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About the Authors

Given the fact that Ethan is an archaeologist by training, people often ask “what the heck is an archaeologist doing writing books about interactive design?” Well, to understand this, you need to understand that he has two great loves in his academic life. The first, which represents a culmination of years of archaeological experience, is household craft production in Predynastic Egypt. He has worked at both Nabta Playa (an extremely large Neolithic habitation site in the Egyptian Western Desert) and Hierakonpolis, where he has excavated such cool things as prehistoric wells, clay mines, households, animal enclosures, pottery kilns, and cemeteries.

The second, and here comes the answer to the big question, is the place of interactive media in archaeology. Whether from the standpoint of an educational tool, a method for scholarly publication, or simply an issue deserving academic discussion, Ethan has dedicated himself to expanding the dialog surrounding the use of interactive media in archaeology. He is particularly interested in the role that interactive entertainment plays in the public perception of archaeology—a topic on which he has published and delivered papers targeted to both professional archaeologists and professional game designers. Not content to simply comment on the situation, Ethan practices what he preaches: active involvement on the part of academics in the interactive entertainment industry.

He is currently a visiting faculty member in the Department of Telecommunications at Indiana University, where he teaches classes in interactive new-media design, the social aspect of new information and communication technologies, and interactive entertainment. He has written several books including Dreamweaver 4/Fireworks 4 Visual Jump-Start, Dreamweaver MX: Design and Technique, and Flash MX Savvy (co-authored with Norbert Herber). His next book, Dreamweaver MX 2004: Solutions, will be published by Sybex in January 2004.

Ethan’s digital alter ego can be found hanging out at www.captainprimate.com.
Norbert Herber is an audio and interactivity architect. His interests are focused on the use of audio in interactive environments, nonlinear music composition, and the effects of the sound+picture relationship in both linear and nonlinear media. When he’s not writing books, you can find him composing music and sound effects for websites, CD-ROMs, generative audio applications, and live performance. When he’s not doing those things, he’s probably out walking his dog.

Norbert is a Visiting Lecturer at Indiana University, Bloomington, where he teaches classes in the areas of multimedia development and scripting, interactive design, and digital audio. He co-authored *Flash MX Savvy* (Sybex, 2002) with Ethan Watrall.

For information on Norbert’s current and past projects, visit [www.x-tet.com](http://www.x-tet.com).
Dedication

To my son Sam. Who would have thought that something that poops so much and robs his mother and myself of so much sleep would bring me such incredible joy?

—ECW

To my family.

—NFH
Acknowledgments

As with any book, especially one of this length, there are quite a number of people who deserve thanks for their help in bringing this project to fruition. First and foremost, I must extend my thanks to my friend, coauthor, and partner in many digital shenanigans: Norb Herber. A book covering an application whose complexity actually extends over two versions in which two authors share writing duties is an undertaking rife with possibilities for disaster. Instead, we managed to create a book with some serious neckwear punch. Here’s to many more fruitful collaborations!

To all those who graciously gave us permission to use their work as Inspirational Design Models or in the Color Gallery (there are way too many folks to list by name—they know who they are), I offer my profound thanks. I especially want to thank Paul Corrigan at Oddity Studios whose contributions and help were above and beyond the call of duty. On a more personal level, as always I want to express my profound love and gratitude to Jenn. She graciously put up with my lunacy and long hours on the computer during the year that this book was being written, rewritten, revised, re-revised, and so on, and so on. Thanks, as always, to my daughter Taylor. Thanks also to both Mom and Dad for their support during this project. Finally, a special thank you (and a good tummy rub) to my dog, Oscar; nothing brings you down to earth like a pooch who wants nothing more in life than to play. Lastly, my sincere apologies to anyone whom I managed to forget. Thanks, everybody!

Ethan Watrall

Not only was this book a team effort by two authors, each of us had our own “support staff” to help us through the writing process. Thanks to Mom and Dad, Genevieve, Lyla, Susan, Hasan, and, most of all, my dearest Jenny. I think it’s time for a vacation! Cheers to those who shared their work as Inspirational Design Models and/or in the color gallery, especially Paul D. Miller, a.k.a. DJ Spooky that Subliminal Kid; Éric Gagnon of Sarbakan; Justin Mysza from NPFC; Harry Gottlieb and Amanda Lannert from Jellyvision; Molly Z, Pall Thayer, Rick Goldsworthy, and Steve Ragatz at Academic Edge; and Scott McCloud. Your work is a constant reminder of why I fell in love with Flash. Thanks also to my colleagues in Chicago—Tim Arroyo and Bernie
Mack at IADT—for their contributions to this book, and Brian Hrastar at Optimus for sharing his video footage. I’d like to offer a huge thanks to my partner in crime, Ethan Watrall. We made it! Now let’s get some degrees. Thanks for reminding me not to sweat the little stuff. Finally, thank you for reading this!

Norbert Herber

Both of us want to acknowledge lots of other people who helped make this book a reality. Many thanks go to our agent, David Fugate of Waterside Productions, Inc. As always, we are forever in his debt for all the work he put in and for the advice he provided during this project. At Sybex, Jim Compton, Mae Lum, Dan Schiff, Dan Mummert, Laura Ryan, and Maureen Forys deserve praise for all their help and hard work. Kudos to technical editors Scott Balay and Tai U for their many insights. Without the help of Mariann Barsolo, our acquisitions editor at Sybex, this project might well have exploded very early. She was always there with great advice, tons of help, and an incredibly understanding attitude, especially during the really nutty periods. We also want to extend our profound gratitude to those individuals who helped with the software and hardware that either appears on the CD or was used while we were writing the book: Karina Bessoudo (Toon Boom Studios); William Reeb (Wacom); Philip Staiger (Eovia); Alisa Popolizio, Silke Fleischer, and Patrick Wallace (eHelp); Carrie Cochrane (Electric Rain); Eric Ott (WebAssist); and Zac Wheatcroft (BIAS).
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In the summer of 1996, a little-known company named FutureWave shipped a small program called FutureSplash Animator, a relatively simple application that was designed to create linear, vector-based animations. After its release, the application attracted considerable attention when it was used in the design of both Microsoft’s Web version of MSN and Disney’s subscription-based Disney Daily Blast. In November 1996, Macromedia approached FutureWave about the possibility of working together. For FutureWave, which was still a tiny company of six employees, this was an incredible opportunity. So, in December 1996, FutureWave sold the technology to Macromedia, who released Flash 1 in early 1997. The rest, as they say, is history.

Fast-forward to 2004. Seven versions later, Macromedia has split Flash into two programs: Flash MX 2004 and Flash MX Professional 2004.

Two Versions of Flash?
This release of Flash is truly unique in that for the first time, users can choose between two versions of the application: Flash MX 2004 or Flash MX Professional 2004. Flash is arguably one of the most popular interactive authoring applications. As such, Flash has become a different kind of application to different kinds of developers.

To support the myriad needs of their users, Macromedia elected to separate the application into two versions. Each has been designed in ways that Macromedia believes serves the interests of an incredibly diverse user base. Flash MX 2004 represents the next step for Flash as an authoring tool and offers enhanced features to streamline many of the most important tasks performed in the application. Flash MX Professional 2004 is the new release on steroids. It includes all the enhancements of the regular version plus additional features that support project-based Flash development, server communication technologies, enhanced streaming-media support, improved video compression, and PowerPoint-style authoring; all in an environment that is conducive to online application development.

The professional version provides more tools for big-picture development and has a few advantages to offer over the regular version. You will be able to do the same kinds of...
work with one that you do with the other. The main difference is that with the Pro version, some tasks can be made easier or more efficient. It offers tools that will be welcome to developers of large-scale Flash projects and applications. If your work requires exchanges of data between Flash and a server or you need to code an application from the ground up, the Pro version is for you. If you like Flash as is and are interested in interface enhancements and functionality improvements, you'll probably feel more comfortable with the regular version.

With both versions of Flash MX 2004, you can create not only unbelievably cool-looking animations, but also incredibly complex interactive experiences that feature rich media and the integration of dynamic, database-driven applications.

Not only are today’s Web-based Flash creations a quantum leap beyond anything that could have been conceived previously for online media, but they are pushing the boundaries of interactive digital media. Although Flash was originally intended for the Web, its sheer popularity (and phenomenal power) has taken it far beyond the online domain. These days, you can see the integration of Flash as an authoring tool in mobile devices, broadcast media, and console games.

To really understand the penetration of Flash into the world of interactive digital media, you need only look at the number of people who have downloaded the Flash Player over the years: more than 436 million. Yup, that’s right, nearly half a billion! Need we say more?

About This Book
This book was written with a lot of love, blood, sweat, and tears…seriously. We don’t want to give you the impression that we are “tortured authors,” holed up in a dingy loft pouring over manuscripts and surrounded by bottles of wine and take-out containers. However, we did put a lot of thought and planning into the writing process. Our objective was to create the most intuitive, learning-focused Flash reference imaginable.

Unlike many Flash books, this one was written not only to explain how to work with Flash but why. Knowing why you do things is a crucial step in the learning process because it gives you the means to creatively apply your newfound skills to original ideas of your own. The techniques outlined in this book will give you the basic concepts to create an
enormous variety of things in Flash. Additionally, all techniques are presented with the assumption that this is just the beginning. Our hope is that you will use these lessons as a point of departure for your own creative ideas. As educators, we approached this book in much the same way we would approach a class.

This book will be equally effective for Macintosh and Windows users. As a writing team, we are split: Norbert is “the Mac guy” and Ethan “the Windows guy.” As much as possible, we present a balanced approach so that regardless of your platform, this book will fit your specific needs and illustrate each technique clearly.

Who Needs This Book?

Every man, woman, and child on the planet needs this book!

But seriously, it’s impossible to write a book that is all things to all people. That said, we did our best to write a book that is many things to a lot of different people. We carefully selected the topics and crafted the way we discussed them so that many different types of people with varying levels of expertise and different goals could pick up this book and find it useful. Granted, if worse comes to worst, this book is large enough to to prop up the wobbly leg on your bed or serve as a pretty decent doorstop.

The range of people who will get the most out of this book will vary from the savvy computer user who “gets” Flash but has never actually worked with the program to someone who is thoroughly grounded in the basics of Flash and wants to move on to intermediate and moderately advanced skills.

We feel strongly that although this book isn’t really written for people who already have advanced Flash skills, we certainly don’t want to discourage any interested individual from using the book—quite the contrary! It covers topics that even the most advanced user might not be familiar with, including several chapters each on ActionScript, working with audio, and integration with other software. However, we feel that those more-experienced Flash users might not find in this book exactly what they are looking for, and would therefore be disappointed—something we definitely don’t want.

Truly advanced users who are looking to explore the ActionScript stratosphere, or investigate the possibilities of integrating Flash with server-side scripting and database
technologies will not find what they’re looking for. With this book, focusing on core topics was particularly important because Flash is now two different programs with different features. The topics we had to exclude are all pretty high-end, and we’re sure that nearly all readers will find everything they might want to do with Flash covered here. Still, we don’t want anyone looking for one of these topics to buy the book and be disappointed.

So, here is an abbreviated list of major topics that we didn’t cover:

• Creating form-based applications with Screens (Flash MX Professional 2004 feature)
• Using Unicode and the Strings panel to publish in multiple languages
• Data Binding and Web Services
• Writing Programs in ActionScript 2.0

Having said this, anyone eager to take part in the Flash revolution and become a dyed-in-the-wool “Flasher” should read this book! That includes any student wanting to put their class project on the Web, any animator or artist wanting to go digital with their creations, anyone who is frustrated by the inherent design limitations of HTML, anyone enamored with the “wow” factor of vector animation and interactivity—in short, anyone who is excited about the endless possibilities and phenomenal power of Flash but a little befuddled about where to start or a bit unsure of their skills. If you’re one of these folks, this book is for you!

How This Book Is Organized

There is a natural progression of skills involved in working with Flash MX 2004 and Flash MX Professional 2004. The chapter-by-chapter structure of this book is designed to emulate this progression. Although each chapter builds on the previous one, this book can also be used as a reference for those wishing to tackle specific problems.

We’ve been careful to point out which features are new in Flash MX 2004; this will be useful if you’ve used Flash MX and are completely new to both the regular and Professional versions of MX 2004. Be on the lookout for the handy “new to MX 2004” icon shown in the margin.
Some topics covered here pertain only to features available in Flash MX Professional 2004. They can be quickly identified with the “Pro only” icon shown in the margin.

Here’s a quick look at what you can expect to explore in each chapter.

PART I: Getting to Know Flash
Part I sets the stage for all your future work in Flash. In Chapter 1, you’ll start off by getting a nice introduction to the world of Flash. You’ll bone up on the venerable history of Flash (including the advances in each version), explore the difference between vectors and bitmaps, and get a snapshot of what kinds of cool stuff are being created with Flash. In Chapter 2, you’ll explore the great updates that Flash MX 2004 and Flash MX Professional 2004 feature. Finally, in Chapter 3, you’ll delve deeply into the Flash interface and get your hands dirty exploring how you can manipulate your working environment.

PART II: Creating and Manipulating Visual Content
Part II is geared toward teaching you the fundamentals of creating and manipulating all things visual in Flash MX. In Chapter 4, you’ll become intimately familiar with all of Flash’s painting and drawing tools. From there, Chapter 5 covers the process of creating and manipulating text. In Chapter 6, you’ll learn how to use objects (a blanket term for just about anything graphical in Flash) to your advantage. Chapter 7 features an in-depth discussion about working with reusable content—primarily symbols and the Library. Chapter 8 explores how to work with layers—a vital subject if you want to create animations having any degree of complexity. Finally, Chapter 9 explores the incredibly handy new project-management tools available in Flash MX Professional 2004.

PART III: Animating with Flash
Part III is designed to teach you just about everything you need to know about creating animation in Flash. First, Chapter 10 thoroughly explores how to use the Timeline to add the dimension of movement to your Flash creation. From there, you’ll learn how to work with Movie Clips—arguably one of the most important elements in Flash—in Chapter 11.
Finally, Chapter 12 will teach you how to work with scenes, a vital tool for partitioning and organizing animated content. The last chapter in Part III, Chapter 13, will look at how you go about creating interactive presentations with Slides—a new feature available in Flash MX Professional 2004.

PART IV: Adding Basic Interactivity
This section of the book will introduce you to one of the most compelling and important aspects of Flash development: interactivity. Chapter 14 introduces you to behaviors, the built-in commands that allow you to control the interactivity of your movies. Chapter 15 presents a discussion on the creation and design of interactive controls, an essential part of any interactive experience. Chapter 16 covers components, ready-made modules that can be added to a Flash movie to facilitate user-input and interactivity.

PART V: Creating Advanced Interactivity with ActionScript
If you love Flash but have hesitated to take the plunge into the world of Flash-based scripting, Part V is for you. Chapter 17 discusses some beginning concepts of programming and explains how ActionScript works inside a Flash movie. Chapter 18 provides details on the syntax, structure, and elements of ActionScript, while Chapter 19 discusses managing multiple Timelines in a single movie, one of the most important aspects of Flash development. Chapter 20 presents a variety of inspiring and useful in-context examples that use ActionScript to add all sorts of functionality to your Flash movies. We feel that it’s important to keep this book realistic; as a result, Chapter 21 discusses the techniques and tools that you can use to troubleshoot ActionScripts that aren’t performing as expected.

PART VI: Working with Audio
Part VI covers one of the most important (and sadly neglected) aspects of multimedia development: audio. Chapter 22 provides useful information on the basics of digital audio and serves as a primer for anyone who is new to working with sound and music on their computer. With the essentials of digital audio under your belt, you can read Chapter 23 to learn how audio works inside Flash and how to publish “sonified” Flash movies. Because
getting your audio to synchronize with any variety of events is a crucial part of animation
and interactive development, Chapter 24 discusses the various techniques for audio-visual
synchronization. Finally, Chapter 25 ups the ante, showing you how to control audio ele-
ments interactively via ActionScript.

PART VII: Integrating Flash with Other Programs
In Part VII, you’ll learn how you can integrate Flash with other useful applications.
Chapter 26 discusses Flash in the context of Macromedia’s other multimedia powerhouse:
Director. In Chapter 27, you’ll learn how to integrate Flash with the latest incarnation of
Macromedia’s popular WYSIWYG web-development program, Dreamweaver MX 2004.
Chapter 28 discusses different ways that you can use third-party audio applications to edit
sounds, compose music, and engineer your digital audio files before integrating them with
your Flash masterpiece. Finally, in Chapter 29, you’ll get a taste of how to integrate 3D
with your Flash creation. The chapter covers both third-party 3D software and techniques
for simulating 3D with Flash’s painting and drawing tools.

PART VIII: Publishing and Distributing Flash Movies
Part VIII focuses on how you go about actually getting your beautiful Flash creations to
your audience. In Chapter 30, you’ll learn how to publish your Flash movies to several
formats that are suitable for distribution. Chapter 31 discusses the techniques involved in
publishing Flash movies that include video and in publishing Flash movies as digital video
in either QuickTime or AVI format. Chapter 32 discusses the ins and outs of developing
Flash movies for delivery on CD-ROM. And finally, Chapter 33 will introduce you to the
techniques involved in creating Flash content for mobile devices running the Pocket PC
operating system.

Inspirational Design Models
Every creative endeavor—and that includes a Flash movie—definitely benefits from a little
inspiration now and then. Let’s face it, even the most innovative person on the planet
sometimes feels a bit creatively constipated.
To help, we’ve included an Inspirational Design Model (IDM) at the end of almost every chapter. Each IDM highlights a notable Flash creation and (loosely) relates to the subject of the chapter. For example, in Chapter 23, “Flash Audio Basics,” the IDM is DJ Spooky’s *Errata Erratum*, a provoking fusion of sound, animation, and artwork by Marcel Duchamp. Ultimately, the IDMs give you not only helpful nudges along the path of creativity, but also a good feel for the terribly groovy possibilities of the application.

**Hands On Sections**

This book offers eight Hands On sections. As the name suggests, these put your skills to work on projects that are larger and more in-depth than those within the chapters. **Hands On 1** shows you how to create your own custom panel layout in Flash. **Hands On 2** features a step-by-step tutorial on using Flash’s painting and drawing tools to create a static seascape. **Hands On 3** walks you through the creation of a short science-fiction animation. **Hands On 4** shows you how to create a favorites application for your website using components and ActionScript behaviors. **Hands On 5** incorporates ActionScript and shows you how to create a modular movie that uses multiple SWF files and pop-up windows. **Hands On 6**, which focuses on audio, demonstrates how you can use Flash to create a mixing-board application. **Hands On 7** shows you how to create an animated 3D preloader and place it in an HTML document. And to top it all off, **Hands On 8** teaches you how to synchronize streaming video to a Flash animation.

**Color Gallery**

The Color Gallery contains some of the most innovative, beautiful, and interesting Flash work on the Internet today. Pieces were selected not only because they are visually stunning, but because they demonstrate the true potential of this application, from concept and artistry to interactivity and entertainment.

**CD Bonus Chapters**

This book’s companion CD-ROM contains several full-length bonus chapters (in Adobe Acrobat PDF format) on a variety of topics. **Bonus Chapter 1** explores how to make Flash
dynamic (either alone or with other database-driven technologies) by sending data out or
bringing data in. **Bonus Chapter 2** discusses integrating Flash with Macromedia’s vector-
illustration application, Freehand MX. **Bonus Chapter 3** offers step-by-step tutorials for
features that didn’t quite fit into other parts of this book. These tutorials show you how
to create some of the coolest Flash widgets and doohickeys (such as navigational widgets
and preloaders) as well as how to create an interactive Flash-based software tutorial with
eHelp’s Robodemo. The **Bonus Hands On** outlines the steps of burning a cross-platform
CD-ROM with Toast 6 Titanium.

**ActionScript Reference**
The ActionScript Reference on this book’s CD-ROM provides you with the correct syn-
tax, contextual examples, and tips for working with many ActionScript terms. This isn’t
a complete reference; rather, it contains what we consider to be *essential* ActionScript
elements. It should prove to be very helpful when you’re composing scripts from the
ground up.

**How to Use This Book**
This book can be used in two ways. The first, as mentioned earlier, depends on the fact
that the material presented follows a logical learning curve. As a result, you can easily read
this book from cover to cover, confident that when you’re finished, you’ll have a solid
foundation in basic, intermediate, and some advanced Flash development techniques.

This book can also be used as a reference. If you want to solve certain problems or learn
specific skills, you can simply locate the information you desire by using the index or the
table of contents.

The bottom line is that whatever way you decide to use this book, you’ll learn the skills
necessary to continue your journey in the wonderful world of Flash MX 2004 and Flash
MX Professional 2004.