The Coolest Macintosh Multimedia Guide Ever!

Cool Mac™ Animation

Clint Hicks

Wow! Free Disk!

Packed with PROmotion™ demos, the Popcorn™ Player, the QuickTime™ Extension, & More!

Includes QuickTime!

Lights! Camera! Action! Roll 'Em...

Cool Mac Animation explores the producer in all of us. Hayden's approach is totally refreshing. A must for anyone who thinks making movies is fun!

—Joe Fantuzzi
VP of Marketing
Macromedia

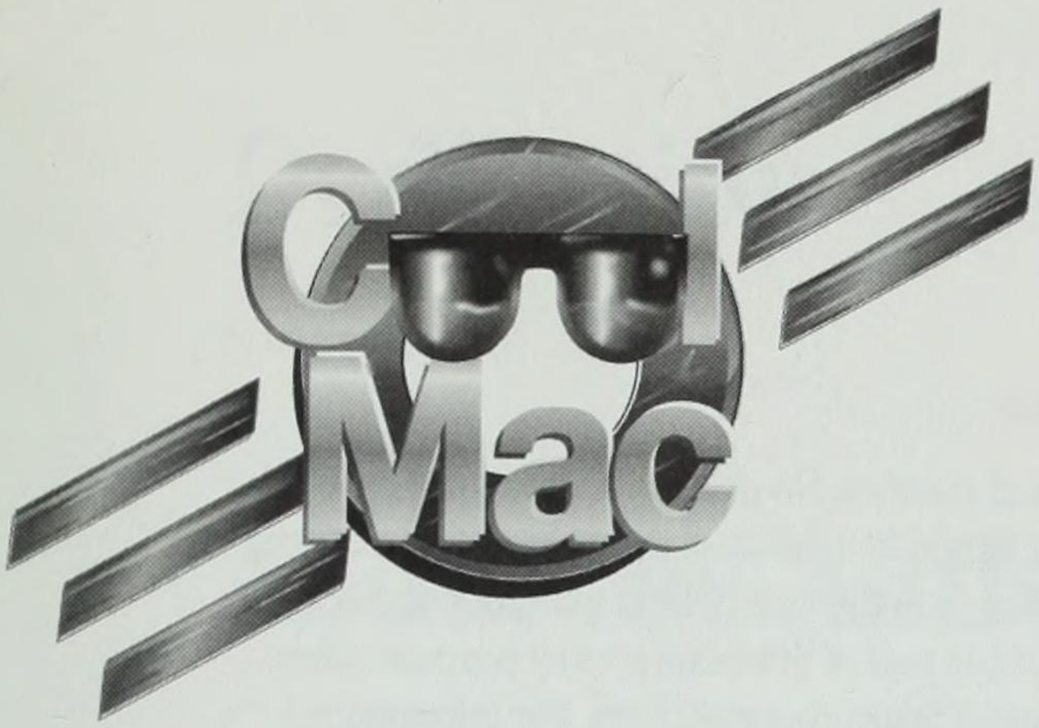
Cool Mac

HAYDEN

Digitized by the Internet Archive
in 2011

http://www.archive.org/details/coolmacanimation00hick

3-



Cool Mac® Animation

Clint Hicks

HAYDEN

Cool Mac Animation

Copyright © 1992 by Hayden.

A Division of Prentice Hall Computer Publishing.

All rights reserved. Printed in the United States of America. No part of this book may be used or reproduced in any form or by any means, or stored in a database or retrieval system, without prior written permission of the publisher except in the case of brief quotations embodied in critical articles and reviews. Making copies of any part of this book for any purpose other than your own personal use is a violation of United States copyright laws. For information, address Hayden, 11711 N. College Ave., Carmel, IN 46032.

Library of Congress Catalog No.: 92-71775

ISBN: 0-672-48521-4

This book and accompanying disk are sold *as is*, without warranty of any kind, either express or implied. While every precaution has been taken in the preparation of this book, the publisher and author assume no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information or instructions contained herein. It is further stated that the publisher and author are not responsible for any damage or loss to your data or your equipment that results directly or indirectly from your use of this book or the software accompanying it.

94 93 92 4 3 2

Interpretation of the printing code: the rightmost double-digit number is the year of the book's printing; the rightmost single-digit number is the number of the book's printing. For example, a printing code of 92-1 shows that the first printing of the book occurred in 1992.

Cool Mac Animation is based on QuickTime, version 1.0; PROmotion, version 1.0; the Supermac Video Spigot; and Adobe Premier, version 1.0. Plus a lot of hard work.

Trademark Acknowledgments: There are too many trademark acknowledgments to list on one page. To acknowledge every product and every company would require that we double the size of this book. Therefore, because we are environmentalists, and because paper is a valuable (and therefore costly) commodity, we are limiting our trademark acknowledgments to the following statement:

All products mentioned in this book are either trademarks of the companies referenced in this book, registered trademarks of the companies referenced in this book, or neither. We strongly advise that you investigate a particular product's name thoroughly before you use the name as your own.

Dedication

For my Mom...

About the Author

Clint Hicks

Clint Hicks is a best-selling computer book author and gourmet cook. A 1982 graduate of Rice University in Houston, Texas, Clint has been writing about personal computers since 1984. He served as Senior Editor and Manager of Technical Publications for Peter Norton Computing, Inc., before it was swallowed up by Symantec Corporation. His software product documentation consistently earned high praise from both users and critics, including awards from the Society for Technical Communication. Other publications of his include *The Official Guide to Norton Utilities for the Macintosh* (with Peter Norton) and the bestselling *PC World DOS 5 Complete Handbook* (with John Socha). Clint lives in Santa Fe, New Mexico—a cool town if ever there was one—with his wife Rosanna and their daughter, Angelina. The household includes three computers, two cats (Merlin and Nimuë), and a Shetland sheepdog named Ace.

Publisher	Mike "Great" Britton
Associate Publisher	Karen "Don't It Make My Brown Eyes" Bluestein
Editorial/Production Coordinator	Karen "I Want to Live in the" Whitehouse
Mac Guru	David "The Trucker" Drucker
Cover Designer	Katherine "Pixel Power" Hanley
Designer	Michele "Rodeo Queen" Laseau
Gaffer	Richard "Swadman" Swadley
Key Grip	Matthew "A" Morrill
Costume Designer	Mary-Terese Elizabeth Ann "I Need a Shorter Name" Cozzola Cagnina
Hair & Makeup	Greg "Doberman" Pilcher
Production Stunts	Paula "A Christmas" Carroll Brook "I Need a Vacation" Farling Phil "Special K" Kitchel Jay "The Way" Lesandrini Cindy "Hott Lipps" Phipps

Filmed entirely on location in Carmel, Indiana, USA.

Composed in ITC Garamond, Helvetica, and MCPdigital by Hayden.



Acknowledgments

Where to begin? There are many folks without whose gracious assistance this book would have been impossible. Thanks to Matt Wagner at Waterside Productions for bringing me the project, and to Mike Britton at Hayden for giving me a shot at it. Special thanks to Karen Whitehouse for all her patient assistance, especially in procuring products to evaluate. Thanks to Motion Works, Vividus, Adobe, and Macromedia for providing samples of their products.

Thanks also to Russ LaValle for providing Re-Animator, and to Trici Venola for creating the artwork. A tip of the hat to the PROmotion user's manual, which was a valuable source of information regarding animation. I should also mention AOL's *Compton's Online Encyclopedia*, and Scientific American Library's *The Science of Words*.

Finally, thanks to Rosanna and Angelina for their patience and assistance. I couldn't have done it without you.

Clint Hicks
Santa Fe, New Mexico
May, 1992

Conventions Used in This Book

Text that you are instructed to type appears in a `special typeface`.

Text that appears on-screen, such as messages and menu commands, appears in **bold**.

Keystroke combinations are indicated as in the following example: "Press command-P to print." This means that you press *and hold* the command key (the key at the bottom of your keyboard with a picture of an apple and a cloverleaf on it), and then press the key labeled *P*. Release both keys simultaneously.

The following icons appear throughout this book:

Icon	*Explanation*
	Cool idea.
	Clue/hint.
	Important note.

Notice

Hayden's licensor(s) makes no warranties, express or implied, including without limitation the implied warranties of merchantability and fitness for a particular purpose, regarding the software. Hayden's licensor(s) does not warrant, guarantee or make any representation regarding the use or the results of the use of the software in terms of its correctness, accuracy, reliability, currentness or otherwise. The entire risk as to the results and performance of the software is assumed by you. The exclusion of implied warranties is not permitted by some states. The above exclusion may not apply to you.

In no event will Hayden's licensor(s), and their directors, officers, employees or agents (collectively Hayden's licensor), be liable to you for any consequential, incidental, or indirect damages (including damages for loss of business profits, business interruption, loss of business information, and the like), arising out of the use or inability to use the software even if Hayden's licensor has been advised of the possibility of such damages. Because some states do not allow the exclusion of or limitation of liability for consequential or incidential damages, the above limitations may not apply to you. Hayden's licensor's liability to you for actual damages from any cause whatsoever, and regardless of the form of the action—whether in contract, tort (including negligence), product liability or otherwise—will be limited to $50.



Disclaimer

Executive summary: We take full credit for anything you like about this product. We designed it just for you. Any aspect of this product that dissatisfies you is purely an accident or simply not our fault.

We at Hayden have tried our best to make this the most fun and useful Macintosh book available to the masses. However, we are (unfortunately) only human, and it is conceivable that you may encounter unusual circumstances that we did not discover in our extensive two-hour testing session. For any problems you may have, we apologize in advance. We'll do our best to make amends wherever possible (and inexpensive).

Be careful. Practice safe computing. Make backups. Try these programs out on a friend's Mac first...

Void where prohibited by law. No stopping, standing, or parking. No shirts, no shoes, no service. Place trays in the upright and locked position. This side up. Do not submerge. Curb your dog. Do not fold, spindle, or mutilate. Tape. Do not staple. Fully microwaveable. Under penalty of law, this tag may not be removed except by the consumer. Do not pass GO, do not collect $200. Have you enclosed your check? No CODs. Keep out of reach of children. Keep off the grass. If product gets in eyes, flush with warm water. No trespassing. This is not a toy. Non-negotiable. Please enclose stub with payment. Open 9 a.m. 'til closing.

We Want to Hear from You

What our readers think of Hayden is crucial to our sense of well-being. If you have any comments, no matter how great or how small, we'd appreciate your taking the time to send us a note, fax us a fax, rhyme us a rhyme, etc.

We can be reached at the following address:

Mike Britton
Hayden: The Cool Mac Publisher
11711 N. College Ave. (a boring address, but we assure you we're anything but boring)
Carmel, IN (yes, Indiana—not California...) 46032
(317) 573-2500 voice
(317) 573-2583 fax

If this book has changed your life, please write and describe the euphoria you've experienced. If you have a cool mutant animation of your own creation, please send it (caged, of course) directly to us at Hayden. Who knows? Your creation may endup in *Cool Mac Animation: The Sequel*.

Do you have a cool book idea? Please contact us at the above address with any proposals (marriage or otherwise).



Table of Contents

Introduction

1 About This Cool Book 1
2 Rewind: The History of Animation? 5
3 The Art of Animation 11

The Macintosh Basics

4 About Mac Hardware 15
5 System Software 25
6 Data File Formats 29
7 Marking QuickTime 33

Cool Mac Goodies

8 Using the Cool Disk 41
9 Popcorn 45
10 Re-Animator 49
11 PICT Files: Guthrie, Dakota, and Home & Yard 51

Being Creative

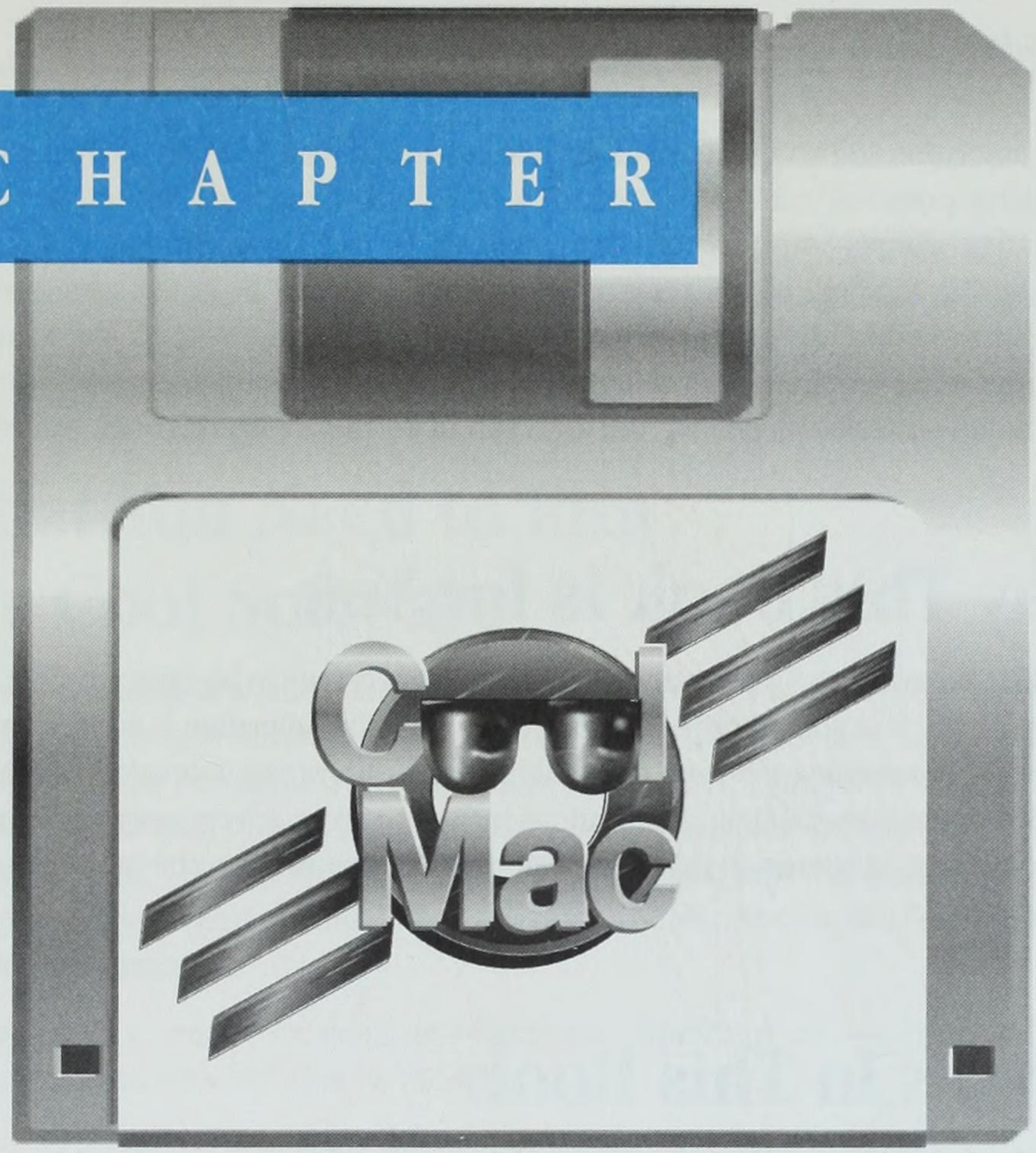
12 Starring PROmotion 55
13 Creating "Guthrie Skates" in PROmotion 63
14 Other Animation Software 69

Making Mac Movies

15 Capturing Video 73
16 Editing and Assembling Video 81
17 Making a QuickTime Movie 85
18 What the Director Is All About 89
19 Using MacroMind Director 95

Closing Credits

20 Cool Solutions to UnCool Problems 99
21 Cool Information Sources 107
22 Getting in Touch 111
23 Cool Words to Impress Your Friends 113
Index 123
Using the Cool Disk 132
How The West Was Won 133
What's on the Cool Disk 133





1

About This Cool Book

There is no doubt that animation has come into its own. Recently, Walt Disney's feature-length animation *Beauty and the Beast* won a Golden Globe award; it also received an Oscar nomination for "Best Picture." (*Beauty* is the first animated feature ever so honored.) Animation has returned to—or even surpassed—the level of craftsmanship prevalent during animation's golden era of the 1940s and 1950s. The resurgence of animation may have much to do with the phenomenal financial success of recent animated features. Today's animators deserve considerable praise for returning animation to its former glory through their hard work.

While animation still requires a considerable amount of manual effort, animators now have many powerful, computer-based tools that alleviate many painstaking and time-consuming manual steps. Recent developments in computer software will further revolutionize the field of animation. Indeed, animation may be at the same point as publishing was during the mid-1980s when desktop publishing emerged. A new generation of personal-computer software promises to make "desktop animation"—among other things—a reality. Better yet, you are a part of it—that's what this book is all about.

Why This Book Is for You

Cool Mac Animation is a handy introduction to what is certain to become a topic of great interest in the Mac community. Whether your interest in animation is recreational, or whether it's harnessing the power of multimedia (synthesizing animation, video, and sound into attention-grabbing presentations and sales-making advertisements)—you can find something of interest in this book. Not only will you find it to be informative, it's fun too.

What's in This Book

Cool Mac Animation is an introduction to desktop animation, video, and multimedia on the Macintosh. This book discusses:

- An overview of the art of animation, with an emphasis on computer animation on the Mac
- A look at Apple's QuickTime, and its significance to animation and multimedia
- Introductions to popular software such as MacroMind•Paracomp's Director, Motionwork's PROmotion, Adobe Premier, and more, with suggestions on how to use each effectively
- A 1.44M disk, featuring PROmotion, QuickTime, and other nifty tools and cool items, and
- Tips on how to avoid problems and how to solve those that do crop up





The Cool Stuff on the Disk

Cool Mac Animation includes a disk with all sorts of goodies: samples of Mac animations and movies; ready-drawn artwork to use when creating your own animations; and several programs that enable you to view our sample files on your computer.

What You Need to Run the Cool Software

Before proceeding, a word about compatibility. The disk included with this book is compatible only with newer Macs—specifically, the LC, IIsi, IIx, IIcx, IIci, IIfx, SE/30, Classics I and II, PowerBooks, and Quadras. Apple's QuickTime software extension, included on the disk, runs on Macs that have a 68020 processor or better, and operates with System 6.0.7, System 7.0.0, or later. Of the Macs listed above, only the Classic I and the PowerBook 100 have incompatible processors. The Mac Plus, SE, and Portable are not QuickTime-compatible.

You will need a "paint"-type program—PixelPaint, SuperPaint, etc.—to open and work with the graphic files included on the disk.

Where We Got the Cool Stuff

QuickTime is a product of Apple Computer, Inc.; it is distributed with Apple's permission. Re-Animator was discovered on America Online (AOL), an information service where you can locate loads of cool stuff. (See Chapter 21, "Cool Information Sources," for more information regarding AOL.) Yours truly created the sample movies and animations; if I can do it, anybody can. The ready-drawn artwork on the disk was created by Trici Venola, Macintosh Artiste Extraordinaire, and is being distributed under license from Trici. Her artwork also was used to create one of the sample animation files.

About Sharing the Cool Disk

Share the movies and animations on the disk with your friends. However, please observe a few guidelines. One thing you may not share freely is the ready-drawn art files. Please don't distribute the original PICT files, and please preserve the copyright notice on



anything you create using these files. The notice is somewhere near the bottom of each of the three picture files. Trici thanks you. As for Re-Animator, share it with anyone. The author of Re-Animator wants it to go as far and wide as possible.

Where You Go from Here

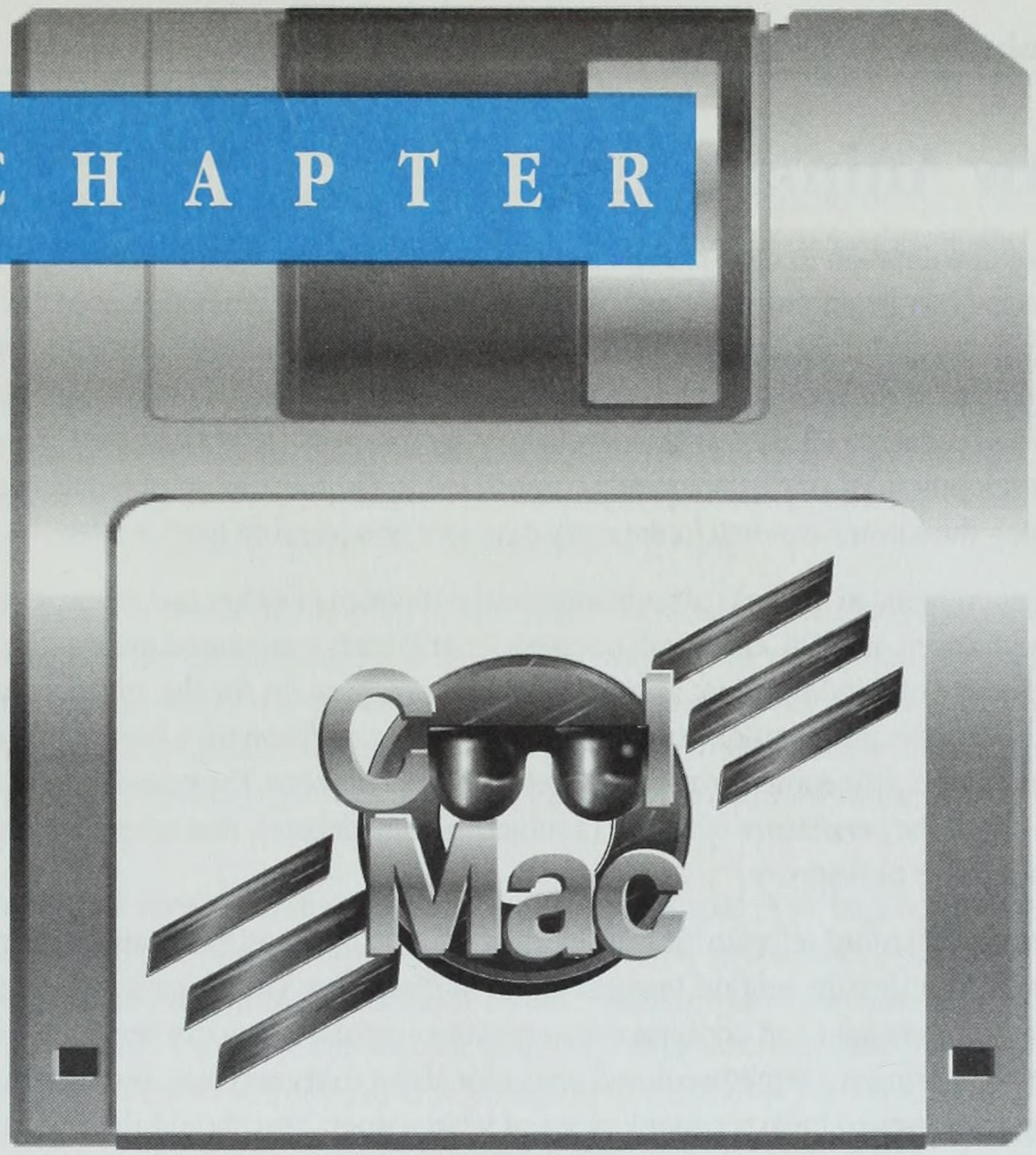
The first several chapters of this book discuss animation in general, and computer animation in particular. Chapter 2 covers the art of animation from an historical perspective. This is in preparation for Chapter 4 which examines Mac hardware. After a brief review to get everyone up to speed on the Mac and its associated terminology, the general structure of animation and video on the Mac is discussed. Later chapters cover QuickTime, and specific software and hardware packages.

Presuming you're all set—let's go. Our first stop: The Royal Society of London.





CHAPTER



2

Rewind: The History of Animation

Before discussing animation on the Mac, an examination of animation's history, and animation in general, is in order. This chapter demonstrates some of the reasons why animation "is the way it is," by tracing its development.

How Animation Began

The use of animation to demonstrate a concept or present an idea, interestingly, dates back to the very beginning of the art. What's more, the earliest animation predates both motion pictures and photography. Indeed, animators waited for further developments in motion pictures and photography before taking their art beyond its preliminary phases. Animation came into flower only after cinematography was well-established. Research and development of animation greatly contributed to the beginnings of movie-making, enriching the former as much in the early days as it was to profit from it later.

Early experiments in the field of animation tested theories of vision and perception that others advanced. In 1824, an English scientist, Peter Mark Roget, caused quite a stir at The Royal Society of London (then, as now, a famous organization for the advancement of science) with the presentation of his paper "Persistence of Vision with Regard to Moving Objects." Roget (the same Roget that developed the infamous Thesaurus) made many claims about the *persistence of vision* (a subject of long debate), that others felt obliged to either prove or disprove.

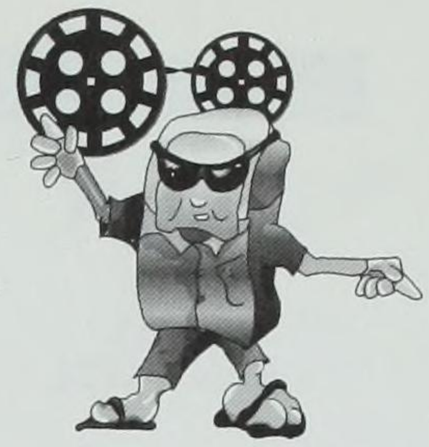
"Persistence of vision" refers to the way that perceived images tend to remain on the retina for a time even after the original images change or disappear. The retina is the part of the eye that registers light and converts it into nervous impulses. You can see the effect for yourself by staring at a brightly-colored object for about thirty seconds, and then quickly moving your eyes to look at a blank piece of white paper. You should then see a faint "ghost" of the image you were staring at before.

Roget felt that this phenomenon of "persistence of vision" had implications for the way we perceive motion. Because each image "persists" on the retina, the motion of an object doesn't consist of a smooth, continuous flow. What we perceive as motion instead consists of a number of discrete images, each taking up a finite (if very small), amount of time. Each new image replaces the one before it, and carries the perceived motion forward by a small amount. In animation, as well as cinema, each of these images is a "frame."

Playing Around with Vision

In science when you make a claim (like Roget) there's always someone who wants to prove you wrong (or right). It took a few years in Dr. Roget's case. By 1832 two different gentlemen, working independently, managed to perfect small devices that seemed to





prove that the good doctor was on to something. The optical toy that they created—a *stroboscope*—may be familiar to you. (I remember trying to construct one as a child after seeing one on a Saturday morning kid's program. Sorry to say I didn't succeed; obviously, I didn't let this lessen my enthusiasm for animation.)

A stroboscope consists of a flat disk mounted onto an upright handle by an axle; the disk then spins easily. Around the perimeter of the disk is a number of evenly-spaced, machined-slots through the disk. On one side of the disk are figures (roughly the same number of figures as there are slots). You then hold the disk up with the painted side pointed toward a mirror, spin it, and look closely at the top.

These figures represent the discrete images Roget implied give the illusion of motion—if presented to the eye with sufficient speed. The slots restrict perception of each image to just the point where it is at the top of the circle. Thus, instead of seeing each image whirling around the disk, you see each one for only a brief time as the slot next to it moves past your eye. These devices became quite popular, while demonstrating aspects of Dr. Roget's theory.

More elaborate versions of the stroboscope, (such as the *zoetrope*), began showing up in the parlors and drawing rooms of fashionable Victorians. In fact, zoetropes still appear. (One appears in a recent catalog from the Nature Company.) And, as this book is written, there's a zoetrope exhibit at the Santa Fe Children's Museum. Kids (and more than a few adults) have access to strips of paper and crayons to make their own animated "shorts" which they can view in the four zoetrope cylinders available. Some of the work is quite impressive.

Work began to move away from drawing—no matter how skilled. By the middle of the 18th century, devices projected the moving images onto a wall, allowing a number of people to view the phenomenon. Soon, photographs replaced drawings as the art of photography evolved and grew popular.

A major problem, however, with early photography—relative to animation—was that "real" motion on photographic plates was impossible to capture. (Film hadn't been invented.) These first photographic emulsions responded very slowly to light. (It took quite a long time to expose them properly.) Thus, everything in the photograph had to remain perfectly still—to avoid the image appearing smeared. (That's why people in early photographs look so stiff; they were stiff—from sitting still such a long time.) To simulate motion, each picture was posed individually.



You Ought to Be in Pictures: Photography's Contribution

Subsequent milestones in the history of animation accompanied advances in photography and the development of cinematography. Again, science (rather than entertainment) was the chief motivating factor. In the case of early cinematography, researchers were not interested in the perception of motion, but in the exact nature of the motion itself. The photographer, Eadweard Muybridge, was a prominent investigator in this field. He arranged a series of cameras along a racetrack and caught a horse in motion. (Among other things, his investigations proved that at one point all four of a horse's legs are off the ground as it gallops.)

Obviously, setting up a separate camera for each frame of action was cumbersome and expensive. So inventors concentrated on producing a single camera that could take multiple pictures in rapid sequence. This work progressed greatly with the development of celluloid film. George Eastman, the inventor of the Kodak camera, did a great deal to popularize celluloid, although he did not invent it.

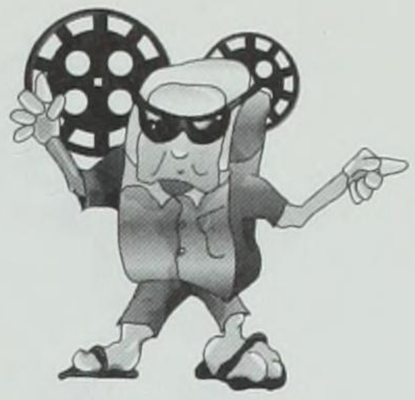
It is not surprising that it took an inventive genius like Thomas Edison to bring all the pieces together into a system. Edison recognized the advantages of celluloid over glass plates (celluloid film was manufactured in long strips, with many frames on each strip). Celluloid was quick since it didn't require much time to expose. What's more, the finished product was translucent, meaning light pasted through it to project an image. Using celluloid film, Edison introduced a motion-picture camera called a *Kinetograph*. Motion pictures taken with this camera were projected with a *Kinetoscope*—a sort of cabinet that a person looked into while cranking a wheel. The first commercial Kinetoscope parlor opened in New York City in 1894.

Edison's early inventions were refined by others, although he continued to play a part. By 1896, it was possible to project moving images onto a screen, much as they are today in movie theaters. The successor to Edison's first machine was called the *Vitascope*, and gave its first public performance in 1896.

Animation Pioneers

With all the tools in place, it wasn't long before animation took off. Animators began to understand how photographic techniques could help their work, and how the results were exhibited just like a motion picture. It is believed the first animated short feature was





"Humorous Phases of Funny Faces," shown in 1906, followed by "Gertie the Dinosaur," a vaudeville favorite in 1909.

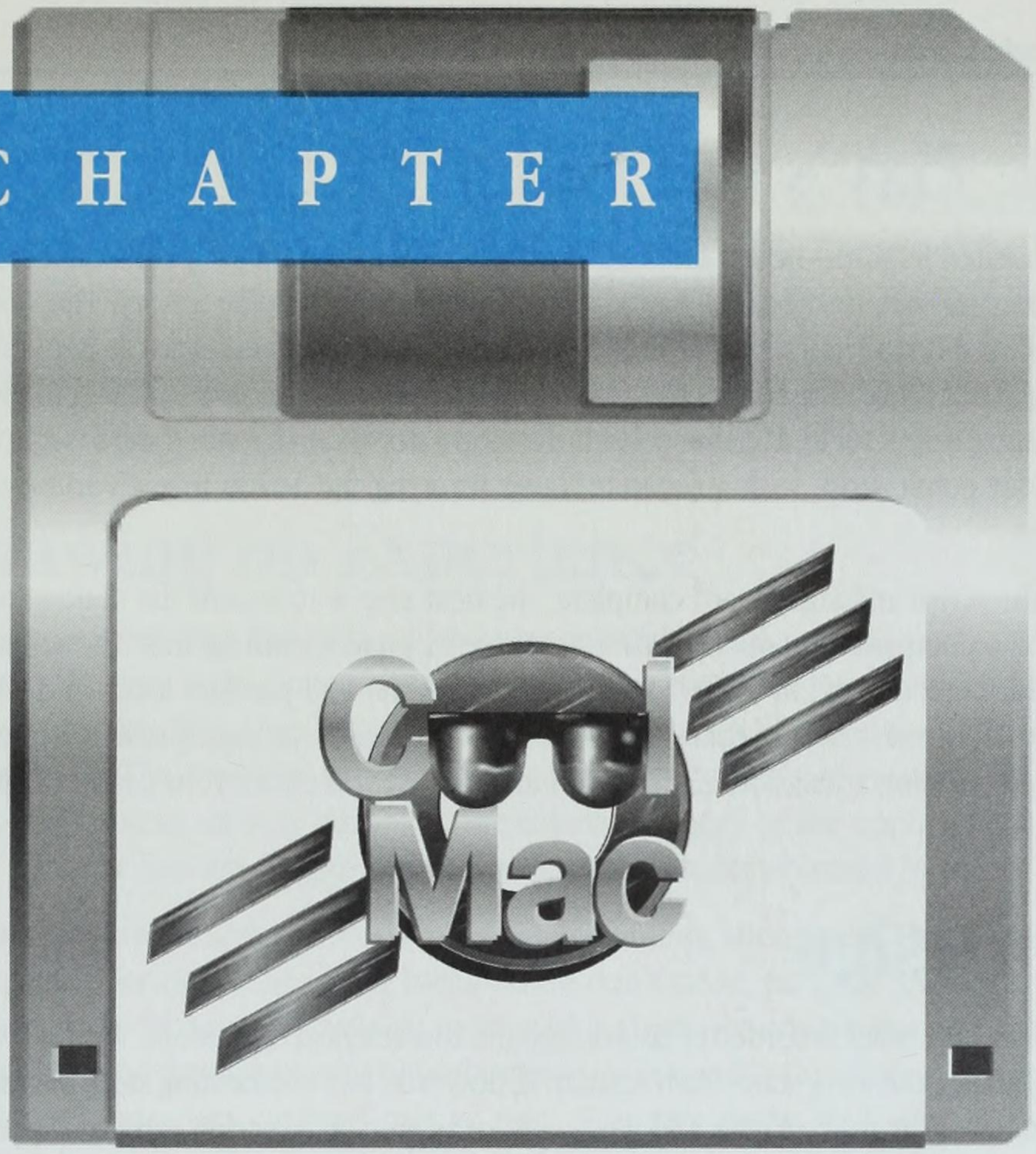
The most famous name in animation, Walt Disney, appeared on the scene and started making animated shorts in 1923. Mr. Disney was innovative in a number of ways. He made the first animated short with sound in 1928; and, at the same time, managed to introduce what would become the most famous animated character in history—Mickey Mouse (in "Steamboat Willie"). In 1937, Disney premiered the first full-length animated feature: the immortal *Snow White*. Disney's studios added another "first" in 1992, with the first animated feature ever nominated for an Oscar for "Best Picture," *Beauty and the Beast*. In the years to come, *Aladdin* and *Fantasia II*, among others will be available from the house that Walt built.

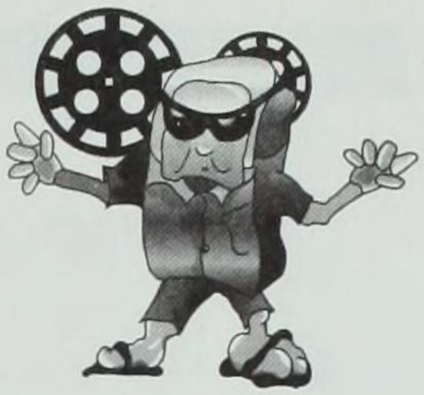
In Conclusion

As it turns out, the tools and methods used to produce *Snow White* are not that different from those used to create *Beauty and the Beast*. Since many of the software tools discussed later are modeled (at least initially) on traditional animation techniques, the next chapter examines how animators traditionally accomplished their feats—or, rather, how they accomplished these feats before the Mac came along.



CHAPTER





3

The Art of Animation

Animation takes much hard work by many talented people. Having computers around helps a great deal, but the field is still more of an art than a science (as perhaps it should be). This chapter tells you how a traditional animation shop gets its work done. This approach will give you a feel for the potential and limitation of the medium; and it also will help later when we talk about Mac animation and multimedia software. Much of the software we discuss is based on ideas and metaphors used in traditional animation, regardless of the software's intention—to produce entertaining cartoons or to design or develop elaborate multimedia presentations.

The Play's the Thing

An animated feature—be it a full-length movie, a Saturday morning kid's cartoon, or a commercial—begins the same way all motion pictures begin, with a story. The working version of this story is a *script*. In motion picture scripts, action is at least as important as dialog, if not more. The script gives indications of the action on screen. Using the script, the feature's director and his/her cohorts develop a *storyboard*. A storyboard is much like a Sunday comic strip, with a separate frame showing the action in each scene of the feature.



With the script and storyboard complete, the next step is to record the dialog and the musical accompaniment (or *soundtrack*). There's a good reason for this! The action and the dialog need to be in perfect synch, otherwise the end-product looks and sounds sloppy. It is much easier to draw all the characters to match the dialog than it is to match dialog to existing animation. Keep this in mind when you create your own animations.

By Design

With the soundtrack recorded, artists design the characters in the feature. With a new cast of characters, the work starts from scratch. If, however, you use existing stock characters, then the work is much easier and you can take advantage of earlier designs. Approved designs are developed into *model sheets* (see figure 3.1). Model sheets show each character in a variety of poses. These sheets help the animators draw the characters properly later.

Figure 3.1

A character drawn in several poses.





The storyboard is now "filmed"—each frame is photographed—and then combined with the soundtrack. This amalgamation becomes a production aid—sometimes called a *Leica reel*—that helps the animators assess developing work. As parts of the feature are completed, they are edited into the Leica reel, which becomes a record of the work in progress. (The Leica reel was named for the brand and kind of camera used to do the filming.)

Drawing on Experience

Work progresses with *line tests*, which are uncolored, pencil animations of each scene. Once each scene is developed and corrected, the relevant line test drawings go to the animators to be cleaned up, traced onto celluloid or acetate film, and then filled in with colored ink. The drawings that result are *cels*. (Today, cels from existing features by famous animators are very valuable.) The colored ink goes on the opposite side of the "cel" from the line drawing, to prevent the lines from being obscured by excess paint.



At some point during this process, background paintings are created. There is only one background for each scene; since backgrounds don't move, the same drawing is filmed for each frame of the scene. Actually, motion of the backgrounds is simulated by moving the background drawing in relation to the character cels and to the camera. This gives the illusion of characters running past an area. You may notice that sometimes when animated characters are running, they seem to run past the same objects over and over. They do! The background is shifted back to the beginning and used over and over until the character reaches the end. This saves a good deal of drawing work.

From Cels to Film

When you have completed all the drawing, transfer the feature to film. First, each frame is shot individually with the cels for each character in the scene laid over the background. Since the unpainted parts of the cels are transparent, the resulting picture of the frame looks like a single drawing. Unless the animators are very good the result can look a bit flat. Special cameras, however, may be used to give the impression of depth; these are called *multiplane cameras* because each part of the picture is put at a separate level, and moved independently. These cameras are large and expensive.

Finally, when all the cels and backgrounds are photographed and incorporated into a print, the sound effects, dialog, and the musical score are added. The sound information,



once it has been mixed together, is itself adapted into visual form and photographed onto the final print, yielding the sound track. The feature is now complete.

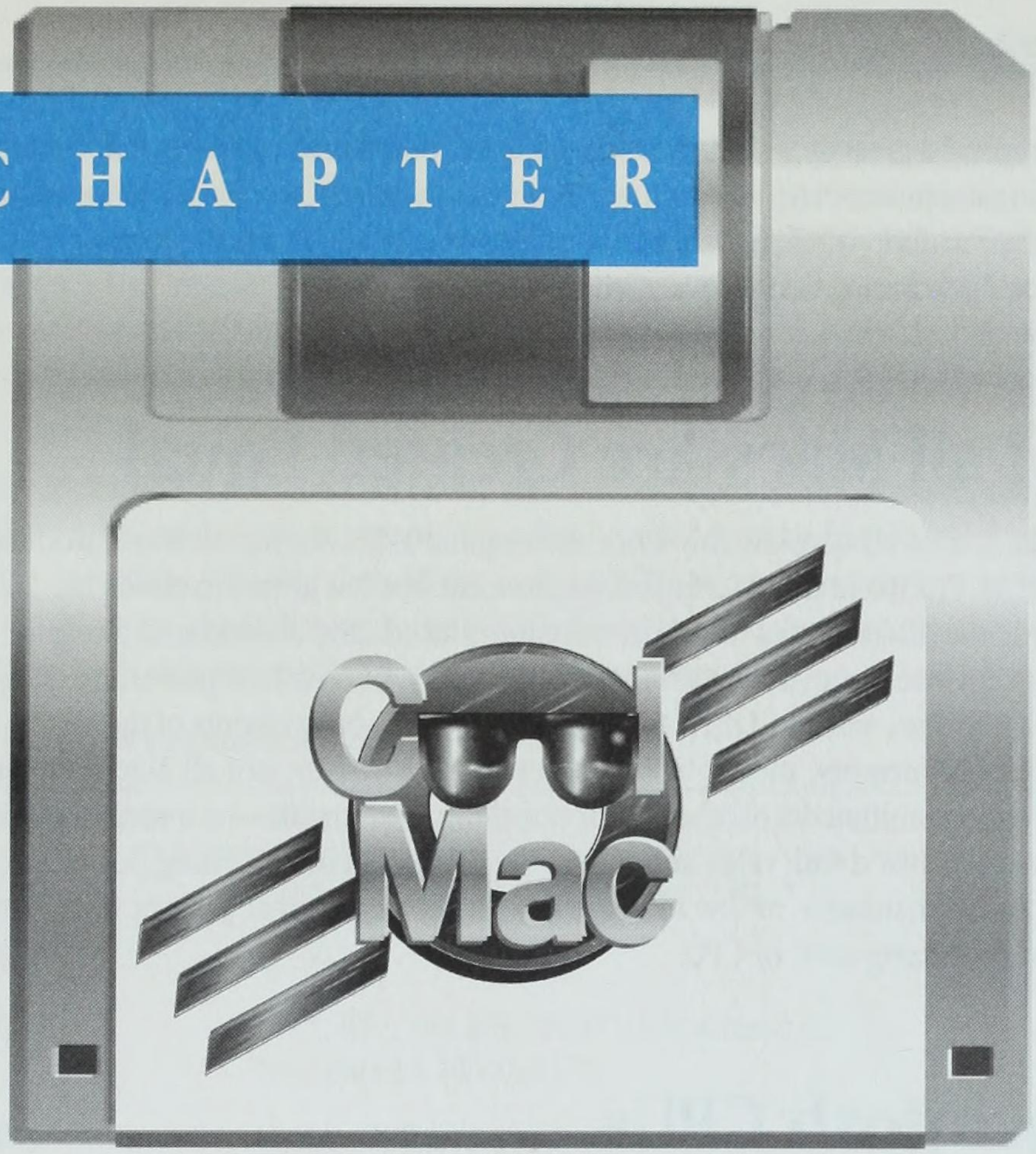
If the above discussion wasn't enough to give you a good idea of how much work goes into a five-minute cartoon, consider this: motion pictures are shot at the rate of twenty-four frames per second. This means that it takes twenty-four separate drawings of each character to create one second of animation. Suppose you have only two characters, that's still 48 drawings per second. To animate two characters for five minutes, you need over 14,000 separate drawings—not to mention the backgrounds—which are always much more elaborate than the cels. Usually, there are approximately 50,000 drawings in a single short feature.

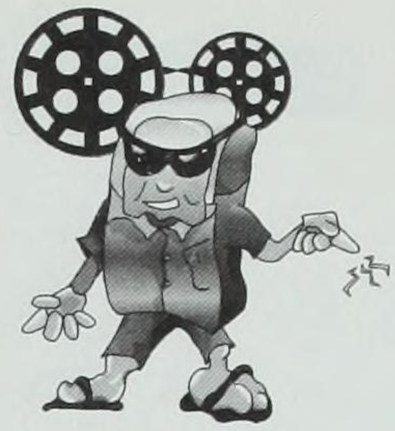
In Conclusion

Animation involves a daunting amount of work for a team of artists to contemplate, much less an individual like yourself. There are now affordable tools on the market that make it possible for even an individual to create animation. The best of these tools are available for use on the Mac, and *Cool Mac Animation* will show you how to use some of them. The Mac itself needs to be examined first; particularly important are the hardware and software features of the Mac that are relevant to animation and multimedia. That's the subject of the next two chapters.



CHAPTER





4

About Mac Hardware

Before considering how to use the Mac as an animation or multimedia platform, a discussion about the machine is in order. This chapter begins with the physical parts of your Mac—known collectively as *hardware*—and continues with a discussion of the relevant parts of the Mac; in turn, showing what each does and why it's important to multimedia and animation work. The Mac has a number of parts that are crucial to doing effective animation and multimedia work. From the Mac's central processing unit (CPU)to its working memory and accessories, each part of the system has a contribution to make to the ease and effectiveness of doing your work.

This chapter helps you assess your system's capabilities and its suitability as a multimedia tool. What we really want to do is save you time, frustration, and money. We don't want

you to spend a great deal of money on expensive multimedia software, only to discover that your Mac just can't handle the load. If you know something of what it takes to do even simple animation, you then can judge what your Mac can do and make your software and hardware purchasing decisions accordingly.

Not all Macs Are Created Equal

Macs have evolved considerably since the original 128K Macintosh was introduced in early 1984. From one almost crippled machine, the line has grown to eleven models, not counting the discontinued Macs that were introduced (and abandoned) along the way. The current Mac lineup offers considerable flexibility. Choose how powerful a computer you want to start with, and then (generally), add other components of the system such as additional memory, monitors, and accessories. However, not all Mac setups make equally good multimedia platforms. For one thing, multimedia—be it simple animation or animation mixed with video and sound—requires a lot of processing power. A logical place for our hardware review to begin is with the engine that powers your Mac: the *central processing unit*, or CPU.

Macintosh CPUs

The central processing unit is the box that contains the heart and brains of the computer. All other parts of the system plug into this box and depend on its capabilities. The CPU determines how fast your Mac is, how expandable it is, and if it is compatible with other hardware and software.

(By the way, we realize that we're throwing a lot of jargon at you here. We didn't pause to define these terms, for fear of breaking up the text in a way that irritates the initiated, while confusing the newcomer. By way of penance, included at the end of this book is a glossary. If you don't quite get the meaning of a term, you will probably find it in the glossary.)

Currently Mac CPUs fall into four categories. The first category, compact Macs, includes the original 128K Mac, along with the Mac Plus, the Mac SE, the SE/30, and available Classic I and II models. All these Macs have built-in video display screens ("displays" for short). The second category, the modular Mac II line, includes the original Macintosh II, the IIx, the IIcx (all discontinued). The modular Mac II line continues with the IIci, the IIsi, the LC, and the IIfx. The display for the modular Macs is in a separate box. This gives you flexibility in choosing a display. (You aren't stuck with the one that comes with your machine as you are with the compact Macs.)





Categories three and four are two new lines: Powerbooks (lap-sized portable Macs with built-in screens), and Quadras (which are based on a more powerful engine). (The Quadras don't work with every piece of software out there, as I discovered somewhat to my chagrin.) The "engine" referred to is really the most important part of the Mac CPU with respect to multimedia—and the four categories listed above aren't the best way to organize things. A better way is to take a peek under the hood, and sort Macs by who has what engine.

All Macs are based on the Motorola 68000 series of *microprocessors*. A microprocessor sometimes is referred to as a "computer on a chip." Suffice it to say that the microprocessor is the part of the CPU that does all the real work. There are currently four members in the 68000 series: the 68000 itself, the 68020, the 68030, and the most powerful of all, the 68040. Each chip has capabilities important to multimedia.

Table 4.1 below summarizes what chip is in which Mac.

Table 4.1
Mac CPUs and Their Microprocessors.

Microprocessor	*CPUs*
68000	Plus*, SE*, Classic I, Powerbook 100
68020	II*, LC **
68030	IIcx*, IIx*, IIsi, IIci, SE/30*, IIfx, Classic II, Powerbooks 140 and 170
68040	Quadra 700 and Quadra 900

** Models marked with an asterisk have been discontinued.*

*** The LC now has a 68030 processor.*

Table 4.1 illustrates that the majority of Macs sold today contain the MC68030 processor. Why? First, the 68030 makes for a faster Mac. You'll discover that you need all the speed you can get to avoid delays when displaying your pictures and playing sounds. Multimedia involves massive amounts of information, or data, to create and play pictures and sounds.

The newer processors, the 68030 and 68040, enable you to work with more memory. It's amazing how much space it takes to store even a few seconds of video images, or CD-quality sound. Many of the older Mac CPUs had built-in limitations (not all of them due to the processor) to their memory. For example, the Mac Plus cannot work with more than 4M of RAM—that's just the way it is made. These limits render them unsuitable for all but the simplest animation work. Finally, only the 68030 and 68040 processors can take full advantage of the latest software because these processors offer memory and instruction management capability not found on earlier chips.



There are other things in the CPU box besides the microprocessor that influence multimedia work. Alluded to in the last paragraph is memory—also known as storage. As its name implies, storage is where data is kept, both while you're working with it, and between work sessions. Having lots of storage is absolutely critical to multimedia work.

Storage

Your Mac CPU needs somewhere to store the data that it's working on, or data that it has finished. Storage takes two forms: long-term storage and working storage. The former usually is handled by disks, the latter by electronic components known collectively as RAM, or *Random-Access Memory*.

Random-Access Memory

Your Mac works with two kinds of information: instructions that tell the CPU what to do, and data. For example, a single frame of animation may be the data and a request to change the size of the frame, the instruction.

Both types of information are stored while the CPU is working on them. Working storage on a computer is random-access memory, or RAM. It's "random-access" memory because the computer can look at any given point, just by giving the correct address. Thus, it doesn't have to look at all of the memory, only the parts containing data that's currently relevant. This means all kinds of data are stored simultaneously without interfering with each other.

These days, RAM is measured in *megabytes* (M). One megabyte is roughly equal to a million characters. By way of comparison, the text in this book occupies about 150,000 characters.

Interestingly, RAM makes an important contribution to the speed of your system. The more RAM you have, the more data your Mac can work with, without having to keep chunks of it in long-term storage (which is much slower). Like the CPU, the amount of RAM you have can constrain the applications you can work with efficiently. Currently, some multimedia packages require very large amounts of memory to work properly—at least measured by historical standards.

A megabyte of RAM may seem like a lot, but it's not. If you plan on doing color work, the absolute minimum amount of RAM to do multimedia work is 4M. The general instructions that, in effect, make your Mac act like a Mac take from one to two megabytes themselves on current systems. Most multimedia software packages need at least 2.5M, and prefer more. You see, it can take more than a megabyte to store a single second of video. Actually,





your life will be easier and you'll be more productive if you have eight megabytes of RAM available. And you'll find current software capable of using even more.

RAM is only part of the storage equation. RAM requires power, and the data stored in random access memory goes away (for good) when the power is shut off. What's more, animations and other multimedia work take up much, much more space than your RAM can ever accommodate. So you need somewhere to put data when you're not working with it; or to buffer large amounts of data when you are working on it: long-term, disk-based storage, sometimes called *mass storage*.

Mass Storage: Hard Disks, Cartridges, Optical Drives, and more

For the long haul, data is stored on disks. You know what floppy disks look like. This little plastic marvel stores about 1.44M on its magnetized surface. (Early Macs could fit only 800K on a floppy, and the earliest Macs only 400K.) All Macs have a least one floppy disk drive; some models have two floppy disk drives.

Floppy disks aren't sufficient for today's multimedia needs, however. Fortunately, most Macs sold today come with much higher capacity disk-based storage systems. We call these hard disks. Most are built into the CPU box, although some are packaged in boxes of their own, which connect to the CPU with cables. Hard disks today range in size from 30M to over 1,500M (also written 1.5GB, or gigabytes).

Like RAM, the more disk storage you have, the better off you are. Many of the folks that manufacture multimedia software are now recommending that you have at least a 100M-hard disk before you even think about installing their packages. When you consider that the information needed to construct a single color photograph can top a megabyte with ease, it's plain to see why large hard disks are in order.

Hard disk drives are expensive to install or replace. Obviously, it's a good idea to buy as much storage as you can afford when you first buy your Mac. Currently, drives in the 200M range are the most cost effective. If you already own a Mac, chances are your hard disk isn't this large. There are alternative disk drives, however, that you can add later to expand your storage capability.

The least expensive of these drives are those that use cartridges. Cartridges are sealed plastic units very much like large floppy disks, except of course the disk itself is rigid rather than flexible. Cartridge drives are available in two sizes: 44M and 88M. The 88M drives can read data from 44M cartridges, although they can't store new data on them. Many people have these drives, so it becomes possible to exchange large amounts of data with a range of individuals if you have one, too. What's more, you can buy additional cartridges, although they're a bit expensive. With many cartridges, you can store all kinds of



multimedia work. Still, even a 88M cartridge will hold only â couple of minutes of high-quality video. But that's better than nothing.

The newer optical disk drives are a better choice—presuming money is no object, and when isn't it? These drives use lasers to read data from cartridges, and they store a lot of data. There are 128M models available, and you can even get drives that will store 600M on a single cartridge. The cartridges aren't interchangeable among models. Once you buy one of these cartridges, you're locked into that size and format.

Again, the long and short of it is the more storage you have the better off you'll be. Multimedia files tend to be huge, so you need lots of disk space to store them and lots of RAM to work with them. Eight megabytes of RAM and 200M of disk space would be close to ideal for current purposes. You can get by with less only if you plan to work with animation and restrict your use of color and sound.

Speaking of color, that brings up another topic: the visual aspects of your Mac system. Specifically, you will need something that will enable you to see what you're working on and show your work to others. The display satisfies this need.

Displays

Apple builds the display screen on the compact Macs into the CPU. These displays measure 9" diagonally, and are limited to black-and-white. To add a bigger display to one of these Macs can be complicated and tricky, (although some (expensive) monitors can attach directly to the SCSI port).

The modular Macs, on the other hand, are more flexible. You must buy a separate display screen (a *monitor*) for these computers. In some cases, you also must buy a piece of additional hardware—the display adaptor—to run the screen. It fits into a special slot inside your CPU.

The display adapter/monitor combination controls the kinds of images you see on your Mac. The most obvious distinction is between color and black and white. Within the range of color systems, however, there are also important differences. The main distinction is the amount of data representing each element on the screen. It takes a lot of data to precisely specify colors. If you have eight bits of data available for each picture element, you can represent 256 different colors. That's enough for animation, but not video.

By expanding the number of bits per pixel (*pixel* equals a single screen dot), the number of colors available increases dramatically. At the maximum, 24 bits per pixel, a Mac can display over 16 million colors. That's enough to show realistic color video and photographic images.





This display realism has its price, however, and not just in dollars. The Mac has one serious design flaw not shared by other graphics-based computers. The CPU must handle all the work of drawing the screen. On other computers, a special part of the CPU called the *graphics coprocessor* handles the screen drawing. This coprocessor leaves the rest of the CPU free to concentrate on calculations. The Mac has no such coprocessor, so its microprocessor does all the work. The more bits per pixel, the more work it must do. Thus, working in 24-bit video is much slower than 8-bit.

Some display adapters help with this problem by accelerating the speed with which the Mac draws the screen. (It's like adding a graphics coprocessor—something many of us think Apple should have done long ago.) The amount of acceleration is product-dependent—check with the manufacturer of the product in question.

Not all current Macs require a display adapter. The LC, SI, and CI have built-in 8-bit video, although using it slows down each of these machines considerably over their speed with a separate display adapter installed. The Quadras have built-in video capable of up to 24 bits. The Quadras' built-in video does not affect speed.

As for monitors, here too you have a range of choices. Color monitors vary in size from 13" to 21". Prices vary almost exponentially with size. If you find 13" too small, a good compromise is the 16"–17" range. These monitors tend to cost less than half the price of their 19" and 21" cousins, although they are twice as expensive as the smallest monitors. Good multimedia work doesn't require a large screen—it's just convenient.

Summing up: a 14" color display with an 8-bit, unaccelerated display adapter is perfectly adequate for color animation. Working with video, you need to move up to 24 bits in the display adapter. Working on anything less than a Quadra (whose built-in video displays 24-bit color on monitors up to 16" in size), you need to think about display acceleration as well. Companies like SuperMac, Radius, and E-machines (among others) offer such a range of products.

There are all sorts of other goodies you can hook up to your Mac. Some of these are even relevant to multimedia. These system accessories are discussed next.

System Accessories

What Mac system is complete without a few accessories? A printer, for transferring work to paper is essential for most work, but isn't really critical for multimedia where most output comes through the monitor. There are other devices you may hook up that expand your multimedia capability, however.

Now, exactly what you hook up, and how you go about it depends on the Mac you have. It is difficult, for example, to install accessories to the compact and portable Macs except through the serial ports and the *SCSI port*. Printers and modems usually get hooked to the serial ports. A modem is a good thing to have, since it lets you share files via telephone lines. Serial ports on most Macs, however, are slow and there aren't many devices available to connect to them.

The SCSI port is faster and more flexible. This Small Computer Systems Interface lets you connect devices like external hard disks and scanners. (A scanner is a useful tool; it lets you convert a photograph or drawing into a data file that your Mac software can manipulate.) SCSI compatible devices hook together, meaning you may have up to seven connected to the same Mac. Your internal hard disk is the first device in this chain, so as a practical matter, you can have six external devices.

Current Macs have a SCSI port, but modular Macs offer more. They all have at least one expansion slot inside the CPU box to connect any one of a number of goodies. The exact number of slots varies with the Mac model. The IIsi has only one slot, a processor direct slot (PDS). This connector gives direct access to the microprocessor. A display adapter card will fit into this slot, or (among other things) an accelerator card to speed up your SI's calculations. Some accelerators let you add extra cards.



Most other Macs have processor direct slots, although each is slightly different. Cards made for one slot won't work in another. However, most modular Macs have at least two *NuBus slots*. NuBus is a standard configuration for add-in cards, display adapters, accelerators, and more. The Quadra 700 has two NuBus slots. (If you use both, you'll block the processor direct slot.) The IIci has three NuBus slots; the IIfx and the Quadra 900 have five slots each.

Display adapters are potential denizens of your NuBus (or PDS) slots, but there is another potential occupant that's quite useful for multimedia purposes: *video capture boards*. These special cards let you take video footage from any standard source—a VCR, a camcorder, a laser disc player—and "pours" it into your Mac. There are some nifty applications out there that let you manipulate video information once it's in your Mac. One particular video-capture board, the SuperMac Video Spigot, is discussed later in this book. It's a cool toy.

In Conclusion

There are multitudes of things to hook up to your Mac, and many ways to put a Mac system together. What does it all mean? Well, with a Classic I, SE, or Plus that has a 40M hard disk, you still can play with black-and-white animation. To do more, you need more. An

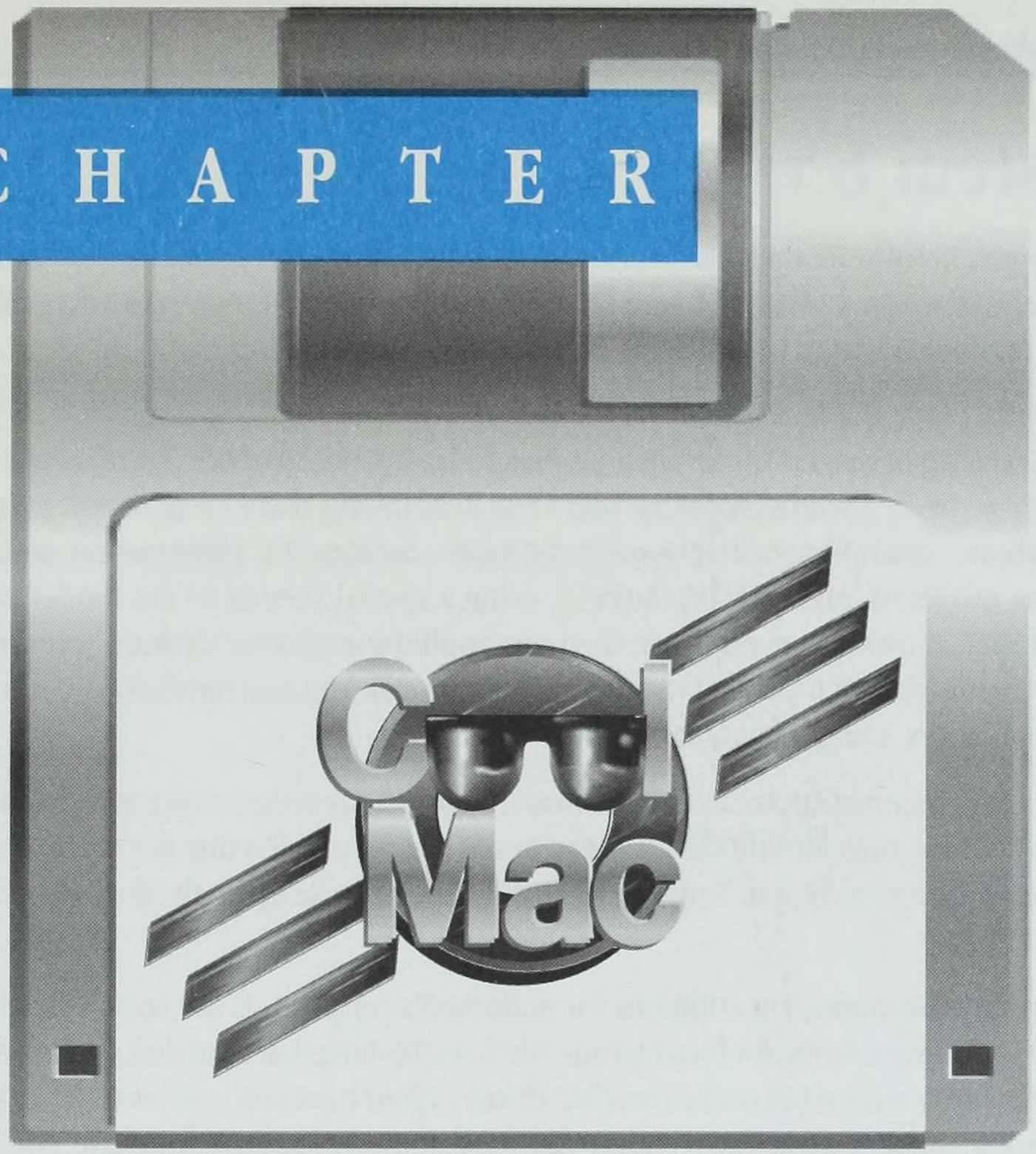


acceptable minimum configuration for multimedia work NOT involving video is a Mac IIsi with 5M of RAM and an 80M hard disk or the built-in 8-bit video with a standard 14" color monitor. To work with video or with color photographic images, you need more video capability. In that case, install a 24-bit, accelerated video display adapter.

No matter what Mac setup you have, you use the same basic software to run it. The most important software is the software that "makes your Mac a Mac,"—the system software. It's so important it warrants its own chapter.



CHAPTER





5

System Software

All computers require a special set of instructions that tells them how to run. These instructions are called *software*, because they consist of information rather than physical objects. Macs use a particular set of software instructions to run them, and make them act like Macs. A single set of software instructions is a *file*. (Data collections such as an animation or a picture are also files. These are data files.) The most important software files on the Mac are the System and the Finder files.

System 6 vs. System 7

It's the system software that tells the Mac how to draw the desktop with its windows and icons, and how to run other software. Exactly how your Mac responds to you depends on which version of system software you have installed on your Mac.

For several years, all Macs came from the factory with System 6.0. This software allowed you to (among other things) set up your Mac to have more than one set of software in memory at once, thereby allowing you to switch among them. Sets of software are applications; examples include word processors, multimedia presentation creators, painting programs, and so forth. Anyway, using a special version of the **Finder** called **Multifinder**, allows you to run more than one application on your desktop (presuming you have enough RAM to accommodate the applications). You also can choose to run only one application, using the regular **Finder**.

The newest version of Apple's system software, System 7, takes that choice away from you. System 7 always runs **Multifinder**; it doesn't even bother to call it that any more: it's just the Finder. However, System 7 adds new capabilities that make up for the flexibility it took away.

Among the most important additions for multimedia purposes is the advent of *virtual memory*. This is a scheme for fooling your Mac into thinking that hard disk space is really RAM. Virtual memory takes over a specified chunk of your hard disk, and treats it like RAM. The amount of space it takes up is equal to the total amount of memory you have, counting real RAM and virtual memory together. Thus, if you have 5M of RAM, and you add 5M of virtual memory, the System takes over 10M of hard disk space for the virtual memory file.



This handy scheme lets you run memory-hoggish multimedia programs. In fact, you can keep more than one running at a time. There's a price to pay, of course. Virtual memory is much slower than real RAM, and you'll find yourself waiting from time to time as you switch among applications. Another thing: don't try to add more virtual memory than you have RAM. If you have 5M of RAM, don't install more than 5M of virtual memory. Otherwise, you risk slowing your Mac down to a snail's pace.

In order to take advantage of amounts of RAM over 8M (historically the limit to Mac memory since time out of mind), you also need other changes that are part of System 7. To take care of RAM beyond 8M requires more bits: 32 bits to be exact. So Apple added a capability called *32-bit addressing*. This new scheme increases a Mac's RAM capacity 256-fold. However, not all applications will work with it...yet. But give them time.



The preceding memory options are set through the **Memory Control** panel. Changes to 32-bit addressing and virtual memory take effect only after restarting your computer.





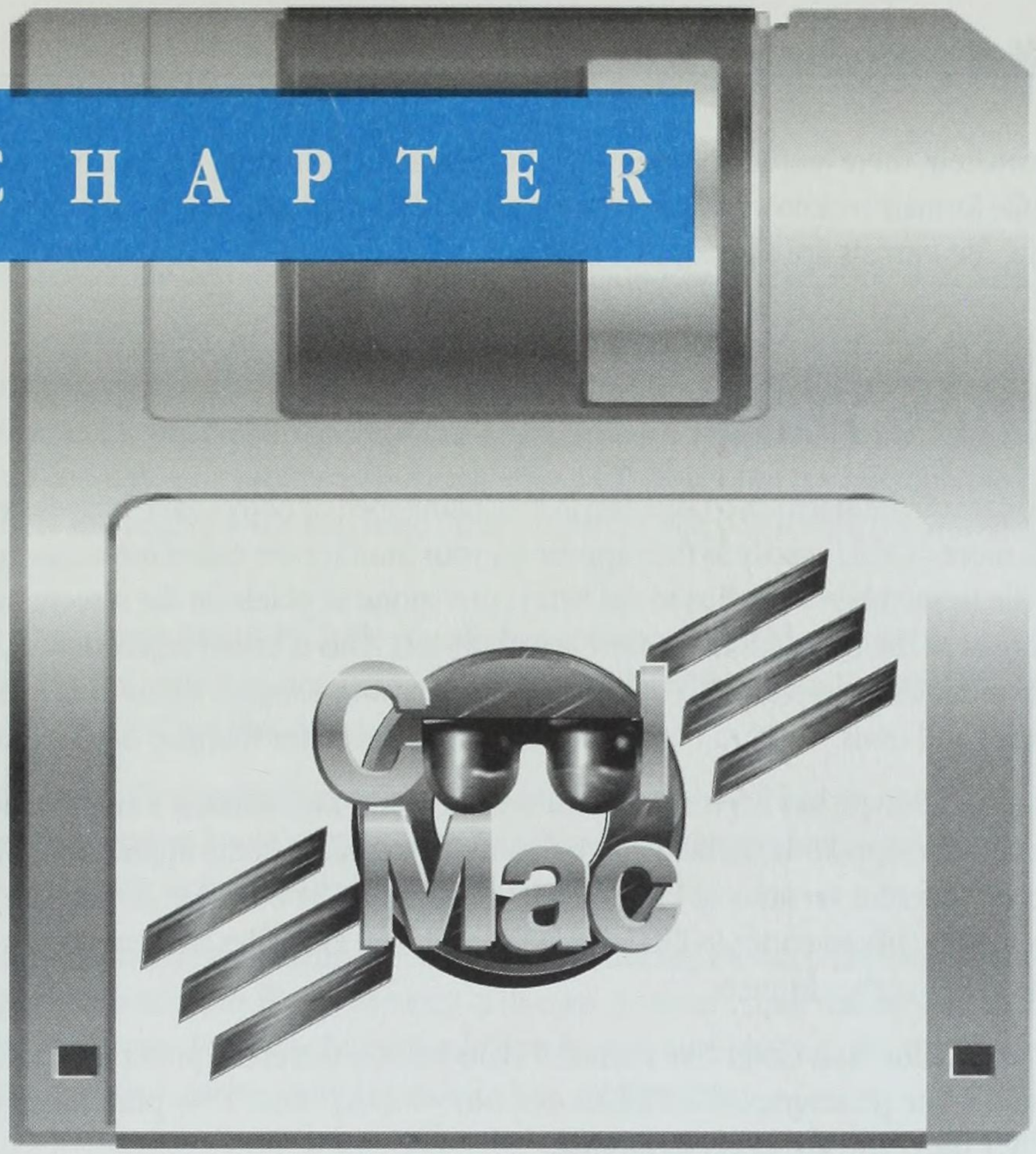
In Conclusion

There are other changes to the Mac system software with System 7; however, they were not discussed because the relevance of these features to animation and multimedia are not significant. There's one new addition, however, that's so important it warrants a chapter of its own: QuickTime (discussed in Chapter 7, "Marking QuickTime").

Before going to QuickTime, there is more ground to cover. Besides system software, there are other files—or more accurately, file types—that are relevant to Mac multimedia work and they are discussed in Chapter 6, "Data File Formats."



CHAPTER





6

Data File Formats

The point of multimedia is to merge several different kinds of data—still pictures, animations, video, and sound—into a single presentation. To do so effectively, however, your applications need to know what kind of data it's being asked to work with. This is where file formats come in.

There are a number of ways to store data. Fortunately, software manufacturers have agreed on file types for picture, sound, and animation data. Most applications use these standard file formats. This is extremely handy; you create files in one application and you can open and modify these same files in another application. For example, you capture a still picture with your scanner—and its operating software—and then use the scanned image in a multimedia presentation.

Unfortunately, there tends to be more than one standard file format for each type of data. These file formats are known by acronyms, and the whole alphabet soup is a bit confusing. To help, file formats are summarized below.

Picture Data

Picture data on the Macintosh takes two forms: bitmapped or object data. Images that are stored, more or less, exactly as they appear on your monitor are called *bitmaps*; the bits in the file (remember: eight bits to the byte) correspond to pixels on the screen. Images also consist of the instructions to draw actual objects. This is called *object data*. Object data is more flexible, although it's limited to drawing simple, colored shapes like rectangles and ovals. You can't make a face into an object: for that you need a bitmap.

PICT This file type has been around for a while. PICT files contain a combination of object and bitmapped data; these combinations can confuse some applications. There have been different versions of PICT. The latest supports 24-bit color, so you can store decent looking photographs in PICT files. One problem: PICT files are very slow to print compared with other formats.

TIFF Stands for "Tag Image File Format." Many believe this is the preferred format for black-and-white photographs. TIFF files only store bitmap data. They print much faster than PICT files, and are easier to modify.

JPEG "Joint Photographic Experts Group." Not so much a file format as a compression standard, JPEG offers a way to make those huge graphics files much smaller. There's a tradeoff: the more you compress a file, the lower the quality. The sacrifice in quality is because you have to throw out data to make files smaller. If you lose much data, quality suffers.

EPS "Encapsulated PostScript." PostScript is a programming language that creates nice-looking output on laser printers and similar output devices. It also is used to create graphics files. EPS files contain the PostScript instructions to create graphics. PostScript graphics are modified easily, while retaining a high quality.

These aren't the only file formats out there, but they are the most common.





Other Data

Fortunately, there aren't as many file formats for sound and animation data files.

SND Sound resources. These usually don't exist as separate files, but as resources within other files, such as your System. Some programs look inside other files for their SND resources. The built-in microphone on most new Macs records in SND format. (You also can connect your audio components, (like a CD player), to the microphone jack on your CPU and record SNDs that way). SND resources that you record are stored in your System file.

PICS Animation files. A PICS file is really just a series of PICT files played in order. Each PICT in the file counts as one frame of animation. A small program to play PICS files is included on the *Cool Mac Animation* disk.

MooV QuickTime movie files. This is a new file format and it is recognized by applications that support Apple's QuickTime. Not all multimedia products recognize or create MooV files as we write this—but, in time...

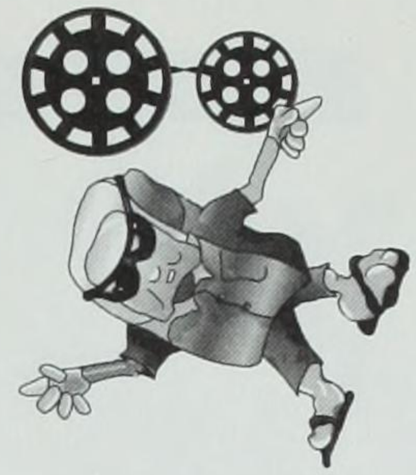
This is by no means an exhaustive list of multimedia file formats. Each application, for example, tends to create files in a format of its own. Some are shared among applications, and other are not. Fortunately, most of them let you save data in one of the standard formats: making it easier to share work among applications.

In Conclusion

By now you've gleaned from the preceding chapters a sense of your Mac's potential as a multimedia engine. You can avoid the frustration that comes from trying to use a tool that isn't suited for the job you want to do. There are few things more irritating than spending upwards of $500 on software that doesn't work well on your Mac.

We covered hardware and looked at software, but we've left out one important piece of the multimedia puzzle: QuickTime (Apple's newest contribution to the Mac's system software). QuickTime promises to do for multimedia what earlier system software did for desktop publishing. In fact, it's so important, it deserves a chapter all its own: the next one, Chapter 7, "Marking QuickTime."

CHAPTER



Cool Item Name:	QuickTime
Location:	**Cool Stuff** folder
Size:	445K
Type of Mac:	Mac II series, PowerBook, Quadra (i.e., 68020 CPU or better)
RAM needed:	4M or better
System Version:	6.0.7, 7.0.0 or better

7

Marking QuickTime

Apple has created media revolutions. Back in the mid-1980s, they almost single-handedly created desktop publishing by introducing the first consumer laser printer, the LaserWriter. The power of a typesetter came to the top of a desk, laying low a lot of trees in the process, and giving lie to all the hype about the computerized "paperless office" of the future. So nobody's perfect. The point is, the power to create and produce snappy-looking documents became available to ordinary folks like you and me.

Well, Apple's done it again. This time the revolution should spare our forests, because the medium is not the printed page—but the display screen (or monitor). Apple added a new capability to its system software: the capability to manage, merge, maintain, and make manifest many types of information—from still pictures, to animations, to video, to

sound. This software provides a platform of common tools and file formats for a new generation of multimedia software. It's called *QuickTime*. It's almost magic!

Why QuickTime?

The name is easy to explain. Fortunately, in explaining the name, you learn a little about what QuickTime is—and what it isn't.

QuickTime is modeled on an earlier Mac innovation called "QuickDraw." Never heard of it? That's not surprising. QuickDraw is almost invisible. It's part of the operating software of the Macintosh and, as such, is usually of concern only to applications. QuickDraw is so important to the Mac that much of it actually resides within the computer, in a special type of permanent memory called *Read Only Memory* (ROM).

QuickDraw is a set of instructions for producing graphics on the Mac. These instructions are available to any application that cares to use them. That's the key. An application doesn't have to be concerned with, say, how to draw a circle. It just tells QuickDraw it wants a circle of a certain radius, at a certain place, in a certain color and pattern. Poof! QuickDraw puts a circle on the screen, and handles much of the management details. The application concentrates on manipulating the circle, with the actual drawing left to QuickDraw.

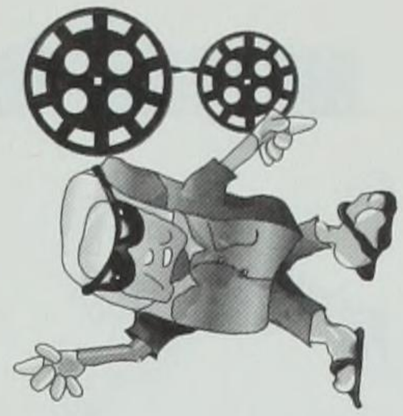
Because QuickDraw is available to all applications, it makes it easy for different applications to share files. Take PICT files, for instance. The objects in a PICT file are really sets of QuickDraw instructions. Any application can pass these instructions to QuickDraw in order to render the PICT file on your Mac screen. Different parts of the file (if any) are isolated and manipulated.

QuickDraw is also fast. Apple has polished and improved it for years. Apple's latest trick was to add photographic quality color, in 32-bit Color QuickDraw. Putting QuickDraw into ROM helped a great deal, since it's now in a predictable, permanent location. The Mac system software accesses QuickDraw's capability in a hurry—without first looking up its location on disk or in RAM.

QuickDraw is at the heart of the Mac's success as a graphics computer. It even had a part to play in the desktop publishing revolution, although not as important as PostScript. PostScript is, as mentioned in the last chapter, a special computer language used to describe printed pages. A printed page is translated into PostScript language commands, which then are passed on to a printer. The printer interprets the commands and produces printed output.

Well, there have been laser printers that rely on QuickDraw rather than Postscript. For a while, it looked like Apple was going to favor QuickDraw over PostScript, but this has





changed. They still produce QuickDraw printers: the StyleWriter and the Personal LaserWriter SC are examples. These printers rely on the Mac CPU to translate QuickDraw commands for them.

QuickDraw served as the model for QuickTime; hence the name. Both are highly optimized and thus "quick." Yet, where QuickDraw is concerned with static pictures, QuickTime handles moving ones, and does so in synchronization with other data types. That's where the "time" part of QuickTime comes in.

Keeping Time

One of the most important tasks assigned to QuickTime is keeping all the different, time-based parts of a multimedia presentation in harmony, while presenting them in a smooth, orderly fashion. QuickTime manages the flow of multimedia information from its home on your hard disk to its destination on your screen and your Mac's internal speaker. Moreover, it does so without you being aware of its presence.

This is an important point. QuickTime is not an application; it's part of your Mac's operating system software. It provides tools for applications, just as QuickDraw does, but the user accesses its capability indirectly. You use QuickTime by using applications that are aware of it and use its tools to help in their work.

Like QuickDraw with graphics, QuickTime provides a set of multimedia management tools that applications share. We divide these tools into four broad categories: system software, user interface guidelines, standard file formats, and compression technology. Each of these are discussed below in turn.

System Software

First and foremost, QuickTime is a **System** extension. You may be familiar with other Mac System extensions. Software that sends instructions to your printer (printer drivers) is one example. The **QuickTime** extension file must be in the **System** folder of your startup disk. The tools and capabilities of QuickTime are then available on your computer when you start up.

The **QuickTime** extension has three parts. The **Movie Toolbox** part of QuickTime provides tools to applications. These tools make it relatively easy for applications to create, edit, and play back QuickTime movies and do so in a standard fashion. This part of QuickTime also is concerned with synchronizing playback of the various parts of a movie. Most importantly, the **Movie Toolbox** is designed to ensure that movies play back

at the same speed, regardless of which Mac created it. A movie created on a Mac IIsi will play back at the same speed on a Quadra 900, even though a Quadra is almost five times faster than the IIsi.

The **Image Compression Manager** part of QuickTime helps to save disk space by enabling QuickTime-friendly applications to reduce the size of the files they create. More about compression later—for now, compression means throwing out redundant data in a file so that the same image is stored in less space. The **Image Compression Manager** handles compressing and decompressing images seemlessly in the background, without you being aware of its existence. You control the type and degree of compression used. Compression can be applied to all kinds of data—from still pictures to moving video.

Finally, the **QuickTime System** extension has a feature that makes it easy for developers to add new functions of their own. Apple calls this feature the **Component Manager**. The **Component Manager** handles software routines that accomplishes all kinds of tasks—from converting video data into computer form, to running hardware components. Hardware manufacturers can plug their products directly into QuickTime by using the **Component Manager**.

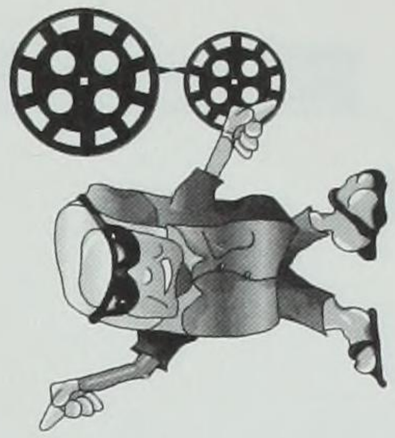
User Interface Guidelines

To make sure everybody is on the same wavelength, Apple published a set of user interface guidelines for QuickTime applications. An application's user interface is its controls and the way they respond to commands from the user. The interface defines how you interact with the application. Apple wants applications to accomplish similar tasks in similar ways. In that way, you, as an end user, don't spend time learning a different way of doing things for every application you buy. Apple provides software developers with the tools to create and manage movies, and tells them how this capability should be presented to the end user. This is one of the few places where you'll be aware of QuickTime at all.

Standard File Formats

As with the PICT file format, Apple is introducing a QuickTime file format to make it easy for applications to share data. The MooV format (see Chapter 6, "Data File Formats") provides a standard way for storing separate tracks of time-dependent data. QuickTime also added to the venerable old file format, PICT, particularly in the area of compression. What's more, QuickTime handles compression and decompression, so that applications that work with PICTs can handle a compressed file, even if compression isn't part of that application.





Compression Routines

Compression is the last important component of QuickTime. Apple provides software to reduce the size of still and moving images, thereby making it easier for other software developers to incorporate compression methods of their own. Apple provides video, photographic, and animation compressors as part of the first wave of QuickTime software. QuickTime is meant to handle compression and decompression, and it does so in real time. This means that compressed images are fetched off a disk as needed, decompressed, and played back, all without slowing down a movie's performance.

Compression is an important point. Without it, QuickTime movies would be huge. The size problem shows up in two ways: increased demands for precious disk storage space, and a slowdown in system speed as vast quantities of data are sloshed around inside your Mac. Compression saves both processing power and hard disk space.

One of the most common compression methods is *Run Length Encoding* (RLE). With this method, large areas of redundant data are represented in shorthand form. Suppose you have a PICT showing a large area of uniformly blue sky. In an uncompressed 24-bit color file, each picture element (pixel) of the sky takes up three bytes. Yet every pixel for the sky contains the same value. In Run Length Encoding, you substitute a special value at the "beginning" of the sky, letting the system know that the following data is in code. Then, specify the value for the sky and how many pixels it covers. The compressed file now says "the following is code: there are xxx number of pixels at this point, all with color number yyy." In pictures with large uniform areas, this type of compression saves a lot of space.

There are other types of compression available, but they won't be dived into here. Suffice it to say that with compression, you can store about ten times as much data in the same amount of disk space. In some cases, the quality of the image is affected somewhat. The amount of quality to sacrifice is generally under your command. Even with compression, you should expect to devote a megabyte of disk space to every ten seconds of video. With luck, you might fit a five minute movie onto a single 44M removable disk cartridge.

Wild Magic

Wild Magic, developed by Apple Computer's French division and not yet commercially available, is a control panel device (cdev). Quite simply, it enables you to cut and paste QuickTime movies into ordinary documents. For example, paste a small amount of footage of your kid into a letter to Grandma. Grandma has to have a Mac, of course. (You can't very well print out a movie and send it through the mail.)

Working some Wild Magic

To activate **Wild Magic**, select it from the **Control** panel. (System 7: Select **Control** panels from the **Apple** menu; double-click on **Wild Magic** (see figure 7.1). System 6: Select **Control** panel from the **Apple** menu. **Scroll** in the area to the left until you find the **Wild Magic** icon; double-click to launch it.)

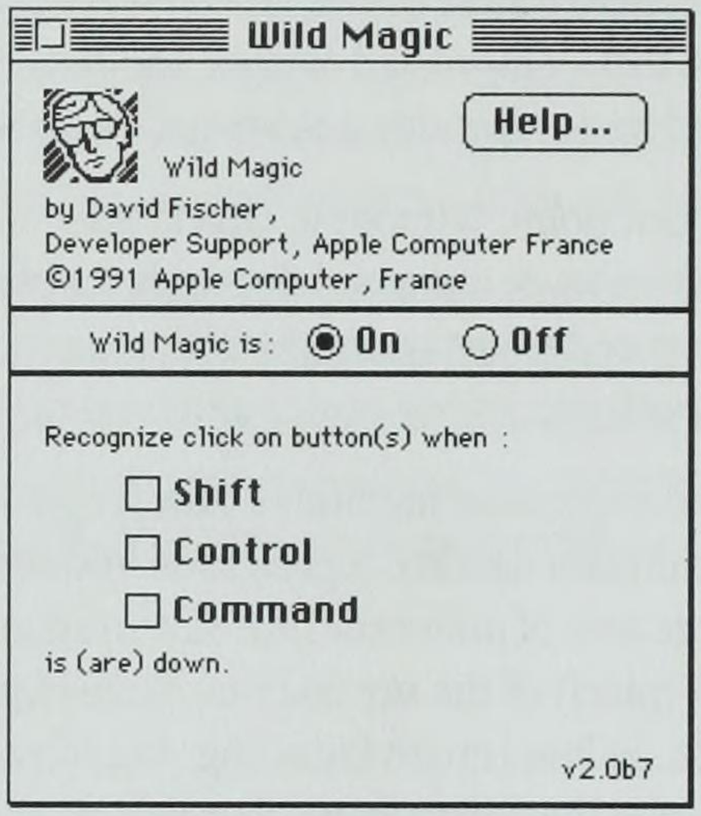


Figure 7.1
The **Wild Magic Control** panel (System 7).

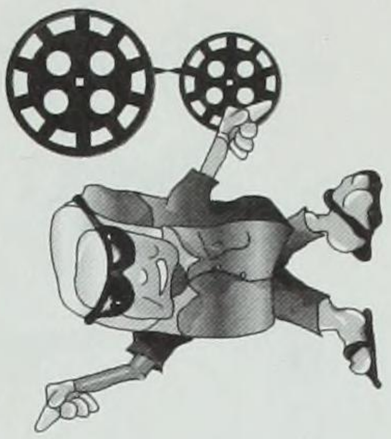
Really, the only choice you have is to turn **Wild Magic** on or off. As for the check mark options, selecting any one of these will mean that **Wild Magic** won't recognize a click on its buttons unless the specified key(s) is/are held down.

With **Wild Magic** on, you can paste QuickTime movies into applications that recognize standard PICT files. Microsoft Word is one example (see figure 7.2).

To play the movie, double-click the **Movie Track** icon at the bottom left. A set of controls appears (similar to those on a tape recorder). The **Frame** icon with the question mark tells you information about the movie itself.



An important note: **Wild Magic** does not actually insert movie footage into a document. Rather, it creates a "link" to the original MooV file from which footage was copied. If you want to distribute a document containing a movie on disk, you have to make sure the movie is on the diskette, and that you select footage from it.



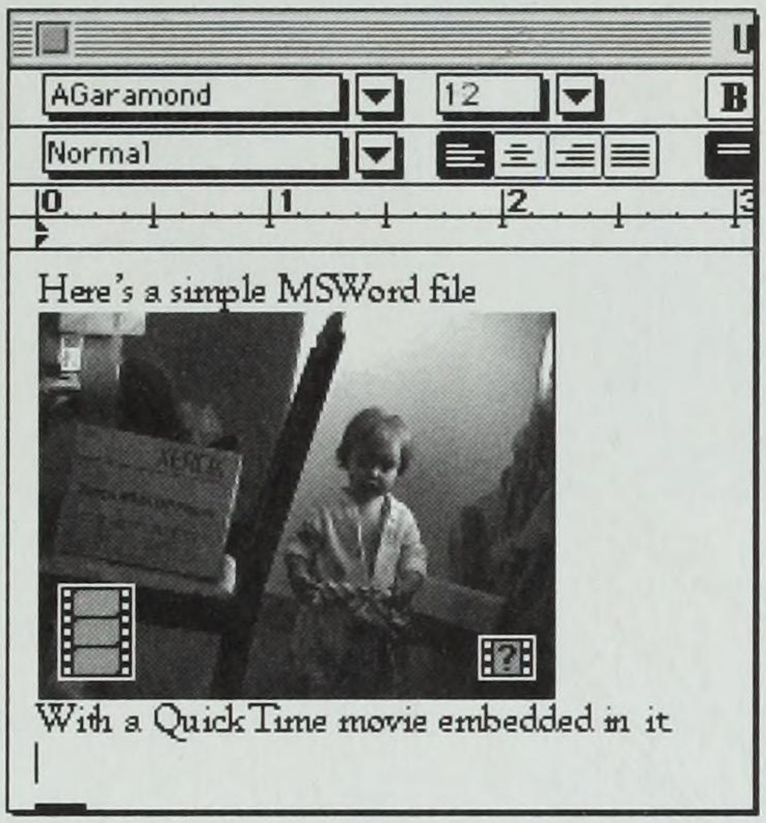


Figure 7.2

Part of a Microsoft Word file, with a QuickTime movie in it.

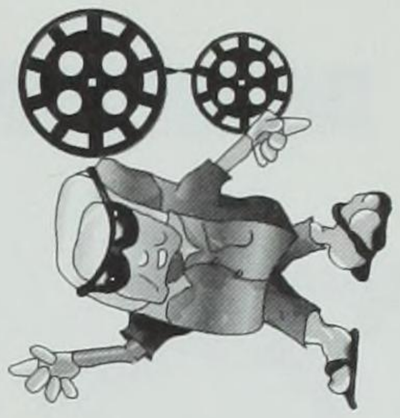
In Conclusion

So that's what QuickTime is about. It's a set of tools, standards, and guidelines for creating, managing, and playing time-based data on the Mac. This data includes animations, video footage, still photographs, and sound. QuickTime's design ensures that all data plays back at the same time and at a constant rate, no matter how fast (or slow, within limits) the machine it's working on. The QuickTime world comprises system software, user-interface guidelines for software developers, a standard file format for movies, and a set of compression routines for saving disk space.

By now, you're probably itching to get to the fun part and start playing with QuickTime. With all the preliminaries covered, we introduce you to specific examples of animation and movie-making on the Mac. Let's go!



CHAPTER



Cool Item Name:	Cool Disk
Disk Size:	1.3M
RAM needed:	4M
Location:	Back of the Book
Mac needed:	Mac with a SuperDrive (reads high-density disks)
System Version:	6.0.7, 7.0.0 or better

8

Using the Cool Disk

The disk packaged with *Cool Mac Animation* contains a small sampler of animation and video files for you, along with the software you need to play them on your Mac. In this chapter, you learn how to install the animations and videos on the disk. Artwork also is included on the disk. You can use this artwork to create your own animations and presentations. *Cool Mac Animation* shows you how. By the way, you should be sitting next to your Mac with it up and running as you read along.

Cool Mac Installation

First, copy the material from the Cool Disk to your hard disk. To save space, the files on the disk are compressed. You need to decompress the files before you work with them. It's really easy.

Before you begin, make sure you have enough room. You need room to hold the **Cool Stuff** file, which holds all the compressed animations, videos, and tools. You also will need room for the material when it is decompressed. It is recommended that you have about 4M of space available on your hard disk when installing the decompressed files.

Presuming your Mac is up and running, insert the Cool Disk into your disk drive. When the **Cool Stuff** icon appears on the desktop, double-click to open it. Drag the **Cool Stuff** icon to the main (root) window on your hard disk. The file copies from the floppy disk to your hard disk. When copying is complete, drag the **Floppy Disk** icon to the **Trash** to eject it. Put the disk away in a safe place in case you need it again.

Now you must decompress the files you've just copied. Double-click the **Cool Stuff** icon. (The file is actually a small application, along with an archive of files.) You then are asked to indicate where you want the files placed when they are extracted from the compressed file; they will extract into a folder called **Cool Stuff**. Leave it at the root level. To proceed, double-click the **Extract** button.

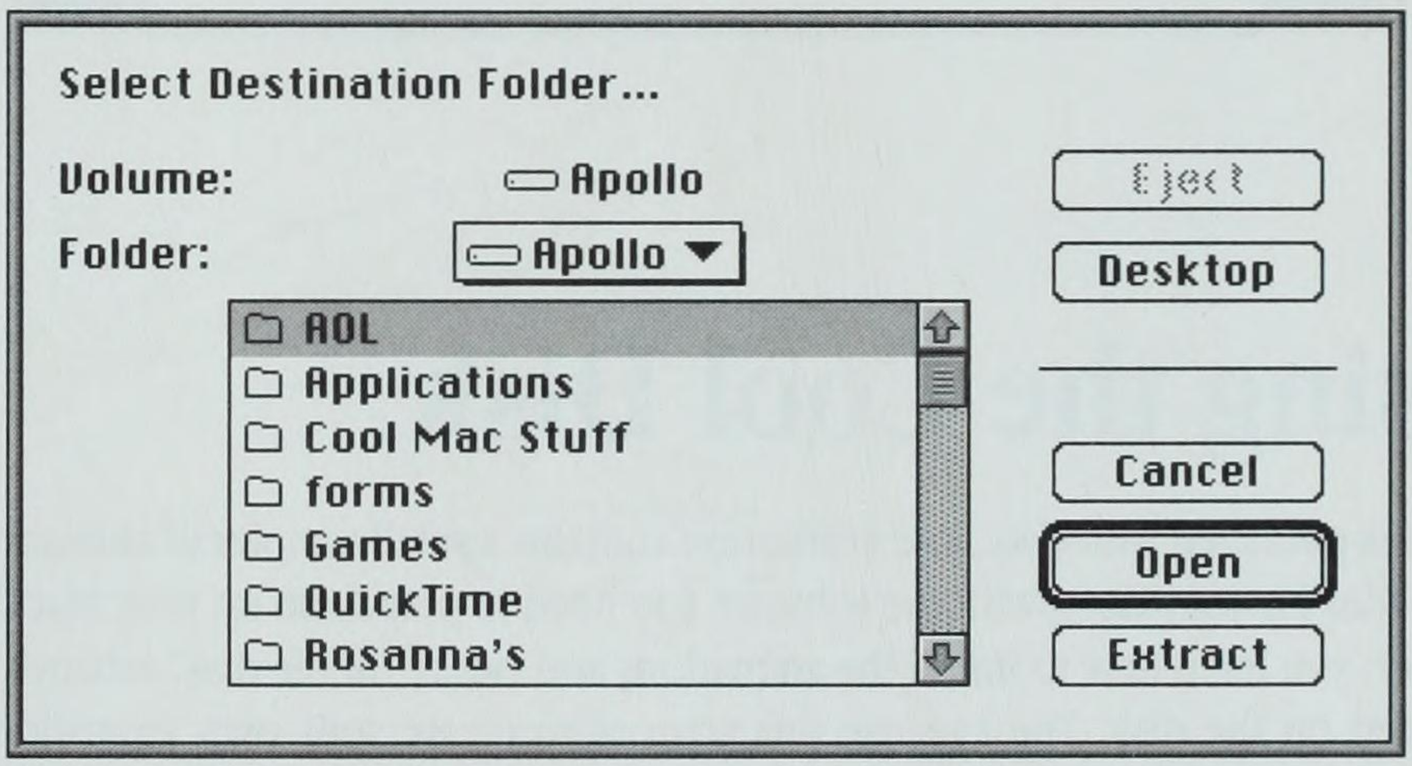
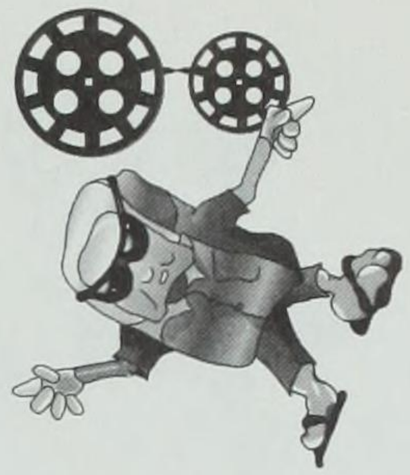


Figure 8.1
Choosing a **Destination** folder for the **Cool Stuff**.

Included on the disk is the **QuickTime** extension. (It is explained it later.) For now, drag both the QuickTime items to your **System** folder. (System 7 will specify that these items should be placed in the **System** folder. Click **OK** to have the System do this for you.)

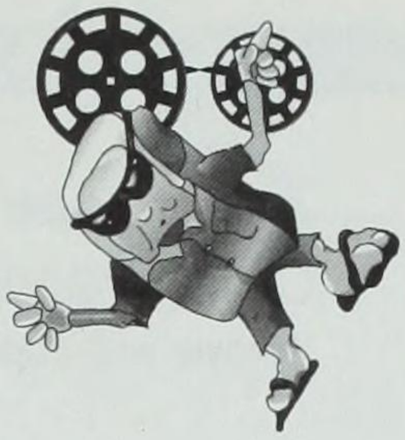


In Conclusion

Now that you have finished the installation of the disk, just look at what you've got! The Cool Disk contains the QuickTime extension you just installed also. The disk features a demonstration version of PROmotion; Popcorn (an application for viewing QuickTime movies); Re-Animator (an application that displays PICS animation files); two short animations ("Guthrie Skates" and "Out of Africa"); and a QuickTime movie entitled "Cool Mac Movie." There are also three PICT files that contain art you can use to make animations. These files are called "Dakota," "Guthrie," and "Home and Yard Background." These files are discussed in the next four chapters.



CHAPTER



Cool Item Name:	Popcorn™
Location:	**Cool Stuff** folder
Size:	81K
Type of Mac:	Mac II series, PowerBook, Quadra (i.e., 68020 CPU or better)
RAM needed:	1M
System version:	6.0.7-7.0.0 or better
Special requirements:	none

9

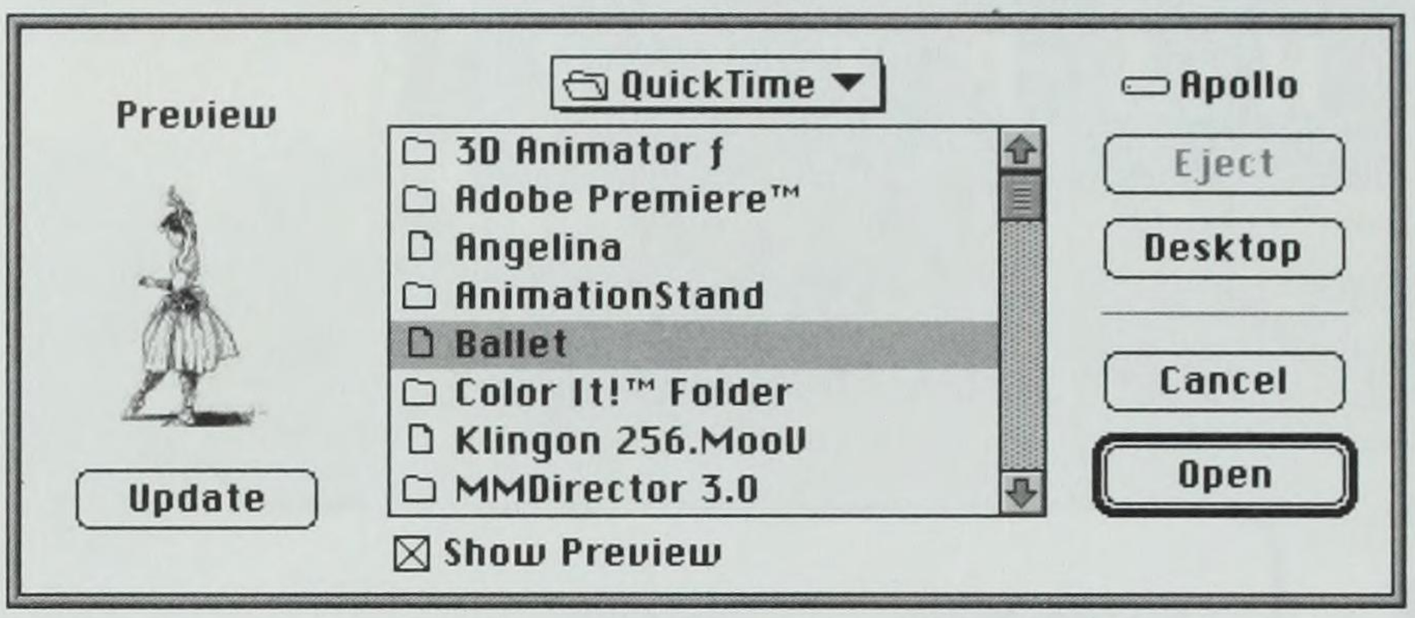
Popcorn™

Aladdin Systems provided the application for viewing QuickTime movies contained on the disk. It's called Popcorn. Using Popcorn, you can examine any QuickTime movie.

Play it Again, Popcorn

To launch Popcorn, double-click **Popcorn's** icon; then select **Open...** from the **File** menu. A small preview of the selected movie appears to the left (see figure 9.1).

Figure 9.1
Opening a QuickTime movie with Popcorn.



After you've selected a movie, click **Open...** to continue (see figure 9.2).

Figure 9.2
The **Open** file dialog box.



A Movie in Popcorn

Click the **Right Arrow** button to play the movie. Click it again to stop. Or, drag the sliding bar to move to a particular frame; drag the bar back to the left to rewind. To select part of the movie for copying to the **Clipboard** (presuming Popcorn is active, and you've selected **Turn Editing On** in the **File** menu), hold down the Shift key on your Keyboard as you drag the bar. Part of the bar goes dark indicating your selection. Choose **Copy** from the **Edit** menu to copy the selection to the **Clipboard**. (Remember: no data is actually copied; only a link is established. This saves space but may cause confusion if you move the file later.) Click the two **arrow** and **bar** buttons to rewind/advance a single frame at a time.



In Conclusion

Popcorn enables you to view QuickTime movies. Not all Mac animations come in that form, though. Some are PICS files, a file type discussed in Chapter 6, "Data File Formats." Re-Animator, an application that enables you to look at these files, is included on the *Cool Mac Animation* disk. It's the subject of the next chapter.





CHAPTER

Cool Item Name: Re-Animator

Location: **Cool Stuff** folder

Size: 18K

Type of Mac: Any Mac

RAM needed: 1M or more

10

Re-Animator

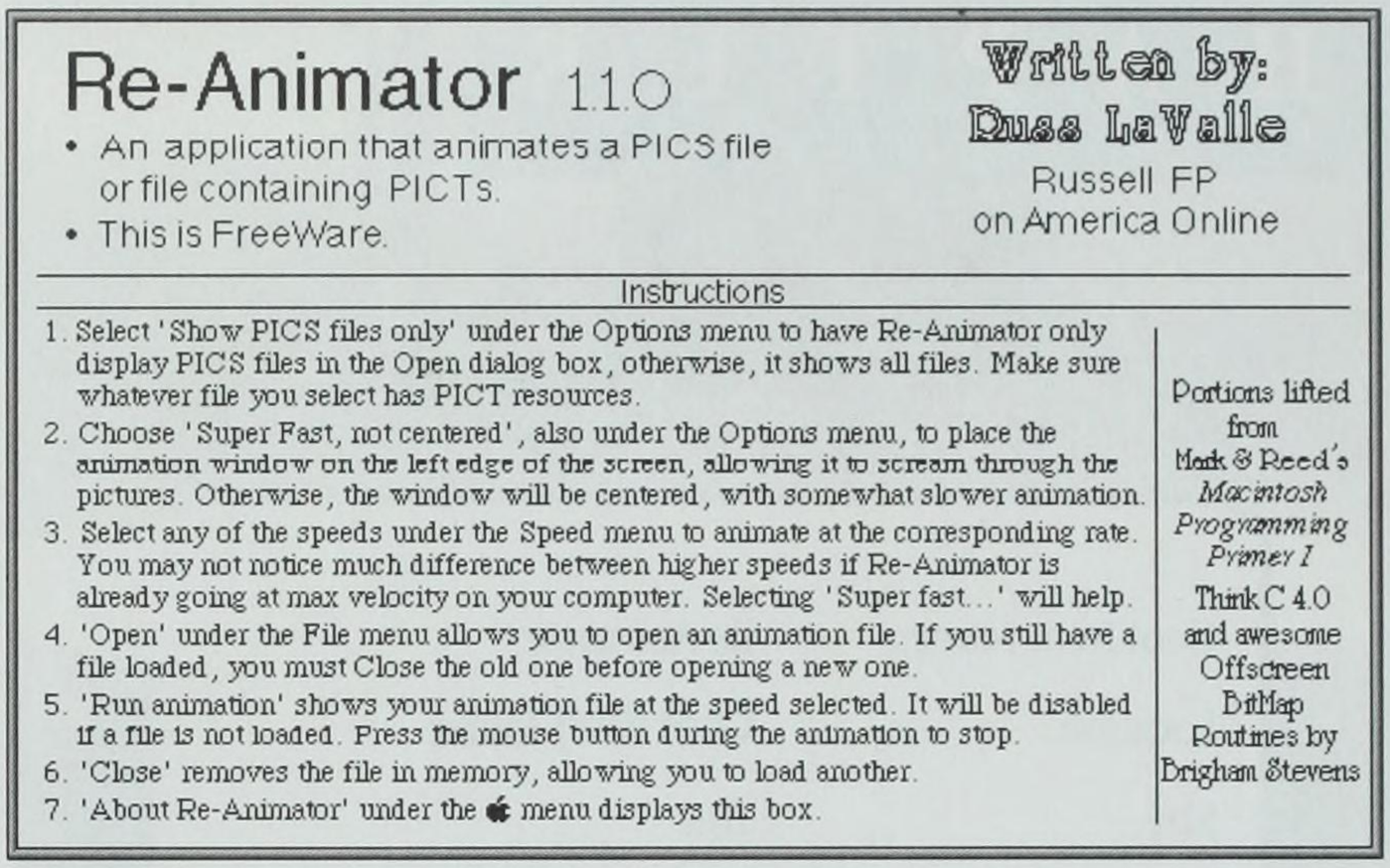
Re-Animator is a simple application that plays PICS files—nothing more. It has the virtue of being uncomplicated, small, and free. Re-Animator was written by Russ LaValle, and is one of the neat things you can find on America Online (an information service that you can access with a modem). Since Re-Animator takes up only 18K of disk space, it can fit easily on a disk with an animation you want to share with a friend.

Animating Re-Animator

When you launch Re-Animator, a sign-on screen appears (see figure 10.1).

Figure 10.1

The Re-Animator Startup message.

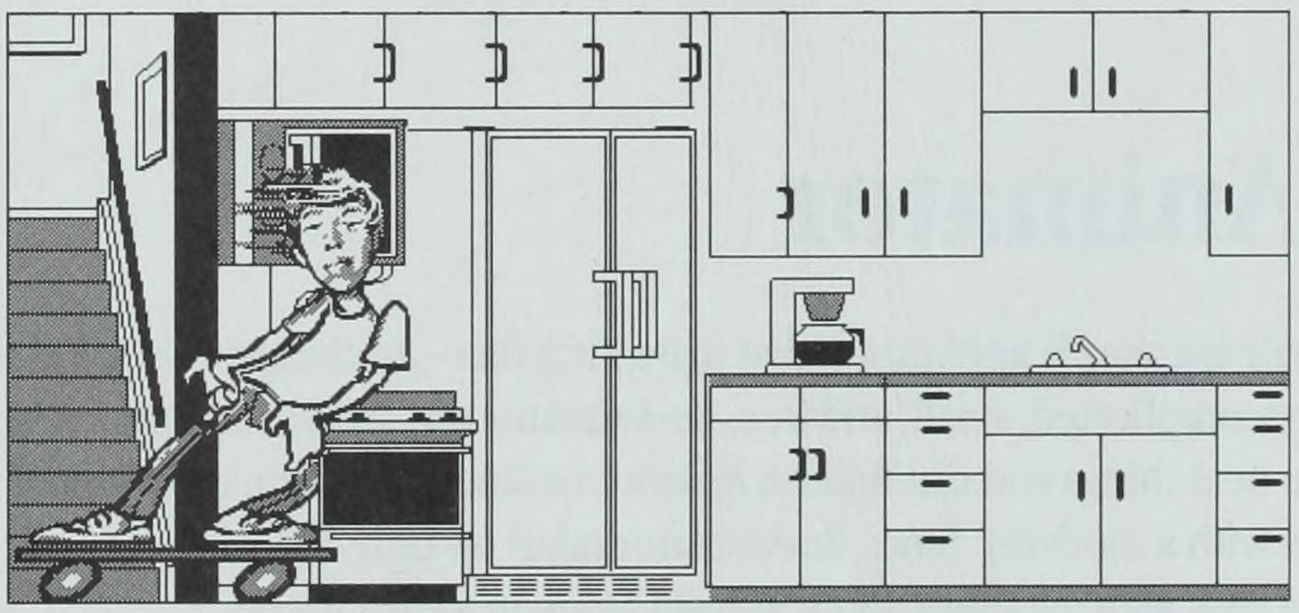


To view a PICS animation file, choose **Open...** from the **File** menu; find the PICS file you want; and click the **Open** button. As Re-Animator reads in the file, you see the frames go past. Set the speed in the **Speed** menu—10 frames per second is a good choice. Then, choose **Run** from the **File** menu. To stop, click the mouse button. Otherwise, the animation loops back to the beginning and keeps playing.

Using Re-Animator, try loading and playing "Guthrie Skates," a PICS file in the **Cool Stuff** folder. "Guthrie Skates" was created using the clip art files included on the *Cool Mac Animation* disk.

Figure 10.2

A frame from "Guthrie Skates," loaded into Re-animator.



In Conclusion

Re-Animator enables you to see the PICS files included on the *Cool Mac Animation* disk. Chapter 11, "PICT FILES: Guthrie, Dakota, and Home & Yard," looks at the clip art included on the disk.

CHAPTER



Cool Item Names:	Dakota, Guthrie, and Home & Yard Background
Location:	**Cool Stuff** folder
Sizes:	130K, 147K, and 158K (435K total)
Type of Mac:	Any Mac
RAM needed:	1M or better
System Version:	4.2 or better

11

PICT Files: Guthrie, Dakota, and Home & Yard

Included on the *Cool Mac Animation* disk is artwork that you can use to create your own movies. If, like me, you're not necessarily the world's best artist, you'll find you can get into animation using the art provided on the disk.

Clipping Along

If you have a paint application that opens PICT files, try opening "Guthrie" or "Dakota" to see what's inside (see figure 11.1).

Figure 11.1

A portion of the "Guthrie" clip art file



Figure 11.1 shows a only small part of the file. You see that Guthrie comes in lots of poses, with lots of pieces. The idea is to cut out the poses you want and assemble the pieces. Take a look at the series of arms near the center of figure 11.1. If you use a different arm in each frame, in sequence, you create the illusion that Guthrie is swinging his arm. I did something similar with Guthrie's "heavy metal hand wave" in the PICS file you looked at earlier. If a rank amateur like me can do it, so can you.



Notice that the artwork comes in black-and-white. It isn't hard to add color. Almost all animation programs have a "flood-fill" option that lets you "pour" a specific color into a bounded area. You have to make sure the area is closed, though! Otherwise, you can end up filling more areas than you intended. More about "closing areas" in Chapter 13, "Creating 'Guthrie Skates' in PROmotion."

By the way, this artwork comes to us from Trici Venola, who holds the copyright. You can use it for your personal enjoyment, but you should include the copyright notice that appears at the bottom of each file. It should appear on the last frame of your animations if they include her clip art. Credit where credit is due and all that!





In Conclusion

The *Cool Mac Animation* disk includes several nifty items to get you started with Mac animation and with QuickTime. The tools to view existing QuickTime movies and PICS animations have been discussed, as well as the artwork that you can use to create animations, without having to actually draw them yourself. Do you want to know more about how to get Guthrie to skate across the screen? Check out the next couple of chapters.





CHAPTER



12

Starring PROmotion

PROmotion is one of the newest entrants in the field of Macintosh animation. Indeed, it was not yet for sale when this book was started, and we had to content ourselves with sampling a "beta-test" version. For those who don't know (but still care), beta-test is a phase of product evaluation where a product works well enough to let it out the door into the hands of strangers, but isn't reliable enough to sell. The idea is, let people use the software, and find out what wrecks it. Then you fix all the problems and sell it. We're glad to report we had almost no trouble with the version we evaluated.

The people who make PROmotion are promoting it as more of a multimedia tool that simply an animation-creator. This is probably marketing. The former market is a professional one; the buyers are business people with money (not their own) to spend. As

for "mere" animation, that's a recreation market, with less sales potential. We've noticed that just about all the animation products are headed toward multimedia land.

Still, we think of PROmotion as an animation tool, because that's where it's strengths lie. It doesn't hurt to have a little bit of multimedia functionality available. It's especially nice to have QuickTime compatibility. PROmotion will save animations as QuickTime movies; we think that's a major plus. PICS files are O.K., but you can't put sound into them. You can do that with QuickTime.



The best thing about PROmotion is that a version of it is included free on the *Cool Mac Animation* disk that comes with this book. The demonstration version of PROmotion has all the features of the regular, for-sale version, with one exception: You can't save your animations as PROmotion files. You can, however, save your animations as QuickTime movies.

The PROmotion Interface

Launch **PROmotion**, get past the ubiquitous startup screen, and choose **New Animation...** from the **File** menu, and you'll see this:

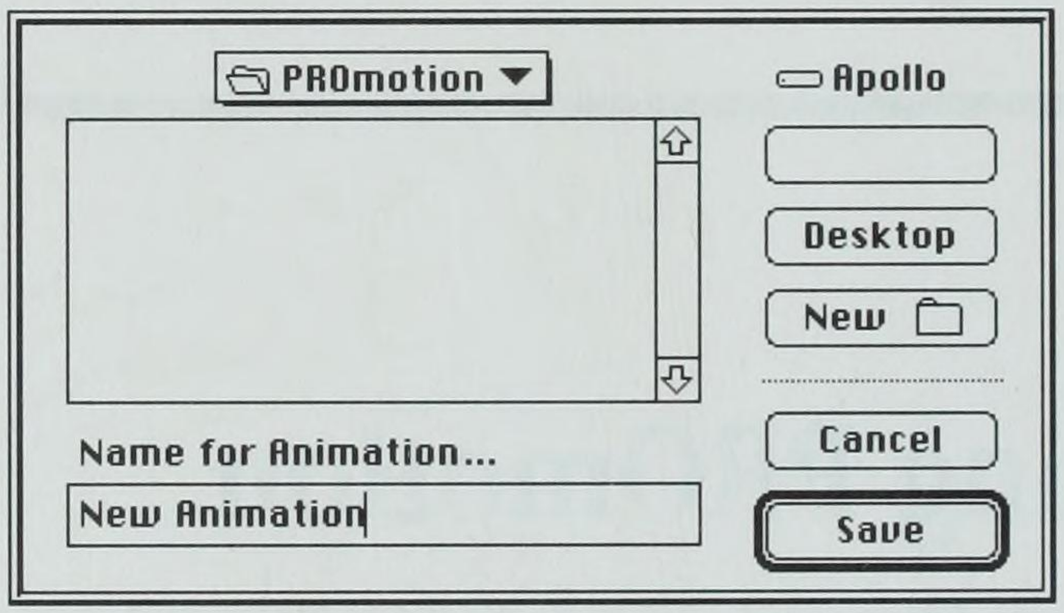


Figure 12.1
Creating a **New Animation** file in PROmotion.

This is just the regular **Save** dialog box, nothing surprising here. When you click **Save**, the real PROmotion stands up, as shown in figure 12.2.

For the sake of clarity, the tool palette was moved onto the top of the animation window in figure 12.2. The animation window is where you place graphics, and drag them around until you have the desired orientation. The animation window is also where you create *paths*. A path tells a specific graphic element how to move; I used a path to make Guthrie slide across the screen in "Guthrie skates." Using paths, you can make still graphics move—like Guthrie.



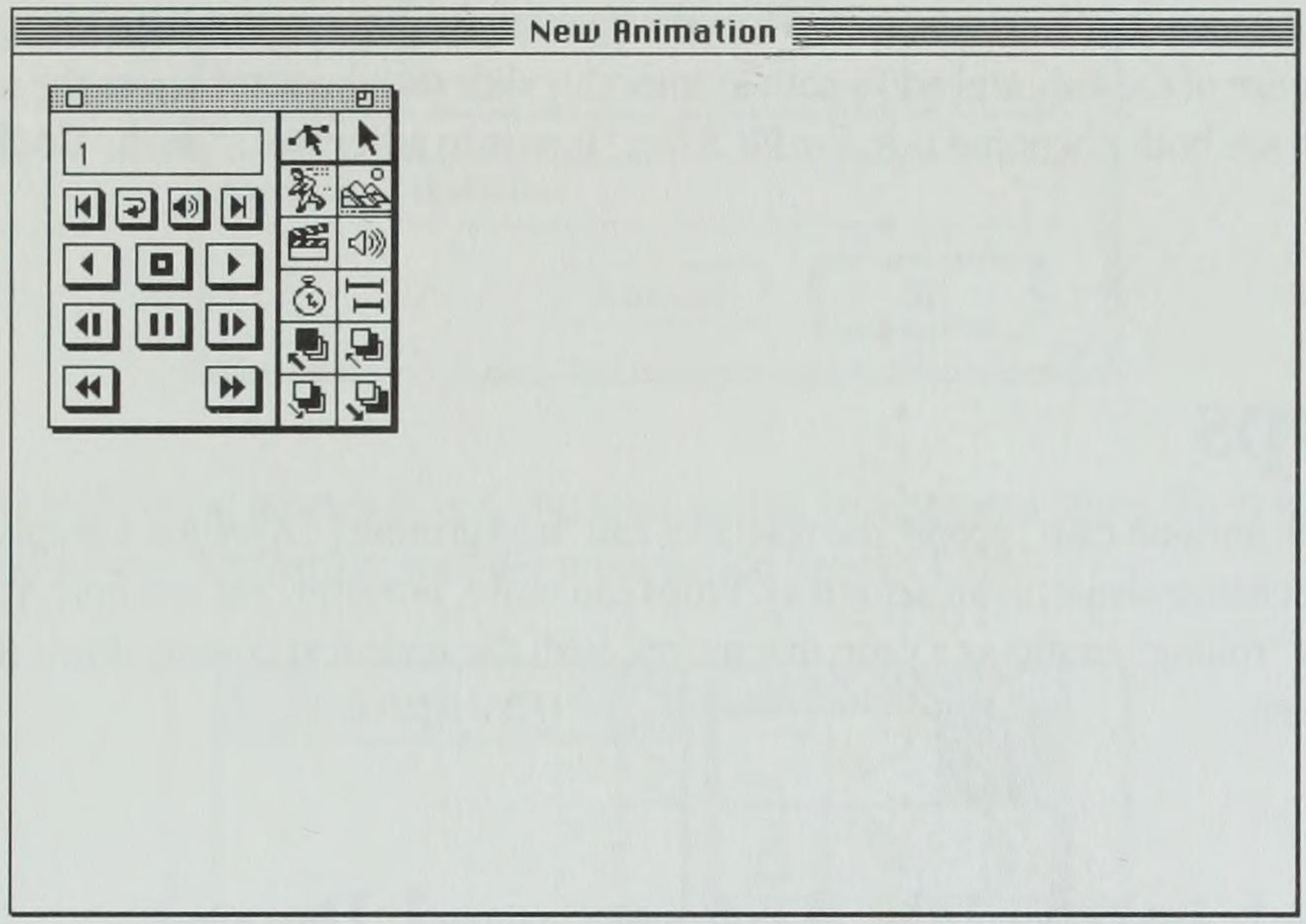




Figure 12.2
PROmotion's **Animation** window and **Tool Palette**

The *tool palette* gives you access to many of PROmotion's features. You can create paths for an object, move objects, insert characters, use backgrounds, and other nifty tasks using the buttons at the right. To the left, you'll see a *frame counter* that shows your current position in an animation, and buttons that enable you to play and rewind your animation, and a button that will advance your animation frame-by-frame. These buttons are labelled like—and work in the same manner as—a tape recorder.

Before these controls are covered in more depth, however, a couple of important concepts warrant discussion. In PROmotion, as well as in other animation packages, you won't hear much talk about characters and backgrounds. Instead, PROmotion refers to them as "actors" and "props." Since PROmotion's main capability is manipulating actors and props, each of these elements is discussed in more detail below.

Actors

The concept of "actor" isn't hard to figure out. An *actor* is an animated character. It consists of, at least, one graphic-filled frame or "cel." It can consist of more than one cel, of course. By constructing an actor made of many cels, you create the illusion of movement. Note that in this case, "move" means "change shape." Waving an arm is an example of *shape-changing* movement. This kind of movement is distinct from translational motion where an actor changes position on the screen. This kind of motion involves using paths. Even a one-cel actor moving across the screen can use a path. If you want

the character's legs to move, however, you have to do both: add cels to change the appearance of the legs, and add a path to smoothly slide the character across the screen. You can see both phenomena in the PICS file, "It pays to advertise...," in the **Cool Stuff** folder.

Props

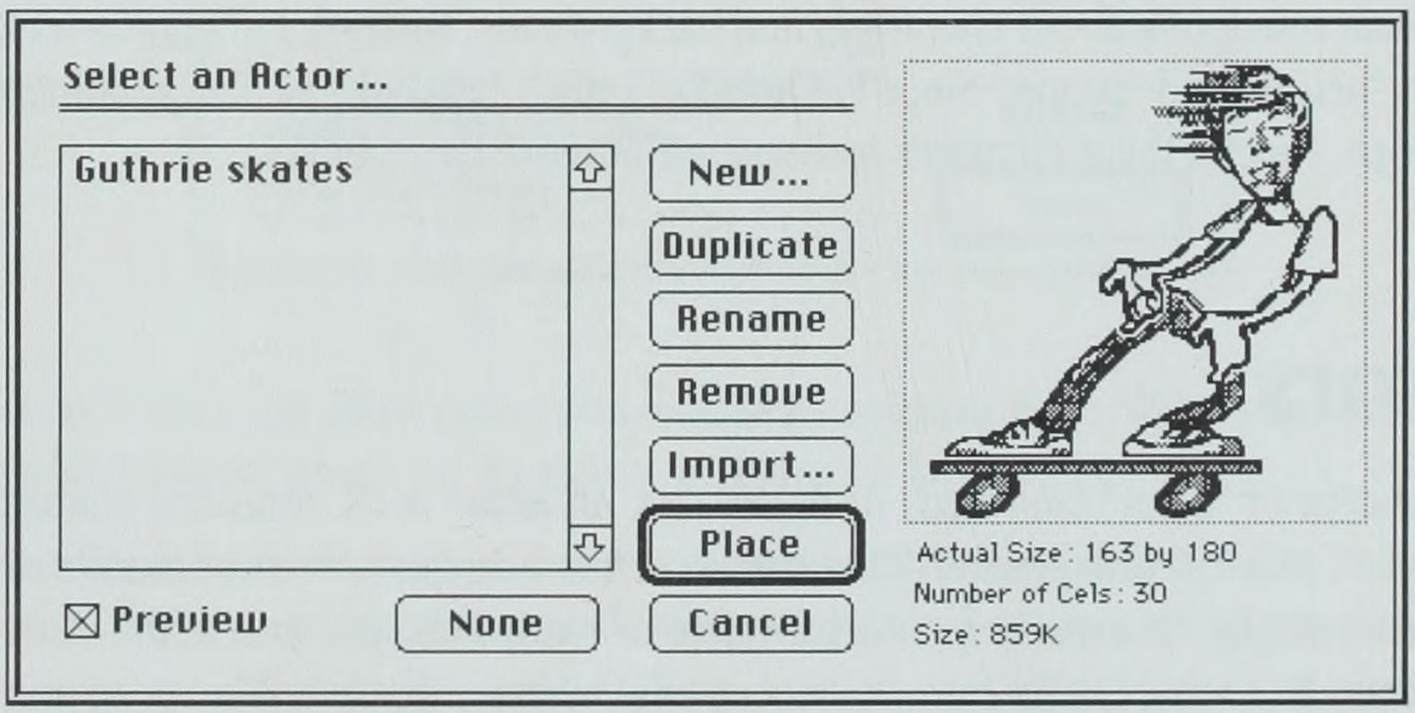
What PROmotion calls "props" the rest of us call "backgrounds." A *prop* is a graphic that doesn't change shape, as an actor may. Props can move, however. For example, you can think of "rolling" credits as a prop that moves, with the static text coming down (or up) the screen.

Working with Actors and Props

Creating new actors and props is fairly straightforward in PROmotion, even more so if you have ready-drawn artwork at hand. To use an actor or prop, you must first bring it into your animation document. You can think of the resulting collection of actors and props as the cast of your movie. The first thing you must do is sign on the cast. When everybody is on board, then you can start bossing them around.

To bring an existing or new actor into an animation, click the **Tool Palette** button that has a little running guy on it; it's in the second row down, to the left (see figure 12.3).

Figure 12.3
Working with Actors in PROmotion.



The actor **Guthrie** is already there, as you can see. To create a new actor, click the **New...** button at the center top of the dialog box. Now the screen changes and prompts you to name your actor (see figure 12.4).



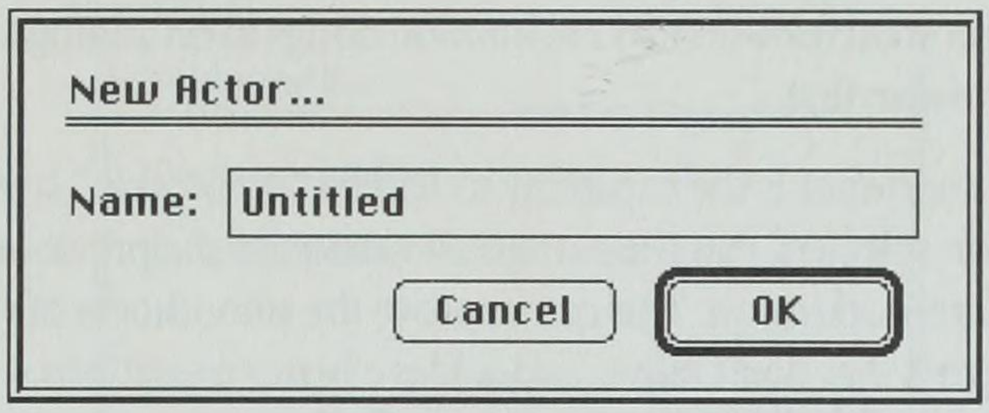


Figure 12.4
Giving a **New Actor** a name.

Like the Hollywood moguls of old, you must give all new actors a name. Then you click **OK**, and go one step further into the process (see figure 12.5).

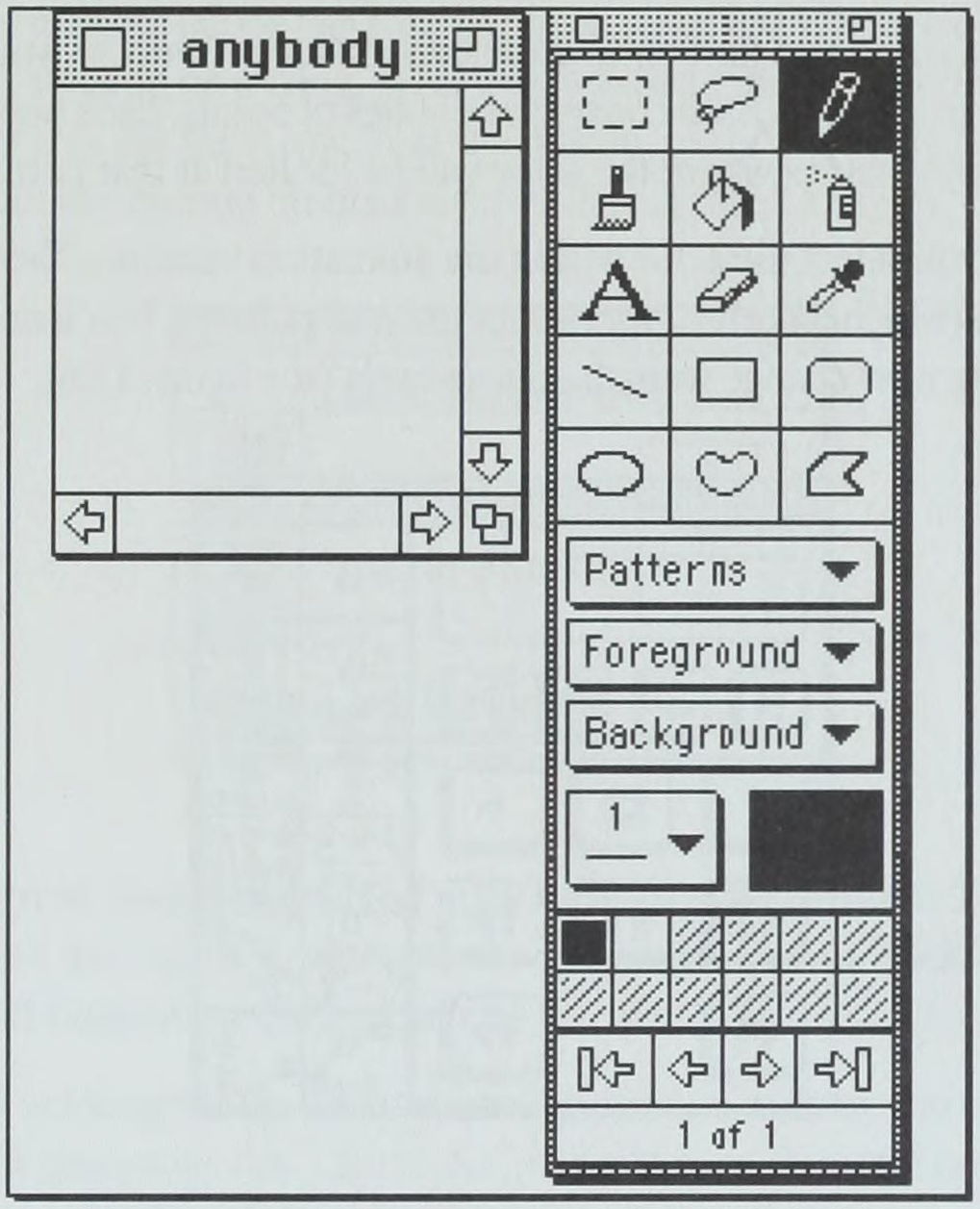


Figure 12.5
Cel window and **Paint Tool Palette** for creating an actor in PROmotion

All actors start out as a single cel. When you want to add more cels, there's an **Insert Cels** command in PROmotion's **Edit** menu. You move among cels using the buttons at the bottom of the paint palette. The leftmost button takes you to the first cel; the rightmost button takes you to the last. Use the center two buttons to advance or rewind one cel at a time.

You can draw each cel by hand, or you can bring in graphics from elsewhere via the **Clipboard**. That's how Guthrie was animated, but more about that later in the chapter.

There are some important features that PROmotion brings to cel editing and actor motion that deserves discussion first.

Perhaps the most important is the capability to add an "onion skin" layer to the current cel. With this option selected, you see a dimmed version of the previous or next cel just behind the cel you're working on. This can improve the smoothness of your animations, since you line up parts that don't move, and achieve better transitions with parts that do move. You find **Onion Skin** within PROmotion's **Options** menu.



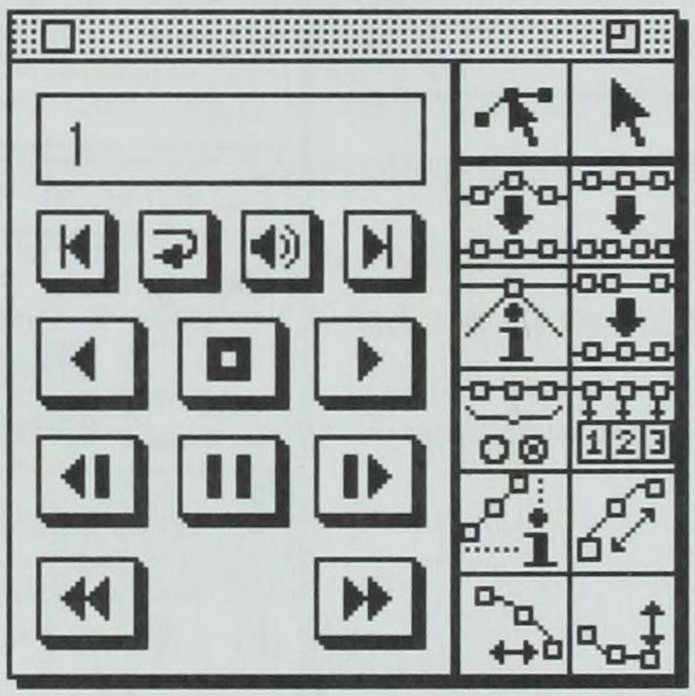
After you've animated an actor to your liking, place it within the animation window. You can edit the actor and add to its repertoire at any time: simply double-click on him. To move him around in the animation window, drag with the mouse.

Finally, you may want to add motion to an actor's abilities. To do so, you must create a path for the actor to follow. A *path* consists of a series of points. Each point corresponds to a frame. The point shows where the actor will be located at that particular frame.

To create a path, you select the actor within the animation window. Then, you click the **Path Tool** button (which is at the upper left of the tool palette). You'll notice that all the tools in the palette now change to path editing tools (see figure 12.6).

Figure 12.6

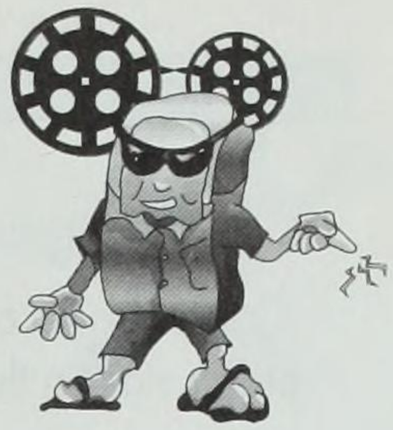
PROmotion's **Path Editing Tools**.



Adding point to a path is simplicity itself; you click in the animation window at each place you want a point. Actually, if you want your actor to move smoothly, you need place only two points: a beginning and end point. You then can add extra points with one command, by clicking the **Scale Path Tool** (see figure 12.7). It's in the second row, to the right. The icon now shows a path growing from three points to four.

Enter the total number of points you want and click **OK**. It's best to have the same number of path points that you have frames in your animation.





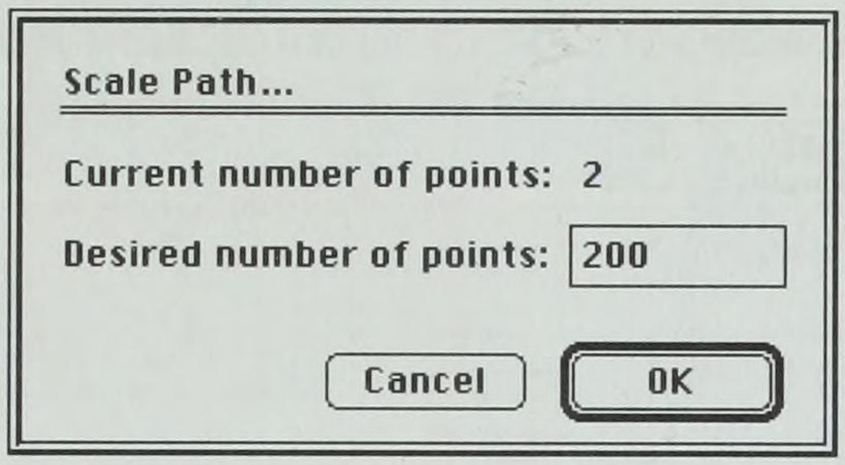


Figure 12.7
Adding points to a path.

Another handy path tool, the Path/Frame tool, enables you to associate a specific cel of your actor with specific points in the path. This way, you synchronize motion. You also cut down on the number of cels you have to create, since you can re-use cels for repetitive motion, such as walking or waving. (This tool was used in the Guthrie animation.) The Path/Frame tool is in the third row from the button, to the right. Click it to see what cel is associated with the current animation frame (see figure 12.8).

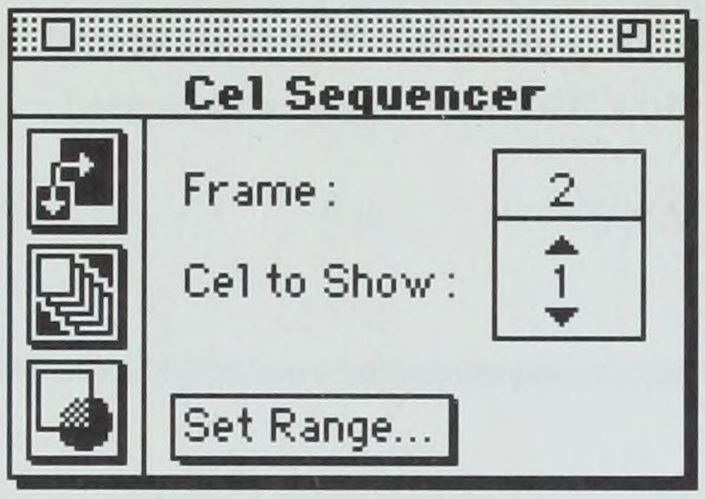


Figure 12.8
Synchronizing an actor's cels to animation frames.

You see the current frame and the cel currently associated with it. To change the cel number, click on the up or down arrows. To change frames, click the single frame **advance/rewind** buttons on the tool palette.

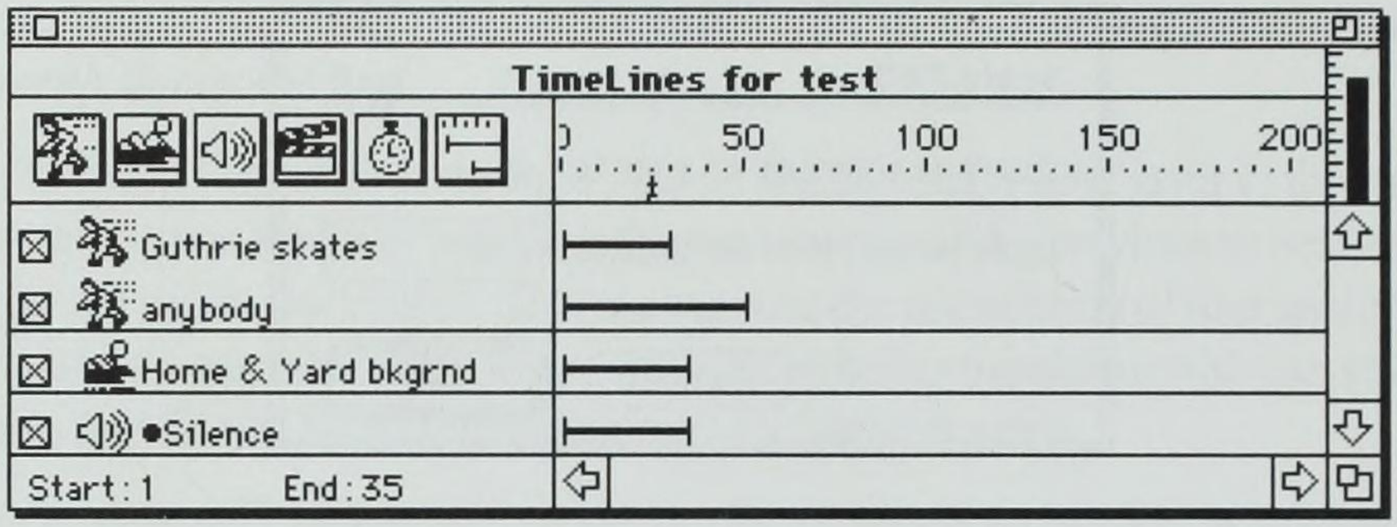
The controls for working with props are virtually identical to those you use for actors. The only exception is that props don't have cels; they just "are." You still can have them slide around on the screen, though.

One more useful tool for manipulating actors and props is the timeline tool. It gives you control over how long each remains in the animation window. The timeline tool is in the tool palette; it's the forth one down on the right. A timeline looks something like figure 12.9. How a timeline looks is influenced by the actors and props present.

Notice the bars to the right of each listed actor/prop. These show the frames that they're visible in. Drag the end points of the bars to change the values.

Figure 12.9

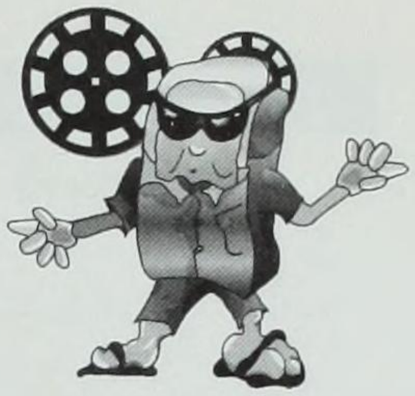
Controlling an actor's or prop's stay on the screen



In Conclusion

PROmotion has loads and loads of features. (Many more features than can be discussed in this book, even if we devoted the entire book to PROmotion. The PROmotion users' manual has approximately 200 pages itself.) Indeed, there are other fish to fry. Our goal was to show you enough to get started with PROmotion. Every PROmotion tool that was used to create the simple PICS animation "Guthrie Skates" was discussed. The next chapter describes exactly how "Guthrie Skates" was created.





CHAPTER

Cool Item Name:	Guthrie Skates
Location:	Cool Stuff folder
Size:	110K
Type of Mac:	Mac II series, PowerBook, Quadra (i.e., 68020 CPU or better)
RAM needed:	4M
System Version:	6.0.7, 7.0.0 or better

13

Creating "Guthrie Skates" in PROmotion

Yours truly is a rank amateur when it comes to drawing. Here's the good news! Clip art is a godsend. Let someone else, someone talented, do the actual drawing. You put the pieces together. It's the graphics equivalent of Lego blocks. That doesn't mean that animation is really, really easy. It's just not really, really hard, especially if you use clip art—like the files found in the Cool Stuff folder.

Animating Guthrie: Setting Up

First, as nice as PROmotion is, it doesn't have all the tools needed to assemble characters from clip art. If you try importing a clip art file directly into a cel, you end up with the whole sheet. Then you have to cut out everything you don't want. Kind of like the instructions for carving an elephant out of marble: "Take a large block of marble, and hack off everything that doesn't look like an elephant."

Ideally, you have a simple paint application, like SuperPaint, PixelPaint, or Color It. The application doesn't need to be fancy, either. (The primary tool you need from these applications is the *Lasso*, a selection tool.) Open and examine the **Guthrie** PICT file in the **Cool Stuff** folder. Notice all his pieces are crammed very tightly together. This means more pieces; it also means more trouble. It's difficult to select only the parts you want. That's where the lasso comes in!

Using the **Lasso**, you "draw" around the piece you want, and then copy to the **Clipboard**. (Don't select **cut** or you'll mess up your original file.) You then paste it into a neutral location (a separate window of the same paint program is ideal). Repeat this process until you isolate the pieces you want for your animation. Save the result as a new file.

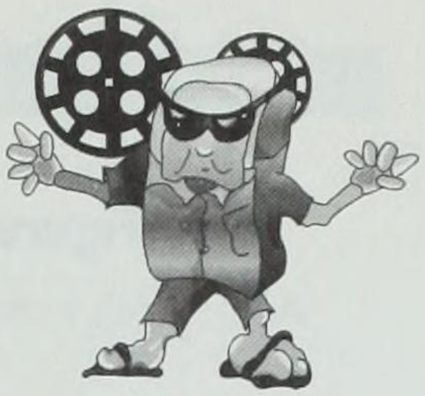
Here's where it is handy to have lots of RAM. Ideally, you have your animation application (say, PROmotion) and your paint application running at the same time so you can move between them quickly. Assemble the pieces in the paint program; lasso them; and copy to the **Clipboard**. Now switch to PROmotion and paste the results into a cel.

Catching the Wave

So much for the overview. Here's how it really happens with Guthrie. Start with a very simple "story." Guthrie skates across a background and waves as he gets to the middle of the screen. That's it. Skating is easy—just create a path across the background. Waving isn't hard, either. Actually, using the *cel sequencer* —a feature of PROmotion that enables you to assign cels to frames—you need only three cels: one for plain motion, and one for each position in Guthrie's wave action. (Sounds like surfing, which Guthrie probably wouldn't object to, either.)

First, go to the paint application and isolate the parts you need. Copy the entire picture of Guthrie on his skateboard and the two alternative arms that can be used to make Guthrie wave.





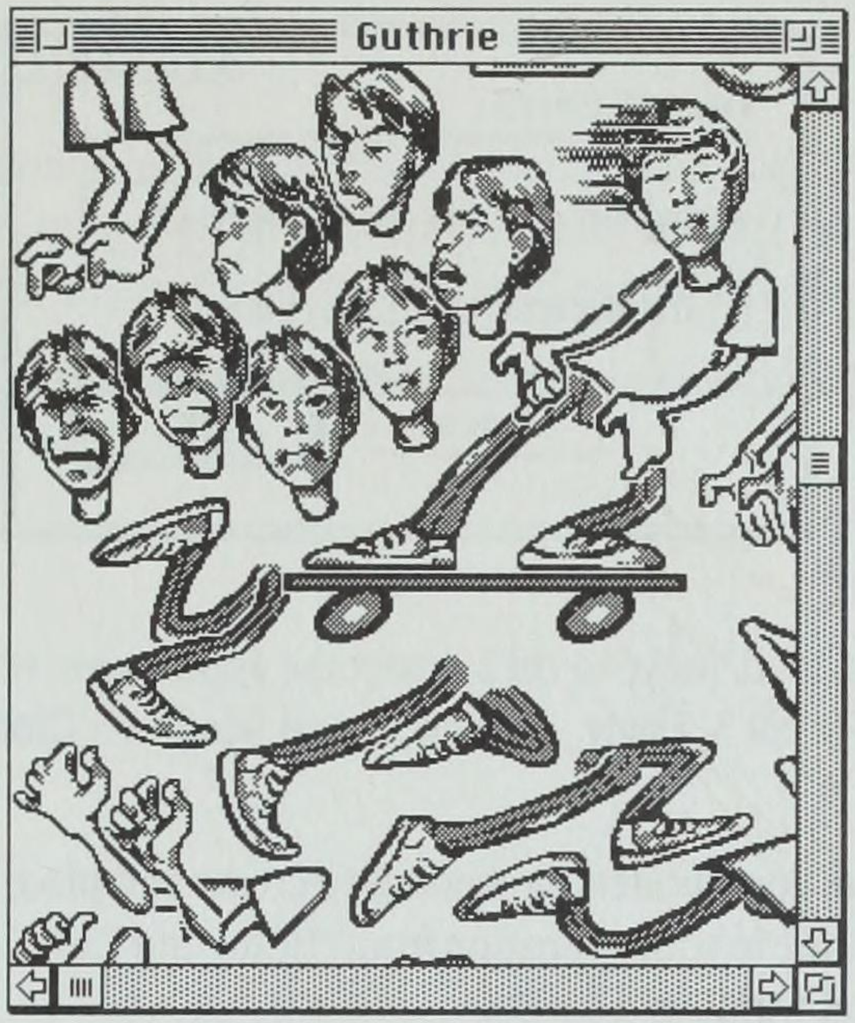


Figure 13.1

Parts of Guthrie used to create "Guthrie skates," (upper right and lower left).

The easiest place to assemble Guthrie's three cels are in the paint file.

1. Make three copies of Guthrie on his skateboard. That's easy enough: select Guthrie with the lasso, copy, and paste twice.
2. Erase his old arm. (You will have to redraw the part of his jeans that was obscured by his arm when it was at his side.)
3. Now lasso a new arm and move it into place.



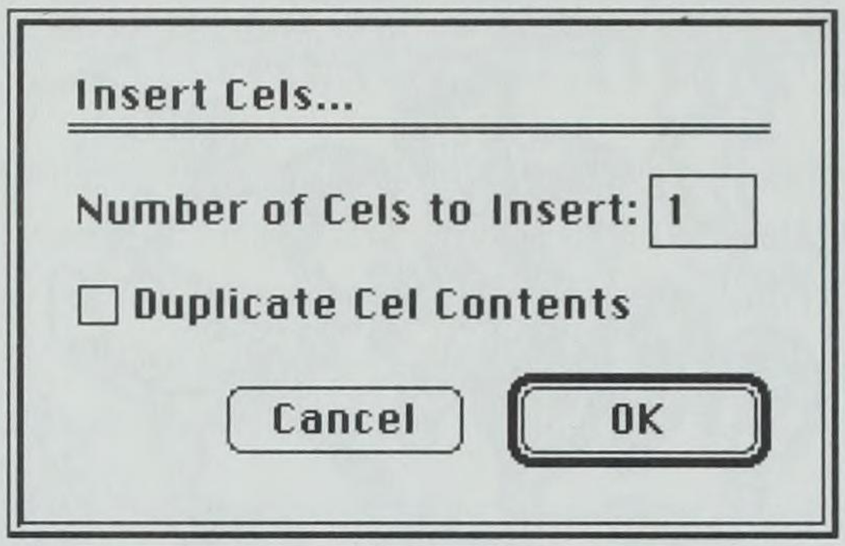
There's one last thing to do before moving Guthrie into PROmotion. Look closely: not all of the lines used to draw Guthrie extend all the way. For example, his arm doesn't connect with his sleeve. There's also a leak at both shoulders. These leaks have serious implications. PROmotion thinks that a "leaky" area isn't a real shape, so it ends up being transparent. If these leaks are not fixed, the kitchen background shows through his tee-shirt. Several of Guthrie's lines require a "touch-up."

To make Guthrie an actor, open the **New... actor** dialog box (see figures 12.4, 12.5), give the actor a name, and click **OK**. The cel window opens. Switch back to your paint application, select the first version of **Guthrie**; copy him to the **Clipboard**; switch back to PROmotion; and paste him into the **Cel window**. Select **Insert cels** from the **Edit** menu to add two more blank cels (see figure 13.2).



Figure 13.2

Adding cels to an actor.



With two more cels added, move to cel 2; insert the appropriate version of Guthrie; and repeat the process for cel 3. Lastly, click on the cel window's **Close** box and save your work.

Use a similar, but less complicated, procedure to create and place the background. Cut out what you want to use in your animation from "Home and Yard," and paste it into place in the PROmotion cel window.

Now, addressing Guthrie's movement across the screen, about three seconds of action sounds radical. At ten frames per second, this means 30 path points. Define the beginning and ending points of Guthrie's path, and then scale the path up to 30. To do this, click the **Path Tool**, click once in the main window to set the beginning and once more to set the end of the path. Now click the **Scaling Tool**. Type in **30** in the dialog box that appears, and click **OK**.

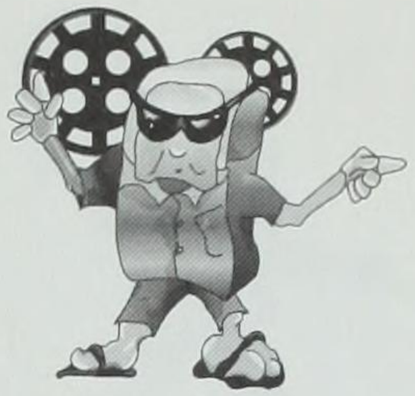
Now it's just a question of associating the correct frame with each point. The first ten and the last ten frames are set to cel 1. The middle ten frames are set to either cel 2 or 3, as appropriate. Use the cel sequencer to set both frames 11 and 12 to cel 2, frames 13 and 14 to cel 3, frames 15 and 16 back to cel 2, and so on.



Remember: The default length for a PROmotion animation is 200 frames. Guthrie doesn't require that much action. So, use the timeline tool to restrict the background to 35 frames, and Guthrie to 30. To compile your PICS file, choose **PICS...** from the **Export Pop-up** menu, (itself within **PROmotion's File** menu). PROmotion ignores all but the first blank frame.

That's all you need to do to put Guthrie on his skateboard.



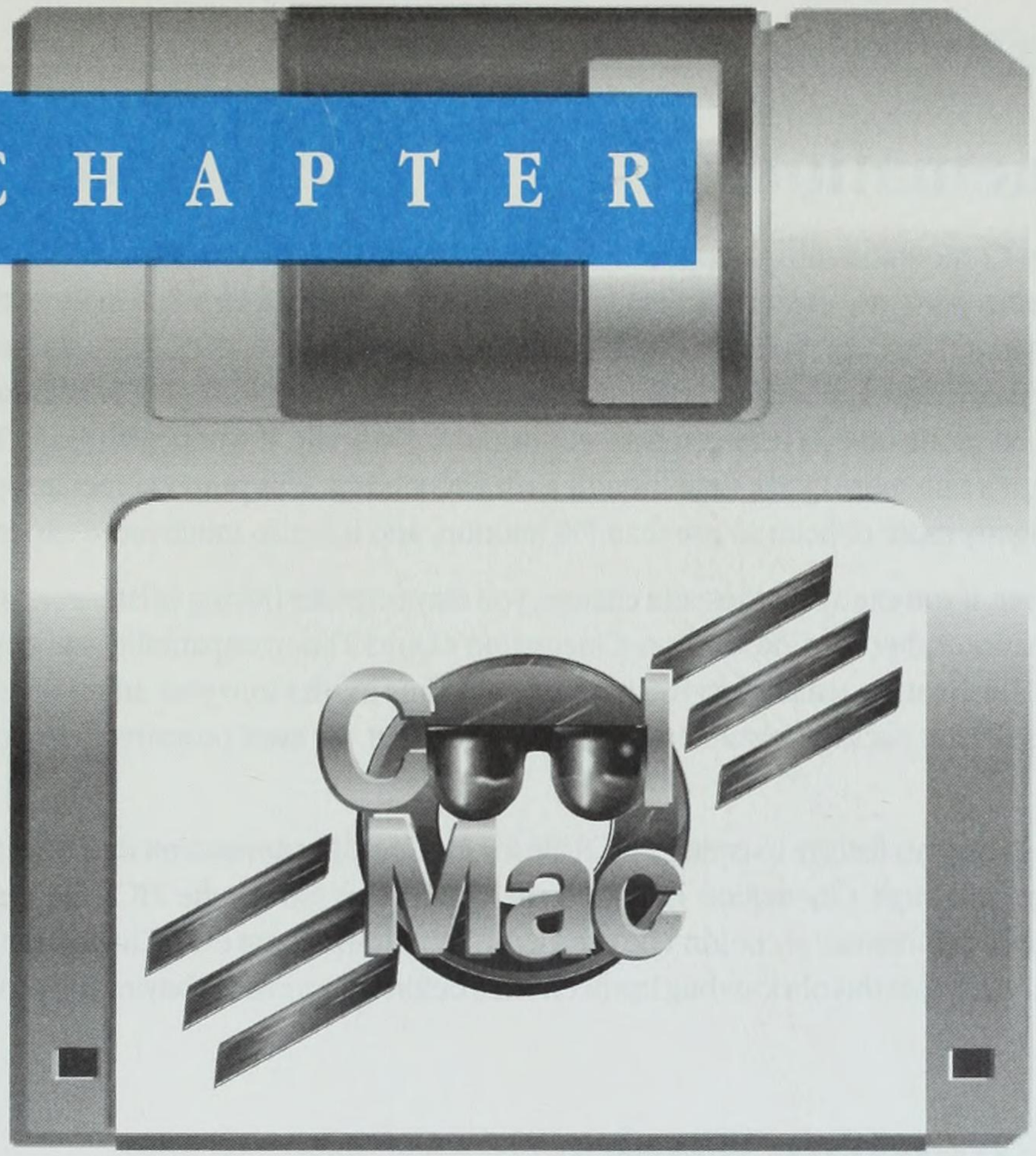


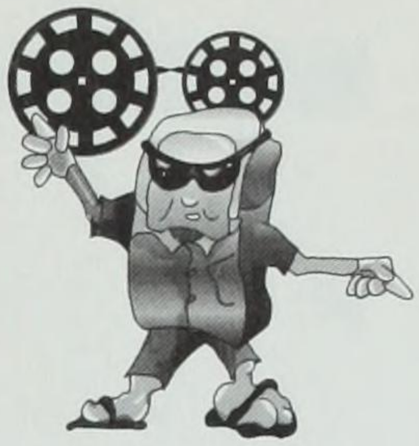
In Conclusion

Using the clip art provided in the **Cool Stuff** folder, you can make animations considerably more elaborate than Guthrie on his skateboard. Try adding Guthrie's brother Dakota for example. Take time to investigate the clip art files and imagine the possibilities.

That wraps up the tour of PROmotion. There are other animation programs out there—covered briefly in the next chapter.

CHAPTER





14

Other Animation Software

There are other animation software packages not covered in *Cool Mac Animation* that you can choose from. Unfortunately it's beyond the scope of this book to go into much detail, but a few of the brighter stars are discussed.

ADDmotion

Motion Works, creator of PROmotion, sells a separate package for adding animations to HyperCard stacks. (See Hayden's *Cool Mac Stacks* for more HyperCard goodies.) It's called ADDmotion and it's very similar to PROmotion. You can share actors and props between the two applications.

Cinemation

Vividus Corporation sells an application called "Cinemation." It's similar to PROmotion, but some parts are better implemented, and it has more features. For one thing, Cinemation "watches" you move an object in order to record its path. Thus, to have an object move across the screen, you just drag it where you want it to go. Cinemation can scale and rotate objects between two set positions. Naturally, it works with QuickTime. In fact, it's a bit more QuickTime-friendly than PROmotion. This power comes at a price. It is slightly more difficult to use than PROmotion, and it is also much more expensive.

However, if you can spare the extra change, you may consider buying (a later version of) Cinemation rather than PROmotion. Cinemation's QuickTime compatibility may come in handy. Cinemation actually lets you import QuickTime movies into your animations. (No other software package I evaluated enables you do that. Or even purports to let you do that.)

I tried to use this feature to create a PICS file for the *Cool Mac Animation* disk's zoetrope footage. Although Cinemation imported the QuickTime movie, the PICS file that exported from Cinemation couldn't be used by any application; not even Cinemation. You should verify that this obvious bug has been fixed before you consider buying the product.

Animation Works

At the low end of the scale, there's Animation Works from Gold Disk. I did not evaluate this package, but someone must think highly of it, since it won the *MacUser* magazine Editor's Choice award for 1992's best animation program. It's said to be easy to use. It has the further virtue of being the least expensive of the products mentioned here. QuickTime support appears to be nil, but that may change.

Animation Stand 2.0

At the very high end, there's the professional program called "The Animation Stand" from Linker Systems. The current version has a list price of $2,000. I've looked at a demonstration version and, frankly, it scares me to death. I've heard that you really have to like to draw to make the most out of this product. Rumor has it that a consumer market version may be on the way, at a considerably reduced price. Keep your eyes open.



In Conclusion

Well, that about does it for our look at animation software. Those who don't care for drawing may feel a little left out. Never fear: There's more to Mac multimedia than animation. In fact, a really easy way to make QuickTime movies on your Mac is with a video camera and a Video Spigot. What's a Video Spigot? Read on and find out.



CHAPTER



Cool Item Name:	Video Spigot card, with ScreenPlay operating software
Sold by:	SuperMac Technologies
Type of Mac:	Mac II series, Quadras, LC
RAM needed:	4M for Screenplay application
System Version:	6.0.7, 7.0.0 or better
Special Requirements:	QuickTime installed

15

Capturing Video

There's an industry joke about that saint-to-be, Mother Theresa. At the end of an interview, a journalist asks her what she would have done if she hadn't become a nun. She replies that she can't imagine doing anything else. The interviewer presses her for an answer; so, she thinks for a minute and at last replies, "Well, I've always wanted to direct."

Who hasn't? Most of us dream of being in the movie business, either in front of or behind the camera, perhaps both. The rise of (relatively) inexpensive video cameras, (also known as camcorders), gives many of us the chance to act out our movie fantasies. We also have taken a lot of footage of Aunt Mable Jean at the family 4th of July picnic. Well, who said everything has to be art . . ..

Actually, those odd clips of family moments are closer to becoming art than you might think (presuming you own a Mac in addition to your camcorder). There's a new generation of QuickTime-compatible hardware and software that makes it really easy to film, edit, and assemble your very own QuickTime movies. I sampled the very best of this stuff recently and it was a blast.

Introduction

Video footage—when you get down to it—is just information. Computers are information processing tools. So, computers ought to be able to process video; they can, but it takes extra hardware. The video signals interpreted by your monitor, for example, are not the same as those that create a television picture. You need something that translates between the two data types, turning ordinary video signals into something that a computer can work with. *Computer-ready data* is called *digital data*. Computer-ready data consists of numbers—digits if you will (like digits in a phone number or bank balance). Digital video uses digital values which are used to record facts about a picture: the color of each picture element, for example.

Devices are available on the Mac market to turn video signals into digital signals and have been for several years. There are two problems with them. One, they tend to be very expensive, out of the reach of the ordinary Mac user. Also, they don't all produce compatible data. It is not always easy or even possible to use captured video data in applications. What's more, Macs only recently acquired the processing power it takes to handle the copious amounts of data that digital video requires, without the addition of expensive accelerators.

Along comes QuickTime, and the compatibility and power issues are largely addressed. As discussed in Chapter 7, "Marking QuickTime," QuickTime provides a standard format for time-based data in movies, on the Mac. Movies can contain video, sound, and animation, all moving in synchronization with each other. Second, QuickTime offers compression capabilities that reduce the amount of data needed to produce pictures. This means less computing power is needed, as well as less storage space.

Pour Video into Your Mac

Among the various first hardware products to take advantage of QuickTime is SuperMac Technologies' Video Spigot card. The Spigot, with its associated software program, **ScreenPlay**, takes a standard video signal from any video source—camcorder, VCR, what



have you—and translates it into digital data that is stored on your hard disk. You play back this data on your Mac as easily as you play back a tape. If your Mac has a built-in microphone, you can capture sound directly from a video source, and store it with the video data.

Turning On the Spigot

The Spigot is very easy to install and operate; but please be aware that Spigot has its limits. You are limited by the amount of data you can capture. At most, you can create video movies with about one-fourth the number of pixels that there are on a standard TV screen. As a practical matter, you'll probably want to settle for less. Full-frame video takes up an absolutely prodigious amount of storage, even after it's been compressed. It's more common to create movies that are about one-fourth a frame per side, meaning they take up just 1/16th the storage space that full-frame video would. Even these can exceed 100K per second.

Also, the Spigot is a one-way device. Video information flows from a video source to your Mac, but not the other way. So you can't use the Spigot to record movies from your Mac onto video tape. Unfortunately that technology is still expensive and difficult. But give it time.

Otherwise, the Spigot is a great little toy and I do mean "toy." It's hard to imagine doing professional work with it. You may capture video to incorporate into presentations. You could use the Video Spigot to capture "live" backgrounds for animated characters. You also could capture people, animals, etc., to "trace over," making animated characters out of them much the way Ralph Bakshi does. But you won't use it to win the next Grammy for "Best Music Video." Although you may use it to make a rough draft of that video... Hmmm. That guitarist brother-in-law of mine, what's his phone number again...

Installation

How you install the Spigot hardware depends on your Mac. The Spigot comes in two versions: one to fit the processor direct (PDS) slot on IIsi's and LC's, and a NuBus version for all other Macs. The Spigot manual does a good job of explaining the process, with illustrations yet! A few words of warning:

TURN OFF your Mac's power before you begin. Leave it connected to its power source, however. This grounds the computer and prevents damage from static electricity.

GROUND YOURSELF before you touch anything. You do this after you open your Mac CPU's case, by touching the power supply cover. (It's the metal box behind the hard disk drive.)

HANDLE CAREFULLY everything you touch. Don't try to force the Spigot card into place: you can crack the circuit board and ruin the card.

SAVE THE PACKAGING that your Video Spigot comes in, just in case disaster strikes and you have to send it back.

With the hardware installed in your Mac, you have one more task. You need to copy the operating software to your hard disk. Copy the **Video Spigot extension** file to your **System** folder. If you haven't installed QuickTime yet, do so. Copy the **ScreenPlay** application(it's on a separate disk) to a convenient place on your hard disk. Restart your computer.

Setting Up

With the Spigot installed, find the single RCA connector at the back of your Mac, where you have installed the Spigot card. Use a standard audio/video patch cord to hook this connector to a video source. A patch cord is used to hook your CD player to your stereo receiver, your VCR to your television monitor, and so on. If you're connecting a camcorder, you should have the relevant connecting cable already; odds are it came with the camera, and lets you record from your camera directly to your VCR. You now can use it to record from your camera to your Mac.

You also may want to hook up audio if your Mac is so equipped. Most new Macs have a provision for an audio jack; usually your microphone is plugged into the slot. However, if your Mac came with an RCA adaptor for this jack, you plug the adaptor into the microphone slot, and then plug the relevant audio patch cord into the adaptor. The cable for most camcorders has RCA jacks for both audio and video, each clearly labelled.

By the way, if you're connecting a camera, you'll find a tripod very useful. Most camcorders take a standard camera tripod. You may also want to plug the camera directly into its AC power adaptor, to save on batteries.

This done, you're all set to begin making Mac movies.

Operating the Spigot

The Video Spigot card is controlled by SuperMac's **ScreenPlay** software application. Launch **Screenplay** to display **ScreenPlay's Video Controller** (see figure 15.1).



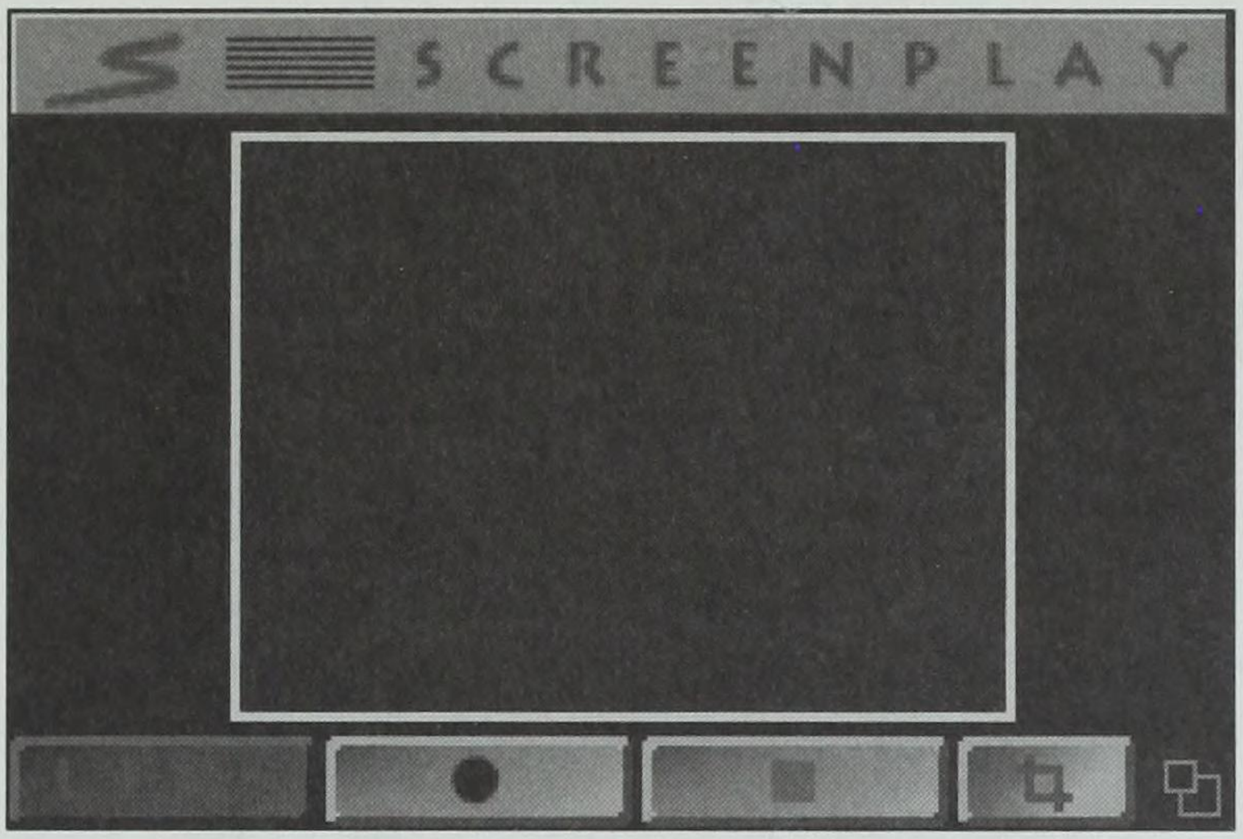


Figure 15.1
The ScreenPlay video controller.

To see "live" video, turn on the video source, and click the **Live** button (see figure 15.2). You may need to press the **Monitor** button on your camera, or one similar to it. Use the button that shows you what the camera is pointing out, without actually recording anything.

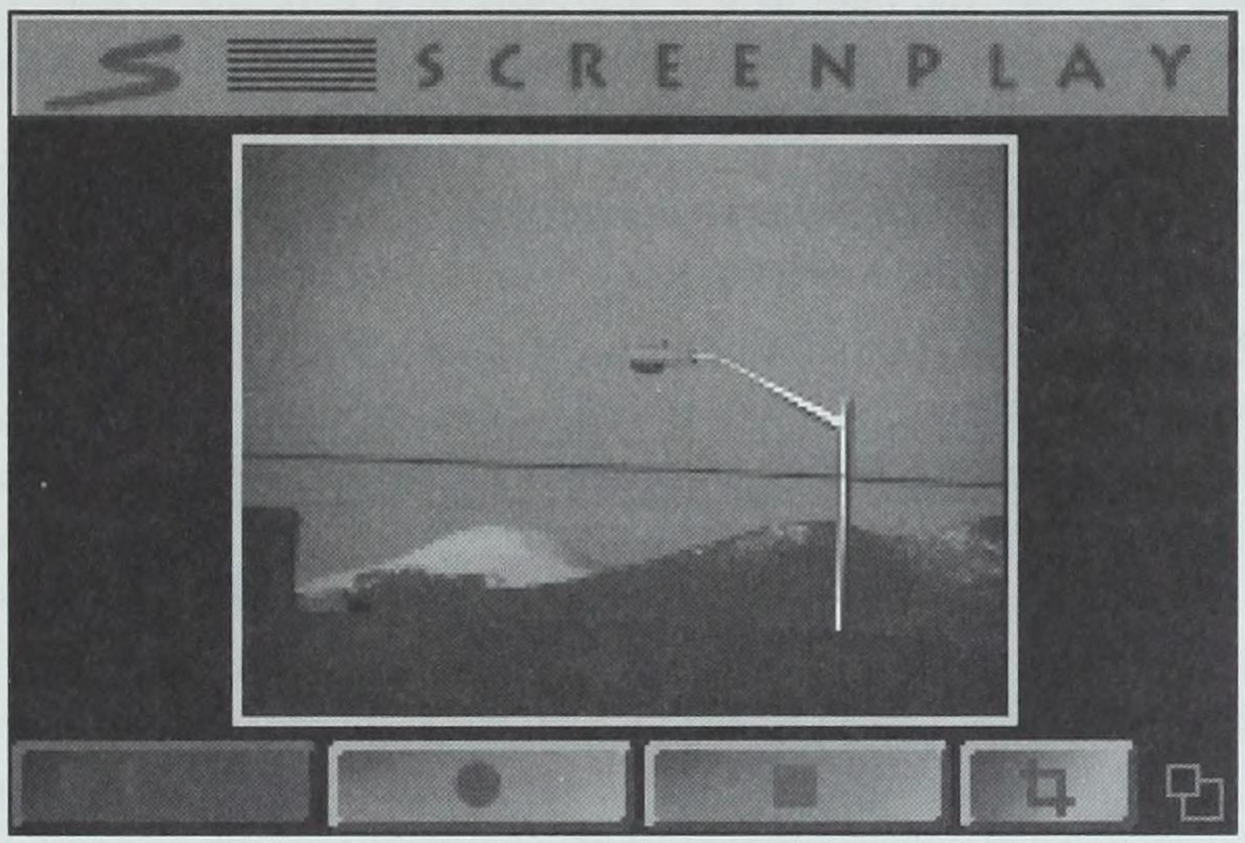


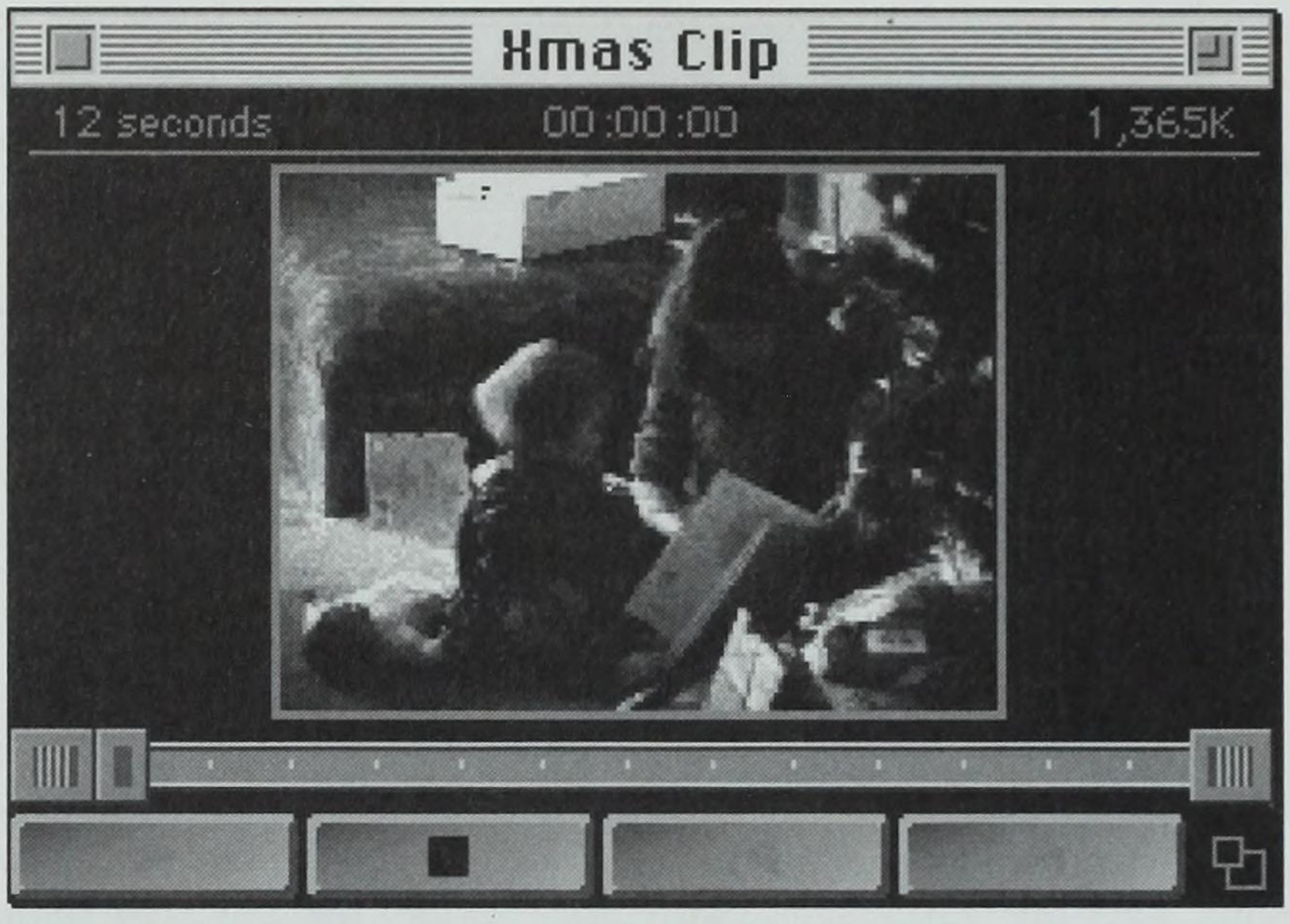
Figure 15.2
A peek at the mountains outside my office window.

At this point, **ScreenPlay** shows you the view from your video source, but it isn't recording. To record, click the second button: the one with the circle on it. A new window appears and video data records to your hard disk. Click the third button (with the square), to stop recording. The video footage recorded appears in a playback window (see figure 15.3).



Figure 15.3

A short movie made from recorded video.



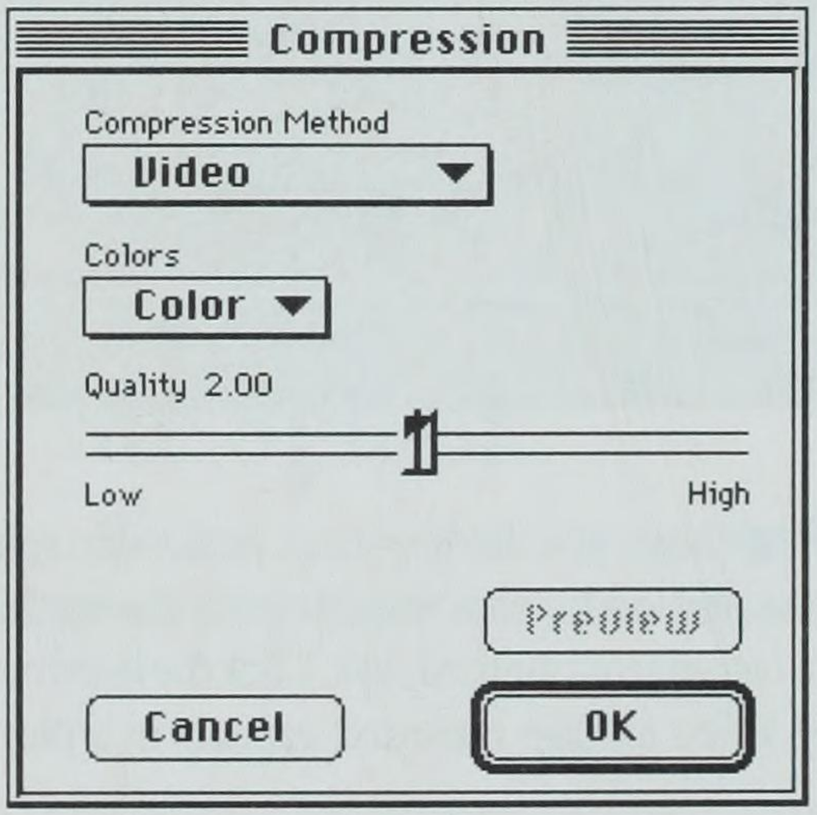
To play the movie, click the **Play** button at the bottom left. Click the button next to the **Play** button to stop. The other two buttons advance or rewind frame-by-frame.

The sliding bar above the buttons lets you move to a particular frame. The *editing thumbtabs* at either end control the beginning and end points of the clip before you save it. This lets you "cut off" unwanted footage.

ScreenPlay has several options for saving video clips. In the **File** menu you'll find the **Compression...** command, which enables you to control how much you compress the images (see figure 15.4).

Figure 15.4

Controlling compression in **ScreenPlay**.





Choose the compression method you prefer from the pop-up menu. Move the slider to set the amount of compression. This shows up as "quality," but remember that lower quality equals higher compression, and vice versa. Click **OK** when you're satisfied.

You change hue and brightness settings using the **Color...** command in the Spigot menu. These are similar to the controls on your TV set. One bar controls how green or red the picture appears, the other controls color brightness.



The Spigot also captures single frames as PICT files. You control this option, (among others), using the **Preferences** command in the **Spigot** menu (see figure 15.5).

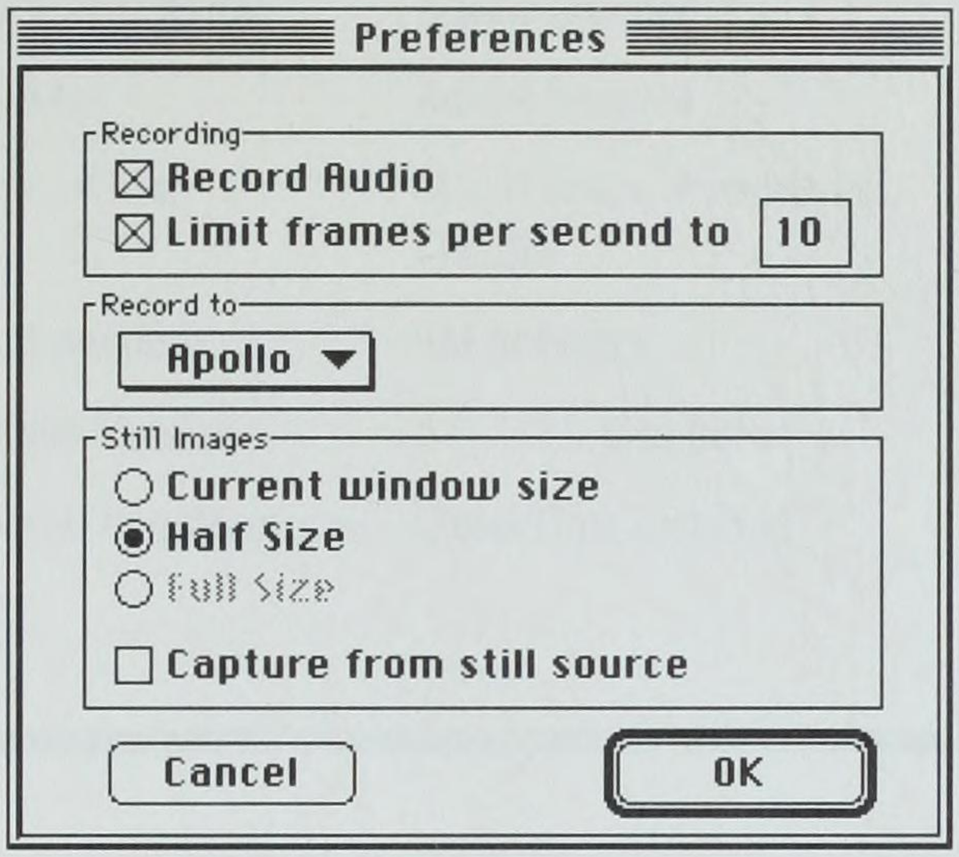


Figure 15.5
Controlling **ScreenPlay** preferences.



Now, you decide whether to record audio, and, if so, how many frames per second to take. Ten is a good number, although motion will be jerky. Next select your destination disk and folder for the recorded data. For still images, you set the size and say whether the source you're using is "still." You get higher quality, larger images from a still source. A steady camcorder looking at a still scene qualifies. In this way, you actually use your camera/Spigot combination as a scanner. You can't scan text very well, but you can do a good job with photographs in a fraction of the time a regular scanner takes. To capture a single frame, postition the cursor on the live **ScreenPlay** window and drag the picture off the window.

The process of creating a video clip with the Spigot is straightfoward. Set your video source to play either live or recorded video. Launch **ScreenPlay**. Play your video source, and click the **ScreenPlay Record** button. Click the **Stop** button at the end of the clip.

Recorded footage appears in a Playback window. Play it to see how it comes out. Use the editing thumbtabs to set the beginning and end frames if you need to clean up your



footage. Select your desired compression and then save your clip. ScreenPlay then creates a QuickTime movie from your clip, with the compression you specified.

In Conclusion

That's how to record video. But there's more to movie making that shooting footage. You need to arrange the footage as well. For that, you need an editing tool like Adobe Premier. Premier is the subject of Chapter 16.



CHAPTER

Cool Item Name:	Adobe Premier
Sold by:	Adobe Systems
Type of Mac:	Mac II series, PowerBook, Quadra
RAM needed:	4M or better
System Version:	6.0.7, 7.0.0 or better
Special Requirements:	QuickTime installed

16

Editing and Assembling Video

Moviemakers have large, expensive machines to assemble footage into movies, and they employ talented people to run them. There are equivalent tools available for Mac movie-making, and you don't have to be that talented to use one of them. This chapter looks at a tool that's becoming the most popular: Adobe Premier.

The Advent of Premier

Premier cuts together QuickTime movie clips into smooth, edited footage. In addition to the sound clips, you can use Premier to add a soundtrack or you can access special effects for scene transitions. You can dissolve one clip into another, fade to black, and so on. When you assemble a movie to your liking, you can print it as a stand-alone QuickTime presentation.

Some complain about Premier's limitations, but Premier appears to be one of the most intuitively obvious and satisfying products I encountered during this project. Within an hour of installing it, I managed to create a small movie out of footage shot at Christmas time. I think you'll like it too—should you decide to buy it.

Using Premier

When you Launch **Premier**, you see quite a number of things, including a **Construction** window (figure 16.1).

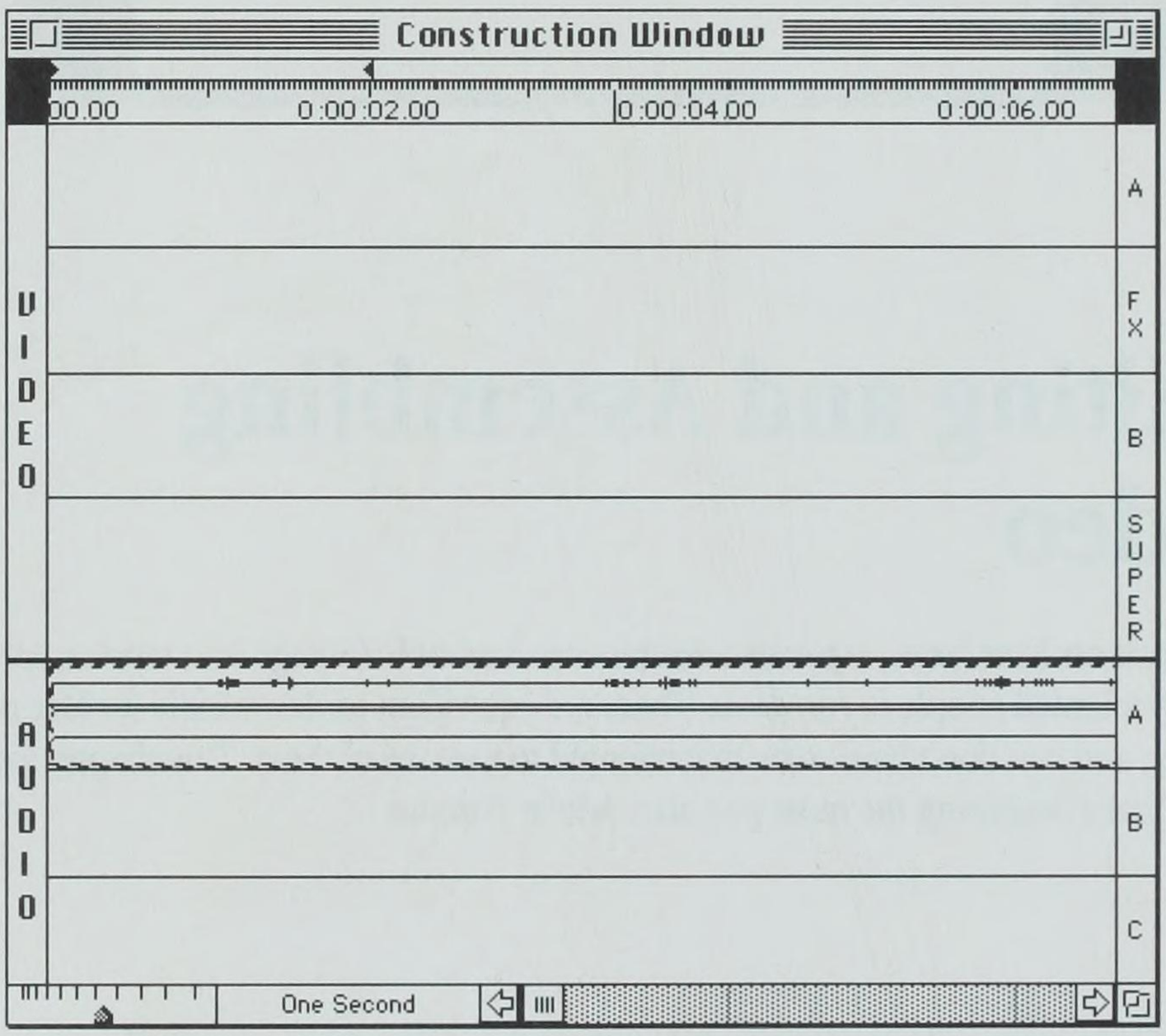


Figure 16.1
Adobe Premier **Construction** window.



This window shows a timeline of the current movie project. There are two **Main Video** tracks, along with a **Special Effects** track, and a **Superimposed** track. There are three audio tracks available.

As with PROmotion, you must import elements into a cast before you use them. You use the **Import...** command in the **File** menu to bring in video and audio clips. Available clips go into the **Project** window (see figure 16.2).

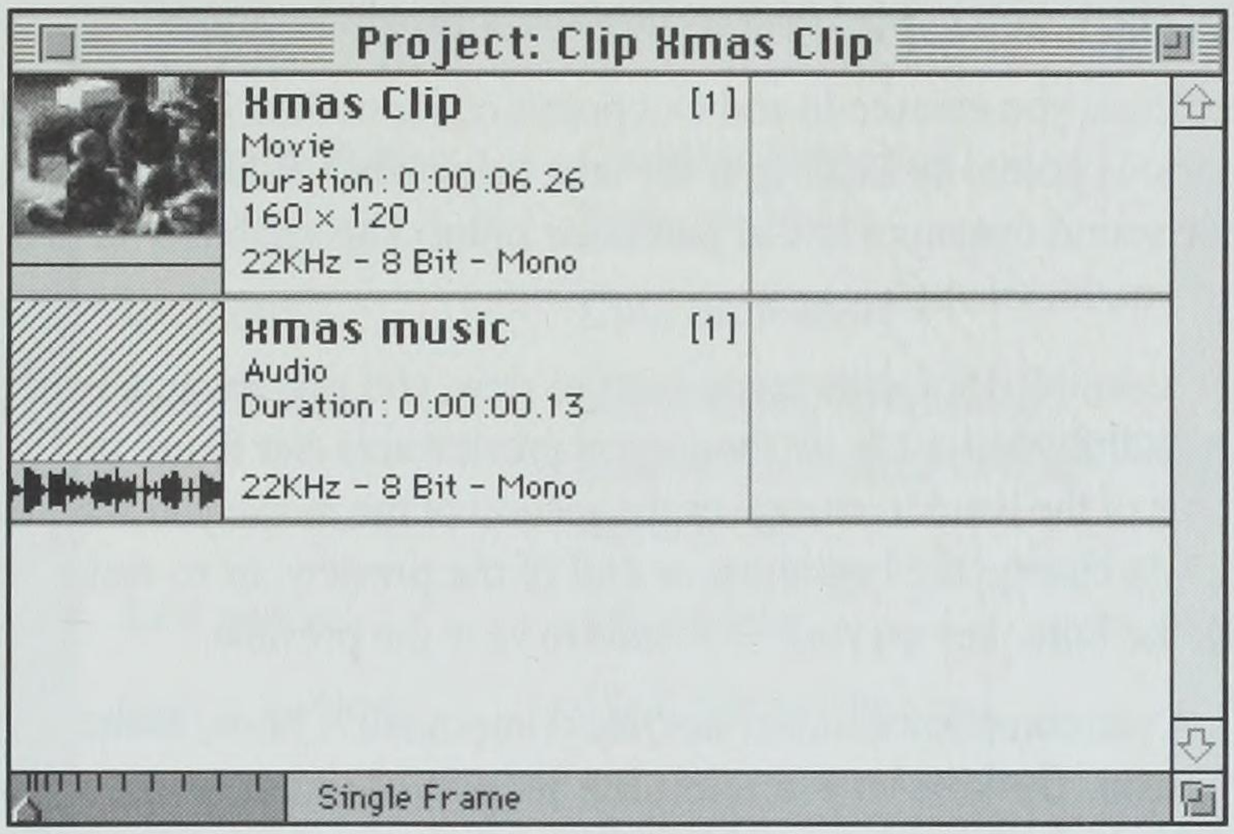


Figure 16.2
Clips in Adobe Premier.

To put a clip into a movie, you drag its thumbnail (the small picture to the left) into the appropriate place on the **Construction** window.

You control the beginning and end points of a clip, the so-called "in" and "out" points. To edit a clip, **Double-click** its thumbnail (see figure 16.3).



Figure 16.3
Viewing and editing the contents of a clip.

There are frame counters to show the length of the clip and your current position in it. Click the **Play** button (right facing arrow) to see the clip move. To set the point where the clip comes in, move to the intended place and click the **In** button. Perform the same steps to set the **Out** point. You control where the clip starts and where it ends.



Special effects are available for switching from scene-to-scene. To add a special effect, drag it from the **Special Effects** window to the **FX track**. FX controls how you move from a clip in track A to a clip in track B. You also can superimpose a clip by dragging it to the **Super track**. This enables you to put credits over a clip, for example.

As with video clips, you edit the In and Out points of a soundtrack clip. You also set the volume at various points by clicking in the area below each **Audio** track. Drag a point to change the sound dynamics at that particular point. This enables you to slowly fade music in and out, for example.

When you've assembled something you want to view, you preview it. A band at the top of the **Construction** window shows the current preview area (see figure 16.1 above). You drag the center of the band to change to the section of the movie you want to preview; drag the ends to change the beginning or end of the preview, or to make the preview longer. Press the Enter key on your Keyboard to view the preview.

When finished, you compile a stand-alone QuickTime movie. Choose **Make Movie...** from the **Project** menu. **Options** let you select the amount of compression, the number of colors to use, and whether to output the entire movie or just the preview area. Note that it takes some time for a movie to compose; it's much slower than simply playing a movie, for example. At the end of the process you have a QuickTime movie that PopCorn or Simple Player can handle, and that you can share with friends (presuming you can find a disk big enough to fit it on. . .).

In Conclusion

You now know how to capture video footage using the Spigot, and how to edit footage using Premier. Ready to play Cecil B. and put together a little QuickTime movie? Chapter 17 tells you how!



CHAPTER



Cool Item Name:	Cool Mac Movie and Zoetrope Movie
Location:	**Cool Stuff** folder
Type of Mac:	Mac II series, PowerBook, Quadra (i.e., 68020 CPU or better)
RAM needed:	4M or better
System version:	6.0.7, 7.0.0 or better
Special requirements:	None

17

Making a QuickTime Movie

Now you know a little about the movie-making tools used to compose "Cool Mac Movie," one of the denizens of the **Cool Stuff** folder. You should find creating Mac movies of your own not at all difficult. Exactly how was it done? Read on...

In Development

As always, start with a brief idea of the "story." (Brief is right, because the end product is only about six seconds long!) Anyway, Hayden had a PICT file of the Cool Mac logo. Using

MacroMind Director to animate the sequence, the clip was exported as a PICS file. Using a new application from Apple called *Convert to Movie*, the animation was saved as a QuickTime movie.

Sneaky Soundtrack

Now the question of music must be addressed. Music as a background sounded like a good idea. First, suitable music was located. (You'll find great sound clips, ideal for accompanying animations or QuickTime movies, in *Cool Mac Sounds* from Hayden.) The Cool Mac Movie then was opened in Adobe Premier. The sound clip was imported and the video and audio tracks were merged together. The file was saved as another QuickTime movie.

Another Sample

There's another QuickTime movie on the *Cool Mac Animation* disk that was created with Premier. It's called "Zoetrope Movie." You'll find it is very short. To view it properly with Popcorn, you need to select the **Loop** option in Popcorn. The movie itself was compiled from video footage that was shot at the Santa Fe Children's Museum, where four zoetropes are among their semi-permanent exhibits.

In Conclusion

This has been a section about QuickTime movie making, one that has focused on two products: MacroMind Director and Adobe Premier. A few words about all this before we go. Remember that Mac movie-making requires lots and lots of hard disk space. We had to be very careful with the time while compiling the *Cool Mac Animation* disk, so that we didn't overload it. You'll need to be careful with your hard disk as well. That two minute movie you're contemplating will probably weigh in at over 10M, maybe closer to 15M in fact. Add the working clips and the figure goes much higher.



Don't mess around with your clips while you've got a Premier project going. Premier doesn't actually copy data from clips; it just references them. The data stays put. If you move or delete a clip in a working Premier document, it's going to get confused. At least,



it'll ask you where the clip is the next time you open a project that depended on it. You can get rid of clips once you have a complete movie that you like; movies don't need clips.

Most importantly, remember: Have fun.

That said, we're going to turn our attention to more serious pursuits. It's time to check in on the last of our multimedia software catagories: full-blown presentation programs. These are not toys, but serious tools, as you'll see.

CHAPTER



Cool Item name:	MacroMind Director 3.0
Sold by:	Macromedia
Type of Mac:	Mac Plus or better
RAM needed:	4M or better
System Version:	6.0.7, 7.0.0 or better
Special Requirements:	None

18

What the Director Is All About

Once upon a time, in another Macintosh era, there was a neat little program called "VideoWorks." Everybody liked it, because it let you make animations on your Mac. That was cool, because there wasn't a whole lot you could do with your Mac in those days. Lots of people played with VideoWorks.

Time went on, and the people who made VideoWorks added more and more features to it. Pretty soon, it got so big and so powerful they decided to give it a new name. They called it "Director."

About this time, business people became interested in the Mac, which up to that time they had regarded as a toy. (As an aside, I can't recall the number of indulgent and patronizing looks I got from colleagues and overseers when I lugged my 128K Mac into work. They viewed it as a kind of electronic Etch-a-Sketch.) The one thing business people did show an interest in was "presentations." These were fancy "dog-and-pony" shows that were put on to impress people and persuade them to buy your stuff.

The folks at MacroMind, makers of Director, decided to jump on the presentation bandwagon. They loaded Director with all kinds of additional features to make it the best presentation software ever. They succeeded! Now Director is a powerful business tool. But somehow, it just isn't as much fun anymore.

Oh well, I shouldn't complain. There are lots of cool Mac toys out there. (*Cool Mac Animation* discusses several: PROmotion, Video Spigot, and Premier.) MacroMind Director is no longer a toy—it's a serious tool. If your work consisted of specializing in creating and making Director presentations, you could probably earn a respectable living in a large city. That's good, because you probably wouldn't have time to learn very much else.

Director 3.0 is truly daunting. What else can you say about a product that comes on 14 disks and is compressed to boot? The MacroMind Director folder on my hard drive occupies over 15M of space. (I must confess I haven't created a single presentation yet.) All that space is occupied by files that come with the software. To the product's credit, however, there are some amazing examples in that folder. The kind of stuff that holds even an 18-month-old's attention for quite a while.

Director 3.0 is only one example of the growing product area known as presentation software. I use it as my paradigm, even though the current version has one serious flaw: it does not work with, or recognize, QuickTime movies. However, this problem was fixed in version 3.1, which appeared as this book went to press. Be that as it may, enjoy the MacroMind Director tour on which you are about to embark. This chapter covers Director's main components and that is about all that can be accomplished in a chapter. To create anything more complicated than what is presented below, you need an entire book—and a thick one.

The MacroMind Director Interface

Director consists of two major components. One component of the software is the **Overview** which is like a storyboard. The **Overview** component creates relatively simple presentations. The results are very similar to an animated slide show. The real power of Director is in the **Studio**, which contains the animation and multimedia-coordination tools. There is a separate user's manual for each component.





The **Overview** window displays icons across the top of the window which represent elements that may make up part of a presentation: paint files, drawings (object graphics rather than bitmaps), Glue documents, other MacroMind movies, etc. (see figure 18.1). To add one of these elements, drag an icon into the **Overview** work area. You are then prompted to locate the file for the object you want to place. For example, to place a PICT, pull down the second icon from the left, locate the PICT file you want, and select it. From this process you see that you need to create objects elsewhere, in another application or in Director's Studio, before you create your presentation.

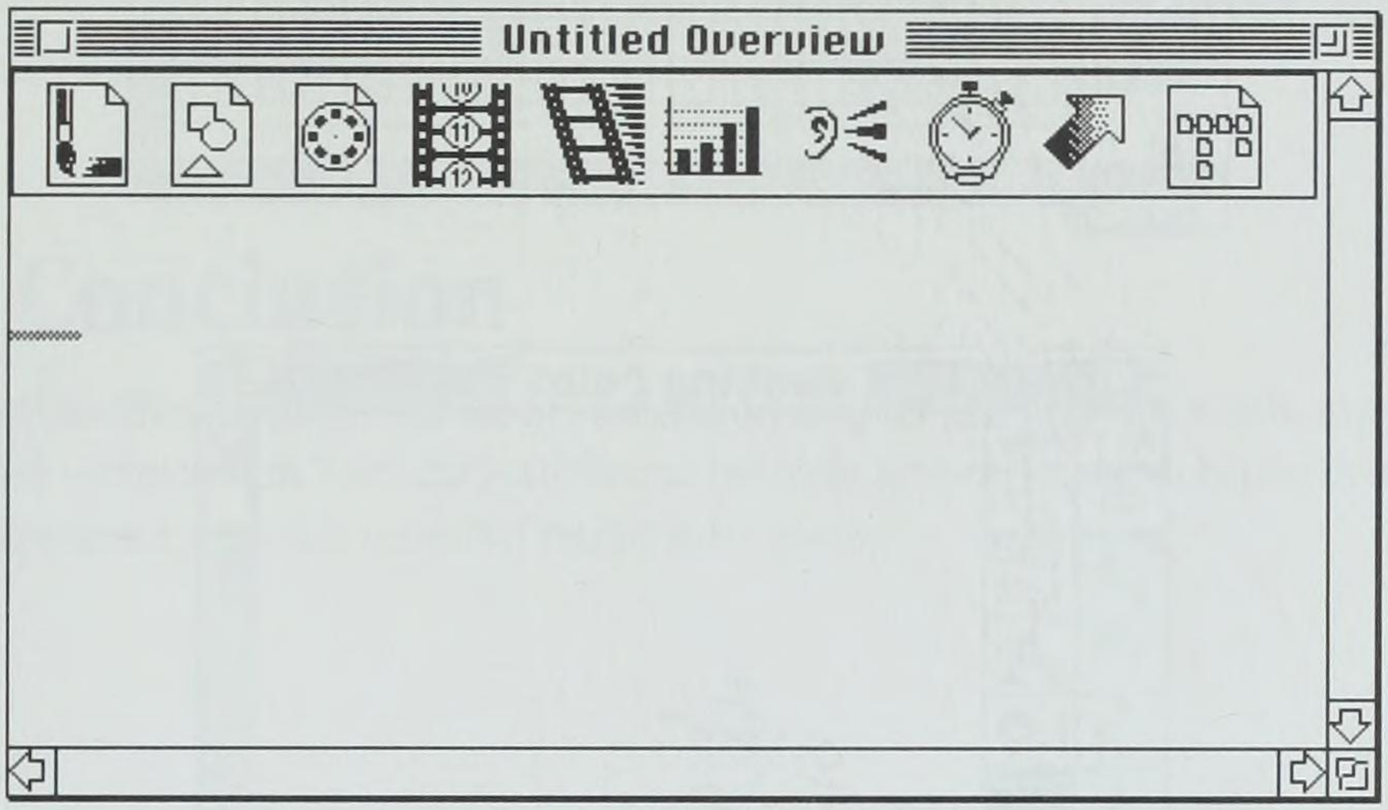


Figure 18.1
MacroMind Director **Overview** window.

The stopwatch icon represents a timer: how long an object stays on the screen during a presentation. To make transitions from element-to-element, use the shaded arrow icon.



The Studio part of Director, (like PROmotion), works with a cast of actors. (Unfortunately, it's not as neatly done as in PROmotion.) Each cel in an animation is a separate actor. You link them all together and define a path for your animation by dragging.

An important tool for working with animations is the *Score* (see figure 18.2).

A pop-up menu at the bottom of the **Score** window lets you select the type of score information to show. (Think of the *Score* as a frame-by-frame summary of all the action for each actor in a presentation.) Associated elements like music and other sound effects are shown as well. Through the **Score** you can control and modify much of the action.

The **Studio** component of Director is where you create objects from scratch. The **Paint** window in **Studio**—where you can create PICT type graphics from scratch—is shown in figure 18.3.



Figure 18.2

The Score for MacroMind cast member "Ball," showing motion.

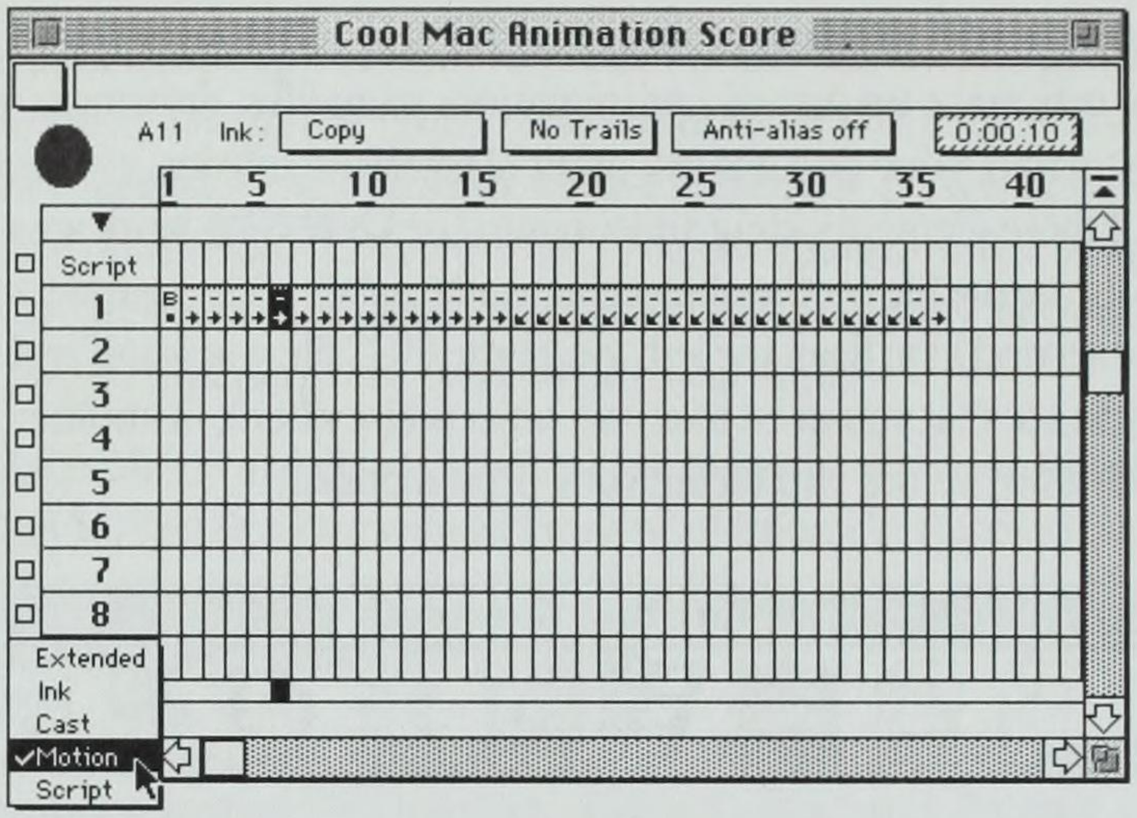
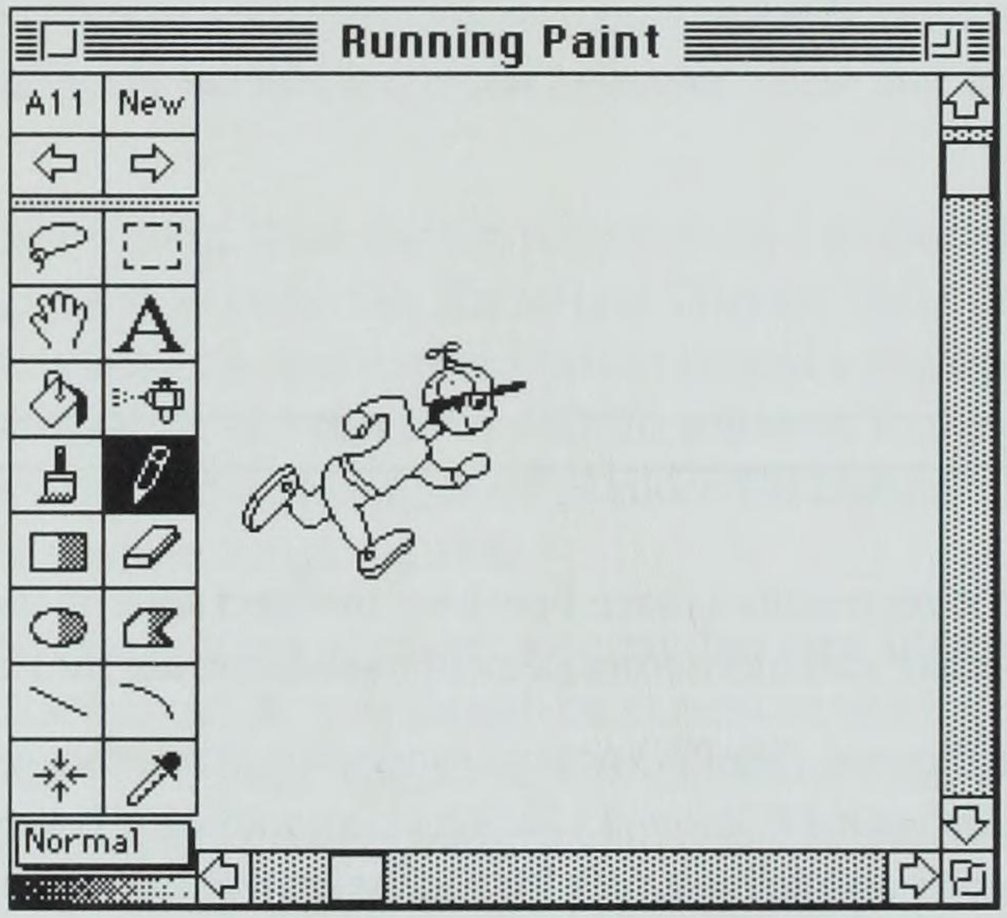


Figure 18.3

Painting an object in MacroMind Director.



MacroMind Director's Studio has a wonderful and intimidating feature, its own programming language called *Lingo*. Lingo has its own separate user's manual; read up and use Lingo to create *interactive presentations*.

An interactive presentation responds to the user. (A menu program is a simple interactive presentation.) The action depends on which menu item the user clicks. Director can associate actions with just about anything. Lists of actions are called *scripts*. Write a script to accompany any Director object: an animation, a whole movie, a still picture. The script tells the object what to do under certain circumstances.





Lingo is similar to HyperTalk, the programming language in HyperCard. (If you read *Cool Mac Stacks*, you have a leg up on the competition.) One aspect of Lingo that I found a bit strange is that the commands are presented in hierarchical menus; you don't type commands into a script, you select them. The menus group them into some sort of logical order. Bottom line: those who want to learn Lingo should expect to make "an investment in time," as the MacroMind folks put it.



By the way, Macromedia produces another, less expensive, multimedia tool called "Magic." MacroMind Magic is, in a way, a subset of Director 3.0. It's more like a stand-alone version of the Studio that omits the Overview and Lingo parts of Director. Although obviously less powerful than Director, it's cheaper and less daunting.

In Conclusion

Doing MacroMind Director justice in such a short chapter just wasn't possible, especially in a book on animation. Director is a different beast altogether. The next chapter describes one experience with this powerful multimedia animal.



CHAPTER



Cool Item name:	MacroMind Director 3.0
Sold by:	Macromedia
Type of Mac:	Mac Plus or better
RAM needed:	4M or better
System Version:	6.0.7, 7.0.0 or better
Special Requirements:	None

19

Using MacroMind Director™

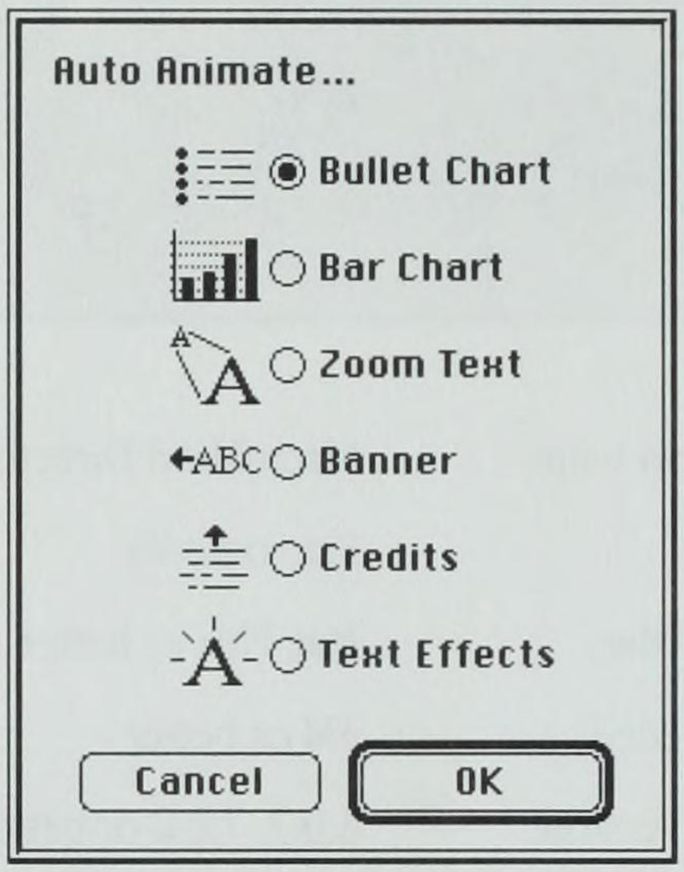
A small credits file was created for our Christmas movie. Of course, getting it into a form that could be used with another application proved impossible, without resorting to the Studio. Oh well! The **Overview** mode is intended to produce slide shows that you run on your Mac.

Using the Overview

Capture your animation or QuickTime clip. Then, launch the **Overview** mode of Director.

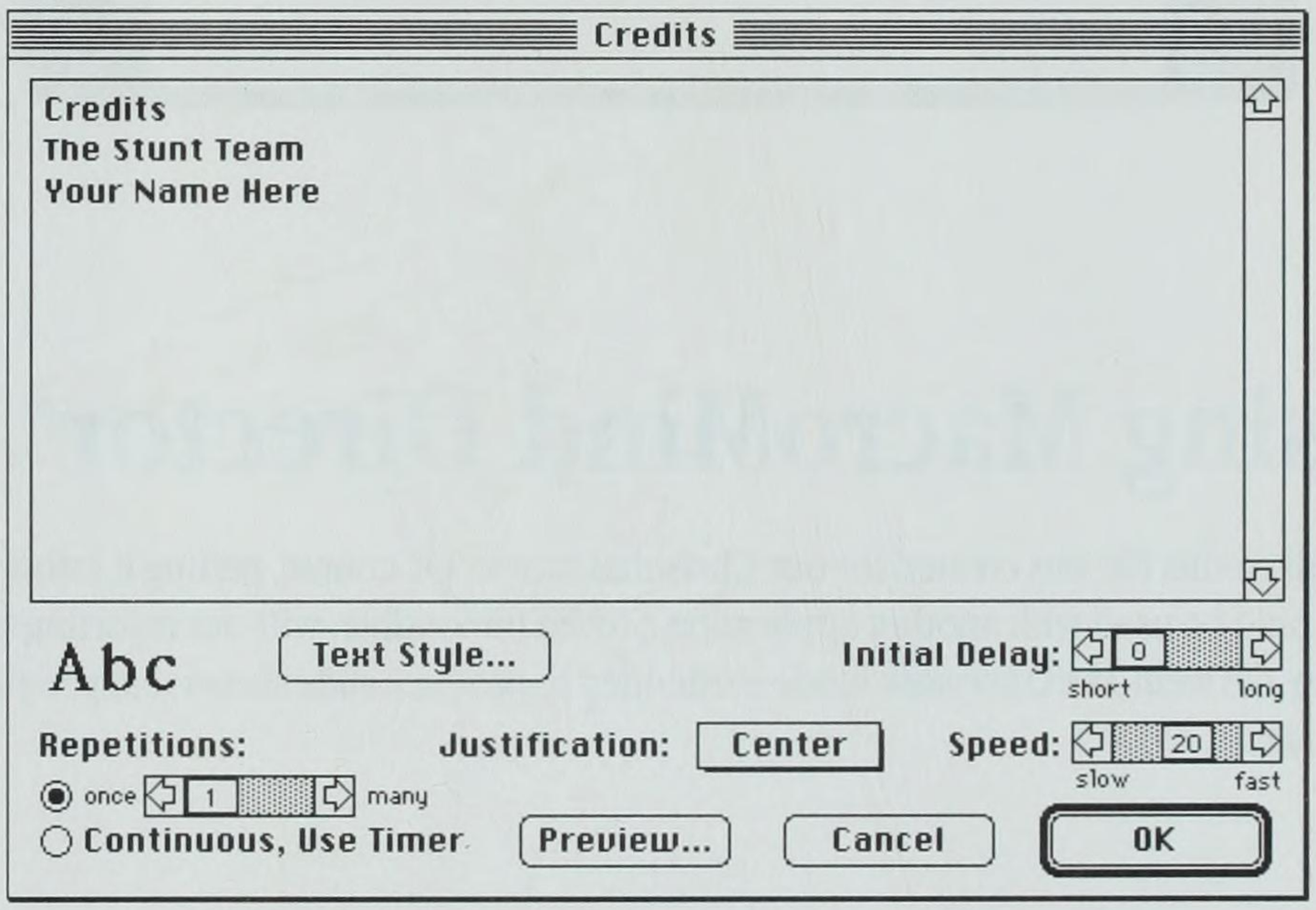
Resize the screen and place the graphic. Director lets you create the rolling credits automatically, if you choose.

Figure 19.1
Director's **Auto Animate**.

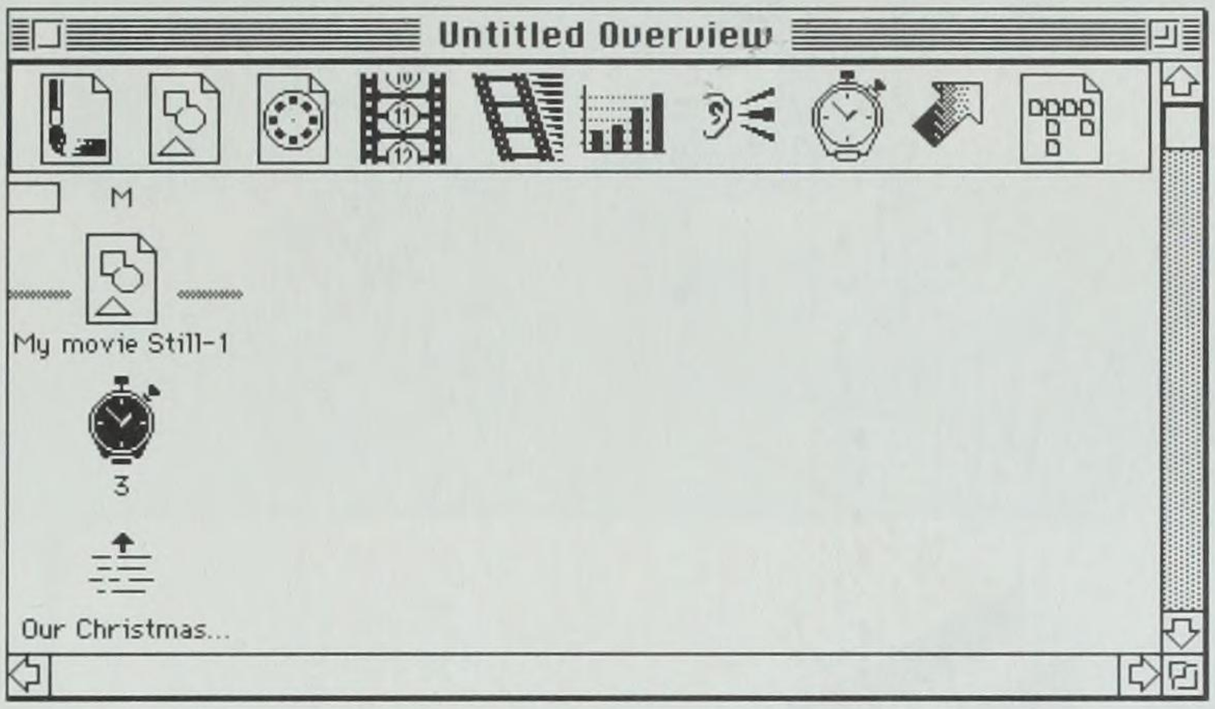


Choose **Credits** and click **OK**. Now type the credits, and select your font.

Figure 19.2
Creating rolling credits in Director's **Overview** mode.



After you have finished the preceding steps, the Director **Overview** window should look like the figure 19.3 below.



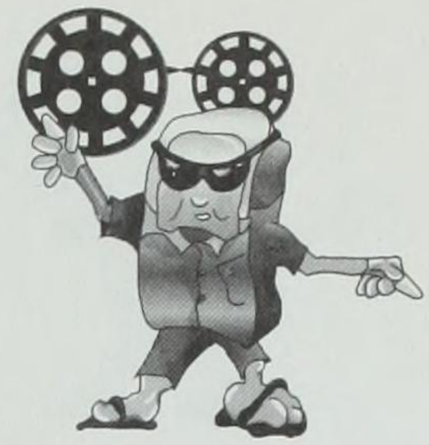


Figure 19.3
A simple **Overview** presentation.

Testing showed that I had credits that rolled up over the picture (figure 19.4). Success!



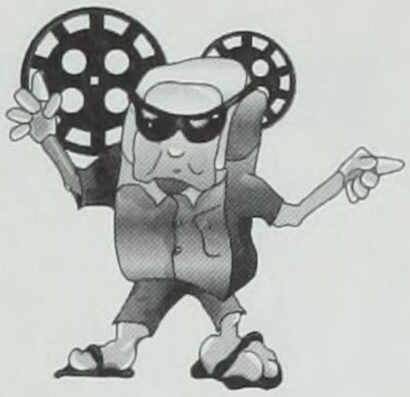
Figure 19.4
A frame from Christmas credits.

The text shows up much better in color than it does in black and white. Now, if we could just figure out how to get them into Adobe Premier...

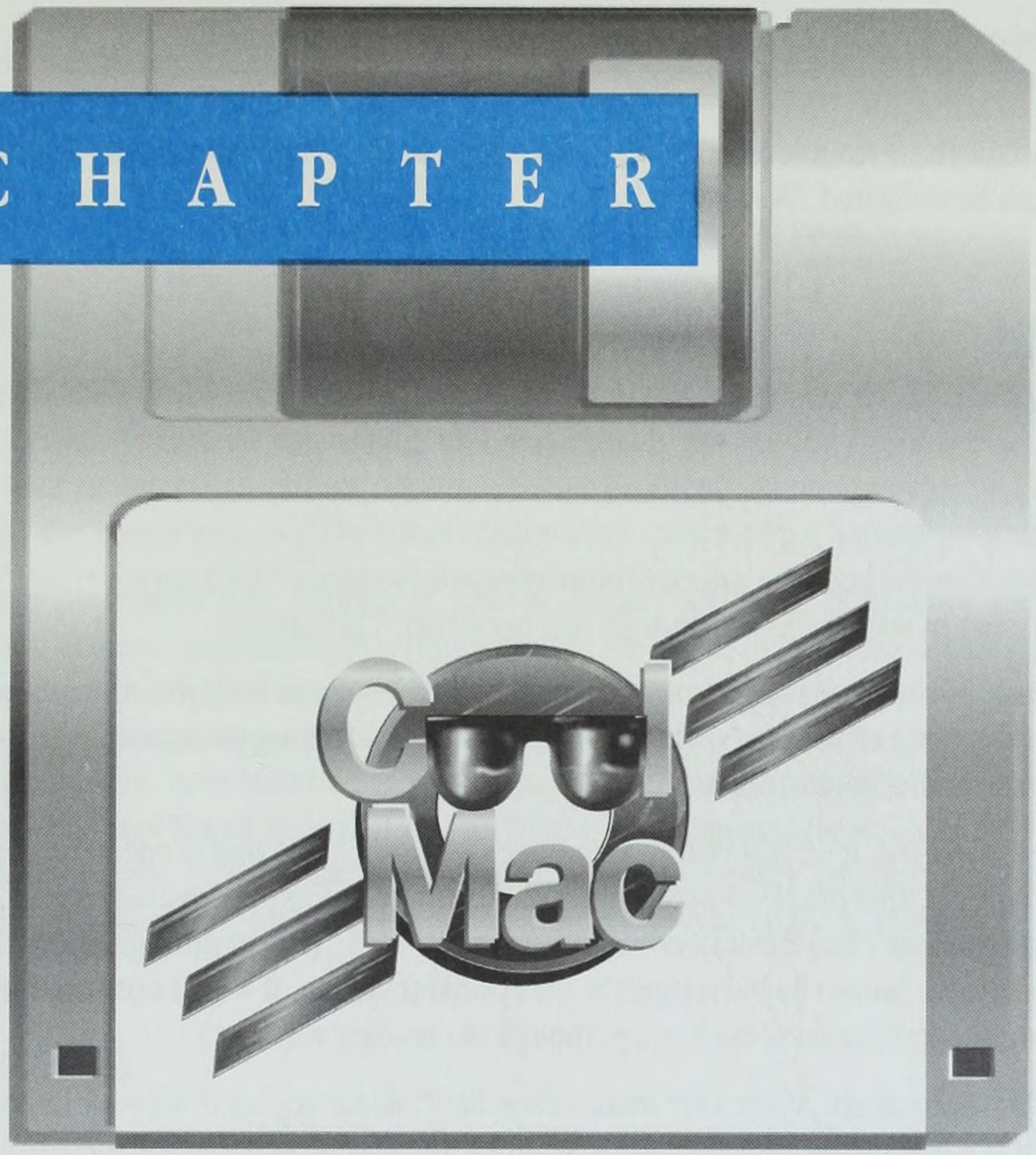
In Conclusion

Learning MacroMind Director is quite a study. You could spend years testing out its nuances and subtleties. Alas, there is not that much time for this book. All I've tried to do in this chapter is show you a little of what Director is all about. Remember, Director is a powerful multimedia tool. You could create a complex presentation with a full-color, full-screen picture of a rain forest. Click the Vervet monkey's head to hear him scream; click his tale to see an encyclopedia entry about the monkeys and their habitat, complete with HyperLinks to other encyclopedia entries. The sky's the limit!

That wraps up the tour of Mac multimedia. Now, some thoughts on getting more information, and avoiding—even solving—troubles.



CHAPTER



20

Cool Solutions to UnCool Problems

Everyone's Mac crashes from time-to-time. (I suffer about three crashes a day, on average, but then again I work with a lot of beta-test software, and I'm running a Quadra—not the world's current compatibility champion.) The symptoms of a crash are familiar: your machine "freezes," nothing seems to help. That's a minor crash. On the major crash side, screens go haywire while the speaker buzzes angrily, (like a swarm of South American bees headed for Brownsville). Then there's the Mac user's worst nightmare: your machine crashes, and then refuses to start again.

Some of the these troubles can be avoided. Others can be solved at little cost. The impact of all can be mitigated. Here's how!

Problem:

How do I protect myself from nasty, data-eating problems?

Solution:

No subject has the been the source of more computer sermons. "Back up your data!" cries the prophet in the wilderness, though few heed him. They should.

"Backing up" means making a copy of valuable data: a copy to back you up in the event a data-destroying crisis occurs. There is nothing, repeat, nothing you can do that is more important to the life of your data.

You see, disks fail. It's a fact of life. Sometimes it's just a "zap" that renders the data on a disk useless. Other times, it's a mechanical failure that renders the drive inoperable. Still, it may be what the French call *force majeur*, an "act of God." (I went through one of these: an office flood, caused by burst pipes in the sprinkler system. It wiped out two-thirds of the computers. They were backed up, though, so no data was lost.)

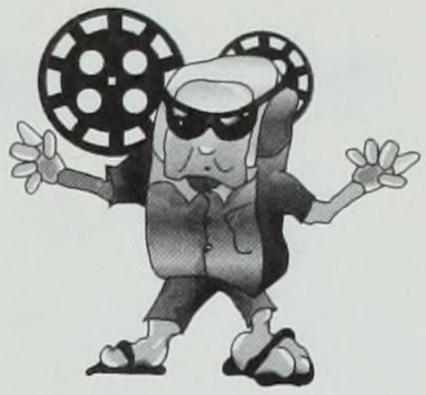
How do you back up? At the very least, you make diskette copies of all your important working documents. As for system software and applications, you re-install these from the original diskettes. Keep your backups safely tucked away, preferably in another room from your computer. It's called "not putting all your eggs in one basket."

If you can spare the dough, buy a software package devoted to making backups. These let you copy all your data onto floppy disks, or other more convenient media. You can choose to copy only those things that have changed since the last time you backed up, a handy feature.

How often should you back up? I'll answer that question with a question: "How much data do you want to lose?" Answers vary. As a rule, you should completely backup once a month, with partial (changed files only) backups once a week. Important files, ones you work with on a day-to-day basis, should be backed onto floppies every day.

Backing up will not prevent data disasters. (Murphy's Law predicts otherwise.) However, it will keep you from losing all your work and all your applications if something terrible should happen. Enough said.





Problem:

My disk is acting strangely; I can't open it or copy data to, or from it.

Solution:

There are disk problems short of total failure: although sometimes the distinction isn't totally clear. What looks like a failed disk may actually just be sick. Fortunately, there's software that detects, diagnoses, and repairs such problems. Symantec's Norton Utilities for the Mac comes to mind. The latest version even comes with a backup program.

Another prominent disk crippler is viruses. Viruses are little, destructive pieces of software that can sneak, unknown, into your Mac system via floppy disks. Viruses are not a consequence of *force majeur*: they are programs written by evil and malicious individuals who want to prove their programming "prowess" at the expensive of innocent computer users. Virus infection can cause your Mac to behave strangely—or just crash. If you use a lot of floppy disks that you get from friends and associates, check for viruses on a weekly basis. Floppy disks containing commercial software are most likely safe, as are files maintained by online services. It is best not to take chances, though.

Problem:

My Mac screen "freezes" while I use some software; the mouse pointer doesn't move, and the keyboard doesn't respond.

Solution:

You can't blame all your troubles on your diskettes. Sometimes it's the software. This is especially true of situations where your Mac seems to "freeze."

Most of the time, when your system crashes, you have no recourse but to turn the power off; wait a few seconds; and then turn the computer on again. However, there's a trick you can try—it may work, and it may not—that may get you out of the current, failed application and back to the Finder.

Press the interrupt button on your Mac: it's the one with the circular depression on it. (Not all Macs have this button installed; it's called the "programmer's switch." Most newer Macs have the button readily available, though.) A dialog box appears.

Type `SM 0 a9f4` and press Return. Then type `PC 0` and press Return. Finally, type `G` and press Return.

If this method works, you "quit" the application; return to the **Finder** with a message that the application unexpectedly failed. Restart your Mac immediately to avoid future trouble; the gremlin that caused your first failure likely is lurking somewhere in your computer's RAM.

If the trick doesn't work, you'll be no worse than you were. Press the "reset switch" next to the interrupt button (or use the power switch) and start over.

One more thing before we go: save your work frequently! This, too, lessens the impact of unexpected crashes. Everything you do between "saves" is lost in a crash, because your work is held in RAM until you save. Only saving transfers it back to disk (where it's relatively safe).

One more thing: read your user manuals! It will surprise you how many troubles and foibles you can avoid by finding out what the developers of your software have to say.

Problem:

A software program that I use seems to crash just about every time I use it. I noticed that crashes occur when I choose a complicated function, like trying to open or save a large document.

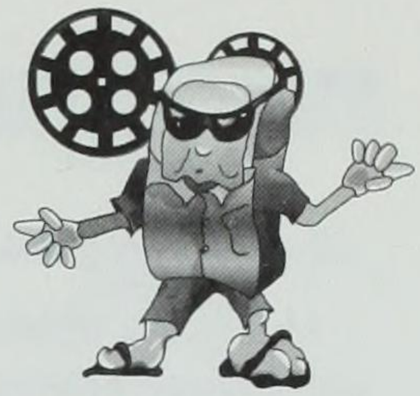
Solution:

The most common cause of these crashes is lack of sufficient RAM. I'm sensitive to these crashes. They usually occur after you ask the software to perform some complex task, such as opening or saving a large document.

If you have the RAM, you can increase the amount allocated to an application under Multifinder, or just in general in System 7. (If you're using the single Finder in System 6, your application already has all the RAM you have available for it to use.) Increase memory allocations in the Get Info dialog box for the relevant application. To see it, select the application's icon in the **Finder** and select **Get Info** from the **File** menu (see figure 20.1).

Figure 20.1 shows you that PROmotion's allocation increased from 2M to 3M. This helps avoid frequent crashes.





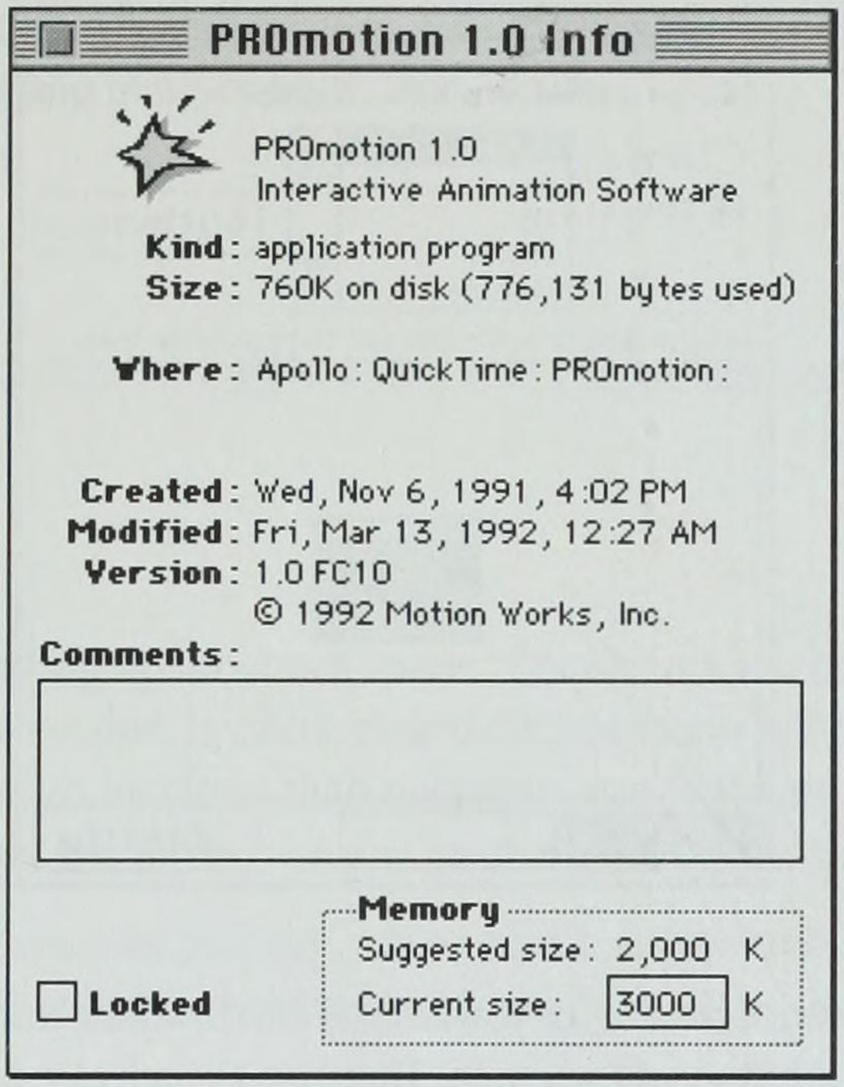


Figure 20.1
Get Info Dialog box for PROmotion.

Problem:

My Mac runs so slowly with all this multimedia stuff that I'm about to pull my hair out. How do I speed things up without taking out a second mortgage on my house?

Solution:

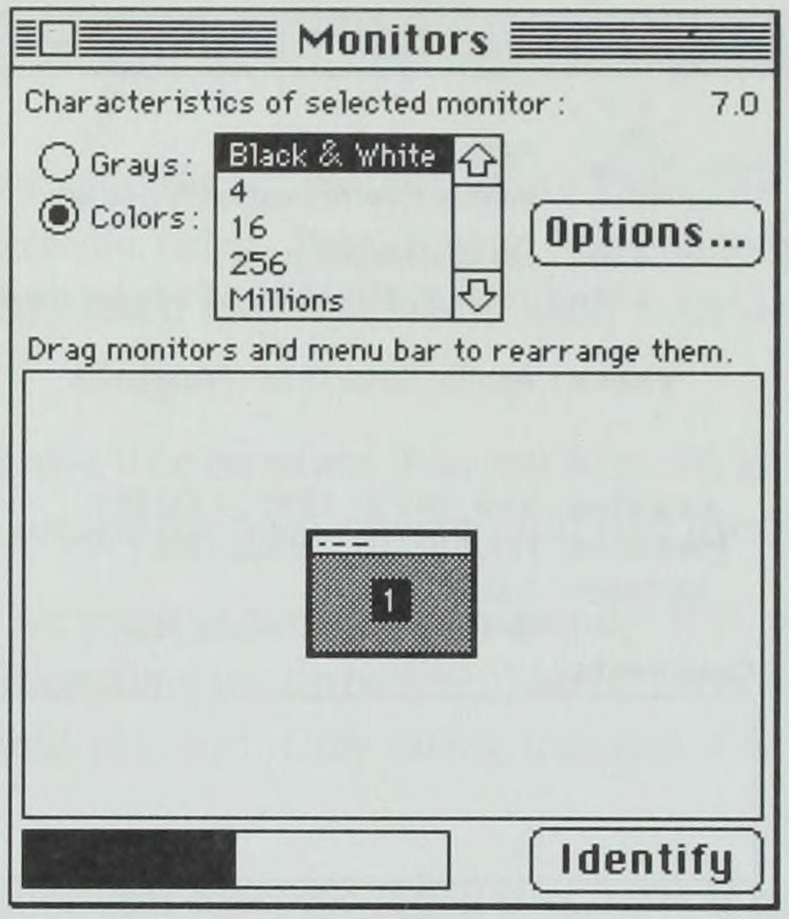
You may be asking your Mac to put out more horsepower than you need to ask. The number of colors displayed on your screen has a critical effect on the speed of your Mac. Remember: the CPU draws every pixel; the more colors displayed, the more work it must do.

If you work strictly in black-and-white, set the Monitor's Control Panel option entitled "Characteristics" to "Black-and-white," as shown in Figure 20.2.

If you work with color, use the fewest number of colors possible without making your work look funny. If you're creating animations, sixteen colors may be enough. Only when working with full-on video or color photography should you use your "Millions" of colors, presuming your Mac handles so many bits in its video.

Figure 20.2

Monitor's Control panel with Characteristics set to Black-and-White.



If your Mac doesn't support color, or you already cut down the number of display colors, then the preceding solution will not help. There isn't much else to do except buy a CPU or display accelerator.

Problem:

My Mac says it doesn't have enough memory to run my favorite program.

Solution:

Your Mac is using too much RAM for things that aren't critical, like open windows and desk accessories. Before launching your application, close all the open windows possible. If you are running other applications, you may need to close these as well.

The ultimate, albeit temporary, solution to this problem is to buy more RAM. (I say temporary because in a couple of years the new applications again will want more RAM than you can spare. Such is progress.) RAM is cheaper; but it is still expensive. Sixteen megabytes are available as of this writing for approximately $500–$600 through mail order houses.

One more way to conserve RAM is, while in Multifinder, to Quit applications in the reverse order that you launched them. Otherwise, RAM gets tied up and made temporarily unavailable. If this happens, restart your Mac to get the RAM back. To know whether this problem is afflicting you, choose "About this Macintosh..." from your Apple menu in the



Finder. If you are certain that the number displayed for "Largest unused block..." is a lie, then you have RAM tied up in never-never land. Restart.

Problem:

I'm running out of disk space! My applications won't let me save; and it says the disk is full.

Solution:

Some of your stuff is taking up too much space. Documents you edit a lot can end up taking more space than needed. In effect, their old contents are still there. To "compact" a document that seems to be larger than necessary, use **Save as...** in that particular application's **File** menu. Use the same name for the document as before.

You know a document is too large if, say, you've cut a large amount from the document, but the **Finder** says it is still the same size when you quit.

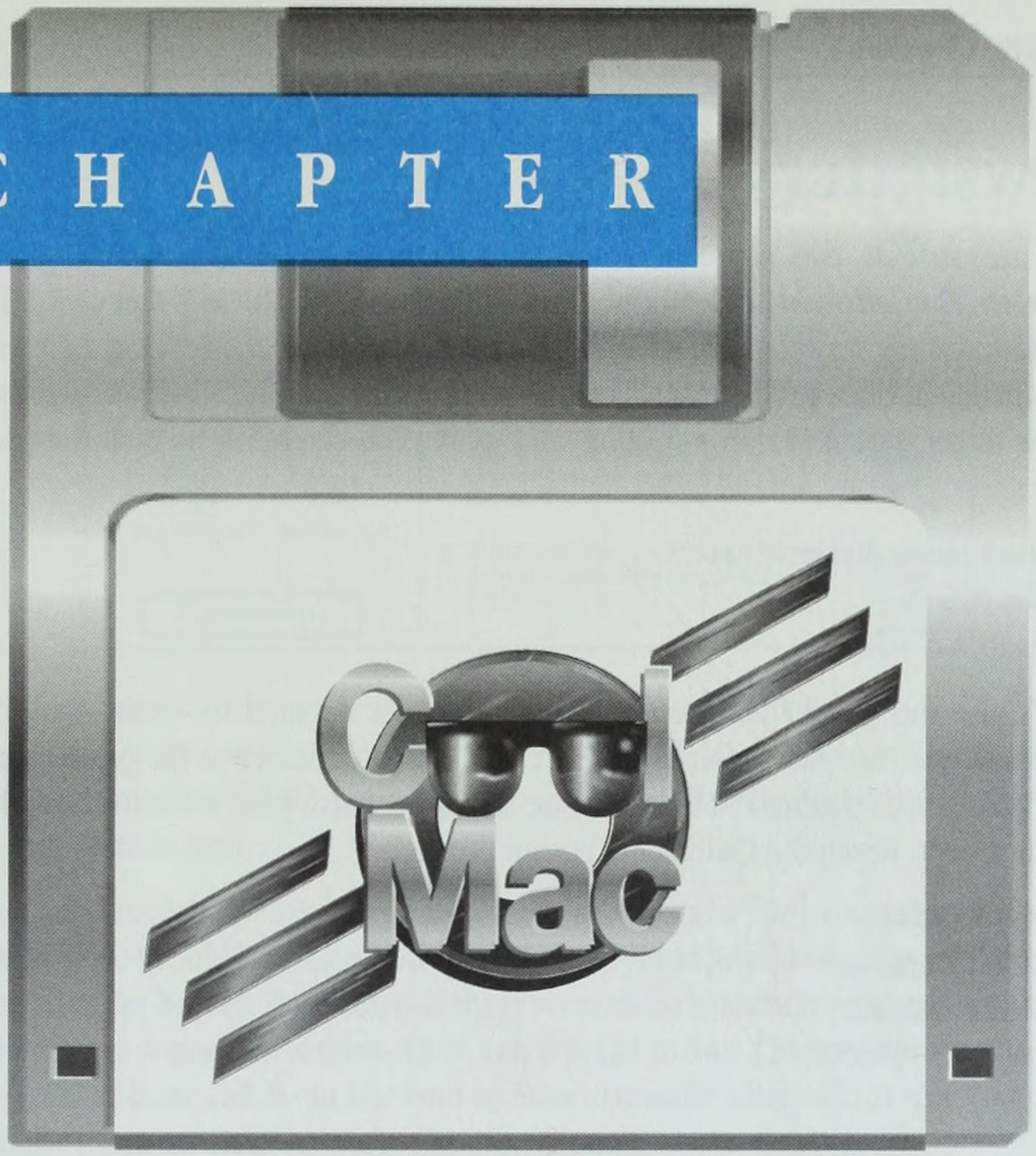
In Conclusion

Hopefully these solutions address some of the problems that might affect you—they happen to be among the most common. These solutions will get you gracefully out of a few tight spots.

There is more info for you than just how to get out of crashes, though. Read on for ways to expand your Mac animation horizons.



CHAPTER



21

Cool Information Sources

Where do I go from here? If you're interested in Mac animation and movie-making, I'd recommend that the first thing you do is buy the software and/or hardware that you need. You'll find "how-to" information in the user's manuals when you do. Specifically, I was impressed with the PROmotion and Video Spigot manuals. Both had much to say about animation, in particular, and multimedia in general.

Beyond user's manuals, there are other information sources, however. A few are discussed below.

Newsletters

There are, at least, two newsletters devoted to animation and movie-making on the Macintosh. *The Call Sheet* is the official organ of the Macintosh Movie-Maker Guild. These guys started at the very beginning with story development and are working their way up to full-on digital video productions. Their newsletter offers product reviews, suggestions on how to get started in movie-making, and more. You can reach them at the address below:

Macintosh Movie-Maker Guild
P.O. Box 893
El Dorado, CA 95623

There's also the *QuickTime Forum*. The newletter is devoted to—wait—QuickTime movie-making. This newsletter is an excellent resource, albeit a bit pricey; charter subscriptions are running $50 for 10 issues. It may be worth your while to check out an issue, however. Reach the QuickTime Forum through:

Way with Words
Circulation Dept.
1455 Cedar Oak Rd.
Placerville, CA 95667

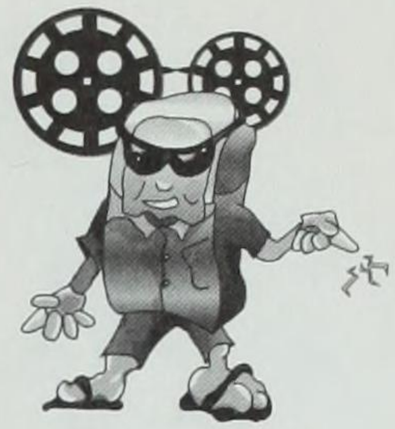
Online Services

If you have a modem, you can go online to find out more and possibly get your hands on other animation and movie work. There are two really good information services, one of which I can recommend to any Mac owner.

What's an online information service? It's a little bit like an electronic library, one that you access with a modem. A modem lets you send and receive information over a telephone line. You use your modem to "connect" to the information service. You need special software to handle the connection.

My favorite online service is America Online. Their software is easy to use, and takes full advantage of the Macintosh user interface. Figure 21.1 shows you what it looks like to be "online" with America Online.

America Online has an extensive library of software to peruse. I've acquired many nifty tools and toys that way.



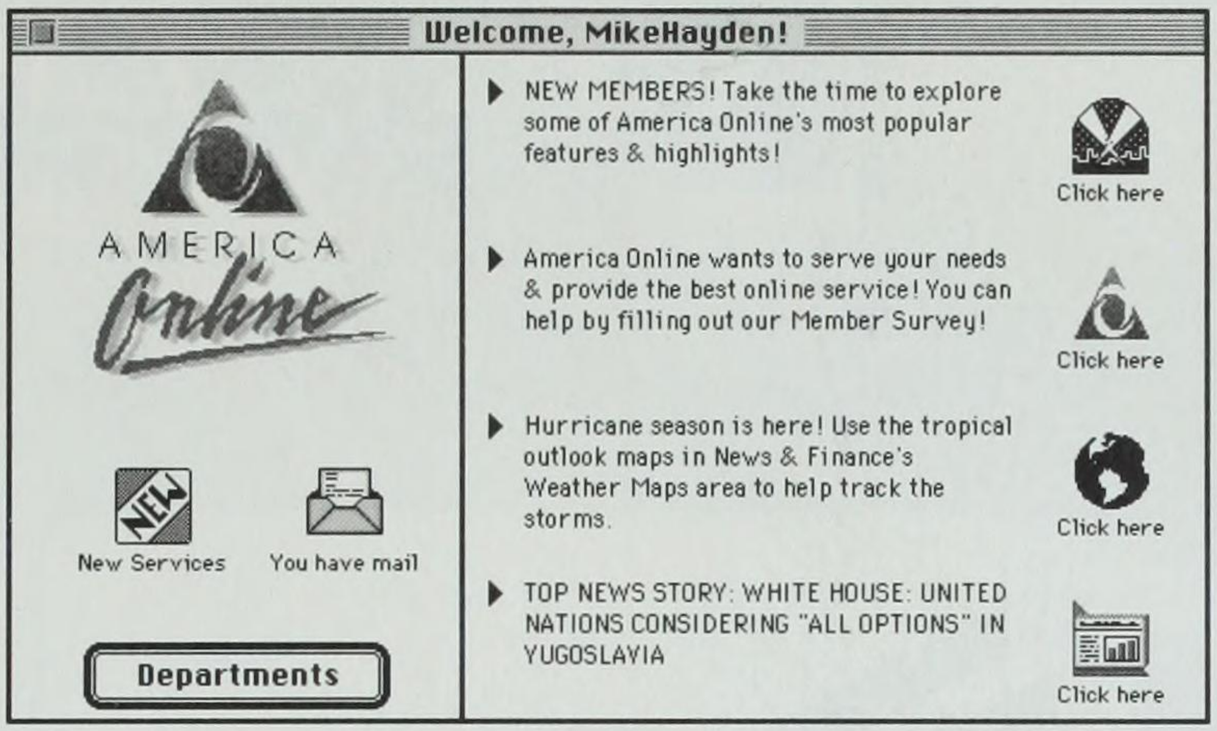


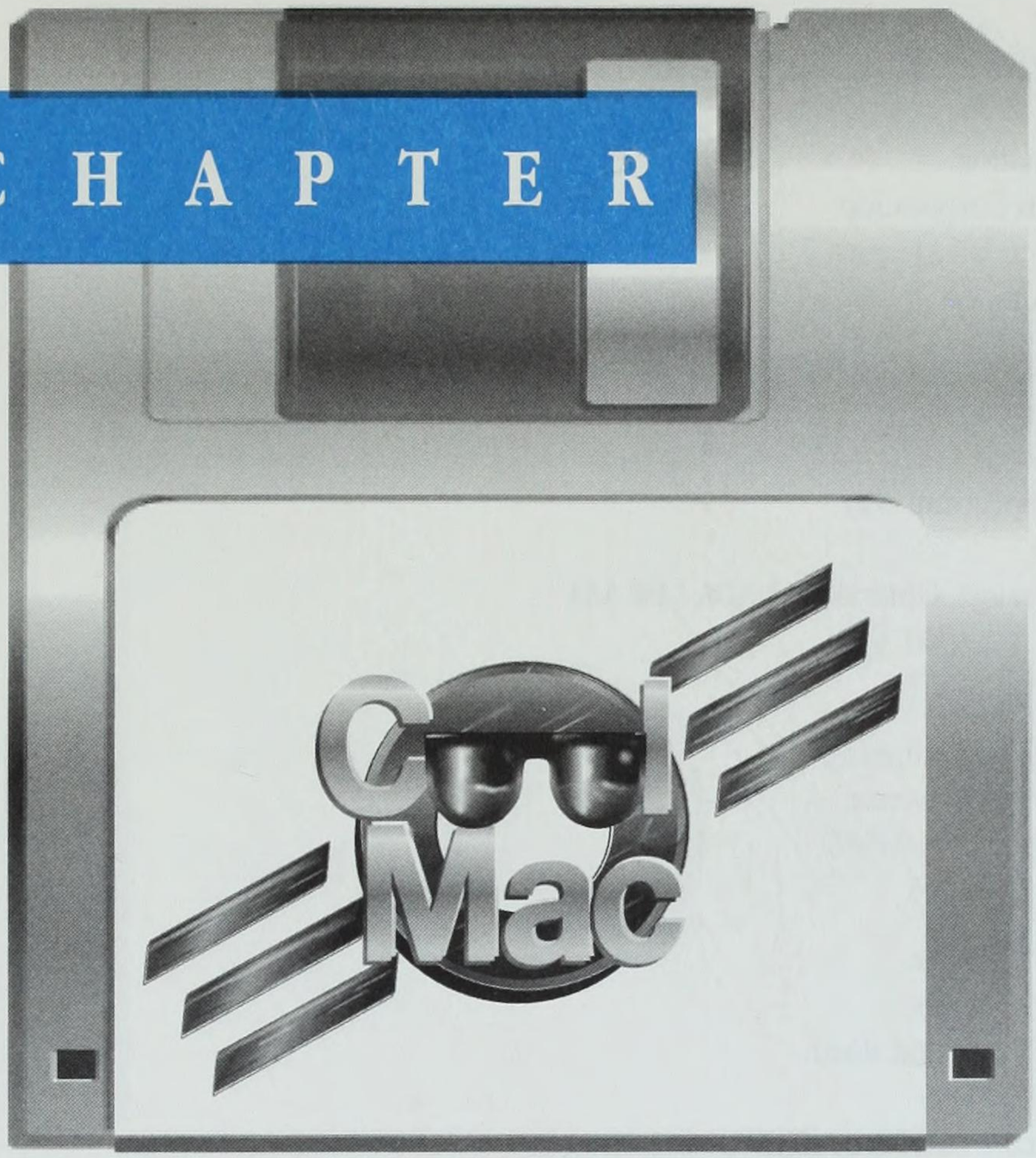
Figure 21.1
America Online's **Main** window.

There's also CompuServe, the granddaddy of them all. Macintosh users in particular should check out their ZMAC forum, which is run by *MacUser* magazine. I got some good tools from them as well.

You can acquire sign-up kits for either of these services at a fairly low price. Your local computer store should have one. You also can order these kits through the mail from the larger mail-order houses. Be aware that these services do have their price: you pay for the time that you're connected to them. Rates vary from $5 to over $10 per hour, not counting the cost of the phone call. It can take over an hour to transfer a large file to your computer. I still think these services are worth the cost, though.

Magazines

I would be remiss if I didn't mention the major Mac magazines, *Macworld* and *MacUser*. Both are great sources of news and information about all things "Mac-ish," including QuickTime, which is a pretty hot subject as of this writing. You have to wade through a lot of ads, but sometimes ads are helpful, like when you're looking for a particular product. You usually can find both of these magazines at a major chain bookstore. I have even seen them at the supermarket.





CHAPTER

22

Getting in Touch

Here's where to get in touch with the manufacturers of the products discussed in this book.

PROmotion, ADDmotion:
Motion Works, Inc.
Suite 201-1334 W. 6th Avenue
Vancouver, BC, CANADA V6H 1A6
(604) 732-0289

Cinemation
Vividus Corporation
651 Kendall Avenue
Palo Alto, CA 94306
(415) 494-2111

Animation Works
Gold Disk, Inc.
5155 Spectrum Way
Unit 5
Mississauga, Ontario, CANADA L4W 5A1
(416) 602-4000

Video Spigot
SuperMac Technologies
485 Potrero Avenue
Sunnyvale, CA 94086
(800) 334-3005

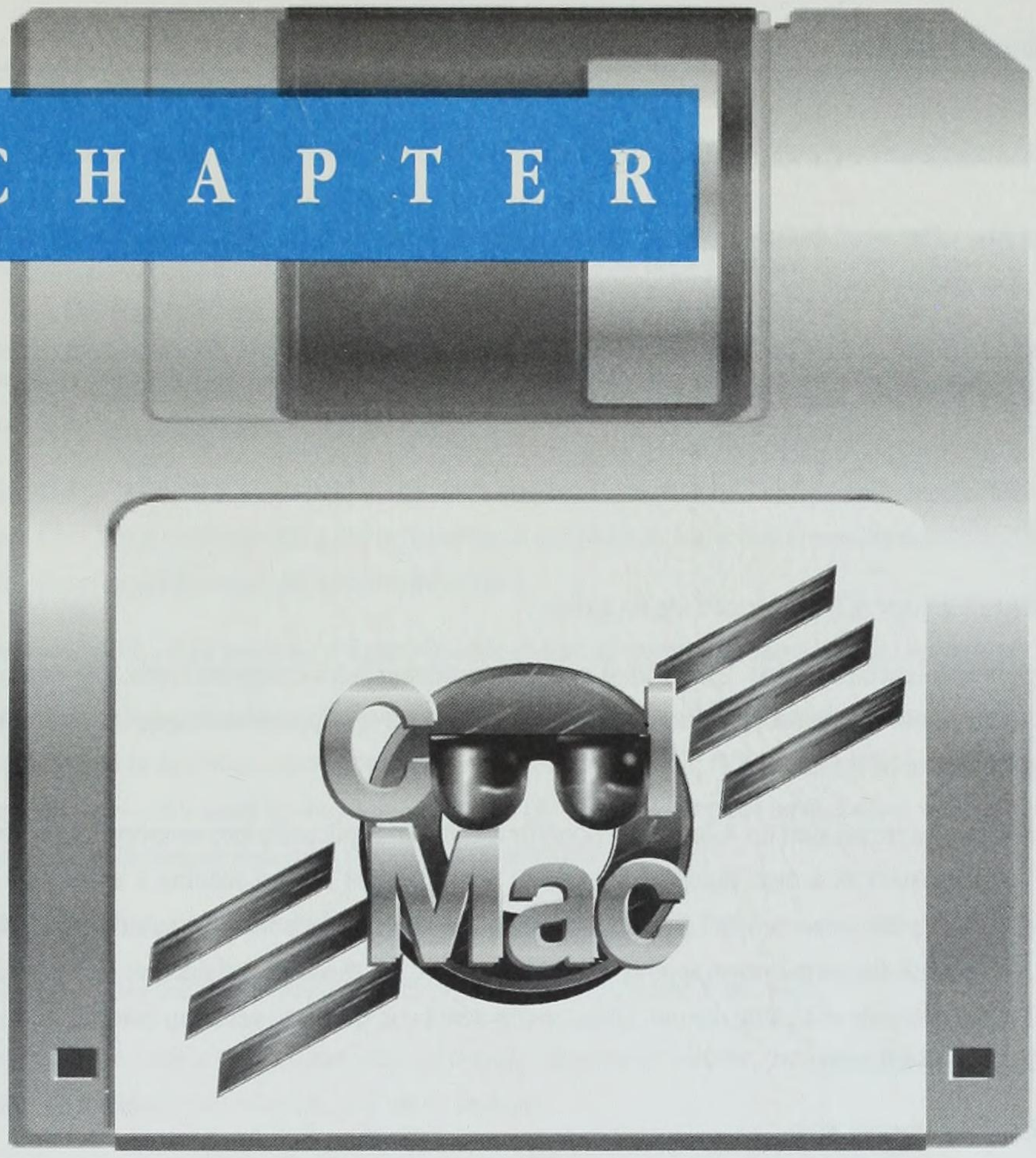
Adobe Premier
Adobe Systems
1585 Charleston Road
P.O. Box 7900
Mountain View, CA 94039-7900
(415) 961-4400

MacroMind Director 3.0
Macromedia, Inc.
600 Townsend Street, Suite 310
San Francisco, CA 94103
(415) 442-0200





CHAPTER



23

Cool Words to Impress Your Friends

What! You didn't know every one of the words just thrown at you? Don't worry! I've compiled a list of them, along with (hopefully) cogent definitions thereof. (Many of the glossary entries below appear in the *Apple Publications Glossary*, Version 3.0, ©1988 by Apple Computer, Inc. My sincere thanks.)

A

Apple menu The menu farthest to the left in the menu bar, indicated by an Apple symbol, from which you choose desk accessories.

application Software that performs a specific task, such as word processing, database management, or graphics.

B

backup (n.) A copy of a disk or of a file on a disk.

bit A contraction of binary digit. The smallest unit of information that a computer holds. The value of a bit (1 or 0) represents a simple two-way choice, such as yes or no, on or off, positive or negative, something or nothing, Democrat or Republican.

boot Another way to say start up. A computer boots by loading an application into memory from an external storage medium such as a disk. Starting up is often accomplished by first loading a small part of the application, which then reads a larger part into memory. The application is said to "pull itself up by its own bootstraps"—hence the term bootstrapping or booting. There are those who claim that the original term referred to the necessity of kicking the old, alligator-clip-wired computers to get them going, but those folk are seldom taken seriously.

boot disk *See* **startup disk**.

button A pushbutton-like image in dialog boxes where you click to designate, confirm, or cancel an action.

byte A unit of information which consists of a fixed number of bits. One byte consists of a series of eight bits and takes any value between 0 and 255 ($00 and $FF hexadecimal). The value represents an instruction, number, character, or logical state. *(See also* **kilobyte**, **megabyte**.)

C

cache A holding area in main memory where write information for block input/output is temporarily stored.

Cancel button A button that appears in a dialog box. Clicking it cancels the command.

checkbox A small box associated with an option in a dialog box. When you click the checkbox, you may change the option or affect related options.





Clear A command in the Edit menu that removes selected material without placing it on the Clipboard. You use the Undo command immediately after using Clear to reverse the action.

click (v.) To position the (mouse) pointer on something, and then press and quickly release the mouse button. (n.) The act of clicking.

Clipboard The holding place for what you last cut or copied; a buffer area in memory. You can insert (paste) information from the Clipboard into documents.

Command key A key that, when held down while another key is pressed, causes a command to take effect. The Command key is marked with a propeller-shaped symbol. On some machines, the Command key has both the propeller symbol and the Apple symbol on it.

compression The act or process of reducing a file in size by removing redundant or unnecessary data.

configuration (1) A general-purpose computer term that refers to the way your computer is set up. (2) The total combination of hardware components—central processing unit, video display device, keyboard, and peripheral devices—that make up a computer system. (3) The software settings that allow various hardware components of a computer system to communicate with one another.

configure To change software or hardware actions by changing settings.

Control key A key frequently pressed with other keys for program commands.

Control panel A desk accessory that lets you change the speaker volume, the keyboard repeat speed and delay, mouse tracking, color display, and other features.

Control Panel device (cdev) An application accessed by means of the Control panel.

CPU Central Processing Unit. Circuitry within the computer that performs arithmetic and logical tasks. The "brain" of the system, if you will.

crash To cease to operate unexpectedly, possibly destroying information in the process.

cursor (1) A symbol displayed on the screen marking where the user's next action will take effect or where the next character typed from the keyboard will appear. (2) The term used to refer to the pointer on the screen.

cut To remove something by selecting it and choosing Cut from a menu. What you cut is temporarily placed on the Clipboard. In other editing applications, "Delete" serves the same function.

cut and paste To move something from one place in a document to another in the same document or to a different one. It's the computer equivalent of using scissors to clip something and using glue to paste the clipping somewhere else.

D

data Information; especially information used or operated on by a program. The smallest unit of information a computer understands is a bit.

delete To remove something, such as a character or word from a file, or a file from a disk. Keys such as the Backspace key and the Delete key remove one character at a time by moving to the left. (Suggest cross-referencing with the following, and deleting subsequent sentences.) (*See also* **Cut**, **Clear**, and **Clipboard**.) The Cut command removes selected text and places it on the Clipboard; the Clear command removes selected text without placing it on the Clipboard. (The Undo command, if used immediately, reverses the action of Clear and of the Backspace or Delete key.)

Delete key A key that moves the insertion point backward, removing the previously typed character or the current selection. Its function is identical to the Backspace key on the original Mac keyboards.

deselect To perform some action (such as clicking a button) that causes an object not to be selected. A deselect command has an effect opposite to that of a select command. For example, deselecting a device such as a printer is to place it into a condition in which it will not receive data.

desk accessory A "mini-application" that is available from the Apple menu regardless of which application you're using.

desktop The working environment on the computer: the menu bar and the gray area on the screen. You can have a number of documents on the desktop at the same time. At the Finder level, the desktop displays the Trash and the icons (and windows) of disks that have been accessed.

dialog box (1) A box that contains a message requesting more information from you. The message may warn you that you're asking your computer to do something it can't do, or that you're about to destroy some of your information. In these cases, the message is often accompanied by a beep. (2) A box that a Macintosh application displays to request information or to report that it is waiting for a process to complete.

digital Refers to data coded in numeric form.

disk A flat, circular, magnetic surface, serving as a medium for storing information.

disk drive The device that holds a disk, retrieves information from it, and saves information to it.

document Whatever you create with an application—information you enter, modify, view, or save. (*See also* **file**).

double-click (n.) Two clicks in quick succession, interpreted as a single command. The action of a double-click is different from that of a single click. For example, clicking an icon selects the icon; double-clicking an icon opens it.





drive (n.) (1) *See* **disk drive**. (2) A button in certain dialog boxes that allows you to access information from a different drive (volume).

E

edit To change or modify. For example, to insert, remove, replace, or move text in a document.

Edit menu A menu in most Macintosh applications that lists editing commands—like Copy, Cut, and Paste.

eject To remove a disk from a disk drive.

error message A message displayed or printed to tell you of an error or problem in the execution of a program or in your communication with the system. An error message is often accompanied by a beep.

F

file Any named, ordered collection of information stored on a disk. Applications and documents you create are examples of files. You make a file when you create text or graphics; give the material a name; and save it to disk; in this sense, file is synonymous with document.

file management A general term for copying files, deleting files, and other tasks involving the contents of disks.

File menu The menu in most Mac applications that lists commands that affect entire documents—commands like Save, Print, and Quit.

Finder The application that maintains the Mac desktop and starts up other applications at the request of the user. You use the Finder to manage documents and applications, and to get information to and from disks. You see the desktop when starting up your computer (if you are using the Finding), unless you have specified a different startup application.

floppy disk A disk made of flexible plastic, as opposed to a hard disk, which is made of magnetically coated metal. The term floppy was applied originally to disks with thin, flexible disk jackets, such as 5.25-inch disks, which were literally floppy and were easily bent. With 3.5-inch disks, the disk itself is flexible: but the jacket is made of hard plastic. Both kinds, however, are floppy disks.

folder A holder of documents, applications, and even other folders on the desktop. Folders (called subdirectories in some operating systems) allow you to organize information in any way you want.

font A complete set of characters in one design, size, and style. In traditional typography, font may be restricted to a particular size and style, or may comprise multiple sizes, or multiple sizes and styles, of a typeface design.



Font/DA Mover An application that allows you to add or remove fonts and desk accessories from a disk's System file or from a font or desk accessory file.

H

hard disk A disk made of metal and sealed into a drive or cartridge. A hard disk stores very large amounts of information compared to 3.5-inch floppy disks.

hard disk drive A device that holds a hard disk, retrieves information from it, and saves information to it. Hard disk media made for microcomputers are permanently sealed into the drives.

highlight To make something visually distinct. For example, when you select a block of text using a word processor, the selected text is highlighted—it appears as light letters on a dark background, rather than dark-on-light. Highlighting is accomplished by inverting the display.

I

icon An image that graphically represents an object, a concept, or a message. Icons on the outside of the computer may show you where to plug cables, such as the disk drive icon on the back panel that marks the disk drive connector. Screen icons in mouse-based applications represent disks, documents, applications, or other things you can select and open.

installation The process of copying files from floppy distribution diskettes to a hard disk and setting appropriate configuration information.

interface (n.) The devices, rules, or conventions by which one component of a system communicates with another. Also, the point of communication between a person and a computer.

K

K *See* **kilobyte**.

kilobyte (K) A unit of measurement consisting of 1024 (210) bytes. Thus, 64K memory equals 65,536 bytes. The abbreviation K also stands for the number 1024, in which case Kbyte is used for kilobyte. (*See also* **megabyte**.)

L

launch To open or run an application or program.





M

Main menu The top level of options in an application having several levels of options. Making a choice from a Main menu takes you to another menu.

megabyte (M) A unit of measurement equal to 1024 kilobytes, or 1,048,576 bytes. (*See also* **kilobyte**.)

memory A hardware component of a computer system stores information for later retrieval. (*See also* **random-access memory**.)

menu A list of choices presented by an application, from which you select an action. In the desktop interface, menus appear when you point to and press menu titles in the menu bar. Dragging through the menu and releasing the mouse button while a command is highlighted chooses the command.

movie A file format for dynamic data, such as video, animation, and sound.

MultiFinder A first-generation multi-tasking operating system for Mac computers that makes it possible to have several applications open at the same time, including background applications that let you perform one task while the computer performs another. Well... sort of.

O

open To make available. You open files or documents in order to work with them. A file may not be read from, or written to until it is open. In the desktop interface, opening an icon causes a window with the contents of that particular icon to come into view. You may then perform further actions in the window when it's active.

operating system (1) A program that organizes the actions of the parts of the computer and its peripheral devices. (2) Low-level software that controls a computer by performing such basic tasks as input/output, memory management, and interrupt handling. Sometimes abbreviated OS.

P

pathname A description of the exact location of a file in a file system, including it's parent folder, grandparent, etc.

physical Hardware specific or governed by hardward. Compare with logical.

pixel Short for "picture element," a single dot on a computer display screen.

program disk A disk that contains an operating system and a self-starting application.

prompt A message on the screen that tells you of some need for response or action. A prompt is usually in the form of a symbol, a message, a dialog box, or a menu of choices.



Q

QuickTime A Macintosh system extension that adds the capability to work with dynamic media, such as sound, animation, and video.

R

RAM *See* **random-access memory**.

RAM cache Random-access memory you designate to store certain information an application uses repeatedly. Using the RAM cache greatly speeds up your work, but use sparingly or not at all with applications that require large amounts of memory. You set the RAM cache in the Control panel and in certain other applications.

random-access memory (RAM) The part of the computer's memory that stores information temporarily while you're working on it. A computer with 2MB RAM has 2MB kilobytes of memory available to the user (minus the amount occupied by the operating system). Information in RAM refers to an arbitrary or random order, hence the term random-access. Information in RAM is temporary—gone forever if you switch the power off without saving it to a disk or other storage medium.

reboot *See* **restart**.

restart To start your computer again, by choosing the Restart command from the Special menu of the Finder.

run (1) To execute a program. When a program runs, the computer performs the instructions. (2) To load a program into main memory from a peripheral storage medium, such as a disk, and execute it. (*See also* **launch**.)

S

save To store information by transferring it from main memory to a disk. Work not saved "disappears" when you switch off the computer or when the power is interrupted.

scroll (1) To move a document or directory in its window so that a different part of it is visible. (2) To move all the text on the screen upward or downward, and in some cases sideways.

SCSI An acronym for Small Computer System Interface (pronounced "SKUH-zee" by most, "SEX-zee" by some—go figure). An industry-standard interface that provides high-speed access to peripheral devices.

SCSI device A device, such as a hard disk or tape backup unit, that uses the Small Computer System Interface.





select (v.) (1) To designate where the next action will take place. To select using a mouse, you click an icon or drag across information. In some applications, you select items in menus by typing a letter or number at a prompt, by using a combination keypress, or by using arrow keys. (2) To enable a device to receive data.

Shift-click A technique whereby you extend or shorten a selection by positioning the pointer at the end of what you want to select and holding down the Shift key while clicking the mouse button.

Shift-drag A technique whereby you select multiple objects by holding down the Shift key while you drag to enclose the objects in a rectangle.

Shift key A key that, when pressed, causes the subsequent letter you type to appear in uppercase or the top symbol on a two-character key to be produced. The Shift key also can modify mouse actions. (*See also* **Shift-click**, **Shift-drag**.)

startup disk A disk with all the necessary program files—such as the Finder and System files contained in the System folder for the Macintosh—to set the computer into operation. Sometimes called a "boot disk."

startup drive The disk drive from which you start your application.

subdirectory A directory within a directory; a file (other than the volume directory or root directory) that contains the names and locations of other files. Equivalent to the folder in the Macintosh operating system.

system disk A disk that contains the operating system and other system software needed to run applications.

System file A file Macs use to start up and to provide systemwide information.

System folder A special folder containing the System file, the Finder, and system resources, such as fonts, desk accessories, control panel devices, etc. The system folder has a small Macintosh icon on it that distinguishes it from other folders.

T

text (1) Information presented in the form of readable characters. (2) A display of characters on a display screen.

text box The place or places in any dialog box where you can type information.

Trash An icon on the desktop that you use to discard documents, folders, and applications.

U V W

unlock To remove the restriction on the use of a disk or a file so that it may be changed, deleted, or renamed. Compare lock.



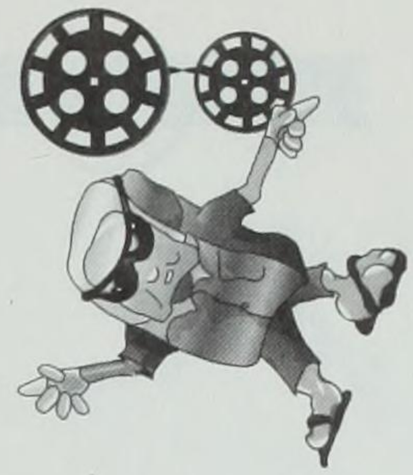
virtual memory Memory space that is separate from the main memory (physical RAM) and is instead located in auxiliary memory media (usually disks). The ability of a system to address virtual memory space is important for multitasking operating systems and applications too large to be handled in RAM alone.

Wild Magic A Macintosh Control Panel device that lets the system copy and paste dynamic data such as video, sound, and animation.

write To transfer information from the computer to a destination external to the computer (such as a disk drive, printer, or modem) or from the computer's processor to a destination external to the processor (such as main memory).



Index



A

accessories
  desk, 116
  system, 21-22
actors, 57-61
  animating, 64-66
adaptors, display, 20
ADDmotion software package, 69
adjusting running speed, 103-104
America Online (AOL), 3
animating actors, 64-66
animation
  history, 5-9
  traditional, 11-14
  with clip art, 51-52
Animation Stand software package, 70
Animation Works software package, 70
AOL (America Online), 3
Apple menu, 114
application programs, 114
  Convert to Movie, 86
  Finder, 117
  Font/DA Mover, 118
  Popcorn, 45-46
  Re-Animator, 3, 49-50
assembling
  cels, 65
  video, 81-84
avoiding crashes, 102

B

background
  creating, 66
backing up data, 100
backup copies, 114
bitmaps, 30
bits, 114
boot disk, 121
booting, 114
buttons, 114
bytes, 114

C

caches, 114
  RAM, 120
cameras, multiplane, 13
Cancel button, 114
capture boards, 22
cards, Spigot, 74-80
  installing, 75-76
cartridges, 19
cdev (Control Panel device), 115
cel sequencers, 64
cels, 13, 57
  assembling, 65
central processing unit (CPU), 16-18, 115
checkboxes, 114
Cinemation software package, 70
Clear command, 115
clicking, 115
clip art
  animating with, 51-52
  importing, 64
Clipboard, 115
Command key, 115
commands
  Clear, 115
  Insert Cels, 59, 65
  Onion Skin, 60
  Preferences, 79
  Restart, 120
  Undo, 115
Component Manager, 36
compressing
  files, 115

images, 37
computer-ready data, 74
configurations, 115
conserving
disk space, 105
memory, 104-105
Control panel, 115
Control Panel device (cdev), 115
Convert to Movie application program, 86
Cool Mac Animation disk
installing, 42-43
coprocessors, graphics, 21
copying movies, 46
counters, frame, 57
CPU (Central Processing Unit), 16-18, 115
crashes, 115
avoiding, 102
creating
actors, 58
background, 66
paths, 60
props, 61
QucikTime movies, 85-87
credits, running, 95-97
cursors, 115
cutting, 115

D

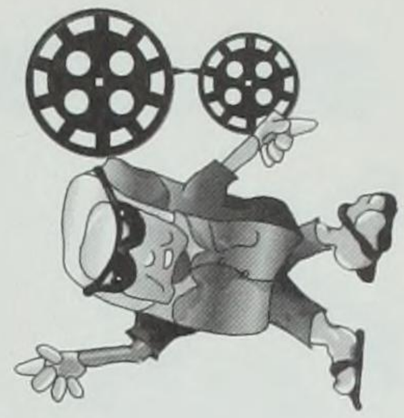
data, 116
backing up, 100
bitmapped, 30
computer-ready, 74
object, 30
data file formats, 29-31
Delete key, 116
deleting, 116
deselecting, 116
desk accessories, 116
desktops, 116
dialog boxes, 116
Director, 89-93
Overview component, 90-91, 95-97
Studio component, 91-92
disk drives, 116
disk space
conserving, 105
disks, 116
ejecting, 117
floppy, 19, 117
hard, 19, 118
program, 119
startup, 121
system, 121
display adaptors, 20
displays, 20-21
documents, 116
double-clicking, 116
drives
disk, 116
hard disk, 118
optical disk, 20
startup, 121

E

Edit menu, 117
editing, 117
video, 81-84
ejecting disks, 117
EPS file format, 30
error messages, 117

F

file formats
data, 29-31
EPS, 30
JPEG, 30
MooV, 31, 36
PICS, 31
PICT, 30
SND, 31
TIFF, 30
file management, 117
File menu, 117
files, 117
compressing, 115
Finder, 25
System, 25, 121
Finder application program, 117
Finder files, 25
floppy disks, 19, 117
folders, 117
System, 121
Font/DA Mover application, 118
fonts, 117
formats, file
data files, 29-31
EPS, 30
JPEG, 30
MooV, 31
PICS, 31
PICT, 30
SND, 31
TIFF, 30
frame counter, 57



G

gigabytes, 19
graphics coprocessors, 21

H

hard disk drives, 118
hard disks, 19, 118
hardware, 15
highlighting, 118

I

icons, 118
  Trash, 121
Image Compression Manager, 36
images
  compressing, 37
importing
  clip art, 64
  video, 74-80
information sources, 107-109
Insert Cels command, 59, 65
installing
  Cool Mac Animation disk, 42-43
  Spigot card, 75-76
interactive presentations, 92
interfaces, 118
  Director, 90-93
  PROmotion, 56-57
  user, 36

J

JPEG file format, 30

K

K (kilobytes), 118
keys
  Command, 115
  Delete, 116
  Shift, 121
kilobytes (K), 118
Kinetographs, 8
Kinetoscopes, 8

L

Lasso tool, 64
launching, 118
Leica reels, 13
line tests, 13
Lingo programming language, 92
Loop option, 86

M

M (megabytes), 18, 119
MacroMind Director, 89-93
  Overview component, 90-91, 95-97
  Studio component, 91-92
Main menu, 119
managers
  Component, 36
  Image Compression, 36
managing files, 117
mass storage, 19-20
megabytes (M), 18, 119
memory, 18-20, 119
  conserving, 105
  virtual, 26, 122
Memory Control panel, 26
menus, 119
  Apple, 114
  Edit, 117
  File, 117
  Main, 119
microprocessors, 17
model sheets, 12
modems, 22
monitors, 20
MooV file format, 31, 36
motions
  shape-changing, 57
  translational, 57
Motorola 68000 series, 17
mouse
  clicking, 115
  double-clicking, 116
Movie toolbox, 35
movies, 119
  copying, 46
  QuickTime
    creating, 85-87
MultiFinder, 26, 119
multiplane cameras, 13

N

naming actors, 58
NuBus slots, 22

O

object data, 30
Onion Skin command, 60
opening, 119
operating systems, 119
optical disk drives, 20
Overview component, 90-91, 95-97

P

packages, software
  ADDmotion, 69
  Animation Stand, 70
  Animation Works, 70
  Cinemation, 70
palettes, tool, 57
pasting, 115
Path tool, 60
Path/Frame tool, 61
pathnames, 119
paths, 56
  creating, 60
PDS (processor direct slot), 22
persistence of vision, 6
PICS file format, 31
PICT file format, 30
pixels, 119
Popcorn application program, 45-46, 86
ports
  SCSI, 22
  serial, 22
PostScript language, 34
Powerbooks, 17
Preferences command, 79
Premier, 82-84
presentations, interactive, 92
printers, 21
processor direct slot (PDS), 22
program disks, 119
programs
  Convert to Movie application, 86
  Finder application, 117
  Font/DA Mover application, 118
  Popcorn application, 45-46
  QuickTime, 3, 34-38, 120
    movies, 85-87
  Re-Animator application, 3
  running, 120
PROmotion, 55-61
  interface, 56-57
prompts, 119
props, 58-61

Q

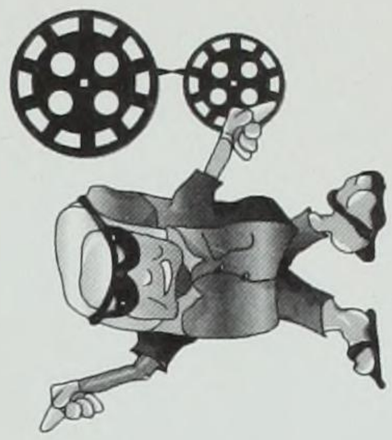
Quadras, 17
QuickTime program, 3, 34-38, 120
  movies
    creating, 85-87

R

RAM (Random Access Memory), 18-19, 120
RAM cache, 120
Random Access Memory (RAM), 18-19, 120
Re-Animator program, 3, 49-50
Read Only Memory (ROM), 34
reels, Leica, 13
Restart command, 120
RLE (Run Length Encoding), 37
ROM (Read Only Memory), 34
Run Length Encoding (RLE), 37
running
  credits, 95-97
  programs, 120
  speed
    adjusting, 103-104

S

saving, 120
Scale Path tool, 60
scanners, 22
scripts, 12
scrolling, 120
SCSI (Small Computer Systems Interface), 22, 120
SCSI port, 22
selecting, 121
sequencers, cel, 64
serial ports, 22
shape-changing motion, 57
sheets, model, 12
Shift key, 121
slots
  NuBus, 22
  PDS, 22
Small Computer Systems Interface (SCSI), 22, 120
SND file format, 31
software packages
  ADDmotion, 69
  Animation Stand, 70
  Animation Works, 70
  Cinemation, 70
soundtracks, 12



speed, running
adjusting, 103-104
Spigot card, 74-80
installing, 75-76
startup
disks, 121
drives, 121
storage, 18-20
conserving, 105
mass, 19-20
storyboards, 12
stroboscopes, 7
Studio component, 91-92
subdirectories, 121
system accessories, 21-22
system disks, 121
System files, 25, 121
System folders, 121

T

text, 121
text boxes, 121
TIFF file format, 30
timeline tool, 61
tool palette, 57
toolbox, Movie, 35
tools
Lasso, 64
Path, 60
Path/Frame, 61
Scale Path, 60
timeline, 61
traditional animation, 11-14
translational motion, 57
Trash icon, 121

U

Undo command, 115
unlocking, 121
user interfaces, 36

V

video
editing & assembling, 81-84
importing, 74-80
video capture boards, 22
VideoWorks, 89
virtual memory, 26, 122
viruses, 101
Vitascopes, 8

W

Wild Magic, 37-38, 122
writing, 122

Z

zoetropes, 7

Using the Cool Disk

Before you use the Cool Disk, you need to copy the material from it to your hard disk. To save space, the files on the disk are compressed. You need to decompress the files before you work with them—it's really easy to do.

Before you begin, be sure you have enough room. You will need room to hold the **Cool Stuff** file (it holds all the compressed animations, videos, and tools). You also will need room for the material to be decompressed into. You will need approximately four megabytes of space available on your hard disk.

Caution: If you insert the Cool Disk (a high-density disk) into a 800K (double-density) floppy drive, you may see the message `This disk is unreadable: Do you want to initialize it?` If this occurs, click **Eject**. Do not initialize the disk! Find a friend who has a SuperDrive. SuperDrives can read 1.4M (high-density) floppy disks. Double-density drives cannot read high-density disks.

To install the Cool Disk, follow these steps:

1. Insert the locked Cool Disk into your disk drive. When its icon appears on the desktop, double-click to open it.

2. Drag the **Cool Stuff** icon to the main (root) window on your hard disk. The file will be copied from the floppy disk to your hard disk. When copying is complete, drag the floppy disk icon to the trash to eject it. Put the disk away in a safe place in case you need it again.

3. Double-click the **Cool Stuff** icon. The file is actually a small application program, along with an archive of files. You are asked to specify where to extract the files to; they'll be extracted into a folder called **Cool Stuff**. Leave it at root level. Click the **Extract** button to proceed.

4. You need to drag **QuickTime**™ to your **System** folder. (If you're running System 7, you are told that the items need to be put into specific places within the **System** folder. Click **OK** to have the System do this for you.)

5. Restart your computer. Now, have fun!





How The West Was Won

This book was created entirely on a computer; that's what makes it so cool. (Not.) Seriously, the text was composed, revised, and edited using Microsoft Word version 5.0. Pages were laid out using Aldus PageMaker. The index was created via PageMaker. The cover was designed using Adobe PhotoShop and QuarkXpress, and icons and other images were created using Adobe Illustrator and Aldus FreeHand. Even all correspondence—from the initial book contract to the "manuscript looks great" and "where's my check?" letters—were created in Microsoft Word on the Mac. Pretty neat, huh?

What's on the Cool Disk?

There is a total of 14 files on the Cool Disk. Freed from their compressed imprisonment, they occupy well over two megabytes of disk space. The following is a short description of each item on the disk:

Software

PROmotion Demo A software program that enables you to create animations. You can save your work as QuickTime movie files. The disk also contains a PROmotion Demo Info file.

QuickTime™ A System extension that manages multimedia. Coolest thing to happen to the Mac since the LaserWriter.

Re-Animator An application that enables you to play black-and-white animations on your Mac.

Popcorn™ An application that enables you to view QuickTime movies on your Mac. This application requires QuickTime to work. The **Popcorn™ Read Me** file contains important information about the application.

Samples

Guthrie Skates A simple animation, playable in Re-Animator, that the author created himself using the artwork provided on the Cool Disk.

It Pays to Advertise... Another simple animation.

Cool Mac Movie A sample QuickTime movie with the Cool Mac logo in animated form.

Out of Africa Another cool movie with a running cheetah.

Zoetrope Movie Want to know what a zoetrope (Chapter 2) looks like in action? This very short QuickTime movie was compiled from footage shot at the Santa Fe Children's Museum, where they maintain a set of zoetropes as a semi-permanent, hands-on exhibit for kids (and adults). Play this movie in Popcorn. You'll see a fish leaping out of the sea. Sort of.

Artwork

Dakota A PICT file with pieces that you "assemble" in various poses. Dakota is a little kid.

Guthrie Another PICT pieces file. Guthrie is Dakota's teenage brother.

Home and Yard Background A PICT file with backgrounds for Dakota and Guthrie to act against.



BREAK AT SEAL AND PULL TO OPEN

HD

HAYDEN

© 1992

The Cool Disk

Clint Hicks

Includes: Software, Samples, and Artwork • 14 files

QuickTime™ • PROmotion Demo • PROmotion Demo Info • Re-Animator • Popcorn™ • Popcorn™ Read Me • Guthrie Skates • It Pays to Advertise... • Cool Mac Movie • Out of Africa • Zoetrope Movie • Dakota • Guthrie • Home and Yard Background

To order more Hayden Books call: 1-800-428-5331

ISBN: 0-672-48521-4

PATENT (U.S.) 4,610,938 FILED PATENT D-286,463

ASUC STORE
GENERAL BOOKS
ISBN 0672485214
$19.95
COOL MAC ANIMATION [W/
J 2
2 9839801995 4
HAYCOOL SECT 2103

Cool Mac™ Animation

INFORMATION CENTER
All Skill Levels
Book / Disk
General Macintosh

What does *Cool Mac Animation* do for you?

Your Mac has suddenly become an animation studio. Pop in the *Cool* disk and—simply put—it's your time to get creative with animated art!

Once you're ready, use *Cool Mac Animation* and learn how to:

- Record, edit, and play back animated QuickTime Movies
- Understand the most exciting and revolutionary Mac technology
- Work with Re-Animator, MacroMind Director, and other video software and hardware
- Explore the spectrum of digital Mac animation—and let it work for you

"Ehhhhhh....What's on the Mac?"
—*Bugs*

"Be vewy, vewy quiet. I'm dwawing Wabbits."
—*Elmo Fudd*

"Louie, I think this could be the beginning of a beautiful friendship—you know, this Mac thing."
—*Humphrey Bogus*



HAYDEN

Clint Hicks
is a best-selling computer book author and gourmet cook. Since 1984, he has been writing about personal computers and winning awards for his technical skills. He has served as Manager of Technical Publications for Peter Norton Computing, Inc., and has authored books for both Mac and DOS users. He lives in Santa Fe, New Mexico—a cool town if there ever was one—with his wife and daughter, three computers, two cats, and a sheepdog.

What's on the disk:

- Popcorn —a QuickTime player
- The exceptional QuickTime extension
- Re-Animator
- Lots of promos and animated movie shorts
- Clip art & more

$19.95 USA
$24.95 CAN

ISBN 0-672-48521-4
90000
9 780672 485213