* (2011), *The Meg* (2018),

Mulan (2020) and *The Power of the Dog* (2021). He designed a set for *Green Lantern* that cost over one million dollars to create. That may be far above your budget, but the concept is the same no matter what the budget is. You should only design the sets or CGI that you can afford. You need to create a believable world for your story to exist within, but do not sacrifice production value in order to save money. Either come up with an affordable design or change the setting of the story to match your budget.

Grant Major's thoughts are:

> Make sure your architecture has logic and recognizable architectural scale and meaning. When starting out on set designing, it's useful to copy existing reference of the real thing, period research, etc. and branch off from there. Be aware of the geography required for the scene, how the director blocks out the scene, who comes and goes where and how. What will the camera coverage be, where will the camera be placed as well as the operators, grips, etc. What lenses will be used in the scene, if you're shooting in 3D, then use the depth by placing things foreground/background. Also, be aware of the interrelationship of the built environment to CGI extensions.

Figure 6.4 *Intolerance* Babylon set

When D.W. Griffith was shooting the movie *Intolerance* (1916), he had a full-scale exterior set built of the Great Wall of Babylon. The set was many blocks wide and estimated to be nearly 150 feet (45m) high.

If you can't find a viable location and you decide to create a set, you'll need to find people who know how to build sets or, if necessary, try to build them yourself.

The simplest sets might be just walls and flooring. You may borrow techniques from television and theater to build your set walls or flats. They are usually 10 feet (3m) tall. A shorter set may only need to be 8 feet (2.4m) tall. The material sheeting commonly used is Lauan wood, but plywood, masonite, cloth, canvas or whatever material works for your purposes can also be used. The sheets come in 4 foot (1.2m) widths. The frames are usually made using 1 x 3 inch (7.5cm x 10cm) or sometimes with 2 x 4 inch (5cm x 10cm) wood. You'll need to add jacks or supports to hold up the flat and weight them with sandbags, so they don't fall over. Set safety is critical.

Several flats can be used to create a room. You'll need to attach them together and then close over the seam. Plaster is a common material used to cover the joints. Once it's dry, then sand and paint.

Make sure you do not paint the wall pure white as that is hard for the digital sensor on the camera. Too much light can wash out skin tones. I suggest that you find a color that is between 80 percent to 90 percent on the gray scale shown in this chapter. A dark beige is a good choice for walls. It is much easier to make a dark wall brighter than it is to make a light wall darker.

You may choose to have a wall appear to be stone, brick, marble or some other type of surface. Although real stone, brick, marble are expensive and impractical you can still give the illusion you desire with some artistic painting. You could also try using molded and printed sheet rock, brick panels and faux marble techniques. You may even find wallpaper that gives the look you want. A flat wall is not very interesting, so you could add some form of texturing to the walls, such as orange peel or knockdown. Orange peel texture looks like the peel of an orange and knockdown is orange peel that has been flattened to look like stucco.

If you have a stretch of wall that runs long, break up the wall by adding a recessed section. Move one of the flats back about 6 inches (15cm) and fill in both sides with wall material to close the gap. You can even add a window to the recessed wall.

You may put some frosted diffusion over the window to give it a soft look and to obscure anything placed outside the window such as a tree branch or a bush. You could also hang sheer curtains to achieve a similar effect. Having a window built into your set walls allows them to be used for a natural source of lighting.

The more detail you can add to your sets, the more convincing they will be and the more production value the sets will have. For example, adding

light switches, electrical outlets, heating vents, thermostats, moldings, windows and doors can convince the audience that the set is a real place. They do not have to be operational or practical, unless called for by the script.

You may even want a section of ceiling in a shot big enough to fill the framing of the camera. You can make the ceiling seem to fit in with the wall or walls by adding crown molding to the edge, which will conceal the edge of both the wall and the ceiling.

There are some great videos on YouTube that show how to build flats. If you want to see very detailed construction techniques, watch hollywood-huanter.com videos such as "Making Set Walls Pt 1" or "How to Build Hollywood Flats."

For many shots, especially wider shots, you may well want to have flooring. This may include a carpet section, linoleum, laminate wood flooring or other material that suits your set. Once you have the flooring in place, add some baseboards to the walls to conceal the gap between the wall and the floor and to give the room a more finished look.

As for shooting in a real bathroom, It will likely be very tight. There will be little room to put lights. Any mirror will probably cause reflection issues. It will be difficult to place the camera, even if it's a GoPro, and the sound will be very reverberant and almost impossible to clean up in post.

VISUAL EFFECTS (VFX) & COMPUTER-GENERATED IMAGERY (CGI)

> **MISTAKE**
>
> I can spend a day learning Maya and then I can create a really good CGI monster that will look awesome.

You may choose to shoot some scenes with green screen or blue screen. You might have a digital artist create the location of the scene or shoot the location without actors and simply composite in the characters in post-production. You may have a character that is totally CGI and not real. You may have a character that is part real and part CGI. You may have a character that is real in closer shots, but CGI in wider shots or vice versa. Having a CGI character takes careful planning and great attention to detail to make it seem real, move realistically and to fit into a scene.

Most VFX are CGI, but not all. For example, there may be miniatures or puppets used and they are not computer generated, but are made by VFX artists. I suggest that you only go this route if you have the artists that can deliver the images you need. Otherwise, revising your story to use only real visual effects and real actors is a simpler way to go.

Figure out from the script what absolutely needs to be VFX/CGI and keep it as simple, inexpensive and straightforward as possible.

Many modern movies use a high percentage of VFX. It is common to combine a physical environment with a virtual environment. An example would be two people swimming in a pond, but in the background there is a volcano erupting. The transition point between these two shots needs to be carefully crafted. Perhaps there are rocks behind the pond that allow for everything above and beyond them to be masked out or keyed out by using green screen and then the shot of the erupting volcano is composited in. In order to do this properly, you will need to know the camera angle, distances, what lens was used, what lighting was like, where the shadows are and other information that will make matching the shots work.

VFX and CGI are often less expensive than shooting on a large set or in a distant location. It is less expensive to composite a volcano behind two actors swimming in a pond than it is to transport an entire crew and actors to a location with a distant volcano that appears behind a pond, should you even be able to find such a location.

PROPS (Properties)

> **MISTAKE**
>
> We can use a water pistol that looks like a real pistol; no one will be able to tell the difference.

Props or properties, which are items that are used by an actor, can play a huge role in telling the story and aiding the action of the story. You also need to think about the characters and what their lives are like, so you can choose props that fit them.

Some people say that an actor has to touch or interact with an object for it to be a prop instead of a set dressing piece or costume item. It might be simpler to say that there are hand props and set props. One is for an actor's use and the other is for set dressing.

If the story takes place in a different time period, then finding props that are appropriate for that era or year are critical. Prop masters or prop buyers will go through the script and note needed props. They do their historical or cultural research and then search for the right items. They may search eBay, Craig'slist or Amazon or some other source of props. Some props may be purchased at flea markets, garage sales or thrift stores. These items need to be added to the breakdown sheets.

If the production is in the Hollywood area, you can go to a prop house like 20th Century Props or, for period props, History for Hire, which has an extensive collection of historically accurate props. Otherwise, most

large cities and some smaller ones have a prop house or a costume house that also sells or rents props.

If you can't find the prop you want, then you may need someone to create it. If it's just for camera, it doesn't have to be durable, unless it's going to be used by an actor. If it's a practical prop, then it needs to be a working prop as required by the script.

If you can afford it, you should have at least two or three backups or extras of any prop. If a prop breaks, malfunctions or someone walks off with it, you'll need to have a backup. If the prop is valuable, you may want it protected by some form of security.

Breakaway glass is usually considered to be a special effect (SFX), however, I have included it in this section as it is often also a prop. If you have a scene where a character grabs a bottle of beer and smashes it onto a glass vase, you'll want to have a case of beer and six or more vases. You need to be prepared for however many takes and setups the scene requires. The beer bottle and the vase need to be breakaway props that are not made from glass. Some breakaway glass props are made with a sugar recipe, but some of the more realistic ones are made with a secret recipe. You can find a breakaway beer bottle on Amazon for around $15.00 to $20.00. NewRuleFX has breakaway glass bottles, windows and various props, such as severed arms and legs.

If you are making a film that has drug use in it, then you might use cornstarch or vitamin B for cocaine powder and use oregano for marijuana. Never use anything that may hurt an actor.

SET DECORATION & DRESSING

MISTAKE

It doesn't matter much what the set looks like, it's the dialogue that counts.

I have been told that whatever you might pack into a moving truck when you are changing homes is considered a set dressing. Set dressings are objects like furniture, curtains, pictures, wall paper, rugs, shelf items and whatever else makes the set look real and lived-in. Set dressers are responsible for finding and placing the pieces on the set.

How you furnish a set can tell the audience a lot about a particular character, a time period, location or the story itself.

You want the furniture to reflect the reality of the story and of any scene within that story. The chairs, couches, rugs, tables, beds, lamps, appliances and equipment can be visual shortcuts that let an audience know more

about the story. A particular chair might subliminally tell the audience more about a character than a long dialogue scene would convey.

If you do not have or aren't able to borrow what you need, you can try to rent it. Most prop houses have furniture and many vintage stores have it too. Renting the furniture is cheaper than buying it.

ARTWORKS

> **MISTAKE**
>
> I downloaded some movie stills from *Frozen* to put on the bedroom wall of the little girl that's in my film. Disney won't care.

Paintings, posters, sculptures and other art forms can add information and interest to a location or character, but be careful that you are not using copyrighted artwork. You need a license to use artwork in your film. Fair use is not often an acceptable excuse for using a copyrighted work.

Do not think you can recreate an original piece of art and it's alright. The recreated piece is "derivative" and thereby requires permission to use it. I suggest that you create your own artwork or hire someone to do it for you. The contracted artwork can be in a style like a famous artist as long as it doesn't copy any of the artist's works, unless the artist's work is in the public domain.

Do some research; if the artwork is truly in the public domain, then you can use it in your film. However, if you are using a photograph of an artwork, you will need permission to use the photograph as that artist/ photographer probably holds the copyright for it.

In big-budget movies, there is often a clearance coordinator who is responsible for securing legal permission to use such artworks as paintings, posters, books, billboards, products and sportswear. Essentially, everything that is identifiable as a creative work in the film needs to be cleared for use, not just artwork.

You should check current copyright laws and even consult a copyright lawyer, should you have any question about the artwork you want to use being copyrighted by someone.

In the movie *Skyfall* (2012), James Bond meets his new Q (quartermaster) in the National Gallery in London. The painting that is shown and discussed in the movie is *The Fighting Temeraire tugged to her last berth to be broken up* (1838), by J.M.W. Turner. Turner's painting is often thought to represent the decline of Britain's global naval power and, in the movie, perhaps the decline of the aging Bond himself. That is the power of images. They can add information without having to state it.

TESTS

Whether you are shooting on film or shooting video, it's always a good idea to test your lighting, test the colors you want, test the special effects, test the wardrobe or anything that is important and has an element that is too variable to predict. You also may want to test some action or camera move to make sure they work properly.

You may want to test the look of the test shots by color grading them for the look or style that you want.

Production design is an important part of storytelling as it creates the world in which the story unfolds. Choose carefully the elements that will exist in that world.

TIPS

- The more effort put into the design the more believable the story world will be.
- Research is critical to knowing what design elements are appropriate for the story.
- Only create what will be seen on camera.
- A dressed location set is usually less expensive than building a set.
- Find locations that really bring the story world to life.
- Use color to create emotions and to help tell the story.
- Select wardrobe that fits each character.
- Props are just as important as the set and wardrobe.

PRODUCTION

7 DIRECTING

INTRODUCTION

MISTAKE

I've been in a few plays, so I know how a director works with actors.

A director will typically work at least 10 to 16 hours a day, every day, for the entire shoot. They will be in communication with the different department heads as needed to keep the production plan on time and on budget. After production is done for the day, they usually meet with the editor to go through the dailies and determine which shots to use in the edit. The director then heads home or back to their room and reviews the shooting plan for the next day in order to be prepared.

The director will make thousands of decisions. Those decisions will be based on their vision of the film and the message they want the film to convey. Below are many of the tools that help a director achieve their film. Using these tools and learning how to work with the cast and crew will make the process easier and better.

The director will select a production designer, a cinematographer, the editor, the cast, the color of the walls and even what color and style the main character's hair will be. It is a job that requires more than just working with actors.

As the director, it is your vision that the crew and cast are trying to create. When a take ends, everyone on the set is waiting to see if you got what you wanted. Let the crew and cast know that you appreciate them and make work a joy. Filmmaking is work, but it can be fun work if the director sets that mood on set.

The two most important aspects of production are planning and communications. The more planning there is, the faster and smoother the production will go. The better the communication, the better the crew and cast will know what to expect and how to act. Not being well organized and lacking plans will lead to stress for everyone and a difficult shoot.

Four great tools that help with planning and communication are the storyboards, shot list, concept artwork and a concept book.

CONCEPT BOOK OR LOOK BOOK

I learned about using a concept book from Robert Sarkies, director of *Deano and Nige's Best Last Day Ever* (2012). Rob did a one-day seminar with my film students and one of the things he showed us was his concept book or also called a look book. He had found images online, downloaded and printed them, then along with cut-out images from magazines, he created a notebook that could be viewed by other crew members, so they could get insight into his vision for each scene.

A concept book can have images that may convey such things as the emotions or mood of a scene, a particular look for wardrobe, makeup and hair, and a visual sense of production design for each scene. These can be used as a reference for creating the concept art.

A variation of the concept book is the mood board or book. This is a digital or paper collage of images and text that convey the director's ideas about locations, characters, color swatches, wardrobe, makeup, emotions and any other visual element.

CONCEPT ART

This is artwork relating to the various scenes and locations in the film. The artist will create either 2D or 3D highly detailed images, which are mostly sets, wardrobe and makeup, and characters, that will be used as a guide for the production design and for the VFX (visual effects) team to use as a reference for what to create.

The director is able to use these images to communicate with the visual artists, production designer, cinematographer, costume designer and many other members of the teams that are responsible for the "look" of the film.
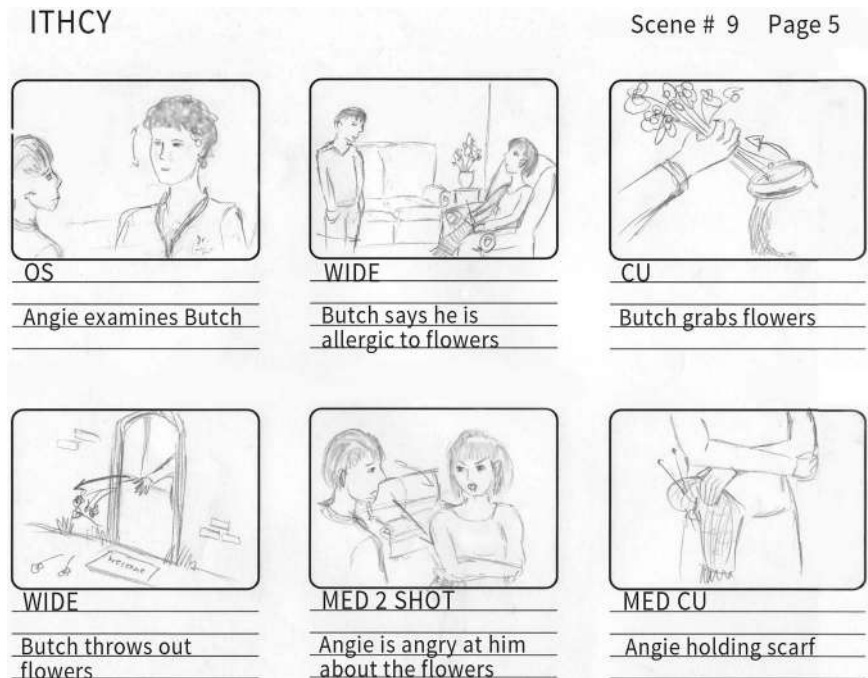
STORYBOARDS

Figure 7.1 Storyboard example (by Teresa Winters)

MISTAKE

I don't needs storyboards. I've got the whole movie playing in my head. I won't forget any shots.

Storyboards are a great way of pre-visualizing how each scene might progress shot by shot during production. They are essentially a shot list with visuals showing camera action and actor movements. Having storyboards can help the director convey to other crew members how a given scene may be shot. They will also help prevent the director from forgetting a critical shot.

Storyboards can be hand drawings, photographs, sketches or simple images from storyboard software.

Storyboards are produced in the aspect ratio that the film will be shot in. The storyboards often include scene number, camera movements, sound effects and music, aspect ratio, lens choices, shot types, special effects instructions, framing and other technical details. It is also valuable to include any important props along with a sense of location. The boards may include some dialogue for reference purposes. Ideally, there is information on what is happening in the scene. For example, Emma is breaking up with Nathan. The single most important element in a storyboard is the actors.

Some directors will draw their own storyboards, while some others will have an artist create them and others do not like to use storyboards at all. For a director to rely only on their memory for each shot is a very risky plan.

If you take all of the storyboard images and edit them together in a non-linear editing system timeline and add some sound effects and music to them, you will have an "animatic." You can even add some "scratch" or temporary dialogue to it to bring it to life. It is not a necessary step in planning a production, but can be very useful. It is fairly common in animation production.

SHOT LIST

While storyboards are a visual form of production preparation, a shot list is a more technical written list of shots for each scene. The list may include camera angle, framing and movement, and anything else that may be important for a given shot or scene. The shot list can be done shot by shot or it can have just the shots that require special planning like a scene with special effects or special camera movements.

A director can create a shot list that replicates how the scene plays out in their head. In order to create the shot list, it can help to connect with the emotional state of the characters in each scene. By being aware of the characters' emotions and the intent of the scene a director can get a sense of how best to shoot that scene.

LOCATION SCOUTING OR RECONNAISSANCE (RECCE)

<div style="border:1px solid black;">

MISTAKE

I did a location search on my phone's map app. I found the exact location I want to use.

</div>

Always know your locations. The best way to do that is to go to them. Do not rely on some map application to inform you about a location. You need to do reconnaissance at the actual location. Being at the location will let you know how the sun crosses the sky, especially if it is an exterior scene. Knowing where the sun is at any given time will allow you to schedule the shoot in a manner that takes advantage of the sun. Being at the location allows you to design the shots. You will know where to place the camera and the actors. You will also know if there is a fire station, airport or construction site making lots of noise nearby.

You can take stills or video of the location and the best camera angles. These can be a reference for the director of photography. Ideally, you will include the DP in your recces.

Basic Recce Checklist

- Contact the owner or legal manager of a location to acquire rights to shoot there.
- Discuss fees and film credit, if any required.
- Exchange contact information with the representative.
- Meet a representative of the location on the morning of the shoot.
- Confirm availability for shoot dates and reconfirm a couple of days before.
- Create a map with directions for the cast and crew.
- Check for electrical circuit breaker location, unless a generator is being used.
- Check for vehicle parking at the location, unless a shuttle is being used.
- Check for availability of toilets or rent a porta-potty or multi-toilet trailer.
- Determine if traffic control is needed by police, security or production assistants.
- Acquire required permits for the location, traffic, pyrotechnics, weapons, etc.

- Check for safety hazards and determine the location of the nearest hospital.
- Check for sound issues such as, traffic, aircraft, schools, fans, background music, appliances, construction, etc.
- Determine if food is available or are catering or takeout meals required.
- Arrange accommodation nearby, which is ideally for one person per room.
- Select an area for departments to set up or stage near the set.

CASTING

The director needs to feel confident that the actors hired will be able to portray the characters well. Sometimes they may choose an actor because they fit the part and the audience will immediately accept them in their role. Other times the director may cast against type, which may give a spin on a character. For example, what would it be like if comedy actor John Krasinski from *The Office* played Ebenezer Scrooge? It might work if the story were told as a comedy. The actor must fit the role in order to be convincing. One way to make sure an actor fits the role is to do a table read.

TABLE READ

A table read or read-through is when the entire cast read through the script out loud as their character. The director and writer are there to work with the actors to finalize the script and develop the characters. Depending on the type of production it is, there may be a need for the cinematographer or some other creative crew member to be there too.

Usually everyone sits around a large conference table or in a circle in a large room. There are often paper scripts for everyone, pens, pencils and highlighters, as well as snacks to help keep up the energy. Having everyone together and playing their parts can help gel the cast. It also allows the director and writer to see if there needs to be any changes in the script, such as combining scenes, eliminating scenes or rewriting them.

REHEARSALS

MISTAKE

Rehearsing is for stage plays and people who don't know what they are doing. I want the actors to be fresh. It's good to keep them on edge.

Some directors always rehearse even for only a few days, while others do not rehearse at all. The ones who do not rehearse often do a couple of takes to see what the actors are bringing to the scene. They believe that this somewhat impromptu approach will create a more realistic performance. The ones who rehearse like to know what to expect from the performers in a given scene. They can then collaborate with the actor to tweak the nuances of the performances to get what they need.

When the actors rehearse the scene the director is able to get an understanding of how the actor has decided to portray their character. This is the ideal time to let the actor know if your concept of the character is different from theirs. You may want to discuss with the actor how and why they made the decisions about their character. You can either accept and embrace their concept or work with them to achieve a mutual understanding of how the character should be portrayed.

Really experienced directors and actors can do fine without any rehearsal; however, many of them prefer to have a rehearsal either before production or before a scene is shot so they can have a stronger sense of what each scene is about and how the other actors are going to behave.

BLOCKING

MISTAKE

I don't want to waste time with blocking. I'll just have them stand next to each other and deliver their lines that way.

Rehearsals are an ideal time to work on blocking the actors. By blocking, the actors will know where they need to be on the set to deliver their lines. During production, the blocking may be changed for the actors and background actors. Once blocking is done the camera and lights can be placed to record the performances in the most effective way.

Simple blocking is having the actors sitting at a kitchen table. Blocking that is more interesting to watch would have the actors move around the kitchen. That does not mean they would randomly move from the table to the sink. Ideally, there is some motivation for one of the actors to move to the sink. Perhaps that character gets the hiccups when they are nervous, so they need to drink a glass of water. The reason they are nervous is that the other character in the scene is trying to coerce them into doing something they do not want to do. Perhaps the coercing character gets up and goes over to the sink too. Since they are taller than the hiccuping actor, they can intimidate them into doing what they want. Blocking can thereby help tell the story and give us information about the characters.

DIRECTING APPROACHES

Different directors have different approaches to directing. There is no one job description that includes all types of directors, other than they are the one who visualizes and realizes the story.

Some directors like to focus on the actors and the acting. This approach puts performance above all else. They may well have rehearsals before the production starts. There are directors that do not rehearse at all and they work with the actors from take to take until they have what they want in terms of performance. There are directors who are more concerned with the lighting and camera work. Some directors concentrate their efforts on the story structure of the script and making it work. They rely on the actors to bring the script to life and they will focus on capturing the performances. Then there are directors who work through the production phase to get the footage they need, but rely on the editing process to really tell the story.

ACTING STYLES

When working with actors it is helpful, but not necessary, to understand what method the actor uses in order to play their role. Here are some of the common techniques used by actors.

The Stanislavski method has the actors connecting with their character by using their experiences and feelings to find a common ground with the character. Once they have created a mindset with the character they are then able to physicalize the internal world of that character into outward actions and gestures. The actors then suppress their outward physical actions, which allows them to unconsciously affect their acting and become more natural.

The Stella Adler technique is to use your imagination and not become caught up in your emotions and past experiences. The idea being that an actor needs to go beyond themselves and create the character as a unique being. An actor will then focus on their character and make an external connection with the other characters.

The Strasberg method, often referred to as Method acting, uses various exercises to help actors connect with and become the character. The actors use their personal memories, emotions and life experiences to become the character and thereby give lifelike performances.

The Meisner acting technique is external in nature. Actors focus entirely on the other actor. The actors believe the other characters are real and play off of them. This helps them become their character living in that moment and reacting to the other character realistically.

WORKING WITH ACTORS

> **MISTAKE**
>
> Before I shoot a scene, I'll walk through the scene playing each character, so the actors know exactly what I expect from each of them. I'll keep doing takes until they act like I showed them.

Figure 7.2 Director with actors on set (by Avel Chuklanov)

Make actors feel special, because they are. They are the actors that you chose to tell the story. On the first day of the shoot, before the camera and lighting are ready, approach each one and tell them how grateful you are to have them on your film. This has to be sincere and it has to be a special moment between you and each actor. Show them you appreciate them.

Remember, the cast members have endowed you with their trust. The most important thing a director needs to do for the actors is trust them. Collaboration builds trust. Trust allows for an actor to do their best. One of the best ways to destroy trust is to do a line reading, which is reading the line to them with the emotion you want them to use, the emphasis on

words you want, the tone you want and the volume level you want. This is essentially asking them to be parrots and not actors. The actor isn't giving you what they are capable of doing, but what you are capable of doing.

Another way to destroy trust is for a director to try to get a reaction from an actor by surprising them or frightening them. This behavior is going to lose the actor's trust and that will make working together very difficult after they are tricked into a response.

Some line-reading suggestions are written into the script with visual cues such as italics, all capitals and bold print. This is a more subtle and non-direct form of demonstrating what is wanted from the actors.

Side coaching is when the director interjects a statement into the middle of a scene that is an instruction for one or more of the actors. Always let the actors know that you use this technique, so they are not surprised by it and thereby can stay in character as you give them direction.

Before each scene, meet with the actors in the scene and discuss with them the character's recent past that leads to this scene and what emotional state the actor needs to be in and why.

If an actor is struggling during a scene, it is better to guide them in finding what their objective or motivation is in the scene. The actor needs to understand what their character has been going through in order to get to the emotional point they need to be in a given scene. One technique is the use of action words. In a bar scene, a server may return to a customer and they may say, "Can I get you anything more?" The way this line is delivered can change according to the objective of the scene. That objective can usually be summarized by an action word. For example, if the director told the server to be seductive, the sentence would be loaded with sexual subtext. Another example could be that the server wants to go home, so they say the sentence in a manner that conveys that they are exhausted or impatient.

By collaborating with the actor to determine emotions, actions and motivations, you are feeding them what they need, both your trust and the opportunity to act. To really act, an actor has to be "in the moment." They have to be their character doing, feeling and thinking what the character would at that point of the story. The character has to be integrated into the actor. The actor needs to say "I would or would not do something," instead of it being the character that says this. The actor needs to see the story through the character's eyes.

There may be times where your interpretation of a scene is at odds with the actor's. Once you are satisfied with the actor performing the way you want, do another take that allows them to do it their way. You may be surprised.

Everyone needs feedback to help them achieve their best. When you are satisfied with a take, make it known and move on. If you want another take, let the actors know what you want to be done differently, otherwise they are left without direction and may struggle to do the scene differently. Be specific when giving direction. It is always better to let the actor know what you want, instead of just saying "good" or "let's try again."

Stay focused on the actors in the scene. There will be plenty happening off screen that can distract you and pull your attention away from what is important. Learn to ignore the sound of the heating system, the hum of a light, the actions of the boom operator and the movement of the camera. All of these are distractions along with many other sites and sound on and around the set. If you are working with a crew that has little experience, you will need to be somewhat observant as to what they are doing so that you know you have the footage you need, but do not become bogged down in less important details to the detriment of the story and the actors.

Letting your actors see their work during production, such as the screening of dailies or take reviews in the video village, may affect their acting and even change how they perform their character. On the other hand, it is important that the cast see their work so that they can maintain continuity. It is better to let each actor decide if they want to see the playback of a scene or not.

DOING BUSINESS

> **MISTAKE**
>
> It's the dialogue that's important. I don't care what they do while they deliver the lines.

Actors standing next to each other and just talking is not very interesting, but if they have something to do while they talk, that might make the scene more interesting. For example: If the script has two people talking about escaping the country they are in by climbing over a mountain range, show them preparing. One actor could be waxing their skis while the other actor could be packing food into a backpack.

Having some "business" for an actor to do will also help them perform. When they do the same movements over and over again for each take or in rehearsal, they are using body memory to help remember their lines.

FIGHTS & INTIMACY

> **MISTAKE**
>
> I want my actors to be in the moment when they are faking sex, so I won't direct it, but just let them find their way.

Fighting does not have any actual hard contacts and intimacy does not have any genital-to-genital contact. The placement of the camera can hide actual contact and still look realistic. Unless you have a qualified fight director or a qualified intimacy director, I suggest that you do not engage in these activities. If the script does call for such actions, keep things simple.

When actors do not have clear direction, they tend to fumble around and take actions that might not work for the story or the characters' relationships in the story. A sex scene needs to be choreographed to work with the story,

If you must have nudity or simulated sex acts, then there are some basic things to consider. First off, there needs to be detailed communication with the actors and there needs to be choreography, so that everyone knows what actions to expect. All the actions need to be acceptable to all actors and respect each actor's comfort level.

It is important to rehearse every move. Hand placement, wardrobe removal and body positions all need to be rehearsed prior to the shoot day. If an actor strays from the predetermined movements, the director needs to stop the shot and remind the actor.

It is important that the actors respect each other's boundaries, otherwise a sex scene could be a terrible experience and the actors probably will not trust the director again.

When the scene is over have the actors thank each other for a good job.

After each take of a sex scene, the wardrobe people need to provide bathrobes or blankets for the actors. This helps them feel cared for and warm. To avoid genital contact, actors can wear Shibues for women and Hibues for men, found at thestyliststore.com, which are strapless thongs that are effective when a silicone guard is inserted between the material and the genitals. A silicone breast enhancer could be used for a guard. When using one of these thongs, usually the pubic area must be shaved in order for the adhesive to work. There are also breast concealers for women.

Actors can include a rider to their contract that stipulates what the actor is willing to do in terms of nudity, violence and sex. Some female actors will only work with female directors as they do not want to be sexually objectified by the "male gaze."

WORKING WITH THE PRODUCER

> **MISTAKE**
>
> I want to make my film. I don't want a producer telling me what to do.

It is too simplistic to say that the director is in charge of the creative aspects of filmmaking and the producer is in charge of the financial aspects. They may work together on many facets of the entire production process.

Independent producers working on lower-budget films may wind up driving around crew or cast or going to get food. They may also be the one to tell the director that they need to stop shooting a given scene and move on. Most directors are keenly aware of the budget and the schedule and try to work with the producer, so that they have a good reputation with the financiers.

In the best of relationships between the two, they are able to work together to bring the director's vision of the story to life. In the worst-case scenario, the producer will try to control the creative aspects of the story and infringe on the director's territory of working with the actors, lead crew members and the picture editor. A good producer knows when to step in and when to step back.

WORKING WITH THE FIRST ASSISTANT DIRECTOR (1ST AD)

The first assistant director (1st AD) is on set to keep the production moving forward and to take care of any technical issues with production in order to free the director of those concerns. This allows the director to focus more on the performance of the actors, which is the storytelling part of a film.

A 1st AD is in the position of working for both the producers and the director. They will work hard to help the director create their vision and complete the film on time and within budget. If a director gets too far behind the schedule or makes decisions that significantly impact the budget, then the 1st AD will have to put on their producer's hat and work with the director to get back on schedule and to keep within budget.

WORKING WITH THE CREW

MISTAKE

I can make an amazing movie, if the cast and crew work 16-hour days and down lots of energy drinks.

On the first day of production, thank each member of the crew and sincerely tell them that you are glad to be working with them.

In order to immediately get the respect of the crew, it is important to know what each crew member on the set does. It is even more helpful if the director has worked in some of the positions. A director can cause a lot

of doubt by asking for something from the wrong person. For example, it would not inspire confidence if the director asks a key grip what lens to use for a shot.

Do not work your crew and cast to a state of fatigue. This will erode morale faster than anything. It will make people careless and could result in injuries. Cast and crew members that are exhausted may start acting out. They may become angry and may become sloppy in their work. Try to limit the production time each day to ten hours. Make sure that there are breaks built into the day and always serve good nutritious meals. Peanut-butter sandwiches may be expedient and cheap, but it is not a full meal. Put out some extra money and buy them full meals. The message to the crew and cast is that you care about them and they will thereby care about you and your movie.

If there is some trouble brewing amongst the crew, keep it away from the cast. They will pick up on it and it may well affect their performances. It is best to deal with issues when they happen. You cannot make everyone like you, but you can show appreciation and respect. It will pay off in the long run.

Ideally, there will be enough crew members on the production that the director will not have to wear more than one hat. It is difficult to make good creative decisions when you are distracted with tasks not normally performed by a director. If a director is spread too thin, it will usually show in the production.

WORKING WITH THE DIRECTOR OF PHOTOGRAPHY (DP)

The relationship between the director and the director of photography (DP) is instrumental in getting the visual part of the story recorded. They need to have agreement on what the movie should look like and how the camera and the lighting will complement the story and the acting.

The DP will know what the director wants for a given scene because they will have had prior discussion about the shots, lenses, lighting, movement and framing for the scene. By making these decisions before production, the DP takes a lot of pressure off of the director during production. However, it is not uncommon for a director to change the plan. It is best to follow the plan as that will save time and money.

The director decides how the movie is going to be shot in terms of camera and lighting. They decide what format and aspect ratio the film will be shot in.

If the camera is moved during a shot, it is the director that determines what that move will be. They will also decide what the framing should be for each shot.

The framing and thereby composition should answer these questions: What am I trying to visualize here? What information and feeling will each camera setup convey to the audience? How are my decisions affecting the story?

WORKING WITH THE PRODUCTION DESIGNER

The production designer is responsible for creating the visual world in which the story takes place. This world is based upon the script and the director's interpretation of that world. A large portion of preproduction time will be spent making decision about the production design. There will be set designs to approve, wardrobe choices to be made, lighting design to be chosen, important props to select and many more decisions.

WORKING WITH THE EDITOR

One of the closest collaborations a director will experience during the filmmaking process is with the picture editor. They will spend weeks together with the goal of honing the best version of the story possible.

When the editor starts working on the picture cut, they have a more objective view, while the director has lived the movie for some time. The editor's objective view can often see through story issues or give options for how to cut a scene that are more effective.

It is a great idea to have the picture editor start with production. They will do cuts of scenes to see if they are working and if they are not, then they can tell the director what shots are needed. As the production progresses, they will be cutting the film together to see how well it is working overall.

TIPS

- Be prepared for production. Once production starts you need to shoot quickly and efficiently. This can be done by being extensively prepared. The more time you put into preproduction, the less time you will need for production.
- Rehearse the actors during preproduction, but don't over-rehearse and lose the freshness factor. Rehearsing allows the director to give relevant feedback and encouragement.
- Play an active role in setting the schedule. You know the actors and what scenes are of greatest importance to get shot. If time or money runs out, at least you have the important scenes to tell the story.

- As director, you need to be the hardest worker on the set. Others will follow your lead. Don't just sit there, get up and help out however you can.
- Have the number of crew members that will allow the production to move fast, but not so many that it slows down the process.
- Make decisions as fast as you can. Everyone will be waiting to hear your decision; even if it's not the best decision, it shows you know what you want. However, if you do not know something, admit it and ask for help. Be open to new ideas.
- Feed your crew and cast well. People are happier and appreciative when they have a full stomach and are fed real meals and not just hotdogs and corn chips.
- Make your actors feel safe. They need to know you have their best interest in mind. If they are having a hard time, take them aside and talk with them and give them support.
- You may get some good character reactions if you wait five seconds before calling "Cut."
- Less is better. When the budget and time are limited, it is better to have fewer "toys" or gear to use. For example, plan to have enough lights, but not so many that the lighting of the set gets bogged down. Limitations can lead to unique and creative options.
- Contingencies are the things that may crop up during production and you need to have them budgeted or scheduled. That is why it is always good to have about 10 percent of your budget not assigned to anything, except the unexpected.
- Always have a backup location, set, caterer, prop, transportation, wardrobe, etc. Figure these out ahead of production.
- There will always be problems during production. Keep things in perspective. You are having a great time making a movie. Problems are a part of it. Face each problem with a positive attitude and it will make everyone enjoy the process more.

8 PRODUCING

Figure 8.1 Irving Thalberg

Irving Thalberg is often called the first studio producer, but he refused to have a credit on any of his films. He started at Universal Studios, or Universal Pictures as it was known then, where he became the studio manager at age 20 and then three years later moved to MGM and became the studio producer. He is quoted as saying: "Credit you give yourself is not worth having."

Thalberg had the ability to combine artistic quality with commercial success. He seemed to intuit what the audiences would like.

PRODUCTION OVERVIEW

MISTAKE

I have perfect taste in stories, so I don't need to do any market research.

Some producers are more involved with a production than others. Most bigger-budget movie producers choose the projects they are involved in because they believe in the story. They work with a particular director because they believe that director can do justice to the story.

No matter what size of budget a production has, the producer is the one that needs to keep track of expenditures and know when to limit any spending to stay within budget. They are focused on being prepared for production, so that the director can accomplish their vision of the story. Every director needs a producer to help push the film forward.

On a major film, the producer will have a team to help produce, but on an independent movie, it may just be one person. The average amount paid to a producer is 5 percent of the film's budget, but this can vary greatly, depending upon experience and past success.

A studio production will usually be funded by the studio or in conjunction with another studio or major production company. A studio producer is usually assigned to a film and they see it through to the end. They primarily fill a business oversight role, but may be involved in some creative decisions.

A normal feature film will evolve from the producer optioning a script, hiring a writer, finding the funding and then attaching a director to the project. The producer will work with the director to find a star for the project that will help determine the marketability of the film. They also must secure the financing. The producer then hires a production team, such as the unit production manager and assistant producers. They will also engage lawyers and accountants to oversee those aspects of the production.

Once production is completed, the producer will work on distribution deals for the various outlets, such as cinemas, television, internet video on

demand (VOD) or streaming, airlines, foreign versions, festivals, sound tracks and DVDs. They will also work on the marketing of the film, royalties collection, press releases, censor certificates, product tie-ins, insurances, payments to investors and more.

It is possible to start out as a producer on lower-budget independent productions. Short films, for example, are a great learning ground and can rapidly lead to feature-film producing. Fortunately, there is a huge field of independent productions, so no one has to start out at a studio production office if they do not want to.

On a low- or no-budget film, the producer may not make much money or any money, but they do get experience. Ideally, the more experience someone has, the better they are able to serve the production. In many lower-budget productions, the director is often the writer. This eliminates the need to hire a writer, unless a script doctor is required, because the script is not fully developed or, as they say, "needs work."

A story may come from a published book, newspaper, short story or magazine. A story may also come from a conversation at a social gathering or on a bus ride to work.

Once a story has been found, the producer must secure the rights to turn it into a screenplay and a film. Instead of paying the full amount for the production rights, the producer may just acquire an "option agreement" that gives them an exclusive right, but a limited time to find the funding. The length of time could be 6 months, 12 months, 18 months or whatever is agreed on. The amount paid for an "option payment" is negotiable, but $5,000 or more is good. A general rule of thumb is 10 percent of the total purchase price for the "rights agreement."

If the funding is found, then the producer will pay the remaining amount for the rights. Generally, the film rights will cost about 2–3 percent of the production budget, but like many things the price is negotiable. Also, there may be a "cap" for the writer, which means they may get their 2–3 percent, but only up to a specific amount, say $100,000. If the funding is not found, then the option expires and the author retains all the rights.

A producer needs to do their homework and try to determine the appeal of the story to an audience. They also need to determine who the target audience is. Part of that is to determine if the subject matter has saturated the market or does it still have drawing power. This will provide a sense of the potential profitability for the film.

A producer should be aware of the subject matter and theme of the film and how it might affect an audience. For example, if the story is about someone with a disability, then they need to be sensitive to that. If the story is about someone who gets an abortion, then they need to be careful about how the subject is presented. A producer needs to know if the story they are presenting is one in which some facts are wrong or untrue. They need to realize that they may be spreading misinformation or even exploiting someone or something.

Once the marketability and sensitivity have been established, then they need to determine what the purpose of the film is. What is the moral of the story? What does it say about humanity? In essence, what is the message, can they support it and is it being presented appropriately?

DEVELOPMENT

In the development phase the producer will either help develop a concept for a film or they will secure the rights for development and production of a pre-existing story, unless it is in the public domain. If it is in the public domain, then no rights are required. If writers are necessary, the producer will hire them and work with them on developing the story. While the script is being developed, they will work to secure financing, since they are the driving force to securing the story and money.

If a producer wants to find out what the current copyright status of a particular story is, they can have a copyright search carried out. There are companies such as Compumark, which specialize in copyright searches. They will discover the ownership of the title in question.

Development Steps
The producer:

- Finds and secures the rights to a suitable screenplay or story to develop.
- Hires the screenwriter or writers to create a final draft of a screenplay or to write a screenplay based upon a story, and gets involved with the director and the writers in developing the final shooting script.
- Secures the funding for the film.
- Selects and hires the co-producer and unit production manager (UPM).
- Oversees the preparation of the preliminary budget with the co-producer and UPM.

On a low- or no-budget film there is still much to do in development, such as finalize the script, break it down, make a schedule and prepare a budget.

PRODUCER'S TEAM

Executive Producer: This is usually the person that acquires or helps acquire the funding for the film. They may also have secured the rights to a story and to have developed the story for production. If they are at a studio then they will not acquire the funding, but will oversee the other producers to make sure that the film is on time and within budget.

Producer: This is the person that coordinates budget and schedule of the film-making. They may assist the director with the hiring of the actors and key crew positions. They may also hire the director, writer and actors.

Associate Producer: They provide preproduction, production and post-production assistance to the producer. They are the hands-on producer that does the day-to-day work on the film. This credit may be given to someone who has helped finance the film. They may also include hyphenated credits for the writer, director, production manager, star or even an editor.

Co-Producer: They may share the producing responsibilities with other producers. One producer may work on the creative aspects of the film while another may handle the business oriented functions.

Supervising Producer: On productions that have more than one producer, they will supervise them all. The supervising producer may take the place of an executive producer once their main duties are done.

Assistant Producer: They perform tasks assigned to them by the associate producer.

Unit Production Manager (UPM): They oversee the budget, staffing and scheduling. They are often the person to break down the script and produce the production board. This is done in order to have a production schedule that will be cost effective and time efficient. They will work with the producer to finalize the schedule and budget.

Line Producer: They supervise the whole budget and logistics on the film. They are on set nearly all of the time. The production manager will inform the line producer of the changing need for funds based on daily requirements. The line producer reports to the producer and all the department heads report to the line producer. They oversee such things as having all sets, props and costumes done on time.

On a limited budget production, there may only be a producer to do everything. However, if a line producer and production manager can be added to the team, it will make the production a lot easier.

PREPRODUCTION

The more organized the producer is at this phase, the better prepared the production will be. This applies to productions with a large producer's team or a solo producer.

Preproduction Steps
The producer:

- Hires the director and works with them on selecting the principal cast members.
- Oversees the final budget in consultation with the co-producer and UPM.
- Works with the director to finalize the shooting schedule.

- Works with the director to select and hires the production designer, cinematographer, editor, visual effects company and other key head of department (HOD) crew members.
- Engages with the director in location scouting.
- Makes all major non-creative decisions that do not require the director's input.
- Negotiates and oversees contracts with all of the various crew members.

SCRIPT BREAKDOWN

At the beginning of preproduction the script will need to be broken down. The script breakdown sheets are used to determine what is required to shoot each scene. The breakdown is used to help create the budget and the shooting schedule.

When the script is "locked" numbers will be added sequentially to each of the slug lines. This is done by either the producer or the 1st AD. The script will be gone through and the various elements will be highlighted. Elements are either a person, an activity or an object.

As the script is broken down, the information is transferred to breakdown sheets, one for each scene in the film. There are separate boxes on the sheet for the elements:

Props
Wardrobe
Makeup
Stunts
Characters
Extras
Livestock
Animal Handlers
Picture Vehicles
Special Effects (SFX) or Visual Effects (VFX)
Special Equipment
Sound
Music
Locations

The header for each sheet will give the scene numbers, script page, script day in the story, scene length in 1/8th pages, location, exterior or interior, day or night, sheet number and a one sentence synopsis of the scene.

The breakdown sheets will provide the heads of departments with necessary information for each scene, so they can be prepared.

DETERMINING SHOOTING SCHEDULE

The producer determines how many pages of the script can be shot on any given day. A simple scene may only take a few hours, while a complicated scene may take days. If there are children or animals involved in a scene then extra time needs to be allowed as they usually slow production down. Crowd scenes take time to set up as do stunts and special effects. If there is travel involved, that will take time too.

There are several software packages available that do script breakdown, scheduling and budgeting. If you make a change in one area it will make changes in the other two. For example, if a difficult scene requires an additional day to complete, the software will update the budget and the schedule. The script breakdown will not change.

The general rule is that one page of script equals one minute of screen time. Script pages are divided into 1/8ths. This makes it easier to determine how many minutes can be accomplished in a day and how long a scene will take to shoot. This assumes the industry standard of 12pt Courier font and proper script formatting.

DAY OUT OF DAYS (DOOD)

Day-Out-Of-Days

Production Title Sunset Grill	Producer Mathew Barron	Director Jennifer Porter		UPM Cynthia Arnold				Script Date May 12	
# Performer Name	Role	Monday June 1	Tuesday June 2	Wednesday June 3	Thursday June 4	Friday June 5	Saturday June 6	Monday June 8	Tuesday June 9
1 Susan Rice	Amy Jones	R	R	SW	W	W	T	W	WF
2 Robert Valhalla	Jerome Jones	R	R	SW	W	W	T	W	WF
3 Xavier Ruiz	Striker Forde	R	R	H	W	W	T	W	WF
4 Andre Roma	Marcelle Young	R	R	H	H	W	T	WF	
5 Ella O'Connor	Loni Lane	R	R	SW	W	W	T	W	WF
6 Reece Grant	Ely Porter			SWF		PWF			
7									
8									
Code Key:	Code Key: W = Work	S = Start	F = Finish	T = Travel	I = Idle (Non-Paid Day)	H = Hold (Paid Day)	PW = Pickup Work	R = Rehearsal	

Figure 8.2 DOOD chart

This is a talent chart that show which days any given actor is working. The producer creates the chart in order to make certain that the actors are being used in the most efficient way. The chart is created after the shooting schedule and before the budget. There is a code key that tells the status of each actor on any given day. For example, W is used to show they are working and R is used for travel days.

WORKING WITH A DIRECTOR

> ### MISTAKE
>
> I've produced several films and I know that a first-time director needs to be told what to do, so I always take charge.

Once the director comes on board for the project, the producer needs to work with them on the production plan. Sometimes it is the director that finds a producer to work with in creating the plan. They both need to agree on how the process will go and what the limitations might be. They need to have a shared vision of why the film is being made and what the approach is to telling the story. Ideally, they both believe in the story, want to tell it and want to make some money.

They need to be clear as to what each person's responsibilities are. Sometimes they may overlap, but other times they need to know and trust that the other person is doing what is best for the film.

They need to work closely to determine the choices for cast and crew as well as what locations will be needed.

During production they need to communicate with the director about the budget and schedule, so that costs can be kept within budget, but they do not need to dictate to the director what to do. Filmmaking is collaborative.

GREEN LIGHT & TURNAROUND

Studios and production companies will green-light a film, which means that it is given permission to be produced. It also means that the financing is in place and committed to the project, so it can move forward from the development phase to preproduction and then principal photography or production and eventually to postproduction.

Turnaround is the opposite of green lighting, in that a film in this status is not going to be made. It is common for a project to be put in turnaround if there are script problems or the right director or actor is not available or interested. It is then made available to other studios and production companies to buy. By selling the project to another company they can try to recoup their development costs. For example, the movie *E.T. the Extra Terrestrial* (1982) was put into turnaround by Columbia Pictures. It was then picked up by Universal Pictures. Columbia did not want to make a sweet kids movie as it did not fit their style. But the sale did get them 1 million dollars and 5 percent of the net profits, which made a good deal for both Columbia and Universal.

Turnaround is less of an issue on independent films as they are not commonly controlled by a studio, which may decide to cease development on a production. An independent film usually is a less expensive production to make, so the stakes are not as high as they might be for a studio. Studios have a high overhead cost to cover, so they need to be fairly sure of a success, while an independent film can take more risks as the cost of production is usually much lower.

PRODUCTION

Any major changes to the story or the budget will go through the producer as they need to make sure the budget will cover the changes and that the changes will not add days or other costs.

Production Steps
The producer:

- Approves the chosen locations.
- Approves any script changes.
- Oversees budget and schedule.
- Manages the business of making a film.
- Oversees the contracting of cast and crew.
- Consults with the director.
- Views dailies and provides director with objective feedback.
- Reports progress to the studio or independent production company.

POSTPRODUCTION

Once the film has reached the postproduction phase, the budget becomes tighter, especially if money was taken from postproduction to pay for extra shoot days or something else during production.

Ideally, the producer will step aside from wanting to contribute too much on the creative side of filmmaking and let the editor and director bring the story to life. Once a final cut has been completed, the producer will watch the film and make suggestions. The director may agree or disagree. The director and the producer will need to reach agreement on whatever issues the producer mentions. At studios the producers often have the final say in the version that is initially released.

The composer will also be working on the film in postproduction. The director and editor will work closely with the composer on getting a

finished film. Some producers will also work with them with consideration for the budget and to give suggestions on the score and music used.

Being a producer is great for someone who loves working with numbers and who is very organized. It is not ideal for someone who is creative. Many producers try to do the business side of filmmaking and try to influence the creative side, but that is not ideal for the director, who is the creative force.

Postproduction Steps

The producer:

- Provides consultation with the director and the picture editor.
- May finalize the cut, depending on the contract with the director.
- Consults on visual effects with the director.
- Participates with the director in selecting the composer, and consults with the composer and the director in the scoring process.
- Attends the recording sessions for the score.
- May arrange for test screenings before picture lock.
- Provides consultation with the director on the re-recording (mixing) stage.
- Attends the color grading.
- Acquires all rights and clearances for use of copyrighted material, such as music and art works.
- Works with the marketers and the distributors of the film for both domestic and foreign releases.
- Watches over the film's box-office performance in hope of it making money.

These are the general expectations and because there are four different phases that can have multiple producers within each, that is why you see so many producer credits on one film.

DISTRIBUTION & EXHIBITION

A digital cinema package (DCP) will need to be created for theatrical distribution. You may also need to produce trailers and production stills. If there is foreign distribution, then discreet music and effects (M&E) tracks may need to be provided. Festivals, online streaming and broadcast television will have their own technical requirements for exhibition.

Find more details on distribution and exhibition in the online Appendix.

MARKETING

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MISTAKE

Once the film is completed, I'm moving on to another project. The marketing people will know what to do with the film.

</div>

It is the producer who does whatever it takes to properly market the film. They are the middle person between the filmmakers and the distribution company. The producer will work with the distributor on marketing the film and in the creation of marketing materials. It is up to them to make sure the film makes money. If there is no distribution company, then the producer may take on that role and work to get the film to where it will make money, ideally a profit. If it makes a profit that is a valuable résumé addition for the producer to get funding for the next film.

CONTRACTS & DELIVERABLES

Producers are responsible for fulfilling all of the legal obligations, such as contracts, rights and releases. Almost every production contract will have a section on deliverables, which the producer must provide. These are items like production stills, trailers and different versions of the film.

The least expensive and most efficient approach is to anticipate the deliverables process from the time of the production's inception. Many horror stories involve inadequate preparation during production for creating the deliverables.

Besides the deliverables are requirements such as errors and omissions insurance to cover mistakes. For example, showing a copyrighted photograph in a scene and not having permission to use the photograph. The E&O insurance will hopefully cover that mistake.

9 THE SHOOT

Some of the information in this chapter expands on topics from previous chapters and some is reemphasized in order to reinforce its importance.

GUERRILLA FILMMAKING

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MISTAKE

All I need is a camera with a light on top of it. It's all about the directing anyway.

</div>

Guerrilla filmmaking is considered to be a low-budget form of independent filmmaking. There are usually only a few actors and the crew is kept to a minimum. Wardrobes are often created from the actors' own clothes. Props are simple and inexpensive or are items found in the filmmaker's home. There are no custom-built sets as real locations are used. The idea is that the cast and crew enter a location and shoot the scenes they need before anyone discovers them and forces them to leave. This saves money because they do not pay for permits or location fees. However, the production quality is usually low and there is the risk of being fined, jailed or sued. It is better to be organized and follow traditional filmmaking steps such as those given in this book.

PREPARATION

Preparation is about time and money efficiency. It is about calculating how best to spend your funds. Rarely is a film shot in sequence from beginning to end. Normally, the order for shooting scenes is based on costs. For example, I may have a scene or two that I would like in the film, but do not know if there will be time or money to do them, so I put them as the last scenes to be filmed. If they do not get shot, then I still have a complete movie, just not with the scenes I would have liked.

Other factors influence the shooting schedule, like availability of actors or locations, the weather, the building of sets and even the type of scene being shot. If there is a romantic scene in the script, it might be better to save it for later in the schedule when the actors playing the two lovers are more familiar and comfortable with each other. Another example would be a loud argument between two characters in a scene. The yelling may stress the actors' voices, so leave this scene until the end of the day.

On any production it is helpful to have lists. A useful list will include things like:

- Script copies
- Shot list and storyboards

- Shooting schedule
- Properties (props)
- Wardrobe
- Makeup
- Sets
- Camera, lenses, and field monitor
- Fluid head tripod, dolly, crane, and stabilizers
- Lights, stands, flags, gels, and reflectors
- Audio recorder and headphones
- Shotgun/boom pole and lavalier microphones
- Catering: food, drinks, and snacks
- Production still photographer
- Talent releases
- Transportation
- Location agreements/permits
- Insurance
- Tables and chairs
- Power cables (stingers)
- Batteries and chargers
- Memory cards
- Sunscreen and insect repellant

I suggest emailing or texting the cast and crew a week before the start of production to ask if they have any questions and to remind them of the schedule. You might also call each member of the cast and crew two days before the start of production to let them know everything is going ahead and to inform them of any issue that affects them. In order to attempt to make sure that all cast and crew are at the right place at the right time, they need to be provided call sheets for each day.

The more prepared the filmmaker is, the less anxious they are about the production. This allows them to concentrate on the acting and the story. For example, really detailed storyboards and a shot list could be given to a director of photography (DP) and they would know what needs to be shot for any given scene. If too many things are put off until the first day on set, the director will not be able to focus effectively on the creative aspects of storytelling. There will be hundreds of questions to answer during production, which could have been answered in a preproduction meeting held with all principal crew members. It is surprising the number of questions that crew members have prior to the shoot. Having lots of questions is a good thing as it shows that the crew care about the production and they want it to be successful.

Along with being prepared for the shoot, make sure each crew member is personally prepared. Everyone should have a rain coat, sun hat, work gloves, sunglasses, flashlight or torch, their cellphone charger and whatever else they might need for their work and their safety.

BASIC EQUIPMENT

MISTAKE

I'm going to have the camera on a gimbal for the entire production, so that it can rove around the set following the actors, reality-TV style.

Camera: It is easy to get caught up in the excitement of a camera and what it can do, but remember filmmaking is all about the story and the acting that brings that story to life. Cameras are there to record the key events of the story. If the story is best told using an iPhone camera instead of a RED camera, then that is what needs to be done.

Monitor: Nearly all cameras come with some type of built-in monitor, however these are usually too small to give an accurate representation of the focus and depth-of-field. Having a larger field monitor will provide greater assurance that the image is acceptable.

Digital Media Storage: Make sure you have enough storage. Nearly every shoot takes more time and uses more storage than is anticipated.

Prime Lenses: A zoom lens can be useful for having different focal lengths, but a prime lens is often sharper and faster, so less light is required for a crisp image. You will have to move the camera to where the framing is right, but the shot will look great.

A Tripod/Monopod: The foundation of filmmaking is the tripod. There is no better way to steady a shot. A film shot with only handheld shots could work, but often it says "amateur." A stabilizer or gimbal camera mount can accomplish shots that give the production a high-end look, but they can be tiring to use and are not always proper for every shot.

Lights: All cameras need light in order to record an image. Every scene should have at least one significant light source. This can be the sun for an exterior shot or light coming through a window for an interior shot. LED lights and 1K, 2K or 10K incandescent lights as key lights is a great way to add some punch to a scene and to give the camera sensor adequate illumination to record a high-quality image. Smaller inexpensive LED lights can be used as fill, accent lights and as backlights.

Sound/Microphone: A directional or shotgun microphone that captures good intelligible dialogue is key to having good sound. When a shot is too wide for a shotgun microphone, then wireless lavalier microphones can be used or ADR can be used if the recording is poor.

Audio Recorder: Some cameras record sound through a mini-jack port or an XLR input, while others will require a separate audio recorder. The camera audio recording can be used as a reference for audio recorder captured sound. Camera audio is generally of lower quality than that recorded to an audio recorder. Also, it is much more difficult to control the audio levels on a camera.

C-Stands: Centuries stands are very useful on a set as they can hold a light, a reflector, a sound blanket plus a multitude of other uses.

Slate: Using a slate for each take will provide information about each scene and take, plus they are used to synchronize the picture and audio when they have been recorded separately.

Color Chart: A color chart is essential in getting skin-tone correct, especially when shooting in RAW. Just a quick shot of the color chart for each lighting set up will make color grading faster and simpler.

Communications: This can be as simple as using smart phones as walkie-talkies or using actual walkie-talkies, which are two-way handsets which provide a lot more functionality to set communications than cellphones do. Also, a megaphone or Bullhorn of some type can be useful for voice amplification, especially when there are a lot of extras moving over a large set and they need to hear directions. A walkie-talkie lingo guide is included in the online Appendix. It is valuable to know how to use a walkie-talkie, so I suggest that you learn the terms and technique included in the guide.

Make a list of every piece of equipment you will need for your shoot. Check off each item as you acquire it. Now, check out the equipment a day or two before the first day of shooting to be sure that everything is working properly. If there is a problem with a piece of gear, then you have time to have it fixed or replaced before the shoot starts.

LOCATIONS

Locations means transportation, hotels and probably catered meals. On distant locations it means that everyone needs a per diem to pay for their laundry and various other expenses. Make sure that each person gets their own room in a hotel, motel or B&B. A sleeping bag in the back of an equipment truck is nowhere to sleep and is no way to treat the people working on a movie. Make sure you have a location agreement that states exactly what you will be doing.

MEALS

As mentioned in other parts of the book, meals, snacks and drinks are really important for the cast and crew. Yes, many short films have been fueled by pizza, but it is not an ideal replacement for a complete meal, which is a way of giving your crew and cast the energy they need to work and it says you care about them. Ask each crew and cast member about any food allergies or restrictions, so you can provide proper meals.

TRANSPORTATION

Ideally, there are people to drive around and pick up the cast to make sure they get to the set. These drivers can then run other errands to help production. You can also secure a parking lot or specific area for everyone to park and they can drive themselves if they have transportation. If the location of the shoot is far from home, then some form of people-mover, even a school bus, will be needed to take and return people to and from the set.

If the location requires everyone to fly, then round-trip tickets will need to be purchased and provided to the cast and crew.

There is more information about how union rules apply to meals, turn-around, housing and per diem in the online Appendix called "Union Considerations."

PRODUCTION STEPS

MISTAKE

I'm going to set the camera in one place and shoot the master, medium shots, two shots and close-ups all from that same place.

Ideally, on a small crew, every member of the crew will get a call sheet, shot list and the storyboards for each day of shooting. Not only does this make everyone aware of what to expect for the day, but it makes everyone feel more involved in the process.

Make sure that the cast is present and in the appropriate wardrobe, hairstyle and makeup, the set is properly dressed and any required props are on hand. Make sure that the camera and sound crews are ready, the lighting planned and the meals arranged. Essentially, make sure that the crew has everything they need to do their job. If everything is prepared and all crew and cast are ready, then get ready for the first shot.

One of the first questions a filmmaker will be asked on the first day of the shoot is, "Where should the camera be placed?" The answer to this common question will be known once the blocking has been set. Once the actors have their movements around the set established, the camera can then be placed in the best position to capture the master shot. It is always good to confer with the DP as to where to place the camera. They will have watched the blocking and they know what is technically possible, so they may well offer some good advice.

The first shot of any scene usually starts with a master shot that establishes the scene location and the position of the actors. Once the director is satisfied with the master shot, the camera can be repositioned for medium shots,

two-shots, over-the-shoulder shots and close-ups. Having all of these different camera angles will make editing so much easier. Once the basic shots are successfully captured and you are ahead of schedule, then some alternative shots can be taken; for example, handheld, overhead, low-angle, dolly, gimbal support, drone and whatever other creative camera placement you may want to attempt knowing that the fundamental shots are "in the can."

When the camera is relocated for another shot, always remember the 30-degree and 180-degree rules. The 30-degree rule states that the camera should move at least 30 degrees between successive shots of the same scene. If the angle of change is less than 30 degrees, it will look like a jump cut, which usually looks like a mistake. It is also helpful to change the focal length of the lens by at least 20mm. For example, if a two-shot is shot with a 30mm lens, then change to a 50mm lens for the subsequent individual medium shots. This is sometimes referred to as the "20mm and 30-degree rule."

If there is some minor continuity issue, it can help in postproduction to edit between two different focal length shots by cutting on the action, which may hide the error.

The 180-degree rule is about the spatial relationship between two or more characters or even one character and an object. It states that two characters facing each other should maintain the same left/right orientation to one another in terms of camera placement and in editing, unless there is a clear reason to "cross the line." You may need to cross the line if there is a scene in which the characters are in a circle, such as surrounding a table. This is known as "shooting in the round." It is a good idea to use storyboards to select the shots you need when you are crossing the 180-degree axis in order not to confuse yourself or the audience with the editing. You will know in editing if you crossed the line when you look at both of the camera angles and discover that both actors are facing the same direction instead of being opposite of each other.
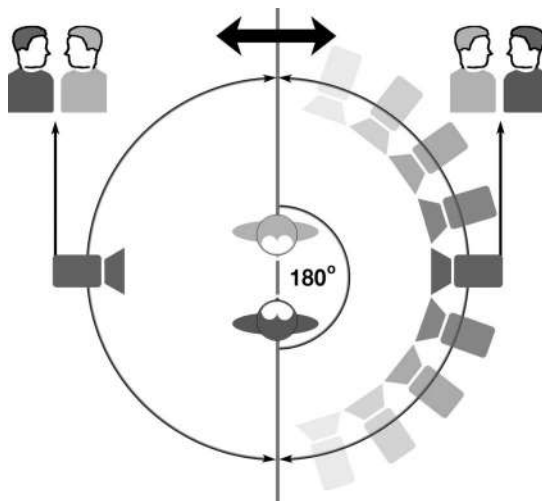

Figure 9.1 180-degree rule

The director has many options as to where to place a camera and how to move it. A static camera on a tripod is the most simple. Director Jim Jarmusch made *Stranger than Paradise* (1984), a full-length feature film consisting of 67 shots, all on a static tripod, all wide shots and no camera movement at all. The average modern feature film contains a little more than 1,000 cuts. An action movie can have several thousand cuts, while a horror movie may have several hundred cuts. That is because horror movies tend to have longer shot lengths.

Although a static camera can be an effective form of storytelling, it is more common to move the camera in a manner that follows the action. This may entail panning, tilting or a dolly shot. Most of the better camera work I have seen in student films usually involves appropriate tilting and panning to follow the action. It keeps the viewer engaged in the scene.

A hand-held camera can be effective in order to create tension in a scene, but it should not move so much that it draws attention to itself. Fight scenes or chase scenes can be effective places to use a hand-held camera. The most visually distracting use of a hand-held camera is when it is used to shoot an establishing shot. It could work, if the shot is the point of view (POV) of one of the characters, but otherwise it looks awkward. I always wonder if the crew forgot to bring a tripod to the shoot.

When shooting a scene from the various angles that are needed for editing, make sure you have at least two good takes of each angle. Once a good take is done, you can do another for safety reasons. You never know when there might be an issue with the good take and you have to rely on the safety take to make the edit work.

Film is a visual medium and, because of this, the standard approach to a scene is "show, don't tell." Dialogue is there to explain and add information, but not if it can be conveyed through a visual. For example, a character might say, "I feel angry my lover is having an affair" or the director could shoot the character opening a closet, grabbing the lover's clothes, taking them outside and throwing them in a dumpster. No dialogue needed; the pictures tell the story.

A director can control the impact of visual images by understanding the specific types of shots, angles and camera movements available to them. Chapter 10 "Camera" describes various shots, angles and movement for the camera.

Once the blocking is done and the camera is in its first position, usually for the master shot, then the lights need to be placed. If you are doing a three-point lighting scheme, the first light to be placed is the key light. The fill light is added next, followed by the backlight. Once these are set, you can move on to the set background lights and any accent lights that will support the lighting style. The lighting style could be natural. An example is if there is a window and no other light sources in a scene, the set should look like all of the light is coming from the window. If a character turns on a floor lamp during the scene, then any additional lighting should look like it comes from that "practical lamp."

Remember, when you light a set, you need to use the lights in a manner that draws the audience's attention to where you want it to be in that scene. In order to save time, the director and DP should develop a "lighting plan" during preproduction. It will give them a starting place for setting the lights. A lighting plan is a drawing or diagram that shows where lights are going to be placed for a scene. There is an example in Chapter 11 "Lighting."

Sometimes a more stylized look is called for. Many commercials and some movies are shot this way. The lighting has a natural element, but also a look that is not based on natural light sources. For example, there may be a blue backlight on a character, but there is no light in the scene that would cast that color of light. It is unnatural, but effective.

Once the lighting is set and the actors are in place, it's show time. When the first scene is done move on to the next one for that day. Ideally, there is a swing crew or there are enough crew members that some of them have gone ahead to the next location to get an early start on being set up.

FIRST ASSISTANT DIRECTOR (1ST AD)

The director will primarily work with the actors and the DP.

Nearly everything else happening on the set will be the responsibility of the 1st AD and the production manager. The 1st AD will often be the one who calls for the cameras to roll and calls for "action." A common form of roll call is included in the online Appendix. The 1st AD will be watching the clock and moving the production along to stay on schedule and within budget. They help the director, but they also help the producer.

Filmmaking is a collaborative effort and the trifecta on set are the director, the DP and the 1st AD. While the director and the DP are creating, the 1st AD is planning for the coming scenes while overseeing the current scene. They all need to work in unison to be effective. For example, if the director decides that they want to move a scene to the end of the day to get a nice sunset, the 1st AD and DP must figure out how to accomplish that in terms of the day's schedule and the lighting needed.

During preproduction the 1st AD determines the shooting schedule and during production they provide the daily call sheets. If the production falls behind schedule, the 1st AD figures out how get back on schedule. They may have to reschedule some of the production days or work with the director on cutting shots or even scenes, otherwise the production may go over schedule and budget.

All of the 2nd ADs and 2nd 2nds (3rd ADs) and production assistants are under the 1st AD. They help out both on and off set, while the 1st AD is just on set. 2nd ADs have responsibilities such as doing some of the daily paperwork, bringing actors to the set, directing the background actors and distributing call sheets.

CALL SHEETS

MISTAKE

Call sheets are a hassle, so I just text everyone where to go and when to be at the location for the next day.

Good Day Productions 11280 San Fidel Blvd. San Fidel, CA (555) 123-1234	**Bad Day Back Call Sheet**	Monday, June 1, 2020 Day 3 of 12 High 78 and Low 65. Sunny No Chance of Rain - Wind 10 mph SW Sunrise: 6:15 Sunset: 8:45
Producer: Todd Smith Director: Jenna Rowlings 1st AD: Brian Moore Associate Producer: Cheri Jones UPM: Derek Ayelle	General Call Time **8:00 AM** 1st Aid: Lisa Bench (555) 543-5432	Breakfast: 7:30 am Makeup & Hair: 8:00 am Shooting Call: 9:30 am Lunch: 1:00 - 2:00 pm Estimated Wrap: 7:00 pm

LOCATION INFORMATION

Location	Address	Notes
Doobie's Pub	1234 Main Street, Crystal, CA	Parking behind Doobie's Pub
Tiller's Beach house	1234 Oceanview Drive, Crystal, CA	Designated parking at Oceanview Park

SHOOTING SCHEDULE

Scene	Set & Description	Cast	D/N-Script Day-Pages		Location
11, 23	INT PUB	1,2	D	4 2 3/8	Doobie's Pub
Company Move - 15 minutes					
12, 15, 22	EXT & INT TILLER'S BEACH FRONT HOUSE	1,2,4	D	5 1 4/8	Tiller's Beach House

CREW INFORMATION

Position	Name	Call Time	Contact Information
DP	Will Bennet	7:30 AM	(555) 123-2345
Prod Designer	Adriene Smythe	7:30 AM	(555) 123-3456
Sound Mixer	Aaron Colton	7:30 AM	(555) 123-4567
Wardrobe	Micky LeVerne	7:30 AM	(555) 123-5678
Makeup/Hair	Julian Greene	7:00 AM	(555) 123-6789

CAST INFORMATION

Cast #	Character	Transportation	Arrive	Makeup/Wardrobe	On Set
1 - Ann Hathaway	Mable Klein	Driver Pickup	7:30 AM	8:00 AM	9:30 AM
2 - Ben Tiller	Brian Tiddle	Drive Self	7:30 AM	8:00 AM	9:30 AM
4 - Leon Grant	Gabe White	Drive Self	9:30 AM	10:00 AM	11:00 AM

TRANSPORTATION

Passenger	Driver	Time	Pickup Location	Drop-off Locaation
1 - Ann Hathaway	Luke Tripper	7:00 AM	122 Fernwood, LA	1234 Main Street, Crystal, CA

BACKGROUND ACTORS

#	Description	Report Time	Set Call Time	Scene
3	Bartender/Patrons	9:00 AM	9:30 AM	11

LODGING INFORMATION

Location	Address/Phone	Notes
San Luca Hotel	1780 Balboa St. Crystal, CA (555) 123-7890	7:00 AM Shuttle

ADVANCE SCHEDULE - Tuesday June 2, 2020

Scene	Set Description	Cast	D/N	Pages	Location
13,14,21	INT. ART STUDIO. Ann and Ben meet Leon	1,2,4	D	2 3/8	Tiller's Office. 1345 N Seaview, Crystal, CA

Notes and Special Instructions:
Wet down for street in front of Tiller's beach house

Figure 9.2 Call sheet

Basic call sheet information can be send via email or texting, but a call sheet printed out and handed to a cast or production member is the best way to make sure they see it. An emailed PDF version is a good follow-up to make sure the call sheet is available to them and not lost somewhere. A simple text will not have enough information to prepare everyone and everything for the next day's shoot.

The 2nd AD creates the call sheet from production information for the next day of shooting. The sheet will inform the cast and crew of the call time, and the location, and they should report to the next day of production.

There is a lot of other information on a call sheet:

- The call time is written at the top of the call sheet in large font size.
- The actor's name, their character name, what time to arrive on set, if needed that day, what time to be in hair, makeup and costume, what time to be ready for filming.
- Meal-break times for breakfast, lunch and expected wrap time is included. The caterer will also be listed and the number of people to be fed.
- Contact information, which are the phone numbers of the department heads and other important contacts.
- A list of scenes to be shot that day, noting if they are INT (interior) or EXT (exterior) and D (day) or N (night). There will also be a sentence about the action to be shot for each scheduled scene.
- Number of script pages that are being shot, which are written in 8ths. For example, a scene that is a half-page long will appear as 4/8ths.
- The address of the shoot locations and any set/location notes. Also, if needed, directions and maps.
- Whatever arrangements are made for the transportation of the cast.
- Parking instructions for all vehicles both personal and production.
- Weather information, which lets everyone know how to dress for the day's work.
- Sunrise/sunset times.
- Safety notes.
- Local hospital address as well as the locations of the production first aid kit and the name of anyone trained in first aid.
- Restaurants near the set/location.
- Hardware stores nearby.
- Special equipment needed for production.
- Notes and requirements; for example, a rain rig may be needed for a scene.
- Advance schedule, which is sometimes included, telling what scenes and locations are scheduled for the next day.

SIDES

Sides are the pages of script that will be shot on a given day. These pages are usually "distro" (distributed) to the talent the night before they will be shot and to the crew the morning of the shoot. They can be created and distributed physically, via email or in the cloud.

SETUPS

These are the various placements for the camera and lights for each scene until that scene is "covered." Covered is when all of the necessary angles have been shot for a scene.

BACKGROUND ACTION

Background actors are usually being directed by a 2nd AD. The actors are told where to go, when to move and what to do during a shot. This is particularly important in the wide shots, but also in the closer setups as there needs to be continuity of action from shot to shot. There are countless times when I have seen a background actor, car, horse or other moving object in the wrong place between shots.

VIDEO VILLAGE

Having a video village on the set or location is great for the key crew members to be able to view what the camera sees. The video is transmitted from the camera to a receiver and monitor in the video village. The sound comes as a feed from the sound mixer. The director, DP and producer may have their own handheld receiver/monitor. Some transmitters can send a signal to the cell phone of other crew members, so they can watch that way.

SCRIPT SUPERVISOR (SCRIPTY)

They will keep everyone informed as to what scene is being shot. The scripty keeps track of the dialogue for each take and what the scene and take numbers are for the slate. In some countries there are only numbered takes starting with 1 and ending with the number of the last shot on the last day of the production.

The scripty is often the continuity person noting what the actors do, where they move and what they touch. They also note the set decorations, vehicle placement, what props are used and how, the makeup and costuming of each character and the blocking. They use this information to make sure that there is consistency between takes and shots. They watch for mistakes like the drink being in a character's right hand in the master shot but being in the left hand in the close-up.

SPECIAL EFFECTS (SFX)

Figure 9.3 Wet down of street (by Chris Curry)

In order to keep costs down, it is a good idea to limit special effects. For example, rain is a great effect, but the setup to get rain falling naturally on the set is expensive and time consuming. A better option is to do a "wet down," which can be done with a garden hose for a small set or with a water truck for a larger set. The truck will spray water on the street, sidewalk, trees, cars, buildings and whatever else might be wet from a rain storm passing by. The wet look is very attractive to shoot and easier and

less expensive than a rain machine rig, but will still give the scene a rainy look. Although I have used a smaller and less expensive homemade rain rig for a limited area and it was effective.

GREEN SCREEN

Green-screen shots are necessary if you want to composite in a special location, object or being. These shots take a while to set up as the green background needs to be hung and then lit evenly. The more even the light, the easier it will be to key the image over the green area.

ADDED SCENES & RETAKES

Once principal photography is completed, you may discover that another scene or perhaps several need to be added to help tell the story. There may also be a problem with a scene and then a retake of that scene will have to be shot.

SAFETY

MISTAKE

The truck will be driving slowly when the actor jumps from the bridge on to the bed of the truck. What could go wrong?

Safety considerations can be found in the online Appendix item called "Safety."

PRODUCTION TERMINOLOGY

Many of the terms used during the production of a film can be found in the Glossary for this book.

10 CAMERAS

CINEMATOGRAPHERS

> **MISTAKE**
>
> I'm going to be my own cinematographer. I'll just put the camera on auto and use available light.

Although it may be easy to shoot in auto mode, the results are usually only fair. It is by learning how to operate the camera effectively that one can use it creatively. This chapter provides information for you to be able to use a camera to make images that best tell the story.

The main purpose of any director of photography (DP) is to serve the story using lighting, lenses, composition and camera movement. Cinematographers apply their knowledge of light to emotionally affect an audience.

Figure 10.1 Cinematographer (by Benjamin Wedemeyer)

The DP and the director work closely to get the right lighting for the right mood on the set and for the actors. Usually they work together to determine blocking, camera placement, camera movement, camera angles and lighting. However, the director determines how much or how little they want collaboration on these decisions. Some directors discuss what they want and then leave it up to the DP to create it. Others will be very specific about what they want both creatively and technically. The only time a DP would normally disagree with the director is if there is a safety issue.

A cinematographer cannot save a bad script or bad acting, but they can help with the look and feel of the film. The DP uses their talent and knowledge to turn the words and emotion of the script into pictures. They are artists who paint with light.

Once the lighting setup is decided for a scene, the DP supervises the camera operators, camera assistants, grips and gaffers to make it happen. The grips actually handle the dolly, crane or other form of camera movement. The gaffers or electricians control the lighting setup and anything involving electricity.

The DP rarely operates the camera on a large crew, but may on a smaller crew. The operator sees when the shot is in focus and if the framing and timing of any moves are right. In most scenes there is a dynamic between the camera operator, the director and the actors.

CAMERAS

MISTAKE

It's the camera that matters the most. If you don't have the best camera, no one will take your filmmaking seriously.

It is usually the cinematographer's choice as to what kind of camera will be used to provide the right look and the specific format required for the film. You can shoot a film on a smart phone, a family handy-cam, or an Arri (Arnold & Richter) Alexa camera. The sole purpose of the camera is to record the story.

The movie *Cosmos* (2019) was made for $7,000 and was shot on a Black Magic Pocket Cinema Camera using a 28mm lens from the 1960s for 90 percent of the shots. It was shot in standard HD at 24fps in ProResLT. It was upscaled to 2K for theatrical distribution.

Whether it is a film or video camera, the media in the camera body is what can record images. Digital video records to memory cards or drives. Most video cameras shoot FULL HD 1080P, 2K, 4K, and some can record 5K, 6K, 8K and higher pixel counts.

Digital video cameras typically come with a viewfinder/monitor, audio inputs, audio monitoring and media storage. Some come with a fixed zoom lens, while others can utilize removable lenses. Some lenses are zoom and others are fixed focal length lenses, especially those referred to as prime lenses. Zooms can change the focal length over a range of sizes, while prime lenses come in many different fixed focal lengths. They are often rented or sold in a set.

A digital cinema camera usually is able to record audio through XLR inputs or even on-camera microphones. DSLR or mirrorless cameras may have audio inputs, but they are usually only the 3.5mm input type, plus the pre-amps are often of lower quality. That is why it is better to record audio on a separate recorder, especially when shooting with a cinema camera.

A DSLR camera uses a mirror to reflect the image coming through the lens to an optical viewfinder. When the camera is shooting, it flips the mirror up and allows the image to hit the sensor. A mirrorless camera has an electronic viewfinder and the image goes through the lens and on to the sensor since there is not a mirror to move away. The DSLR design is based more on a classic 35mm still film camera, while the mirrorless camera is more like a video camera.

Different cameras have different dynamic ranges, which is a measurement from how light to how dark of an image the sensor is able to achieve. A less expensive digital video camera may only have dynamic range of 5 or 8 stops, while a professional camera may have 12 to 15 stops between the dark and light areas captured. The less dynamic range, the sooner the light areas become white and the dark areas become black. Dynamic range is the depth of gray area between black and white.

When you are considering what camera you need for your production, you need to look for the camera that will best produce images that support the story. Test different cameras until you find one that has the best look in terms of color rendition and contrast. Shoot some test footage with each camera and do a color grade to make sure it can produce the look you want.

MEDIA

The media used will vary from camera to camera or recorder to recorder. The biggest issue with media is not having enough cards or drives to record everything. Another issue is not having a good system for data wrangling, so that the media is transferred properly and that cards are not mistakenly erased before that can happen.

Try to calculate how much storage space is required for the shoot so that you have enough media.

SUPPORTS (TRIPODS & RIGS)

MISTAKE

I don't need some kind of camera support. I'm going to shoot my film all handheld. Tripod shots are so boring.

Tripods

Tripods, which are three-legged camera supports, are useful for performing pans and tilts of the camera. A "pan" is a horizontal camera movement and a "tilt" is a vertical movement. A tripod allows for smooth movement when following the action with the camera.

Tripods with "fluid" heads provide a smoother movement than those with "friction" heads. A tripod with a claw ball is easier to level than one that requires the operator to adjust the height of the legs until the camera is level. Tripods usually have legs that are adjustable in height.

Tripod Usage Tips

Make sure the legs are spread out in order to give stability to the tripod. Point one of the legs out front so there is room for your body behind the camera. Put two legs out front when the tripod is on a hill for a sturdier camera platform.

If the tripod legs have more than one section to extend, then extend the top ones first as they will provide great stability. The thinner lower legs are less stable. If there is a center column, only use it once all of the legs have been extended fully as the column is really a monopod and is not as stable as the three legs.

In order to add greater stability, a weight of some kind can be added to the tripod hook below the camera. If there is no hook, the weight can be placed on the "spreader" between the legs. If there is no hook or spreader, wrap the legs with sand bags or some other weight.

Once the camera is at the proper height, make sure that the camera is level, unless you are doing a tilt shot. Some tripods have level bubbles and ball heads that make leveling easy, while other less expensive models may need to have the legs adjusted until the bubble or framing looks level.

While you are setting up the camera, go into the menus and turn off the IS (image stabilization) as it is not needed when the camera is on a tripod. If left on, some cameras will constantly try to stabilize the image.

A scene could be shot handheld, but using a tripod adds a more cinematic look to the shot. It is good practice to shoot all scenes on a tripod until you

have the "coverage" you need then shoot the scene using a gimbal, drone, dolly, crane or even handheld, if you may want to use such a shot.

Handheld Cameras

Shooting with a handheld camera is great in concept, but difficult to do effectively. Where it works well is in news and documentaries because the camera operators become adept at this shooting style. It is also used in some television shows and in films. It is particularly effective in horror and action movies as it gives the audience a sense of being in the action.

There are handheld rigs that help the operator balance and stabilize the camera. They are most useful when the camera is in full cinema mode and has an external monitor, matte box, follow focus and audio receivers attached to it. These rigs are especially useful when shooting with a mirrorless or a DSLR camera since they are smaller than most video cameras.

Handheld shots works best if the lens is in a wide-angle framing. A telephoto or zoomed-in shot can be fairly shaky and difficult to keep properly framed.

Handheld will look acceptable when following along with an actor. The camera operator needs to get in step with the actor in order to make the walking motion less noticeable. Handheld does not usually look right when shooting an establishing shot of a building, landscape city or other static object.

The biggest issue with shooting everything handheld is that it can look like a home video, unless the subject of the film really calls for it. Otherwise, a tripod is your best friend. A fluid-head tripod will allow for smooth pans and tilts, which will add movement to the shots, without being distracting. It also adds a level of professionalism and consistency to the footage. Save the handheld shots for the dramatic fight scenes or the tense action shots.

Stabilizers

Gimbal and manual stabilizers are a great way to add movement and still maintain a stable look. Some require manual operation, while others are motorized. The manual ones function much like a larger classic Steadicam, which allows the camera to free-float using a vest, stabilizing arm, weighted sled and spring-loaded apparatus. The motorized ones will maintain the balance without manual interaction. The manual ones do not require battery power, but the motorized ones do. Many of the inexpensive stabilizers do not have vest and springs, but are weight balanced to reduce unwanted movement.

These stabilizers allow for long continuous moving shots that do not require tracks to run on like some dollies do. However, operating a floating stabilizer can get tiring fast, while operating a dolly does not require the demanding effort of the operator holding the weight of the camera and outboard gear.

Sliders

A slider is a track that can hold a tripod or a camera head and allows for the camera to move much like a dolly. They can move side to side and move in or out. Most of them have a limit to the length the camera can move. Some are only a few feet (1m) in length, but they still allow for some dolly-style movement. Some sliders are simple and require the camera operator to push them along, while others are motorized and can perform the same move repeatedly. Some sliders can be positioned in a vertical orientation, which allows the camera to have an up-and-down motion. They are essentially small dollies with a limited range, but they are effective in adding movement to a shot.

Dollies

Some dollies ride on tracks that can be straight or curved, while others ride on the ground or other smooth surface. The track wheels are made of hard rubber and the wheels for the ground usually have inflatable tires. Some dollies allow for both types of wheels. A doorway dolly, a crab dolly and many other types can be pushed and steered by a dolly grip.

A skateboard dolly can be made for very little cost. PVC pipe can be used for the track. Skateboard wheels can be used for the dolly wheels. The wheels are attached to a wooden board that is large enough to accommodate the camera and tripod. This simple design will give you a workable dolly. There are internet videos that show how to build them.

- Dolly In: A slow push into a character can add a feeling of intimacy and help the audience connect with the character. A fast dolly into a character can have a shock effect on an audience.
- Dolly Out: A long slow dolly out from a character can be used to show they are alone or unwanted. A quick dolly out could be to reveal something or someone who was outside of the initial frame.
- Dolly Tracking: As the dolly smoothly moves from one side to the other across the set, it can reveal the setting or another character in the scene. It can also be used to direct the attention of the audience from one important view to another one; for example, a dolly move from a person watching a television show over to just the television.

Jibs/Cranes

A jib is an arm that can move the camera up and down, left to right and everywhere in between. The camera is at one end of the arm and a balancing weight system is at the other end. The jib arm is usually held up by a tripod or a center column.

It can be very effective to start with a bird's-eye view establishing shot that leads into a scene by craning down from up high and settling at eye level. It can also be effective as a sweeping horizontal shot that takes in the landscape before framing in the talent.

Cranes are large jibs, some of which can carry the camera operator, an assistant and sometimes even the director. Most of them are remote controlled and some are motion controlled, which allow for the same movement to occur repeatedly. The operator will stand on the ground and view the framing through a monitor while remotely controlling the crane and the motorized head that holds the camera.

Action Cameras

These are the small cameras that can be mounted to anyone or nearly anything. They can be mounted to cars, bicycles, snowboards, helmets, surfboards and many more items. Some of them are capable of shooting underwater footage. They are inexpensive and thereby used for dangerous shots that may damage the camera.

When mounting a camera to a vehicle safety is the primary goal. A process truck with driver is ideal because the picture vehicle is mounted on a lowboy trailer pulled by the truck. Another option is to tow the picture car behind a pickup truck using a tow bar. A common low-cost way to shoot a driving shot is to use a suction mounted camera platform attached to the picture car. It is important to do proper rigging with a suction cup mount or the rig and camera may fall to the ground during the shoot. Lightweight DJI Osmo and GroPro cameras are ideal for this type of a shot. When using a suction cup mount, the driver of the car is actually driving, so it is best to do a lockdown and block off the road. If you are using a private street or driveway get permission from the owner to shut it down, but if you need to use a public street, then you need to contact the appropriate police department to coordinate the shoot.

Aerial Shots/Drones

Drones are small remote-controlled helicopters that carry remote-controlled action cameras as well as larger cameras, depending on the size and power of the drone. They are great for getting aerial establishing shots,

either static or in motion. Drones are programmable and can repeat shots over and over. Be aware that each drone will have a limit as to the wind speed it can effectively fly in. Drones are capable of a dolly- or crane-like movement; however, they are noisy and would require ADR (automated dialogue replacement) for any dialogue spoken near one.

High winds can make a drone shot difficult. A general rule is that the wind should not exceed two-thirds of the fastest speed the drone can fly. For example, if a drone has a top speed of 30 mph, then the wind speed should not be above 20 mph. A strong wind can send a drone off-course and make shots very shaky. An actual helicopter rigged with a stabilizing camera mount is the better option for high-wind environments.

Wire Rig

This is a high-end remote-controlled system that has the camera mounted on a gimbal and the gimbal held up by four wires. The four wires stretch out to all four corners of a location. The wires are attached to one of four motors, which are mounted as high up as possible in the location. The motors can raise and lower the camera and also move it anywhere inside the rectangle of a stadium, concert hall or large set. They are commonly used in professional football or gridiron games to give the viewer a birds-eye view of the field. There are less expensive versions that use only one or two wires.

CAMERA MOVEMENTS

MISTAKE

A zoom lens is all that I need to make a film. I like how it can go from a wide shot to a close-up and then back out to a wide shot again without having to change lenses or move the camera.

Static: The camera does not move at all. It is "locked down."

Pan: This is a horizontal movement either left or right. It is best performed on a tripod. It is commonly used to follow the action, show a pano-ramic view or to move between two actors or objects. The movement usually begins with a static shot and then turns into a pan and then ends with a static shot. This type of action will make the shot easier to edit. Sometimes for dramatic effect a "whip pan" or "swish pan" is used. This is when the camera moves so fast that the image is blurred.

Tilt: This is a vertical movement either moving up or down. It may be used to follow the action, but is commonly used to reveal something about a person or object. The movement usually begins with a static shot and then turns into a tilt and then ends with a static shot.

Zoom: A zoom is a lens that smoothly changes focal lengths and thereby framing, without moving the camera. A shot may start out as wide and then zoom into a close-up shot or the reverse. A zoom shot is more commonly used in television than film. In film, the lens is changed or the camera is moved to change the framing. A zoom can be combined with a dolly shot, called a dolly zoom, to give a disorienting feeling to the shot. If timed properly, the zoom and dolly will keep the subject the same size in the frame, but the background will change during the moves. Alfred Hitchcock used it in *Vertigo* (1958) and Steven Spielberg used it in *Jaws* (1975).

Tracking Shot: A tracking shot usually has the camera moving alongside the actors. It can be a visually simple way of getting actors from one location to another. This may be accomplished with a dolly, gimbal stabilizer or even a drone.

Dolly: This type of shot is usually for moving around or along with the actors. The dolly can be on a track or it may be steerable.

Crane: A shot from a crane is primarily for up-and-down movements; however, they usually are able to move side to side too.

360-Degree Shot (Arc Shot): This is an arc shot that orbits totally around the objects or characters in a scene. This is accomplished with a dolly running on a circular track. It can be performed more simply with a stabilizer, such as a gimbal. A dolly will be more accurate in making an exact circle, but it will require a crew moving around with the dolly in order to stay out of the shot. Because of lighting and a 360-degree view of the background, these can be difficult and time consuming shots to accomplish.

SHOT FRAMING

Most directors start with the establishing shot and progressively move in to tighter shots. However, in an emotional scene, it might be better to get the close-ups first.

It is common for less experienced filmmakers to shy away from shooting close-ups. They tend to make a medium shot the closest shot they use. Although it may seem invasive to shoot a close-up, it is worth shooting in order to have a greater sense of intimacy and for an audience to be able to read the emotions on an actor's face.
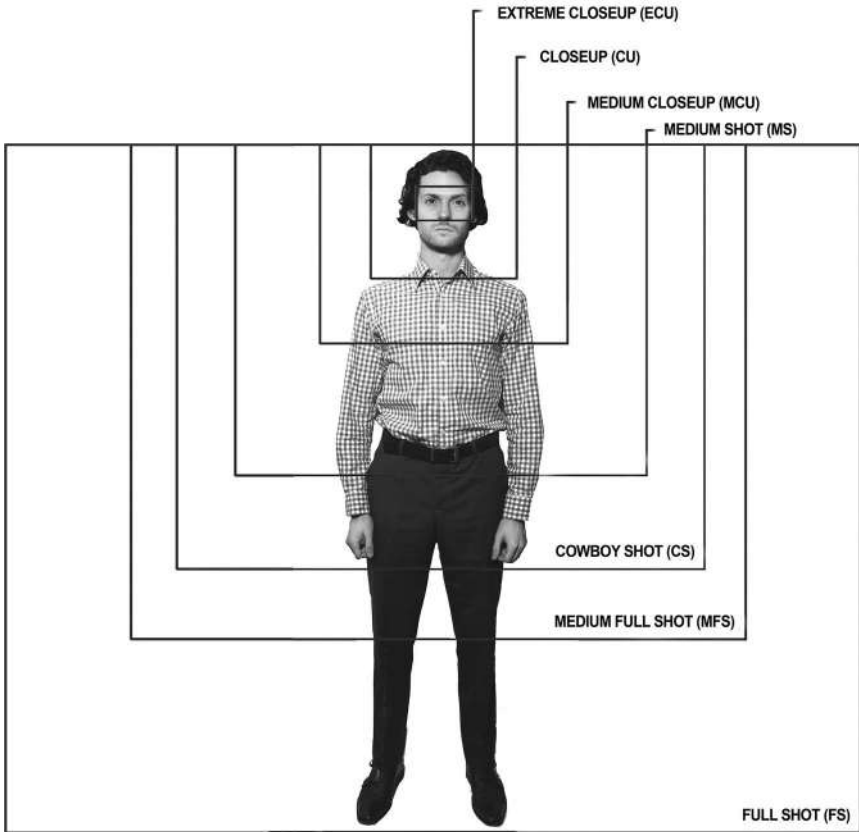
Figure 10.2 Different framing options on actor

Extreme Close-Up (ECU): This is a tight shot on the face or some small
 detail or object.
Close-Up (CU): This is a very powerful shot that focuses close into a sub-
 ject such as the head and shoulders of a character.
Medium Close-Up (MCU): A medium shot frames in the upper torso and
 head of the character.
Medium Shot or Mid-Shot (MS): This shot type allows the audience to see
 most of the character, from about the waist to above the head, which
 gives us information about their wardrobe, the environment and any
 props they may carry.
Full Shot (FS) or Long Shot (LS): This is a shot that frames in the whole
 body of a character and the surroundings.
Wide Shot (WS)/Master Shot/Establishing Shot: All of these terms mean
 that the scene needs to be shot wide enough to take in all of the

characters, action and the environment at the location. It shows which characters are in the scene and where they are in relation to each other.
Ultra-Wide Shot or Very Wide Shot (VWS): This is a more panoramic shot than the others and is very wide.

In general, a wide lens is used for wider shots and telephoto lenses are for closer shots, but there are films that have been shot with only a standard 50mm lens.

SHOT TYPES

Figure 10.3 Shot types

Single Shot: A single shot is of one character only.

Two Shot: This is a shot with two characters in it and they are usually facing each other.

Three Shot: A three shot has three characters in it and two or all three may be facing each other.

Over-the-Shoulder (OTS): This is a usually a medium shot where two people are talking and the framing has one character off to the side of the frame with the back of their head and/or one shoulder in frame and the other character facing toward them. It is useful to bring the audience into a conversation in a dialogue scene. This is commonly edited with a reverse shot coming from over the shoulder of the other character.

Reverse Angle Shot: This is a shot that is 180 degrees, or nearly that, from the previous shot and usually shows a reaction shot from the person being spoken to in a two-person conversation. In keeping with the 180-degree rule stated below, each person will be on opposite sides of the frame.

Reaction Shot: This is a shot that shows the reaction of a character to an event or to a statement made by another character. The first shot shows the character making the statement and the second shot shows the reaction of the other character.

Point of View (POV) Shot: The POV shot takes the first-person point of view and allows the audience to see the world through the eyes of a character. It can help the viewer to feel completely immersed in the world of the story and to have a sense of what emotion the character is feeling.

The Oner or Long Take: A "oner" or one-shot is when there is either one very long take or there are many different shots linked together to give the impression of one long take. The Sam Mendes movie *1917* (2019) is a perfect example of an entire movie shot as though it were one long take.

Cut-In or Insert Shot: This is a close-up shot that is inserted in the action to draw attention to some small detail or object. It is usually of something that can be seen in a wider shot and is important enough to bring attention to it.

Cutaway Shot: A cutaway shot is usually of something that has not been seen before in a wider shot. It interrupts the flow of action, adds information and then usually cuts back to the action.

CAMERA ANGLES

Figure 10.4 Shot angles

Along with all of the other aspects of choosing how to shoot a given shot, there is also the angle from which the camera is recording. The camera

angle can give the viewer information about the emotional state of the characters. Below are some examples.

Eye Level: The most commonly used camera angle is the eye level one, which puts the camera and thereby the viewer on the same level as the actors. It is a very natural perspective for observing the action.

Low- or High-Angle Shot: A low-angle shot might be from around knee or waist level and is looking up. Worm's Eye is from ground level. These angles can make a character look strong and dominating. A high-angle shot is one that is above and looking down. This angle can make a character look powerless and insignificant.

Dutch Angle, Canted or Tilted: This is an off-level or canted shot where the camera is at an odd angle to the characters or action. It is a good angle for making the audience feel disoriented and uneasy.

Overhead and Aerial: This bird's-eye view is great for showing the magnitude of scope and scale of a setting. Helicopters or drones are great at capturing this type of shot. Just like with a high-angle shot, it can also make a character or object look insignificant in comparison with the wide world view.

BASIC RULES

The Rule of Thirds

Figure 10.5 Rule of thirds (by Kevin Noble)

The rule of thirds is a commonly used technique that is employed to create images that are balanced and engaging to the eye. The idea being that composition that is off-center is more interesting. Some cameras have guides that overlay the viewer with two vertical and two horizontal lines which divide the frame into equal proportions. The lines and the intersecting points show the camera operator where to place the subject or actor. The area around the subject or actor is called "negative space," which causes the viewer to focus attention on the subject as the other parts of the frame are of less interest.

Framing of Actors

Figure 10.6 Head room and lead room

Proper framing of an actor is essential unless there is a good reason to have an off-balanced frame. There needs to be "lead room" or "nose room" which places more room in front of an actor than is behind them. Allow

some head room, but do not put too much room above the head, nor have the head at the top of the frame. In general, the bottom of the frame should either be above or below arm or leg joints.

180-Degree Rule

The "180-degree rule" states that when two characters are opposite each other you should maintain the same left/right orientation to one another in terms of the camera placement, unless there is a clear reason to "cross the line." There is a graphic and a more detailed discussion in the Chapter 9 "The Shoot."

LENSES

The cinematographer usually chooses the lenses that will be used to film the various scenes in the film, although some directors have certain lenses they like to use.

Most film cameras and digital cinema cameras do not come with a fixed lens, which is a lens that cannot be removed from the camera. If a camera comes with a fixed lens, it is usually a zoom lens. The advantage to having an interchangeable-lens system is that the camera has the ability to use a multitude of lenses, including a zoom lens. The fixed focal length lenses run the range from very wide angle (6mm) to super telephoto (150–600mm) and above. A zoom lens does offer a continuous set of focal lengths from wide to telephoto, but unless you spend a lot of money on a zoom lens, the zoom will probably not perform as well as the fixed focal length lenses.

There are many things to consider when choosing lenses to shoot a film. For example, how sharp is the image of a given lens? How well does it transmit light to the sensor? What is the widest aperture or f-stop it allows? Does it match other lenses that you intend to use? In order to achieve a level of consistency in image quality, a set of lenses that are created to match, such as prime lens systems, are an ideal choice. Some common prime lenses are 14mm, 24mm, 25mm, 35mm, 50mm, 85mm and 135mm. A 50mm lens used on a full-frame 35mm sensor camera will give the viewer a similar view as the human eye does.

A basic video on how to choose the right lens for a shot can be found on YouTube at: www.youtube.com/watch?v=JAZ7mXRDa7M.

JavaScript if it is disabled in your browser.

ASPECT RATIOS

Aspect ratios represent the dimension of the frame of the image. The first number in the ratio represents the width of the frame and the second number is for the height.

There are spherical lenses for various aspect ratios such as, 1:1, 3:2, 4:3 (1.33:1), 16:9 (1.78:1) or 1.85:1 (cinema), which are the most common types. There are anamorphic lenses for cinematic wide screen at 2.35:1 or 2.39:1. Anamorphic lenses on a camera squeeze the wider image into the standard 4:3 aspect ratio. In order to properly view the anamorphic image it must be unsqueezed. Many digital cameras have the ability to shoot a wide-screen format without having to squeeze the image, but if you shoot with an anamorphic lens the image must be unsqueezed during postproduction as most modern theaters only show movies with spherical lenses, not anamorphic.

A common ratio is 16:9 (1.78:1), which means that for every 16 pixels wide the image is, there will be 9 pixels in height. Full HD video is 1920 × 1080 pixels. 1920 × 1080 can easily be scaled down to 1280 × 720, which is HD-720 or scaled up to UHD-4K, which is 3840 × 2160 (1.77:1). However, C4K Full Frame (Cinema 4K) also known as DCI (Digital Cinema Initiative) at 4096 × 2160 (1.9:1), is slightly wider than UHD (Ultra High Definition). CinemaScope is 4096 × 1716 (2.38:1). Some digital cameras shoot at 8192×4320, while some cinemas project 8K images at 8192 × 8192. 8K UHD has a resolution of 7680×4320. 16K has a resolution of 15360 × 8640, which doubles the size of 8K UHD. There are a lot of variables to consider when choosing an aspect ratio and resolution. Figure 10.7 shows the classic aspect ratios for film.

4:3 or 1:1.33 and 1:1.37 for Non-wide Screen Academy Standard — 4:3

3:2 or 1:1.5 for Mirrorless and DSLR Standard and 35mm Film Cameras — 3:2

16:9 or 1:1.78 for Standard High Definition — 16:9

1.85:1 for USA Standard Film (Flat) — 1.85:1

1:2.35 or 1:2.39 for Wide Screen (Scope or Anamorphic) — 2.39:1
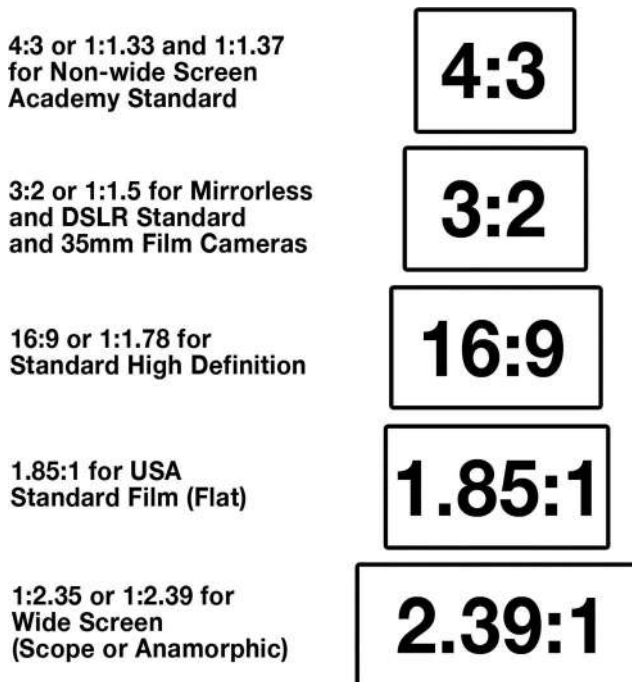
Figure 10.7 Common aspect rations

APERTURE OR IRIS

MISTAKE

If I put the camera on auto, I won't have to worry about all of the settings. The camera does that for me.

Putting the camera setting to auto may make it easier to shoot, but it takes away all of the creativity that can occur with camera settings and filters.
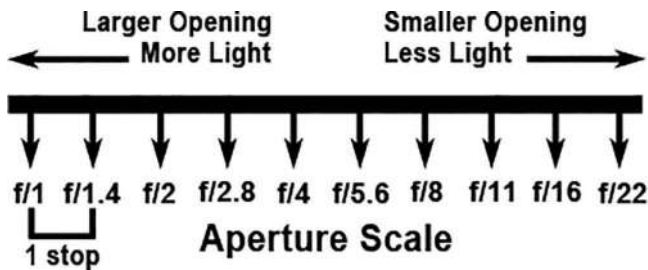
Figure 10.8 Aperture scale

The aperture or iris is a set of blades located inside the lens that adjust the amount of light allowed onto the sensor. The larger the aperture or opening, the more light is hitting the sensor. This would be an f-stop with a low number such as f-1.2. The smaller the aperture opening, the less light cast upon the sensor. This would be a higher number f-stop such as f-22. A "stop" is one step in a scale of light passing through an aperture.

Each step or stop down, which is an adjustment to a higher number, allows half as much light into the camera:

- f/1.4 (Is a very large aperture opening, which lets in lots of light)
- f/2.0 (lets in half as much light as f/1.4)
- f/2.8 (lets in half as much light as f/2.0)
- f/4.0 and so on …
- f/5.6 (is a common opening for an interior lit scene)
- f/8.0
- f/11.0
- f/16.0 (is a sunny day setting)
- f/22.0 (is a very small aperture, which lets in very little light)

Remember, f-stops start at either 1.0 or 1.4 and then double as they go up a stop. For example, f-1.0 doubles to f-2.0 and then that doubles to f-4.0,

then f-8.0, f-16.0, f-32.0 and so on. Doubling f-1.4 gives an f-stop of f-2.8, then f-5.6, then f-11 (rounded off) and then f-22 (rounded off), etc.

An f-stop is a calculation involving the focal length of a lens and the diameter of the aperture. For example, a 100mm lens with a f-stop of f4 would have an aperture opening of 25mm, which mathematically would be 100/4 = 25. The f is the focal length, which is divided by the stop number in order to get the diameter of the opening of the iris.

The proper stop setting depends on the power of the lighting, the distance of the subject to the light source, the aperture size and the cameras ISO setting.

T-Stops vs F-Stops

There is a subtle, but important difference between these two ways of determining exposure. Most video and still photography lenses use f-stops, while high-end cinema lenses use T-stops. The f-number of a lens is the ratio of the focal length to the diameter of the aperture. The T-number is based on the actual light transmission that travels through the glass of the lens. The glass will absorbs some of the light.

They are close, but the difference will show in postproduction when the shots using a lens with f-stops might vary in exposure with different focal lengths lenses even if they are set at the same f-number. This variation is usually no more than a third of a stop. Different shots that use lenses with the same T-stop, no matter what the focal length is, will all have the same exposure and thereby, in theory, will probably not need to be color graded differently for exposure in postproduction.

An exposure in f-stops of f/2.8 might be f/3.2 in T-stops for the same lighting setup. The glass on the T-stop lens will have absorbed about one-third of a stop of the light. Since f-stops do not take into account the loss of light through the glass, the exposure stops will be different.

If the human eye were calibrated in f-stops, the number for a bright day would be around f/8.3, while a night scene would open our irises up to about f/2.1.

GAIN OR ISO (INTERNATIONAL ORGANIZATION FOR STANDARDIZATION)

This is the light sensitivity setting of a camera's sensor. ISO values or speeds such as 100 or 200 are common base or native settings in both digital video and film; however, some cameras have 800 as the base.

The ISO can be changed on the camera, but as the number gets larger, the more grain or noise is introduced into the image. It is better to open the aperture or use more lights to get a cleaner image recorded. Shooting with

the ISO at 100, 200, 400 or even 800 may be acceptable, depending on the amount of light available, but as the number increases to 1600, 3200, 6400 or higher the image starts to deteriorate.

When you double the ISO, you are effectively doubling the brightness of the image that is being recorded. Electronic brightening occurs when the ISO is set above the base setting for that camera. The light level of the image that is focused on the sensor may be adjusted higher in the analog state and again when it is converted to a digital state. Ideally, all images shot should be at the base ISO in order to maintain the highest quality possible.

SHUTTER SPEED

The shutter speed is the length of time that shutter opens up and allows light to expose the sensor. Basically, it is the length of time the camera takes each picture. The slower the shutter speed the longer the light hits the sensor and the higher the shutter speed the less time the lights is allowed to hit the sensor. Normally, the shutter speed for a digital video production stays the same throughout the production.

The "180-degree shutter rule" is the film industry standard for film cameras and it states that your shutter speed needs to be set at double that of the frame rate. For example, if the shutter is set to 180 degrees and the frame rate is 24 fps (frames per second), then the shutter speed needs to be 1/48th of a second, which will give the smooth motion humans experience with their eyes. Some cameras do not have 1/48th, but have 1/50th instead, which is close enough for a cinematic look.

Here are some basic shutter speeds and the equivalent shutter angle:

Speed = Angle
1/32 = 270
1/48 = 180
1/50 = 172.8
1/60 = 144
1/96 = 90
1/120 = 72

You can break the rule for a specific effect. A shutter angle above 180 degrees or a shutter speed of 1/24th of a second will cause film like motion blur, while a higher shutter speed will show less motion blur and can look choppy. Usually, a higher or faster shutter speed will create a darker picture with no motion blur, while a slower speed produces a lighter image and noticeable motion blur.

When you are setting your f-stop, ISO and frame rate, consider your shutter speed too. You will want to make sure it is set properly for the aesthetic you desire.

A film camera uses a mechanical shutter that spins in front of the film gate. When the shutter is open light exposes a frame of film. When the shutter covers the gate, the film advances one frame and stops so that another exposure can be made. Digital cameras may have either a "rolling shutter" or a "global shutter" that controls the exposure time.

Rolling Shutter

The light hits the sensor and the data from each pixel is read line by line starting from the top left and going to the bottom right. Once this is completed, the shutter closes and the process starts all over again for the next frame. If the camera is panning fast during the brief period the data is being recorded, there may well be a warping of the image as it is being recorded. Most rolling shutters are fast enough to avoid this visual artifact, but some are not.

Global Shutter

The light hits the sensor and then the shutter closes. While the shutter is closed the data is read for all of the lines and then the shutter reopens for the next frame. This action keeps all of the vertical and horizontal lines of the image stable when panning rapidly.

THREE EXPOSURE FACTORS

One way to affect exposure is to change the lighting. However, if you cannot change the lighting or the lighting is just the way you want it then you can change settings on the camera. On a camera there are three ways to affect exposure. Adjustments can be made to the aperture, shutter speed and ISO. Changing any one of the three will affect the darkness or lightness of the image. For example, you could brighten an image by changing the aperture from f/5.6 to f/4. You could brighten the image by changing the ISO from 200 to 400. The shutter speed could be changed from 120th to 60th of a second. Each of these changes will independently lighten the image by one stop. If you changed all three of them the image would be lightened by three stops.

If you wanted to darken an image and not use one of the three options above, there is always reducing the intensity of the light or adding a neutral density filter to the lens.

Study the aperture/shutter/ISO card in Figure 10.9 and you will see how changes in each can affect the image you shoot. The card shows how aperture affects depth of field, shutter speed affects motion blur and how ISO affects the amount of digital noise caused by electronically brightening of

the image. Most editing software have some type of video noise reduction, but it requires a lot of the computer CPU (central processing unit) power to process it and play it back. It is better and easier to keep the ISO at the native setting and adjust the other settings or the lighting to get a proper exposure. The graphic in Figure 10.9 shows the effects of different aperture, shutter and ISO settings on the image.
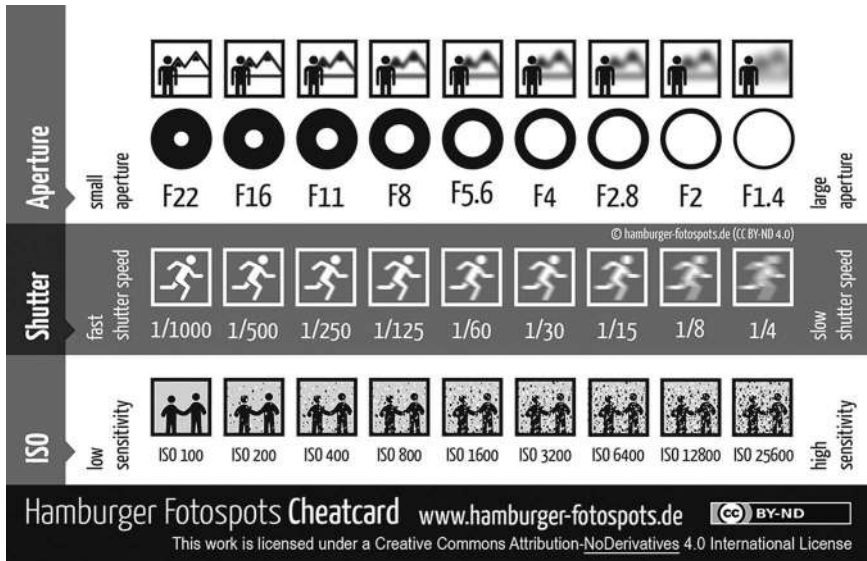
Figure 10.9 Three exposure factors
Source: Image provided by Daniel Peters of Hamburger-Fotospots

FOCUS

The focus along with the shot type, camera angle, framing, subject placement and depth of field are tools that the director can use to guide the audience to see what is important in a shot.

Manual Focus
The classic way of finding focus on a zoom lens is to zoom into the subject, find focus and zoom out to the proper framing. This method assumes that the back focus of the lens is accurate. Another method is to use a tape measure to find the distance between the front of the camera and the eyes of the subject. The lens is then focused to that measurement. Otherwise, using a large high-resolution monitor to check focus is a viable option.

Rack focus or pull focus is a maneuver that changes the focus during a shot. For example, a man and a woman are having a conversation and the focus is sharp on the woman and then the man speaks and the focus shifts to him being in sharp focus.

A follow focus mechanism is commonly used to perform a focus pull and to maintain focus as the action and movement of the actors or objects require. The mechanism is attached to rails beneath the camera and has a gear that meshes with the focus ring on the lens. A large knob on the mechanism turns the gear and thereby moves the focus ring on the lens. The knob has a wide white wheel around it that is for the first assistant camera operator or "focus puller" to put marks on the ring. The marks for a rack focus might be for the beginning focus and the end focus of a shot. If an actor is moving around the set, there may be several marks that correspond with the distance the actor is away from the camera as the actor hit their marks.

On the floor of the set are tape "marks" that are predetermined positions which the actor will use based on the blocking. There will be one mark for each actor's starting position and other marks for the different positions they may take on the set. These marks help with maintaining focus.

Marks are usually color coded and assigned to the different actors for the entire production:

Red is exclusively for the lead actor.
Blue is exclusively for the second lead or main supporting actor.
Green, orange, yellow or other colors are for the other supporting actors or
    for extras. White can be used if all of the colors are taken.
Black is never used as it can be hard to see on set.

Two lengths of tape in a "T" shape is the most common mark for the actors to place their toes. In the grass, sand or dirt-colored golf tees or rocks can be used.

Figure 10.10 Actor on mark

When the camera is not within reach, a remote control system is used, along with a monitor, to see what the camera is seeing since the focus puller does not get to see through the lens. They almost always focus on the eyes of the actor. That is typically what the audience will be looking at.

Deep focus is when there is a large depth of field (focal plane) and everything or nearly everything is in sharp focus.

Shallow focus is when the depth of field is narrow. One plane is in sharp focus but other planes in the shot are soft focus and lack detail. This limited range of focus is ideal for making the background blurry. The blurry portion of the image is referred to as "Bokeh." Bokeh is a Japanese word for haze.

Tilt-shift photography is accomplished with the use of a specially designed lens and housing that changes the position of the lens in front of the sensor. The tilt mechanism can be used to move the lens and thereby the field of focus around the frame.

Auto-Focus

Auto-focus can be very useful when shooting some things, but not so much when shooting a film. It can be used to get a rough focus and then switch to manual for the fine focus. A manual focus can be repeated, while an auto-focus can be hit and miss.

If you are shooting video with a still camera, you will find that there are two types of auto-focus systems, phase detection and contrast detection. DSLR cameras, which have a reflex mirror to send the image to the viewer, typically use phase detection, while mirrorless cameras typically use contrast detection, which determines focus by determining when the image contrast is highest.

Contrast detection is better at getting an accurate focus on a still object, such as an actor. Phase detection is better at getting and keeping focus on a moving object.

The most reliable form of focusing is manual with an experienced focus puller. They can finesse a focal change, while auto-focus is more mechanical.

DEPTH OF FIELD (DOF)

MISTAKE

I do not want to worry about depth of field or precise focus, so I shoot my films with a fast wide-angle lens and use the sun as my light source.

Depth of field is a creative tool that can be used to draw the viewer's attention toward a particular part of the frame. When one object is in focus and the other objects are not, our eyes go to the one in focus. Using a fast wide-angle lens and the sun as a light source, the depth of field will be extreme and the entire image will look sharp and flat.

Figure 10.11 Depth of field (by Jefferson Santos)

The depth of field is the distance between the closest and farthest parts of an image that is in focus in the frame and is acceptable to the human eye. The lens only focuses on one point, yet the depth of the focus is determined by these four factors:

Aperture/f-stop: A lens with a wide aperture will give you a shallower depth of field. A large or wide aperture means that the f-stop is smaller in number, for example f/1.8 or f/2.8. A larger or deeper depth of field will be created by having a small aperture, for example, f/16 or f/22. T-stops are not as useful for determining depth of field as f-stops.

Subject Distance: The shorter the distance between the camera and the subject, the shallower the depth of field.

Lens Focal Length: Wide lenses will have a deep depth of field, at most distances to the subject. Using a telephoto lens or being zoomed in will reduce the depth of field.

Sensor Size: The larger the sensor is, the shallower the depth of field is. A camera with a smaller sensor will have a greater depth of field. A large sensor, such as a 35mm full-size one, will work well for shooting a

cinematic film, whereas a smaller sensor, such as a 1/2 inch (1.27cm), will work well for documentary shooting where more will be in focus than would be with the 35mm sensor, unless you want that look.

A quick way to get a shallower depth of field is to put a neutral density filter on the lens, which will reduce the light entering the lens and will thereby require a wider aperture opening. If a film calls for a greater depth of field, also called deep focus, then one approach is to use a wide-angle lens with a lot of light. Shooting in exterior daylight can provide that look.

FRAME RATE

The standard frame rate for 35mm film is 24 fps (frames per second). Most digital cameras shoot 24 fps, which is actually 23.976 fps (23.98), while a few only shoot 25 or 30 fps. Using 24 fps will give your film a cinematic look. Some cameras will allow you to use an over-crank or under-crank frame rate. Over-crank is when you shoot at a higher frame rate than is normal. For example, shooting a 48 fps will slow down the action when used in a 24 fps timeline, so slow-motion. Under-cranking is when you shoot at a fast frame rate, like 6 frames per second. This will give a fast motion time-lapse effect when played in a 24 fps timeline.

MATTE BOX & CAGES

A matte box is used for two reasons, to protect the lens from light flares and to hold filters in front of the lens.

Cages are designed to hold the camera and an array of accessories, such as hand grips, a monitor, manual or wireless follow focus, a microphone, rods and a matte box. They are of great value for anyone filming with a DSLR, mirrorless camera and most video cameras.

Having a matte box helps with keeping light off of the lens by adjusting the top hood and side flags or wings, which are similar to the barn doors on a light. Always check your monitor to make sure they are not seen in the frame. The matte box holds the various filters that might be used during production. Two common filter sizes are 4ins × 4ins or 101mm × 101mm and 4ins × 5.65ins or 101mm x 142mm and a third size of 6.6ins x 6.6ins or 168mm x 168mm for high-end cameras.

There are also filter holders that have anywhere from one to three slots for the filters to set in.

LENS FILTERS

The DP will decide what filters they want to use to get the look that the director wants for any given scene. Filters such as fog filters, graduated ND

filters and diffusion are filter effects that can be utilized for effect; however, they are baked into the image.

There are many types of filters to put in front of the lens. Many of them can be replicated in postproduction, but some people like to bake in a look. Some of them are useful during production. For example, if a camera does not have the ability to apply an internal neutral density filter, then when the situation calls for one, it can be screwed on the lens or dropped into a filter holder slot. Below are several commonly used lens filters.

Neutral Density Filters

These are gray filters that absorb light as it passes through the lens. They are very useful on a bright day as they can be used to reduce light to achieve a proper exposure. ND filters come in full stops and in third and half stop increments. There is also a variable-density version that can be smoothly adjusted to allow less or more light to pass through by rotating the filter.

Some neutral density filters are graduated. They start off dark on one side and gradually change to clear on the other side. This filter can be used to reduce the brightness of the sky while having little effect on the scene below the sky.

Non-graduated filters come in fixed amounts designated as 0.3ND (one stop), 0.6ND (two stops), 0.9ND (three stops), 1.2ND (four stops), 1.5ND (five stops); for ten stops it would be a 3.0ND and if you needed 20 stops a 6.0ND filter.

Polarizing (PL) Filters

A polarizing filter is a special ND filter and most of them offer a two-stop filtering effect. There is no effective postproduction processing that works like a polarizing filter for reducing glare in the sky, windows, water and other reflective surfaces. As the filter is turned in the ring the amount of polarizing increases and then decreases.

Ultraviolet (UV) Filters

UV filters are also called haze filters as they are designed to cut through the moisture and haze that is in the atmosphere. These are commonly used in front of a lens to protect the lens from scratches. A filter is much less expensive to replace than a lens should an accident happen.

Soft/Diffusion Filters

There are filters to add softness to a shot and or diffusion to reduce skin blemishes or wrinkles. A diffusion filter will create some resolution loss. Pro-mist (net) filters will have a similar effect on the image.

Diopter & Split Field Diopter

By adding a diopter to a lens, it allows for a closer focus and for a more shallow depth of field. A split diopter has a macro focus lens on one half of the filter and no filtering on the other half. Care needs to be taken in placing the camera and the split diopter so that it does not look unnatural. It is common to use a vertical divide like a door or wall corner to hide the split.

Color Filters

There are subtle color filters that can add a warmth to any shot and there are strong color filters that can add an overtone of yellow, green, purple, blue, etc.

WHITE BALANCE & COLOR TEMPERATURE

MISTAKE

There is no need to worry about white balance as it can be corrected later by color grading.

White balance is all about getting the correct color temperature for any given camera setup. Color temperature is measured in Kelvins (K). The higher the temperature, the more blue the hue of the light. The lower the temperature, the more orange the hue. The two most common color temperatures for film and video lighting are "Tungsten" at 3200K and "Daylight" at 5600K.
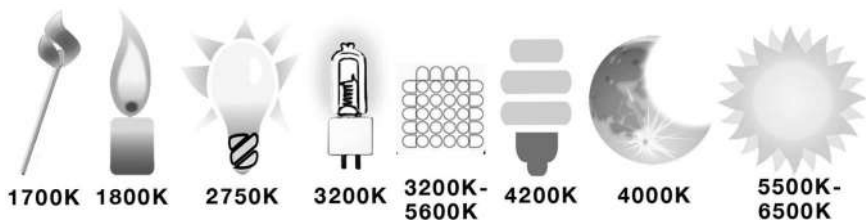
Figure 10.12 Color temperatures

Temperature Sources

Match Flame and Sodium Lights: 1,700K
Candle Flame, Sunset/Sunrise: 1,800K
Incandescent Lights: 2,750K
Tungsten Halogen: 3,200K
LED: 3,200 to 5,600K or higher
Fluorescent: 3,200K/4200K or higher
Moonlight: 4,000K
Horizon Daylight: 5,000K
Midday Daylight: 5,500K–6,000K
Overcast Daylight: 6,000K–6,500K

The human eye can adjust automatically to different hues of light, but cameras need to be adjusted for accurate color reproduction, which requires the correct white balance. Getting a white balance is the process of showing the sensor what true whites it.

Nearly all digital video cameras allow for the manual setting of the white balance. This is done by holding a white card in front of the lens with the light sources hitting the card. Set the exposure and the focus for the white card. Any white or nearly white object that fills at least 15 percent of the frame, if not 100 percent, can be used, but it may not be totally accurate like a white card would be. With the white balance setting on the camera set at manual, push and hold the button for a few seconds, until the camera has made the correct white balance adjustment. There are usually different presets such as incandescent/tungsten lighting, fluorescent lighting and daylight. There is usually an automatic mode too, but it may not be as accurate as the manual method.

When shooting day exterior shots, it is good practice to white balance throughout the day as the color temperature changes during the course of the day. Making white balancing a normal procedure for each camera setup is a good practice.

GRAY CARD

A gray card is used to determine a manual exposure for a scene. Either the cameras built-in reflective meter or a handheld meter is used to determine the exposure. The card needs to face the meter and be held in front of the illuminated subject to be filmed. The 18 percent gray card's main purpose is to allow users to make adjustments to the aperture to set up correct exposure at the beginning of any shot.

COLOR CHART

Figure 10.13 Color chart

The above image is in the gray scale, but be aware that the smaller squares represent many natural colors such as dark and light human skin tone, foliage, and blue sky. The larger squares include black, white and 18 percent gray.

Whatever light hits the front of the actor should hit the card evenly. Shoot a few second of the card and include some of the scene around it.

Color charts will all generate a specific predetermined pattern on a vectorscope when done properly. In postproduction, these charts can be used in different editing software to automatically calibrate the footage to the chart and a colorist will use the colors as a reference for grading. Vectorscopes are discussed more below.

BROADCAST STANDARDS

NTSC (National Television Standards Committee) broadcast standards have a frame rate of 29.97 drop frame. Drop frame is used to adjust video time to match clock time for broadcasting. Films are shot non-drop, which is 24 or 25 frames per second with no adjustment. PAL (Phase Alternate Line) standards have a frame rate of 25 fps. The REC. 709 standard is for HDTV and includes

information like resolution, color information and frame rate. The REC. 2020 standard is for UHDTV 4K television, while Cinema 4K, which is 256 pixels wider than UHD, uses the DCI (Digital Cinema Initiative) standard.

FORMATS/CODECS

All video formats have a container and a codec. The term format relates to what type of container and codec a video and audio file are in. Most of the video formats are named after their container. AVCHD (Advanced Video Coding, High Definition) and MOV (QuickTime) are both formats. These two use the H.264 or MPEG-4 codecs. Some others are HEVC or H.265, DNxHD, REDCODE and XAVC. JPEG2000 is the format used for theatrical projection. The codec H.266 VVC (Versatile Video Coding) is a successor to H.265 that requires 30–50 percent less data space than H.265 for the same resolution. H.266 is designed to handle 4K to 16K and for 360-degree video.

A container is a wrapper that stores audio and video information in a single file. QuickTime is a container wrapped around a compression codec, like MPEG or MXF. MXF (Material eXchange Format) is an open source and broadly compatible wrapper for several codecs. It is a format for many professional cameras by manufacturers such as Sony, Canon and Panasonic. A container like MOV can hold a variety of codecs. Containers can hold metadata like video frame rate, scene and take information and other camera data.

The term "codec" combines the words coder + decoder. A coder compresses data, like audio and video, for storage on media and then a decoder is used to decompress the data for playback and editing purposes.

There is Lossy compression, which leaves out some of the data from the image, and there is Lossless compression, which keeps all of the data from the original file, so there is no degradation of the video quality.

LOG & RAW

A log (image profile), such as Sony S-Log, ARRI LogC or Canon Log, are the image profiles when shooting. They all map a log gamma curve that pulls as much information off of the sensors as is possible. Log provides a wide dynamic and tonal range that allows for greater latitude during the color grading process. Log appears fairly flat or washed out looking on a camera source monitor; however, it preserves the highlights and shadows very well.

Log is not raw data; it is a video format image with ISO and white balance baked into it. It requires LUTs (look-up tables) to be applied to the footage for proper viewing. A standard LUT will convert the log video to HD video (Rec. 709).

There are many versions of raw data recording. There is ARRI RAW, ProRes Raw, CinemaDNG Raw, Canon Cinema RAW, REDCODE RAW (R3D) and many more. Raw is the unprocessed data created from light hitting the sensor and before it is converted for video output. It will also need to be converted for postproduction, although some NLE (non-linear editing systems) can convert and edit raw data. While log is a video format, raw is not. It is raw data that is not visible unless it is converted to a video format. In actuality, it is a compilation of digital code data representing the light that hit each pixel on the camera's sensor.

Raw is the highest quality of image data that can be recorded. It will have the highest bit depth, the greatest dynamic range and the most color information of any format. Some of the raw formats allow for the ISO to be adjusted in postproduction.

Both raw and log may create uncompressed data or there may be some compression to keep the files size down.

Most image sensors use a filter array to create normal color images. The pixels, which are colored either red, green or blue, are commonly organized with a Bayer pattern of RGBG, which is then processed and interpolated for viewing in a manner that will display the color of each pixel as close as possible to the real image. Raw image data is processed when it is input into the software used for postproduction.

MONITORS & VIEW FINDERS

Most cameras have an LCD monitor or viewfinder and some have both. The key to a useful monitor is that it has a high resolution and that is large enough to be able to determine proper focus and framing. Remember that the camera monitor and viewfinder will show a composite image that has the color at full value. The raw images would appear washed out in comparison and thereby harder to discern image quality.

A LUT can be applied to some monitors to see how a lighting setup will look once it is color graded.

Different cameras will have different sets of image controls. Some controls might include: Anamorphic De-Squeeze, Focus Peaking, RGB Parade and Screen Markers.

In terms of exposure, there are some great camera tools for getting it to be optimal. These tools are Zebra Stripes, Waveform Monitors (WFM) and Histograms. Scopes and meters are usually more accurate than monitors.

> **MISTAKE**
>
> I don't care about all of the displays or using a meter, I just go by how it looks in the monitor.

ZEBRA STRIPES & SCOPES

Zebra Stripes

Zebra stripes are a common tool in video, DSLR and mirrorless cameras. They are a visual reference as to the brightest areas within the frame. These warning stripes appear in relation to the cameras settings for zebra stripes. The stripes can be set to appear when the brightest areas are at or above a selected camera setting of 70, 80, 90, 100 IRE or a variable level on some cameras depending on the cameras specifications.

An IRE (Institute of Radio Engineers) is a relative unit used in the measurement of a composite video signal that ranges from 0 IRE to 100 IRE. When shooting HD video, 0 IRE is designated to be black. 100 IRE is 100 percent white and exposure above that may overexpose, although raw allows more latitude before being overexposed.

With the zebra stripes turned on, a light-skinned person should register around 70 to 80 IRE. Adjust the aperture until you see stripes on an actor's hotspots, which are the forehead, cheekbones and nose. Those areas will be at 90 IRE and the remained of the actor's face will be below that. This procedure should provide a proper exposure. If the subject has darker skin, then use the zebra strips the same way, but overexpose by .5 to 1.5 stops, depending on the darkness of the skin tone. Check the exposure without the zebra stripes and use your eyes to see if the exposure looks right.
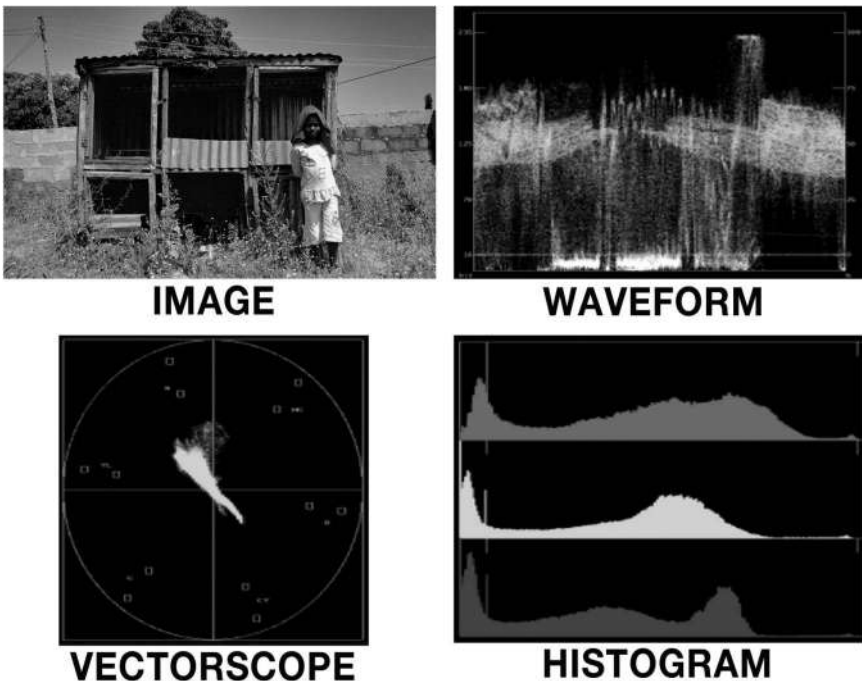
Figure 10.14 Waveform, histogram, vector scope (by Muhammadtaha Ibrahin Ma Aji)

Waveform Monitor

A waveform monitor is included on many cameras. It is more informative than the zebra stripes as it shows the brightness level of an image. Waveforms monitors display 0 IRE or black at the bottom and 100 IRE near the top which would be the brightest area. Without using a monitor, it is easy to overexpose the bright areas and underexpose the darker areas of the frame, especially if the monitor is not calibrated correctly.

Histogram

A histogram displays the luminance values of an image based upon the percentage of pixels that have specific lightness values. A waveform displays brightness from bottom to top, while a histogram displays from left to right. The brightest part of a histogram is on the right side. The left-side edge of the histogram is 0 and the right side is 100. The image itself is not displayed, only the amount of luminance values in the image.

ETTR (expose to the right) is a common approach to using a histogram for setting exposure and getting a wide tonal range. The exposure will be better if there is enough light hitting the sensor, so the brightest areas in a frame are on the right side of the histogram. This is better than having to bring up the brightness in postproduction and thereby add noise to the image.

Vectorscope

It can be very difficult to judge color by eye alone. A vectorscope can be used to measure color in a video image and provide a graphic display of that image that shows the colors and their intensity.

A vectorscope displays six boxes surrounded by a circle, each box represents a specific color: red, blue, green, yellow, cyan and magenta. When a video signal is input into a vectorscope, representations of each color that are present in the video image will display in the proper place in the circular display.

When SMPTE (Society of Motion Picture and Television Engineers) color bars are input into the vectorscope, all of the different colors should have corresponding dots in the center of the corresponding boxes. A color chart shot for each lighting setup will give you the same information as the color bars and the chart colors should line up in the same squares as the color bars. If not, they will need to be adjusted during the grading process.

White, black and gray generate dots that are located in the center of the display because they contain no color information. The distance out from the center of the display to each of the color dots represents the intensity or saturation for each color.

A vectorscope can display either 75 percent or 100 percent of the video saturation levels for the target boxes. To be safe for broadcast purposes, it is better to set the display at 75 percent saturation; however, 100 percent can be used if needed.

Color Bars (SMPTE)

The graphic in Figure 10.15 is in the gray scale, but the bar colors are identified for reference.

Gray 80%	Yellow	Cyan	Green	Magenta	Red	Blue
Blue	Black	Magenta	Black	Cyan	Black	Gray
I	Super White	+Q	Black	3.5 7.5 11.5	Black
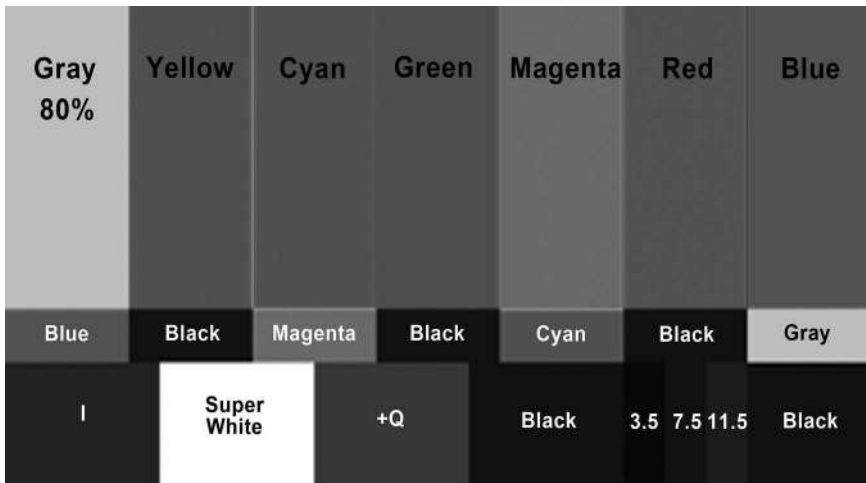
Figure 10.15 Color bars

PICTURE PROFILES

Most cameras have "picture profiles" that are a customizable selection of different looks that can be applied to the image. Within the picture profiles an operator can change many of the parameters of the image. Some options might include black level, knee, contrast, color mode, color level, brightness, darkness or gamma curve, and image detail. These settings can be stored in internal memory, usually as PP1 (Picture Profile One), PP2, PP3, etc. Each camera has its own profile settings and options.

Creating an in-camera look is useful, if there is no time to do a color grade in postproduction, but it is better to shoot in raw format so that color grading can be done to the image, which is usually better than having the look baked into the image.

IN-CAMERA SPECIAL EFFECTS MODES

These effects may not work well for raw format images, but work fine otherwise. Different camera makers sometimes use different names for the effect. Some of these effects are: soft focus, grainy film, colored, watercolor, vintage, bleach bypass, invert color, fish-eye, monochrome, posterization and many more. Be careful about using an in-camera special effect as it will bake in the effect and not give you as many options to make changes in postproduction.

IN-CAMERA EFFECTS

In-camera effects are tricks that are used to convince an audience that what they are seeing is real. For example, if a normal-sized adult is standing next to a chair the size of a house, the human mind assumes the adult is small, not that the chair is extra-large.

Forced Perspective

Forced perspective is a technique of placing objects or actors so that one is very close to the camera and appears large, while another object or actors is place farther from the camera and appears small.

Shutter Speed

By lowering the shutter speed an image with action in it will make the action appear blurred. By using a high shutter speed the action take on a staccato look that feels fierce and wild.

Day for Night

Day for night is shooting during the day, but with a dark filter, usually blue in color, with the intent of the image appearing to be shot at night. The trick is not to shoot the sun or the sky as they may give away the trick. Also, attention must be given to the shadows as they need to have a realistic source. Fortunately, if some sky appears in the shot, it can be replace in postproduction.

Slow Motion and Fast Motion

Shooting at a higher frame rate than is normal will play back as slow motion. For example, if you are normally shooting at 23.98 fps (24 fps) and you shoot a specific shot at 50 fps, that 50 fps shot will be slowed down to

23.98 in the timeline of the editing software and will thereby playback at about half speed. Fast motion is shooting at a slow speed, like 16 fps, and playing back at a higher speed, like 24fps.

Time Lapse

This is ideally an in-camera effect that entails taking individual pictures at time intervals. For example, you might take single frames of a flower opening every 2 minutes. After shooting for 4 hours, there will be 120 frames that will playback for 5 seconds at 24 fps. The effect will be of a flower opening up rapidly. It can be done in postproduction, but with a slightly different look.

Camera Shake

This is the effect of shaking the camera during a take in order to add extra movement to a shot. For example, at the end of *Jurassic Park 3* (2001) a velociraptor runs out of the jungle next to the camera. As it passes the camera there is a fast camera shake as though the weight of the animal caused the camera to tremble in its path. A shake can be added in postproduction.

GREEN SCREEN

By shooting a scene with either blue or green screens in specific areas of the frame, other images can be composited into those specific areas in postproduction.

Shooting green or blue screen can be a challenge. The light on the screen needs to be even and the illumination of the talent needs to match whatever images will appear where the green is located in the frame. If the sun in the keyed image is coming from the back left side, then the illumination on the talent in front of the green screen needs to come from the same direction or there will be a mismatch in lighting for the scene.

There are 10 million different colors that the human eye can distinguish. In daylight the human eye is most sensitive to a green light that is approaching yellow light, so yellowish-green would be a good description of that light. This yellowish-green light is at 555 nm (nanometer) and appears to be the brightest color the human eye can discern. This is because this green light stimulates two of the three types of cones in the human eye, not just one of them.

The sensors in video cameras record red, green and blue (RGB) colors in varying amount to capture a wide spectrum of colors. The green channel has the highest level of luminance, which is the intensity of light. Green is

also the farthest color from human flesh tones. Because of these qualities, the green channel has less digital noise and usually creates the cleanest key.

If there is any green in a "green screen" shot, such as foliage, wardrobe or props, you can use "blue screen," which is a good backup, but may not give as clean of a key as the green. If an actor has light-colored hair, like a blonde, then you may want to use a blue screen and side light the actor's hair with a yellow or straw-colored gel over the lights to counter the reflected blue light from the blue screen tinting their hair. Some compositing software is more forgiving than others, so it is a good idea to do a test to make sure you can get a good key.

3-CCD (charged coupled device) cameras have three chips, one for each color of red, green and blue. One chip cameras use either a CCD or a CMOS (complementary oxide semiconductor) to collect the light and convert it into an electronic signal. On single-chip cameras there is a special filter arrangement on the pixel array that separates the red, green and blue colors of the image being received onto the camera sensor. This is called a Bayer pattern and it records twice the amount of resolution of green light as that of red and blue.

When you are shooting green or blue screen, make sure that motion blur is turned off inside of the camera. Having it on will make keying more difficult as the image will be less sharp and harder to create a clean "chroma key."

If there are visual effects that will be added later to a scene, then there are some basic measurements that need to be written down to assist with accurate placement of CGI objects and creatures:

Focus Distance: Write down all of the object or actor focal points used in each shot.
Lens Focal Length: Note which lens was use along with its focal length.
Filters: Note which filters were placed on the lens.
Camera Height: Note how far it is from the ground to the middle of the lens.
Camera Angle: Note what angle the camera is pointed up or down.

How to light green screen is covered in Chapter 11 "Lighting."

METERS

A light meter is a device that is used to measure an amount of illumination, which is then used to set the iris on a lens for an optimum exposure.

There are two basic types of meters, reflected light meters and incident light meters. There is also a specific form of reflective meter called a spot meter.

Handheld Meters

Figure 10.16 Light meter

Some handheld meter makers are: Sekonic, Kenko, Gossen and Spectra.

These are for serious cinematographers who want accuracy. Some are analog and others are digital. The analog meters do not rapidly drain batteries, so no failures in the field. Analog meters are usually faster at displaying the readings than the digital ones. Most of these type of meters will have both reflective and incident light readings.

Light meters are standard equipment when lighting a set and actors. You need to know what exposure setting to use and a meter, whether built into a camera or as a separate tool, will let you know what f-stop is best to use.

Before you use a handheld meter, make sure you have entered your frame rate, shutter speed and the ISO into it. The read out will then give you the proper exposure or f-stop setting.

Reflective Meters

All in-camera meters are the reflective type. They measure the light reflected off of a subject and into the camera. The meter reading is affected by both bright and dark objects along with highly reflective ones, such as white walls and windows. They measure all of the light reflected toward the camera in a given environment. It then calculates a workable f-stop reading that is balanced at a midway point. This midway setting is calculated to be 18 percent gray.

Spot Meter

A spot meter is very useful in determining how bright a specific area or object is. They have a very narrow range of light detection, usually 1–2 degrees. They measure the light that is reflected off of an object or actor and toward the camera. It is very useful in determining the reading off of a bright or shiny object. To get a true reading, it is better to place an 18 percent gray card in front of the spot you want to meter and then point the meter at the card.

Most DSLR and mirrorless cameras and many video cameras use a built-in matrix that averages the light levels in the frame. If you are using a built-in meter on the camera, then you need to select only one of the zones, which you will use as a spot meter.

Incident Meter

An incident meter measures the light that is falling on the subject. The meter is held in front of the actor or subject and is faced toward the camera. This will give a reading that is more accurate than a reflective reading because the incident reading is not affected by very bright or dark objects on the set. You would input your camera ISO and shutter speed settings along with your frame rate and then take a reading from in front of the actor's face or some area or object.

Some incident light meters display light values in foot-candle units, which are an amount of illumination on a surface. A one-foot candle

equals approximately 10 lux. The foot-candle values typically run from 0 to 70 and are used by some cinematographers in the United States to achieve proper overall lighting and for creating desired contrast ratios.

Meter Applications (APPS)

There are many smart-phone apps that act as meters. Some are better than others, which gets down to the quality of the software and the smart phone. If your phone's camera works well in low light, then so will the app, but if it does not work well in low light, the app may not also. Some apps use the camera for reflective and spot metering and the phone's light sensor for incident metering. It is best that you do not use any of the applications (apps) that are available as they are not very effective. Your smart phone was not designed to be a good reliable light meter.

Some apps for smart phones include color temperature readings in Kelvin numbers to help with white balance. Some cameras can display color temperature too.

REPORTS

Camera reports are useful for postproduction. The editors can look at the information and know what has been shot and where to find it. The report will include information such as what lens was used, what f-stop was used, what filters were on the lens, what media card was used, and what scene and take numbers are on the card. A camera report is included in the online Appendix.

TIPS

- Use the highest-quality camera you can afford.
- Find the best-quality lenses you can that will give you the image qualities you desire. Make sure they have all of the manual controls that you will need.
- Invest in a high-quality solid tripod. These will last you for years, if not decades.
- Acquire any lights you can, but you need to invest in LED lights that have a CRI (color rendering index) of 95 or higher in order to get closer to correct color. LED lights are generally less expensive, operate at a low temperature and are lighter and easier to use.
- Shoot in a format that can be handled by your computer and editing software.

- Shoot without special in-camera effects and make changes to the images in postproduction, so that you have more control over the look.
- Use the scopes and a meter; they are your friends and will help you get a good strong image recorded.

Figure 10.17 35mm film

Information on shooting on celluloid film can be found in the online Appendix.

11 LIGHTING

MISTAKE

I can use any use any light to shoot my short film. It doesn't matter what it looks like as long as you can see the actors. It's all about the story anyway.

LIGHTING

Figure 11.1 Lights on a scene (by Hao Rui)

Renowned cinematographer John Alton wrote in his book *Painting with Light* (1949) that he divided lighting into two categories, quantity and quality. In terms of quantity, he lit for proper exposure, so that no part of the frame was underexposed or overexposed. In terms of quality, he lit for orientation, mood, beauty and depth. Orientation should tell the audience where the scene takes place and what is important in each shot. Mood should convey a feeling about the scene and also tell the audience what season it is and time of day. Beauty is about the aesthetics of the lighting and what it communicates. Depth refers to the illusion of three dimensionality of a set by breaking it up into various planes. The information in this chapter will provide you with useful information to artistically light your film, because it does matter what it looks like.

Lighting can be used to make important characters or objects brighter in the frame to draw attention to them. This can work in a point of view (POV) shot too. The protagonist may be lit brighter than the antagonist, which tells the audience who is good and who is bad. Color and the cultural meaning of different colors can add meaning to a scene. Softer light is good for a romantic scene, while a harder light might be good for a confrontation. Lighting can convey much more information about a scene and the characters than just basic illumination. It is a tool to help tell the emotions of the characters and the story.

The cinematographer or director of photography (DP) works with the director and the production designer to establish the lighting pallets for the

film. They discuss the story as a whole in terms of what look is right and how to best approach lighting the different scenes. Consideration is given to the mood or emotions of each scene and how lighting can reinforce them.

LIGHT TYPES

> **MISTAKE**
>
> I don't need lights. My camera can just about see in the dark; besides, I want a gritty and natural look.

Lights are commonly rated by how many watts of power or energy they provide. They are also categorized by the color temperature of the light. Another measurement is by how bright a light, which is calibrated in lumens. Both a 100W incandescent bulb and a 20W LED light give off about 1600 lumens at the source. A lux is a measurement of the light where it hits a surface. One lux is equal to one lumen per square meter. The below discussion of lights and lighting will use the more common watt as the standard measurement.

Halogen or tungsten or quartz are common forms of incandescent light used in filmmaking, but at a less common rate. These lights create a lot of heat for the amount of light they produce. They are not very energy efficient, but they are quite bright and produces a near pure 3200K or 5500K color temperature. These lights range in power from a few watts up to 24,000 watts. They come as both open face and as a Fresnel light fixture. Many of these filament lights are being replaced by other lamps, such as LEDs.

HMI lights, or Hydrargyrum Medium-arc Iodide, are a 5600 Kelvin DC arc lamp that creates up to four times the amount of light that an incandescent bulb can produce. Since they operate at 5600K color temperature they are useful as a source of sunlight on sets. A HMI Jocker 800 watt light will put out as much light as a 4000 watt quartz light.

Plasma lights are more energy efficient than HMIs and they provide nearly twice the lighting power; however, they do not come in very high wattages. They are useful for outdoor lighting and for broad or fill light.

Fluorescent film lights are much cooler than incandescent or HMI lights, but they do not put out a strong focused light, so you will need to have them closer to the subject you are shooting. They are especially good for interiors. They come in several different color temperatures, but 3200K and 5600K are the most common.

LED (light-emitting diode) lights are solid state semiconductor electronic devices that create light. Some of them can be adjusted to meet whatever color temperature that is require for your shoot. There are some

lower-powered LED lights that run off of batteries. There are some higher-powered LED lights that can take the place of some halogen lights. LEDs are engineered in a manner that produces very directional light, due to a parabolic lens that focuses the light. The light can be diffused and can be dimmed without changing the color temperature.

There are some LED lights that the angle of light can be adjusted from a breadth of 68 degrees to 150 degrees. There are LED lights that offers the full RGBWW (red, green, blue, warm white and white) color gamut and various lighting modes and different filter modes. Included among these modes are hue, saturation and diffusion control. There are hundreds of industry-standard built-in electronic gels and a variety of special effects, such as lightning strikes, flash bulbs, flickering fire and television. For some LED lights the color temperature and brightness can easily be adjusted using an app on a tablet.

Be aware that some of the lower-cost LED lights are not good at producing true color. Make sure that they have a CRI (color rendering index) of at least 90, if not 95 or higher. The range is 0–100, with 100 being the truest color production.

Whichever light you use on your set, remember that it is set protocol to call out the word "striking" in order to warn others that a light is being turned on and to avoid looking at the light. I suggest that you call "striking" and then count to three before actually turning on the light. Some people will hear you yell and turn toward you and the light automatically. The three seconds gives them time to realize they need to turn away from the light.

Lighting Fixtures

In 1822, French physicist and inventor Augustin-Jean Fresnel developed a composite lens divided into concentric circles that bend the light into a single focal point. This Fresnel design allows for the instrument to be adjusted from a flood setting to a focused spot setting, while maintaining an even light pattern.

Ellipsoidal lights, commonly used in theater, but also used in film, can be used to put spots or circles of light on the set. They also can project patterns on the set with the insertion of steel patterned gobos in front of the instrument.

PAR can lights can have a parabolic reflector and a variety of lenses to place in front of the lighting element. The lenses commonly range from 10 degrees of lighting width to 50 degrees.

There are lighting instruments that have no lens or other form of diffusion in front of the bulb or other type of light source. They create a hard light that casts distinct shadows.

LIGHT PLACEMENT

Key Light

A key light is the principal light for a scene. It is the first light set up and all the other lights are placed in relation to the key light. It is the most intense light that is illuminating the subject. It is the primary light in a typical three-point lighting scheme. The closer that the key light is placed to the camera, the more flat the lighting will be, and the farther the key light is from the side of the camera, the more dramatic the lighting will be. You can also shoot the shadow side of the actor instead of the key lit side, but only if it fits the story. Remember, the key light is the light that makes the actor stand out from the rest of the set, so they are often brighter than the background.

High Key Light

It is usually fairly flat frontal lighting that illuminates the entire set. The lights falling on the actors is usually a softer diffused light. In order to avoid everything looking soft, a hard light is often used on the set itself.

Low Key Light

This dramatic style of lighting has dark tones, blacks and distinct shadows. There is a definite contrast between black and white. It is commonly used for film noir style lighting designs. It can be achieved with only the key light and no fill light. It works best when a hard light source is used, such as an open-faced light. Any incidental light is commonly controlled or blocked by using flags.

Fill Light

A fill light is primarily used to remove or reduce shadows created by the key light. A fill light is usually placed on the opposite side of the camera from the key light. It is standard practice to have the fill light be less powerful than the key light. Ideally, the fill light does not create any shadows and is not distinct in any way.

Backlight or Hair Light

Backlights are used to create a more three-dimensional feel to the image and to help separate a subject from the background. The light is placed higher than the actor, a short ways behind them and directed toward the

back of the actor's head and shoulders. It can also be placed low or on the floor and pointed up at the back of the actor. If the backlight is placed directly over the actor, it is called a top light.

When you are shooting an exterior day shot, the sun can act as the backlight if you are not shooting directly into the sun. If the sun is too bright, then you can bounce the sun's light onto the back of the actor with a shiny board or some other reflective material.

Kicker or Rim Light

A kicker is similar to a backlight, except that it is placed on the backside of the actor either on the left or the right, usually opposite of the key light. It is an accent light that does not significantly affect the frontal lighting, but does add some illumination on the side of the face. A rim light is similar to a kicker, but it does not illuminate the side of the face much or at all.

Side or Cross-Lighting

Side lighting is appropriately named as the lighting does come from the side in a way that dramatically highlights the subject or actor. It is sometimes referred to as "chiaroscuro" lighting, which was taken from the Renaissance and Baroque painters who used this technique of light and shadow to create a three-dimensional look in their paintings. It is the low-key and high-contrast look common in film noir movies. Usually there is no fill light or if there is a fill light the ratio is high such as 1:8 or 1:12.

Eye Light

This is a light that is used to illuminate an actor's eyes if the key and fill are not making the eyes visible. It is usually a lower watt light that is often set near the camera or even on the camera. If you look closely at the talent's eyes, you will see the reflection of the lights used to illuminate them. This light reflection is called "catchlight."

Bounce Light

Bounce light is light that is reflected, not direct. You can use a white card, silver or gold reflector or some other colored reflector as a light source. On exterior shots, it is common to reflect the sun onto the subject. Bounced light can be used as a key light, fill light, backlight or as a kicker or side light. You could use a butterfly or overhead to act as a large reflective surface when it is covered with muslin, silk, white grid cloth or even a bed sheet. For a lesser amount of bounce, you could use a white foam core sheet

or the white side of a handheld reflector. Softer light comes from surfaces that are more flat than shiny.

Hard Light: Low-Key Lighting

A hard light is intense and creates harsh shadows. It is not diffused in any way. It is dramatic and can be used to focus the viewer's attention on a particular actor, object or portion of the frame. The sun is a hard light source. Smaller un-diffused lights will create a hard light, whereas, a larger lighting instrument tends to produce a softer light. A hard light is especially useful in producing silhouettes. In shooting a silhouette, the backlight becomes the key light and may be the only light used.

Soft Light: High-Key Lighting

A soft light it is fairly diffused and will create soft shadows or even no shadow at all. It is normally used as a fill light. A soft light can be used on a subject to give the impression that the light is coming from a practical source. I suggest that it be used only on the actors and a harder light be used on objects and the environment. Too much diffused light and the scene might start to look dull and uninteresting.

AVAILABLE, NATURAL LIGHTING & PRACTICAL LIGHTING

Available lights are those that already exist at a location. For example, if you are shooting in a grocery store, there may be fluorescent or LED lights illuminating it and they may be bright enough that cinema lights are not needed.

Practical lights are ones that are part of the furnishings on set and really do turn on and off. A practical could be a house lamp, television, fire, candle, street light and many others. Most of these practical lights are not strong enough to adequately capture a decent image, so additional cinema lighting is usually necessary.

Ambient light is the light that leaks onto the set. This is especially true for location shoots. The sun, street lights, signs, traffic and any other light source that affects the lighting on the set is ambient.

You could refer to natural light as practical light. If you are shooting in the living room of a house, then the light coming in through the windows is a natural light that comes from a practical source, the sun. You may choose to control the window light by placing a bright cinema light outside the window pointing in. If you choose to do this, then put a dark tent around the light to block the sun, otherwise you will have difficulty controlling the light entering the window.

For an interior daytime shot, you may put diffusion gel, window netting or neutral density gel over a window to make the sunlight more useable and not overpowering the cinema lights you are using inside. Unless you are shooting something very stylistic, you will want to try to have as natural a lighting setup as possible.

If you are shooting the same living room as you did during the day at night, then you will need to augment the moonlight as it will not be strong enough to register well on the camera sensors. A bright cinema light placed outside the window with the customary blue gel on it will appear as moonlight.

If you are shooting an exterior with the sun as the main light source, you could diffuse the sunlight with an overhead or butterfly that has a silk on it. This will make the light soft on the subject, but the background may still appear as being in harsh sunlight.

LIGHTING RATIOS

MISTAKE

I don't need to use a lighting ratio. I can tell when a shot looks good.

Figure 11.2 2:1 lighting ratio on actor

A lighting ratio is the relative difference between the brightness of two parts of a scene or shot. A lighting ratio is a mathematical comparison usually between the key light and the fill light. A ratio of 1:1 represents flat lighting in which the subject is equally bright on both sides of their face. A ratio of 2:1 represents a one f-stop difference between each side of the face. It is a ratio that adds a little bit of dimension to the image. If a 2:1 ratio is used, then the key light will be twice as bright as the fill side. A ratio of 4:1 represents a 2 f-stop difference between the key and fill sides of the face. If the ratio is 4:1 then the fill light will be one-fourth the brightness of the key. For a more dramatic look, use an 8:1 to 12:1 ratio.

It is best to use a spot meter to determine the brightness from both the key and fill lights. Once a lighting ratio has been established for a given scene, it can then be used to do all of the lighting for the scene and that will create a uniform look. A meter is the best tool for achieving a desired lighting ratio. Meters are covered in Chapter 10 "Camera."

LIGHTING TECHNIQUES

Always start with the key light and then add fill. Once both of these are set and look right, you can decide to add a kicker or other lights for contouring or for separation.

One (Single) Point Lighting

This is when you only use one light on the subject. This can be very dramatic and it can hide many sins. In *Citizen Kane* (1941), the director Orson Welles did not have a huge budget, so for some scenes he had only a portion of the set built and the remainder was in the dark. The viewer would assume that the rest of the set was there. These sets appeared to have been lit with only one light source, but were not.

A single light source can be the key light and then its light can be bounced off of a white card or reflector to be the fill and can be further bounced to be a backlight, side light or a highlight on a background wall or some object.

Two-Point Lighting

The key light, which is the main light source, and the fill light, which is used to fill in the shadows, usually make up a two-point lighting system. If you want to make the two-point lighting system more dramatic you can place two lights opposite of each other at 180 degrees. One would act as a key light and the other would act as a backlight. The camera can be placed anywhere between these two lights as long as it does not put one of the lights in the frame.

A common way of two-point lighting is to place the key light 45 degrees from the center of the subject on one side and the fill light at 45 degrees from the center on the opposite side of the subject. A variation on this setup is to place the key light high pointing down at the subject and the fill light low pointing up at the subject.

When a key light can be placed above the subject pointed down into their face, the fill light can be used to add some light to the eyes, since they will most likely be shadowed.

Three-Point Lighting
The key light, fill light and backlight or rim light all make up the three-point lighting setup, which is great for creating depth in the image. Three-point lighting is a standard method used in visual media. By using three separate positions, the cinematographer can illuminate the subject anyway they want, while also controlling shadows produced by direct lighting. The backlight can either be above and directly behind an actor or above and off to one side, usually the fill side.

How you light is up to you and you may use any number of lights to get the creative effect and emotional look that will support the scene.
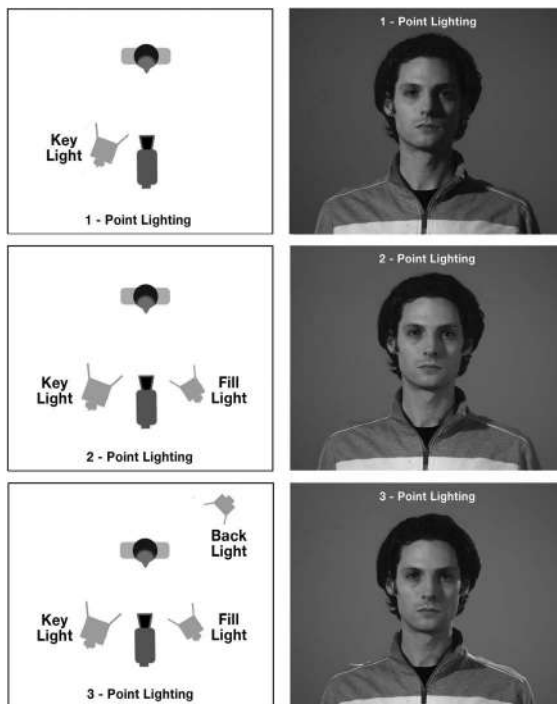
Figure 11.3 1, 2, 3 point lighting

Once you have the three lighting instruments in place, you can now adjust them to get the look you want. You can start with a 2:1 ratio and see how well that works. Turn each light on one at a time and get a meter reading for each light. For example, if the key light is hitting the actor at f4 and the fill light is at f2, you are set for a 2:1 ratio, but if the fill is also f4, then you need to reduce the intensity of the fill by putting a scrim on it, flood it, dial down the intensity or even move the light farther away. If the fill light is at f1.4, then you will need to increase the light intensity up to f2. This can be done by dialing up the light intensity, focusing or spotting the light more or by moving the light closer. Once you are happy with the key and fill lights, you can adjust the backlight for optimum effect.

Video and film are two-dimensional mediums. We can use lighting to add depth to the sets. If you look at the set as having three planes, you can light for the foreground, mid-ground and background. This will obviously not work if the set is an elevator or some other small area.

Background Lighting

Depending on how a set is lit, it may be useful to add lights to the background. It is more interesting to add pools or areas of light instead of lighting the entire background.

Once the actors are lit, then the background can be adjusted to work with the blocking and to highlight areas in the frame that are important.

Negative Fill Light

Negative fill light is actually subtractive, in that you are removing light to give a subject a more dramatic and natural look. Flags or solid overheads can be used to block the light from hitting one side of an actor's face in a manner that gives the face more of a contoured lighting. This is a great technique to use when light is falling flat on the actor's faces or to hide some part of a set.

Golden or Magic Hour

A stunning cinematic look is one created during "magic hour" or "golden hour." This is just before sunrise and just after sunset when there is still illumination. The color temperature of the sunlight is warm and the longer shadows are dramatic. Generally, you can count on about 20 to 25 minutes of magic hour. There are smart-phone applications that can be used for determining optimum time for magic hour.

During this small window of golden opportunity, the sunlight is being filtered extensively by the earth's atmosphere. This causes the blue light to scatter and the red and yellow light to dominate.

Blue Hour

Along with golden hour is "blue hour," which is about 20 to 25 minutes in duration. It is the time period that the sky appears super blue. It occurs just after sunrise and just before sunset when there is no direct sun illumination. Make sure you have a proper exposure and white balance.

Be aware that the exposure and the color temperature will rapidly change during this short time frame, so make sure you keep a proper exposure and try using auto white balance. Remember that adjusting your exposure with an f-stop setting will change the depth of field, which may be undesirable, so you can use other setting like ISO to adjust the exposure.

LIGHTING CONTROL

MISTAKE

Flags and diffusion are a waste of time. I'll just set up a key light and be done.

In order to be able to control light, it is important to position the light where it is needed. There are a number of stands and clamps that aid in properly setting the lights.

Stands

There are several types of stands to aid in lighting. For example, there are standard light stands, which hold small to medium size lights. These are the lights that fit on a 5/8 inch (1.6cm) stud and there are larger lights that fit on a junior stand, which has a 1 and 1/8th inch (2.8cm) stud.

There are highboys or high-high stands, which are roller stands that hold large silks. They can extend up to 18 ft (5.5m) high. There are reflector stands to hold various size reflectors. These stands are also called "combo stands" because they can hold lights too.

C-Stands

C-stands or Century stands, which is the name of the first company to make them, are very versatile and useful tools on the set. They can hold bounce cards, overhead lights, curtains, microphones, lightweight set walls, wardrobe, flags and much more.

When setting up the C-stand, make sure that the stud end is pointing up and then open the legs and lock them into place. Some C-stands have a pin that allows the legs to be released and swing open and then lock into place.

When you attach a flag or other light controller to the C-stand, make sure the gobo arm is over the biggest leg, so it can better support the weight of the flag. Make sure that the grip or gobo head knob is on the right side of the gobo arm. Secure the flag to the arm. If the flag falls down, you have the head on the wrong side; if it stays up and the head actually self-tightens, then you have properly set it.

It is good practice to put a sandbag on the biggest leg to hold down the C-stand. If you put it on a shorter leg, it may rest on the ground and not provide the necessary weight to hold the C-stand in place.

The last thing to do is put a tennis ball or at least an empty water bottle on the end of the arm that isn't being used in order to prevent someone from getting injured running into it.

Clamps

There are C-clamps, bar clamps, pipe clamps, Mafer clamps, Cardellini clamps and vice clamps. They are used to hold lights, Foamcore, reflectors and many other items.

They can be used on furniture, pipes, lighting grids, beams, 2 × 4 lumber and many other places that a light could be attached to.

Controlling Light

For most of the history of filmmaking, there were scrims to reduce light, solids to block light and silks to diffuse light. Now, there are a lot more materials used in lighting control, especially in reflecting light—silver and gold lamé along with Griff reflectors and black silks.

Using light for dramatic effect usually requires the use of various tools that help control where the light goes and what qualities the light has.

Flags
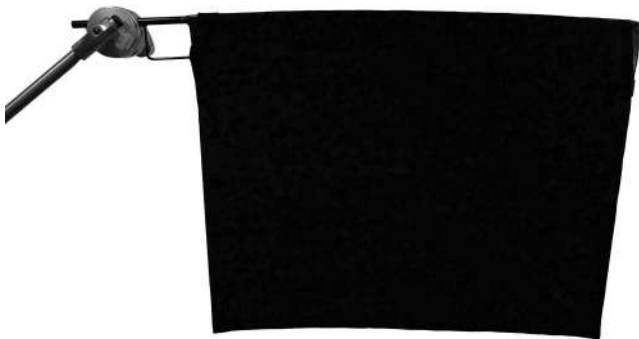
Figure 11.4 Flags

Flags are designed to block the light. They are also called "cutters." They come in various sizes and shapes. They are commonly placed on C-stands and positioned in front of a light to reduce the spread of the light on the set.

Flags come in all sizes and shapes. There are "dots," which are circles of various sizes. There are "fingers," which are long thin flags. There are also flags that are on frames and have a loose sheet of material that can hang down from the frame. They are called "floppies."

A flag that is used to keep the light from spilling onto the ceiling or onto the background is called a "topper." This is especially useful in eliminating the microphone boom shadow from the frame. A "bottomer" is used to block light from spilling onto the floor or to keep the lower portion of the frame dark. A "sider," as the name implies, is to cut the light coming from the side of the set.

The farther away from the light the flag is placed, the harder or sharper the edge will be. If the flag is close to the light, then the edge will be softer. Flags are easier to use on a Fresnel light than they are on a panel fixture. The Fresnel has a more defined light, while the panel light is more scattered.

Flags, nets and silks can all come with one open end that feathers the effect of the light on the subject or set. The other three sides are usually solid, but all four sides may be solid.

If you have hot spots in the lighting, you can use a net or a flag or even a barn door to remove the hot spot. If the hot spot is created by a shiny object, such as a chrome door knob, then you can try using dulling spray that can be purchased at most art supply stores.

Nets & Scrims

Cloth scrims or nets are made out of a material called bobbinet and they are placed in front of the light on a C-stand to reduce the intensity of the light. Scrims that are metal mesh are placed directly on the front of the light.

A red-trimmed scrim or "double" reduces the light by half, which would be a whole stop. A green-trimmed scrim or "single" reduces light by half of a stop. They both come in either a full scrim that covers the entire light or frame and as a half scrim that only covers half of the light or frame that holds it. The cloth nets come in both black and white. The white will add some ambient light to the set, while the black will not.

Silk Diffusion

Silks are used to soften the light and reduce shadows. They come in full and half diffusion strengths. They can also be used as a reflector.

Butterflies & Overheads

Silks that are larger than 4ft × 4ft (1.2 m x 1.2m) are called overheads. They start at 6ft × 6ft (1.8m x 1.8m) and go up, such as 8ft × 8ft (2.4m x 2.4m), 12ft × 12ft (3.7m x 3.7m) and 20ft × 20ft (6m x 6m). They are referred to as "6-by," "8-by," "12-by" and "20-by" on the set. Other material can be used as overheads, such as a bed sheet, uncolored plastic tarp or a shower curtain. The purpose is to reduce the intensity of the sun light.

Cucoloris or Cookie

A cucoloris is a patterned flag that allows light to pass through the openings. This creates both lit areas and shadowed areas on the set. It can be used to break up the light on a flatly lit wall or to add drama to an actor's face or body.

Another type of cucoloris is called the "branchaloris," which is a leafy branch, either real or imitation, that is placed in front of a light in order to create a shadow of a tree on some part of the set. A fan set to low can make a breeze that gently moves some of the leaves and adds to the reality of the shadows.

Some people refer to cookies as gobos, but gobos are typically not put on stands in front of the lamp. They are metal cutouts that slip into place in a slot in the front of a light. They are able to withstand the intense heat of some lights. Gobos come with many different patterns. There are some that are window blinds, stars, multiple paned windows, tree limbs, clouds, cityscapes, stained glass, birds, leaves, flowers, architecture, common objects, words, abstract patterns and blobs.

Gels

Gels are thin sheets of translucent material made of polycarbonate, polyester or some other heat resistant material. They are placed in front of a light fixture or other light source such as a sun-filled window. There are many different opacities and colors of lighting gels. Using colored gels can add interest to the image by having areas of the set bathed in blue, yellow or some other color.

There are color correction gels called CTB (color temperature blue) filter and CTO (color temperature orange). These gels come in various degrees of correction. There are 1/8, 1/4, 1/2 and full intensities of color correction. An 1/8 would have just a little correction, while a full would be dark and have a high amount of correction.

Tungsten lights produce an orange light at 3200K, while an HMI produces a blue light at 6000K. The tungsten would need a CTB gel to get it to match the HMI and the HMI would need a CTO get to get its color down to match the tungsten's 3200K light. Many LED lights have an adjustable color temperature, but some are either 3200K or 5600K or both.

If you are shooting in a location that has older fluorescent bulbs, they may have a green tint to them. You can use a minus green gel over them to reduce the green. There is also a plus green, if you want to match your tungsten lights to the fluorescents. These are known as magenta-green filters.

There are also neutral density gels that work just like the ND does in the camera, but these gels are for lights and windows. They cut down the amount of light depending on the strength of the gel. Gels rated.15ND are a half stop reduction, those rated .3ND are one stop of light reduction,.6ND are two stops and.9ND are three stops of light reduction. ND gels can come with color correction built in to them. For example, an 85.9ND will drop the light intensity by three stops and correct daylight to 3200K.

Gels are either held in front of light by clips built onto the barn doors or more commonly they are attached with "C-47s," which are wooden clothes pins or pegs.

Sometimes they are referred to as "bullets." C-47s can become C-74s, if the spring is reversed and the long ends become the clamps. C-74s are used to remove hot scrims and gobos from a slot in front of a light.

Variable color LED lights do not require gels as they can be adjusted to deliver the desired color.

Reflectors

Reflectors or "shiny boards" come in foldable sheets on frames and in solid boards. Some can be handheld, while others require a stand. They come in highly reflective silver or gold foil. Some are more reflective than others. The important thing to remember is that they are often reflecting sunlight, which is very powerful and can hurt people's eyes. It is better to place the reflector off to one side of the actor or behind them, but not directly in front. Always start with the reflector pointed down where you can see the reflected light, then slowly tilt the light to where it belongs.

It is better to start with a white board or silk to bounce the sunlight. If you need more punch to the light, you can then use a foil reflector.

Griff cloth or Griffolyn, which is a super-strong tarpaulin, is a tough versatile material. It comes in white, black and clear. The white is great for reflecting light and the black is a good for negative fill, but it is somewhat reflective too. The clear is good for putting on an overhead and blocking wind or acting as an umbrella in the rain.

Barn Doors

Barn doors are used to limit the spread of the light coming from a lighting instrument on to the set. Since they are right in front of the light, they create a soft edge only, which may be what you want. It would take a flag situated farther away to make a hard edge. Barn doors come in two-, four- and even six-leaf configurations. The most common is the four-leaf barn door, which forms a square around the perimeter of the light beam.

Black Wrap

Black wrap is aluminum foil that has a flat black coating. It is useful in blocking light, shaping light and creating patterns. Since it is foil, it is flexible and can be bent in to nearly any shape and affixed to the front of a light. It can be shaped into a "snoot" to limit the spread of a light. Be careful in that it can get too hot and start to smoke on hotter lights.

Dimmers

Dimmers are useful in bringing down the intensity of a light or a group of lights, but remember that reducing the power to an incandescent lamp may also bring down the color temperature. If you are using a specially designed dimmer for LED or cinema fluorescent lights, you will be able to dim them without much color temperature change. HMI lights can only be dimmed to about 50 percent before they have a slight color temperature change. Instead of using a dimmer, it may be simpler to move the light closer or farther from the subject. If the lighting instrument is focusable, then the intensity can be adjusted between spot and flood.

LIGHTING STYLES

Lighting is a powerful tool that can be used to influence an audience. Simply by adding a gel or a flag to a light, a character can go from being good to being evil. You may choose to light the good people more brightly and the bad people darkly. Using colored gels on some of your lights can connect an audience with the emotion of the character. For example, a blue gel or light can represent sadness, whereas a red colored light can represent love or anger. You may use a soft light for scenes about love or pleasure. Of all of the elements that give a movie its look, lighting is perhaps the most important.

How you create the lighting design for your film will depend upon such influences as the genre, the style, the mood, the scene's time of day, the characters and the story.

Here are some lighting styles to consider:

Horror: This is seemingly very little light, but it is very intentional light. It is common to use a hard light that is either positioned up high pointing down or from below pointed up.

Film Noir: Use hard lights and flags to get shadows. Place a light to the side of the talent, which will only show part of their face. Putting a hard light behind a window blind that is attached to a C-stand can create a shadow of the blind on a wall near the talent.

Sci-Fi: Using colored gels on the lights can give a futuristic look. Fluorescent tubes, LEDs and recessed lighting can add to the look.

Flat Light: This is common in comedies. Both side of the talent's face are equally lit. The set is completely lit with no dark areas.

Dramatic: "Rembrandt" lighting has the key light slightly off to one side of the talent. If there is a fill light, it is at a high ratio compared to the key light, so fairly weak. There may be a rim or side light on the dark side of the face. This style is known for forming a triangle off of one side of an actor's nose.

Paramount: This "butterfly" lighting causes a butterfly shape under the nose of the talent. It requires the light to be placed high and above the camera

Loop Light: The key light is placed to create a shadow that drops down from the nose and off to one side.

Clamshell: A key light is placed above the talent to light the face and a fill light is placed below to illuminate the neck.

Shoot into the Shadows: This is putting the key light on one side of the actor's face and then putting the camera on the opposite side, which will outline or silhouette the actor's face. If you were to look directly in front of the face, one side will be lit and the other side will be dark.

Light for Depth: Lighting the foreground, mid-ground and the background separately will add depth to this two-dimensional medium.

Practicals: Using workable practical lights such as Christmas lights, outdoor house lights, floor lamps, table lamps, flashlights, candles, fires and headlights.

Shadows: Using cookies, window blinds, glassless window panes, lighting gobos, tree branches or whatever patterns you want to break up the shadows and make them interesting.

GREEN SCREEN

Figure 11.5 Green screen lighting (by Ryan Garry)

When you shoot green or blue screen, first light the background screen evenly. Any hot spots will make it more difficult to pull a clean key. Secondly, light the talent as you need them to be to match the light of the image you will be keying behind the talent. If the image is an exterior and the sun is shining on the location from a 10:00 o'clock position, then you need to light the talent from the same position.

Green screens are used much more than blue screens for chroma keying. Blue was more common when movies were shot on film. Green works better for digital filmmaking. Green is the most sensitive channel in video, which is why blue is not commonly used and red is almost never used, as red is found in most human flesh tones. Green is the farthest color from human skin color you can be. Green produces the cleanest key as it has the highest level of luminance of the RGB (red, green blue) colors. If you are shooting with a single CMOS/CCD sensor camera, there will be a Bayer pattern, which is a filter arrangement on its pixel array, which allows the camera to record with twice as many green pixels as red or blue.

Blue can be useful when you are shooting talent that has blonde hair. Green tends to spill onto the light hair making it more difficult to pull a clean key. It could also be useful to use blue screen if you need to have a green prop, green wardrobe, green set pieces or even green plants in the shot.

If your green screen or chroma green wall is not large, for example wider than 12 to 16 feet (3.6–4.8m), you should be able to light it with two lights, one from each side. It can be useful to use the camera's onboard waveform, if there is one, to make sure the screen is evenly lit. Also, turn off any sharpening or motion blur as these will adversely affect the keying.

The talent needs to be at least 6 feet (1.8m) away from the screen, for a medium or close-up shot and about 10 feet (3m) in front of the screen for a whole-body shot. Try to keep any light used on the talent off of the screen. It is more effective for keying to have the talent brighter than the green screen, so they stand out.

Sometimes an entire set is a green screen, while other times there may only be certain areas in the set or there may be a need for set extensions that add digitally created scene elements to the live action set.

REFLECTIONS

Mirrors are a common visual technique to add dimension to a character or place. Mirrors can also help logistically in terms of blocking the actors. For example, in a small room, such as a bathroom, there is more room behind the actor to place a camera and be able to see the actor's face reflected in a mirror. A mirror can be used as a transition device into another world or time period. A broken or shattered mirror can be used to signify an actor's mental state. There are many creative uses for mirrors.

Water when used as rain can accentuate an introspective or sad emotional state of an actor. Water, when used for a "wet down," can be sprayed on the ground or street at night and will then pick up reflected light.

Glass is an effective reflective device. For example, they can be used for superimposing one image over another. An actor can be on one side of a glass window and the camera can be on the other side shooting toward the actor, but also recording the scene behind the camera that is reflected in the glass. This would be the scene that the actor would be looking at. It is important that the image reflected in the glass be lit enough to be reflective and that the camera be out of the frame.

Sunglasses, eyeglasses, computer screens and televisions are among the many objects that work well in reflecting images. A scene or image can be superimposed on these reflective surfaces in postproduction by an effects editor.

It can be a problem to see the reflection of a crew member that is in the shot. Even a wine glass or water bottle can reflect a crew member. Seeing the crew member can break the spell of the story, especially if the crew member's reflection is obvious or they are moving.

MINIATURES

Lighting a miniature set has become less difficult since LED lights became available. They can be used on a miniature set as street lights, interior building lights, illuminated billboards and much more.

GRIP EQUIPMENT

There are a lot of pieces of equipment that are used by grips. Gear includes, but is not limited to: light stands, clamps, rigging, C-47s, C-stands, gobo heads, stingers (heavy duty extension cords), distribution power boxes, apple boxes, sand bags, blankets (sound and furniture). You do not need all of these, but they help, especially stands, stingers and C-47s.

EXPENDABLES

Like a good scout, you need to always be prepared. A short list of items would include: different tapes, batteries, foam core, black wrap/cinefoil, duvetyne or commando cloth, Visqueen (opaque black or clear), rope, first aid kit, fire extinguisher, rope, bongo ties, paint, markers and more.

LIGHTING DIAGRAMS

> ### MISTAKE
>
> I don't want to spend a lot of time lighting. Just bounce a light off of the ceiling. It'll be fine.
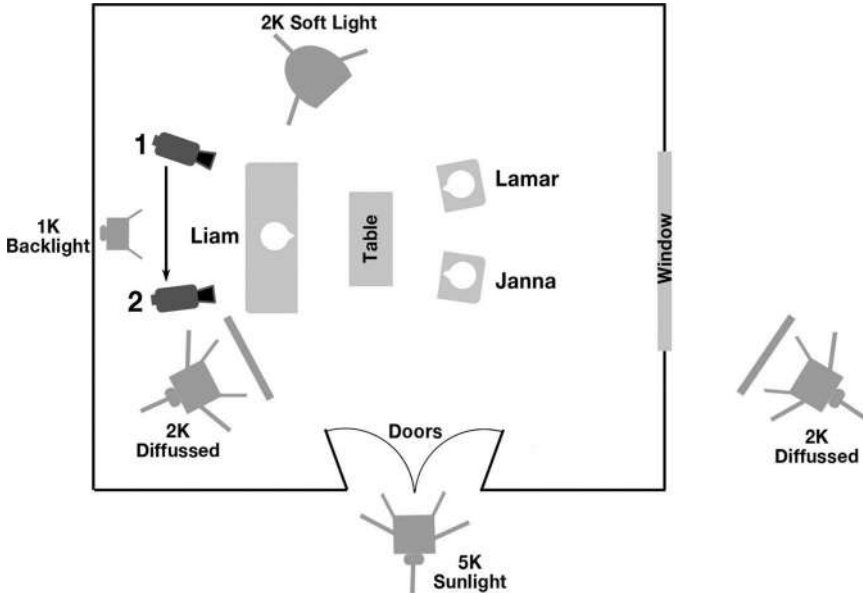
Figure 11.6 Lighting diagram

It can be embarrassing to walk on to a set and be asked about the lighting and not being prepared. Having a simple lighting plan will help jump start the shooting for each setup. Ideally, the director of photography and the director have met and made decisions as how to light a given scene. If those decisions are put into a diagram form, then anyone who needs to can look at the diagram and know what needs to be done. Instead of being asked a lot of questions about lighting, the director can give more time to the actors, where it is of greatest importance.

INVERSE SQUARE LAW

The formula is $1/d^2$. The intensity of a light is inversely proportional to the square of the distance (d). For example, if a light is placed 1 yard (3 feet) or

1 meter (which is 3.28084 feet) away from a subject and then you decide to move that light 2 yards or 2 meters away, you will only have 1/4th of the light intensity that you had before. If you now move the light 4 yards or 4 meters away, you will have 1/16th of the light you had at 1 yard or 1 meter away. 4 meters becomes the "d" in the formula and it is squared, which is 16, and that squared number is divided by 1, so the answer is 1/16.

Every time you double the distance of a light from your subject, the light's intensity will decrease to a quarter of its previous brightness. This is also inversely proportional to the area of illumination that the light is creating. In other words, if you move the light farther from the subject, the light will be less bright and cover a larger area. You will find that when you either double the light distance from the subject or reduce the distance by half, the f-stop will change by two stops.

COLOR TEMPERATURE

Color temperature describes the color or specific spectrum of light in degrees on the Kelvin scale, which is similar in magnitude to the Celsius scale, except that Kelvin starts at absolute zero or 0K (Kelvins). The British scientist Baron Kelvin (Lord William Thomson, slowly increased the heat on a block of carbon and noted that the color progressed from a dim red light, to orange, to yellow and finally to a bright blue-white glow as the temperature rose. His temperature scale is used to designate light source colors for many purposes including filmmaking. The two most common color temperatures for film lighting are tungsten at 3200K and daylight at 5600K. Some LED lights can be adjusted for nearly any color temperature desired.

Be aware that the color temperature of the sun changes throughout the day. If shooting a night exterior be mindful that the moon reflects light from the sun. That light is generally a warm yellowish light around 4100K color temperature, but that is not how our eyes perceive it. This is because of the Purkinje Effect, which says that as illumination is reduced, for example after sunset, our eyes shift from using cones to the rods, which are better at seeing green and blue in the reduced light. That is why we perceive the color of the moon to be slightly blueish, even though it is actually yellowish.

ELECTRICITY

Just in case a circuit is overloaded and trips, you need to know where the circuit breakers are located. You also need to know how to compute the amount of electricity is being used.

REMEMBER:

Volts × Amps = **Watts** or
Watts ÷ Volts = **Amps** or
Watts ÷ Amps = **Volts**

Normal single-phase household voltage in the United States is 110v to 120v. In many other countries, such as England and Australia, the voltage is 220v to 240v.

Voltage is the pressure that pushes electrons through a wire or an electrical circuit.

Amperage is the measure of consumed electricity or current.

Wattage is the measure of power or electricity consumed.

A 200W (watt) light will require less amperage than a 1000W light. Using the second formula above, we can determine how much amperage is being used by each of the 120V lights.

200W ÷ 120V = 1.66 Amps
1000W ÷ 120V = 8.33 Amps

If you are using a household outlet in the USA, then you have either 15 or 20 amps available in that circuit. You can determine how many amps are available by looking at the number on the circuit breakers in the power box. If they are properly labelled, then you should be able to determine which breaker applies to which of the outlets, rooms or appliances. If there is no way to determine the amperage of a circuit breaker, then assume it is 15 amps, so you can avoid tripping the breaker.

If you plug in two 1000W lights into a 15A (amp) circuit, then you are drawing 16.66 amps, which is 1.66 amps above the threshold for a 15 amp circuit breaker. This will trip the breaker and your lights will go out. If you only plug one 1000W light into the circuit, you can also plug a 650W fill light, as it would use only 5.41 amps and the total of the two lights would be 13.74 amps, which is below the 15 amp threshold. It is always good to have some headroom with amperage.

Circuit breakers are a way of protecting the wiring from overheating and catching fire. Do not try to bypass or overload them as it may cause a fire.

It always pays to find out what power is available and which outlets are wired to the same circuit breaker, so you can make a lighting power plan that will not trip any breakers or start any fires.

If you are shooting with all LED lights or some other low power light, you may not have to worry about tripping a breaker, but it is always good practice to be aware of the amount of amps you require for any given lighting setup. If the lights are running off of battery power, then your only concern is keeping the batteries charged.

LIMITS

Know your limitations. Do not try to do more than you or your crew are capable of completing. An overly ambitious script, lighting plan or shooting schedule has doomed many films. Consider your resources and adapt your script and shoot for success. A completed film is far better than one that was never finished.

If you have a crew of five to ten people, do not expect the shots you complete in a day to look like they were done with a full crew of 100 or more people, unless you have a lot of time to shoot your film.

Do not let lack of lighting equipment stop you from making your film. Find creative ways to minimize on lights and still have an appropriate style for your film. A more natural approach to your lighting will allow you to exploit available light by using reflectors and white boards.

Watch films that are similar to yours in story, genre and budget and use the lighting in them to create your own lighting plan that has a similar look.

TIPS

- Do lighting plans for each scene.
- Determine what and how many lights you will need for the film.
- Do not spend so much time lighting that the film falls behind schedule.
- Use enough light to capture a good strong image.
- Use the sun on exterior shots to your advantage.
- Sometimes less is more when it comes to how many lights to use on a set.
- Know the color temperature of the lights you use.
- Have and use the gels, flags and other light control equipment you have to enhance the lighting.
- Choose a lighting style and stick with it.
- Use a consistent lighting ratio for each scene.

12 LOCATION SOUND

MISTAKE

Films are called motion pictures, not motion sound. Nobody cares what a film sounds like.

When George Lucas said that sound is 50 percent of the movie experience, he was referring to good location sound, good postproduction sound and a good score. Location sound recording is just as important as the camera recording images. This chapter will provide useful information about recording location sound and not with the camera microphone.

MICROPHONES

A microphone is a transducer that converts sound waves into an electrical signal. That signal is recorded on a medium that allows the original sound to be reproduced.

In film production, microphones are used to pick up dialogue from the actors. They are also used to record ambiance, sound effects, wild lines, footsteps and other sounds needed for a film.

There are essentially three categories of microphones that are commonly used in sound recording; dynamic, condenser and ribbon. There are others, such as laser, fiber optic and crystal microphones, but they are not commonly used, especially in the film industry.

Each of the three commonly used types of microphones have their own strengths, weaknesses and unique attributes. Although dynamic and ribbon microphones could be used to record sound for a film, and were in the early years of cinema sound, nearly all modern recordings are made with the condenser-type microphone. Each of the three categories of microphones is based upon the transducer principle employed in a given type of microphone.

Dynamic
In 1877, German inventor Ernst Werner Siemens received a patent for the dynamic or moving coil microphone.

Dynamic microphones are workhorses, particularly in the music world. They are inexpensive and very durable. They work well on guitars, drums and other loud sound sources. They are commonly used by vocalists and news reporters, but they are not usually very good for recording dialogue.

When variable air pressure in the form of sound waves enter the microphone, they vibrate a movable coil, which moves inside a magnetic field, which in turn produces an electric current.

Although the quality would be low, a dynamic microphone can be used as a speaker and a speaker could be used as a microphone. Loudspeakers have a diaphragm coil and magnet, just like the dynamic microphone.

Ribbon
Historically, this type of microphone is fragile and expensive; however, there are some newer versions that are more durable and much less expensive. It was invented in 1924 by German scientists Walter Schottky and Erwin Gerlach.

A ribbon microphone utilizes a thin metal ribbon suspended in a magnetic field and the sound vibrations in that field create an electrical signal that can be recorded. They are similar to moving coil microphones as both create sound through magnetic induction.

Condenser

The condenser microphone, which is the one most commonly used in film sound recording, was invented in 1916 by E.C. Went at Western Electric. It is sometimes called a capacitor microphone or electrostatic microphone.

A condenser microphone works by using a condenser (capacitor) to convert the sound energy into an electrical current. The electrical signal needs to be powered, so usually a 48V (volt) phantom power is required to operate them. Some require different voltages.

Early condenser microphones had large diaphragms, one inch (2.5cm) or more, in order to keep noise levels from the vacuum tube electronics down. A way of categorizing condenser microphones is by the size of the diaphragm. A diaphragm, which is a thin membrane, vibrates when affected by sound waves. Small diaphragm microphones are those in which the diaphragm is 1/2 inch (1.3cm) or less in diameter.

Large Diaphragms (LDC)

Condenser microphones with large diaphragms are commonly found in recording studios. They are ideal for recording vocals. The large diaphragm picks up lower frequencies very well.

Small Diaphragms (SDC)

Small diaphragms are very useful for recording dialogue and acoustic instruments. They are also useful for recording stereo signals when combined into a matching pair.

As transistors became more common in the 1950s and 1960s, smaller diaphragms were constructed, which had a lower signal to noise ratio, meaning they were quieter than most large diaphragm microphones. This made them ideal for film work.

MICROPHONE PICKUP PATTERNS

Omnidirectional   Bi-directional   Subcardioid   Cardioid   Supercardioid   Hypercardioid   Shotgun
                   Figure 8
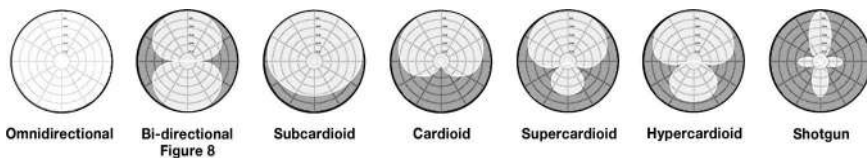
Figure 12.1 Microphone patterns

Microphones can be categorized by the pickup pattern design. For example, an omnidirectional microphone picks up sound in a 360-degree pattern, whereas a shotgun microphone is very directional and has a limited pickup pattern.

Like any tool, it is best to know what tool works for a given situation. If two people are having a conversation in their living room on a couch, then a cardioid mic on a boom should work well. If two people are having a conversation while playing tennis, wireless lavalier microphones on each actor may be the better way to go, but use a shotgun as well, just in case you need it in postproduction for automated dialogue replacement (ADR).

The main purpose of a microphone on a set or location is to capture the dialogue of the actors. Directional microphones such as the shotgun are designed to exclude other sounds, particularly sounds coming from the side. The longer and more narrow the pickup pattern, the more directional the microphone is and therefore the more side cancelation.

MISTAKE

I'll just use the camera mic to shoot my film. That way I don't have to have any sound people and besides the boom person always get in the way of the lighting.

Although it may seem expedient to use the camera microphone, it will rarely get you quality sound. The most natural-sounding audio comes from a boom mic. The next best microphone to use is a lavalier, which will pick up voice sounds well, but they will not have much of the surrounding ambiance that a boom microphone picks up.

LAVALIER MICROPHONE

Figure 12.2 Lavalier microphone

Lavalier microphones are usually omnidirectional. They pick up sound in a 360-degree pattern. Some have a cardioid pickup pattern. They are sometimes called "lapel" microphones because the news and some documentaries have them placed on the lapel of clothing and are thereby visible. For dramatic films they must be hidden.

The lavalier is good at reducing background sounds, but usually does not sound as natural as a boom microphone. Lavalier microphones can be placed on the head or sternum. Both of these positions will sound differently as the timbre is not the same. Usually, the best placement is at the sternum area of an actor and hidden under their clothing. The sternum position allows for good pickup no matter what direction the actor's head is turned. However, sternum placement under clothing means that the higher voice frequencies of 2–4 kHz will be reduced. Some microphones correct for this loss while other times equalization (EQ) is used in postproduction to boost these frequencies.

The sternum area produces a lot of low-end or bass sound from the chest cavity. The microphone easily picks up this intensified bass sound. Some attenuation or reduction of these lower frequencies using an equalizer is often required in postproduction to create a more natural sound.

If the sternum area is not workable then the microphone can be placed on other parts of an actor's body. For instance, if an actor is wearing a two-piece bathing suit, the microphone may be hidden in the actor's hair or on the inside of the temple piece of a pair of sunglasses. If it is appropriate for the actor to wear a hat, then the microphone can be hidden below the brim of the hat.

A hidden lavalier microphone can pick up clothes rustle from the actor moving and their clothing rubbing the microphone. Sometimes an actor accidentally bumps the microphone and this can cause a "hit" that could interfere with the dialogue. Other issues could be heavy breathing or lips smacking. Sometimes these issues can be fixed in postproduction by the dialogue editor, but some of them may require ADR.

In order to reduce movement sounds, there are different types of tape that will keep the microphone protected and secure. Moleskin and Transpore tapes are two types that can be put on both the front and back of the microphone, but not covering the windscreen as that will interfere with sound hitting the diaphragm. It can then be placed on the talent. I do not recommend using duct tape or even gaffer tape on a hairy chest as they are difficult and painful to remove. Another approach is to fold tape into a triangle that is sticky on both sides. A tape triangle is then placed on both sides of the microphone and then on the actor, either between the skin and shirt or between an undergarment and a top.

BOOM MICROPHONES

<div style="border:1px solid black;padding:1em;">

MISTAKE

I'll just have my best friend hold the microphone on a boom in front of the actors. How hard can it be to record sound?

</div>

Figure 12.3 Shotgun microphone

Boom poles allow the microphone to be placed close to an actor without actually touching the actor. The microphone pickup patterns commonly used on a boom pole are either cardioid, hypercardioid or supercardioid, depending upon the framing of the shot and how close the microphone can get.

A cardioid microphone placed in front of an actor and above their head will pick up the most natural sound possible. The cardioid pickup pattern, which is heart shaped, is excellent at receiving dialogue from the front and reducing extraneous noise from the back. This is closest to the sound an audience member would hear if they could be in the actual scene. Little, if any, postproduction processing is required on dialogue recorded with the boom microphone to get it to sound natural.

In order to capture good sound, the boom pole operator, standing in an "H" position with elbows slightly bent, maneuvers the boom in a manner that directs the microphone toward each actor as they speak while keeping the boom and the microphone out of frame. Although it sounds simple to hold the microphone in front of an actor, it actually requires a skill set that takes some training.

In order to know where to place the microphone at any given time during a dialogue scene, the boom operator must know the script as well as the actors do. This allows the boom operator to anticipate the next line. They can then cue or swing the boom between actors as they speak the lines.

Boom pole handling noise is an issue to be aware of during recording. The boom operator's hands need to be secure on the pole and the microphone cable also needs to be secured well to the pole. Some boom poles have the cable running through the middle of the pole and this is less of an issue with them. Other boom microphones are wirelessly transmitted, so there is no cable to cause noise.

Booming techniques are covered in the online Appendix.

SHOTGUN MICROPHONES

MISTAKE

I'll just put a wireless lavalier microphone on all of the talent, then I don't have to deal with the boom getting in the way.

A shotgun microphone on a boom is the most common microphone used in film and television production because they sound so natural. A shotgun can be used both for exteriors and interiors, but can have issues with reflections (reverberation) when used in rooms with hard surfaces like windows, mirrors, uncarpeted floors and walls with large open surfaces.

Shotgun microphones are unidirectional and thereby highly directional. They are essentially supercardioid microphones inside an interference tube. They use an interference tube to increase the forward directionality. It does this by canceling out off-axis sound waves entering the side slots. A potential drawback to this design is that there is also a rear lobe, which can pick up sound from behind the microphone.

Many people will say that a directional microphone has "reach," but that is a common misconception. They reduce sounds coming from the side and that makes what is in front of the microphone a stronger signal. It does not reach, but instead rejects.

It is important to select the right kind of microphone for each scene depending on how many actors are speaking in the scene, how they are blocked, how much movement of the camera will occur, what type of location it is and what camera angles will be shot. Knowing your script well, having storyboards and watching rehearsals will help you determine what your needs are for recording sound.

In postproduction, it is not uncommon to use the close-up dialogue as the wider shot. It will need to have some adjustments made to it to make it sound far away, but you will have a quality recording to work with. Synchronizing the close-up dialogue with the wide shot may take a bit of work

but you do have the advantage that the camera distance makes it harder to see the actor's lips moving.

PLANT MICROPHONES

A plant microphone is not placed on the body of an actor nor is it held above the actor on a boom pole, but is placed in or on an object near the actor or actors. For example, if two male actors in bathing suits and not wearing tops are sitting at a poolside table with a flowering plant on it and it is a wide shot, the only effective place to position a microphone might well be in the flowerpot or under the table pointing toward the actors. An omnidirectional microphone pointed up would be an acceptable way to mic this scene; however, a cardioid pointed at the actors will work well too.

It's important that the microphone be shock mounted, to isolate it from the object to which it is attached. You can float the microphone by making a small loop of gaffer tape or paper tape and attaching the tape to the object and the microphone to the other side of the tape, thereby holding it away from the object.

Using a plant mic is not an ideal way to record dialogue, but as long as the actors speak toward the microphone and do not turn their heads away, then you may get a decent recording.

WIRED OR WIRELESS MICROPHONES

A wired microphone literally has wire running from the microphone into the audio recorder. This is a safer way of getting a good recording without some of the hassle of receiving radio transmission interference in a wireless system.

A wireless microphone system transmits audio using either an analog or digital signal. The microphone, which is usually a lavalier, is connected to a transmitter that is usually located on the actor's body. The audio signal is sent from the transmitter to a nearby receiver and from there into an audio recorder or the camera. It is also common to have a wireless system for a boom microphone. This gives the boom operator greater freedom in movement.

Even though the best sound comes from a wired boom microphone, it is common to have the main actors and some or all of the secondary actors wear wireless microphones for any scene that has dialogue in it. It is best to think of a wireless microphone as a backup to the boom microphone.

RECORDERS & MIXERS

Figure 12.4 Location mixer Ken Saville (by Joe Fraser)

If you are shooting double system, then you will use an audio recorder of some type.

Some recorders are simple and others have many menus and attributes that can be confusing. Get to know the recorder as well as you would know the camera. Make sure that the recorder you use can do all that you need it to do. At a minimum, it needs to be able to record a .wav or .bwf file at 24 bits and 48K sampling.

Dedicated audio recorders are better than recording directly to a camera because the pre-amplifiers (preamps or prez) on most cameras are noisy and of mediocre quality. That is one of the main reasons for recording audio on an audio recorder. Generally, audio recorders have much better preamps than cameras, so they have very little noise being recorded on the tracks. Pre-amplifiers do what the name says: they amplify the low-level sound coming from the microphone, so that the recording is of higher volume and quality.

Mixers allow the person recording the sound to send the microphones signals to whatever tracks on the recorder they desire. It is also a lot easier to adjust levels on a mixer than it is on the small dials or menus on a camera.

A useful fact is that if you are recording a single track of audio at the 24 bit rate and 48K sample rate you will get two hours of record time per 1 gigabyte of storage. Two tracks being recorded will drop that record time in half. A helpful calculator can be found at: https://www.sounddevices.com/audio-recording-calculator/.

WIND GEAR

A windscreen or windshield is used to protect the microphone from wind noise. Indoors, the noise can come from moving the microphone too fast or from an air vent or open window. Outdoors, the most common issue is the wind. Wind noise is made up primarily of lower frequencies. Some wind noise can be attenuated in postproduction, but there are no guarantees that it will be eliminated.

Foam wind screens will help with very light wind, but they are better for use indoors. The more dense the foam the better the wind blocking will be.

The furry windscreen, commonly called a "dead cat," will do a much better job of wind noise reduction than just the foam windscreen.

A blimp or Zeppelin is a heavy-duty wind blocker that is a material-covered cage surrounding the microphone and allowing for space at the front of the microphone capsule for greater wind noise reduction. Sometimes a furry windscreen is placed over the blimp to give maximum attenuation of noise. With this combination, you can record good audio in heavy wind.

Shock Mounts

Shock mounts hold the microphone and are designed to isolate it from handling and boom pole noise. Some noise may still come through, but it will be greatly reduced by the shock mount.

Cables

Most consumer video cameras, mirrorless and DSLRs, come with 3.5mm (1/8th inch) jacks or mini-XLR for audio. Professional audio generally utilizes XLR connectors and cables. There are adaptors to XLR cables and microphones, but watch the levels as the output may be high. XLRs usually have a three-pin male and a three-pin female connector that sends a balanced signal. The balanced signal with three pins is cleaner than an unbalanced 3.5mm plug with two rings would be because the balanced signal is designed to cancel out cable induced noise.

ROOM TONE, AMBIANCE, PRESENCE

> **MISTAKE**
>
> There's no time to record room tone. We can get it from a sound effects library, if we need it at all.

It is the sound of the room you are recording in. Record it either before or after the scenes is shot. Not recording room tone or ambiance makes it harder for the dialogue editor to smooth out the transitions between the different shots in a scene. Room tone is used under any ADR to make it blend in with the production track. Room tone may also be used to fill holes and to replace unwanted noises in the production track.

For the best results in postproduction, it is common practice to record room tone with everyone frozen quietly in place, the lights turned on and any prop or set piece making sound in the scene operating. It needs to be the same sound as was recorded with the dialogue, but without any dialogue. It is not necessary to have the camera running, but some sound recordists like to have the camera turned on too.

Most dialogue editors would love to have 15–30 seconds of room tone/ ambiance from each camera angle shot in a scene, but that would take up a lot of set time. If there is no time for getting room tone for each camera angle, try to allow 5–10 seconds of quiet just before "Action" is called. That will at least give the dialogue editor something to work with, even though it is brief.

Always record room tone. Just because a room seems quiet to you, it will have a unique sound and an audience will notice if the replacement sound is wrong or missing.

INTERIOR OR EXTERIOR LOCATIONS

> **MISTAKE**
>
> I can use a hypercardioid microphone for both interiors and exteriors. They're best for all dialogue.

Interiors

Shooting on a sound stage is ideal for sound, but most films with lower budgets wind up shooting in living rooms, bedrooms, garages, offices and larger areas such as a warehouse or a basement.

Shooting indoors can be more challenging, especially if the room is reflective and has low ceilings. Another issue is trying to find a position around the lights to place the microphone. A cardioid pattern microphone or a short shotgun microphone may give you the best chance of getting good sound in most situations. Some recordists never use a shotgun microphone for interiors as they do not like the sound. They may use a cardioid microphone that is not a shotgun instead. Another option is to use lavalier microphones, so long as there is no action in the scene that would cause clothing noise.

The best way to tell which microphone to use is to try out two or three in the room and see which one gives you the best sound. It probably will not be a hypercardioid that you choose. They are difficult to move in close quarters and they will pick up more reflections than the other patterns and can give the dialogue a hollow sound.

Exteriors

Cardioid, especially super, hypercardioid and shotgun microphones are great for recording dialogue for exterior scenes. If the wide shot is too wide for a boom microphone, then the dialogue will have to come from the wireless lavaliers. It is always good practice to record with the boom on a separate track even though you are recording with the lavaliers.

There are short shotguns and long shotguns. The long shotgun will do a better job of picking up dialogue on a wide shot. The longer the shotgun, the longer the interference tub, the more ports on the side cancelling sound from the sides. Just because a long shotgun is good at capturing dialogue from a distance, does not mean it will work well for close-ups or even medium shots. The pickup pattern is very narrow and the boom operator would have to work hard to keep each actor within the narrow pickup range. It would be very easy to miss a line when cueing the boom between two or more actors.

RECORDING PREPARATION

Sound Crew

You may have a one-person sound crew and that person does both booming and recording. This is extremely difficult to do and do well. A better option is to have a sound mixer to record the audio and a boom operator. The mixer will make sure the levels are good and that all microphones are being recorded well.

The boom operator works to position the microphone in the best manner that will pick up the actors' dialogue and general sounds when there is no dialogue. A really good boom operator is a bit of an acrobat as they need to move with the actors and position the microphone properly while keeping it out of the camera frame.

It can be very helpful to have a sound assistant or utility person who helps with the setup, checks equipment and changes batteries. Sometimes the assistant is needed to operate a second boom and possibly record dialogue from actors when they are off-screen.

The production sound mixer and the boom operator work together to determine which microphone to use for any given setup in order to ensure good sound coverage.

Location Scouting

Location scouting is how you determining if there will be any problems for sound at each location. As long as you know about a sound problem, you can plan for it and try to remove or reduce that issue. If the sound problem is insurmountable, then you need to consider finding a different and more suitable location. Ideally, one of the sound crew is on the location scout.

If a room is highly reflective, you may put black sound-absorbing blankets on the walls, doors and on C-stands to reduce the problem. If you wind up using colored moving blankets, make sure the camera is white balanced after the blankets are hung, otherwise there may be an unwanted hue to the image. The sound crew will often lay carpet on the floor to knock down sound reflections in a reverberant room.

Track Selection

> **MISTAKE**
>
> I like to record and mix all of the microphones onto one track because it's easier to edit the picture that way.

Some cameras have one audio input while others have as many as four inputs. Some may be 3.5mm (1/8 inch) and others will be XLRs. Camera audio inputs are very limited compared to a recorder. Audio recorders can have a multitude of tracks. There are portable audio recorders that can record 64 tracks. The most common setup would be to have one track for the boom microphone and additional tracks, one for each wireless lavalier and plant microphone. There is usually a mix track that combines all of the important microphones on to one track, but it would rarely be used

in the final film. It is commonly used for the video village and for picture editing.

If all microphones are recorded onto one track it will bring up the level of the noise floor, because the noise floor, which is both from circuitry of all of the microphones and the room tone or ambiance of the location or set, will be added together. It will also make it very difficult to dialogue edit. It's best to keep all tracks for postproduction discrete on separate tracks.

Decibels
Named in honor of inventor Alexander Graham Bell, the decibel is a logarithmic ratio between two numbers that provides a measured value. A decibel is not a unit of sound intensity or power, but is a unit of change in the intensity. It is used in many different sciences, but in the audio world it is used to determine volume levels. In the digital audio domain, (zero) 0 dB represents the highest volume level attainable before distortion occurs. –12 dB is the highest for dialogue recording. Most dialogue is recorded between –18 dB to –30 dB.

Gain or Trim
Some audio-recorder manufacturers will label the same potentiometer (volume knob) as either gain or trim. However, there is a slight difference, even though they both amplify the audio signal. Often, the term gain applies to a signal entering the recorder via the pre-amplifier, but before it arrives at the A/D (analog/digital) converter, so it is still analog when the level is increased. While the trim usually refers to the signal after the A/D converter, so within the digital audio world when the level is adjusted.

Use your meters to determine the optimum recording level. In order to give some head room for the occasional unexpected loud sound, make the industry standard –12 dB be the loudest level.

Phantom Power or Batteries
Condenser microphones require some form of power. This can come directly from a battery or from phantom power. Phantom power is when the microphone is powered from the battery in camera or audio recorder. The power travels through the XLR cable to the microphone. Two of the three pins are audio signal lines in the XLR cable and they also carry the power, which is ignored by input circuitry making it disappear or become a phantom. The third pin, which is the ground line is not used to provide power. Make sure that all the equipment you are using has the same voltage. 48 volts is the most common for phantom power.

Timecode

Timecode is a useful tool for both production record keeping and for synchronization of audio and picture. When both picture and sound have timecode recorded in synchronization, they are easily cross-referenced. The audio can be linked to the picture in postproduction. Along with synchronization, the use of timecode provides both audio and picture with unique identities for each frame of picture and the corresponding "frame" of sound.

Any editing system that utilizes timecode would have a difficult time finding clips, if a multitude of clips had the same timecode, so it is best practice to make sure no timecode is repeated for a production. It is common for films to be shot with time-of-day timecode. This could cause problems with repeated timecode, but part of the metadata is the date, which is used to avoid confusion of duplicate timecodes.

Some productions increase the hour in the timecode for each media drive or card as they are used. In other words, if you had two media cards, you might enter a starting timecode or 01:00:00:00 for the first card and then 02:00:00:00 for the next card. You will have off-loaded the first card while shooting on the second card. The first card would follow the second card and it would have a starting timecode of 03:00:00:00 and so on.

Slates

Figure 12.5 TC slate and standard slate (top image by Jake Owens)

There are standard slates and there are smart slates. The smart slates display the timecode on a LED panel. The timecode on the slate can be jam-synced (synchronized) with both the camera and the audio recorder. That way the timecode is accurate for all three pieces of equipment and postproduction synchronization is easy.

Timecode is not flawless. There can be issues with it, especially if the camera, slate or audio recorder are not running at the same speed. This may require some form of resolving in postproduction. If resolving the time-code does not work then synchronization might be achieved by matching where the sticks on the slate close with the sound of that hit on the audio file. The hit audio waveform is very useful for getting close to sync. It looks like a tree on its side with the hit showing on the left side. This is the same procedure used with a regular slate that does not have timecode.

Formats

The two main formats are: Broadcast Wave Format (BWF) and Waveform Audio File Format (WAV).

BWF allows for metadata, which is useful for being able to access sound recordist inputted information about the shoot. WAV is the same as BWF, except that it does not allow for metadata.

There are other options, but these two are the most common ones found on location audio recorders. Some recorders will record MP3 files, but do not use MP3 for anything that requires quality. It is a lossy format and throws away lots of audio information in order to get the file size down. Having less information makes it hard to manipulate the MP3 recording in postproduction because noticeable sound artifacts can be easily created.

Metadata

Metadata is information recorded along with the audio in the BWF format.

The information is entered by the recordist during production and is very useful in postproduction. Below is an example of the type of information found in metadata:

Current Name: POW
Channels: 2
Scene 21
Take: 2
Project: Psycho's Revenge
Media: Card 04
Sample Rate: 48kHz
Fame Rate: 24
Start Timecode:
Length: 00:00:00:55
Bit Depth: 24
Track Info: 1-Josh, 2-Ellen, 3- Roger

Comments: No equipment issues, very windy day, loud bang at :50
Format: BWF, 24 bits, 48zHz
Recorder & Mics: Sound Devices 688, Sennheiser 416 & Sony Wireless Lavs
Creation Date: 01-01-2020
Boom: Rick Owen
Engineer: Patrick Winters

16 Bits or 24 Bits

CDs are usually 16 bit and audio engineers usually record at 24 bit. The more bits, the greater the dynamic range from soft to loud can be recorded. Some sound design is recorded using 32-bit floating point.

48kHz, 96kHz or 192kHz Samples

The higher the sample rate, the more information is recorded, so there is more detail in the recording. Sound designers often record in a high sample rate so that they can manipulate the sounds without noticeably losing sound detail or quality. Recording dialogue at 48kHz is an acceptable sample rate. While sound design may be recorded at 96K or even 192K.

Always test your equipment before the shoot. It is good practice to record some sounds or yourself talking and play it back to make sure the gear is operating correctly.

SINGLE SYSTEM & DOUBLE SYSTEM RECORDING

Figure 12.6 Single and double system

There are two approaches for recording sound for film: single system and double system. Single system is when the sound and picture are recorded on the same device, such as a camera. Double system, which is an industry standard, records audio on one device and the picture on a separate device. Single system records the audio in synchronization with the picture. Double system requires that the audio and picture be synchronized in postproduction. Depending on how you are synchronizing them, it may be helpful to record the sound on both the audio recorder and the camera for synchronization later and use a slate for backup.

The reason why double system is the industry standard is that the sound is recorded at a higher quality on a dedicated audio-recording device. Only high-end cinema cameras can record at a high quality. Most high-end cameras have at least two audio tracks to record on. Some have as many as four tracks to record on, but that may not be enough for every scene.

Although you can record audio to camera, it's better to have a sound crew, then saddle the camera operator with another responsibility. It would be difficult for the camera operator to watch levels and make sure the camera is properly framed and not miss anything undesirable in the shot, such as a smart phone being left on top of the piano in a 1870s Western movie.

DSLR/MIRRORLESS CAMERA SOUND

If you are shooting on a DSLR or mirrorless camera, do not record audio into it, unless you have a mixer/amplifier that operates with the camera. DSLR and mirrorless audio is generally of poor quality. Some of these cameras do not even have a headphone jack, so you don't really know what you are recording. Most DSLR and mirrorless cameras have only automatic audio controls, so there is no manual control available. Some cameras only have a 3.5mm input, so you need to have an adapter if you want to use a XLR microphone. Overall, it is better to shoot with a separate audio mixer and recorder and a sound mixer to operate it.

RECORDING DIALOGUE

> **MISTAKE**
>
> I don't need to wear headphones when I'm recording. I just need to watch the meters to know I have a good level.

A useful video on location sound recording can be found on YouTube by searching for: Jeff Pullman Location Sound Mixer.

It is a common saying that you wouldn't shoot a picture without looking through the viewfinder, so why would you record sound without listening through headphones?

You have to use your headphones to make sure there are no unwanted sounds, weak batteries or unsecured cables and that your levels are good. How can you tell if the microphone is pointed at the sweet spot for dialogue unless you can hear it? Continually listen through the best headphones you can get, since that will let you know if something goes wrong. The best headphones are those that fit completely over your ears. Earbuds are not headphones and they are more limited in their frequency range. Do not monitor sound with earbuds, unless you have no other way of listening.

If you are recording into the camera only, make sure that any camera microphone is turned off and that your boom or lavalier microphone is turned on and has phantom power if it requires it. If you are not using all of the audio channels on your camera, feed the same signal to two channels and manually turn one of them down by –6 dB. That way if an actor gets too loud and exceeds 0 dB, you may still have a good recording. Most cameras have a built-in limiter that will suppress loud sounds.

When using a boom microphone, the ideal sweet spot is as close to the talent's mouth as you can get without getting the microphone into the shot or causing other issues, like shadows or reflections. The best starting point for positioning the microphone is in front of the talent and above the talent's head, just out of frame. For most shots, that is about 2 to 3 feet (60–90cm) above and about 1 foot (30cm) in front of the talent angling down at about 45 degrees. It is important to make sure the distance between the microphone and the talents is consistent, as this prevents any fluctuation in the level of the recording.

If there is more than one speaker, then you may need to position the microphone in a way that picks up all of the talent. This may require the boom operator to swing the microphone between the talent or if the talent are close to each other, to simply rotate the microphone back and forth as each person speaks. If the talent is moving around as they speak, the boom operator will have to move with them to keep the correct microphone placement.

Sometimes, in a scene with two or more actors, one actor may speak softly and the other at a normal level or loudly. The boom operator needs to adjust the distance of the microphone for each talent according to the talent's speaking volume, in order to maintain a consistent level for all of the actors. For example, you may need to position the boom microphone three feet away from a loud actor and only two feet away from a soft speaking actor.

Keep the levels below –12 dB and hovering between –18 and –30 for most average volume level dialogue. The –12 dB gives you plenty of headroom

should an actor raise their voice way beyond their normal speaking level. Avoid zero at all costs. Digital recordings immediately deteriorate once they cross the zero threshold.

One way to avoid over-modulated or distorted audio recordings is to record in 32 bit floating point format using dual A/D (analogue to digital) converters as this recording will have a dynamic range of 1528 dB, so plenty of headroom. The DAW (Digital Audio Workstation) will also need to process in the 32-bit floating point format in order for the full dynamic range to be available.

Getting good levels from the talent is critical for keeping the ambient noise floor at a low level. As a microphone moves farther from the talent the noise floor increases. The noise floor comes from the microphone or recorder pre-amplifier and the ambiance of the set or location. Positioning the microphone as close as possible to the talent will reduce the noise floor.

Other noises come from people talking or moving around, which can be a problem even on big-budget movies. Location noises are the hardest to control. Noise may come from a nearby traffic, a barking dog, wind, a lawnmower, construction, an airplane, a siren and other such everyday sounds. At interior locations, there are even more noise culprits, like refrigerators, freezers, air conditioners, heating systems, clocks, doors, radios, elevators and office equipment.

Shot perspective is an important aspect of sound recording. A wide shot will require the microphone to be out of frame and therefore farther from the talent. This distance adds air to the recording, which matches the expectation of the audience. A close-up shot allows the microphone to be much closer to the talent than a wide shot does. This closeness matches the shot as well as the audience's expectations of a more intimate sound from the actors.

Getting good production sound will make the entire postproduction process easier and may eliminate some or all ADR. Dialogue is part of sound design and the purpose of sound design is to engage the audience in the story. Remember, sound conveys emotion and picture conveys information.

The recordist or mixer on the sound crew can keep all of the microphones discrete by recording each to its own track. These ISO (isolation) tracks allow for greater flexibility in postproduction. The recordist can also supply a mix that can be used for dailies and for editing picture.

The five top production sound problems are:

1. Dialogue levels are low in comparison to the background sounds, which are often referred to as the noise floor. There should be a difference of at least 16 dB between the noise floor and the dialogue level, if not much more.

2. Dialogue that is recorded with distortion or has mumbled words re-
   quires a lot of work to correct. It may be unsalvageable and thereby
   require the lines or words to be looped in an ADR session.
3. There is no room tone or ambiance recorded, which helps with smooth-
   ing out the dialogue and providing a way to make the ADR blend in
   better with the dialogue.
4. One-take wonders. Even if the first take is the one that the director
   wants, it's good practice to do a second take for protection. Because if
   something should go wrong with that one and only take, the dialogue
   editor has nothing to fall back on, no second take where a clean line
   can be taken from in order to replace a line with some noise in it. It's
   that take or none.
5. Crew members or the director talking during a take can make it very
   difficult to clean up the dialogue, especially if their talking is during a
   line of dialogue.

RECORDING WILD SOUND

> **MISTAKE**
>
> As long as we record dialogue, we don't need to waste time
> recording location sound effects and wild sounds. That's what post
> sound is for.

Wild sounds are those that are recorded without any synchronization to pic-
ture. If there is time, it is common to record wild sound during production.
Otherwise the wild sound will be recorded in postproduction. Sometimes
wild lines of dialogue are recorded on set, so that the ambiance matches the
dialogue recordings at a location from when the camera was running.

When a dialogue scene is shot entirely as a wide shot or dialogue occurs
during the establishing shot or wide shot, it is best to record dialogue wild
using a boom microphone near the talent immediately after the last take.
This will not only give the wild lines the correct ambiance as the location,
but it will also help the actors perform in character and with the right
emotion for that scene. Otherwise, the actors would have to try to recreate
their emotional state for the scene at a later time in an ADR session and
usually the other actor or actors are not there to act with. Most directors
and actors try to avoid ADR sessions, because they do not sound natural
and they rarely achieve the same emotional level the actor felt during the
scene. Lavalier microphones could be used and then the dialogue would
be treated in postproduction to sound more distant.

Recording wild location sound effects can be very useful in postproduction. For example: if the shoot is at an old printing press in colonial Williamsburg, Virginia, then the sound effects needed for such a machine might not be readily available, so it would be a good idea to record the press in action at the location. These types of sound effects are wild sounds, in that they are recorded when the camera is turned off and in some instances not even at the shooting location.

These wild sounds may be used in the overall sound design, which will include sound effects, Foley, walla, dialogue and music. The overall sound design is created so that all sounds work together to support the story.

PLAYBACK

Playback is essential when the production is a musical or anytime that lip-sync is required. The sound person will play back the music or voice track during the take. They will also record the playback as though the actor were actually singing or speaking. This production recording will be used to synchronize the pre-recorded music or voice to the take in postproduction. On some musicals, the music is played back through an earpiece that the actor is wearing and they sing along to it. The music can be recorded on one track and the singing on another and married later in postproduction.

SHADOWS & MIRRORS

Cameras require light. There are often objects in front of lights creating shadows, including a boom with a microphone. When the audience sees a microphone or a boom or their shadows, it can be distracting and easily destroy their suspension of disbelief.

Ideally, the lighting crew and the sound crew work together so that there is an appropriate place to position the boom microphone in any given shot. It is more common that a shot is lit and then the boom operator has to find a place to position the microphone without creating any shadows. It may be possible to hide the boom and microphone shadows within another shadow or in a darker part of the set.

It is a common lighting practice to have the lights in front of and above the actors, pointing down at them. This approach places the actors' shadows on the floor or low on the wall behind them. Placing the boom and microphone in front of and above the actors should place their shadows on the floor or on the wall behind them also. This will ideally keep the shadows out of the camera frame.

Getting rid of a shadow may be as simple as adjusting a barn door or placing a flag in a manner that removes the shadow from the frame. If all else fails, you can try to capture the dialogue from below, pointing the

microphone up toward the actor's mouth. This position is not ideal, as the sound quality maybe different from the quality of sound from a microphone pointed down. Also, if an actor is doing something with their hands and it is noisy, that noise will be louder because the hands are closer to the upward pointing microphone.

Mirrors and windows are difficult to have to work around. Ideally, the boom operator will never be seen reflected in a mirror, window or other reflective surface. The boom operator needs to work with the camera operator to make sure they are not seen in the frame.

TWO CAMERA SETUPS

Shooting with two or more cameras can make it difficult to light properly, but also to record good production sound. For example, if one camera is on a wide shot and the other camera is on a close-up, then the boom microphone is forced to be positioned above the frame of the wide shot. This may work for the wide shot, but on the close-up the sound will be unnaturally distant. Putting a wireless microphone on each of the actors may work well for the close-ups, but not sound natural for the wide shot. It may take time in postproduction to get both the wide shot and the close-up to have similar sound characteristics.

SOUND REPORTS

MISTAKE

I won't need sound reports since the scene and take numbers will be recorded on the camera.

As boring as it might be to fill out a report, it is of vital importance and usefulness in postproduction. The picture editor, dialogue editor and sound effects editors may be able to save time and money by having production sound reports. Some of the most important uses of a sound report are to find alternate takes, wild lines or production sound effects. A typical sound report can be found in the online Appendix.

TIPS

- Record double system if possible.
- Use a sound crew if possible.

- Record in either BWF or WAV format.
- *Always* wear headphones.
- Check out your equipment before the shoot.
- Make sure the batteries are charged or fresh.
- Make sure you have media to record on to.
- Properly place the microphone for good audio.
- Use the right microphone for the job.
- Keep a sound report.
- Record room tone/ambiance.
- Do not mix dialogue microphones together on the same track.
- Make sure to tell everyone to silence their cell phones.

Final thought: An audience will forgive a slightly out-of-focus shot or poor lighting, but they will not forgive bad audio; therefore, it is worth having someone competent recording sound.

POSTPRODUCTION

13 PICTURE EDITING

INTRODUCTION

> **MISTAKE**
>
> I'll just put in all of the cool shots and then edit the rest around
> them. I'm sure it will work out.

Before you start editing, you need to have a plan. Just putting in the best shots and seeing what happens is not a plan and is not likely to turn out well. First of all, you need to decide which editing software will be best for the technical aspect of telling the story. Secondly, it is up to the editor working with the director to tell the emotional truth of the story. Finally, you need to decide your organizational approach, which is what needs to be accomplished and when each step needs to be completed. This may mean omitting favorite scenes, shots or lines of dialogue. If something does not serve the story or support the emotional arc, then it may be better to remove it from the film. This is the often painful concept of "killing your darlings."

As you edit the film it is important to pay attention to the pace of the film overall. Some parts will move rapidly while others will move slowly. A normal script will have action sequences which are either introduced by or followed by an exposition sequence or scene. Exposition is the period when people talk and give out information that is important to the storyline or about a character. In order to slow down the pace the edits may hang or pause a little longer on each character as they talk. In order to speed up the pace, the pauses and some lines may be shortened. A film is hardly ever edited as it is shot. The final version of the story will come out during the editing process.

Whatever non-linear editing system you are using, the process is the same. You setup a project, ingest media, view the media, decide which media to include in the film, place the media in the timeline and edit it until you are ready to export it.

EDITING PICTURE

Figure 13.1 Picture editor (by Nicole Maturo)

The director and editor will be working closely to shape the story. The editor will have a more objective eye than the director as the editor bases the story on what they see and hear and not on what is preconceived. The relationship between the director and editor is not a clash of egos but a collaboration of creative ideas. There needs to be a trust in the process that eventually a story will be told and told well. As a team the director and editor must be willing to try each other's bad ideas and good ideas. You never know what might happen from a happy accident.

An editor may be called in to start work during production or they may start once principal photography has been completed. When an editor starts working during production, they will review the dailies and may do a string-out of all of the takes for each scene. They view all of the takes with the director and then they start a rough assembly or "rough cut" of the footage that has been shot for the completed scenes. As the editor becomes familiar with the footage, they can make viable decisions about which takes work the best. This rough assembly allows the director to see the cut scenes and then determine if additional footage needs to be shot to make a scene work better. It also allows the director to give feedback and change notes to the editor.

Once production has ended, the director can focus on working with the editor to refine the cut by analyzing every shot and reworking, removing or reordering the scenes until the story is told in a manner that reflects the director's vision. As the editing progresses and the story comes together, the director can determine if there are any holes in the plot, missing shots or retakes of scenes or shots that do not work well.

When the director, editor and producer are satisfied with a cut of the film, it is considered "locked" and sent on to sound postproduction. If there is a tight deadline, an unlocked version of the film may be given to the sound team to start work on and then, once the film is locked, the sound can be conformed to the final edit. It is this final cut that is seen by an audience.

When an editor is working on a film, they are aware of the story arc, emotional arc and the rise of conflict. There is no dramatic story without some form of conflict. This awareness is instrumental in making choices for edits. Another aspect to be aware of is the character arc of one or more of the characters. This is the inner journey of a character, usually the protagonist, to some form of self-discovery over the course of the story.

There are no right answers for edit lengths, but paying attention to the actors and being aware of the shots before and after a particular shot can provide a sense of timing. As an editor begins to internalize the story and get a feel for the characters they are better able to externalize the story in the timeline and find the proper rhythm to guide them.

Whichever software is used to edit, it should be able to accomplish whatever the editor needs it to do. There are many to choose from, such as Avid Media Composer, Blackmagic DaVinci Resolve, Apple Final Cut Pro, Vegas and Adobe Premiere Pro.

ORGANIZATION

The more organized the edit process the faster and simpler it will be. Every editor needs to make a plan of how to input media, where to store the media, what settings the project needs to have, including what the final output formats will be.

Before the editing begins it is best to know the workflow. An 8K project can be edited with proxies, which is footage transcoded down to a lower resolution. Some editing software may allow for the playing of footage at a lower resolution, if your computer is not able to handle the data flow without the need for transcoding. Once the edit is done, then the project can be switched back to 8K or other resolution for output.

There are some edit-ready codecs, like Apple's ProRes and Avid's DNx, which require no conversion into most video-editing software.

The basic steps for a do-it-yourself postproduction:

1. Set up the editing project in the software.
2. Import media clips into the editing software.
3. Move selected clips into the timeline in story order.
4. Cut out unwanted parts of the clips/shots in the timeline.
5. Use the editing tools to arrange the clips/shots in a visually cohesive manner.
6. Add cutaway shots or inserts shots onto a separate video track.
7. Add transitions where needed and apply any visual effects.
8. Edit the audio until it plays smoothly and then add special effects (SFX) and music.
9. Adjust volumes and add any equalization (EQ), reverb or other audio effect that is needed.
10. Do color correction and then color grading.
11. Export to the desired format.

PROJECT CLIPS

> **MISTAKE**
>
> I don't need to name all of my clips. I can tell what they are by looking at the thumbnail image.

An effective way of staying organized is to name folders, bins and clips so that they are recognizable and immediately accessible. A common approach is to have a bin for each scene in the film. A bin named, "Scene 1" will contain all audio and video clips for that scene. The name of each

clip needs to include the scene number, take number, characters who are on camera and what type of shot it is. Scene 1D Take 1 would say that a particular clip is the fifth camera angle that was shot, as "D" is the fourth letter used after the establishing shot, which itself has no letter after the scene number. I might add "Tony OS Amanda" to tell me that the camera is on Tony and over the shoulder of Amanda, who is the only other person in the scene. However, if the software is able to show thumbnail images from the take, then only the scene and take number may be all that is necessary for the name.

TIMELINE PANCAKING

Pancaking is an editing setup that can be organized to have one timeline for the select takes and one for the rough cut. A shot can be "comped" from the selects track to the edit track and then cut into the edited sequence at the appropriate place. This compilation of shots to the edited track is a simple and easy way to edit a scene. The term comped is commonly used in the audio-editing realm, but is appropriate for picture editing too.

MAINTAINING SYNCHRONIZATION

Maintaining video and audio sync is key to avoiding wasted time searching for misplaced clips. While picture editing it is a good idea to keep track of the audio edits too. It is fairly easy to separate the audio from the video to make an edit and then forget that you have not relinked them. As clips get moved around an audio clip can easily be orphaned somewhere in the timeline. Not noticing this error will be an issue when you finally export the project and discover an unwanted sound or out-of-sync sound in the output.

It is normal to unlink picture and audio during editing, but it is best to make a habit of relinking them, if that is appropriate for the edit being made.

CONTINUITY & DISCONTINUITY EDITING

Continuity editing is done in order to give the audience a seamless visual and auditory experience while being emotionally engaged in a story. There will always be continuity errors in a film, but an editor will aim to engross the audience in the story, so that most of those errors will go by unnoticed. The point is to produce a flow that appears uninterrupted.

Discontinuity is when the director and editor break the rules of continuity and still keep the audience engrossed in the film. Intentional jump cuts and montages are examples of discontinuity. However, by not maintaining continuity there is a risk of having no fluidity of action and time, which can leave an audience confused.

Continuity Editing Review

- Start each scene with an establishing shot.
- Use shots and reverse shots.
- Follow the 180-degree rule and do not cross the line.
- Only show pertinent action by removing anything that does not progress the story.
- Match the cuts, so that an action started in one shot continues into the next shot.
- Match the eye lines of the actors to other actors or objects of interest.
- Cross-cut between parallel storylines.
- Pace the shot lengths to match the emotions and actions of the scene.

This is the conventional concept of a continuous narrative, which seamlessly moves the story without drawing attention to itself. Each shot logically and coherently follows the previous one so as not to distract the viewer. If the story is incomprehensible due to poor choices in editing, then you need to continue editing.

Even though a script supervisor notes what actions the talent do in a given scene, such as which hand is holding a drink, the editor needs to pay attention to these potential continuity issues too. If one shot has the actor holding a drink in the left hand and the next shot has them holding it in their right hand, the audience may notice and that may distract them out of the story.

Eye Line

When an actor is looking at something or someone off-screen, the next shot needs to be what the actor is looking at. The eye line must match between the two. The eyes must be looking toward the person or object in the next shot. The editor must make sure the two shots work so that the audience believes the actor is looking directly at the subject of the following shot. For example, an actor may be on the left side of the frame and looking down and to the right side of the frame. The next shot might be of a puppy. The puppy would need to be on the right side of the frame looking up to the left at the actor. When these two shots are cut together, it appears that they are looking at each other.

The same concept is used when, for example, two actors are facing each other in the wide shot, but when we cut to their close-ups, they are looking

at each other off-screen. This is usually the classic shot-reverse-shot technique that follows the conversation or action. However, it may be valuable to not cut away from an important line to make sure the audience gets it. Then you can cut to the other person to see their reaction. The weight of some lines needs to be emphasized by when to cut or not to cut away.

Eye Guiding or Tracing

This is the editing technique that draws the viewer's eyes to the portion of the frame that has important information in it. For example, a match may be lit in the center of the frame of the first shot and the lantern may be placed in the center of the second shot. The match enters the frame of the second shot and lights the lantern. The viewer's eyes do not need to search the frame for what is important, because it remains in the center.

Another tool for guiding the viewer's eye is to use a matching color in the first and subsequent shots. A classic use of the color technique is in Steven Spielberg's, *Schindler's List* (1993). The images are in black and white, except for the coat of a young girl, which is red. Because she wears the only color in the various cuts we are able to follow her through a number of busy streets.

The editor is not readily able to perform these types of edits unless the director has preplanned the shots in order to guide the viewer's eyes. The director can use color, camera moves, blocking, lighting and eye lines to achieve this goal.

Cutting on Action

When cutting on action, the editor is looking for matching action or movement in two different camera angles. The cut is made during the action, not before or after. For example, when a shot shows a character about to sit on a bench, the next shot needs to complete the action of sitting. The second shot starts from where the action of the previous shot left off. There is a flow and continuity of action.

Before making any edit, the editor needs to assess why they are making a particular cut. They need to know what motivates the cut and how it supports the story. There needs to be a valid reason for making any cut. Cutting on action is particularly useful in action movies, especially in fight and chase scenes as it makes the editing seamless.

A cut on action can also be used as a transition between scenes. For example, one scene could end with a hominid throwing a bone in the air and the next cut is to a space station in exactly the same frame position as the bone. This match cut was used in Stanley Kubrick's *2001: A Space Odyssey* (1968) with the effect of progressing time by thousands of years. The subtext of this change of imagery is that humans had advanced from primitive tribal beings to the point of being able to undertake space exploration.

Direction of Action

When an actor exits a car door and crosses the frame from left to right, the next shot of them walking to their house needs to have them also moving from left to right. There is continuity of action with this type of cutting. However, the amount of time an actor takes to get from their car to their house can be compressed if it is shot properly. This is accomplished by letting the actor exit the frame in the first shot and then hold that shot for a beat. The next shot is of the actor entering the frame, in the same direction, as they reach for the doorknob. All of the time walking from the car to the house has been shortened as it is not likely to be pertinent to the story, tempo or action.

180-Degree Rule

MISTAKE

I didn't know until I started editing that I crossed the line in one scene. I'll just throw in a jump cut or two and that will make the scene more experimental. It will be kind of French New Wave style.

Ideally every scene will be shot following the 180-degree rule, unless the director intentionally breaks the rule. This rule was discussed in Chapter 9 "The Shoot," but is important to mention it again for editing purposes. The rule comes into play when there are two or more actors facing each other. Let us say that a scene has two actors and the camera shoots both of them individually. Once an actor has been established as being on one side of the frame, the other actor needs to be on the other side of the frame for all of the shots in order not to disorient the audience.

Parallel Editing

This is a technique of cross-cutting, which is when two different scenes are occurring at the same time, but in different locations. There can even be two different stories being told simultaneously by cutting from one story to the other at appropriate times. The audience can put the stories together in their heads and find additional meaning by having the stories be in contrast with each other or in being in direct relationship to each other.

Cutaways & Inserts

It is common for filmmakers to use the terms "cutaway" and "insert" interchangeably, but there is a difference.

A cutaway is a shot that cuts away from the main action of a scene to a shot of some other person, place or object. It is often used to show a memory or daydream of an actor and, once the cutaway is finished, the editor usually cuts back to the main scene. The cutaway scene can give the audience additional information about the character, such as what they are thinking and feeling.

An insert can be used to cover a gruesome action. A knife is raised. A character screams. The knife comes through the air. The body of the stabbed actor falls to the ground. But, the editor never shows the character actually being stabbed. An insert shot can be used to fill in that part of the action.

An insert is a shot cut into a scene that shows the audience an object of importance. For example, if one character passes a wallet to another character, there may be a close-up insert shot of the wallet changing hands.

Cutaways and inserts can be used to manipulate time, build suspense and to cover continuity mistakes from production. It is common for cinematographers to shoot inserts so that the editor has a tool to use for pacing and for covering up errors. An insert could be used to cover a jump cut. An insert can also be used as a transition between differently framed shots in a scene.

When working in the timeline, performing an insert edit into a scene will push all of the subsequent footage, after the insertion point, down the timeline the length of the inserted footage. When using an overwrite edit, no footage is pushed down the timeline, but instead the shot being added will cover or replace footage already existing in the timeline starting at the selected in point.

Jump Cut

A jump cut can be very distracting, or it can be a memorable creative decision. Jump cuts occur when a section of a single shot is removed from the middle and then the two remaining clips are joined together. The two shots will have the same or similar framing; however, because of the time change, the action jumps. A jump cut was commonly used during the French New Wave era. They can be used to shorten or compress time.

Montage

MISTAKE

I'm going to use a montage sequence for a scene in which the sound is bad. That way I won't have to record ADR for the whole scene.

A montage is a way of editing related images together without concern for continuity, except in the case of a timeline of events that move from a beginning to an end. A montage often shows the passage of time. For example, a character may be waiting at a bus stop and the passage of time is shown by posing the characters in different postures of boredom and then cutting all of those positions into a faster than normal paced sequence, which makes it a montage sequence. A montage may also be used to add background information to narrative. For example, it could be a technique for providing information through a flashback of various images from someone's past. Usually a montage is accompanied by some appropriate music.

TRANSITIONS

> **MISTAKE**
>
> I want to have dissolves between every shot. It will make my film look like one long dream sequence.

Figure 13.2 Translations on timeline

Hard cuts are the most basic kind of cut in editing. It is cutting from one shot to another without any transition. The end of one shot butts up against the beginning of the next shot. The hard cut keeps editing simple and is used in most scenes to keep the action moving in a continuous timeframe, such as the shot-reverse shot-shot style that is common to films. It may not be the best choice to show a passage of time, which is usually accomplished with a dissolve or fade-out and fade-in.

Dissolves, also called crossfades, are used to show a passage of time or a transition from one scene to another. A dissolves shows the end of one shot slowly overlapping with the beginning of another shot. Besides being used to show a passage of time, they can be used to transition into what is being seen as a dream or memory inside a character's head. Making a dissolve between every shot is more like making a music video than a dramatic movie.

Fades are essentially a dissolve to or from black. A fade-out starts with the final shot in a scene slowly overlapping a totally black image, until there is only black. A fade-in starts from being a totally black image to slowly overlapping with a shot until the black is gone and the shot remains. A fade is a visual way of showing a change in time. They can be interpreted as the end of one chapter of the story and the beginning of the next chapter. For stylistic purposes a different color than black could be used.

J-cut is the term used to describe an edit that starts with an audio cut first and then later the picture cut. This allows the sound to bridge the cut and connect the picture edits and the shots.

L-cut is the term used to describe an edit that starts with a picture cut first and then is followed later by an audio cut.

J-cut and L-cut get their names from the loose appearance of the edits in the timeline to the letters "J" and "L." Both of these types of cuts can be useful in dialogue scenes by allowing some dialogue to continue from a speaking actor, while the shot has changed to the non-speaking actor. This beaks up the shot-reverse-shot cutting.

Wipes are not commonly used, but they can be very effective. A wipe is a transition from one shot to another using a visible pattern that moves across the frame removing the first shot and replacing it with the next.

PACING

In its simplest form, pacing is about the timing of cuts. The timing of the cuts will depend upon the scene being cut. If it is a slow and easygoing conversation, then the cuts might happen slowly. If it is a conversation that turns into an argument, then the cuts may pick up speed during the argument. A long scene that is slow to unfold may need the pace to be faster than it would be for a shorter scene in order to maintain audience interest.

If there are more than two people talking in a scene, then the pacing can be faster when cutting between characters, but not so fast that the audience does not know who is talking to whom. Commonly, it gets down to the editor's instincts and how the cutting feels.

Along with pacing is the choice of shots for a given scene. The more "coverage" that is available, the more the editor can vary the shots. Coverage is the amount of camera angles used to shoot a scene. The more angles shot, the more coverage and the more choice in editing, which means an easier job of setting and maintaining pace.

A common approach to editing is to enter near the middle of a scene and leave before it is over. This eliminates some of the slow time when a scene starts and gets out before the last shot lingers too long. In other words, make the scene play tightly.

FLASHBACK & FLASHFORWARD

A "flashback" is a sequence or shot from the past that is interjected into the current scene. They may be used to add "backstory," which are events that preceded the events in the film's story. This is often the subjective memory of events previously experienced by one of the characters.

A "flashforward" within a scene will reveal events that will happen in the future. They may show anticipated, real or imagined events.

Both flashback and flashforward require visual techniques in order to alert the viewer that what they are seeing is not in the current timeframe. Often the face of the character having a flash experience will be shown just before the flash occurs in order to show that this character is focused on the out-of-time event. The actual flashback or flashforward may be shown in monochrome, sepia or some other visual treatment. Sometimes the edges of the frame are blurred to signify a memory occurring. It is common to dissolve into and out of a flashback or flashforward.

PICTURE-EDITING ISSUES

Black Frames

These are the randomly occurring flashes of black you might have between cuts in the picture. These happen when two clips are not next to each other in the timeline, but are separated by a frame or more. The software inserts black where there is not a clip, so when it is played, there is a momentary flash of black. Join the two clips and the black frame will disappear.

Flash Frames

This is similar to a black frame, but instead it is an orphaned frame or more from a longer clip that has not been entirely removed. This can be caused by using the razor tool to trim a clip or by using the trim tool to grab the end of a clip and reducing it to only a frame or two, making the editor think the entire clip is gone. Remove the unwanted frames and either extend one of the clips to cover the blank area or slide the two clips together.

Unmatched Frames

This is when the action has not been continuous. For example, a character reaches for a bottle on a wide shot, but when there is a cut to a medium shot, they either start reaching for the bottle again or they already have it in hand. There is either a repeat of the action or the action is a jump cut. If there is no alternate take to cover the mistake, then an insert or cutaway shot might work.

Ghost Frame Dissolves

Clips need to have enough frames to allow for the desired length of dissolve. If shot A is cut next to shot B and shot B starts at the very first frame after the slate, then when you add a dissolve, the slate from shot B will be visible. You could try to start the dissolve right after the slate is out of frame.

EDITING SOUND

> **MISTAKE**
>
> I know that the background sound changes for each camera setup, so I'm just going to find a room tone and put it under all of the dialogue for each scene to cover this problem.

The "production track" is the recording that is made on set, whether it was on location or in a studio. It is this sound that you edit with when you do the picture editing. It is often a mono or multi-mono track of some or all of the microphones used for recording a scene. At other times you may be editing picture with all the audio tracks that were recorded on the set in a discrete layout, which means each microphone will have its own track in

the timeline, but editing with all the tracks is not the norm. It's easier to edit picture just using a mix of the production audio tracks. The discrete tracks can be imported into the picture editing software and then muted and edited along with the picture and mixed production track, but that might be difficult to handle unless you are doing the dialogue edit in the picture-editing software, in which case you will need those discrete tracks. Otherwise, a dialogue editor will work with the discrete audio tracks and prepare them for a mix. You should determine your workflow before you start picture editing so you know what audio you need in the timeline.

During picture editing it is common to try to get all of the dialogue to be at about the same level. An editor can add EQ or some effect if they want to, but it should be seen as a temporary fix that will be properly addressed in the final mix.

Most audio is recorded in BWF (Broadcast Wave Format) or WAV (Waveform Audio File Format) as they are universally accepted formats and are of higher quality especially if the recording is at least 24bit and 48K or even better 96K. 48K is a digital sample that is occurring 48,000 time per second, which will provide a high-quality recording.

Chapter 15 "Sound Effects & Design" goes into more detail on how to smooth out the production track.

TEMPORARY MUSIC

It is very common for a director or editor to place temp (temporary) music in a film. Either the director has not made a decision yet as to the type of music needed or they are having the film scored and the score is not available. The temp music is just a place holder so that the director hears music that is similar to the music that will be used in the final mix. There are many times where the temp music becomes the final music because the director and editor become used to hearing it and maybe even did some cutting to it. Make sure that you have all clearances needed to use music that is not score.

AUDIENCE TESTING & FEEDBACK

Once the editing of the film is close to being finished, it is often useful to do a test screening to get the reaction and input of an audience. They have fresh eyes and can let you know if the story and editing are working. It is helpful to hand out questionnaires at the end of the screening and have the audience members fill them out.

Feedback can be valuable for the director and editor as they try to finish the film. Any input should be considered and taken seriously. That does

not mean that it must be done, but that it may bring to light some issue with the film.

RE-EDITING

Once the test screening has been done and the feedback received, the director and editor can determine what are valid suggestions and then work to re-edit the film to address the issues. Re-editing is a process of revision and improvement that includes minor tweaks, removing or adding dialogue, dropping scenes and changing pace or whatever else is required to make the story work and feel right. Once all of the changes are made and the film is working, then a final pass through the film to tighten up the performances in the scenes can be valuable.

PICTURE LOCK

> **MISTAKE**
>
> Picture lock is an illusion. I change shots and recut scenes right up to the time we mix sound.

Once the picture editing is done and no more changes are going to be made, the picture is considered "locked" and ready for audio postproduction. In reality many directors have a hard time letting go of the picture edit and keep working on it after the picture was supposedly locked. This last second tinkering has a huge impact on the sound editors, music editors and visual effects team. They have been working diligently with a locked picture and the deadline is approaching and now they have to make changes in the audio tracks or computer-generated imagery (CGI) to match the changed shots in the new locked picture. This creates a lot of stress and can result in a slightly reduced quality of visual effects and sound track. Do not say the picture is locked until it really is, unless you are doing all of the postproduction work yourself.

SCOPES

A description of the three scopes waveform, vectorscope and histogram are in Chapter 10 "Camera." They are used in postproduction as guides for creating a look and for maintaining consistence with that look.

COLOR CORRECTING & GRADING

MISTAKE

Manual color correction and grading takes too long. I just hit auto-correct on all of that.

Figure 13.3 Color grading

Color correcting is the technical process of adjusting the images until they appear natural and reflect the true vision of the world in which the film was shot. Correcting can include adjusting the white balance, white and black levels, contrast and even exposure until the images look correct and matched in a given scene. These are the foundation adjustments before doing color grading.

Color grading is the technical process of adjusting images in a more creative manner, which might mean giving some shots different colored tints or tones in order to evoke emotions, an atmosphere and an aesthetic.

Common areas of adjustment of color and brightness are hue, saturation and brightness (luminance), known as "YUV" or "HSL." These three make up the basic color elements of any video image.

Hue is the actual color such as red, green or blue (RGB).

Saturation is the intensity of the hue. It is determined by how much gray is added to the colors. The less gray, the stronger the color. The more gray,

the more washed-out the color. For example, a light saturation is baby blue, while a heavy saturation is navy blue.

Brightness or luminance is the level of lightness in any given color. A strong bright hue will have a lot of energy to it. It will stand out to the human eye. The lower the brightness, the darker and muddier the image.

A vectorscope is a helpful tool to work with color correction and grading. It is useful in managing the color and luminance in a manner that gets the image to look as close to the image on the cameras sensor as possible. Once the image looks right, then start working on the most important aspect of color grading, which is adjusting the skin tones. Each of us have a concepts in our heads about what good skin tone looks like. Draw on these internal images and adjust the hue, saturation and luminance until it appears like the image in your mind. A very useful guide is the "skin tone line" on the vectorscope that represents human skin tone or the hue of skin, no matter what a person's skin color is. The line starts in the center and extends out to about 10:00, which is between the yellow and red squares. Once the skin tone has been adjusted to appear correct or to match our concept, then it is time to get creative. Using color correction for artistic purposes may mean moving away from the skin tone line. For example, you may want a slight washed out look, so reduce the saturation. You may also want a slight bluish tint to the image, so add some blue and perhaps reduce the reds. There are no rules for color grading, but the above are some guidelines that should help.

If your software has color-matching ability, you can automatically apply a grade to all the clips in a scene. The software will copy the color grading of any image you choose, such as a shot from another movie or an image you find online. The shot should resemble a shot from the scene you are grading in order to be most effective. Otherwise, you can choose a reference look and copy and paste it to the other clips. This will make the initial process much faster and then time can be spent fine tuning the grade.

If your editing software has a "three-way color corrector" in it, you can adjust the shadows, mid-tones and highlights along with the overall color using the color wheels. Use the three-color (RGB) parade view on a waveform monitor along with the vectorscope to get the look you want.

There are also tone curves, which are interactive graphs of the various colors. These are good for minor changes, but should not be used for major changes as the video can easily become unrealistic looking.

Color qualifiers will allow you to select a color or a range of colors and make changes to them without affecting the other colors in the image.

Masks or "power windows" can be used to select a specific area in a frame to adjust. These windows allow for isolation of areas, such as an overlit window that could use some reduced exposure or even some color tinting.

Lookup Tables (LUTs)

A LUT is a set of values for brightness, contrast and color, specifically the colors, red, green and blue. LUTs are a coded mathematical equations that can be used to change the color of the footage to give it a desired appearance. There are even LUTs that can give the footage a 35mm film appearance. They are basically preset color grades that can be selected for a film project.

There are different formats, such as .lut and .cube. There are also different sizes, such as 11-point and 33-point LUTs. Different cameras, monitors and editing systems support certain LUTs. A "look" may incorporate LUTs to achieve a certain visual quality. A "look" is more than a LUT as a look may involve a soft-focus, special effect treatment or other image manipulation beyond the limits of a LUT.

A LUT is one tool that can make the color grading simpler; however, it is not a straightforward fix for all shots. A LUT works best if all of the shots are properly exposed and white balanced during color correction. If one shot is too dark or overexposed, the LUT will not have the same effect as on the properly exposed ones.

Footage shot in log makes the application of a LUT color simpler too. The log footage will appear flat, but the LUT will bring it to life. Log footage has greater dynamic range and more latitude for color and brightness adjusting than non-log footage, except for raw footage, which has greater latitude.

During production, some cameras and external monitors allow you to use LUTs so you can see the image as you might want it looking when finalized. It is becoming more common to use a "transform" instead of a LUT. A transform is like a LUT, but it uses a mathematical formula that can calculate a new value for every single pixel. A LUT applies change to the entire image.

COMPOSITING

Compositing images together can be done somewhat in picture editing software or in visual-effects-oriented software like After Effects. The most common software used in the motion picture industry is Nuke. Compositing is beyond the scope of this book; however, green-screen shooting is discussed in Chapter 10 "Camera" and Chapter 11 "Lighting."

GRAPHICS/CREDITS

Graphics are usually created in software designed for that purpose by graphic designers. Some of the software used includes Photoshop, Illustrator, InDesign, CorelDraw, Inkscape and Sketch.

Figure 13.4 *The Squaw Man*

The first feature film shot in Hollywood was called *The Squaw Man* (1914) and it had a graphic with the sole credit: "Picturized by Cecil B. DeMille and Oscar C. Apfel."

Credits can be designed by people who create graphics, but they can also be done simply in any non-linear editing system. The industry axiom is: give credit where credit is due. Do not leave anyone out and spell their name and job title correctly. Many contracts require that credit be given and some require specific placement in the film.

VISUAL EFFECTS (VFX) & COMPUTER-GENERATED IMAGERY (CGI)

VFX and CGI can be edited directly into the timeline, but often they require a compositing software that is specifically designed to combine live action with VFX and CGI.

VFX are beyond the scope of this book, but some limited effects are discussed throughout the book.

CGI is also beyond the scope of this book, but there is a lot of information online and there are classes that teach it. Some common software for character generation are Maya, Houdini and Modo. There is also the open source software Blender.

TIPS

- The more organized the edit, the faster and easier it will go.
- Make sure the project settings are accurate for the output desired.
- Maintain continuity of edits.
- Find the right pacing for each scene and the entire film overall. Trust your instincts.
- Use cutting on the action or an insert shot to help cover production-continuity issues.
- Follow the 180-degree rule.
- Use scopes for proper color correcting and grading.
- Achieve 100 percent picture lock before moving on to sound editing.
- Use J- and L-cuts, fades, transitions and dissolves to support the story.
- If it feels off or odd, re-edit until it feels right.

14 DIALOGUE & ADR

INTRODUCTION

A filmmaker that does not put any emphasis on attaining good dialogue recordings is hurting the film. This chapter is about working with dialogue so that it fulfills its role in storytelling.

Having a clean and smooth dialogue track is one of the main differences between an amateur film and a professional film. Poor production sound is one of the most common technical problems with lower-budget films. An audience will forgive a shot that is not quite framed properly, is dark or

is a bit out of focus, but they will walk out of a viewing if the sound is bad. Good sound begins with a well-recorded and well-edited dialogue track.

On set there is often a mindset that all that matters, in a technical sense, is the lighting and the camera work. It is not until postproduction that many filmmakers realize that they should have spent more time recording good-quality production sound. Better sound can be achieved with better planning and by giving the sound crew adequate time to prepare to record each scene.

DIALOGUE EDITOR

Editing dialogue requires meticulous attention to detail. Any unwanted sounds are removed from the dialogue or production track and placed on a separate track that is still in sync, but muted. The holes left by these removed sounds are filled with room tone or ambiance from the scene.

Another aspect of dialogue editing is going through the dialogue and replacing any lines that were not recorded or acted well. The editor may search through different takes to find a word, phrase or sentence that is a better performance choice. A good dialogue editor can save a scene in which the performance is choppy by building it using syllables, words, phrases and sentences from different takes.

SPOTTING SESSION

Once the film has been edited and ideally the picture has been locked, it is time to turn attention toward sound. The first thing to do is go through the film in a spotting session. This is where the director, sound supervisor, sound editors and designers, and the dialogue editor sit down together and watch the film looking for sound issues, in particular dialogue problems. The director will often note where they want a particular sound added or line replaced. If possible, it is helpful to have the person who did the picture edit at the spotting session too. They know about every edit in the film and can provide useful information for the sound crew.

If you're the director, picture editor and the dialogue editor all in one, then you still need to sit down with yourself and go through the film looking for sound issues. These concerns may include automated dialogue replacement (ADR), Walla (background voices), sound effects (SFX), dialogue issues and general location sound problems. In particular you want to pay attention to off-mic recordings, wireless mic issues, dolly noise, location and crew noise and difficult-to-understand dialogue.

Taking detailed notes has saved me many hours of having to go back through a film to make sure I have all of the sound problems fixed. Write down the timecode and then write a note next to it about the issue.

I suggest entering the information into some document or spreadsheet software.

SYNC CHECK (SOUND & PICTURE SYNCHRONIZATION)

It is important that the picture and sound be in perfect "sync" before any editing is done. Otherwise, you'll be correcting sync as you edit and that can affect other audio on the timeline. If you recorded your production audio directly to the camera, then you will automatically have synchronization as they are married together, unless they were separated during picture editing.

If you have recorded double system sound, using a separate audio recorder, then you will have to sync them in the picture editing timeline. Some non-linear editing (NLE) systems will automatically sync the picture and audio using either timecode, metadata or waveforms. If all else fails, you may have to find sync by using visual cues.

The most common visual cue is the slate and the exact frame where the two sticks come together along with the hit sound of the sticks in the audio waveform. The waveform hit will look like a sideways pine tree.

If the sound was recorded on both the camera and an audio recorder, then phasing can be used to find sync on the time line. This is done by matching the waveform until you find "phase." Phasing the two signals is aligning them close together on separate tracks until you hear the strange sound of frequencies canceling each other out.

TRACK LAYOUT

MISTAKE

I know what's on my tracks, I don't need to label them or put them in any specific order.

Start by creating a mono audio track for each character. Name them DIA 1, DIA 2, etc. or use the character names. In order to checkerboard the dialogue, you will need to create at least one additional track for each character. Next create a track for each character that you can insert ADR lines onto. Now create a track for each character for wild lines, which are lines not recorded in sync with picture. Below that track add a couple of room tone tracks. Next you can create tracks to move unwanted noises from the production track onto. You might call this one PFX 1 or Prod FX 1. You can

mute this track and just use it as a storage place, just in case you decide that those noises are useful for the mix. Remember to keep them in sync as you move them, just in case they get used.

Figure 14.1 Track layout

Once you have the tracks created, you should add a reference tone for studio calibration purposes and sync pops, which are useful for making sure all tracks are in sync.

Reference tones are usually 1KHz (1,000 Hertz) at either –18 dB (decibels) or –20 dB and at 48KHz sampling and with a 24-bit word depth, but could be different for a given re-recording studio. A reference tone is essential if you are mixing your film at a re-recording studio as they will use the tone for calibrating their mixing and monitoring system. They may want either 30 or 60 seconds of reference tone. You can insert the reference tone followed by a countdown leader at the beginning of the timeline.

The sync pops or beeps are one-frame long and occur exactly two seconds before the start of the first frame of action (FFOA) or picture. There is also a tail pop that is exactly two seconds after the last frame of action (LFOA). The term "action" refers to the last frame of the picture. These pops will be on each track and will be placed at the head and tail in your short film or for each reel of a longer film and they will be used to tell if sync has been lost during the editing or mixing process.

For all sound tracks there needs to be a one-frame-long 1kHz tone "beep" or "2-pop" placed exactly two seconds before the first frame of action (picture), which is known as the FOA. If you are using timecode, that

could be at 00:59:58:00 for the first reel of a film. The first frame of picture would then be at 01:00:00:00. Some studios want to have a countdown leader, such as the SMPTE leader, that starts at 01:00:00:00 and then the 8-second leader would follow. In this instance the 2-pop would occur exactly at 01:00:06:00 and the first FOA would be at 01:00:08:00.

Figure 14.2 Sync 2-pop in track

Once you have the reference tone, the countdown leader and sync pops inserted in the timeline, you can start work on the dialogue tracks.

EDITING

> ### MISTAKE
>
> I'll just keep an ear out for the dialogue while I edit the picture. I'm sure I'll notice if something is wrong.

An informative tutorial video on dialogue editing can be found on YouTube by searching for: Marlena Grzaslewicz Dialogue Editor – Tutorial.

If you do nothing else for the sound on your project, you should complete a separate dialogue edit. This is usually done after the picture has been completely edited and is locked. It is possible to begin dialogue sound work while you are picture editing and before picture lock, but it can take time to re-conform your audio edits to any newly re-edited picture. It is better to focus on performance while picture editing and then focus on sound when the picture is locked.

A serviceable dialogue edit can often be done on a non-linear video-editing system. The biggest issue with trying to do a dialogue edit in one of the video-editing software packages is that video editing is often based upon picture-frame editing and not on the audio sample rate. If the audio is recorded at 48K sample rate, then there are 48,000 frames or edit points

in the audio for every one frame of picture. That makes audio editing in an audio software at 48,000 samples or "frames" per second much more accurate.

Some of the non-linear video editing systems allow you to unlink the audio from the picture, do your sample level editing and then relink it to the picture to keep sync. Pro Tools and other audio editing software don't have this linking issue because they are specifically designed to work with audio at the sample level.

The first step of a classic dialogue edit will be to split the audio tracks. This is often referred to as "checkerboarding." The audio regions for each shot should occupy alternating tracks.

Figure 14.3 Checkerboarding in timeline

You could have all of the dialogue on the same track. If you do that, you will have to process each audio clip independently in order to have the audio from each shot sound the same and smoothing the clips may be difficult. A simpler method would be to split by microphone placement, so each shot has its own track or tracks. For example, if a scene starts with a two-shot of the actors at a sidewalk taco stand and then goes to over-the-shoulder shots of each actor and then to close-ups, you have five camera angles, so use a different track for the dialogue from each of the five angles. You may be fortunate in that there may be little or no difference between the OS shot and the CU shots as the microphone could have been in nearly the same position for both.

When you move on to the next scene, you can checkerboard the sound for it by putting all of its files on the tracks below the previous scene's tracks. For example, you may have dialogue on tracks 1, 2 and 3 for the first scene, then the next scene's dialogue would be on tracks 4, 5 and 6 or whatever works for your film. When you finish the second scene and move on to the third scene, you can move back to working on tracks 1, 2 and 3 that were used for the first scene.

The main purpose for splitting dialogue tracks is that this allows for different processing of the sound for each of the different microphone placements when lines were recorded during production. Some software allow for effects and processing to be clip specific and others will only allow the effects and processing to be applied to the entire track. The processing, which is commonly equalization, reverberation or noise reduction are needed to make each shot sound as close as possible to each other.

For example, the taco vendor is facing away from the busy street, so the microphone will be pointed toward the park behind the vendor, while the taco customer is facing the park, therefore the microphone will be pointed toward the busy street. The backgrounds will sound different and will need to be blended, so that the audio cuts between the two characters are seamless. Even scenes shot in relatively quiet interiors can have different background sounds and levels depending on the placement of the microphone.

Remember, you are not necessarily splitting by picture edit as some lines of dialogue may overlap shots. You are splitting the lines according to the position of the microphone or microphone angle. You may also need to split according to the type of microphone used: the lavalier on one track and the boom microphone on another.

For example, let's say you recorded a scene with two people having a conversation. A boom is used on each actor individually. This means the mic will be pointing at each actor directly, but at opposing angles in the environment for the differing shots, like the taco vendor and the customer mentioned above. You will then place the boom from shot #1 on one track and the boom from shot #2 on another track. Cross-fading between the two mics is the most common way of blending the backgrounds so they do not abruptly change.

Make sure to cut out the section of each track in which the dialogue doesn't occur. In other words, checkerboard so that only the dialogue is heard, not the extra room tone between lines. For example, if you have a scene in which two wireless microphones were used, one placed on each of the two actors, then you'll have two recordings of the shot from two differently placed microphones. If you don't checkerboard the dialogue, then both tracks of dialogue will play at the same time. This means that the noise floor or room tone will be doubled in volume because we will hear the ambiance from the speaker's microphone, plus we will hear the ambiance from the listener's microphone. So, the microphone of the actor who is not speaking will pick up a faint level of the dialogue from the actor who is speaking because they are both on and being recorded. The faint dialogue may have some unwanted reverberation in it because that microphone is farther away from the actor who is saying their lines.

MICROPHONE CHOICE

MISTAKE

I'll just use the lavaliers for all of my dialogue. They tend to sound the same no matter what scene they are used in.

A boom microphone picks up a more natural sound because a boom can be close to the actors on a close-up and will be farther from the actors on a wide shot in order to avoid being in the shot.

You use hidden wireless lavalier microphones placed on the actors to capture dialogue that may be difficult for the boom to pick up.

Lavaliers are not the best microphone to use as they have no perspective and they make the dialogue sound muffled and have less high-end frequencies because when the microphone is hidden under the clothing the material acts as a sonic filter. They also have a heavier low-end frequency since the microphone is next to the bass-accentuating chest. It is common practice to use equalization and reverberation to try to get the lavalier to sound more natural. The general rule is to try to make the boom microphone track work first and then go to the wireless lavalier microphone track when you need to.

CLEANING

> **MISTAKE**
>
> I'm not concerned with some production noise. I'll just use the noise-reduction software that comes with my editing software to clean it up.

Audio professionals are frequently asked to "clean up" dialogue. It is commonly assumed by the inexperienced filmmaker that there are some cool magic devices out there that will take badly recorded sound and correct it quickly and simply. The truth is that while there are many tools available to improve shortcomings in audio recordings, few of these remedies are without a price, in both a monetary and sonic sense. The really effective software, like iZotope RX, is expensive and using it incorrectly can add digital anomalies. The more sound processing there is, the more likely the anomalies can be heard. Keep it to a minimum, whatever noise reduction you use.

If the production audio was recorded in the 24-bit format, and there is volume distortion, the only viable option is to find a good alternate take or to do ADR. If the production audio has been recorded in the 32-bit floating point format using dual A/D (analogue to digital) converters it will have plenty of headroom to handle over-modulation. The DAW (Digital Audio Workstation) will also need to be able to process in the 32-bit floating point format in order for this dynamic range to be available. Even though it may have sounded distorted during recording, once it's in the 32-bit floating point environment, it should sound acceptable. If instead of being too loud, the audio is too low, any sound recorded in 32-bit floating point will be able to be boosted and there will be no significant increase in the noise floor.

A major part of the cleaning work in dialogue editing is removing the unwanted sounds. These may be lip smacks, strange breaths, body noises, the director's voice or sound effects such as a door closing, floor creaks, crew footsteps, cell-phone rings and many more unwanted production sounds.

In postproduction, a clean dialogue track will have all of the extraneous sounds removed from it and the holes are then filled with the ambiance or room tone that matches the rest of the take. This is partly why it is always good practice to record at least 10 seconds, if not 30 to 60 seconds, of room tone for each setup during production.

The idea is to get a clean dialogue track with no other sounds in it. That way the dialogue can be manipulated in the mix without affecting any other sounds. The same is true of having clean Foley, sound effects, ADR, backgrounds and Walla.

Generally speaking, the dialogue tracks need to play the loudest of all of your tracks in the final mix. If additional sound effects or music are used at the same time as the dialogue, some dialogue track problems can be concealed to some extent, but it is considered good practice to treat the dialogue track as if it will play alone and be acceptable to an audience, unless there are missing key sound effects.

Again, this is one of the major sound issues that separate many no- or low-budget films from higher-budget productions.

FILLING HOLES

Anytime you are cleaning up dialogue, you are removing a sound or noise from the production track, so you will need to fill in that hole, with the appropriate room tone or ambiance. Otherwise the sound will drop out and you will hear silence. If you are mixing the film yourself you can just plug the hole with room tone from the same shot or another take or a shot from the same camera angle as long as it matches. If you're mixing the film at a postproduction facility, check with the rerecording engineer, who is doing your mixing, and see how they want to handle any room tone that is filling in a hole.

SMOOTHING

MISTAKE

I don't mind the background sound changing from shot to shot. It's so real, so cinéma vérité.

If we assume that dialogue has been recorded well on set and there are no significant issues, such as the microphone being too far from the actors

or the noise floor being too loud, then smoothing is one of the primary processes needed to lift a sound track above the amateur level. No matter what level of filmmaking you are at, all films need to have some smoothing in order to sound good.

It can be a challenge to make the dialogue tracks sound smooth; after all, the film was likely shot on different days or maybe even in different years and at different locations. Assembling an apparently seamless stream of sound from a wide variety of recordings is the core of the craft of film sound.

Smoothing sound within a scene is done by overlapping audio from adjacent shots within a scene and adding unnoticeable fades between the overlaps.

When the action moves from one scene to another, the room tone or ambiance may be permitted to shift, so don't be too concerned with scene changes unless the shift is too dramatic.

OVERLAPS

Splitting and overlapping sounds allows room tone to be faded from one shot to another in an effort to create smooth transitions between them. Overlaps should not extend into dialogue. This part of the edit requires the best sound reproduction that can be achieved. You may need to listen at a higher than usual volume and you may need to use headphones as well. At this point you are working on the room tone between the dialogue, not the dialogue itself.

Figure 14.4 Overlap in timeline

Once overlaps have been added, most editing systems allow fades to be rendered at the transition points.
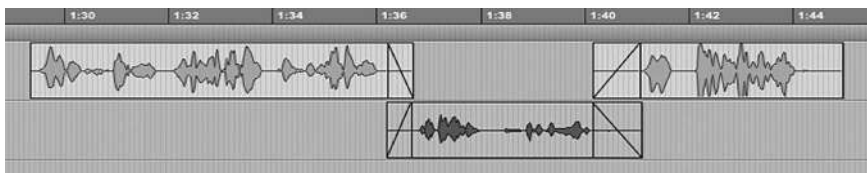
Figure 14.5 Overlap with crossfade in timeline

Sometimes room tone must be added to the beginning or end of a sound file in order to allow for a crossfade.

ROOM TONE

MISTAKE

Recording room tone on set is a waste of valuable time. If you did need it, there's always a couple of seconds between actors' lines.

There are sound libraries that contain different room tones. They rarely match any of the room tone for a production, so getting them to fit is a challenge. If usable room tone was recorded on location, that will be the best to use. It will match the sound of the takes. If no room tone was recorded during production then mining the production track for a few seconds of clean-room tone is a viable option for finding useful room tone. Often clean sound can be found right after the sound of the marker or the "Action" call.

The tone needs to be the same or similar to the tone of the audio that is actually being used in each of the shots. Once again, this is determined by listening.

Sometimes, the shot that has the loudest room tone or noise floor is the one that the other shots will have to be adjusted to match. This will effectively make the background of the entire scene noisier, which is not the most desirable solution, but at least it will match from shot to shot. It may be possible to reduce the noise floor by using some form of noise-reduction processing or if the noise is too noticeable, you may have to record ADR.

Figure 14.6 Room tone at head of shot

If the clean room tone section you find is too short your editing software may have a plug-in that will actually replicate the room ambiance to any length required.

Remember the most important steps to having a professional sound track are:

- Acquiring the best production recordings possible.
- Checking that all of the dialogue is in synchronization with the picture.
- Removal of as much non-dialogue sounds from the dialogue track as possible.

- Smoothing the transition between shots, so that there is no noticeable change in the ambiance or room tone.
- Splitting the tracks so that they can be easily processed with EQ and noise reduction.
- Resort to ADR if there is no usable take for an unusable portion of dialogue.

AUTOMATED DIALOGUE REPLACEMENT (ADR) OR LOOPING

MISTAKE

I can tell what the actors are saying. If the audience misses a few words, it's not the end of the world.

Dialogue replacement is called Automated Dialogue Replacement (ADR). It may also be called Automatic Dialogue Replacement or Additional Dialogue Replacement and is historically known as "looping".

The golden rule of ADR is: Whatever dialogue cannot be made intelligible, found in another take, smoothed out, hidden or removed, should be recorded again.

If you or someone who is unfamiliar with your project cannot understand the dialogue that has been recorded for a particular scene or the actor had a cold, the audio from that scene should be replaced either by an alternate take or by rerecording the lines.

If you have a great take between two characters, but there is the sound of a very loud car driving by at some point in the shot, you may have to find an adequately acted alternate take that doesn't have the car driving by. You can then replace the section of dialogue that has been ruined by the car passing. It may take some fine-point dialogue editing to get the alternate take to sync up with the lips, but you'll have saved the scene.

If there is no alternate take, then you'll have to bring in the actor to record dialogue over again, ideally in a postproduction facility. When dialogue is replaced, all other sound (room tone, actor movements, sound effects, etc.) must be replaced as well.

ADR RECORDING TIPS

- You can record ADR using a software program such as the NLEs Media Composer, Final Cut Pro and Premiere, but it's easier and more effective to use a DAW (Digital Audio Workstation) such as Avid Pro Tools, Abelton, Logic Pro, Audition, Nuendo or Cubase.

- Don't add any processing, such as compression or de-essing to the re-cordings, as they can be done later in mixing.
- Use the same make and model of microphone that was used during production in order to get the ADR to sound more like the production track.
- There are different approaches to recording ADR or looping and some actors prefer one way over another. One is with the picture and orig-inal audio of the scene playing for the actor as they say their lines, another is the picture and audio playing for a few times and then the audio is muted, so the actor can only hear their own ADR lines, and finally the other approach is without any visual, but just hearing the line from the production track and then repeating it as perfectly as possible.
- Allow the actor to choose between seeing written lines, just hearing the lines through the headphones or both. The written lines may be embedded at the bottom of the picture or they may be on a sheet of paper or on a laptop.
- Work with the talent to get the proper playback level in their head-phones. Some people like a strong level while others prefer to just barely hear the original lines.
- If an actor is having a hard time adjusting to doing ADR or getting all their lines delivered in a take, then work in smaller chunks of dialogue.
- Be sure the actor is re-acting their lines like they were performed during the original take, not just mechanically reading them.
- When the scene requiring ADR is outside on a busy street corner or per-haps indoors at a sporting event, it is important that the actors speak loudly, just as they would naturally do at that location.
- Don't get caught up in getting exact lip-sync, which can be achieved later in editing. Obviously, the closer to exact lip-sync the easier it will be to edit.
- Actors and directors should pay attention to the breathing that they did in the production track and try to follow it along with the lines as that can affect performance too.
- Make sure you record "efforts," which are the sounds humans make, such as grunts, huhs, ums, throat clearing, phews and whatever other non-dialogue sounds the character might make in the film.
- Always take breaks so the actor can maintain the energy required for delivering the lines. Repeating lines in an attempt to match emotion, pitch, timing and the nuances of their original on-set delivery can take a lot of energy.
- The actor's performance is what matters most. If the actor isn't able to recreate the emotions in the ADR session and the production dialogue isn't too bad, then it might be better to accept the location sound.
- Ultimately, directors often prefer the production sound in the final mix, even if it is noisy or distant sounding.

NO-BUDGET ADR RECORDING TECHNIQUE

If you cannot afford to rent a recording studio, but you have a computer, headphones and a microphone, then you can still do ADR in your living room, bedroom or other quiet room. Ideally, your bedroom is quiet and doesn't have any or much reverberation in it. Reverberation is caused by sound, in this case voice, bouncing off of hard surfaces and into the microphone after the voice has directly reached the microphone. However, reverberation can be reduced by closing the curtains, leaning a mattress against a wall and a box spring against another wall. It can also be helpful if you have carpeting on the bedroom floor. If there is a hard surface on the bedroom floor such as linoleum or wood, place a blanket or throw a rug on the floor to absorb some of the reverberations.

It is better to reduce reverberation in the recording and then add it in postproduction, if necessary, so that you can control the amount of reverberation added. Reverberation is added in order to make the ADR sound like it belongs in the location in which the scene was shot. For example, a scene shot in a cathedral would have a considerable amount of reverberation, while a scene shot in the middle of a wheat field is not likely to have much, if any.

Once the reverberations are minimized and you have turned off any noise making appliances like clocks, air conditioners, heaters or fans, you can playback the video with the actor wearing headphones or even your typical mediocre quality earbuds will work here. The actor will listen to the line and repeat it in synchronization with their lips and voice in the picture. If you cannot see the actor's lips in the scene, then that is a better situation for not needing to have perfect synchronization.

Figure 14.7 ADR mic placement

Make sure that the actor is standing about the same distance from the microphone for the ADR as they were for the actual shot. The image above shows a common distance between actor and microphone. You can adjust the distance to match the level of the actor's original line.

While the actor is speaking into the microphone, which is ideally set on a microphone stand and not being handheld, you will be recording the ADR lines with a digital recorded or a video camera.

Remember to have the recordist wear headphones. That is how you know if you are getting a quality recording.

If you have a computer, Pro Tools or similar audio recording and editing software that allows you to play your film, some type of I/O device, the same type of microphone used in production and headphones, then you can record ADR in synchronization to picture, which will make syncing the ADR a lot easier.

If you are editing your film with a non-linear editing (NLE) system, then you may be able to record directly in to it. Many NLEs, such as Avid Media Composer, Final Cut Pro, Sony Vegas, Resolve DaVinci and Adobe Premiere can record audio within the program. Some of the NLEs have companion software that will record ADR too. You can use Audition, Sound Forge, Logic, Nuendo, Pro Tools, etc. as stand-alone recording and editing software.

If you do not have any equipment, but you have access to it at a school or through a connection at a studio or a company with facilities, by all means try to use them.

ADR EDITING

An ADR editor must try to get the replaced dialogue to be in sync with the dialogue track. This is a detail-oriented job that required finesse and a discerning ear.

Not only does the ADR have to be in sync with the lips, but it has to fit with the same tone and reverberation as the other lines from the scene. This is accomplished by the way the ADR engineer records the ADR lines and how the dialogue rerecording mixer chooses to add reverb, EQ and other effects to make the ADR lines match the original dialogue.

If you are really fortunate, the talent will hit perfect synchronization with the production line; however, this is not as common as we might like. You may also have to do some cleanup work to eliminate slurring or mouth sounds.

Hollywood commonly uses Revoice Pro software to time align ADR takes with the original production track dialogue. In my experience it works about 80–90 percent of the time and greatly speeds up editing. The issue with it not working well usually has to do with the poor quality of the production recording.

If you don't have software or a plugin that helps with ADR editing, you'll need to do it by sight and sound. You'll have to line up the waveform of the new ADR lines with the original dialogue waveform to achieve sync. If you play the ADR and production lines together you can hear if they are in or out of synchronization and make adjustments until they match up.

You will probably have to do some slicing up and moving around of the words, syllables and phrases in the ADR lines. If an ADR word is later in the timeline than the production track word it is replacing, then make a cut just before the late word and then slide it into exact position. If the word is early, then slide it later in the timeline. You may even have to do some slicing and moving on a syllable or at the individual-letter level to get the synchronization right and to provide the best inflection.

Sometimes the director may like the beginning of one sentence and the end of another. You can then combine the two into one line of ADR replacement, so long as the intonation and acting work well. They may also want one word, syllable, phoneme or letter sound inserted in a different take. Piecing together a performance from separate takes is called "comping." Comping allows for the best performance to be created out of the various takes of an ADR line. You may then need to do some fine-tuning to make sure the flow of the words sound right and are in synchronization with the original production lines.

Sometimes, when the ADR line you want to use doesn't match the timing of the production line, you can use time expansion and compression to get the lines in sync, if your software has that ability. You may even have to compress or expand a vowel in a word to get it to be in sync.

If the production track has any breaths or mouth sounds in it and they add to the performance, then you'll want to include those in your ADR edit. That's why recording efforts is very useful.

TIPS & FIXES

MISTAKE

I like the way natural dialogue sounds. I think too much time is wasted on "fixing" dialogue.

Alternate Words and Syllables

If you're editing in a replacement syllable or word, then it is best to find a hard consonant, like a *b*, *d*, *k*, *p* or a *t* as a place to make a cut. This will make the edit less noticeable and thereby more natural. Making the edit unnoticeable becomes more important when you are cutting in a phoneme, which is the smallest meaningful unit of speech that distinguishes

one word from another. For example, if you remove the phoneme or letter "p" from the word "pant," it becomes "ant." If you substitute the letter "r" for the letter "p," in pant, then you have changed the meaning of the word again. Since you are most likely replacing one "p" in pant with another "p" from another word that starts with the letter "p," you'll be swapping the same phoneme.

Removing Dialogue Overlap

If a scene is cut with an unwanted dialogue overlap in it, which is when two or more actors speak at once, you may need to fix it by using lines that don't overlap. Hopefully these lines will be clean on an alternate take. This has to be done without making the replacement lines appear out of sync with the lips. Ideally, at least one of the actor's lips aren't seen in the shot.

Replacing Wide-Shot Lines with Close-Up Lines

When you're working on a scene in which there is a cut from a wide shot to a close-up, you may want to replace the dialogue in the wide shot with the same dialogue from the close-up. You'll need to match sync with the wide-shot dialogue. This will make the audio transition between the wide shot and the close-up more seamless. If the actor's lips cannot be seen in the wide shot, then this task is easy. Remember to adjust the volume level slightly for the variation in distance of the actor in both shots. During the mixing session EQ and reverb will be needed to get the dialogue to sound farther away.

Small Problems with Sound May Be Hidden

When audio between adjacent shots cannot be smoothed out sufficiently, additional "room tone" or "ambiance" should be added on a track to help hide the inconsistency. For example, let's take a city park scene that consists of two characters talking at dusk. One character's close-up is shot first and the crickets are chirping softly, but the second character's close-up is shot later when there are more crickets and they are louder. The dialogue editor may have to put the louder crickets under the first character's shot to balance the background level of the crickets between the two shots.

Another way to disguise a background shift is to cut very close to the beginning of the first utterance of the next dialogue line. The sound of the actor's voice might cover the change in background, especially if the volume level of the actor is adequate to mask the change. This is a trial and error procedure. If you do get it to work, make sure that you leave enough tail at the end of the line for the background to be slowly faded out of the mix.

Common Production Sound Problems

Dialogue recording levels are too low and the noise floor or room tone is too high. There should be at least 16 dB difference between the voice and the noise floor. Next time get the microphone closer to the actor.

Dialogue is over-modulated and sounds distorted. Find a different take with better levels or ADR is required to fix the distortion.

Talking during a take by the director, crew or visitors. This can make it difficult for the dialogue editor to clean up. Ideally there is another take that the audio can be taken from to salvage the take used in the edited scene.

It is always best to do a "safety" take, even if the first one was perfect. This will give the dialogue editor that safety net, should they discover an issue such as a mic hit, mouth noise, radio interference, boom-pole-handling noise or a corrupted audio file. If there is no other take then ADR is required.

Lack of recorded room tone or ambiance. Without it the dialogue editor will have a difficult time getting the ADR to sound right with the rest of the production lines and it will make smoothing the dialogue harder. Next time record room tone for every location and if possible for every setup or microphone position. Those 10 to 30 or even 60 seconds can save a lot of time in postproduction.

15 SOUND EFFECTS & DESIGN

INTRODUCTION

> ### MISTAKE
>
> I'll just sweeten the sounds in the production track as I edit the picture; that will be good enough. Nobody pays attention to sound effects anyway.

Just sweetening the sound effects that are already in the production track is a quick and dirty approach that will help the film a little, but not as much as a full-on sound effects edit. This chapter is an in-depth guide to providing effective sound effects to your film.

By making a sound rich environment for your film, you are increasing the production value. If you're doing your own sound design, you can reduce the number of tracks and sounds by making proper choices as you spot the film. You can select the sounds as you are doing the editing. If you

are mixing on a mixing stage, whatever you can do for your film before you get to the mixing stage the better off you'll be during the mix, especially if you are having the mix done professionally.

Always plan more time than you think you need for sound postproduction. Most of the student filmmakers I have taught have learned this lesson the hard way. They would spend so much time on the picture edit that they only had a few hours or days to do the sound, including the mix. The result was often a thin or rough sound track.

As mentioned previously, sound can be edited on video-editing software, like Media Composer, Premiere, Final Cut Pro or Resolve, but it is a lot easier and more in-depth to edit sound using sound-editing software, like ProTools, Logic Pro, Nuendo, Fairlight or Cubase.

SPOTTING SESSION

Just like in Chapter 14 "Dialogue and ADR," the director goes through the film with the appropriate sound crew members present.

Notes will need to be taken as to where the film needs sound effects, which include, walla, Foley and backgrounds. If you know what sounds you want at a particular point in the film, then note that too.

If you are planning to release your film in a foreign language, then you need to spot for everything that would create a sound. If it moves, it needs a sound. Films that are dubbed into another language only have sound effects and music provided as the original language has been removed, which means the ambiance or room tone that is heard in the production track along with the voice and the sound effects have to be replaced.

SYNC CHECK (SOUND & PICTURE SYNCHRONIZATION)

You need to go through the entire film and check for picture and sound synchronization. It's important that the picture and sound be in perfect "sync" before you do any editing. Otherwise, you'll be correcting as you edit and that can affect other audio on the timeline. This is necessary even if you recorded your production audio directly to the camera, as it may have gone out of synchronization during picture editing.

TRACK LAYOUT

You can start out with three or four sound effects tracks at the top and add more as needed. Also, have three tracks or more for backgrounds, which are usually stereo or surround. You should add mono Foley tracks for footsteps, moves, specifics, grabs and pats for each character and at least one each for the extra players.

FOLEY

> **MISTAKE**
>
> I don't need to record Foley, I can just edit in some sound library footsteps, add some sound effects and cover the rest with music.

The term "Foley" came from the name of the original creator, Jack Foley.

The main reason for creating Foley sound effects is to augment the production sound track and thereby to create a more realistic soundscape. During production the sound crew are concerned with capturing the dialogue, not someone's footsteps, clothing movements or prop handing. So, all the other sounds have to be added in postproduction. This is especially true when it comes to lines that require Automated Dialogue Replacement (ADR) or for foreign versions of the film where most or all of the production track is stripped out. Since most or perhaps all of the production track will not be in the mix, any footsteps, cloth movements and specific sound effects must be added under the new foreign-language dialogue lines.

A low- or no-budget film can be made to sound more professional by adding Foley sound effects. However, if the production dialogue wasn't recorded well then even Foley can't save it.

Foley is not so much a mechanical operation as it is a sound art form, which is performed by artists. Most people who perform Foley prefer to be called Foley artists.

Foley requires thought, planning and creative performance in order to customize the sound effects to the scene, characters and the film in general.

The three areas of Foley are footsteps, moves and specifics.

Figure 15.1 Foley pit

Footsteps

Footsteps are the sounds of feet falling upon various surfaces. These surfaces are each in "pits" which are boxed or contained areas, often only a few feet or a meter square. Usually the artist's feet are inside a shoe, but they may be barefoot, wearing skis or in some other footwear. Whatever is needed to make the sound that matches the feet movement and footwear on screen is used.

Performing Foley footsteps is a difficult technique and is usually harder than doing any other Foley. To be good at footsteps takes practice, practice, practice. When performing footsteps, the microphone should be placed about 3 feet (1m) away from the Foley artist and is commonly positioned in front of them. This microphone distance might work well for an exterior scene, as this will reduce the roomy sound of the studio. If the scene is an interior, then the microphone should be about 6 feet (2m) away from the artist. These distances for the microphone will give the recordings the proper sound of being in a room. You will have to adjust the microphone distance to match the films rooms, so experiment until it sounds right.

There is no one way to walk Foley footsteps, but a common approach is to walk heel to toe in one place. Some Foley artists use a technique in which they roll their foot from the outside of their heel to the inside of their toes to better simulate walking. However, whatever style you choose to walk as a character, make sure it fits that character.

In order to find synchronization with a character on screen, you need to watch their shoulders move and time yours to match theirs. This will give you the same sway and stride that the character has as they walk. If you try to watch the character's feet, you will probably get confused quickly, especially if they are moving erratically.

If you cannot see the character's shoulders, then you can get the walking movement from their arms, hands or hips. If you are only able to see a character's feet, then watch them and do the best you can.

When performing and recording Foley footsteps it's important to remember that even if the character's feet are not on screen and they are shuffling, walking or running, you need to perform their footsteps. For example, a character may step into a room and walk across the room to join in a conversation with two other characters in front of a window, but the audience only sees the character take a step toward the other characters and then the next shot is of the two actors at the window, then the first character enters the shot and joins in the conversation. During the time the character wasn't on screen, but was walking across the room to the window, the audience needs to hear their footsteps.

Moves

Moves are also called cloth or clothes rustle and refer to the sound garments make when an actor is moving in them. This could be a three-piece suit, battle armor, a diving suit or a wedding dress, to name a few.

If you are wearing long pants and you walk a few steps, you'll notice that your pants rub together and make a distinctive clothing rustle sound. Different types of material make different sounds when rubbed. You cannot use wool to make a silk clothing sound and nylon does not sound like cotton.

Types of moves include actions like putting on a pair of gloves, tying shoes or taking off a hat. These simple and natural clothing sounds bring life to a film sound track.

Moves are the common starting point for recording Foley because they allow the Foley artist to get familiar with the film before having to do footsteps or specific sounds in hard synchronization with the picture.

Moves are usually recorded in mono with a directional microphone placed about 3 feet (1m) in front of the Foley artist. Some people prefer to sit in a quiet chair to perform Foley moves and others prefer to stand. Whichever position you choose, make sure you can easily see the screen.

Specifics

Specifics include hand pats and grabs, which are sounds that actors make by touching or interacting with something. They commonly touch or pat something with their hands, but other parts of the body come in contact with objects too. The actor could be dismantling a pistol, wrapping a present, stirring a teacup, kicking a ball or cleaning a window. All of these sounds would be considered specifics.

Specifics are the fun part of Foley. They are the created sound effects, which are based upon what a character touches, falls onto or their body comes into contact with.

When you create a specific sound effect, you don't necessarily need to have the exact item that was used as a prop on the set. What you need is something that can make a sound that the audience will accept as being that prop. For example, you might use a staple gun and a door latch to make the combined sounds of a gun being loaded and cocked. The gun sounds are an example of layering sound effects. The stapler might be recorded on one or two tracks and then the door latch on another track. Combined together they sound like a gun.

Pats and grabs are sounds of the film's characters' hands touching things such as their own skin or someone else's skin. Their hands may also touch the surface of an object or rub the object. Pats or "body touches" include grabbing onto something, such as a body part, a piece of cloth or clothing, an object such as a door, steering wheel or knife.

Pats can include interactions between people or between people and objects. These actions include such things as kissing, hugging, pushing and pulling. They are often performed while sitting, but may be done standing in the case of hugging, pushing and pulling.

Recording Foley

When recording Foley remember that you need to make the sounds bigger than life. This allows for a better recording and keeps the ambient or acoustic noise floor down. If you're layering Foley sound effects, then each layer will have the noise floor in it, so if you use three different Foley recordings to make a gun sound, each of those layers will add another level of noise floor, so the noise floor will become three times as loud.

If you're not recording Foley on a Foley stage, you will have to find the best position for the microphone or microphones in the room you are using. If the noise floor in the room is high, you may have to put the microphone closer to the walking surfaces, cloth or prop than would be normal. This will make the sounds a bit harsh and probably not as realistic as the scene might call for, but it will keep the noise floor lower. It's a trade-off for not being able to record in an acoustically treated quiet room or sound stage.

Performing Foley

Figure 15.2 Foley moves

Before you start "shooting" the Foley, make sure your cellphone is turned off, your pockets are empty and you have removed your watch and jewelry, including any rings. You don't want any accidental sounds ruining a good take. Many Foley artists wear shorts and T-shirts to reduce the risk of unwanted clothing rustle sounds.

Some Foley artists like to wear headphones to make sure the sounds they make are working with the picture, but most do not wear headphones and rely on their ears to judge the sound's appropriateness as they make it. If the Foley is done at a Foley stage with a Foley mixer, then it's the mixer that hears the recorded sounds and can give feedback to the Foley artist as to whether or not the sounds work well.

Check to make sure you have all the props, shoes, cloth and pits you need to do your work for the entire film. Even though there is no one way to record and perform Foley, there are some conventions and procedures that will make the process more effective. The primary one is to always perform Foley in a manner that helps support the story and adds life to the characters. Jack Foley always put himself into the place of each character he was performing and that standard has remained for all Foley artists to this day.

SOUND EFFECTS (SFX)

MISTAKE

I'll just use whatever sound effects I can find online and record the ones I can't find on my iPhone.

Creating

When you create sound effects for film, you are not necessarily concerned with recording the sound that an object or creature makes in the real world, but with the sound that an audience would expect to hear. Very few people know what the sound of a bullet or knife penetrating a human body sounds like, but there's a visceral or gut sense of what that might sound like. The job of the sound editor is to give the audience the sound they anticipate. The key is to make the sound believable. If it's not believable, then it might distract the audience and momentarily take them out of the story.

Recording

Ideally, sound effects are considered from the beginning of the project. Some of the top directors focus on sound effects from the script stage forward. They know how important sound is to the film and they work to achieve a high level of creativity in the entire sound track. It's not uncommon for a big-budget production to hire a sound person to start recording sound effects and backgrounds during production. There is no reason why a low- or no-budget film cannot have someone record sound effects prior to or during production.

Sound effects are usually recorded without a picture reference. However, you could easily take along the video on a portable device, if you want to make sure you have the timing correct.

Most of the sound effects that will need recording are "hard effects," which are sounds that need to be in synchronization with picture, such as a gunshot, car door or glass breaking. Softer effects are ambiance sounds such as wind, birds and distant traffic, which do not usually require specific synchronization to picture.

A common format for recording sound effects is WAV or BWF, at 48K sampling rate and 24-bit word depth. If you're going to be doing a significant amount of processing, especially pitch shifting of any of your sounds, then you would be better off recording at 96K or even 192K to maintain the accuracy and quality of the sound data. Some professional sound design recording is being done at either 24 bit and 96K or 32-bit floating point and 192K. This will allow for significant digital manipulation without any discernible audio artifacts.

In order to easily record sound effects, you will need an audio recorder and a microphone. The recorder could be a video camera; however, the pre-amplifiers used to boost the audio signal coming from the microphone are often not of high quality on most cameras. I suggest that you use a decent portable audio recorder. Record.wav or.bwf files not mp3 as it is not ideal for working with sound effects, especially if you are going to do any processing. MP3 files are designed to discard a lot of audio information, but still have a listener believe they are hearing the full music or sounds that were recorded.

BWF (.bwf) files contain metadata that can be useful to the picture editor and the sound editors, especially the dialogue editor. The metadata can include timecode stamping, scene, shot and take numbers, recordist's name, channel names, date and time as well as notes and other useful information.

If you are recording a loud sound like a gunshot or door slam, you'll probably have to use a pad on the input, unless you are recording using an audio recorder that can record 32-bit floating point and has dual A/D processing, then the dynamic range for recording is amazingly high. A pad attenuates or reduces the signal level by a specified amount of decibels. A common amount for a pad is –10 dB, but there are other options depending on the equipment you use. I've seen –12 dB, –15 dB, –18 dB, –20 dB, –30 dB and others. It's better to insert a pad after the sound passes through the microphone. Most recorders have pads that can be turned on when you're recording. The problem with most pads that are built into microphones is that the pad occurs between the capsule and the microphone preamp. This means that the loud part of the signal has been reduced, but the electronic noise floor remains the same.

If you're recording sound effects in a studio, similar to a Foley recording session, then you would usually record directly into a DAW (Digital

Audio Workstation), such as Pro Tools. If you are alone and recording the sounds, then make sure you wear headphones, so you know if the recording is good.

Common types of microphones used to record sound effects are monophonic shotguns and cardioids. Sometimes you may want to record a sound in stereo and if it's a background sound you may want to record it in surround sound.

When you're recording outside of a studio, try to isolate each sound and limit extraneous noises, so that you can control the individual sounds later. Isolated sounds allow you to layer and manipulate them independently. If you need to record the sound of a Ford Mustang starting up, revving the engine, sliding into gear, popping the clutch, tires squealing away and the motor fading in the distance, it's better to record each sound separately, if possible, and then edit and layer them on the timeline to create the sounds you want. Recording all of those sounds in one continuous recording will not allow much if any room to manipulate them.

You may think that a location sounds quiet, but there might be a noticeable distant sound or there may be a subtle nearby sound that detracts from the purity of your recording. You have to wear your headphones and you have to pay close attention to everything that you hear to get a good clean recording.

It's always good practice to record something up close and then record it from a couple of other distances away. This will allow you to place the sound in the environment in which the audience sees it.

Make sure you record the sound effects near –20 dB with highs near –12 dB, so you have a safe amount of headroom below the –0 dB disaster point. This will give you a good recording, with a lower noise floor, and will allow you to manipulate the sound with various signal processors.

Production Sound Effects

These are effects that occur during a take on the set. If a character in the film opens and closes a refrigerator door during a take, the sound of the door will be recorded along with the dialogue. The dialogue editor will remove the refrigerator door sounds from the dialogue track and put them on a separate track for production effects called a PFX track. They may then be used in the mix or they may be replaced by other sound effects. The key to doing this is to keep the production effects in synchronization with the picture, so carefully move them to the same place in the timeline on a PFX track.

Location Sound Effects

When there is time, the production sound crew will record various wild sound effects on location. For example, if a film had a World War I tank in

it, the sound crew would record the sound of the engine, the tracks moving, the hatch opening and closing, the firing of guns and whatever other sounds the tank might make. They are recorded wild, so not in synchronization with picture.

Library Sound Effects

These are the pre-recorded sound effects that are usually purchased, but can sometimes be found for free. They can come as a set of CDs, a file collection on a hard drive or as an internet download. They may also be sound effects that you've recorded for your own library.

Library sound effects are great, if you don't have any time or budget to record your own sound effects, but they were not recorded for your film, they're generic. You can use them and try to make them fit, but it's better to record your own.

One of the creative elements that can make a big budget film stand out from a low budget one is that there is often the budget to custom record nearly all the sound effects. However, if you are making a low- or no-budget film, try to custom record as many of the sounds effects as you realistically can.

I've used library sounds in big-budget movies when it's not practical to custom record a sound effect.

A minor character in the movie *Finding Forrester* (2000) was a Connecticut Warbler bird. It's viewed and referred to in one scene, so there needed to be the sound of the bird's call. Most of the recordings had a lot of wind or tree noise competing with the bird's call. This led to me calling organizations such as the Audubon Society and the Cornell Lab of Ornithology to try to find the sound of the bird, which I did eventually get.

Some library sound effects are ones that would be difficult to record, like a volcano, an ivory-billed woodpecker mating call or a submarine traveling at top speed. Other library sounds that are more commonly used are ones like cars, airplanes and weapons.

Editing

Editing sound effects is different than editing all the other sounds that are in a film. Dialogue, ADR, group, Foley and music are all recorded in synchronization with the picture, but sound effects, including backgrounds, are usually recorded wild.

Ideally, you can wait until there is picture lock before you start editing. It's time consuming to have to adjust and smooth out all of the sound tracks because of a picture change, especially if the changes are made just before a mix. A really smart director will realize this and not make changes in the last few days leading up to the mixing session.

Layering

Layering is a very useful approach for the editing of sound effects. It is a sound creation technique that is used for backgrounds, sound design and sound effects. Layering is the compositing of sounds to create a new distinct sound. Since you want to be able to control the level and processing for each sound independently, you'll build your layered effects one sound element at a time. For example, if you are creating the sound effect of a motorized drawbridge rising, you might start with a sound of a large electric motor starting up and then add the sound of the motor running continuously until the drawbridge stops. Other layers might include the sound of a motor switch, chains or gears moving, and perhaps some metallic scrapes and bangs. Each of these sounds will be on a separate layer or track.

As you cut the sound effects, make certain that you have a natural beginning and a natural ending. The sound you need may have an abrupt beginning or ending or it may fade. If it has a fade, ideally you can let the sound fade out on its own and you'll not have to add a fade to it. If you have to use a fade, make sure it fades in a way that does not draw attention to itself.

Sometimes, for timing purposes, you may need to cut out a section of sound somewhere in the middle. It may sound fine with a cut, but it might not, so in order to get it to sound right, you could try a crossfade.

If you are cutting a sound effect in the middle, try to cut it at the "zero crossing point." In some software this is a centerline on a track waveform. If you cut at that point, there should be little or no pop or click, but if you cut above or below the line, you may well have a click or pop. This zero point cutting works better with higher frequencies than with lower ones, as there are fewer crossings of the zero point with lower frequencies. If cutting at the zero point is not an option, you could try a very short crossfade.

When you are editing, try different options. Experimenting with the sounds can make you aware of an option you hadn't thought of and it may work well. I'm a big fan of serendipity. You never know what happy accident might work.

WALLA (LOOP GROUP)

MISTAKE

When I'm home for the holidays, I'll get my family together and record some Walla.

Figure 15.3 Loop group around mic

A common sound effect in films is that of people talking, yelling, whispering or mumbling, usually in the background. A "loop group," which are voice actors, add all of the background talking and vocalizations. Their "walla" makes the scene sound more natural, just like you might hear in a real restaurant, mall or sporting event. During production the extras are just mouthing words while the main characters have a conversation. The walla is added in postproduction.

There are different types of walla and the key is to get the right sound for the scene.

General

Walla is either a wash of voices or it can be actual words. The wash sound seems to be people talking, but in reality is just voices. The idea is to not be saying any actual words, but just make syllabic sounds. A classic word choice in the United States is "walla" and in the United Kingdom it is "rhubarb." These words are repeated over and over. This technique has become less common than using actual word sounds.

The other form of walla is to actually have the artists speaking lines or do ad libbing. When to use each is a creative decision. The actual use of words gives the walla a sense of the real world, but you must be careful that no walla line interferes with the dialogue, unless it is intended to do so. Using a wash of word like sounds does not run the risk of distracting the audience as there is no real conversation to hear.

Specifics

A specific is when someone, like a restaurant's host, says, "Right this way, please," which is a specific line of dialogue. Since it wasn't recorded on

set, it will be done by one of the loop group actors. These specific lines are recorded just like standard ADR, which is in lip-sync with the character on screen. During the scene the character was doing a silent "lip flap." If it is not known what the character is mouthing, then some line that matches the lip flaps will have to be made up either by the ADR editor, loop group leader or the actor performing the line. These specific cues are usually done as separate recordings that will be added to the general walla recording for that scene.

Callouts

Another type of walla is "callouts," which are specific lines spoken by a background actor that are supposed to stand out from the general walla. These are not specifics as there is no attempt to be in lip-sync with a character.

The loop group actor doing a callout will need to adjust their voice level as though they are actually in the scene. If the scene is at train station, we might hear, "All aboard" just before the train departs. In a restaurant scene, we might hear, "Check please" or "Are you ready to order?" At a boxing match, we might hear, "Knock him out." There will not be a specific character in the scene saying the line, but it will be added into the overall walla.

Callouts are usually done by a selected loop group actor or by several actors or by the entire loop group. For example, in the boxing match just mentioned, several actors will stand around the microphone shouting callouts one person at a time. These can then be spaced out around the dialogue, so as not to interfere with it, when the walla is edited.

Efforts

Efforts are the non-dialogue sounds that actors make. These are often not recorded during production and need to be added later in the group walla or ADR session. For example, if a principal actor is involved in a fistfight in a scene, they only appear to be getting hit. They will move their head rapidly to one side to look like they were just hit in the face, but they were not actually hit. These types of scenes are hard to record audio for on set because there is so much movement, so most of the sound is done in postproduction. A loop group actor will make the necessary grunts and groans for the principal actors in the fight.

Other types of efforts might include breathing heavily, kissing, sex scenes, gasps and other such human voice sounds that are not actually speech.

In *Finding Forrester* the post-sound team was told to add the sound of a couple having sex in the apartment next door to the bedroom of the main character. The couple is never seen, but they are heard.

Screams

In order to save the voices of the loop group actors, it's common to have someone else provide screams. If you record screams for your film, make sure the microphone is sufficiently far enough away as to avoid distortion. If your recorder has a pad, you may want to turn it on to lower the recording level.

Performing

Most loop group performers are actors. They may have a stage or screen background or they may be voice-over artists. They often have training in improvisation, which allows them to react rapidly to a scene. Improvisation training also means the actors are able to change characters rapidly and come up with lines on the spot.

Another talent that is used by loop group actors is the ability to change voices. The actors will have a number of realistic characters that they can perform, like police officers, cashiers and emergency medical technicians. They know the terms and phrases that are commonly used by these workers. Another talent they may have is the ability to do dialects or accents. For example, in a Greek restaurant some or all the employees may speak with Greek accents. The key is to keep it real. Hiring a native speaker to help with this might be necessary.

Loop group actors never use swear words and they never mention brand names like Sony, Ford or Apple unless they are requested to do so.

The overall job of the loop group is to enhance and augment the story. This may involve the actors changing the feel, texture or mood of a scene. They can add excitement to a crowd scene or make it a calmer. The overall purpose is to make the story or even a scene play better.

If you cannot afford to hire a loop group, then you need to enlist your friends who have done some acting or ideally some improvisation work. If your actor friends are used to performing on stage, they'll have to adjust to performing in front of a microphone instead of a live audience. Using your untrained relatives over a holiday break to record walla could easily turn into a disaster.

Recording

You can use nearly any recording studio to record walla. If you cannot afford to go to a studio to record the walla, then find a large room that is very quiet. Ideally, the room has carpeting, drapes, wall hangings or anything else that will cut down on sound reflections. The fewer reflective hard surfaces in the room, the better the sound. A hard surface might be a window, door, mirror, ceiling, floor, whiteboard or anything else that doesn't absorb sound.

You will then need a recording device and at least one microphone. The recording device could be a handheld audio recorder, a computer or even a video camera.

The microphone is usually a boom-type microphone like the ones commonly used during production. It usually has a cardioid or supercardioid pickup pattern.

You might use a shotgun microphone, in which case it is placed about three or four feet (1.2m) away and above the actor pointed toward their mouth. If the cue is for a character that is farther back in the scene, you can position the actor farther away, so their line fits the character's position in reference to the camera. For a group the distance between actors and the microphone will need to be increased in order to properly record all of the voices.

You may want to record the walla of the loop group in stereo or in surround. These are artistic choices that you make to better serve the story. Not all scenes will call for a surround sound walla experience. Use surround sound with caution as it may cause the audience to look around at who is talking behind them.

When you use more than one microphone to record a group, be careful of the "three to one rule," which helps reduce the risk of phase cancellation. The rule says if the sound source (talent) is three feet (90cm) from a microphone, then the second microphone should be three times that from the sound source, or about nine feet (2.7m). If the two microphones are too close, some of the lower frequencies could easily be lost in the recording.

The number of ADR or walla actors needed at a recording session will depend upon the scenes and the number of background actors in them. It's normal to have between six and ten actors in a loop group, unless there are scenes that require more actors. You might be tempted to actually go to a large event and record the crowd, but this doesn't usually turn out well. The noise in such a large group is often too loud to use and there are often other unwanted sounds mixed in. Ideally, you'll record the loop group several times, then layer those takes and build the crowd to a level that works for the scene and works with the dialogue of the principal actors.

When you are ready to record the actors, it's common to either position them around the microphone in a horseshoe shape or group them together in a cluster.

Depending on the scene, it can be useful to place some actors off of the microphone axis and to change their positions in the room between each take. This will keep it from sounding staged.

You can create a depth of walla sound by having the actors walk by the microphone.

This pass-by or cross-by technique usually involves the actors pairing up and having a conversation while walking. The conversation starts before they get to the microphone and then ends shortly after they pass the microphone. This technique gives a scene the sense of people moving past the camera. It works well in scenes taking place on a busy sidewalk, shopping mall, airport and other locations that have people passing by. A variation on the pass-by technique is the "donut." This is where the looping actors walk around a microphone in a circle while constantly conversing.

When doing any of these walla techniques, each actor must always match the volume of the other actors around them, so they don't stand out

in the overall walla. Also, they need to put themselves in the location of the scene. For example, if the scene is at a horse racing track and a race is on, they need to shout as though they are actually at the racetrack. At the other end of the noise spectrum for locations would be in an art museum, where they need to talk at a quiet level, more like a murmur. Remember, a little walla can go a long way. Don't overdo it unless the scene calls for it.

Editing

When you edit walla, it's a bit like editing a sound effect or a background, even though it's actually closer to ADR. You choose takes or a part of a take that works with the scene. If it doesn't work well with the scene you will know it because it won't feel right. You might layer the walla to get the right effect just like you do with sound effects. You choose the places for callouts where they don't interfere with the dialogue or draw too much attention to the callout, unless that's desired. Remember, you are using these vocal sounds to add depth to a given scene and to support the story.

First listen to all the takes and decide which performance works best for the given shot or scene. Next, place the line or vocalization near the place in the timeline that you want it to be in synchronization. Now go into the detail work of lining up the callout with the lip flaps on screen.

If you are having your sound mixed at a mixing studio, you will need to ask the rerecording mixer where to put the specific lines. They may want them on the ADR tracks or somewhere else.

BACKGROUNDS

MISTAKE

The film was shot at a lake. I don't need to add ducks, wind and water sounds for the audience to know that.

Backgrounds are an important part of sound effects. They are the general ambiance sounds that are added to the sound mix to give the location realism. Backgrounds are also referred to as BGs, ambiances or atmospheres. They are not room tone. Room tone is the clean sound of the location or set from the production recordings. Backgrounds are usually sounds like wind, birds, rain, traffic, construction and crowds. These sounds are either taken from a sound effects library or are custom recordings, often for a specific film.

Backgrounds are the foundation on which all the other sound effects are placed.

It is best to start your sound effects editing with backgrounds, so you can build the sounds of the scene in a way that helps tell the story and define the characters. These sounds help create a mood, establish a location, time period and evoke emotions. They are essential for a good sound design for your film.

If you have a scene with two people arguing in their one-room Bronx apartment that was shot at a very quiet location or perhaps in a studio, you have to add the sounds of the city to "sell" the location to the audience. If you want the apartment to be located near an elevated train track, you can add a train passing sound to the background; even though the audience may not be able to see outside, they know where the apartment is as well as the socio-economic level of the fighting couple. If the train wheels screech as they pass, it will build tension in the scene. I think of this as subliminally manipulating the audience for emotional and psychological purposes.

Using the right backgrounds can make a scene or character seem sad, tense, safe, happy, fearful and whatever other emotion that is needing to be portrayed. The most important part of picking a background is for it to serve the story. If you do this well, the audience will immediately respond because you will have helped draw them into the scene.

Recording

It is easier to get background sounds from a sound library, but it is more satisfying to go out and record the backgrounds yourself. Once you have located the right background to record, you'll need to set up your recording equipment, put on your headphones and adjust the microphone direction until you hear the background you want and then start recording. Always record more than you think you need, because this gives you some flexibility in editing the background to work with the scene in which it will be used.

Backgrounds are usually recorded in either stereo or surround sound. This gives the sound a wraparound feel, which is designed to put the audience in the environment of the scene.

Editing

Once you have all the backgrounds or ambiances you need for the film, it's time to edit them.

If your film is going to have a foreign-language release, you'll need to create backgrounds for every scene that has dialogue in it. If there is a dialogue editor, then they will create the underlying room tones or ambiances from production tracks. However, these are often just foundations. If you want a more detailed, effective and sound-designed background, you'll have to create it from various sound elements.

As you work on a scene you may find that using one simple background is all that you need to establish the location. However, most of the time you will use several background sounds to create the overall ambiance. If a scene takes place at a beach, you may have an ocean waves layer, a gulls calling layer, a wind layer, fog horn and whatever else is needed to support the scene.

The main background for any scene comes from the dialogue track, which is placed in the center channel of a cinema release mix. These would have been recorded in mono as they are in the dialogue recording. It is a good idea to listen to these production backgrounds to learn what sounds were actually recorded during production. You can now make a decision as to how to approach the backgrounds. If the scene is in a large factory, then you might have the sound of some pounding machine on one side in a multi-track mix and a whirling sound on the other side. This creates a sense of being inside the space of the factory.

SOUND DESIGN

MISTAKE

There's a shot of a bald eagle in my film, so I did a sound design for their call by combining hawk, turkey and a heron calls. I reversed the heron sound.

Figure 15.4 Sound designer

There are a couple of ways of defining the term "sound design." It is commonly used to refer to the creation of a sound for a creature, alien, monster, spacecraft or other thing that humans may never have encountered before. This is what I refer to as a sound effects design. Sound design's larger meaning is the overall soundscape of a film. This includes the music, sound effects, Foley, designed sound effects, backgrounds and even the dialogue and how they all work together.

Generally speaking, the term sound editor refers to someone who edits pre-recorded sounds and a sound designer is someone who creates new sounds by editing and manipulating sounds.

When you have a plan for recording, editing, processing and mixing all of the various types of sounds together, you are creating a sound design for a specific film.

The greatest tool for creating a designed sound effects is your imagination. You start by deciding how sound can best serve the story and what approach you need to take with sound to achieve that goal. You then need to be able to conceive of what a particular sound for some creature, futuristic machine or unfamiliar experience might sound like. You can then determine what real world sounds might be used to realize your imagined sounds. You may decide to take a common everyday sound and process it. You may decide to take several sounds and blend them together or layer them in a way that creates your conceived sound. You may create and use some synthesized sounds to augment the sound design or to be the sound design. Creating a sound for a real creature, like a bald eagle is not a good idea as they have a call that many people know already.

Most sound designers prefer to start with organic sounds and then alter them. They may use some synthesized sounds, but would not commonly use them without some organic sounds layered into the design. It's important to experiment with the various sounds. Often trial and error leads to a sound that just happens to work. As you create the individual sound design elements, the important thing to remember is to make sure that all of the sounds work together to create an effective overall sound design.

Sound design is really the creation of custom effects. Sometimes the Foley artists are able to record sounds that the sound designer will use to help build a special sound.

Film sound does not happen by accident. It starts with a deep understanding of the story in general and each scene in particular. It then includes an understanding of each character and what their purpose is in the story. You then use your head, imagination and gut to determine what sounds will work to support the character and story. Use your head to determine what you need to do to create the sound you have imagined and then use your gut to determine if a sound is working. Basically, your job is to do whatever it takes sonically to breathe life and feeling into the film.

Recording

There are different designs of microphones that can be used for recording sounds in general, including sounds for sound design. There are specific-use microphones such as hydrophones, for recording in a liquid environment, contact microphones for picking up direct sounds from a vibrating medium and parabolic microphones for picking up sounds from a long distance. There are even microphones that record frequencies far above human hearing, as high as 50kHz or more.

When you record your sound effects for your film, you'll mostly use either a shotgun microphone, a large diaphragm microphone, a stereo microphone or even a surround microphone. Ambiances are usually richer when recorded with stereo or surround microphones because they give the audience the sensation of being surrounded by the auditory environment of the scene.

EDITING & PROCESSING EFFECTS

There is a lot of processing that can be done in audio-editing software and even in video-editing software. There are hundreds of software plug-ins that can be used to alter a sound. You may also choose to use a sampler or MIDI keyboard to alter sounds. The keyboard allows a sound designer to combine sounds and to alter and pitch shift those sounds by mapping them to the keyboard. This can be very useful when your sound design includes making a sound more musical in nature or when you want to easily control the pitch of a sound.

As you process various sounds to create your conceived sound design, you should pay attention to what they'll sound like together. If something isn't working quite right, you can then alter that sound, replace it or perhaps delete it because it doesn't accomplish what you intended it to. Experimentation is part of the process.

Figure 15.5 Laser gun (by Suzanne M. Day)

If I'm going to layer sound elements for an electronic pulse or laser gun, I might create some sounds like these:

- Click for turning on the gun
- Low frequency hum as electronics are activated
- Rising pitch sound to represent it charging up
- Beeps to designate that it's charged
- Standby tone when it's in ready state
- Safety release tone alerting that it's ready to fire
- Electro-mechanical sound as the trigger is pulled
- Energy release sound as the pulse is fired
- Reverberant electronic recoil sound

TIPS

- Spot the film for needed sound effects and check them off as you create and edit them.
- Find sounds that are what an audience expects to hear.
- Use layering of effects to enhance the basic sounds.
- Use processing to alter any sound until it is appropriate.
- Make sure the sound effects are correct and in synchronization with picture.
- Use your imagination when determining how to create a sound effect.
- Record sound effects up close and then at an arms distance to provide options.
- Record walla and Foley that fit each scene.

16 MUSICAL SCORE

Figure 16.1 Composer at keyboard

INTRODUCTION

MISTAKE

I don't need any music. It's all about story and acting. Music would just compete with the dialogue.

It is rare that music does not play a role in a film. There have been some films without it, but it really helps to support the emotional aspects of the story.

This chapter is focused on how to find or create a musical score and how to work with music to the advantage of the film.

Film music can be created in several different ways. The classic way is to record an orchestra performing the score for the film in synchronization with the picture. This requires a significant budget in order to pay for the musicians, engineers, studio and the other staff to orchestrate, arrange and conduct the music. This is often the best way to create a score, because the music is written for the film and is timed out to match the emotional changes expressed in each scene that uses music. A customized score using real instruments has a richer sound than most digital scores, also the musicians can put feeling into their playing that would be difficult to replicate with samples or synthesizers.

If a full orchestral score is beyond the budget, then a possible alternative would be to hire a few musicians and use their real instrument tracks to

augment the sound of a digital score. There are some great instrument samples for digital scores, but it can be difficult to get them to sound right. Having a few real musicians included in the music can help "sell" the sound.

If hiring any musicians is outside of the budget, then you can use samples to create the score. There are some well-performed real instrument samples that either come with the different music creation software programs or you can buy various orchestral music samples. EastWest Studios, Vienna Symphonic Library and ProjectSAM Symphobia instrument samples are some of the best available.

If you don't have any budget at all, then you can use software like GarageBand to create a score using MIDI, synthesizers and sample loops that are available for it. There is also a Windows version of GarageBand called GarageBand, but it's not an Apple product like the Mac version.

If you are not musically inclined, then there are royalty-free libraries from which you can purchase CDs, music-loaded hard drives or downloadable music that could function as a score for your film. Because they are preexisting music cues, they may be difficult to get to fit well, so you may need to edit them and alter them so they work for your film. A "cue" is any individual piece of music, whether it is 3 seconds long or 30 minutes long. Some of the companies that sell music tracks will also do some customization of their music for you. For example, Megatrax will customize their existent tracks or create an entirely new score for a film. However, there is a significant cost for the customization of their music or for them to create a score.

If you have a friend who is a performance musician or there is a local band you like, then you might have them try to create music for your film. Remember, their experience is performing live music to an audience, so they are used to being front and center. However, the music they create for your film will mostly be used to underscore the emotions in a scene, which means it is usually not supposed to be noticed by the audience. This can be a huge challenge for a band as they are more familiar with music that has a defined structure, while a score moves along with the emotions of a scene. It is important that your musician friend or the band know that they need to create a score and not just songs, although you may use their songs in the film too.

A local band might not charge much or they may even give you their music for free so they can have more exposure. Ideally they own the sync and master-use rights to their own music. Make sure you get permission to use their music in writing.

A score is different from a standard musical composition in that music written for a film rarely stands on its own, although some do. A score is written to affect the story and relates to specific characters and events, while music from a local band is not created for the story, which makes it harder for the band music to fit the story.

If the band's music doesn't work for underscore, their music may work well for the opening titles, montages, closing credits or all three. You can then create the underscore separately. If you choose to do the score separately, then whoever does the score might to try to work with some of the

elements used in the songs created by the band in order to maintain a level of continuity to the music. This may mean using some of the same instruments, tempos, keys and musical styles as the band uses.

MISTAKE

I want to use music throughout my film. It will be kind of a music video drama.

There are films that have nearly every minute covered with music, but that's not the norm. If you have too much music in your film, it can become wallpaper and it will lose its impact, because the audience will start to tune it out. Wall-to-wall music makes a film more like a music video than a dramatic story. On average a dramatic film will be 90 to 120 minutes in length and will have about 40 to 60 minutes of music in it. A short film may run from a few seconds up to 40 minutes or more and will usually have a higher percentage of music than the feature film.

When you are thinking about the music for you film, consider the following questions:

- What genre of music fits the story?
- What are the scores like for similar films?
- What tempo or rhythm works for a given scene?
- What instruments will work best for the film?
- What scenes will play better without music?
- Which scenes will need sound effects to be dominant and which will need music to dominate?
- What is my budget for music?

SPOTTING SESSION

Spotting is the process of going through the film and determining where, when and why to use music.

Spotting Session Notes

Whether you're the director, composer or both, you should write down notes on what your thoughts, ideas and views are about the role of music in the story. Include in your notes the underlying mood and the emotions of each character in any given scene in the film. These will help you determine what your goals are for the musical score in the film.

It might be useful to find a couple of films that are similar to the one you are making and listen to the music for them. You may get ideas as to what music to use in your film or perhaps not to use.

The notes will include information about what genre of music to use, what the emotional intent of the scene is and what the start and end time is for each cue. If you are spotting using a software that has timeline markers, you could place a marker at each cue point.

All of these notes will create a cue list that will help in the creation of a musical score that is in synchronization with the various events and emotions in the film.

Detailed Notes
- Watch the movie all the way through to get a feel for the story.
- Watch it a second time and stop when it feels like music should be present.
- Note the start timecode where you sense a music cue should start.
- Note the time where it feels like the music should end or transition.
- Note what genre of music would work for a particular cue.
- Note what type of instruments you would want to hear.
- Note what key might be best for the cue.
- Note what tempo might work and when to change tempos.
- Note where there may be a key turning point or emotional change.
- Note where there may be a critical line of dialogue.
- Note if the music should come in hard and fast or ease in slowly.
- Note where a scene reaches its climax or ending.

MISTAKE

If an actor is a bit weak in their performance, I'll just use music to add some punch to it.

Some music choices may affect an actor's poor performance in a scene, but no music will make a bad actor better. Music can help when a scene needs to feel more important or perhaps funnier or a scene is moving too slowly and needs the music to increase the pace. These are not the best reasons for using music, but sometimes the music can help.

There needs to be a reason to use music in a given scene. Some directors want music whenever there is no dialogue, but that may not always be the best choice. Some directors want lots of music, while others want hardly any music at all.

If a scene is intense, it may be good to take a breath before using music again. It may be more effective to let the sound effects take over and ease the audience down from the intensity of a dynamic scene. Silence can make large sounds or music stand out when it precedes them.

There are no hard-and-fast rules as to when to use a music cue. Music can be used as a transition from one location to another or to show the passage of time. It is commonly used in a montage sequence. When the purpose of

a cue is to underline an emotion, great care needs to be taken to make sure that the music does not overdo it.

If music is being used under a dialogue scene, then make sure it is subtle and not too melodic. A strong melody can actually compete with the dialogue and distract the audience by drawing attention to it instead of the actors. Dialogue is the most important part of the sound design for a film. If you add music to a dialogue scene, it normally needs to fit in naturally and play in the background.

HITS OR HIT POINTS

Hits are usually high points or turning points in a scene. They may be a specific instance in a scene where the music needs to match the action. Making the score match the action is an involved process that takes planning and timing, especially if there is score leading up to the hit, as the music has to work with the picture.

A hit doesn't have to be the start or end of a cue, but can also be a key change, a change in tempo, introducing a new instrument, starting a new melody, changing a chord progression or any other manner that says change, yet works well with the scene. Whatever changes in the music are used, it should be for a purpose. It should also convey information about events and emotions.

Watching a few films that are similar to the one you are working on is a good way to get a sense of when to use a cue and add a hit.

TEMPO MAPPING

Tempo mapping is the layout of beats per minute for a cue or different parts of a cue. You may envision a cue that starts out slowly and then ramps up to a faster tempo when the action starts. In the example in Figure 16.2 the tempo starts at 75bpm (beats per minute) and then increases to 120bpm.

Figure 16.2 Tempo mapping

Changing the tempo is one of the greatest tools you have as a director, composer or editor. Whether you are using an orchestral recorded score or samples, most software will allow for the tempo to change during a cue. You'll need to map out whatever changes you do. It's better if you ramp up or down from one tempo to another. It would be quite abrupt to change from 70bmp to 140bpm. A simple way to make a smooth transition in tempo is to hold a note and then begin the new tempo during or at the end of the sustained note.

CLICK TRACKS & GUIDE TRACKS

A click track is essentially a metronome that keeps all of the instrumental recording at the same tempo and thereby in sync with each other, especially if the parts are recorded at different times. Click tracks are useful in film scoring to guide the tempo changes in the score by speeding up and slowing down where needed and by timing the hits so that they are in sync with the visuals. Recording with a click track makes the music tighter and easier for the music editor to edit.

Once you have a click track, you can record a guide track, if it's useful to your musicians. A guide track is usually an instrument such as a keyboard or guitar that has been recorded just as a guide for the other musicians to hear while playing their instrument. It's not intended for the final score. The musician creating the guide track will perform in synchronization with the click track. This recording will help the actual score performing musicians with timing and consistency, especially if you are tracking different instruments in different recording sessions.

TEMPORARY SCORES

Temporary or "temp" scores are very useful for getting a feeling of what type of score will work with the story. It can also act as a guide for the composer. Temp scores are often used for test audience screenings when the actual score has not been completed.

The temp music is edited into the film at the appropriate places. Since it wasn't written for the film it takes some careful editing to get the music to fit properly with the picture edit.

Temp music is often protected by copyrights, so make sure you are following copyright laws when you use it. If you decide to use copyright-protected music in the final mix of your film, you'll have to acquire the proper rights and pay usage fees.

Usually there are two separate copyrights for any given song, so you need to get clearance to use a song. The first, called a sync license, is for the composition, which will be owned by the publishing company. This license will allow you to record the song with your own talent. The second, called a master use license, is for a particular music recording already made, which is typically

controlled by the record label. A music clearance and licensing company can make this process simple and easy, but they do charge for their service.

If you don't use a music clearance company, you should consider hiring an attorney who is experienced in getting music clearances. If you choose to try it on your own, you can start by contacting The Harry Fox Agency in New York City, which issues mechanical licenses on behalf of the publishers, so you can make a new recording of a song. Songwriters and performers are usually represented by one or more societies, ASCAP (American Society of Composers, Authors, and Publishers), SESAC (Society of European Stage Authors and Composers) or BMI (Broadcast Music, Inc.).

Pre-existent music needs to be addressed early in the production process as it can take a long time to acquire rights and those rights may require a large royalty payment, which could impact the budget. You may discover that you cannot use the music you wanted to and now there is a rush to find a replacement. If you do choose to use pre-existent music, then it is a good idea to hire a music clearance and licensing company to get the rights. Fees for rights vary greatly from song to song and artist to artist. In order to save money, you can acquire festival rights first and then, if you get a distributor, you can renegotiate to use the music for a commercial release of the film.

MUSIC SOFTWARE

In order to compose music you can use a pen or pencil and paper, but you might want to use notation software such as Finale, MuseScore or Sibelius. MuseScore is free and available for both PC and Mac usage. Too create, edit and mix a musical score for your film, you'll need to have a way to make music and a way to edit it in synchronization with the picture. Some of the industry-standard software for creating music are Logic, Reason, Cubase, Digital Performer and Pro Tools. Whichever one you choose to use, make sure you get to know it very well, so it can be an effective tool for you.

If all the above software are outside of your budget, you can acquire software such as Sonar, Sound Forge, FL Studio, GarageBand or Acid, which are all useful for music creation. The software available to you will depend upon whether you have a PC or a Mac.

Some music production software, such as LMMS, DarkWave or Temper, are available for free; however, some of them don't allow for synchronization with picture.

SCORING

> **MISTAKE**
>
> My band plays country and western music and it might be fun to use it as score in my sci-fi film.

Composing is the main creative endeavor in scoring. Once the score has been created, there are other steps before it can be recorded. The music must be arranged, orchestrated and instrumentation determined. This is especially true for an orchestra, but also applies to a small band of musicians.

When you hire a composer, they are creating a work-for-hire, so unless you agree otherwise, you own the rights to the score. It is in your best interests to have a contract with the composer that spells out everyone's expectations.

A score is music that does not come from a specific source inside the story world, like a song on the radio, but is added as a layer of pertinent sound that helps tell the story.

There are some shortcuts to scoring that come with standard movie conventions. You can use a simple melody in a major key for the protagonist and a dark piece in a minor key for the antagonist. A simple melody is one that has no counter-melodies and no strong rhythm such as you get from a bass or drums.

Some science-fiction movies employ the use of strange-sounding electronic instruments, such as the theremin, to tell the audience that what they are seeing is not normal. Such music could also be used to show a character is confused, drunk or on drugs. A standard synthesizer is useful in creating these types of sounds too.

There are common conventions for different genres of films. For example, romance stories often utilize string instruments to create a soft and gentle feeling, westerns commonly rely on folk music performed on pianos, guitars and accordions, while war films tend to have some form of a march and often use drums and brass instruments in the score.

The important thing to remember is that the score needs to have continuity throughout the film and that it needs to support the story, while remaining nearly invisible most of the time.

THEME & MOTIF

Themes are generally considered to be longer pieces of work than are motifs. Motifs are parts of the theme. Leitmotifs are lead motifs that identify a character, place, object, idea or feeling in a film. Generally speaking, themes are several measures long and motifs are only a few measures long. A motif may even be a short phrase of only a few notes. A great example is the reoccurring leitmotif for Darth Vader when he is nearby or on screen in the *Star Wars* movies. His theme is usually performed as a march, but when he is dying that theme has a slower tempo and no longer sounds like a march, because it conveys a sense of life fading away.

Throughout a film, you may choose to speed up, slow down, change instruments and keys, whatever makes that cue work for a given scene. By altering the leitmotif, you can demonstrate a change in a character, like a

character becoming brave. You can use them to show a change in relationship between two of the characters. You can also use them to foreshadow events. These changes might be nuanced or direct hits.

TITLES, MONTAGE & CREDITS

The music used with the title sequence can be either a song or score, so long as it sets up the story. The title music can give the audience an idea of what type or genre of film they are about to watch. It can set the emotional tone of the film. It can weave in the various motifs. It can also let the audience know the locale and time period of the film.

Montage sequences can have sound effects supporting them or they may have music. Sometimes they have both. If it's music, it could be a score or it could be a song playing along with the sequence. If the music has any lyrics, they usually give meaning and create continuity for the various images that make up the montage.

The end credit music is often a song that maintains the feeling of the film and also offers a sense of closure. The right song can have the audience leaving the theater with a smile on their face, which is good for word-of-mouth promotions for a film.

MOCK-UPS

MIDI mock-ups are great for films that will ultimately use live musicians as it gives the director an idea of what the orchestra will sound like. Mock-ups are commonly done with samples or virtual instruments. The composer writes the music and then creates it using a keyboard and samples of instruments. The better the samples the better the mock-up will sound. Most composers try to have really good-sounding mock-ups as they are trying to get approval for their score, which will be performed by an orchestra. The director can hear the mock-ups in place against picture and decide if the cues are working.

DIGITAL MUSIC

Synthesizer (Synth)
A synthesizer is usually operated by playing a keyboard, which produce sounds using voltage-controlled oscillators, amplifiers and various filters. They can either imitate musical instruments or they can generate other types of sound. Synthesizers are commonly used for sci-fi and horror films. They can be used to create some unique sounds. The limit is your imagination.

MIDI and Virtual Instruments

MIDI is a useful tool for creating a score. It can be used to manipulate sampled instruments or synthesized ones as well as augment real instruments. It is often used to mock-up what a final real orchestral score might sound like.

Most software used for MIDI allows for some velocity and pitch randomization. This will help make the MIDI music sound more human made. You could add some volume, reverberation and pan automation to help reduce the mechanical sound of the MIDI instruments.

Samples & Loops

Many low-budget films and even some higher-budget ones are utilizing sampled sounds to create a score. The samples are recordings of actual instruments and the sounds that can be played back at different pitches or notes. Often the scores for these films are created and performed entirely by the composer using only a keyboard.

They function similarly to synthesizers, but they don't create sounds, they manipulate them. The most common manipulation is to pitch shift the sounds into a musical scale. This allows for playing individual notes, multiple notes and chords.

Loops are samples that have been created or edited so that they can be repeated in a looping fashion that sounds continuous. The key and tempo of the loops can be changed so that the music or rhythm does not sound too repetitive.

SONG SCORE, POP MUSIC & SOURCE MUSIC

MISTAKE

I'm going to change a few notes of the *Star Trek* theme music, so I don't have to pay for copyrighted music.

Songs are generally not considered to be part of a film's score, but they can be used to enhance and comment on some aspect of the drama of the story. Scores do not usually have lyrics, although they may contain a choir singing. If a composer uses a choir, they may have them singing actual lyrics, made-up words or just syllables, like *ahs* and *ohs*. There are virtual instrument choirs that can be very effective in a score. EastWest has a choir sample package that allows you to enter text from nearly any language and the "choir" will sing it.

A composer may write a pop song for a film, which is usually based upon the overall theme for the film. The composer of the film *Titanic* (1997), James Horner, wrote the song "My Heart Will Go On" for singer Celine Dion. The song fit in well with the story.

The difficulty of using pre-existing songs as a score is that they usually have only one mood, while a scene may have several mood or emotional shifts within it. A song would then not be able to support the scene well. Songs do work well with action scenes and montages as they usually only have one mood and little if any dialogue for lyrics to compete with. The important aspects are that the song fits in with the film and that there is a valid reason for using the song.

Sometimes songs are used as "source music." Source music is when a song is occurring within the story and not as underscore. Academics refer to this usage as being "diegetic," which means within the story world where the characters can hear it. Source music might come from a radio, television or even a band in a scene in the movie. Source music is different from score, in that score is not heard by the characters.

If you use songs in your film, you'll need to get all of the rights to use them. It is important to keep a cue sheet. The cue sheet contains information such as what song you used, the composer, the publisher, how much of the song was used, how and where it was used in the film. Was it used in the main title sequence, the end credits, as a background or other purpose in the film? The cue sheets are used by ASCAP or BMI to determine the costs of the songs usage and how much royalty to pay the composer or composers and other rights holders.

There is a common misconception that it is alright to use only a brief part of a song. If it is recognizable, there will probably be copyright infringement issues. Changing the lyrics or writing your own sound-alike version do not qualify as a new song as this new work would probably be considered "derivative" of the original and would thereby be protected under copyright law.

CUE PACKAGES

Packages are common in productions such as documentaries, industrial films, instructional films and some television programs. It is sometimes used in creating a score for a film. A composer is hired to create music that will work for the subject matter or genre of the program. The score is not produced in synchronization to picture. It is up to the picture or music editor to make the cues work. The composer must create music that is flexible, has various hit points and can be easily edited, started and ended.

MUSICALS

If you are making a musical, then the songs you choose will act as a form of dialogue, helping to tell the story. The lyrics are directly tied into the spoken lines of the script. It is common for a line of dialogue to lead into a song. When a character breaks out into song, these are usually moments of intense emotions for that character and they sing to express them.

Technically the songs for a musical are written and often recorded before the film is shot. This allows the actors to lip-sync to the music during the shooting of a scene. Sometimes the song is played into a wireless earpiece and the actor sings along to the music. This allows for the actor to add their natural emotions to their singing, which comes from being on the set with other actors and not alone in a vocal booth. Other times the pre-recorded music is played through a speaker on the set in order to get accurate lip-sync.

LIBRARY MUSIC

MISTAKE

I'm sure I can find some hip hop music on SoundCloud that will work as a score.

There are some great pre-recorded music libraries available on hard drives, CDs or as internet downloads to use for scoring a film. This is one of the least expensive ways of acquiring music. Some things to consider when using a library are that the tracks are available to anyone, so they are not exclusive to your film. Therefore they may turn up in someone else's film. They are often preset in duration, so they usually have to be edited to make them work. There are usually only a few variations of a track, if any. This means you have little, if any, choice in instrumentation, tempo or hits for any given track.

There are some great music libraries, like Associated Production Music, Extreme Music, SonicFire and VideoHelper, that create their music in a manner that is easy to edit. They might include some hit points within each cut, which helps with timing a hit or with beginning or ending a cue within time limits. They might also include sections of the music that can be looped or can be edited to adjust for timing. They are easy to edit because they usually don't change key or tempo, which can be helpful or limiting depending on the needs of the cue. Sonicfire Pro creates music loops that are designed so that they can be easily edited to whatever length you need for your cue.

Some of the music library companies will compose music for your production. Others, like Artlist, De Wolfe Music or Sounddogs, simply license the music they have. Some of them charge a flat rate to use their song or some charge per music cue used or by length. They may also charge for purpose of use or type of distribution of the film.

You can often download music cues from a website and pay the licensing fee at the same time. This will allow you to use the music in your films, but you do not own it. There are a number of composer that have their music on websites, like SoundCloud, Freesound and Bandcamp, where you can download and use them for free or very little money. Normally, these composers require that you list them in your credits for their music compositions.

You need to be aware of the terms for any licensing agreement because the agreement will likely have some restrictions on using their work. It might be fine to use it in a film, but not for broadcast television. It might be fine to use it in whole, but not to edit it in any way. You do not want a cease and desist letter or order against you showing your film.

EDITING

Music editors are more common in big-budget films. Because of tight budgets, lower-budget films often have the composer, picture editor or sound effects editor performing the duties of the music editor.

If you are working in an audio editing software, then you may receive the dialogue and sound effects on one track and the temp music on another or to receive a version that has no music in it at all, just dialogue and sound effects. If the audio editing is being done in the picture-editing software, then you just need to import the music. Whatever software is used, the music editor's job is to make sure that the cues are in sync with the picture and that all of the cues work well with the emotions of each scene as well as the sound effects and the dialogue.

The list of cues and your notes from the spotting session are very useful for guiding you through the editing process. You can use the notes with the cue names or numbers and the in-and-out times as a guide for placement of each cue on the editing software's timeline. Some software will put a time stamp with the start timecode into the metadata for each music cue. This will allow you to import the cue directly to its place in the timeline. It is best to start with the first cue and work to the last cue.

Editing pop music often requires a good sense of rhythm. It is common to want to cut on the downbeat, so that there is no interruption in the rhythm. However, cutting on backbeat 2 or on beat 3 may sound much more transparent in some music. The downbeat is the first beat of a measure. A backbeat is the accent that is put on the second and fourth beats of a measure in 4/4 time. Most music used for scoring is in 4/4 time.

Orchestral music can be more challenging than music with a strong beat. The down beats in pop music are edit points, but orchestration is not always so defined. You'll have to work to find the right place and possibly have to use a long crossfade to make orchestration work well. However, a key or tempo change in the middle of a crossfade may not sound right.
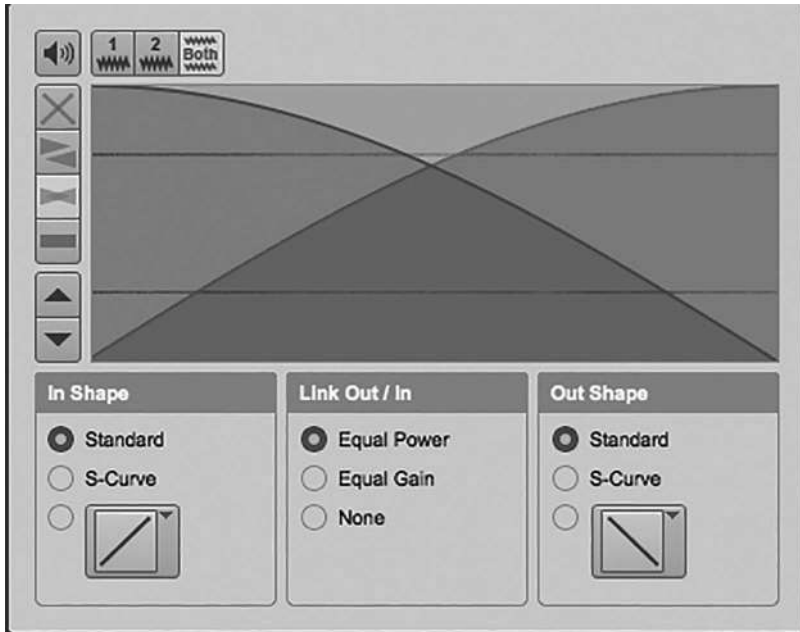
Figure 16.3 Basic crossfade

Some editors say that in order to come across to an audience as being in sync, music hits should happen within one-third of a second after the picture hit occurs. This allows the audience time to digest whatever has happened on screen, so they are ready for the music. Other editors say it should be right on the action. It's best to experiment with the timing to get it to work properly.

If you are editing with music that is not custom made for your film you'll need to make the music fit. One simple trick is to back-time the music so it has a natural ending. For example, if you are using 40 seconds of a 60-second music cut, then you'll need to edit out 20 seconds of music. You can start by placing the end of the song at the place spotted for it to end. Now go back 40 seconds from the end of the cue and edit out the first 20 seconds. If you are lucky, the beginning will sound like a natural start for your cue. A quick or slow fade up might help the start. If you are not lucky, then you'll need to edit the music so it has a natural start. This may mean taking out a section in the middle of the cue and then joining the

beginning and the ending so they are as near as possible to 40 seconds and the music works well with the picture.

If finding an edit point in the melody, chord progression or key is proving difficult, you could try to find a place where a single note is held for a couple of beats and doing a crossfade into the other piece. It's always a bit of trial and error to get these types of edits to work. If you have run out of options, then you might try a different cut of music.

If the picture has been re-edited since the music was created and you are working in an audio-editing software, then the picture editor should be able to give you a "change list" of the picture changes which will contain the timecode and how many frames were added or removed or if the shot or scene has been omitted or moved. There is software such as Conformalizer that will do the editing for you, but you'll still have to make sure the music is in synchronization and flows correctly. You may have to resynchronize music cues by hand and eye, if you do not have re-syncing software.

STEMS

> **MISTAKE**
>
> I don't need to make stems, I'll just mix down eight tracks at a time and then mix them together for a final mix.

In film postproduction there are three separate types of sound: dialogue, music and effects. These are referred to as DME. During the final mix of the film all the sound is mixed down to these three elements, which are called "stems." The three stems can be played together at unity volume or gain and you'll hear the final mix. Unity volume is when the input equals the output, so the slider on a channel would be set to zero.

It's much easier and faster to make a change in the stems than it is in the final mixed tracks. It would be difficult to change a music cue if there were sound effects and dialogue playing at the same time, but if you make the change in the music stem, the dialogue and sound effects are not affected.

Another attribute of having stems is that the music and sound effects can be played together, without the dialogue, and a foreign dialogue track can be added to them, which will make the foreign version sound a lot like the original language version when mixed together.

In music there are also stems, which are the various types of instruments being grouped together. Strings might be one stem, percussion another and brass another. There might also be stems such as a violin pair, viola pair, cello pair, etc. The music stems, which are sub-mixes, make it much easier to mix the music for the DME and final mix, because the music is already somewhat premixed.

MIXING

It is common practice for the music to be premixed prior to the rerecording or dubbing session. This premix will allow you to reduce the number of tracks you provide for the final mix session. It's important that you group similar types of instruments together. You might premix the percussion instruments, in which case you might have the snare drum tracks mixed down to a stereo pair. The overheads might be another stereo pair. If there were two mics on the guitar, then you might mix those down to just one track or you could leave them as two discrete tracks if there aren't too many other tracks.

Normally, the music mixer does not want to mix the composer's music for them. They want the composer to provide the score at mixed levels. However, they will probably change some of your levels to make the music work better with the film. They'll do some equalization (EQ) adjusting so that some of the instruments don't compete in the same frequency range as any of the actor's voices. They may add some reverb or other filtering to make the music fit into the mix, but they usually don't have the time to do the composer's premix.

The premix should have very little compression on it, if any. Film sound is about having a wide dynamic range. Too much compression reduces that and makes the music sound harsh. When the rerecording mixer hears highly compressed music, they may drop the volume level considerably to compensate for the compressed music banging at the top of the range. Nuance, subtlety and suggestion are what film music is about, especially under dialogue. There are times where it needs punch and other times where the subtle details of the music need to be heard by the audience.

If the film mix is only in stereo, then a composer may deliver a stereo mix pair along with the stems. Make sure that all of them are at the desired mix level. If the music is for a surround film, then discuss with the director and the rerecording mixer how to assign the music tracks to the various cinema tracks available. Most studios have a template that can be used for music sessions. They will set up in a way that will allow them to input a music session into their system and be familiar to the mixers.

If the mix is for television, then it's more common to use some compression on the tracks, so that the music cuts through household noise and can be heard on home speakers.

If you are the rerecording mixer doing the final mix of dialogue, music and effects, then you can add the panning that you want to the music mix. If you are mixing in a studio with a rerecording mixer, then ask them if they want you to do the panning or to leave it for them. This is especially true if the mix is being done in surround. If you are the one doing the panning, then you might try placing the music in the left and right speakers and the music's reverb in the surrounds. It could add some depth to the music. Do not place the music in the center channel as that is for dialogue.

If you are doing you own mix and are working with diegetic music, you may need to adjust the volume level to match the shot perspective. For example, if an actor is playing a violin and there is a cut from a close-up to a wide shot the volume level, EQ and reverberation may need adjusting to match the camera angle change. The wide-shot music will be at a lower volume level than the close-up. The frequency range will be different in the close-up. The reverb will sound different between the shots.

DELIVERABLES

If you are taking your music to a studio to be dubbed into a film's audio track, then you need to talk to the rerecording mixer to see what specifications they require for the delivered music tracks. The most commonly acceptable formats are .wav and .aiff. They may want a stereo mix, a 5.1 or 5.0 mix or they may want all the tracks to be discrete or just the stems. It's becoming more common for the music editor to do some or all of the premixing, especially on low- and no-budget films.

The software used for a studio mix is almost always Pro Tools. Most studios can also work with other software like Nuendo, Cubase or Logic Pro, but Pro Tools is dominant in the film industry.

There are two main interchange file formats to transfer audio from one audio system to another. They are either OMF (Open Media Framework Interchange) or AAF (Advanced Authoring Format). These allow the music score session to be transferred to the rerecording system. They retain information such as timeline placement, clip names, volume levels, fades and pans.

You may be required to provide a Pro Tools or other editing software session for the studio to import into their system.

Some rerecording studios may want a length of 1K tone, such as 30 seconds, at the head of every track so they can set up for the audio level that matches the music levels. There should be a 2-pop at the head and tail of each track. See Chapter 14 "Dialogue and ADR" for details on using 2-pops.

Make sure that you have the correct timecode and sample rate for your music session. Most films are shot at 24 frames per second, but there are other possible rates. The film might be at 25 fps, 30 fps, 29.97 fps or even 23.976 fps. You need to know the video rate in order to avoid having to convert your session to match it. The good news is that you can convert the audio sample rate.

It can be very helpful to have the picture editor give you a version of the film with a timecode burned in. This is a window that displays the timecode for each frame of the film visually. Make sure that the timecode for the first frame of your session matches the timecode for the first frame of

the picture in the time line. If they are not in sync, you have a problem with either the picture or session timecode.

If you can afford to use pre-existing music, then you will need to keep records of the usage for the purpose of negotiating and acquiring rights and clearances. The various parties that have control over the usage of a specific song will have a lot of questions about the song usage and about the film. You will have to provide this information in writing, so maintaining a cue sheet can be very helpful. An example of a cue sheet can be found in the online Appendix for this book.

As you can see in the sample cue sheet given, the titles, artists, composers and publishers of a song are required. The intended use must be given. The duration of the music used in minutes and seconds must be noted. The budget of the film, a brief synopsis and what the distribution plans are must be given. For more information, you can read ASCAP's "Music, Money, Success and the Movies."

TIPS

- Choose music that is appropriate for the era and location of the film story.
- Use tempo to reflect the action.
- Unless needed, do not create the music to match the action like cartoons often do.
- Spot where you want music and what style of music.
- A motif can be used as a character, location or other element identifier.
- Use music that reflects the emotions of the characters and their inner world.
- A score is normally music without much beat to it or vocals in it—unlike your favorite band.
- Know when not to use music and let silence or just sound effects play.
- Create music that does not compete with dialogue frequencies.
- A musical score usually is like wallpaper and is not noticeable.

17 MIXING

INTRODUCTION

MISTAKE

I'm just going to set the volume levels on everything and be done with it. I don't know what EQ or compression do anyway.

Figure 17.1 Mixing console (by Christian Wiediger)

This chapter is about how to approach mixing beyond setting levels by using the mixing tools that may be available to you in order to get a great sounding mix.

Once the picture is locked for good, hopefully, and the sound effects, dialogue and music are edited into their proper place, then it's time to prepare for the mix. Mixing brings the sound of the film to life.

Some people like to set levels as they edit. This is somewhat effective, but it usually requires a final mix anyway. Some people will do more than set levels; they will do panning and even add Digital Signal Processing (DSP) to the individual sound files and to the tracks. Some of the more commonly used types of DSP are equalization (EQ), compression, reverb, noise reduction and effects. There are many online tutorials on the various DSP plug-ins that you may have available to use.

Prior to a final mix is a step referred to as "preliminary mixing" or premixing and it is a worthwhile step in the mixing process, especially if you are having your film mixed at a rerecording studio. The idea of the premix is to reduce the track count to a manageable level and still maintain some separation of critical sounds from those that are mixed together. If you are mixing the film yourself, then premixing is a helpful approach in that it breaks down the process into bite-size chunks and allows for the focus in the final mix to be more on the creativity and storytelling and less on the technical aspects. There is no one way to go about premixing or final mixing.

The premix can be done using all of the sound food groups of dialogue, Automated Dialogue Replacement (ADR), walla, sound effects, ambiances, Foley and music, at one time in one session, or you can divide it up into separate session mixes each for dialogue, music and sound effects and then combine all of these sessions into one session for a final mix. However you decide to approach your mix, the first thing you need to do is make sure your session is set up in a way that will give you the outcome you desire, such as a stereo mix, a surround mix or both. If you are doing the mix in your picture-editing software, you can do the entire mix on one timeline.

If you are doing your mix on a non-linear editing (NLE) system, there are usually limits to the number of tracks you can have. Some NLEs only have eight tracks or channels, while others may have 16, 24 or more. If your NLE system has limited tracks and you need more, then you should seriously consider transferring your audio over to a Digital Audio Workstation (DAW) for a final edit and mix. The audio in the picture-edit timeline can be output as either an OMF or an AAF transfer file. They both allow for audio to be transferred to an audio editing system for mixing while keeping clip and track names, levels, fades, pans and even some of the effects you may have added.

It is common to do a temp mix for the purpose of audience testing on a NLE and then do your final on a DAW. Some low-budget filmmakers are doing a final mix right in the NLE. I have done final mixes in a NLE, but only when the track count is low, around 8–12 tracks.

Many of the NLE picture-editing software packages have a broad range of plug-ins that allow for a decent amount of processing. However, if you have a feature film or a short film that requires a lot of sound tracks and processing, you will be better off with one of the DAW software programs. In terms of affiliated audio software for mixing, some combinations are: Media Composer has Pro Tools, Final Cut Pro has Logic, Resolve has Fairlight and Premiere has Audition. They are there to allow for an in-depth sound edit, sound design and mix.

Your film may have a couple of dozen tracks or even fewer and you may elect not to do a premix, but just to go ahead and do a final mix with all your tracks at once.

A standard approach to a premix is to do the dialogue first as it is key to mixing the other sounds. You'll be working on adding and adjusting the levels, pans, fades, EQ, compression, reverb, noise reduction and whatever Digital Signal Processing (DSP) effects that are needed to have a viable mix. You'll do whatever is needed to make the final mix as streamlined as possible, so that you and the director are able to maintain a creative flow with little time needed to make technical adjustments.

Once you've completed the premix and if you created stems (Stereo Master or Surround Master) and they're ready, it's time to do a final

mix. The stems are the separate mixes for dialogue, ADR, walla, sound effects, ambiances, Foley and music, which are then used to create the final mix. It is easier to mix a handful of tracks than it is to do the entire session. The stems will all be mixed down onto a composite or master mix track. It is common for the deliverables to include the stems and the final mix.

The technical aspects of the final mix involves tweaking the levels, getting a good balance between the food groups (dialogue, effects and music), adjusting Digital Signal Processing (DSP) to improve the overall sound, getting all of the sounds to blend together well and preparing the deliverables. The artistic aspects involve making the right creative decisions to fulfill the filmmaker's vision and to make the story work.

The person doing the final mix is usually referred to as a rerecording mixer or dubbing mixer. If you are doing your own mix, you can call yourself whatever you want. The important thing is to go through the film scene by scene and make the creative decisions along with the technical ones that will tell your story. In the end you should have the mix you want and the deliverables you need. The biggest issue with doing the final mix yourself is that it's hard to keep perspective. During the mix, you need to keep asking if the sound is being used in a way that supports the story and affects the emotional involvement of the audience.

You need to determine what formats are needed for distribution. You might have a stereo mix, surround mix, dialogue, music and effects (DME), music and effects (M&E), television, DVD, Blu-ray, VOD streaming or other required mix. The television, DVD and Blu-ray are similar mixes and you could use one for all three. If you don't have a contract, then you can create the mixes you need in order to get your film distributed the way you want. If you have a contract for distribution, then there will be required deliverables. Whatever you need to do, you'll almost always need to do a stereo mix, as it is the most universal format. If the mix is for cinemas, then you will need a LCR (3.0 left, center, right) mix for the three main theater speakers in the front.

SETUP

Ideally, your final mix will be set up to output the primary format or formats that you'll be using for exhibition. One costly approach is to mix in surround, either 5.1 or 7.1, and then take that mix into a 3D space, like Atmos, and do a mix for that environment. If you need a stereo or LCR mix, then either one or both can be created by doing a fold-down from the surround mix. Depending on your needs, just doing a stereo mix may work well for you. Otherwise, an LCR is a basic mix that will work for nearly all cinemas because there will be audio for the left, right and center speakers. Another mix to consider is the LtRt, which is left total and right total. This

is very common on the festival circuit and in television, and is a DVD format. It allows for a stereo system to play a stereo mix and for a surround system to play a surround mix. The trick is in how the mix is encoded and decoded. There are plug-ins that will allow you to do this fold-down from your surround mix.

In most DAWs there are templates that are designed for specific purposes like film mixes and music mixes. Some of these are very complex and can take some time to figure out what the signal path is for the different elements in your mix. I try to keep the mixing paths as simple as possible, without taxing the computer's processors. If your film sound is fairly straightforward and simple, then you might try mixing all the tracks directly to a master fader. If your film sound is more complex, then you may need to send each group of sounds to an auxiliary (AUX) track and/or a voltage-controlled amplifier (VCA) or digitally controlled amplifier (DCA) track where they come all together under one controlling track. For example, if you wanted all of the Foley sounds for a scene to have the same reverb added to them, then you may be better off adding that reverb to the Foley aux channel, than to add the same reverb to each individual Foley track. The Foley aux channel would then feed into the master fader.

GETTING STARTED

> **MISTAKE**
>
> I don't need 2-pops because I'll know if the sound is not in sync with the picture.

Most short films and lower-budget independent films are mixed in stereo. If your film gets distribution, you can then look at a surround mix. If you do choose to do a surround mix, then approach it as a way to subtly enhance the audience's experience. Don't overdo it with sounds coming from all over unless it is appropriate.

If you are doing a surround mix, don't neglect the low-frequency effect (LFE) channel. It can be used for those intense bass sound effects that shake the audience.

It's a common practice to use a low-pass filter at 80–120Hz on the LFE channel. If you are doing a Dolby mix then the filter is set at 120Hz. Some filmmakers choose 100Hz as the filter setting. This will keep unwanted frequencies out of the subwoofers.

If you are doing a mono mix or a fold-down to stereo or mono, you'll need to remove the LFE signal from the mix. Most stereo or mono systems

would have trouble trying to reproduce the LFE frequencies without subwoofers.

Below is a basic track layout for doing a mix:

DX1 or DIA1 (Dialogue)
DX2
DX3
DX4

ADR1 (Automated Dialogue Replacement)
ADR2
Group1
Group2
DFX1 (Dialogue track effects such as Phones, door closes, etc.)
PSFX1 Mono (Production SFX)
PSFX2 Mono

Foley1 (Feet)
Foley2 (Feet)
Foley3 (Moves)
Foley4 (Specifics)

SFX1 Mono (Sound Effects)
SFX2 Mono
SFX3 Mono
SFX4 Stereo
SFX5 Stereo

BG1 Mono (Backgrounds)
BG2 Mono
BG3 Stereo
BG4 Stereo

SrcM1 (Source Music)
SrcM2

MX1 (Score)
MX2 (Songs)

DXSub (Stem)
FOSub (Stem)
FXSub (Stem)
BGSub (Stem)
MXSub (Stem)

Verb1
Verb2
Verb3

Master
(SFX and FX are both abbreviations for sound effects.) Character names can be substituted for DIA, ADR and Foley tracks names.

Whether you are using an NLE to do the mix or if you are using a DAW, you need to use Head 2-Pops & Tail 2-Pops on all of the tracks to confirm that the picture and sound are in sync. There is a detailed explanation and a visual example of a 2-pop in Chapter 14 "Dialogue and ADR."

It is standard industry practice to have head and tail pops on your time-line. 2- pops will tell if all of the tracks are still in synchronization by the end. They are also useful in aligning the sound with the picture once the mix is printed and exported.

MIXING LEVELS

MISTAKE

I want my sound track to rock, so I'm mixing at –1dB and compressing everything up to that level.

When you start mixing, watch your meters to make sure you have proper levels.

The most important level you need to pay attention to is the one for dialogue. All of the other sounds will be adjusted to fit in with the dialogue. If the dialogue level is generally moving between –18 dB and –30 dB on a typical root mean square (RMS) meter, then you will have a decent level for your mix. A scream might hit –12 dB and a whisper might drop to –40 dB or lower. It all depends on the scene. A starting place for music would be between –18 dB and –20 dB, then adjust for the dialogue. Sound effects can start around –18 dB to –20 dB and then be adjusted around the dialogue. Next, adjust the music levels to work with the dialogue and sound effects. Remember, dialogue is the most important sound, so it needs to be heard.

An important facet of setting levels is "gain staging." Gain staging begins with the original recording. There needs to be an adequate signal to noise ratio for whatever you're recording. From the recording on through the final mix, you want to maintain a good balance between the sound and the noise floor. Gain staging is the different steps that the signal or sound takes from beginning to end. Try not to let the sound drop in volume until the final mix when you will set the appropriate level.

MIXING TOOLS

Equalization
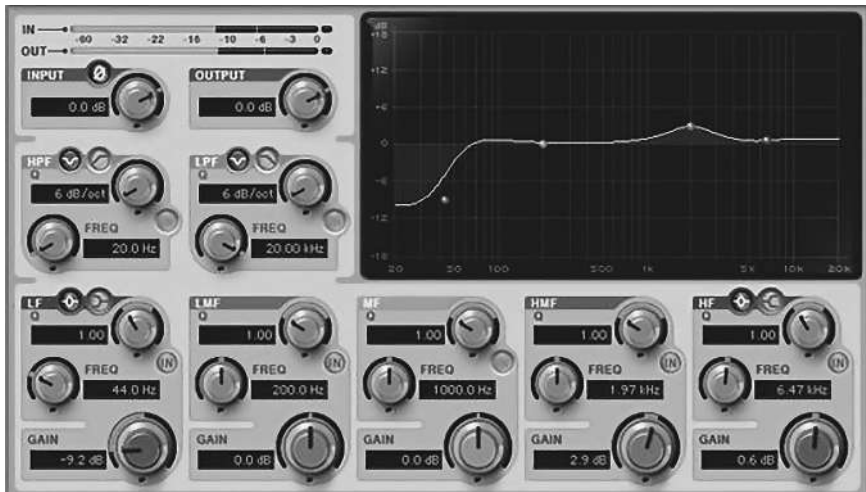
Figure 17.2 EQ voice

EQ or equalization is used to boost (increase) or cut (decrease or attenuate) the volume level of selected frequencies. It is very useful for making dialogue, sound effects and music work together to give a broad frequency range and not compete in the frequencies that are typically used for dialogue.

The human ear has a range of hearing from 20Hz to 20,000Hz (20KHz). The most sensitive range is from 2,000Hz to 5,000Hz. The human speech range typically falls between 200Hz and 8,000Hz. The male voice is usually has a fundamental frequency of 85–180Hz and for the female voice it is 165–255Hz.

The human ear is more sensitive to boosted frequencies in the speech range than it is to cut frequencies. That's why it's better to cut than to boost, if possible. The narrower the cut, the less noticeable it will be. The wider the boost, the less noticeable it will be. The "Q" factor controls the bandwidth of frequencies that are cut or boosted. The lower the Q factor, the wider the bandwidth will be and the higher the Q, the narrower the bandwidth of frequencies will be. Undesirable sounds can be reduced or removed by using a narrow bandwidth of the noise and cutting those frequencies.

General Rules:

- Cut first and then boost, if needed.
- Cut the Q narrow and boost the Q wide.
- Don't cut or boost too much.

Compression

Once the EQ has reduced or removed the unwanted frequencies and/or boosted the desirable ones, you can focus on "compression." A compressor is used to control the dynamic range of the sound, which is the difference between the loudest sound and the softest sound. It will limit the loudness of the peak sounds going through it. Once the loud peaks are tamed, you may need to increase the gain or volume level to get the sound back to the desired level in your gain staging. By adding gain to the sound, you'll be increasing the level of the entire dynamic range including the noise floor, so be careful how much you raise the output gain level.

Noise Gate

A "noise gate" is the inverse of a compressor. Once the input signal drops below the threshold, the gate closes and mutes the output. This can be useful in reducing or removing a noisy background; however, when the gate is off, the noise will return. If you are using a gate to clean up a dialogue track, it may sound odd if too much gating is applied. A noise gate is less noticeable when there is a lower noise floor. If you try to remove too much of the ambiance, it will be noticeable. If you set the threshold of the gate just above the noise floor, it will be closed during pauses in the dialogue and then open when the talking starts again.

Expansion

An "expander" is basically the opposite of a compressor. It expands the dynamic range of an audio signal. They are generally used to reduce the level of noise floor, room tone or background sound in a scene. They can make a relatively quiet sound even quieter.

An expander kicks in when a sound goes below the threshold. Any sound that sits below the threshold gets expanded down by an amount determined by the ratio setting you've selected.

Noise Reduction

If you have a noisy track that can't be helped much with EQ, compression, noise gate, expander or any other standard approach, then you will need to try some form of noise reduction. Many of the NLE and DAW software have plug-ins that deal with noise reduction. Some are better than others. One of the best is iZotope RX, which is commonly used for film sound clean-up. Other worthwhile options include Sonnox, WaveArts, Waves, Acon and Sonic Solutions products.

Noise reduction needs to be used judiciously, otherwise it can introduce artifacts that are worse than the offending noise. If you have some really bad noise, you could try removing some of it with one noise reduction

pass and then remove the remainder with another pass or with a different plug-in, such as EQ. If you find the process confusing, there are some fairly straightforward plug-ins, like Waves Noise Suppressor, which has a single fader to adjust between dialogue and noise.

Reverberation & Delays

Reverberation or "reverb" is used to add reflections to sounds to make them seem to fit in a scene's environment even though they may not have been recorded in that environment.

Many of the reverb presets have names like Large Hall, Small Hall or Church. There are also ones called plate and spring, which are based on reverb created using metal plates and springs. Some of the reverbs include presets that are more designed for sound postproduction, like kitchen, bathroom and bedroom.

Delay is an echo where the initial distinct reflective sound comes across as more spacious and open feeling than a reverb would. A delay repeats from one to many times. If the repeated sounds are fast enough, you'll have created a reverb-like effect.

Delay can be used like reverb to make ADR or sound effects fit into a scene as though they were recorded on location.

When working with dialogue, ADR, Foley and sound effects, you'll have to decide if reverb fits the scene or if a little delay might be better. Whichever one you decide to use, make sure it's subtle, unless the scene takes place in a cathedral.

Limiter

A "limiter" lives up to its name by putting a limit on the volume level of a sound. They are used to reduce or squash the peaks in the sound without having any effect on any other part of the sound envelope. They are similar to a compressor, but have different purposes. A compressor will reduce louder parts of a sound without squashing the peaks, which can be useful for obtaining a consistent level for the sound.

Limiters and compressors are often used together. The compressor is used to smoothly roll off the loudest levels to create a more consistent sound, while the limiter creates a wall to keep the strong peaks from clipping. Many engineers and rerecording mixers only use a limiter on the master track.

Buses, Auxes, Sends & Returns

A bus is a pathway down which a number of tracks can be routed. Most DAWs have some or all of these features, but not all NLE picture-editing software packages do. You may choose to put some processing on the

auxiliary (aux) track that the bus leads to; so that whatever tracks are sent to that aux track get the same processing. For example, if you wanted all of the Foley to have the same reverb, you would create a bus 1 & 2 output on each of the Foley tracks and send all the Foley tracks via the same bus to an aux track with an input of bus 1 & 2. The aux track would then have a reverb inserted on it. This would allow you to control the output level of all of the Foley with just the one aux track fader. This also allows for a consistent reverb effect and for less processing by the central processing unit (CPU) on your computer. The output of the aux track with the reverb added could then be sent to the master fader.

Master Fader

The main purpose of a master fader is to control the master output levels for the mix. They can also be used to control the output level of bussed tracks, sub-mixes, effects sends and other routing needs. It might be useful to have a master fader assigned to a bus to be able to adjust the inputs level going into an auxiliary track.

Master faders are capable of accepting all types of tracks and they allow for the adding of post-fader processing. You could add a compressor or limiter to the master fader output to allow for that last step of protection from clipping. These faders usually do not have the ability to pan, mute or solo.

Metering

Figure 17.3 Dorrough meter

If you want your film to sound good in a theater or through television, the internet or on a DVD or Blu-ray, then you need to be monitoring your sound with an audio meter. Meters will show how loud or quiet your film is. A common way to meter is to use volume unit (VU) meters and peak meters or peak program meters (PPMs).

A VU meter shows the *average* volume level or root mean square (RMS) of the sound passing through it. A PPM meter shows the *peak* volume level of the audio passing through it.

All NLE or DAW software packages have some form of metering built into them. Some are better than others. Some meters combine both peak and average metering. There are many software plug-in meters available for free, but the high-end ones need to be purchased. One of the best is the Dorrough meter, which is commonly used for film mixes.

DIALOGUE FIRST

MISTAKE

I've made a couple of music videos, so the music is going to make my film great. It's more important than the dialogue. Who remembers dialogue?

The standard starting place for a mix is with the dialogue. Your goal is to make sure that all the lines are intelligible and at the appropriate level. Once the dialogue is set, you can then mix the sound effects and music around the dialogue. Dialogue is the most important part of a mix. Everything else is secondary and serves the dialogue.

A lot of student films put music first and the dialogue and story suffer for it. Music can greatly support a story, but it can also sink it if it overpowers the dialogue and thereby the story. Remember that dialogue usually sits around the –18 dB to –30 dB range. If you're mixing for television, then a higher level of –12 dB would be acceptable.

If you've done some dialogue cleaning during the editing process or if you've done a premix, then you'll only have some tweaking to do in the final mix and you'll want to get the dialogue to work well with the music and sound effects.

If you haven't done so already, you'll need to add whatever EQ, compression, panning, reverb and other processing is needed to make the dialogue shine. There are no hard and fast rules. You just use your ears to get the best sound you can. The main thing to watch out for is not to over-process. Only do what needs to be done. You'll find that if you play the dialogue along with the sound effects and music, for a given scene, that you may need to do less cleaning. A common mistake is to clean the dialogue while only playing it and that can result in over-processing. However, it may be better to play the dialogue by itself when you're doing other non-cleaning processing. I suggest doing both. Checking the dialogue processing by turning on the music and sound effects and then turning them off to do some tweaking.

Only add reverb or delay to dialogue if the microphone used is too dry for the perspective of the actors in the scene. If the shot is medium to wide and the actors are wearing lavalier microphones, then there won't be much reverb, but if they are being picked up by a boom microphone instead, then there will be some reflections from the location's surfaces in the recording. You'll probably have to add some reverb or delay to the lavalier microphones if you choose them over the boom.

You might decide to add a small amount of compression to the dialogue. This may work better on the lavaliers than it does on the boom. The compression used on the boom microphone recording could cause its natural reverb to be more pronounced.

ADR

If you are replacing all of the dialogue in your film with ADR, or even one scene, then you are free to create whatever sound effects will work for the locations. If you are replacing just a word or a sentence or two, then you'll need to adjust the ADR to match the dialogue.

- First adjust the ADR volume level until it matches the dialogue.
- Next adjust the room tone or ambiance level to match that of the dialogue.
- Next equalize the ADR until there is a similar frequency spectrum for it and the dialogue. You'll probably have to cut some low end and boost some middle to high frequencies.
- Next add some reverb or delay to get the ADR to sound like it's in the same acoustic environment as the dialogue. Start with it set at the minimum level and slowly increase it until it sounds right.
- Finally, readjust the gain or volume of the ADR and room tone to match that of the dialogue.

SOUND EFFECTS

Once the dialogue and Foley are premixed, you can either move on to sound effects or music. I suggest that you take on sound effects first. Most sound effects are based upon the real world and are used to position the story in the time period and location in which it occurs. Music, especially the score, is most often outside of the story.

Most films have a lot of sound effects. If you have a lot of tracks and are mixing on a DAW, like Logic Pro or ProTools, you may want to use a VCA fader to control some of the sound groups. Most picture-editing software programs do not have VCAs or some of the other sound-oriented tools that help with a mix. You may have guns, cars, robots, hard or sync effects and other groups to contend with during the mix. Once the levels in each of the

individual tracks are set, it will be easier to route each group through its own VCA fader to control the group's level. If you have a group that needs some processing then you would send that group to a common aux track.

If you've done a premix, you may have already added EQ, reverb or whatever else was needed to make each sound effect work. If you haven't done a premix, then you'll need to make sure that the sound effects have the same reverb treatment as the dialogue if reverb is appropriate. Most sound effects are recorded as dry as possible, to allow the mixer to add what is needed for a given scene.

AMBIANCES

Start by playing the constant ambient sounds, like wind and rain, and then start adding the ambient effects, like birds, dogs, frogs and thunder. You'll adjust the levels of each as you add them and then again after they are all playing; adjust them until you find the right balance for the scene.

Ambiances need to be carefully blended into the overall sound design. The elements in the ambiances can be used to add emotion to a scene. I've used fairly melodic-sounding birds in the beginning of a romantic scene, but as the scene progressed and the two actors started arguing, I brought a crow track up subtly with just an occasional crow caw in the background. The idea was to have the unpleasant sound of the crow's call add to the emotional state of the actors and thereby the audience. You could also add the crows at the beginning to act as a foreshadowing of the argument.

FOLEY

> **MISTAKE**
>
> I read that you should just set the Foley tracks to –20 dB and leave them there.

Foley needs to fit with dialogue and it needs to be panned to the front speakers following the same placement as the dialogue. If all of the dialogue is in the center speaker, then put the Foley there too. It could be in the left and right speakers if the situation warrants it. The Foley always stays with the dialogue. The simple reason is that the actor's mouth, feet, clothes and hands all occupy the same space at the same time. Usually, wherever the actor is in a given scene their other body parts are there too. This means that if an actor is far away and walking toward camera, then we'll hear their footsteps and their clothes more loudly the closer they get to camera. If an actor exits the frame and then comes back into frame, their

Foley needs to move with their body. Because of this close relationship, it's best to mix the Foley with the dialogue playing.

The levels need to be loud enough to be intelligible, but not so loud as to be noticeable, unless there's a reason to bring them up. Most professional Foley artists will walk the Foley footsteps so that they get louder as they actor approaches the camera and softer as the actor walks away, so they are almost premixed.

If you're adding reverb to the dialogue track, then you need to add it to the Foley tracks too. It may work to use the same reverb settings for both, but usually it works better if you tweak the reverb for the dialogue and Foley separately.

Make sure that all of the Foley has a low pass filter that removes all frequencies above 8kHz. This will keep the air and hiss at a minimum. You may also want to have a high pass filter that removes all frequencies below 100Hz. This will keep any rumble from getting into the mix, unless it's desired. You may need to cut the mid frequencies some in order to not compete with dialogue and to thereby allow the highs and lows to be boosted. Boosting them will make the sounds louder without interfering with the dialogue.

You may need to add compression to the footsteps as they may have fairly sharp transients when the foot first hits the walking surface, especially if it's a hard surface like concrete or wood. That attack can be a distraction, so a compressor with a fast attack and a fast release might soften those foot hits to an acceptable level. Most audio and video software have compression available.

Add whatever reverb you are using for the dialogue, if any, and then tweak the reverb for the Foley as it is usually a bit different than what you have set for the dialogue.

When I was the Foley editor on a feature film, one of the interns asked me if it was true that all of the Foley faders were just set to –20 dB and let run that way for the entire mix. I told the intern that Foley was mixed just like the other elements in order to get the right balance.

MUSIC/SCORE

Music is not reality. Dialogue, sound effects, ambiances and Foley are all there to create a reality or a world for the story to occur in. Music doesn't directly add to that reality or world unless it happens to be diegetic. Music is a convention that works with storytelling, but it's not necessary to tell a story. Mixing a score into a film sound track is an art form in and of itself. Music is a non-verbal indicator of emotions. It helps drive the story. It gives the audience information and it helps identify characters, locations and themes.

Just like in the film world, the music world also uses the term "stem" when it describes the different elements or food groups of instruments. There may be the drum stem, the string stem, the horn stem, etc. They are all at a mixed level and can be played at unity and you'll hear what the composer intended.

During the final mix, the music is played along with the dialogue and sound effects and the director makes decisions as when to favor music or when to favor sound effects. Sometimes silence is called for and a musical cue is dropped. Other times the music may pull the story along and the sound effects are dropped. Once all the elements are brought together in the final mix, the director can make the creative decisions that they believe produce their vision of the story.

It is common for whoever composed and created the music to have done more than is needed. You'll have to remove the music cues that do not help or are conflicting with the sound effects or dialogue or even the need for silence.

EQ can be used on the music in order to not compete with the actors' vocal frequency range. The EQ will essentially cut a shallow hole for the dialogue. Cutting a hole involves finding the general frequency range of the dialogue, say 100Hz to 2,000Hz (2kH) and then using an equalizer to cut those frequencies by –3 dB to –6 dB, which would then allow the dialogue to fill those frequencies.

Levels, panning, compression and reverb are all part of getting the music to sit right in the mix. You'll want to bring in the music without calling attention to the move, unless it's an action scene or montage, although they may need to be brought in unnoticed too. If you have a scene that starts off with just music and sound effects and then turns into a dialogue scene, you'll want to fade out the music or dip the music under the dialogue. This needs to be done in a way that masks or covers the change. You could use the downbeat to slide down the music level, because that would sound fairly natural or you could hide the dip in a prominent sound effect, a drastic cut, a camera movement or an emotional change in one of the characters. The point is to find something that will distract the audience while you perform your sleight of hand magic.

If the music tracks are stereo, they'll work well in either a mono or a stereo mix. If you use that stereo music in a surround mix, then you can pan a small percentage of the music into the surrounds, but keep the power of the music in the front speakers.

If the music is premixed in surround, then you'll be all set for your mix, but be careful of what you put in the surrounds and how loud they are. If you have a surround mix, the stereo mix is very easy to do. Most systems have a plug-in that will do that for you and the results are usually fairly good.

DME STEMS & M&E

Figure out what your deliverables are. If you have a distributor, they'll tell you what their needs are. If you are self-distributing, then you'll have to decide what you need for the avenues of distribution you intend to use. Television has very specific "specs" or specifications. Each broadcaster or cable company may have their own specs. The internet has its specs and film

festivals have their own specs. I've entered short films and documentaries in a number of festivals and have found that there is little consistency.

You may well need to have a mono mix, a stereo mix, a 5.1 surround mix, an M&E plus other deliverable formats. It will be helpful if you have a good set of stems. At the least, you'll need to have a stem for each of the three main sound groups: dialogue, sound effects and music. These stems should be able to have the faders set at unity and when all of them are played together, they replicate your mix. You may choose to break your stems down further and have an ambiance stem, a Foley stem or even a loop group stem.

You might choose to do a basic stereo mix and then when the film gets picked up by a distributor, you do whatever mix is required, hopefully with the distributor's money.

The DME, or dialogue, music and effects, stems allow you to make some changes without going back into the mix. You can change a music cue or add a sound effect easily and quickly. The M&E is the music and effects part of a DME. These need to have all of the sounds in the film except the dialogue, walla and ADR. They have to be fully loaded, so that a foreign-language version can be done. The foreign-language distributors do not want to have to do any editing or inserting of missing sounds. Many foreign-language distributors will send the film back if there are any holes in the M&E sound track.

MASTER OUTPUT

You need to be monitoring the levels on your master output meter. You don't need to stare at it, but glance at it often so you know that your mix is consistent and within acceptable range. Most NLE and DAW systems have useful meters to watch.

When you are done with the mix, it's time to output the film's audio tracks. You need to select what formats to render and export. In a DAW, like Pro Tools, you could route all of the stems to an empty track. You would record arm the track and hit record. When it's done, you'll have a print-master. Another option is to export the audio by bouncing to disk. Make sure you have all the tracks you want to include turned on and that you have the entire timeline selected.

QUICK & DIRTY MIX TIPS

MISTAKE

I'm not making some Hollywood blockbuster, I just need my film to sound OK. So, I'm not spending much time with sound. I have a festival deadline looming.

If you don't have any money and the deadline for a festival or other competition is rapidly approaching, then you can go for a "quick and dirty" mix, hopefully more quick than dirty, and then work on a final mix after the deadline. Here are some basic steps to get your sound to a serviceable level:

1. Clean up, fill in and smooth out the dialogue as best you can.
2. When you use EQ, do not change how the actor normally sounds.
3. Replace or sweeten any critical production sound effects.
4. Add any essential Foley sounds, especially footsteps.
5. Add background ambiances, unless the music will cover it adequately.
6. Add whatever music will support the story.
7. Mix dialogue, effects and music all together.
8. Review your mix, looking for issues.
9. Marry the picture and sound together and check for sync.
10. Create the Digital Cinema Package (DCP) if needed.
11. Send it off or upload it.
12. Use the prize money to do a better mix.

DISTRIBUTION & EXHIBITION

Figure 17.4 Movie theater (by Jake Hills)

Once the film is completed, it's ready for an audience. There are many ways in which to distribute and exhibit a film. There are also different formats and technical requirements for the various outlets. Along with distribution there are also considerations for marketing a film. There is in-depth information on these subjects in the online Appendix called "Distribution and Exhibition."

GLOSSARY

10/100 or 10/1: This is film-set walkie-talkie code for "I'm going to the restroom."

180-degree rule: The 180-degree rule is about the spatial relationship between two or more characters or even one character and an object. It states that two characters facing each other should maintain the same left/right orientation to one another in terms of camera placement and in editing,

2-pop: One frame of a 1kHz tone placed two seconds before the first frame of picture.

3 to 1 ratio: If a sound source (talent) is three feet (one meter) from the microphone, then a second microphone should be three times that from the sound source, so about nine feet or three meters.

30-degree rule: The camera should move at least 30 degrees between successive shots of the same scene. Also, the lens should change by at least 20mm, say from a 25mm to a 50mm focal length. This helps prevent jump cuts and makes the editing smoother and easier.

ADR (Automated Dialogue Replacement): The re-recoding of dialogue in synchronization with the picture in order to have higher-quality sound. (See also **Looping**.)

apple boxes: Strong wooden boxes in sizes, full, half, quarter and pancake, that are used for sitting on, holding up equipment and many other creative uses.

back in: Term used when lunch or a break is over and work is about to begin.

background action: These are the actors working behind the principal actors.

beat sheet: Story beats are the progressive points of action that happen during the story.

blue screen: A background of blue that allows another image to be composited or keyed into the shot where the blue exists.

bokeh: It is the blurry area that is outside the clearly focused depth of field.

breakdown: This is a description of the actor needed for a role and what the character is like.

butterfly: A large metal frame that holds different types of fabric in order to alter lighting.

C-47:   A clothes pin used to hold gels to light frames or any other number of uses.

call sheet: A list of what is to be done and by whom on the set each day.

camera left/camera right: Camera left is on the left side of wherever the camera is facing and camera right is to the right side of the camera, as if you were standing behind the camera. This is usually opposite the talent's left and right.

character arc: Through the course of your story it is important that your main character experiences some sort of change that shows they have developed as a person. It is by going through conflict both internal and external that the character is changed.

check the take: This is a playback of a take to make sure that there are no issues.

CGI (computer-generated imagery):   These are the worlds, characters and effects that would be difficult to realize on set.

chiaroscuro lighting: This is side lighting coming from the side in a way that dramatically highlights the subject or actor.

chroma key: A key that uses a color such a blue or green in order to replace that color with a second image where the color exists in the frame.

codec: The term "codec" combines the words coder and decoder. A codec compresses data, like audio and video, for storage on media and then is used to decompress the data for playback and editing purposes.

color temperature: The color variation, measured in Kelvins, from orange to blue of light.

comped (comping):   This is when the better sections from different takes are combined onto one track.

compression: A compressor is used to control the dynamic range of the sound, which is the difference between the loudest sound and the softest sound.

conformed script: At the end of production a conformed script will be created, which will achieve its final stage once the editing is done. This script will reflect the actual film. All changes are in this version of the script.

continuity editing or cutting: Cuts are made in order to give the audience a seamless visual and auditory experience while being emotionally engaged in a story.

continuity error: This occurs when an action or object do not match between shots.

cookie (cucoloris):   A patterned or perforated material used to break up the light or to project a pattern on a wall or other surface.

covered or coverage: This is when all of the necessary angles have been shot for a scene.

craft services (crafties):   This is the truck of table that supplies food and snacks to the cast and crew. It also refers to the people that work at craft services.

crew call: The time of day shooting is scheduled to begin for the day. Your call time may vary depending on your job and time needed.

cross-cutting: This is a technique in which two different scenes or stories are occurring at the same time, but in different locations.

crossing: If you have to walk in front of the lens while the camera operator is looking in the viewfinder, you call out "Crossing," so they know their frame will be blocked momentarily as you pass by.

crossing the line: This is when the 180-degree rule is not obeyed, which can lead to a framing of characters that is confusing to the audience. For example, this commonly leads to two characters being on the same side of the frame instead of being on opposite sides while having a conversation.

cue: A signal to start an action or a piece of music in a score.

cut (hard cut):   An immediate transition where one shot is followed by another.

cutaway: The interruption of a sequence with a shot that is related to the sequence, but is not part of the action.

daylight, 5500K: The most common color temperature for daylight.

day player: An actor or crew person hired for just one day or perhaps a few days.

diegetic: This is something, such as music, that is within the story world and can be heard by the characters.

DCP (Digital Cinema Package):   A container format that is a set of files that work in conjunction with each other to provide the data for digital film exhibition.

dissolve: When the end of one shot overlaps with the start of the next one in order to create a gradual scene transition.

dolly: A cart that runs either on a track or on pneumatic wheels and provides smooth camera movements.

down conversion: This is the process of producing lower-resolution images from higher-resolution ones.

duvetyne: A black opaque fabric that is used on flags, butterflies and other types of light cutters.

dynamic range: It is the difference between the loudest sound and the softest sound.

editing: The process of selecting shots of raw footage and combining them so that each shot logically and coherently follows the previous one so as to tell a story.

EQ (equalization):   Equalization is used to boost (increase) or cut (decrease or attenuate) the volume level of selected frequencies.

establishing shot: A shot wide enough to show where all of the characters, action and the environment are located.

eye-line: When an actor is looking at something or someone off-screen, the next shot needs to be what the actor is looking at.

expander: It expands the dynamic range of an audio signal, which is the opposite of a compressor.

f-stop: A "stop" is one step in a scale of measured light passing through an aperture.

fade: A fade is essentially a visual effect that dissolves from picture to black or some other color or from black or some other color to picture. A fade is a visual way of showing a change in time.

first position (ones): The place where an actor is located at the start of a scene. They may then have a move to a second position and then other positions on the set.

flag: A duvetyne material covered frame used to control light.

flag on the play: If someone discovers a problem with a take after "new deal" or "moving on" have been called, then everyone stops and discusses the problem before actually moving as another take may be required.

flashback: It is a sequence or shot from the past that is interjected into the current scene.

flashforward: It is a sequence or shot within a scene which reveals events that will happen in the future.

focus pull or rack focus: This is a maneuver that changes the focus during a shot from one object or character to another.

four walling: Independently distributing a film by renting out theaters.

fringes: These are the dollar items on a paycheck that are not your actually pay. These are the taxes taken out, labor union dues paid, medical or medicare contributions, pensions, disability, social security, etc.

furnie blanket: This can be a furniture blanket or a sound blanket.

gain staging: Maintaining an optimum level for sound throughout the various processes which lead to a final mix.

genny: This is a familiar term for an electricity generator.

green-lighted: This is when a studio has approved for a production to start.

green screen: A background of green that allows another image to be composited or keyed into the shot where the green exists.

hand props: Any prop that an actor interacts with.

head room: Framing that allows a bit of space above the head of the actor.

honeywagon: A multiple toilet trailer.

hot points or points: Yelled by any person carrying equipment that might damage the human body.

hot set: Nothing on the set is to be touched or moved as filming will continue in the near future.

inverse square law: The formula is $1/d^2$. The intensity of a light is inversely proportional to the square of the distance (d). For example, if you light a subject from one meter away and then you move the light to two meters away, you will only have one-quarter of the light intensity.

iris or aperture: It is a set of blades located inside the lens that adjust the amount of light allowed onto the sensor. The larger the aperture or opening, the more light is hitting the sensor.

J-cut: It is the term used to describe an edit that starts with an audio cut first and then later the picture cut.

jam sync: To synchronize something, usually the camera to the sound recorder using time code.

jump cut: They occur when a section of a shot is removed from somewhere in the middle and then the two remaining clips are joined together.

kit rental: This is a payment to a crew member for use of their items in the production.

L-cut: This is the term used to describe an edit that starts with a picture cut first and then is followed later by an audio cut.

lead room: Framing that has extra room in front of an actor and less behind them.

lighting plan: This shows where lights are going to be placed for each given scene.

limiter: They are used to reduce the loudness peaks in the sound without having any effect on any other part of the sound by creating a wall to keep the strong peaks from clipping.

line items: These are the subcategories in a budget.

locked: This refers to a script or an edit that is no longer going to be changed.

look: this refers to the entire design of the film, including sets, costumes, hair, makeup, props, furnishings, vehicles, etc.

looping: This is the same as ADR in that it is the rerecording of dialogue in synchronization with picture.

LUTs: These lookup tables are a way to ensure that the images have the desired color, brightness and other visual attributes that were designed for a shot or scene.

magic hour (golden hour):   This is just before sunrise and just after sunset when there is still illumination.

marks: Colored tape, sand bags or T-markers are put on the ground to let the performers know where to stand and where to stop if they are moving. There will be a different color of tape for each actor. Markers also help the focus puller know where to focus the lens, the dolly grip where to start and stop the dolly, and the camera operator when and where to move the camera. "T" and "L" markers are commonly used for actors and "I" markers for the camera crew.

master: This is usually a wide shot of the entire scene which will include all of the scene's characters in the frame. This establishing shot is normally the first shot for a scene and then singles and two shots and over-the-shoulder shots follow.

match cut: Cutting on action between two shots that are similarly composed is particularly useful in maintaining the continuity of action and story.

montage: A montage is a way of editing related images together in a sequence without concern for continuity, except in the case of a timeline of beginning to end. A montage usually shows the condensing or passage of time.

MOS (mit-out sound or mit-out sprochen or motor-only shot or many other possibilities):   Whatever the original words may have been it means that the camera is rolling without sound being recorded. MOS is written on the slate so that the editors know there are no sound files for the take. The slate is held with the sticks closed.

MOW (make own way):   An actor or crew member will provide their own transportation to the set instead of being driven by the transport department.

negative space: The area in a frame that is of little visual interest.

new deal: Moving on to a new camera setup for that scene. Once the director and all involved are satisfied with the takes, then "new deal" will be called out by the assistant directors.

noise gate: Once the input sound drops below a selected threshold, the gate closes and mutes the output. This can be useful in reducing or removing a noisy background.

off-screen: This is when an actor is not in the camera frame but is elsewhere on set to provide an eye-line for the actors who are in frame and to deliver their own dialogue.

omnies: When a group of background actors are asked to make speech sounds like you would hear in a restaurant or a party.

oner: This is when a scene either is one long take or is edited to appear as one continuous take.

option: An agreement that allows a producer to temporarily hold the screenplay or story rights to a work while they seek funding.

outline: This is a step-by-step progression of the events of the story and the main character's attempt to reach their goal. There is no established format that is the standard.

pan: A "pan" is a horizontal camera movement.

per diem: A daily allowance for some of the costs you may incur while filming on location. Food, laundry, postage, cell-phone charges and other such expenses.

picture profile: This is a customizable selection of a "look" in a camera.

pits: The various surfaces that are used by Foley walkers to make footsteps.

POV (point of view):   A shot taken from the view of the character. Usually, it is what the character is looking at.

practicals: These are actual working props or set pieces, such as a desk lamp.

production track: This is the audio recorded on set.

Q: This is a scientific symbol for controlling the amplitude and shape of the EQ curve. High Q values use steeper curves, which limits the range of frequencies. Low Q values allows a wider range of frequencies and tend to sound more gentle when used subtly.

quality triangle: The concept that you can choose two of the three: good, cheap or fast.

recce (reconnaissance or reconnoiter): Visiting a location during preproduction in order to determine if the location will work, plan the shoot and address any issues discovered at the location.

reverb (reverberation): It is used to add reflections to sounds, which provides a spatial sense or feel.

room tone (ambience): This is the background sound on the production track without any voices.

rough cut: This is a roughly cut of the various scenes that still requires a finer cut.

runner: Runners transport whatever items the management team needs between the production office and set, and also pick up anything needed for the crew.

sand bag: A heavy cloth bag filled with sand and used to weigh down and secure equipment.

scriptment: This is basically the story with a little dialogue. It is called a scriptment because it combines elements of both a script and a treatment.

second sticks: If the slate clap is not seen in the frame or is missed all together, then the second assistant camera will call for second sticks.

second unit camera crew: This is a secondary crew that shoots inserts, cutaways, stunts and establishing shots.

sequence shot: A complete take that extends for an entire scene or sequence.

set props: Objects that are part of the set dressing.

shooting script: The shooting script is based on the original script; however, there are usually changes in the dialogue, locations, actions and other aspects of the story.

shot reverse shot: During a conversation between characters, the scene is shot with alternating over-the-shoulder shots or reverse shots.

sides: A few pages of or an entire scene from a script for each day of shooting.

singles: A medium or close-up shot framing just one character.

slate (clapper board): The slate is operated by the second assistant camera in order to identify a take and to be used to sync the sound with the corresponding camera take.

snoot: A cone shape placed in front of a light to focus the light and reduce spread.

sound design: This can be either the creation of sounds that do not exist in the real world or it can be the entire sound track's design with all elements designed to work together.

specs (specifications):   The technical requirements or attributes for audio and video.

spraying: This is called out when any substance is being sprayed on or near the set. The camera, lens, audio recorder, microphones and other gear need to be protected.

stems: These are the separate mixes for dialogue, ADR, walla, sound effects, ambiences, Foley and music, which are then used to create the final mix. In music they are separate musical groups.

stinger: an extension cord.

striking: This is a term that is derived from arc lights in which two rods are touched together in order to induce a bright arc between them. It is a term that is used anytime a light is being turned on.

sweetening: The process of adding sound effects to a production. The goal is to enhance the existing audio.

sync (synchronization):   When the picture and the sound are operating in unison.

tail slate/end slate: if a camera setup does not allow for a slate to be used at the beginning of a take, then it is used upside down or sideways at the end of the take.

tilt: This is a vertical movement of the camera.

timecode: This is an incremental signal that maintains a consistent speed for audio and video.

treatment: A treatment is a kind of novelized version of the screenplay prior to writing the screenplay, although it may be written after the screenplay. It is written in prose style and not in screenplay format.

tripod (sticks):   A three-legged support for holding a camera and allowing movement of the camera.

tungsten, 3200K: A common color temperature for interior lighting.

unit base or basecamp: This is where the makeup, costume, cast trailers, honeywagons are located, as well as crew parking and catering. It's the location to check in when arriving for work.

video village: This is an area for viewing a monitor of a camera feed.

wet down: spraying water on to the street, buildings and surrounding area to look like it has recently rained. The wet look is very attractive to shoot as it reflects lights and has a shine to it.

wipe   The transition from one shot to another with a noticeable pattern.

write-up   This is a written version of a story pitch.

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