

director 8

lingo

shockwave

```
on getBehaviorDescription me
return \
  "ROLLOVER MEMBER CHANGE"
  "Change the sprites's c
  PARAMETERS:" & RETU
  * Rollover cast me
end getBehaviorDescr
Change the sprites's cast member when the mouse
PARAMETERS:" & RETURN & \
  * Rollover cast member
end getBehaviorDescription
```

phil gross jason roberts

director8

demystified

The Official Guide to
Director 8 Shockwave Internet Studio



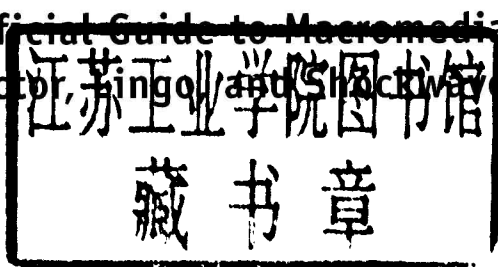
Includes Win/Mac CD-ROM

DIRECTOR 8



DEMYSTIFIED

The Official Guide to Macromedia
Director 8, Director 8.5, Director 8.5 Shockwave



PHIL GROSS & JASON ROBERTS



Director 8 Demystified

The Official Guide to Macromedia Director, Lingo, and Shockwave

Phil Gross & Jason Roberts



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Printed and bound in the United States of America

for
PATRICIA LOUISE
ma jolie

and

MARTHA KUHL
my constant companion

MEL AND SHEP HOUGHTON
ALEX GROSS
JOHN AND LYN KUHL
who made us who we are

This book is dedicated to the memory of
KEN NOBEL

ACKNOWLEDGMENTS

No project of this magnitude ever gets done by one or two people, even if we are the ones who get the credit. From the people who help us get through our daily lives and tolerate us as we struggle along, to the people who encourage us and coax us to let go of the next chapter, to those who provide us with all of the necessary information, this book has been the collaboration of some very talented and very special people.

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INTRODUCTION



LIFE BEING VERY SHORT, AND THE QUIET HOURS OF IT FEW,
we ought to waste none of them in reading valueless books.

—John Ruskin (1819–1900)

ADVENTURES ON THE LEARNING CURVE

What you have in your hands is a book about Director 8, the authoring software created and marketed by Macromedia that enables you to develop multimedia and Web-based productions. The CD on the inside back cover is packed with learning materials, samples, and resources for creativity. Together, the book and CD make up a multimedia approach to (ta da!) multimedia.



This is a cross-platform book, appropriate for both the Windows and Macintosh (Mac OS) operating systems.

Director is marketed in versions for the Windows and Macintosh (Mac OS) operating systems. The two products are remarkably similar, with the commands, menus, and underlying principles practically identical for both platforms. Although the screenshots for this book were taken on a Windows system, all the information applies to Windows and Mac OS alike. In the few instances where the platforms diverge, separate instructions are given for each.

In the pages to come, we'll try to live up to the title of *Director 8 Demystified*. It's more than a nifty alliteration; it's a summation of the goals of this project. Both the interface and the concepts behind Director can be pretty intimidating, and all the hype about multimedia in general seems to breed a lot of confusion and muddled expectations.

Our task is to slice through the abstractions and buzzwords and get down to business. Director may seem like a monolithic development platform, but ultimately it's just a tool, one that works as well in your hands as in anyone's.

What's new in this edition?

If you're familiar with previous editions of this book, you should know that this edition of *Demystified* continues to keep pace with the changes to Director. The appendices alone, which include a *complete* lexicon of Director commands, functions, and properties, contain nearly 100 new elements, including some undocumented Lingo for you to play with.

This volume consists of three books plus a reference section:

- **Book One: *Director Basics*** focuses on mastery of the mechanics of Director, leading you to a working familiarity with all of Director's features and an understanding of how to build productions complete with animation, sound effects, and a degree of interactivity. If you've never used Director, you'll find this section invaluable. If you're an old Director hand, you'll still find it a worthwhile refresher: The interface in Director 8 departs significantly from that of earlier versions; you may find yourself not knowing your way around.
- **Book Two: *Digging Deeper*** eases you over the next hill on the learning curve: a firm understanding of Lingo, Director's powerful scripting language. Everything you need to gain proficiency in Lingo is here, from basic tutorials to advanced scripting exercises. And if you've never worked with a computer language before, you'll probably appreciate the in-depth discussion of programming concepts.
- **Book Three: *Special Topics*** takes you deeper into Director by expanding on individual topics. Here you will find in-depth discussions of some specialized Lingo elements, such as lists, and the essentials of Director's built-in error-tracking and resolution capabilities, to help you debug your productions. You'll also find chapters to help you integrate sound and video into your productions. Information on Xtras will help you expand on Director's capabilities, and the final chapter gives you hints on how to avoid some common problems that plague productions, especially larger ones.
- The **Reference** section provides an assortment of useful appendices. Appendix C, "A Lingo Lexicon," is a book in itself. In it, Lingo terms are defined by type and sorted alphabetically for easy access. All Director commands, functions, and properties are described and shown with the appropriate syntax. Examples are given for each element to help you integrate the elements into your productions. Notes are provided when an element behaves differently than you might expect, and suggestions are made for other elements that might better serve your purpose.

HOW TO USE THIS BOOK AND CD

The information and exercises in this book should take you from a raw beginner to someone able to author interactive CDs, Web pages, and other professional-level applications. The book is designed to have three lives: as a tutorial (with multiple exercises), as an inspiration, and as a reference (hence, the substantial appendices).

You could start with Chapter 1 and work your way through to Chapter 22, dipping into the CD only when directed to do so. But why opt for the boring linear approach to learning a nonlinear medium? Instead, we recommend taking the following steps:

- **Play.** Ignore the text at first. Just fire up the CD and play the arcade-style game *Simple Invaders*. Or experience the exploration-friendly interface of the *Universal Import Demo*. Each of the projects profiled were created with Director, so you'll be getting a feel for the software's creative potential—while having fun.
- **Peruse.** Skim the chapters, and don't bother with the exercises or even with absorbing the jargon. You'll get used to seeing the workings of Director in many manifestations, and you'll get a clearer picture of the conceptual terrain ahead.
- **Plow Through.** Start at the beginning and work through the exercises chapter by chapter. As you progress, you may find that new levels of knowledge give you fresh ideas for real-world projects. You might want to have a notebook handy to write down your bright ideas, so you don't get sidetracked too long by the glittering potential unfolding before you.
- **Rebind.** When you have read the book through, take the book to your local copy shop and ask them to cut off the spine and rebind the book into two sections (or drill holes for a loose-leaf binder). You can then have the appendices easily accessible and still have the text of the book for reference. My local copy shops tell me this should cost only about \$5, and it will make the "Lingo Lexicon" a lot easier to use.

What the symbols mean

Like most computer books nowadays, *Director 8 Demystified* employs a bit of custom iconography to guide the roving eye.



This indicates a helpful **suggestion**—not something that you necessarily have to pay attention to, but a bit of advice. It pertains not only to Director, but to other software as well.



This is the **fast forward** symbol, indicating a useful shortcut, such as a key-stroke alternative to a menu command.



This is the **key concept** icon, and it means Pay Attention: This Is Important Stuff to Remember.



The check mark is a **reminder**, meant to head off possible problems. These sections usually point out common misconceptions or oversights, not potentially serious errors.



The **see elsewhere** arrow points you to other sections in the book and CD. It often indicates where a topic is discussed more fully or where a file illustrating a principle can be found.



The **explanation** icon indicates a curiosity-quenching passage—not a tip or a warning, but a bit of background.



The **try** icon denotes an optional activity that further illustrates a feature or principle.



The **new feature** icon indicates that the action or function being discussed is either new or significantly revised in version 8. As some of the differences are substantial, those of you familiar with earlier versions (up to 6.0) should make a point of reading these sections.



The **Windows** and **Mac OS** icons call attention to information specific to each of those platforms.



The **yikes!** symbol pops up only when real caution is necessary—when a mis-step or oversight could lead to data loss, massive time wasting, legal problems, or other hassles. Ignore these sections at your peril.

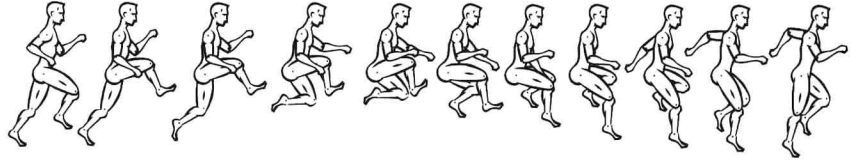


Most of the icons draw your eye to statements in the margin of the pages, but others point to **sidebars** like the one you're reading right now. The format distinction is primarily one of length.

In addition to the icons, *Director 8 Demystified* has a cast of characters ... well, *one* character, to be exact.

MEET SWIFTY:

This energetic fellow is a character adapted from the pioneering photographs of Eadweard Muybridge.



This character is named **Swiftly**, an apt appellation for someone as mobile and agile as he is. Swiftly is the star of most of the tutorials, and we mention his name not to be cutesy, but because we'll be referring to him directly in the pages to come, saying "place Swiftly on the Stage," rather than "place the animated sequence of the little walking man on the Stage."

Swiftly is a collection of symbols of a human figure (walking, running, jumping, and so on) based on the historical work of Eadweard Muybridge (that's really how he spelled it). Muybridge was the nineteenth-century artist and inventor who first used a sequence of cameras to capture authentic motion, thus paving the way for the motion picture.

The CD component

Many of the contributors to the CD-ROM have not only created some pretty amazing stuff; they've graciously submitted their work in nonprotected form. That means you can muck about in their files and see not only what they did, but exactly how they went about doing it.



Although the contributors to the Gallery section of the CD have provided their projects in open form, they haven't given up the copyrights to their work. That means that you can browse through their files, learn from them, and copy them onto your hard drive—but please don't plunder them for your own projects.

The demystified.com Web site

As version 8 amply demonstrates, Director has become much more than an animation application. It's now a complete Web/Internet development environment, able to integrate media spread across a worldwide network as easily

as it can coordinate files drawn from your hard drive. That's why we're maintaining a dedicated Web site at <http://www.demystified.com>.

This site serves a number of purposes:

- It's an online location for *networked media*. In the latter part of this book, you'll find exercises that download and manipulate media stored here. You can, of course, perform such snazzy Web tricks anywhere, but using the media provided simplifies the learning process for you.
- It's a *bulletin board* for late-breaking information on Macromedia Director (bug fixes, new versions, and so on) and its related technologies.
- It's a *forum* for corrections, clarifications, and enhancements to this book. If you're puzzled by something on these pages, check out the site: We may have something that clears up the matter. If we don't, drop us a line and let us know; you'll find contact information at the [demystified.com](http://www.demystified.com) Web site.

Comments? Suggestions?

If you have comments, questions, or reports of inconsistencies, or even suggestions of topics you would like to see placed on the Web site or in the next version of the book, you can contact me (Phil Gross) by e-mail. I can't guarantee an instantaneous response (I have a very busy vacation schedule that puts me out of the country and out of touch at times), but I'll do my best. You can contact me at pgross@jps.net.

PRELUDE



THE DIRECTOR UNIVERSE

BEFORE YOU START GETTING UP TO YOUR ELBOWS IN TERMS AND techniques, let's take a few pages to put Director in perspective. In this prelude, we'll together trace the development of the software from modest animation tool to driving engine of the multimedia industry. We'll look at the features Director has added over the years and bluntly assess its strengths and weaknesses. Finally, we'll preview some of the many changes and new features that debuted with the latest version of Director.


DIRECTOR DEFINED

Macromedia Director belongs to a specialized genre: software used to create other software. As such, it's often referred to as an *authoring tool* or a *development platform*. Armed with only a copy of Director and your imagination, it's possible to create a fully self-contained, self-running program—and since Director is available in both Mac OS and Windows versions, it's relatively easy to produce work that runs on both Macintosh computers and PCs.

Since Director can incorporate sound as well as still and moving images, these productions are usually called *multimedia*. Furthermore, since they can include a high degree of user feedback, the double buzzword *interactive multimedia* is often applied. But interactivity isn't a given, and the term *multimedia* doesn't always apply; you could create a noninteractive work consisting of a single medium (such as a slide show of photographs), and Director would accommodate you nicely—so don't get hung up on buzzwords.

In the multimedia marketplace, Director has long been the standard authoring tool, used not just for developing CDs, but for creating special effects and

for adding a whole new dimension to otherwise static pages on the World Wide Web. Some multimedia tools are useful only for disk-based production, but Macromedia has been aggressively retooling and upgrading Director to meet the growing need for Internet/intranet multimedia. As you'll discover for yourself, Director 8 has enough online features to make it an essential tool for Webmasters everywhere.



An authoring platform can be pretty nifty, but the real software powerhouses are *computer languages* (such as C++, Pascal, and Java). Both can create free-standing software, but a language can more fully employ the raw number-crunching power of the computer. Still, the border between platforms and languages is starting to blur, especially in the case of Director, which includes Lingo, a built-in command syntax that, over the years, has evolved to qualify as a language of its own.

What's so special about Director?

Director may have a pioneering history as a multimedia tool, but history doesn't count for much with today's breakneck pace of software development and marketing. Plenty of competing authoring platforms have risen up to challenge it—but frankly, most of them, such as SuperCard, Apple Media Toolkit, and Quark/mFactory's mTropolis, haven't made much of a dent in Director's dominance. So why does Director remain king of the heap?

Superior animation

Director produces graphic motion with the same techniques used by conventional animators: It places elements on individual layers and moves them through the scene one frame at a time. This can mean a laborious development process, but the end results are objects that move (and interact) in a believable fashion. Some authoring platforms don't use a frame-by-frame metaphor, opting instead for icons of specific screens (connected by linkages). That provides a faster way of developing an interactive infrastructure, but the finer elements of action are usually harder to control. With Director 8, the degree of control is even further refined, with new features that let you precisely synchronize sound and motion, twist and turn images, and include new image types. When it comes to setting images in motion, Director offers a clear advantage.

Royalty-free distribution

All files created with Director can be freely sold and distributed, without having to pay Macromedia a royalty for the privilege. That may be something you take for granted—after all, you don't pay Microsoft a royalty for a novel written with Microsoft Word—but some development platforms actually have licensing provisos that stipulate that you have to pay in order to market anything created with that product. Macromedia doesn't demand a piece of the action with Director-based works, but it does stipulate that a special "Made with Macromedia" logo be displayed on your work's packaging (the logo is included, in file form, on the CD that accompanies this book).

THE LABEL TO LOOK FOR:

Rather than demanding a royalty on all products created with Director, Macromedia asks that this logo be incorporated into the product packaging.



Cross-system portability

As you probably know, not all software runs on all computers. There are different operating systems, and most software is designed to be compatible with just one of them. Some software products are "ported" from one system to another (usually Macintosh to Windows, or vice versa), but these new versions tend to be complete ground-up rewrites that bear only a surface resemblance to the original version. Such porting can be a very costly process.



Throughout this book, we'll use *Mac OS* to refer to the operating system used by both Apple Macintosh models and third-party clones (such as Motorola and Power Computing), and *Windows* to refer to Windows 95, Windows 98, Windows 2000, and Windows NT (as opposed to Windows CE or Windows 3.1), used by just about everyone else. Director no longer supports Window versions prior to Windows 95 or Macintosh systems prior to version 8.1.

When multimedia started to come into its own as an industry, developers were in a bit of a quandary. The Macintosh offered superior graphics capabilities, so it was the operating system of choice for designers and animators. But as target

audiences go, the Macintosh-owning population is far outnumbered by those with Windows-compatible machines. Was it possible to combine the best of both worlds, by building multimedia on the Macintosh and then translating it into Windows-ready files?

Director made this possible, and with a minimum of headaches and hassles. There are two versions of Director (one for Mac OS and one for Windows), and files created by one can be opened directly by the other and saved in a stand-alone form for either platform. The conversion process isn't completely seamless, but it's pretty close, and it sure beats rewriting the project from scratch. And when you store both versions on the same CD, you can market a single disk that plays on both Windows and Mac OS machines.

How can Director provide such a smooth transition between the disparate worlds of these operating systems? The answer lies in the structure of its code, which includes an *idealized machine layer* (IML). The IML is a sort of toolbox that maximizes portability by keeping the multimedia data isolated from the system-specific data (the Java language works on a similar principle, as does HTML). In its anticipation of the conversion process, the IML makes it possible to offer compatibility not only with Windows, but with a multitude of operating systems—including ones that don't yet exist. Apple and Microsoft are hard at work developing the next generation of their operating systems, and the IML approach makes it likely that no matter what new technical twists ensue, Director won't be left in the dust of obsolescence. So you can see why learning Director is worthwhile, despite the steep learning curve. It may not be the dominant development tool forever, but Director expertise isn't likely to be a dead-end street any time soon.

Shockwave: Director's Net result



For more information about Shockwave, see Chapters 5, 14, and 15.

Here's where Director's adaptability starts to get truly exciting: Director movies can now be ported to the platform where the *real* action is: the Internet, or more specifically, to the multimedia-hungry World Wide Web. With the advent of Shockwave technology, a Director movie can be seamlessly integrated into a Web page; anyone with a properly configured Web browser can interact with the movie while viewing the page. Converting Director movies with Shockwave is fast and easy and requires only a splash of specialized knowledge.

In the online interactivity field, Shockwave's primary competition is Sun Microsystems' Java scripting language. But Java requires multimedia to be remade from scratch (and has a steep learning curve), whereas Shockwave is essentially another porting process for Director. Most Director productions can be saved as Shockwave files, with only the limitations built into the

browsers and the Internet to consider. Shockwave is probably the quickest way to turn multimedia into Internet content, and that's generating a lot of excitement and experimentation.

The X files: Extensibility and external control

If you want to improve your hardware's performance, it's pretty easy to make incremental advances. You can just plug in a peripheral or add new memory or even speed up the CPU with an upgrade card. Usually, it's only after several years that the itch arises to chuck it all and start afresh.

Computer software tends to be a different story, however. Capabilities aren't added incrementally: They're clustered together in a new incarnation of the product (which instantly renders the old one obsolete). You can't take some of the neat new features of ThingMaker 7.5 and add them to your copy of ThingMaker 7.0—you have to throw out 7.0 to make way for 7.5.

Director isn't immune to these numbered-version incarnations, but it does offer the ability to employ special classes of software, called *Xtras*. Xtras are self-contained subapplications written specifically to extend or improve upon Director's features. Some are created by Macromedia, but many others are produced by third-party programmers. Once installed on your system, Xtras show up in Director's user interface, and working with them simply becomes part of working in Director. Using Xtras is kind of like adding extra blades to your Swiss Army Knife: Each one has a special purpose and can be whipped out when you need it.



For more information
about Xtras, see
Chapter 21:
Extracurricular
Lingo: Xtras.

It's in the script: The growth of Lingo

Why is English the dominant language of international commerce? Not because it's easy to learn (or even spell), but because of its massive and growing vocabulary. It's the same with Lingo: Director's unique scripting language may have started out as a close cousin to HyperTalk and SmallTalk, but it's definitely come into its own over the years.

Director 8 puts the finishing touches on the process begun in Director 7 of converting to a new syntax (called dot syntax) for Lingo. This new syntax allows you to create programming scripts using the same object-oriented programming styles used by hard-core programming languages such as C++ and Java. The new dot syntax doesn't replace the older Lingo syntax; the two co-exist, and you can use either one or a combination of both—whatever feels more comfortable to you.