

Foreword

I may be biased, given the amount of my career devoted to it, but composite imagery and its enabling technology, traveling matte, are at the core of the art of visual effects. In turn, visual effects are basic to the very philosophic foundation of our art form—motion pictures, which commenced by reveling in the ability to depict the reality of life, such as the simple sneeze of Fred Ott, but then quite quickly set about conjuring not merely what was but what could be—no matter how farfetched. (Just think, a scant six decades passed between Georges Méliès' *A Trip to the Moon* and Neil Armstrong actually landing on it.)

Film art (as with most art), being interpretive, requires editorializing—lots of editorializing. Include this, discard that, emphasize this, diminish something else. The montage and juxtaposition of images and ideas give voice and vision to a particular perspective and point of view. The process includes the elements that comprise a film's plot, the characters who inhabit that plot, the order of its scenes and shots, and ultimately, the elements that comprise each shot and every image. The great paradox of this art, or any, is that to conjure for you the truth that I desire you to comprehend, I must lie—sometimes outrageously. Thus, the amusing and insightful motto of the USC Film School's Visual Effects Club reads: "Better films through trickery and deceit."

Traveling matte, a magic carpet that can take you anywhere you can imagine, is actually part of the ancient, rich, and honorable heritage of "Natural Magick." We are, of course, the immediate and direct descendant of the "magic lantern." Méliès, recall, was a professional magician of some repute when he took up film. As long ago as 1558, Giambattista Della Porta, in his book *The First Book of Natural Magick: Wherein Are Searched Out the Causes of Things Which Produce Wonderful Effects*, compares and contrasts two sorts of magic: one is infamous, unhappy, foul and wicked, called sorcery (or "black"); "The other Magick is natural; which all excellent wise men do admit and embrace, and worship with great applause; neither is there anything more highly esteemed, or better thought of by men of learning." Della Porta teaches essentially the virtue of deceit and trickery in the pursuit of knowledge. Thus, the book that lurks behind this page is going to teach you to lie, to fudge, to shade, to misrepresent, to mislead, to misinform, and to beguile—all in the service of the truth you desire to convey.

To lie successfully you must convince, and to achieve that, you must plot and scheme meticulously, exhaustively, and then perform the artifice with exquisite deftness. All this Jeff Foster will teach you. Note particularly the section called "The Importance of Previsualization and Storyboarding." You will learn also that each element and layer of a successful composite "deceit" will incorporate the effect of lighting, or perhaps a gentle breeze, in the other elements. For example, a flashing neon sign in a background "plate" will be seen to be reflected on a foreground actor shot on the green screen stage. Such subtleties are time-consuming and difficult to achieve, but, while their effect is subliminal, it is compelling. Failure to comprehend and envision the eventual total composite image is perhaps the single greatest error in a green screen shoot. And this error is not confined to amateurs but committed by many professionals. Traveling matte imagery is employed for

a host of viable reasons mostly having to do with such goals as avoiding risk to life, excessive cost of sets or locales, or physical environments that are impractical to create other than as CGI elements. But resorting to green screen simply because one has not yet decided what the shot should look like is appallingly unprofessional. Recall W.C. Fields retort to a “rube” who asks, “Is this a game of chance?” to be told by Fields, “Not the way I play it, it isn’t, no.” Chance is so inherently endemic to film making that its planned diminution should be encouraged at every opportunity.

Orson Welles had the unique good fortune to have access to Linwood Dunn, A.S.C., his optical printer, and his formidable skills to help make *Citizen Kane* the classic it is. The fact that today computers are routinely employed in composite imagery does not mean that computers “do it.” Very sophisticated software (sometimes including the use of several different programs on a single shot and often including software derived from Petro Vlahos’ landmark photochemical process), operated by skilled and knowledgeable people, are required today, just as in the past it took skilled optical camera operators like Lin Dunn to do the same job—and remember, in those days, long before the computer, the optical printer was parallel processing at the speed of light. The real advantage we have today is that far more filmmakers can gain access to, and be empowered by, the kind of image manipulation that was the preserve of the very few at the time of *Citizen Kane*. The open question, of course, is, will that result in films of such brilliance? That, neither Jeff Foster nor I can answer, but, if the spark of such brilliance resides in you, then Jeff and this book could help ignite it.

—Jonathan Erland
President, Composite Components Company

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Introduction

For several years, a great deal of confusion has surrounded green screen and blue screen production. People tend to ask the same questions regarding lighting, background materials, shooting, and compositing techniques:

- When should I use green or blue screen?
- What kind of materials should I use?
- What can I use to light the green screen?
- What kind of cameras should I use?
- What should I use to composite my green screen footage?
- How do I fix bad green screen shots?

In addition to my many years of experience in blue screen and green screen production, I've done a great deal of research on the topic to dig into the history of compositing, testing products, and running through every kind of workflow and technique I could to answer these questions and more. I've interviewed some of the pioneers in this industry, such as Jonathan Erland, John Galt, and Petro Vlahos, the Academy Award-winning technology inventor who has perfected the traveling matte system several times over. I've worked with many industry pros who have shot major motion pictures, commercial television producers and editors, and indie filmmakers who are constantly pushing the edge of this technology. Adding that to input from many hardware and software manufacturers, I believe that I have developed the definitive handbook for all phases of green screen and blue screen production—from start to finish.

I sincerely hope that you will find this book not only a useful production guide but also a great resource to return to for years to come. I also want to invite you to contact me with any questions you may have and follow my ongoing blog from my website at www.PixelPainter.com.

Happy matting!

Who Should Read This Book

As the title implies, this book is intended for people who need an overview of all aspects of green screen production, as well as a quick-reference guide for students and working professionals getting started in the industry. This book was structured as a textbook, with quick references at the end of each chapter and a full appendix listing all the resources and manufacturers mentioned in the book. The following people will benefit the most from this book:

- Film and television students needing to learn the history of compositing as well as all phases of studio production and post-production techniques
- Experienced videographers and indie filmmakers needing to learn the concepts and process of creating better green screen shots and composites

- Editors who have been given poor green screen footage and don't know how to make it work
- Producers, directors, and production leads who need to understand the value of proper lighting, staging, setup, and production as to minimize the necessity of always relying on post-production to "fix" their sloppy shooting

For everyone, this book can serve as a go-to guide for quick reference. The chapters cross-reference other chapters where a subject is discussed in more detail and point you to online resources where you can learn more about a product or service that may help you in your own productions.

The practical application examples and projects in this book may reference certain software applications, but those packages aren't a requirement to gain knowledge of the workflows. You can implement the examples through virtually any complementary compositing software.

If you are teaching courses in green screen technology and are interested in obtaining course curriculum and a course syllabus structured around *The Green Screen Handbook*, please go to www.sybex.com/go/greenscreen and we will post information as it becomes available.

What You Will Learn

The Green Screen Handbook: Real-World Production Techniques covers the spectrum of green and blue screen production workflows of big studio productions, live TV broadcast, indie filmmakers, and small-budget student projects. Not only does the book cover practical applications of lighting, staging, planning, shooting, and compositing in most any scenario, but it emphasizes the history of compositing and gives an overview of how real-world productions are produced. This will give you the benefit of learning not only the "hows" but also the "whys" of the entire production process. This book should provide creative inspiration and serve as a reference for your productions for years to come.

What You Need

This book covers a lot of different production techniques, exposing you to high-end production studios, cameras, lights, and compositing hardware and software. I don't assume that you have access to these while reading the book; instead, you can use this book to learn about what is being done in professional environments in the industry. However, for most of the practical application examples and projects in this book, I use the Adobe Creative Suite or Apple Final Cut Pro on standard desktop hardware. The example project files are often included on the book's DVD but aren't always necessary to follow along with the chapter contents.

What Is Covered in This Book

The Green Screen Handbook: Real-World Production Techniques is divided into three parts: Exploring the Matting Process, Setting the Scene, and Compositing the Footage. The chapters are in a sequence that supports the resource materials covered in each section but aren't necessarily in any chronological or instructional order. The book can be

read from cover to cover, or select topics can be read independently for reference. There are plenty of cross-references in each chapter, should you need more detailed information regarding a process or technology. At the end of each chapter is a quick-reference list of the resources used.

Part I: Exploring the Matte Process

Chapter 1: Mattes and Compositing Defined Often misrepresented as chroma keying, the *matting* or *traveling matte* process uses a sophisticated series of elements that allow you to make more complex extractions and composites.

Chapter 2: Digital Matting Methods and Tools This chapter addresses the question, “Why should I use green screen over blue screen?” and what kinds of hardware/software compositors are available today.

Chapter 3: Basic Shooting Setups The foundational elements for shooting all green screen setups are the materials used and the lighting of the background and the foreground subjects, including how these elements are positioned in relation to each other.

Chapter 4: Basic Compositing Techniques This chapter introduces you to the various methods of keying and matting with both hardware and software keyers and compositors.

Chapter 5: Simple Setups on a Budget Don't have the budget for a dedicated green screen studio and professional lighting? This chapter will show you how to still get good results when shooting outdoors or how to build your own studio lights for around \$100.

Chapter 6: Green Screens in Live Broadcasts We've all watched the TV news and seen the large weather maps that the meteorologist stands in front of while delivering the evening's weather forecast. Now, learn how that's done in the real world.

Chapter 7: How the Pros Do It This chapter gives you a real-world look at studios and productions from HBO's *John Adams* miniseries to successful and industrious indie filmmakers' home-spun productions.

Part II: Setting the Scene

Chapter 8: Choosing the Right Matting Process for Your Project This chapter is about understanding the tools and processes before you plan your budget, if possible. Knowing how you'll achieve the results the project calls for will dictate the path you take and what that workflow will entail.

Chapter 9: Proper Lighting Techniques Nothing wastes more time than shooting a great scene with the wrong lighting for the intended composition. This chapter shows you the proper techniques for lighting your background screen and the subjects.

Chapter 10: Matching Your Subjects to the Background This chapter introduces some of the basic elements to look out for, including matching lighting angles, compositing tips, and motion tracking.

Chapter 11: Digital Cameras and Camcorders This chapter covers some of the basics of how digital cameras and camcorders work, and what to watch out for when selecting a camera to use for your green screen work.

Chapter 12: Storyboarding and Directing Your Talent The better you can communicate your production ideas to your talent and crew, the more successful your project will be, both in front of the green screen and in the post-production process.

Chapter 13: Interacting with the Background and Objects With the proper lighting, staging, and prop preparation, you can put your subject into nearly any virtual world or scene, complete with props and other objects the subjects may come in contact with.

Part III: Compositing the Footage

Chapter 14: Getting a Great Matte Getting a great matte depends on many production factors: lighting setup, screen background, camera and lens, subject staging, shadows and reflections, and more.

Chapter 15: Color Balancing the Subject and Background It's not always possible to perfectly match the color temperature of your lighting on the green screen stage and on your background plate, so this chapter gives you post-production solutions for color corrections and matching plates.

Chapter 16: Fixing Problem Green Screen Shots The most common problems with poor green screen or blue screen shots result from improper lighting, poor positioning, and the use of backgrounds that are the wrong color. This chapter shows you how to work around most any poorly shot scenario.

Chapter 17: Working with Virtual Sets Virtual sets are more commonplace in the commercial television and corporate video production landscape, and this chapter shows you how they're created and implemented with green screen shots and live broadcasts.

Chapter 18: Motion Tracking and Matchmoving This chapter will show you some examples of the hardware used for various motion-control techniques and tracking tips for software trackers, plus a few secrets for faking it visually.

Chapter 19: Complex Composites Sometimes it's necessary to extract your subject from between two surfaces or have them interact with the surfaces in some manner, retaining the shadows on the surfaces. This chapter will show you some examples of production techniques.

Appendix A The appendix is a comprehensive compilation of all the resources used in this book, listed alphabetically, including information resources, manufacturers, studios, and contributors.

The companion DVD is home to all the demo files, samples, and bonus resources mentioned in the book. It's organized to provide you with video and image examples, project files, and source materials that will help you follow along with the text. The DVD is divided into folders for each chapter. See Appendix B for more details on the contents and how to access them.

How to Contact the Author

I welcome feedback from you about this book or about books and/or videos you'd like to see from me in the future. Feel free to contact me at my website at www.PixelPainter.com and check out the ongoing tips, tricks, and reviews on my blog.

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